

# THE ROLE OF TRANSPORT IN THE DEVELOPMENT PROCESS: CASE STUDIES FROM QUÉBEC, INDONESIA, ZIMBABWE AND CHINA

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*On the basis of the discussion in Chapter 2 of some theoretical aspects of the relationships between transport and the development process, and the introduction of a wide range of examples, this chapter outlines in more detail the evidence from four contrasted case studies chosen from North America, Africa and Asia. By this method the chapter interprets, in a variety of contexts, the concept of transport as a permissive factor rather than as a direct stimulus to economic development or spatial change. A conclusion attempts to draw lessons from the individual case studies that may be of wider general relevance.*

## INTRODUCTION

This chapter examines the role of transport in the process of spatial change, in a variety of contexts, at various levels of development and in terms of a range of modes and intermodal systems. The essential focus is on transport as an economic enabler and as a social facility, at various levels within the development spectrum, in the more distant as well as the recent past, and with an eye to the present and to the foreseeable future. The interpretation rests on the idea, discussed in Chapter 2, that transport is normally a permissive factor in socio-economic terms rather than a direct stimulus to economic development or spatial change.

Four case studies – from Québec, Indonesia, Zimbabwe and China – allow varying interpretations of the balance between factors affecting the transport-

development relationship. The broad sweep of Québec's history, in a North American context and in the context of Euro-American relations, illustrates the power of transport to mould and condition societies and economies as their political frameworks evolve. While China differs from Canada in almost every respect, the evolution of China's transport systems and services, and their relationships with economic development, nevertheless reflect Sino-European relations as well as China's characteristically introspective policies. Zimbabwe and Indonesia illustrate in other ways the impacts of colonialism as an initial provider of modern transport facilities, but equally demonstrate the problems faced by developing countries today where there is a widening gulf between transport demand and the resources available to meet that demand, and where increasing rather than reducing diversity in levels of

transport provision acts as a brake on economic progress and national-scale integration.

Each case study reflects a complex web of relationships involving transport and a wide range of other physical and human factors, sometimes over specific periods of development and change, sometimes at particular points in time. At a detailed level, most of these relationships are specific to the areas or countries analysed and to particular development phases, but collectively they demonstrate some of the broad underpinnings of transport geography in a developmental context. While one purpose of presenting four contrasted examples is to demonstrate both the universality and the variety of the transport–development relationship, viewed globally, another is to encourage readers to investigate different but comparable case studies where similar or contrasted factors may have played an important role.

### **QUÉBEC: INTEGRATION, ISOLATION OR INDEPENDENCE?**

The Canadian province of Québec provides a first case study and offers not only an illustration of relationships between transport and development in a variety of contexts, past and present, but also an exemplification of the general principles outlined in the models proposed by Vance (1970) and by Taaffe *et al.* (1963) (Chapter 2). Québec is Canada's largest province in area (1.7 million km<sup>2</sup>), but contains only about 6.5 million people, most of whom live in the St Lawrence lowlands, along the transport axis linking Montreal and Québec City (Yeates, 1975) (Figure 3.1). Transport is undoubtedly a fundamental factor that has affected the development and character of Québec's economy and society over time and continues to do so today (Allison and Bradshaw, 1990).

The Québec environment is not a particularly promising one for settlement and development, especially in climatic terms, in comparison with other North American areas into which European migrants moved over hundreds of years. Yet in this

case the combination of the beaver, the offshore fisheries, the agricultural potential, the timber and above all the magnificent transport artery provided by the river made the St Lawrence lowlands a zone of attraction from an early date, and human use of this environment and in particular its arterial route-way has had significant politico-economic repercussions throughout much of North America (Lasserre, 1980).

### **Heartland and Hinterland: Québec as a Focus of In-Migration**

Québec is the historic heartland of Canada, the location of the first substantial European settlements in North America, the historic context of the confrontation between Britain and France in this part of their colonial empires, and the geographical focus of French culture in present-day North America. In terms of the heartland and hinterland concept, Québec is historically the Canadian politico-economic core (Waddell, 1987). Modern Canada, however, has seen the migration of this core south-westwards towards the neighbouring province of Ontario and its capital Toronto, Canada's largest city, as well as to Ottawa, the federal capital. Today, although Québec remains a highly distinctive entity geographically, politically and socio-economically, this province has for some years appeared to be poised on the brink of secession from the Canadian federation. If Québec secedes, the geopolitical disintegration of the rest of modern Canada may follow.

In many ways, the geography of transport provides an essential key to an understanding of the Québec problem. From a historical perspective European intervention in North American affairs, based on transatlantic sea transport, took place in the context of earlier, overland migrations of so-called Indian peoples from another direction. Before the coming of the Europeans across the North Atlantic, much of Québec was inhabited by groups of "native" peoples. Following the retreat of the last Ice Age over 10 000 years ago, migrants from Asia had crossed via Alaska into Canada and gradually

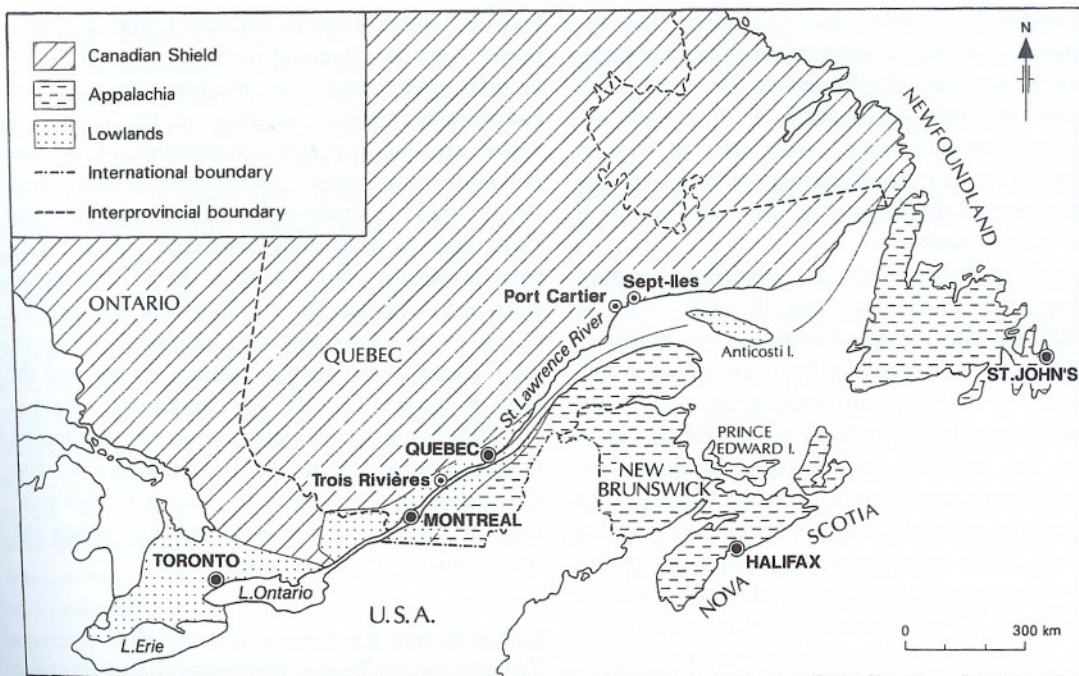


Figure 3.1 The St Lawrence artery

moved south and east, on foot or by canoe. For these Indians, the St Lawrence lowlands were an attractive but terminal zone in their long-continued migrations from the far northwest. For the Europeans coming westwards across the North Atlantic, in contrast, the St Lawrence artery provided ready-made access, a gateway into new North American territories ripe for exploitation.

## New France

The beginnings of European settlement and economic exploitation in Québec, initially dependent upon sea transport, date back many centuries. European explorers came across the Atlantic in search of new resources and new ocean-transport routes to the Orient and its riches, and at first had no idea of the extent of the Americas or of the Pacific Ocean's existence. Thus, North America was labelled "Nova India" on some sixteenth-century maps, and its inhabitants termed "Indians". Quite early in this

process of exploration, the St Lawrence became known as a convenient navigational entry route into new lands of economic opportunity, and trading posts were set up along the river. Between 1570 and 1650 many French fur traders came to the shores of Québec, bartering with the Indians who brought furs down to the St Lawrence from the north and west, overland and by canoe. European traders were sometimes actively discouraged from penetrating inland, but at first there was no real need for them to do so.

New France, as areas coming under French influence in North America were known, centred on Québec City, founded in 1608 as a gateway in settlement and transport terms. The fur traders who set up their extensive supply and trading networks were known as *coureurs de bois* – literally, the runners of the woods – and moving around on foot, sometimes over considerable distances, was an important if elementary form of transport at the time. When New France was declared a crown colony in the 1660s this

encouraged immigration and settlement, the development of transport facilities and the diversification of the economy. Explorers travelled west to the Rockies and south to Louisiana. At its greatest extent New France covered a vast area, at least in theory; but it was in practice no more than a trading empire, dependent upon slow, primitive forms of transport, especially rivers.

French pioneer settlers in seventeenth-century Québec lived off the land and off trade as far as possible; but they remained dependent on maritime transport for the expanding fur trade with Europe, for imported textiles and clothing, as well as for wines and brandy to help them survive the rigours of winter. The farm unit and the family were the keynotes of this peasant society, and river transport was the essential network tying the settler communities together. The later seventeenth and early eighteenth centuries were punctuated by Anglo-French wars in northeastern North America as settlements, transport routes and territories were fought over.

Eventually, Britain gained the upper hand: Québec City, the strategic gateway, was captured by the English in 1759 (an encounter in which the river played a crucial part); and all of New France was formally ceded to Britain in 1763. In spite of the advantages of the St Lawrence transport artery, therefore, the French endeavour in North America was relatively unsuccessful, partly because the English colonies along the eastern seaboard of the continent were far more accessible and more attractive to settlers. Ultimately, links between an emergent USA and the core zone of an emergent Canada in Ontario contributed to the marginalization of Québec as an anomaly in a predominantly anglophone continent.

### **British Rule**

At first, the change from French to British rule did not fundamentally alter the Québec economic and transport systems, but as the nineteenth century progressed a society undergoing rapid transformation began to generate new forms of economic activity and new transport demands. The creation of an

English Upper Canada (Ontario) and a French Lower Canada (Québec) in 1791 reflected Anglo-French rivalry and also reactions to the early politico-geographical evolution of the USA. The American Civil War (1861–5) convinced Canadians of their need to achieve political independence from Britain and to remain separate from the emerging USA; and, to these ends, produced a political climate favouring union between the various British colonies in Canada. The British North America Act of 1867 created the Canadian Confederation, signalling the end of the British colonial régime and the birth of modern Canada. These political changes at the Canadian national scale were in part a reflection of transport factors, notably the building of a trans-Canada railway, and within Québec as in other provinces they gave rise to new demands for urban and rural transport facilities and services.

### **Economic Expansion and Transport Development in an Independent Canada**

The expansion of transport networks, especially railways, played a prominent part in the process of economic development in Canada. As the geopolitical and economic map of North America evolved, Québec's geographical location ensured an important role for the province in transport terms. The first great period of railway construction began in the 1850s, and by 1885 the Canadian Pacific Railway linked the Atlantic and Pacific coasts. The great port city of Montreal became a focal point within this system. By the 1870s industrialization, urbanization and the influx of French urban employees meant that Montreal had become eastern Canada's major economic and transportation centre, where entrepreneurs were investing heavily in industries, railways and banks.

The early twentieth century brought accelerated economic development in Québec, and Montreal became increasingly a nodal service centre for the development of the Canadian west – exporting wheat from the prairies through its growing port and sending its own industrial products along the railways to

the pioneer fringe. During World War I the transcontinental Canadian Pacific Railway was replicated by the consolidation of other privately owned railways to form two further transcontinental lines, the Canadian Northern and the Grand Trunk Pacific, which were taken over by the Federal Government during World War I to avoid closure and which together formed the Canadian National Railway in 1923. In Québec, new industries based on hydro-electric power exploitation began to appear – aluminium, chemicals – as well as a modernized forestry and paper industry. This industrial progress, partly based on US investment, led to increased transport demands met by port development, road construction and rail-network improvements. While transport improvements helped to bind the emergent Canadian nation together in political as well as economic terms, by the 1930s they also facilitated the beginnings of the migration of economic power southwestwards through the Canadian heartland away from Montreal and towards Toronto.

Recent decades have seen a scientifically based modernization drive, as Québec has tried to keep its place in the forefront of twentieth-century North American development, although increasing economic prosperity has been paralleled by increased dissatisfaction with Québec's place within a federal Canada. Rapid post-World War II economic growth – in mining, manufacturing and service industries – involved rapid urbanization, improved transport and the further marginalization of the farming community. Today, the Québec economy depends substantially upon natural resource exploitation, including vast hydro-electric power resources, iron ore deposits, abundant timber and numerous other minerals including asbestos, copper, mica and lead. Growing industries include pulp and paper, chemicals, aircraft and food processing.

### **The Québec Port System**

Ports and port cities have played, and continue to play, a particularly important part in the economic life of Québec. The development of the province, as

in a sense the development of Canada as a whole, is rooted in maritime exploration and trade, and in the foundation of coastal settlements which provided an initial basis for movement into the interior. Today, several of Canada's major cities – including Montreal and Québec City – continue to function as seaports, although their urban economies are now greatly diversified.

The Province of Québec possesses a great variety of ports, paralleled by a complex management system involving federal, provincial and local government. Four of Canada's top 10 ports, measured by total cargo throughput, are located in Québec (Table 3.1). Two of these, Montreal and Québec City, are major multifunctional general cargo ports; the other two, Port Cartier and Sept-Îles, located on the north shore of the St Lawrence estuary, serve primarily as exporting ports for iron ores and other minerals extracted from the northern interior of Québec province. The province is also served by a variety of smaller ports such as Trois-Rivières that fulfil important local and regional functions. Table 3.1 lists all Canadian ports handling over 10 million tonnes in 1995 and shows that in this respect no individual Québec port approaches the leading Canadian port, Vancouver, which maintains its traditional west coast dominance (Forward, 1982) and has a largely different foreland. It is interesting to note, however, that Thunder Bay (Ontario), the interior terminal on Lake Superior of the route plied by ocean-going vessels using the St Lawrence Seaway, handles a total throughput approaching those of the four Québécois ports on the list. While the Seaway has accentuated a tendency for shipping to bypass Québec ports in favour of destinations further west, the need for transshipment (for example, in the grain trades), due to the Seaway's limited maximum ship size, has enhanced throughput levels at Montreal. In terms of interport competition, however, Québécois ports are disadvantaged in locational terms in comparison with US east coast ports such as Baltimore, Boston and New York.

Québec today is nevertheless an important component in the Canadian overseas trading economy,

Table 3.1 Leading Canadian ports by total throughput, 1990–95  
In order of 1995 performance (million tonnes)

Port	1990	1991	1992	1993	1994	1995
1 Vancouver (BC)	64.5	68.4	61.3	58.9	64.6	69.5
2 Port Cartier (Qué)	20.6	22.9	21.3	19.3	21.7	24.9
3 Sept-Îles (Qué)	21.3	21.4	19.2	21.0	22.6	18.7
4 Saint John (NB)	14.4	17.2	15.6	19.3	20.9	18.7
5 Montreal (Qué)	21.1	16.2	16.6	15.8	19.6	18.6
6 Québec (Qué)	17.1	18.2	15.7	13.2	16.0	17.4
7 Halifax (NS)	16.8	14.2	13.8	14.2	14.4	13.2
8 Hamilton (Ont)	11.9	10.7	12.6	12.4	12.5	11.9
9 Port Hawkesbury (NS)	7.9	6.2	4.1	6.4	6.9	11.9
10 Thunder Bay (Ont)	13.9	16.9	12.7	11.3	13.7	11.5
11 Prince Rupert (BC)	12.5	13.0	12.6	11.3	13.5	11.4
All Canadian Ports	353.1	350.8	327.7	324.1	351.7	360.6

The table shows all ports handling more than 10 million tonnes in 1995, the year in which Port Hawkesbury entered the top 10 group for the first time.

Source: Statistics Canada, *Shipping in Canada* (Ottawa, annually).

exporting vast quantities of grains, ores and forest products to a wide range of destinations, as well as relying on international container trades for a wide variety of imported and exported goods. It follows that the efficiency of Québec's ports is a matter of critical provincial and national importance in developmental terms. Any port system is by definition dynamic, and the changing character of port activities, together with the broad sweep of late twentieth-century urban economic and social change, have radically altered the historic relationships between ports and cities, and between ports and hinterlands in recent decades. This has affected the character of individual Québec port cities, modified the provincial port system, and produced some striking examples of the now widespread phenomenon of waterfront revitalization. While continuing to serve as maritime terminals, older zones within port cities such as Québec and Montreal have acquired new functions and characteristics in their new role as tourist-historic cities. In this sense the sites of some of the earliest European settlements and transport foci in North America, doorsteps from which development spread far and wide, have themselves experienced further substantial changes as their functions are once more transformed.

## INDONESIA: NEEDS, RESPONSES AND INTERMODAL BALANCE

A quite different but especially interesting case study of relationships between transport and development can be found in Indonesia (Figure 3.2). With an archipelago setting of huge geographical dimensions, a significant resource base, and a large population, the country has faced a major challenge in coping with transport demand, with the rapidly increasing need for enhanced transport capacity and with the need to provide transport facilities on an efficient and equitable basis (Leinbach and Chia, 1989). Nowhere is there a more conspicuous example of the real dilemma of satisfying regional and structural needs from limited resources. Yet Indonesia's emergence as one of the more dynamic economies in the South-East Asian region is testament to the fact that transport has responded to critical needs. This case study, which exemplifies some aspects of the Rimmer (1977) model (Chapter 2), discusses very briefly the historical background and then the economic bases associated with the development of transport in Indonesia. Most important are the critical needs involved in revitalizing an

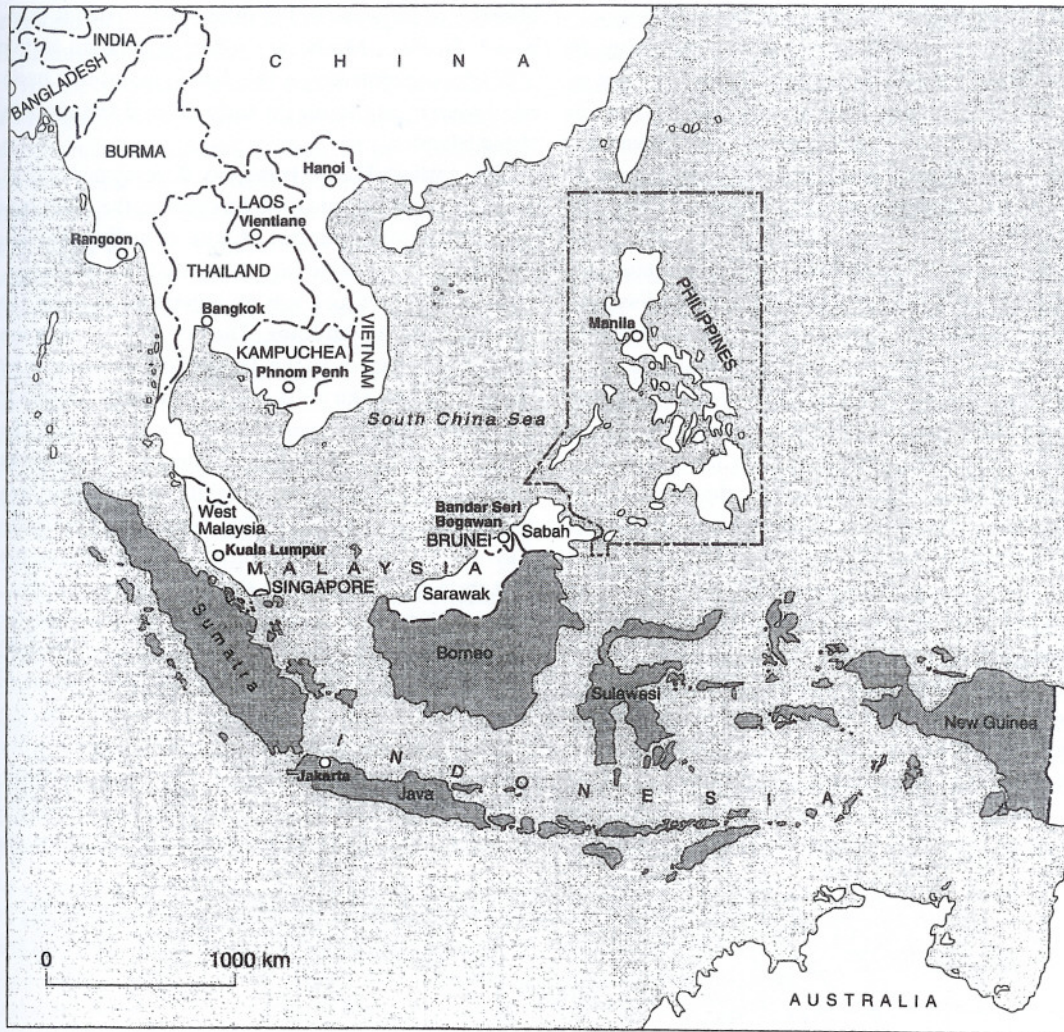


Figure 3.2 Indonesia in its South-East Asian context

archaic system, and the ways in which the government has responded. Changing priorities, problems and policies are addressed.

As with colonial intervention elsewhere in South-East Asia, water transport played a key role in early economic development for both intra- and inter-island movement. The significance of inter-island shipping has been emphasized in a recent study (Rutz and Coull, 1996). The development of land transport in Indonesia reflected the Dutch need to

establish administrative control and simultaneously to encourage the growth of a spatially discrete agricultural economy. The first development attempts were carried out by the United East India Company, a Dutch trading firm, through a mastery of trade in spices, especially nutmeg, cloves and pepper. So-called "factories" or processing operations were established throughout Sumatra, Java, Sulawesi (then the Celebes) and the Moluccas during the seventeenth century (Van Goor, 1996). These

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isolated coastal operations had few internal transport connections. After the Dutch monopoly of shipping in the archipelago was broken by the Treaty of Paris in 1784, British and other vessels were free to trade in the area. Shortly after this, a new Dutch Governor-General emphasized a refashioning of the administrative system in order to exert better control and stimulate commerce. One aspect of this was the construction of interior roads. Another major development impact was the Dutch-introduced system of forced cultivation, known as the Culture System. Instead of paying taxes and rent in money, Javanese peasants were obliged to devote land and labour to the cultivation of export crops such as indigo, sugar and especially coffee. Earnings from these were not used in Java but rather transferred to the Dutch treasury and were used in part to finance construction of the Dutch railways. However, when these transfers ceased in 1878, more revenues from the East Indies were used for local development and especially for transport and irrigation.

Given the fragmented nature of the country, a decision was made at an early stage to concentrate the limited resources available for transport investment, both road and rail, in Java. While a railway was developed in Sumatra to support commercial agriculture, the fragmented lines there and the

absence of railways in the other Outer Islands (Sulawesi, Borneo, Moluccas) reflect a decision in the 1930s to concentrate on the development of a basic road system as the major form of land transport in these islands.

The earliest Dutch transport development effort focused upon Batavia with linkages to the other major administrative centres of Java, as well as the agriculturally productive areas of that island. Later, Sumatran agriculture was an important stimulus for road and railway building. The first major link in the Javanese system was the Great Post Road built by the Dutch between 1808 and 1811 in preparation for a possible British invasion. The road ran from the Sunda Strait to Jakarta (then Batavia) and along the north coast via the agricultural heart of central Java to east Java (Figure 3.3). This main link in the highway system provided essentially the route for the first state railway. Later, a shorter route via Cirebon, Semarang and the lower Solo Valley was used for both the main highway and railway lines. Coupled with this early growth, the gradual development of ports, first on Java and later elsewhere in the archipelago, also provided an important stimulus for the further development of the road network. Gradually, as the administrative and commercial impress of the Dutch diffused outwards, a maritime

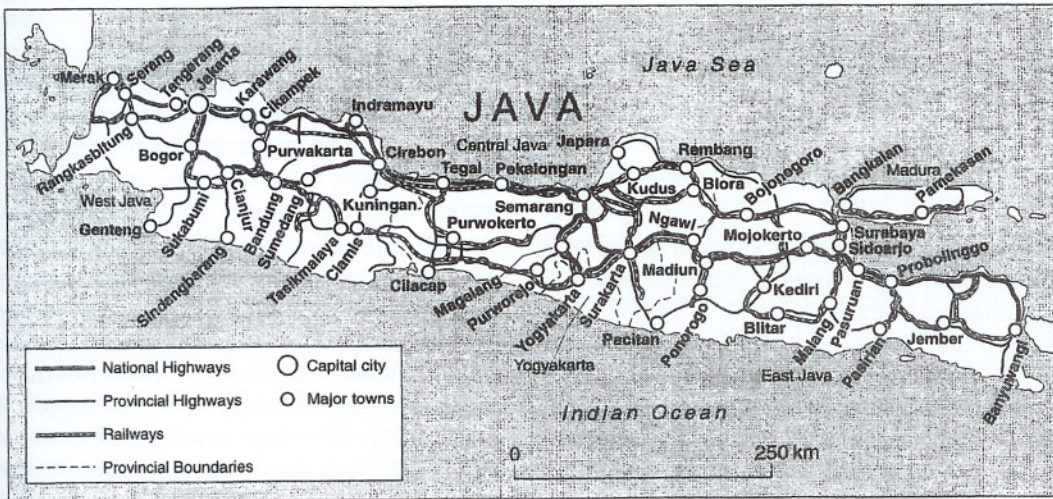


Figure 3.3 Highways, railways and ports in Java



emphasis became evident and is conspicuous today in patterns of interaction.

The early spatial focus of Dutch efforts produced a strong centre-periphery contrast in the pattern of development in Indonesia. Over 60 per cent of the current population of over 200 million is concentrated in Java and Bali where well-developed market economies exist. Concentrations also exist in select areas of Sumatra, Sulawesi, Kalimantan and other Outer Islands. Rubber, oil palm and other commercial crops dominate the lightly settled areas of portions of the Outer Islands. Agriculture and timber were the major revenue sources prior to the 1970s when oil became a key resource. Oil prices and the world market for this commodity have been closely tied to development investment. Transport expansion and upgrading benefited greatly from the strong oil revenues of the 1970s and 1980s.

However, recognizing the drawbacks of reliance on a single source of revenue, the government has now moved towards a policy of economic diversification in a range of bulk commodities and has expanded the production of plantation crops, such as oil palm, and emphasized the development of new basic industries such as fertilizer and cement. The allocation to transport in Five Year Development Plan budgets through the mid-1980s was dominated by an emphasis on roads. During the 1970s roughly 93 per cent of all goods and 99 per cent of all passengers were accounted for by the road system, but from 1979 to 1984 the modal allocation recognized the need for improvements in civil aviation and sea transport. This continuing trend reflects the improved quality and maturation of the road network as well as the need to extend assistance to other critical modes, given the fragmented nature of the spatial economy and population base.

Transport investment in Indonesia has increasingly been utilized since the mid-1970s as a policy instrument in development. Beginning with a series of highway rehabilitation projects funded by the United Nations Development Programme (UNDP) and the World Bank, progress in the diffusion of reliable access in the Outer Islands has been steady. Such higher-order linkages are forged to

strengthen basic connectivity in the highway system but at the same time often serve as major developmental or penetration linkages, which are intended to stimulate growth in areas where poor transport has been a binding constraint on regional development. The notion of "bottlenecks" and "constraint points" in the transport system throughout Indonesia remains an important factor in policy decisions on new investment.

The Trans-Sumatra Highway is a prime example of such a linkage. The concept of a spinal highway developed in the 1970s from the notion that it would be a catalytic force and stimulate development along its length. The highway, which stretches from Banda Aceh in the northwest to Tanjungkarang opposite Java, is actually a synthesis of road segments built at various times, mostly during the Dutch period, and is now (mostly) a two-laned surfaced road (Figure 3.4). Funds for the project were initially provided by the World Bank as part of rehabilitation efforts in Sumatra. Later the objective was to close gaps in the highway mainly in support of nearby transmigration and plantation areas. While the catalytic impact on development has been somewhat overstated, there is little doubt that the development of a continuous through-road has integrated the major cities of Sumatra and lowered transport costs while improving trade within the island and the major market areas of Java. Plans for similar trans-insular highways exist for Sulawesi and Kalimantan but have not been fully implemented.

There is widespread agreement that a rationalization and more efficient use of the existing road network is possible and, moreover, desirable in lieu of new construction. Despite this acknowledgement, however, there are numerous instances throughout the archipelago where rapid growth and capacity constraints have created bottlenecks to economic development. One strategy in these situations has been to construct toll roads. These are viewed as a tax on the relatively affluent segment of the population and have been utilized in both inter-urban and intra-urban situations. In Java, the Jagorawi Highway linking Jakarta with Bogor was the earliest such facility (Photograph 3.1). With an emphasis on

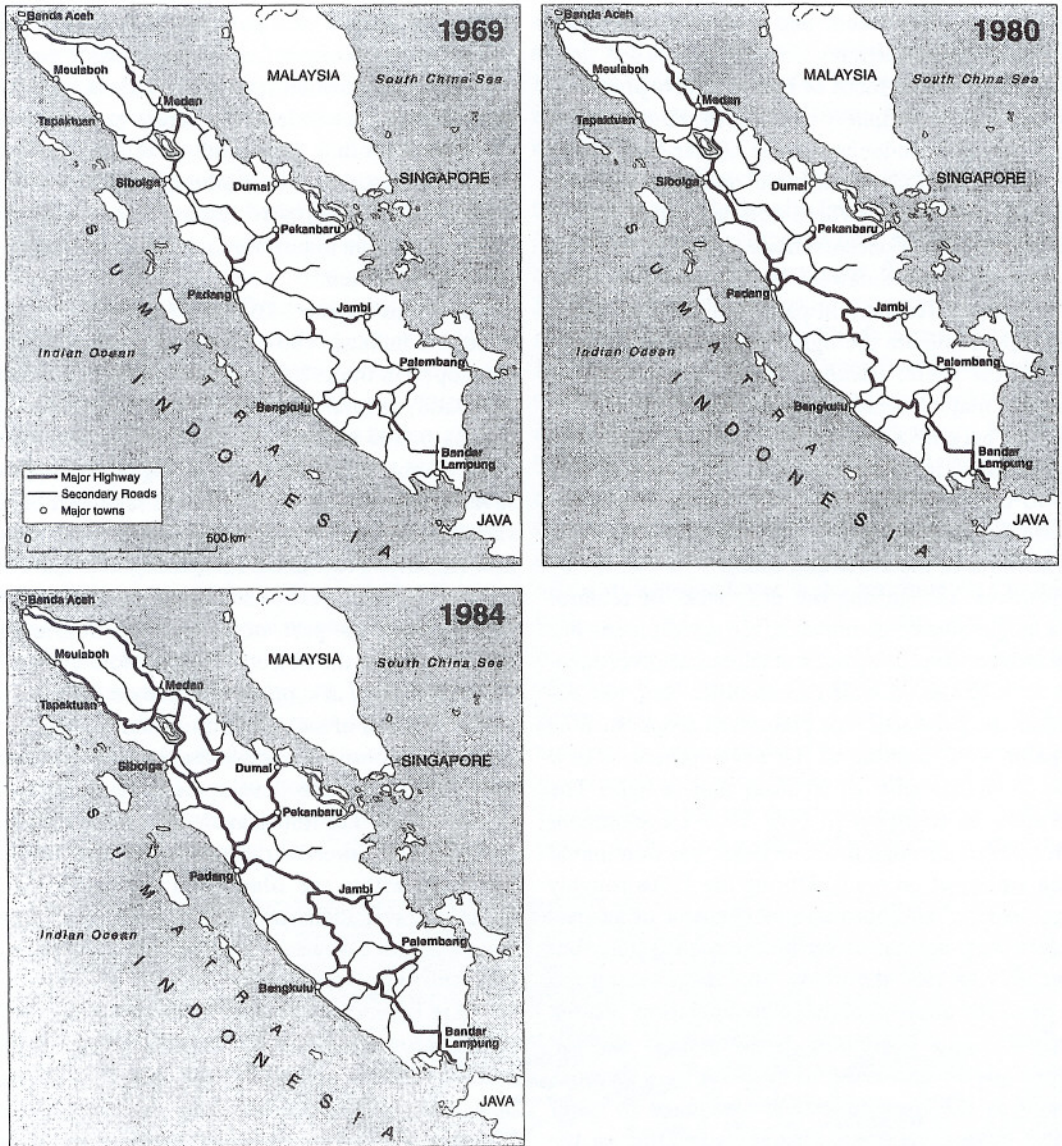
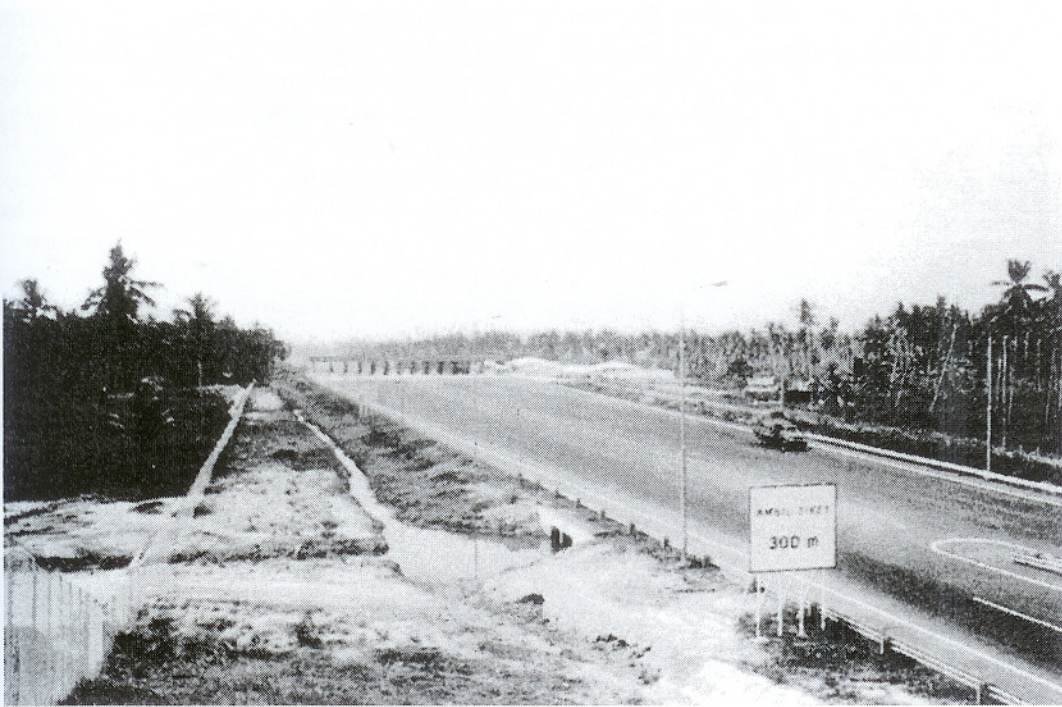


Figure 3.4 The development of the Trans-Sumatran Highway

liberalization, the concept of the toll road operated by private enterprise has grown considerably and currently many such projects are planned for Java. The toll road system is partially financed through the sale of bonds on the local market and operations and maintenance are financed through revenues (Table 3.2).

## Rural Development

In the context of the development objectives for the Outer Islands, in particular eastern Indonesia, rural road improvements and the enhancement of port facilities have become high priorities. In the early



Photograph 3.1 The Jagorawi Highway, Indonesia, between Bogor and Jakarta (T. Leinbach)

1980s it was estimated that 30 per cent of Indonesian villages outside Java did not have vehicle access to main highways. A concentrated effort to improve rural roads came relatively late as a result of the critical need to rehabilitate basic highways especially after the Japanese occupation. However, this need has been a part of formal development plans since the mid-1980s as the country's rural development strategy has gained momentum.

Funds to implement and finance road improvements at the district level come from central government and foreign sources. The programme known as *Inpres Jalan* has been used internally to allocate funds provided by international assistance agencies to especially needy districts. In this connection the government also developed a programme called *Padat Karya Gaya Baru* that aims to provide supplemental cash incomes for unemployed labour through the construction of roads through labour-intensive methods (Photograph 3.2). Popular

through the early 1980s, the programme resulted in the growth of cash crops, improved marketing, attraction of regular transport services, expanded personal mobility and the more frequent use of social services such as family planning. Although employment was temporary, it provided a critical income injection for many poor families. At the same time negative impacts under this programme included the destruction of existing modes of production, which in turn created unemployment. Moreover, too often the new or upgraded access provides the most benefit to outsiders, not local residents. Another critical factor in the ongoing success of these small road projects has been the need to establish responsibility for maintenance.

### Transport Sector Issues

The objectives of the transport sector are clearly tied to strategic development issues such as the

Table 3.2 Indonesia: toll road construction plans, early 1990s

Road Section	Length (km)	Investment (m rupiah)
1 Cawang-Tanjung Priok	17.6	371 000
2 Cibitung-Cikampek	47.5	78 000
3 Tangerang-Merak (1st stage)	34.2	260000
Tangerang-Ciujung (2nd stage)		
Ciujung-Merak	43.2	441 220
4 Surabaya-Gresik	20.0	183 000
5 Jakarta Outer Ring	39.8	1 252 843
6 Cikampek-Padalarang	59.0	834 352
7 Jakarta-Serpong	11.9	94 128
8 Medan-Binjai	21.9	138 655
9 Ujung Pandang	3.1	19 534
10 Jakarta Harbour Road	12.0	585 000
11 Cikampek-Cirebon	133.0	1 271
12 Semarang Arteri	8.0	97 465
13 Semarang Bawen	22.0	65 930
14 Surabaya-Mojokerto	38.0	400 000
15 Semarang-Batang	29.0	120 000
16 Gempol-Malang	55.0	87 600
17 Gempol-Pasuruan	27.0	81 000
18 Yogyakarta-Surakarta	60.0	123 700
19 Bogor-Bandung	120.0	703 253
20 Cirebon-Tegal	69.0	
21 Tegal-Batang	69.0	

Source: Ministry of Public Works.

promotion of non-oil exports, increasing food production, and supporting transmigration, industrial centres and tourism. In an effort to achieve these objectives, within the constraints of limited budgets, a number of issues have emerged (Leinbach, 1986, 1989). These include: the adequacy of public-sector investment and appropriate modal balance; inadequate transport sector management and intermodal

coordination; government subsidies within the transport system; deregulation of the transport industry; the lack of road maintenance; utilization of rail capacity; and improved efficiency in the maritime and ports sector.

Debate and discussion on these issues are ongoing and no clear policy directions or strategies have emerged. Table 3.3 shows the general emphasis on roads and, in recent five-year plans, increased emphasis on railways, ports and airports, sometimes (as in Repelita IV) at the expense of roads allocations. Among the many issues under debate, several deserve special emphasis. These are the future of the railway in Indonesia, the restructuring and improved efficiency of ports, and the status and implications of government subsidies within the transport system, including the pioneer transport services programme.

### The Indonesian Railway Dilemma

The Indonesian State Railway system provides a total track length of 6800 km, 30 per cent of which comprises three separate lines in North, South and West Sumatra (Figure 3.5) while the remaining 70 per cent serves Java (Figure 3.3). Despite an effort to carry out a railway rehabilitation and modernization programme, inadequate maintenance and the lack of re-investment in equipment have plagued operations and discouraged traffic. The railways have gradually deteriorated. Although the share of passenger and freight traffic improved between the mid-1970s and the mid-1990s, the system's financial performance declined. Revenues increased, but expenditure more than doubled and the deficit expanded four-fold. One explanation for this is the existence of cross-subsidies. Several essential commodities, but especially petroleum products, the largest single traffic item, were carried at rates much below the average tariff. Remedial measures have now been effected so that tariffs have increased. Yet the basic problem of inadequate demand persists.

The long-term role of the railway in the Indonesian transport system must lie in its effective bidding



Photograph 3.2 Indonesia: a labour-intensive road project under the PKGB programme (T. Leinbach)

Table 3.3 Indonesia: allocations for transport, 1969-94 (percentages)

	<i>Repelita I</i> 1969-74	<i>Repelita II</i> 1974-79	<i>Repelita III</i> 1979-84	<i>Repelita IV</i> 1984-89	<i>Repelita V</i> 1989-94
Transport percentage of development budget	17	16	14	12	18
Intermodal distribution of allocation					
Roads	75	78	67	46	63
Railways, road transport	6	7	8	18	12
Ports and shipping	10	10	13	22	11
Airports and aircraft	9	5	12	14	14
	100	100	100	100	100

Sources: For 1969-89, Indonesia, Directorate of City and Regional Planning; for 1989-94, *The Five-Year Plan IV (1984-89) and V (1989-94)*.

for the haulage of bulk commodities especially in Java but also in Sumatra. The government must also improve and restructure its tariff schedules for the railway so that it may operate more flexibly in order

to compete with road transport. The long-standing problem of competition between these modes, especially over short distances in Java, is still relevant in Indonesia as elsewhere. At the same time

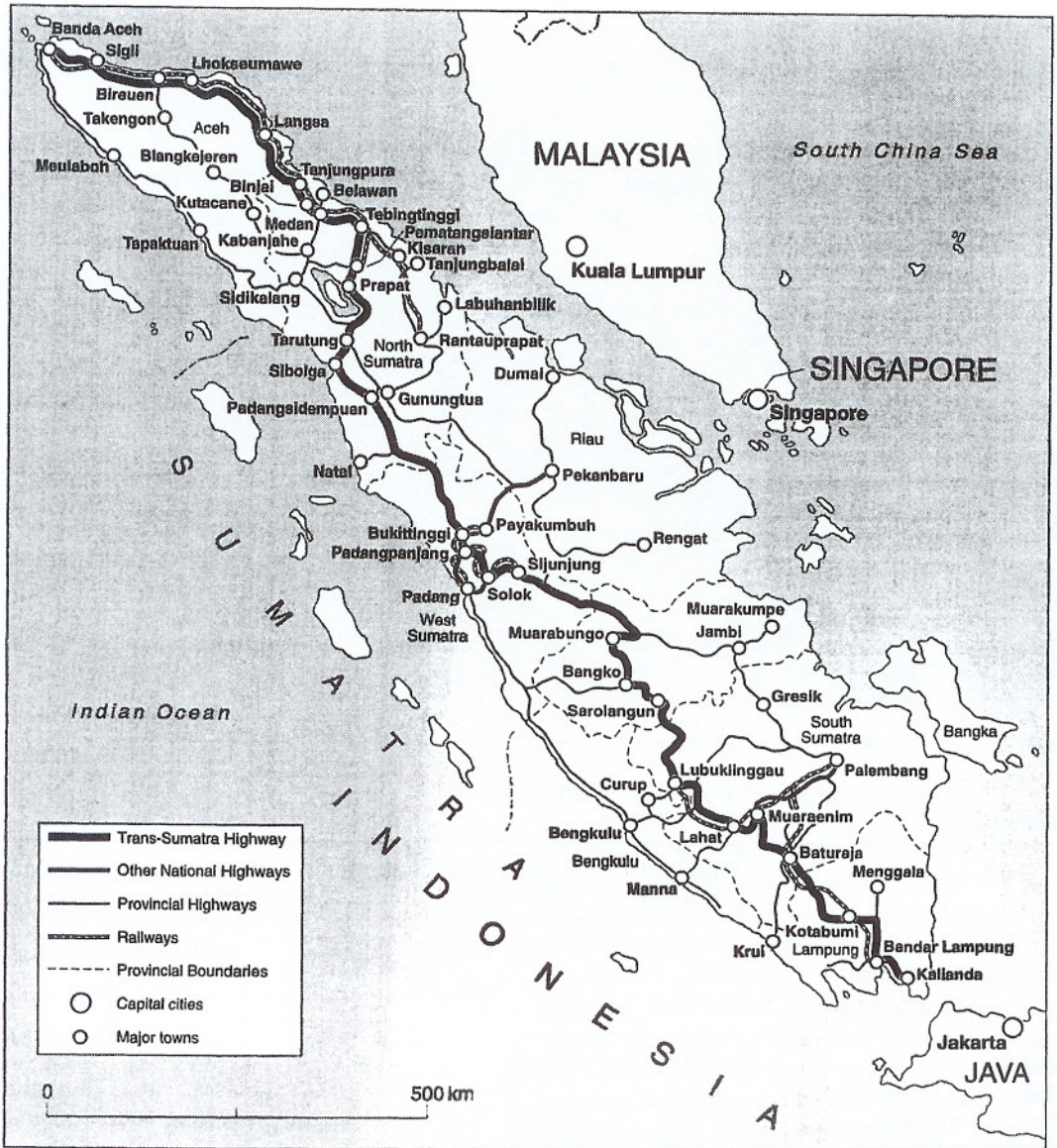


Figure 3.5 Toll roads, railways and ports in Sumatra:

long-run variable costs must be covered and non-bulk services must be upgraded to entice users. Freight consolidation between major nodes in Java could result in additional substantial traffic. Impact analyses suggest that the railway could be an economical carrier of intermediate and long-haul

passenger services. Given a Java-centred industrialization policy, traffic forecasts reveal healthy growth in freight and passenger traffic of 4 per cent and 7 per cent respectively. Major keys to future improvements might lie in the closure, as elsewhere in the world, of short inefficient branch lines and new

strategies that seek additional traffic generation and operational efficiency.

## The Indonesian Port System and Inter-Island Shipping

It is essential that a fragmented, island-based country such as Indonesia has an efficient port system especially now that a strong export policy is being pursued. While early efforts to improve ports largely failed, in the mid-1980s a recommendation for a trunk-feeder system was made. This system is intended to allow the transfer of cargo more efficiently from high-order to low-order ports. Operationally this has resulted in a "gateway" scheme whereby four ports (Tanjung Priok in Jakarta, Tanjung Perak in Surabaya, Ujung Pandang in Sulawesi, and Belawan serving Medan) were selected to serve as major export outlets for the country. These major ports are served by a series of collector (second-order), trunk (third-order) and feeder ports. This reorganization, while comprehensive and logical, required massive investment and heightened the demands on management. The results of this reordering strategy have been far from satisfactory. Port modernization, however, has proceeded in Tanjung Priok, Tanjung Perak and Belawan (Airriess, 1991).

The impact of port deficiencies is greater upon deep-sea shipping, however, than upon inter-island shipping. Being much smaller, inter-island ships are more easily able to obtain berths and make fewer demands upon mechanical cargo handling. Moreover, since they do not carry import cargo they are not impacted by warehouse congestion constraints. The impact of port quality is also clearly associated with firm efficiency and proper management skills. More efficient firms have used a variety of initiatives to circumvent the perceived deficiencies of smaller ports. For example, scheduling berth usage and using manpower around the clock are two techniques that have proved useful. In the smaller ports of the Outer Islands as well as in the larger ports of Java, *lokal* (local/feeder) and *prahu* (indigenous craft) operations are not constrained by the state of

physical facilities. Despite the lack of modern infrastructure these ports function at a high level of productivity because there is much less bureaucracy and customs procedures are much more informal. Although cargo is manhandled, rates are high, damage low and pilferage much lower than elsewhere.

At the same time a strong environment of control developed, and a variety of restrictive regulatory measures were imposed. These measures reserved Indonesian cargo for Indonesian vessels, controlled the entry of foreign flag ships, and allowed transshipment container cargoes to and from Singapore to be reserved exclusively for Indonesian and Singaporean vessels. More important were customs regulations and long delays in ports which tended to constrain export expansion. This protected and strongly regulated system was shaken by a Presidential decree, INPRES No. 4 1985, intended to smooth the flow of goods, which essentially provided for streamlining and greater efficiency in customs and port procedures. A major improvement occurred as export goods were exempted from customs inspection and a Swiss firm was appointed to inspect cargoes. However, in contrast to this positive development, shippers were allowed access to foreign flag vessels, which in turn exposed inter-island shipping to international competition. Displacement of capacity, even in areas such as eastern Indonesia, resulted and the effect was to create financial uncertainty for Indonesian shipowners already plagued by overcapacity and depressed rates. Partial deregulation has essentially forced a survival attitude in the shipping industry. Despite some loosening of control the continuation of regulation reinforced the high cost of inter-island shipping, which in turn presents an obstacle to a growing domestic market. Premature replacement of ships and overinvestment in port facilities because of a "technology preoccupation" rather than a management focus were other negative side-effects. Such continued constraints on shipping will ultimately force more cargo towards a trucking industry unhampered by regulation (Dick, 1987). A completely deregulated inter-island shipping industry must be an important stimulus for regional

development. This economic reform is now in the process of implementation.

Despite the tremendous growth of air transport, it is clear that inter-island freight and passenger shipping will continue to be critically important to development. Revenue evidence from low-income passengers (many higher-income users have switched to air) and the continuing influence of government policy in transmigration (voluntary resettlement of poor families to the Outer Islands) and regional development, especially the emphasis on eastern Indonesia, supports this statement. The current pattern of routes and frequency of services reflects a high intensity of connections from Aceh to Timor and especially from Java to the ports of Kalimantan and Sulawesi. Clearly the greatest demand for inter-island passenger connection is on the routes between Java and the nearby regional metropolises but, in fact, ships also serve the provincial capitals of eastern Indonesia as well as Jayapura, the capital of Irian Jaya (Rutz and Coull, 1996). Since 1985 regional centres in the more remote provinces have gradually become linked to the inter-island shipping network by the use of smaller vessels, which are accommodated in the shallower channels of these ports. Despite these improvements there continues to be unsatisfied demand for passenger shipping, for there are parts of the archipelago for which connections with Java are too slow and in other areas service is non-existent or too infrequent. When the required upgrading will be achieved will depend upon government priorities for investment, traffic demand and profitability as well as the future impact of deregulation (Rutz and Coull, 1996).

### Transport Subsidies

With the objectives of income redistribution and national stability the Indonesian government has subsidized elements of the transport system (Leinbach, 1989). The subsidies have included those to transport fuels, controls on transport charges for select commodities, financing of the operating deficits of State-owned transport enterprises, and the less-than-full recovery of the costs of infrastructure provision from

users. An example is the airport system, which in the recent past has operated in deficit and required a 42 per cent subsidy to cost including depreciation. Similarly numerous major and minor ports, and the railway system, as noted above, do not operate profitably and must be subsidized. The issue of fuel subsidies has been an important part of the overall controversy. Pertamina, the national oil company, has been provided with both "cost" (where production costs are in excess of revenues) and "economic" (the difference between fixed local market prices and prices at which the product could be sold in the global market) subsidies. While the fuel subsidy has been decreased by increasing the price of fuel, in the mid-1990s Indonesians paid considerably less for fuel than their South-East Asian neighbours. An interesting, but complex, question is the impact that these subsidies have had on the location and growth of economic activity in the Indonesian space economy.

### Pioneer Services

As a final illustration of the dilemmas of providing access in a fragmented area, Indonesia's pioneer transport programmes are of interest. These services also link to our previous discussion of subsidies. Pioneer services, which exist for both sea and air transport, are essentially attempts to provide low-cost and efficient services to remote and inaccessible areas of the archipelago. These networks are intended to serve those areas where there is no other form of access, where commercial capacity is insufficient, or where low volumes of traffic have produced very high tariffs. The services operate through a complex system of subsidies, which are paid to semi-commercial (generally State-owned) companies to operate routes through schedules specified by the government. Subsidies take the form of capital costs for aircraft/vessels as well as operating costs. Both the air and sea programmes focus on eastern Indonesia and other remote parts of the nation. Clearly the purpose of these services is not only to offer basic transport for critical needs but also to stimulate regional development. The evidence of impact, as analysed to date, is quite mixed. The effects of sea pioneer services seem to



indicate that the impact on regional development is positive but marginal. For example, constraints on development in the Nusa Tenggara area of eastern Indonesia are not primarily of a transport nature but rather are associated with deficiencies in human and production capital (Leinbach, 1995).

## ZIMBABWE: TRANSPORT EVOLUTION UNDER SOCIALISM

Over the past 100 years the relationship between transport and development in Zimbabwe (Figure 3.6) has reflected the experience of many African countries. On achieving independence in 1980 Zimbabwe inherited a transport system adapted to the needs and aspirations of the colonial powers and which typified the colonial stages of the spatial models proposed by Taaffe *et al.* (1963) and Rimmer (1977) (see Chapter 2). Post-independence policies have sought to maintain this network and its external linkages, which are vital to the nation's economy (Griffiths, 1990; Smith, 1988).

However, development policies under the socialist government have given higher priority to the needs of the African population (Drakakis-Smith, 1987). The development plans of the 1980s placed great emphasis on State involvement in both rural and urban transport. The improvement of mobility and accessibility in rural areas has been a key feature in national development planning. In urban areas the focus has been on providing mass transport for the rapidly growing numbers of urban dwellers who do not have access to private transport. Although State involvement has continued throughout the 1990s, policies are being adjusted to take account of the World Bank's Structural Adjustment Programmes with their emphasis on economic liberation.

### The Colonial Transport Network

The emergence of Zimbabwe's modern transport system dates back to the 1890s when Cecil Rhodes'

British South Africa Company extended the South African railway network through Bechuanaland (now Botswana) to Bulawayo in 1897 and crossed the Zambezi at Victoria Falls in 1902. A second major penetration route was established from the east, linking the Mozambique port of Beira with Umtali (now Mutare) in 1898 and Salisbury (now Harare) in 1899. The two routes were connected in 1902 along the ridge of the high veld by the Bulawayo to Salisbury line (Kay, 1970). These early railway routes exerted considerable influence over subsequent network development and settlement patterns. The policy of settling Africans into reserves and selling land rights to European immigrants began in the 1890s and the patterns of land ownership were well established by the time of the 1930 Land Apportionment Act. European settlement, attracted by minerals or agricultural potential in climatically favourable areas, dominated the high veld and eastern highlands and the emerging urban hierarchy. Africans were confined either to reserves in the less-productive middle and low veld areas, or to townships on the periphery of European towns.

Such contrasts became more marked once road building began in Rhodesia during the 1930s. Main roads paralleled the railways linking major centres of European commercial development and were maintained in good condition, especially during the years of the Central African Federation (1953–63) and, for security reasons, during the period of Southern Rhodesia's illegal Unilateral Declaration of Independence (1965–80). Moreover, throughout the European commercial farming areas, rural councils invested local taxes in a substantial feeder road network. In contrast, lack of resources severely limited expenditure on the road network in the Tribal Trust Lands, which were heavily dependent on subsistence agriculture. The liberation struggle that preceded independence in 1980 prohibited even limited maintenance and many African rural areas were left without a basic transport infrastructure. Africans in the urban areas were similarly affected since they were confined mainly to the high-density housing developments served by a network of narrow, ill-kept lanes (Kay, 1970). Road building was strongly

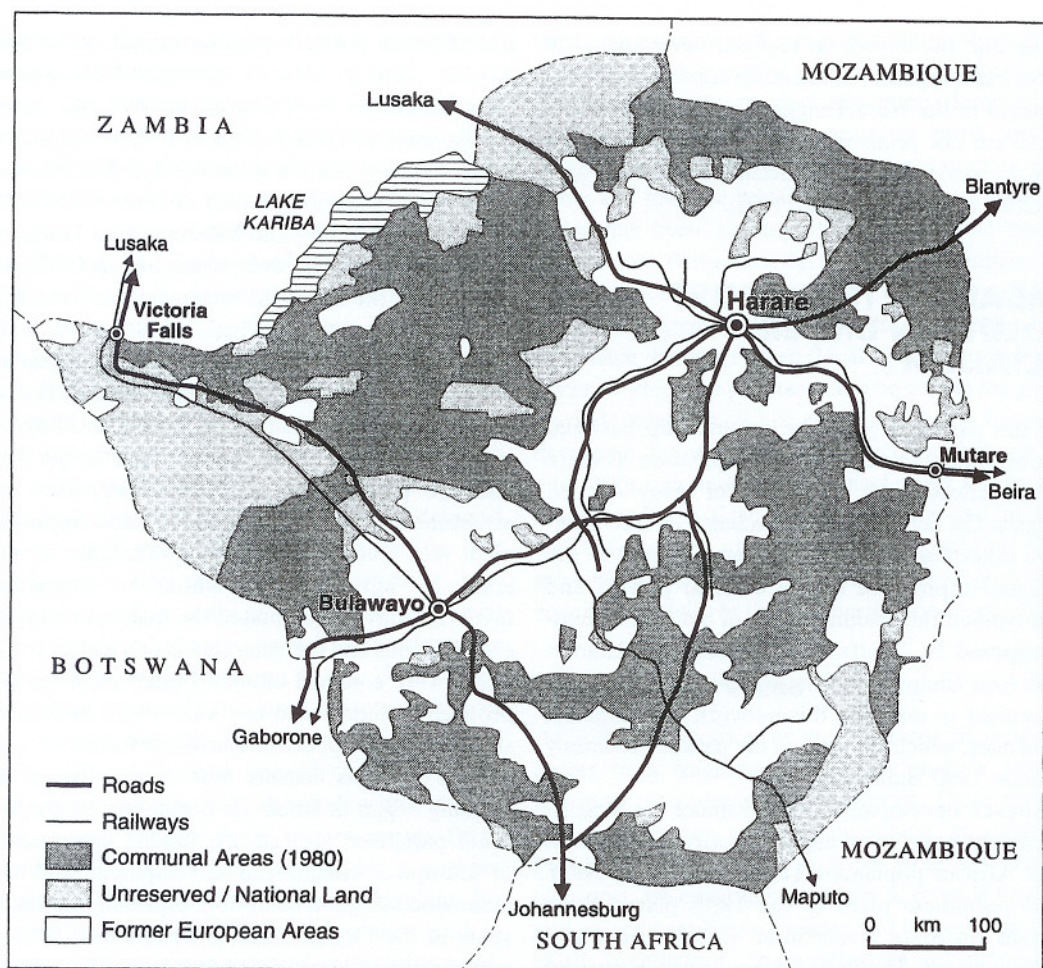


Figure 3.6 Zimbabwe: transport network

influenced by security issues and public transport, in the form of stage bus services, was controlled by European operators and existed mainly to link the townships with centres of employment.

### Rural Transport and Agricultural Development

During the 1980s Zimbabwe focused much of its national development effort on the reconstruction of the Communal Areas (the former Tribal Trust Lands) (Figure 3.6). In 1980 57 per cent of the

country's population lived in these areas, which were characterized by dependence on agriculture, land degradation and outward migration. Most were located in ecologically marginal zones and drought was a major problem. Upgrading the rural road network was regarded as a major prerequisite for improving the social and economic conditions in such areas. Between 1984 and 1992 the government invested in a Rural Roads Programme designed to facilitate the marketing of surplus agricultural produce, to offer equitable access for all households to basic facilities and service centres, and to provide all-

weather roads suitable for bus transport. In total 16 600 km of primary rural roads were provided, of which 82 per cent were improved existing roads and the remainder totally new.

Since the Communal Areas lack nucleated settlements, household access to primary roads was a key element in the design of the feeder road network. "Scotch carts" pulled by animals (Figure 3.7) are the traditional form of transport in the Communal Areas and the network was designed so that ideally each household was within 10 km of a primary road (this distance represents a day's return journey using a scotch cart). Primary roads had all-weather surfaces suitable for bus transport and linked with rural service centres and the national road network. They were supplemented by a secondary road system (not all-weather) which aimed to reduce the homestead-to-road distance to 5 km. In hilly terrain, where scotch carts are impracticable and loads are carried by human portage, only primary roads were provided but these aimed to limit the homestead-to-road distance to 3 km.

The provision of primary roads has encouraged the expansion of the long-distance rural bus network. Since Communal Areas are characterized by a lack of urban development, most services link these areas with major urban centres located in the former European commercial areas, especially Harare and Bulawayo. By 1985 nearly 200 firms operated throughout Zimbabwe: each tended to serve a specific locality, all were privately owned and most were family concerns. However, post-independence expansion has not been without its problems. The industry is highly dependent on imported equipment

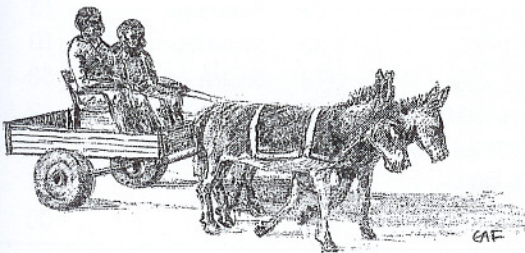


Figure 3.7 A Scotch cart

and has faced rapidly rising costs and shortages of spare parts consequent upon the growth of Zimbabwe's foreign debt during the 1980s; fare increases have been limited by the government and have not kept pace with costs. Moreover, the network exhibited marked inequalities: marginal areas had low levels of service provision while some major routes, for example those linking Communal Areas of the northeast with Harare, offered up to 10 services a day.

Freight transport has faced similar problems. The railway-owned Road Motor Services (RMS), which was established during the colonial period, was the only operator offering a nationwide scheduled and contract freight service. However, although it operated in some Communal Areas, its scheduled routes were confined mainly to the main road network which runs predominantly through the large-scale commercial farming areas (Turton, 1991). Consequently, communal farmers depended on small-scale hauliers for freight transport. Like the bus industry, freight operators have faced escalating costs, limited foreign exchange and a shortage of spare parts. In 1992 the initiation of the World Bank's Economic Structural Adjustment Programme eased the financial situation and allowed the import of some spare parts for essential repair and maintenance. However, the investment was insufficient and farmers faced acute vehicle shortages during the harvesting season and with the transport of perishable crops. In response to these problems, a number of initiatives have been developed aimed at improving vehicle availability (Dawson and Barwell, 1993). Recognizing that many small-scale farmers are unable to purchase vehicles, State marketing boards collect crops from the Communal Areas. The District Development Fund, the organization responsible for the road-building programme, own trucks which they hire out to communities for the transport of their harvest to the nearest crop marketing point. The latter have also been increased in number: for example, grain buying points were expanded from five in 1980 to over 40 in 1990. This expansion has made markets more immediately accessible to the communal farmers.

Policy-makers have also realized that motorized transport is inappropriate for some rural activities and the importance of the traditional form of transport, the scotch cart (Figure 3.7), has also been emphasized. Such carts are manufactured on both large and small scales throughout Zimbabwe. In wealthier crop-producing regions, their supply is plentiful and purchase by farmers has been assisted through loans provided by the Agricultural Finance Corporation. In the poorer south, where demand is more sporadic, most carts are produced by local artisans. Technical assistance to these small manufacturers has been provided in the form of wheel-making equipment. Again farmers have been provided with loan facilities to purchase these simple but efficient vehicles (Dawson and Barwell, 1993). Such is the lack of transport in the Communal Areas that many farmers are able to recoup their capital outlay by hiring their cart to neighbours.

The rural roads programme, and improved vehicle availability, have together had a considerable impact on the expansion of agricultural output from the Communal Areas. Combined with schemes to promote smallholder cultivation, such as guaranteed prices, agricultural extension and credit, outputs of both staple and export crops have been increased (Rukuni and Eicher, 1994). In the State marketing sector, the most dramatic increases have occurred in the production of maize, Zimbabwe's staple food crop. Whereas communal farmers accounted for only 7.5 per cent of maize deliveries to the State-run Grain Marketing Board in 1980, their contribution had increased to 63 per cent by 1989 and has remained at this level throughout the 1990s. Cotton has also been developed as a cash crop for both home consumption and export: deliveries to the Cotton Marketing Board by communal farmers increased three-fold during the 1980s. Whilst it may be argued that transport developments alone cannot account for the expansion of maize and cotton, there is strong evidence to suggest that, as one of a range of measures, transport has had a positive effect in improving agriculture within the State sector.

Developments in the transport system have also enabled many communal farmers to participate in

the private marketing sector and the urban economy, a point well illustrated by the results from a survey undertaken in the late 1980s (Smith, 1989). Horticultural crops are widely grown for home consumption on small plots of irrigated land throughout the Communal Areas. Although marketing opportunities are limited within the Communal Areas it is estimated that 65 per cent of farmers in northern Zimbabwe sell horticultural crops, mainly in Harare (Figure 3.8). Since less than 5 per cent of farmers have their own transport, most used non-motorized transport, especially Scotch carts, to reach the main road network (Table 3.4). Long-distance bus services were the most important mode for farmers transporting themselves and their produce to the city markets (Table 3.5). Substantial distances were a feature of the journey patterns: only 24 per cent travelled less than 50 km while 22 per cent of all journeys were over 100 km. Journeys were both time-consuming and costly: 66 per cent of growers surveyed stated that journey costs represented at least 20 per cent of the sales and most growers experienced trips in which they did not recoup their transport costs. However, such trips provided many families with an important source of regular income. In addition, most farmers used the opportunity whilst in Harare to undertake other activities such as purchasing household goods and agricultural inputs, thus benefiting from their links with the urban areas.

Table 3.4 Farm to main road journeys in Zimbabwe

Distance (km)	Percentage of Growers	Mode	Percentage of Growers
1.0 or less	32	Porterage	13
1.1-3.0	33	Wheelbarrow	10
3.1-5.0	14	Scotch cart	58
5.1-10.0	7	Private car	2
10.1 and over	2	Lorry	16
Not given	12	Other	1
Total (N = 182)	100		100

Source: Smith (1989).

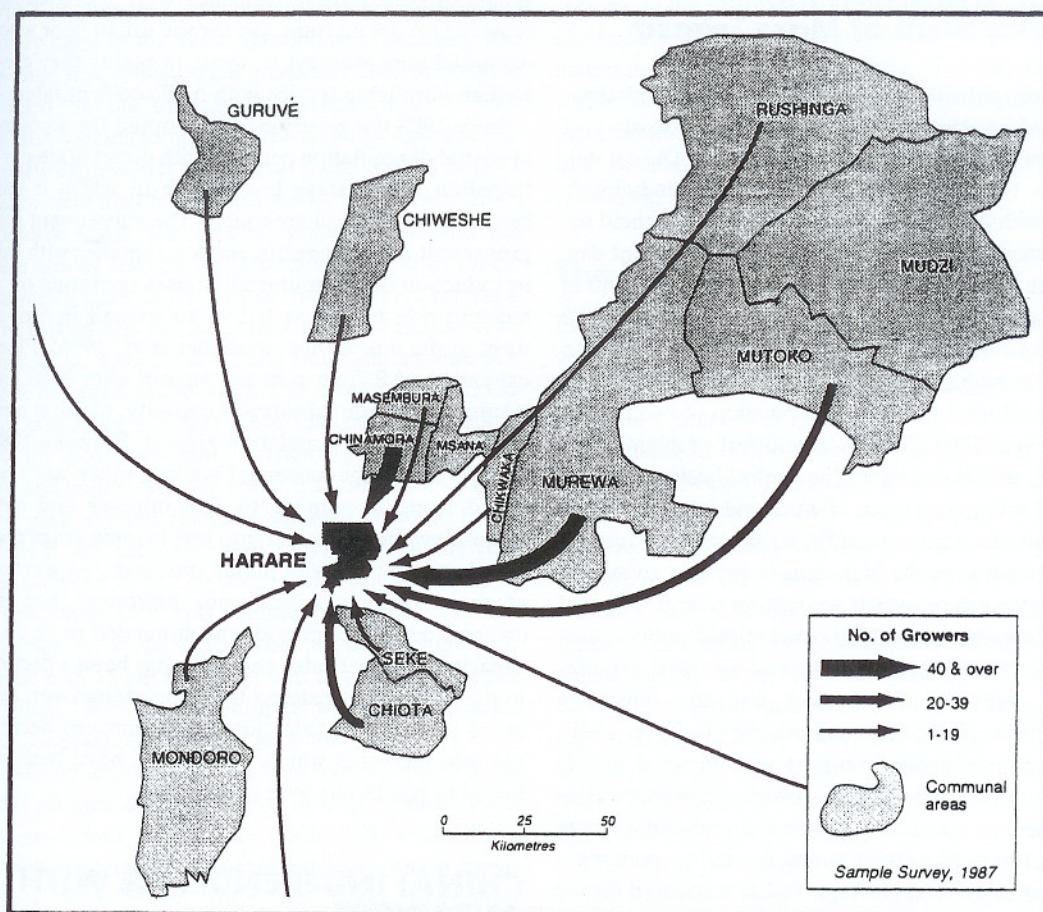


Figure 3.8 Horticultural marketing into Harare, Zimbabwe

Table 3.5 Journeys into Harare

Distance (km)	Percentage of Growers	Transport Mode	Percentage of Growers
1-25	3	Grower and produce by bus	70
26-50	21	Grower by bus/produce by lorry	6
51-75	24	Grower by bus and lorry/produce by lorry	5
76-100	30	Grower and produce by lorry	16
101-125	10	Grower and produce by private car	3
126-150	6		
151 and over	6	Total (N = 182)	100
Total (N = 182)	100		

Source: Smith (1989).

## Urban Transport: the Development of Mass Transit

Transport policies for the urban areas of Zimbabwe have had less impact on the structure of networks and more on the public transport participants. The capital, Harare, typifies the urban structure of Zimbabwe's towns with its extensive urban area and apartheid social system which has remained until the present day. Greater Harare covers approximately 600 km<sup>2</sup> and in 1980 had a population of one million of whom 250 000 lived in Chitungwiza, its dormitory township. With an annual growth rate of 8.1 per cent, it is predicted that Greater Harare will have a population of two million by the year 2000. The city's transport problems stem from its urban structure. The central business district (CBD) is the main place of work and attracts over 50 per cent of commuter traffic, inducing long journeys to work between the high-density housing areas (the former townships) which account for over 60 per cent of the population. In 1980 conventional public transport accounted for 80 per cent of all travel requirements, walking 10 per cent and the remaining journeys were made by private car (Lefevre, 1991). Conventional public transport was provided mainly by a municipal bus company, which operated a monopoly service connecting residential and employment zones. Bus services were supplemented by both regular and illegal taxi services, which accounted for an increasing proportion of journeys to work.

In 1980 central government removed the power of local authorities and became the sole regulator of public transport. In 1981 the State refused to subsidize public transport operators and, as an emergency measure in 1982, legalized the informal sector operators. Unfortunately, the combination of these policies created considerable problems for both public transport operators and passengers. Although bus patronage increased in the early years of independence, fixed revenues and escalating costs resulted in decapitalization with a consequent deterioration of the bus fleet and quality of service. In parallel, the legalization without constraint of informal sector taxis allowed substantial growth and by 1989 taxis accounted for an estimated 38 per cent of journeys.

Whilst in theory these measures were intended to provide low-priced transport for the urban poor who often had long journeys to work, in reality they created an unreliable service with high accident rates.

Since 1988 the government has opted for a policy of partial deregulation coupled with direct State participation in the stage bus service in which it has become a majority shareholder. The subsequent improvement in the stage bus service, together with the introduction of commuter minibuses operating on a hail-and-ride basis, has led to an overall improvement in the bus service (Maunder *et al.*, 1994). Fleet expansion of 8.7 per cent per annum after 1988 has resulted in additional carrying capacity, which is now above the rate of population growth. Between 1988 and 1992, average passenger waiting times were reduced from 36 minutes to 22.8 minutes and new routes have been opened into low-income areas previously not served with public transport. As a result of these policies, overall bus patronage has increased, minibuses provide much-needed peak time capacity on busy routes and there has been a decline in the use of unregistered transport. Moreover, levels of passenger satisfaction have improved despite the fare increases which, since 1991, have been allowed to rise in line with costs.

## CHINA: INDEPENDENCE WITH AUTARKY?

China stands out from the other case study regions discussed in this chapter in at least two respects. Firstly, it was never actually colonized although at certain crucial periods external powers could easily dictate terms to it. Secondly, its size, natural resources and history of technological and organizational achievement have given it a potential for autarkic development unmatched by any other non-European civilization except India. The history of China's transport and national development since the early nineteenth century reflects the interplay of these opposing factors.

Although China had for centuries had a complex economy, it displayed strongly autarkic tendencies.

While its porcelain, silk and tea were highly prized luxury items in the West, the domestic economy was so large that foreign trade mattered little to it; there seemed "no use for ingenious articles, nor . . . your country's manufactures", as the emperor Qianlong famously expressed it to a British trade mission in 1793. There were also fears of espionage and piracy. Even domestic trade was limited; grain, metals and salt were among the chief commodities moved to supply the major cities in the east of the country. The transport system was patchy. Apart from the major rivers such as the Yangtze or Chang Jiang and a dense network of canals in the south and east (the Grand Canal, stretching 1782 km from Hangzhou to Beijing, was the most important), carriers had to rely on narrow and poorly surfaced roads, built more for couriers and pack animals than for wheeled vehicles. In the 1870s it was estimated that moving freight by road was between 20 and 40 times more expensive than by water, while water was commonly faster as well: salt shipments covered up to 28 km per day by junk compared with 15 km by oxcart and 25 km by pack mule (Chiang, 1983). Coastal shipping was caught up in the general discouragement of seaborne trade.

Infrastructural problems were compounded by official policies. Salt was a government monopoly and its movement was closely controlled, while duties (*likin*) were levied on other internal freight movements. One 500 km route from a salt distribution centre was interrupted by no fewer than 10 checkpoints (Chiang, 1983) and a 320 km road journey from Shanghai passed through seven *likin* collecting points, which together could extract some 35 per cent of a good's price (Liang, 1982, 137). Controls on foreign trade were numerous and, to Western eyes, irksome, although the long and indented coastline afforded many opportunities for evasion to the more resourceful and less scrupulous traders (Chiu, 1973).

Transport difficulties had not prevented the Chinese from assembling both the resources and the finance to set up embryonic industrial economies producing such commodities as iron, timber and textiles. They relied for markets on a dense local population and on water transport where it was available. Their failure to develop into mechanized industrial

regions on the European or North American pattern has been attributed to exhaustion of the local raw materials and the overabundance of cheap labour, which formed a disincentive to mechanization. "In these conditions, the sprouts of capitalism received little nourishment and inevitably made no growth" (Leeming, 1993, 53).

## The Imperialist Period

For a government disposed to autarky the encounter with European and US mercantile traders was a culture clash of the first order. Matters came to a head with the Opium War (1839–42) which ended with China being forced to cede Hong Kong Island (and later the Kowloon peninsula) to Britain, to permit trade through five ports (Guangzhou, Xiamen, Fuzhou, Ningbo and Shanghai) and to allow foreigners to live there and carry on their businesses immune from Chinese law. Subsequent wars and treaties with various countries raised the number of treaty ports to 107; most were coastal, 10 more lined the Yangtze and several were on inland routes crossing from Indo-China, Burma or Russia (Williams, 1920). Although only a few were successful, notably Shanghai, China's economy became increasingly oriented around these port cities.

Mercantile penetration called for railways leading inland and here, again, the foreign powers had the ascendancy. Although Chinese capital funded the first successful line in 1881, this was purely a mineral railway serving coal-mines near Tianjin. Extensions to turn it into a genuine trunk line, linking Beijing with Mukden (now Shenyang), were beyond the promoters' resources and it came under the control of British financial interests. In 1896 the Russians secured a concession for a line across Manchuria to serve, first, their own port at Vladivostok and then a second – and ice-free – one at Port Arthur (now Lüshun), which they had seized in 1898. Both this latter line and its port came under Japanese control in 1905. Germany occupied the port of Qingdao in 1898 and began a line along the Shandong peninsula to exploit coal-mines near Jinan. The French began to extend a line northwards from their possessions in

Indo-China. Various foreign interests supported a line from Beijing to Hankou, while the British opened one from Hong Kong to Guangzhou. By now China's central government was in decline and Figure 3.9 graphically illustrates how the foreign powers were attempting to carve out spheres of influence. It was popular opposition to this heavy foreign investment – in what were seen as the arteries of China's future prosperity – which helped to trigger the downfall of the imperial government in November 1911 (Spence, 1990).

### The Inter-War Years

Although official thinking in the new Republic followed the ideas of its architect, Dr Sun Yat-Sen, in urging the development of ports and new railway lines (Edmonds, 1987), lack of capital and political instability between 1911 and 1938 meant that expansion was painfully slow. Three major trunk lines were completed but only in Manchuria did a relatively dense network emerge. The major factor here was Japan's continued drive for political domination and industrial exploitation (Chou, 1971).

Despite the lack of progress the impact of the new railways on agriculture, at least, was appreciable. By lowering the costs of moving both inputs and produce, they helped to raise yields: a 1 per cent fall in transport costs raising outputs of grain crops by around 0.3 per cent. Wheat yields could be 17.1 per cent higher, and rice yields 7.8 per cent higher, in rail-served counties compared with counties in the same area without rail connections (Liang, 1982, 69 and 85). Access to large urban markets helped to assure farmers of higher and more stable prices. This in turn led to greater commercialization with increased cultivation of cash crops, growing agricultural surpluses and greater capital formation. Data collected between 1927 and 1934 show that in areas close to the Beijing–Hankou railway 85 per cent of the cotton grown, and 42–55 per cent of wheat, was marketed compared with 37 per cent and 26 per cent elsewhere (*ibid.*, 115). The opening of the Beijing–Shenyang line in 1907 led to a 100-fold increase in fruit prices and an expansion in the

acreage planted, often at the expense of grain crops (*ibid.*, 99–102). Land values were higher in rail-served counties, agricultural credits were more widely taken up and research stations were generally located at railway centres from which agricultural innovations diffused, mainly along the railways themselves (*ibid.*, 93 and 115–8).

There were also adverse impacts. Growing commercialization enabled farmers to buy manufactured goods from factories in the cities in preference to locally produced products. In addition, the limited penetration of the rail network and the failure to improve road transport meant that the impacts of commercialization were spatially rather limited. Areas away from the railways could lose out in competition, though Liang (1982) saw this as a consequence of too little, rather than too much, investment in transport. Administrative inefficiencies also set limits on what was achievable. The fragmented network, set up by numerous companies funded from widely varying sources, made through-traffic from one line to another difficult, and while the *likin* had officially been abolished in 1931 it stubbornly persisted in the inter-war climate of corruption and warlordism. For Liang it was this factor, above all else, which limited the railways' ability to promote economic development (*ibid.*, 139). In the matter of industrialization, polarization was even more marked; a study in 1947 revealed that of the 20 most important cities 54 per cent of industrial employment was in Shanghai while the next most industrialized city, Tianjin, had only 8 per cent. In 1952 over 70 per cent of China's industrial employment was concentrated in the coastal provinces (Lippit, 1966).

### Liberation and Reconstruction

China emerged from World War II and the Communist takeover of 1949 with its transport system in ruins. Reconstruction had largely been achieved by 1951 (Ginsberg, 1951), since when its development has been bound up with the shifting directions of economic and planning policies. It is common to identify three main phases.



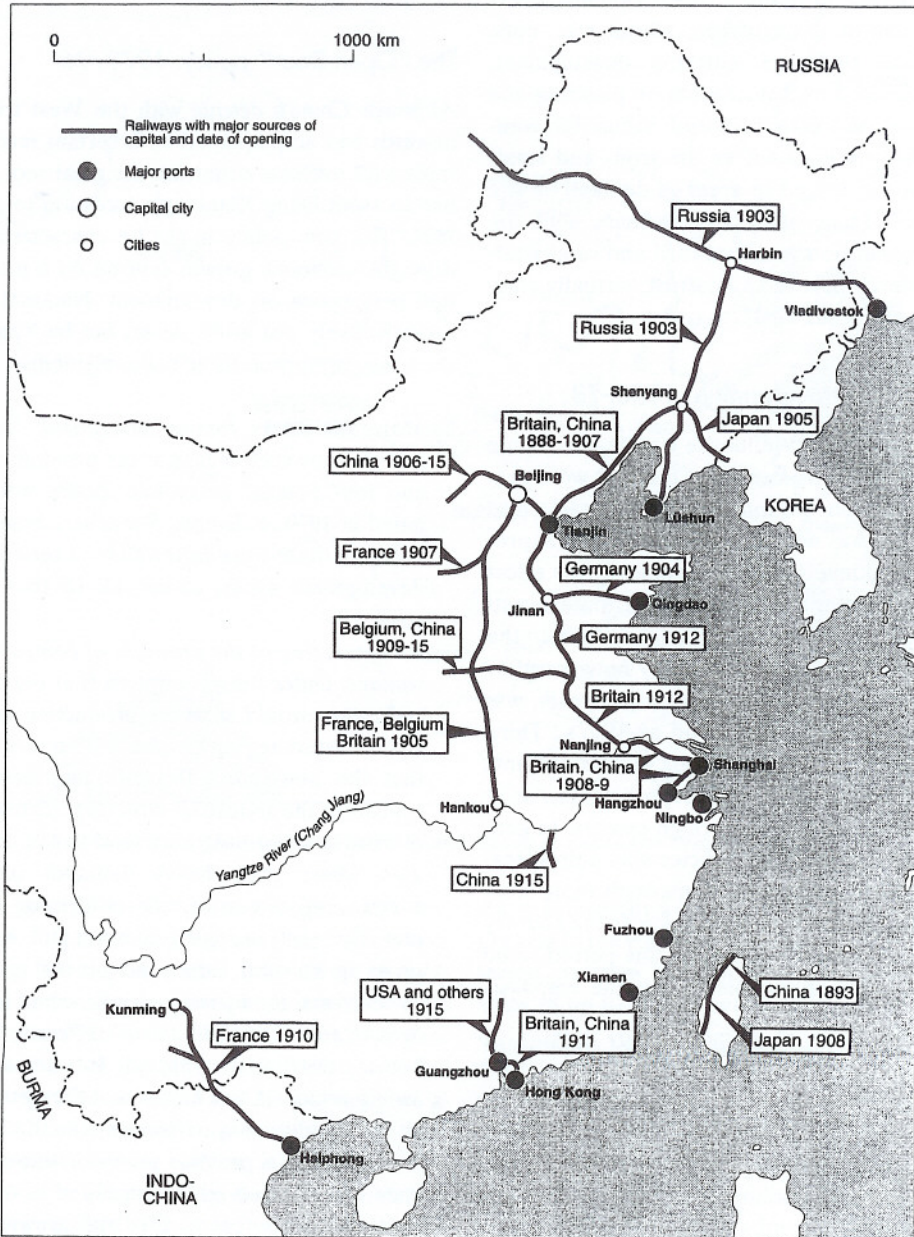


Figure 3.9 China: major ports and railways up to 1915  
Sources: Chou (1971) and Darby (1945)

### The first Five Year Plan: 1953–57

With the “classic” stimulus to development, overseas trade, almost extinguished, China was, once again, thrown back on autarkic development. Strongly influenced by Soviet ideas on planning, the emphasis was on resource-based industrial complexes in the interior such as the iron- and steelworks at Baotou, linked to areas of demand by rail (Lippit, 1966). In accordance with these aims the bulk of rail expansion was westward and southwestward. Port development, in contrast, virtually stagnated (Chiu and Chu, 1984).

### The eclipse of central planning: 1958–78

By the late 1950s Soviet influence was on the decline and Mao Zedong’s anti-centralist theories were generally dominant. The national autarky characterized by the first Plan was now increasingly echoed at provincial and local levels also. Paradoxically the effect of this was to hamper attempts to redistribute investment, which continued to flow predominantly to the east of the country (Table 3.6). Only between 1966 and 1970, the early Cultural Revolution years, was there any major shift in the trend as Mao’s “Third Front” policy attempted to relocate industrial plants and research institutes to interior provinces so as to be out of reach of attack by foreign powers. In general, the result of all these policies was a proliferation of small and inefficient plants with more than 1200 iron- and steelworks spread across the country by 1979 (Leeming, 1985). During this period some major rail lines were completed but the emphasis

Table 3.6 China: percentage of capital construction investment by region

Region	1953– 1957	1966– 1970	1976– 1980	1991– 1992
East	36.9	26.9	42.1	49.5
Central	28.7	29.9	30.2	24.5
West	19.0	34.8	19.9	16.8
Unspecified	15.4	8.4	7.8	9.2

Data in this table exclude Hong Kong and Taiwan.  
Source: Computed from Zhao (1996, Appendix 3).

shifted to local roads and other intra-provincial links (Lippit, 1966).

### The “Open Door” policy: 1979–96

Although China’s *détente* with the West from 1972 onwards was accompanied by a certain readiness to trade with overseas countries, the great reorientation had to await Deng Xiaoping’s accession to power in 1976. The new policy might be characterized as a drive for economic growth centred on a modernization perspective on development. National autarky was effectively cast aside. As set out by Yang (1990) the policy comprised three major elements.

1. *Moves to attract foreign investment, technology and skills* by such means as tax privileges. To this end four Special Economic Zones were designated in 1979 in Zhuhai, Shenzhen, Shantou and Xiamen; these were followed by a series of other development areas, almost all of them on the coast.
2. *An embracing of the principle of comparative advantage*, under the assumption that regional specialization would increase productive efficiency. In the eastern region (Figure 3.10) it was intended that the new-found foreign investment would transform the industrial structure, displacing traditional heavy industries inland to the central region where their heavy demands on energy sources and raw materials could more easily be met. The western region, remoter still, would rely on its agricultural, forest and mineral resources.
3. *A belief that the interior regions would ultimately benefit from “trickle-down” effects*. Although some government support for these regions would remain it was hoped that they would benefit principally from partnerships with enterprises in the east. In practice many of these arrangements have involved the supply of raw materials and energy sources to feed the growing coastal industries.

Representative of these new policies has been the solution adopted to the coast’s energy shortages.

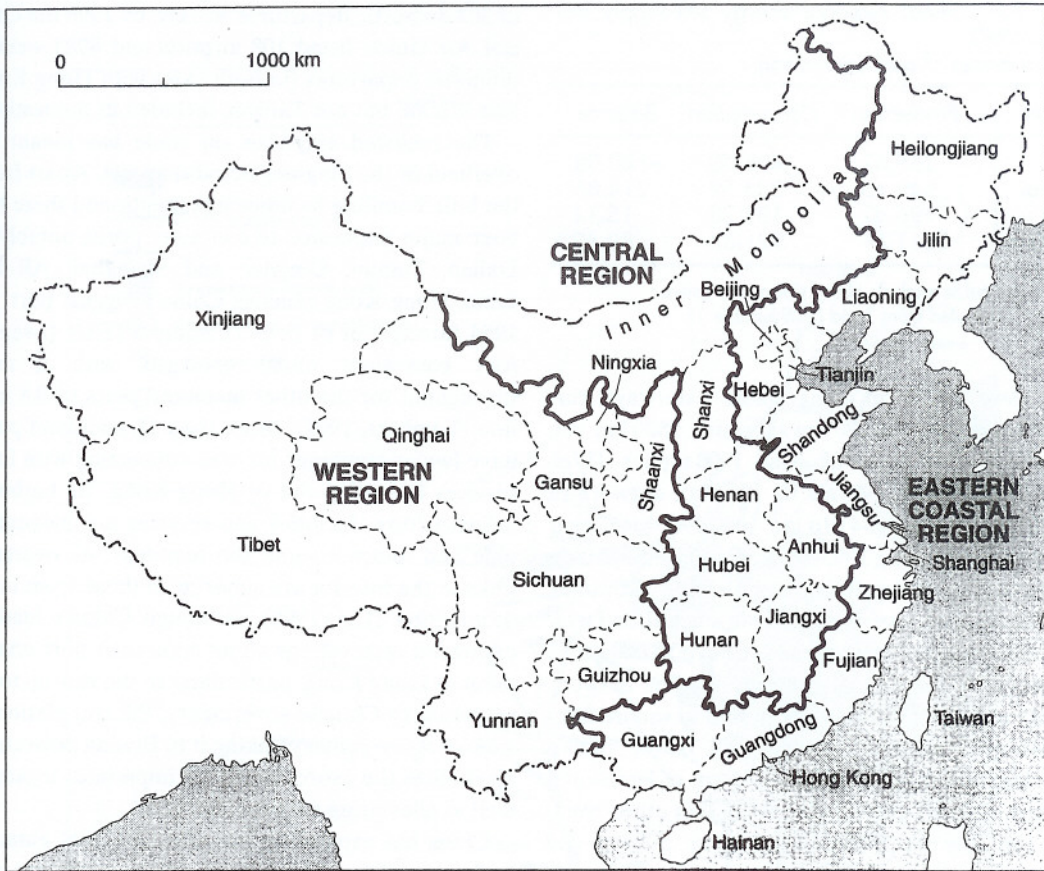


Figure 3.10 China: economic regions (administrative boundaries as at December 1996)

Economic growth in the eastern region and the lower Yangtze, particularly in Shanghai, Jiangsu and Guangdong, has increased their demand for energy; the central and western regions, in contrast, have an energy surplus (Table 3.7). Shanxi province, in particular, has some of the largest coal reserves to be found anywhere in the world and already supplies a quarter of China's annual requirements. The new policies in effect see its coal as a resource to be traded and increasingly heavy flows to the deficit regions have resulted (Figure 3.11). With the existing rail network already heavily taxed by growing freight traffic, China's planners have adopted a water-borne solution. New rail construction has concentrated on west-east links from Shanxi to the

coast: principally a double-track electrified line from Datong to the port of Qinhuangdao which, long neglected, has now been massively upgraded to admit ships of up to 50 000 dwt (deadweight tonnes). This has offered cost savings of up to 20 per cent over direct rail haulage to Shanghai although the capacity of the port installations has proved critical to the economics of the operation. A rail link has subsequently been created from southern Shanxi to a port at Rizhao in southern Shandong; improvements here have enabled this port to admit ships double the size of those using Qinhuangdao (Todd, 1996).

China's investment in its transport system since 1949 has been impressive. In the early Communist years

Table 3.7 China: regional energy self-supply balances, 1990  
(million tonnes of coal equivalent)

Region	Production	Consumption	Balance
East	265.62	406.00	-140.38
Central	549.45	334.59	214.86
West	196.42	181.28	15.14
All China	1011.49	921.87	89.62

Data in this table exclude Hong Kong and Taiwan.  
Source: Computed from Todd (1996, table 1).

there were 70 000 km of navigable waterways; currently there are 110 000 km of which 5800 km can accommodate vessels of over 1000 tonnes (Wei, 1987; *China Daily*, 1997a). Its 1942 rail network of 19 370 km reached 54 616 km in 1995 with over 800 km added during 1993–95 alone. The completion of the Beijing–Hong Kong and Nanning–Kunming lines, along with several others, has since added over 3500 km more and it is planned to have 70 000 km in operation by the end of the century. The network density of 5.71 km of line per thousand square kilometres of land area, though well below India's 19.06 km, compares well with 3.13 km in Brazil and 5.12 km in the Russian Federation, two other countries similarly faced with opening up a large and undeveloped interior; in fact, eliminating the largely rail-less regions of Qinghai, Tibet and Xinjiang raises the density to a respectable 8.65 km. It is interesting to compare these figures with what Sun Yat-Sen envisioned, back in 1922, as a "basic" system of 160 000 km, which would have given a density approaching India's (Lippitt, 1966; *Railway Gazette International*, 1996, 1998; Qian, 1997). What the early visionaries could not have foreseen has been a 15-fold increase in the highway network from 80 000 km in 1949 to nearly 1.2 million km by 1996, reaching virtually all of China's townships and over four-fifths of its villages (Li, 1990; *China Daily*, 1997a). More tellingly, since its inception in 1989 an expressway system of 375 km had grown to 3422 km by the end of 1996 and a further doubling by the end of the century is planned. And whereas in 1947 China had 26 airports listed in the ABC Air Guide with a total

of 304 domestic departures weekly, by 1996 the Official Air Guide listed 108 airports and 8985 weekly domestic departures (in both cases with Hong Kong and Macau, but not Taiwan, included as domestic).

The renewed emphasis on trade has meant an overhaul of the long-neglected seaports. Apart from the bulk handling facilities just mentioned there has been major expansion of container ports, notably at Dalian, Tianjin, Qingdao and Shanghai. All the same, Hong Kong remains China's biggest port. Its 1994 throughput of over 11 million TEUs (twenty-foot equivalent units) contrasts with a *total* throughput for the other mainland ports of 3.8 million (Lambert, 1997). More than 15 mainland ports have feeder container services connecting with liner services operating out of Hong Kong. Its harbour, infrastructure, facilities and services are incomparable and, despite some shortcomings, its overland links to the interior are superior to those from most other ports (Lin, 1995). Although China's leaders expressed reservations about continued port investment at Hong Kong, particularly in the run-up to its reversion to Chinese sovereignty, the completion in 1996 of a new railway linking it to Beijing powerfully symbolizes the exorcizing of the imperialist legacy as well as alleviating some bottlenecks.

China has experienced an alternation of autarkic and externally oriented modes of development, not always as a product of its own choosing. It is common, though not entirely accurate, to characterize the autarkic periods as times of stagnation but relative equality, the externally oriented ones as exhibiting strong but polarized growth. The imperialist period saw development focused on a system of treaty ports and inward-penetrating railway lines imposed on China by the foreign powers. China's experience in this context was comparable with, but different from, those of other world regions such as Africa or Latin America. Latterly the Special Economic Zones and open cities, admittedly under Chinese sovereignty but still predominantly coastal, have become the new foci for growth. As Table 3.6 shows, for most of the post-war period the largest share of government investment has gone to the eastern region; this dominance continues and 84 per

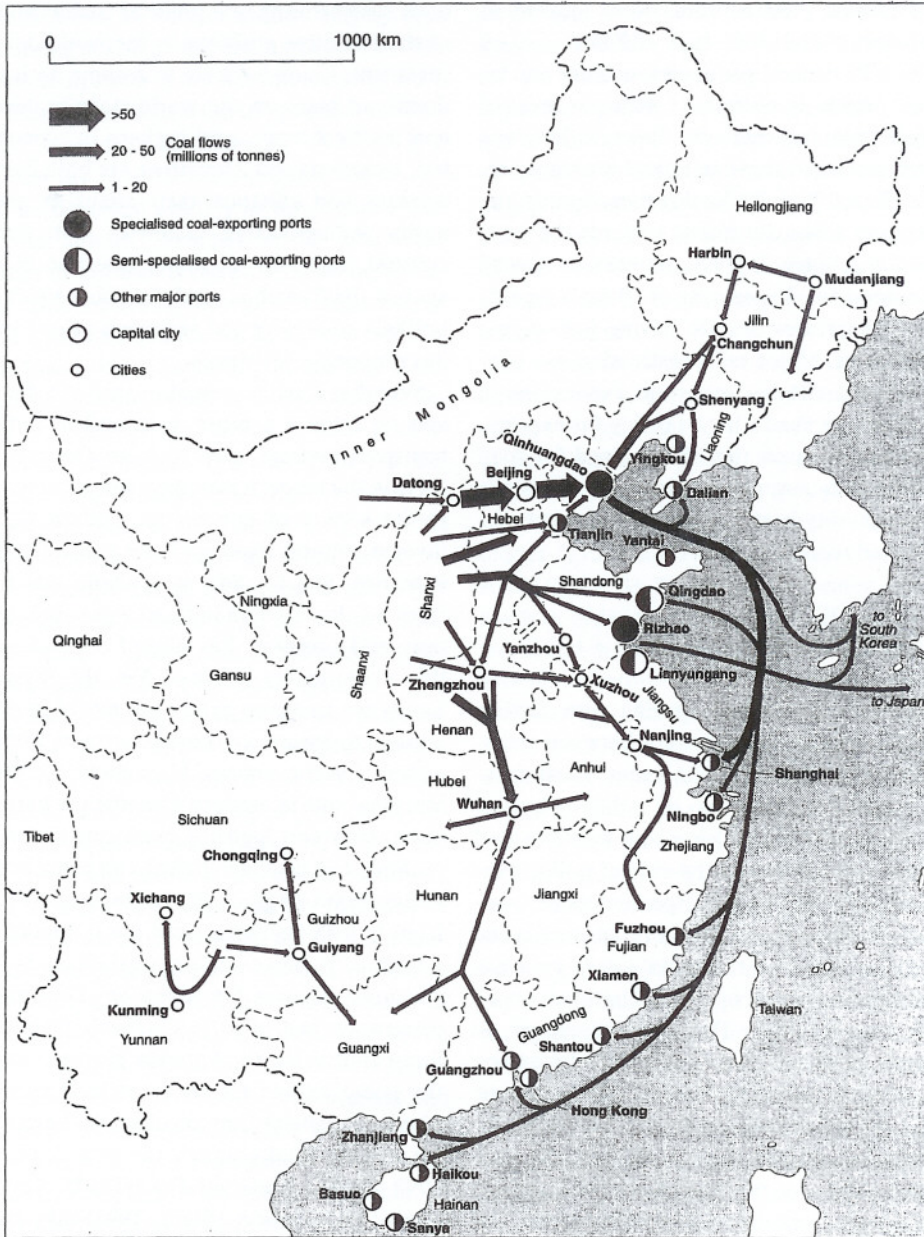


Figure 3.11 China: inter-regional coal movements, 1990, with associated port infrastructure  
 Source: Todd (1996)

cent of foreign investment between 1989 and 1992 was also directed here (Zhao, 1996). Up to 1985, 92 per cent of foreign joint ventures were located in coastal provinces and few had diffused inland (Leung, 1990). Provinces' per capita incomes can be shown to be positively correlated with the level of their foreign trade and economic linkages between coastal enterprises and those in inland provinces remain sparse (Fan, 1992). Reflecting these trends, the transport system is heavily biased towards the eastern part of the country. In 1996 the eastern coastal region accounted for 71 per cent of China's weekly domestic air departures despite having just 46 per cent of its airports. Major rail construction has continued in the east despite important expansions in the centre and west. And China's policy for expressways explicitly recognizes that the demand for road transport will be highest where there is an externally oriented, commodity-based economy: in short, the more developed regions (Li, 1990).

## CONCLUSIONS

This chapter has considered specific case studies chosen to illustrate the relationships between transport and development at various scales. Each demonstrates the significance of the physical environment, the effects of changing political and economic circumstances, and the role of policy evolution. Essentially, the material presented here re-emphasizes the permissive nature of transport in the development process and the multifaceted contexts in which transport systems operate in both advanced and developing societies. The cases discussed all confirm the importance of the historical dimension in understanding the spatial form and economic functioning of present-day networks and the processes that have created them. Above all, the case studies reflect some of the complex ways in which the changing relationships between transport and development reflect the wider structures of economies and societies.

The four contrasted countries discussed in this chapter – Canada, China, Indonesia and Zimbabwe

– are likely to experience substantial changes in the twenty-first century both in terms of internal economic restructuring and political change and in terms of their relative positions in the world development spectrum. China is likely to assume an increasingly dominant place on the world stage in demographic and political terms, and perhaps in economic terms too. Indonesia and Zimbabwe are both likely to consolidate and enhance their status as progressive, newly industrializing countries with strong agricultural traditions. A major question mark stands against the Canadian confederation, which would be unlikely to survive the secession of one or more of its component provinces.

Whether Québec remains part of a federal Canada or follows a more independent pathway, the transport systems derived from the past and now serving the modern economy will continue to evolve in the service of one of the modern world's most diverse cultural regions (Trent *et al.*, 1996). Québec Province, like Canada as a whole, has progressed from a colonial to an industrial/post-industrial economy and transport has played a significant part in this evolutionary process. Yet the magnificent St Lawrence transport artery has not been magnificent enough to ensure continued centrality within the Canadian space economy. Ultimately, Québec plays a marginal role in modern Canada: the harsh environment, transport logistics, economic history, political realities and language policies all contribute towards a significant degree of marginalization – different from British Columbia, and not so marked as in the Atlantic Provinces – but nevertheless a factor underpinning pressures for secession. Disadvantaged by geography and history, Québec's place in twenty-first-century North America seems uncertain, and the geography of transport, at least in part, underpins and explains that uncertainty (Lamonde, 1996). In a continental context, the overall effects of the 1992 North American Free Trade Agreement on Canadian transport (Slack, 1993) may enhance the province's commitment to a distinctive future.

Indonesia provides a good example of a transport system that suffers from a lack of regionally balanced and modally coordinated planning, a failure to

come to grips with maintenance throughout the system, imperfect regulatory policies and practices, and inadequate services by certain modes. Highly centralized planning is also problematic where too often decisions made in Jakarta are not informed by local circumstances and evidence. On the positive side the most recent five-year plan, Repelita VI (1994–99), maintains that the road-building programme will be the first to be devolved entirely to the regions, thus loosening the hitherto strong financial centralization. Another bright spot is the progress of deregulation of domestic sea transport which is beginning to provide the types and qualities of services needed by shippers at lower costs. Especially interesting is the regional development impact of this process of deregulation. In order for the railway to exist profitably without subsidization, full-cost recovery for medium- and long-distance passenger services as well as renewed efforts to capture freight traffic must be implemented. Perhaps the major policy issue that is currently being addressed is the policy conflict provided by national goals for a more equitable distribution of growth and simultaneously the creation of a more efficient transport system.

The provision of transport facilities, as a response to demand or in an attempt to facilitate socio-economic change, is invariably uneven, in both more-advanced and less-developed countries. Inequalities in transport provision, in geographical and structural terms, are however a marked feature of developing countries, as illustrated by Zimbabwe where post-independence policies under a socialist government have gone some way towards ameliorating the mobility and accessibility problems of the African population. Development plans during the 1980s placed great emphasis on the rural areas and improving conditions for 800 000 smallholders and their families in the Communal Areas. The provision of feeder roads and the development of rural bus and freight services facilitated the development of agricultural marketing in areas formerly dominated by subsistence agriculture. Maintaining this momentum has been more difficult in the 1990s as road maintenance and vehicle fleets have suffered from escalating costs and shortage of foreign exchange.

Similar problems have beset the urban areas with their dependence on public transport. Whilst vehicle ownership levels have risen since independence, they are still less than 50 per 1000 population and, for the foreseeable future, urban populations will depend on public transport, especially for the journey to work. A policy of deregulation combined with an increase in State ownership has improved public transport, especially in Harare. However, greater State involvement is unlikely, given the introduction of the World Bank's Structural Adjustment Programme with its emphasis on privatization and economic liberation.

In common with most other countries, whether advanced or less-developed, China's planners have acknowledged what they regard as the shortcomings of past transport policy. Apart from the general failure to expand capacity, they feel that they have emphasized railways unduly at the expense of other modes (Liu *et al.*, 1987). In similar vein the World Bank (1985, 83–5) has urged greater investment in roads in order to benefit local agriculture, passenger travel and the movement of high-value freight. Some foreign investors have attempted to distribute their products by road rather than rail, arguing that rail's lower costs are outweighed by delays and the risk of damage in transit (Anon., 1996). It will be hard for the government to resist further pressures for road building and environmental objections are unlikely to carry much weight. The ninth Five Year Plan (1996–2000) is ambiguous, presenting road expansion as a "priority" yet continuing to regard railway building as the principal means to expand transport capacity (*China Daily*, 1997b). Meanwhile autarkic tendencies remain, particularly at provincial and local level, where leaders are understandably seeking to attract development to their own areas (Auty, 1992). Ports are being expanded, locally funded road and rail links to them are being built, and provincial authorities have set up airlines and invested heavily in airports. Any perceived central government bias in development priorities is bound to arouse sensitivities in places which feel that they are losing out, and there is some evidence that under the 1996–2000 Plan attempts will be made to halt the widening

disparity between the coast and the interior, for instance through increased road building in central and western China. How successful this will be remains to be seen.

Some interesting comparisons and contrasts emerge between the various examples discussed in this chapter. The impact of foreign technology on the development of port and rail systems in China has been outlined, and in developing countries such as Indonesia and Zimbabwe most modern transport networks owe their origins to the European colonial period with its emphasis on external links rather than internal network development. In all such cases, adaptation to modern postcolonial needs has been in many ways problematic. Models of the transport/development relationship (discussed in Chapter 2) based upon colonial experience were inclined to accept an external orientation as a normal feature of the global transport system, but postcolonial studies have understandably called for a more "developmental-specific" approach to transport provision, questioning the validity of earlier views and arguing for closer attention to the demand-provision-assessment relationships (outlined in Chapter 1) in the context of today's development priorities and needs. Indonesia and Zimbabwe are among many former colonial territories which show that postcolonialism has produced a more pragmatic, policy-orientated and development-centred approach towards the further development of transport systems.

The communications revolution induced by advances in telecommunications is also beginning to affect Third World transport systems and this will not only accelerate the process of shrinking the globe in transport terms but will also provide some alternative solutions to the limitations of the transport systems inherited from earlier phases of development. In this context, the accelerating speed of change in transport technology is a critical factor. It is important to remember that transport has normally been a slow and laborious business throughout the greater part of human history, and for many people (especially in the less-developed countries) it remains so today. The nineteenth and twentieth cen-

turies, however, have been characterized by rapid technological advances which have revolutionized the transfer of people, goods and information throughout the world, although the spatial effects of these advances have been far from uniform and many places and socio-economic groups still remain relatively untouched by these advances. Thus the dynamic nature of transport systems has played, and will continue to fulfil, an important role in the process of spatial change and in the differentiation of societies, economies and people. The technological transfer of information is today virtually instantaneous, air transport has effectively reduced the world to a global village, and efficient multimodal networks have streamlined goods movement. As the case studies developed in this chapter have shown, changes in transport demand and provision both reflect and encourage socio-economic and political evolution, but such changes must be carefully assessed in the context of the promotion of overall regional development. This has usually been best achieved in advanced societies by balancing the growth of strong external links with continuing intensification of internal networks. Developing countries are attempting, with varying degrees of success, to achieve a similar balance between internal networks and external linkages in order to enhance wherever possible the growing competitiveness of their economies.

The theoretical and empirical material presented in Chapters 2 and 3 has illustrated an interesting dichotomy in terms of global spatial relationships and in terms of modern transport geography, by focusing on the role of transport as a facilitator of social, economic and political change. The world development surface is forever very uneven, and it is apparent that as the rich get richer and the poor remain poor, global inequalities in development have never been greater. Advanced countries have developed sophisticated, technologically advanced transport systems, yet in less-developed countries there is still heavy reliance upon basic forms of transport such as head-loading, walking and cycling, and the use of animal-drawn vehicles. The increasing use of motorized transport brings, of course, its own



benefits and problems. The provision of more modern transport facilities, in response to increasing demand, can by itself do relatively little to reduce inequalities, and sometimes on a local or regional scale can actually increase them. The incorporation of appropriate transport strategies as part of multifaceted development programmes, however, must ultimately play a major role in overcoming problems of regional and global inequalities in development levels that are widespread today.

The global telecommunications revolution has accelerated a trend that had already become apparent throughout the nineteenth and twentieth centuries during which various transport modes have shown an increasing ability to overcome physical barriers and to reduce the friction of distance. As a consequence, the world has become a much smaller place linked by intercontinental and global networks, and this trend will not only continue into the twenty-first century but will also come to affect a far higher proportion of the world's peoples. To some extent, transport technology may ultimately have the effect of reducing some of the inequalities of the global development surface, although it is unlikely ever to obliterate them entirely.

## REFERENCES

- Airriess, C.A. (1991), "Global economy and port morphology in Belawan, Indonesia", *Geographical Review* 81 (2), 183-96.
- Allison, R. and Bradshaw, M. (1990), *The concept of French Canada in a geographical context*, Canadian Studies Geography Project for sixth forms and colleges (Plymouth: College of St Mark and St John).
- Anon. (1996), "No truck with trains", *Far Eastern Economic Review* 159 (3), 46.
- Auty, R.M. (1992), "Industrial policy reform in China: structural and regional imbalances", *Transactions, Institute of British Geographers (New Series)* 17, 481-94.
- Chiang, T.C. (1983), "The salt trade in Ch'ing China", *Modern Asian Studies* 17, 197-219.
- China Daily (1997a), "More roads, waterways, ports to be developed through 2000", 8 September.
- China Daily (1997b), "Government to double investment in transportation projects", 13 October.
- Chiu, T.N. (1973), *The port of Hong Kong: a survey of its development* (Hong Kong University Press).
- Chiu, T.N. and Chu, D.K.Y. (1984), "Port development in the People's Republic of China: readjustment under programmes of accelerated growth", in Hoyle, B.S. and Hilling, D. (eds), *Seaport systems and spatial change* (Chichester: Wiley), 199-215.
- Chou, S.H. (1971), "Railway development and economic growth in Manchuria", *China Quarterly* 45, 57-84.
- Darby, H.C. (ed.) (1945), *China proper*, vol. 3 (Edinburgh: HMSO).
- Dawson, J. and Barwell, I. (1993), *Roads are not enough* (London: Intermediate Technology Publications).
- Dick, H. (1987), *The Indonesian interisland shipping industry: an analysis of competition and regulation* (Singapore: Institute of Southeast Asian Studies).
- Drakakis-Smith, D. (1987), "Zimbabwe: the slow struggle towards socialism", *Geography* 72 (4), 348-52.
- Edmonds, R.L. (1987), "The legacy of Sun Yat-Sen's railway plans", *China Quarterly* 111, 421-43.
- Fan, C.C. (1992), "Foreign trade and regional development in China", *Geographical Analysis* 24, 240-56.
- Forward, C.N. (1982), "The development of Canada's five leading national ports", *Urban History Review* 10 (3), 25-45.
- Ginsberg, N.S. (1951), "China's railroad network", *Geographical Review* 41, 470-4.
- Griffiths, I. (1990), "The quest for independent access to the sea in southern Africa", *Geographical Journal* 155 (3), 378-91.
- Kay, G. (1970), *Rhodesia: a human geography* (University of London Press).
- Lambert, M. (1997), *Containerization International Yearbook 1997* (London: EMAP).
- Lamonde, Y. (1996), *Ni avec eux ni sans eux: le Québec et les Etats-Unis* (Québec: Nuit Blanche).
- Lasserre, J.-C. (1980), *Le Saint-Laurent: grande porte de l'Amérique* (Montreal: Hurtubise).
- Leeming, F. (1985), "Chinese industry - management systems and regional structures", *Transactions, Institute of British Geographers (New Series)* 10, 413-26.
- Leeming, F. (1993), *The changing geography of China* (Oxford: Blackwell).
- Lefevre, C. (1991), "Management of Harare urban public transport: relations between informal transport and conventional transport since independence", in Heraty, M. (ed.), *Urban transport in developing countries* (London: PTRC Education and Research Services).
- Leinbach, T.R. (1986), "Transport development in Indonesia: progress, problems and policies under the New Order", in MacAndrews, C. (ed.), *Central government and local development in Indonesia* (Singapore: Oxford University Press), 190-220.
- Leinbach, T.R. (1989), "Transport policies in conflict: deregulation, subsidies, and regional development in Indonesia", *Transportation Research* 23A (6), 467-75.
- Leinbach, T.R. (1995), "Transportation and Third World development: review, issues and prescription", *Transportation Research* 29A (5), 337-44.
- Leinbach, T.R. and Chia Lin Sien (1989), *Southeast Asian transport issues in development* (Singapore: Oxford University Press).
- Leung, C.K. (1990), "Locational characteristics of foreign-equity joint venture investment in China, 1979-1985", *Professional Geographer* 42, 403-21.

- Li, P. (1990), "Reform brings vigour to road construction", *Beijing Review*, 26 November, 20-25.
- Liang, E.P. (1982), *China: railways and agricultural development 1875-1935*, Research Paper 203 (Chicago: University of Chicago, Department of Geography).
- Lin, K.P.K. (1995), "The development of port facilities in Hong Kong and southern China", *Proceedings, Chartered Institute of Transport* 4 (3), 13-26.
- Lippit, V.D. (1966), "Development of transportation in Communist China", *China Quarterly* 27, 101-19.
- Liu, G.G., Liang, W.S., Tian, J.H. and Shen, L.R. (1987), *China's economy in 2000* (Beijing: New World Press).
- Maunder, D.A.C., Mbara, T.C. and Khezwana, M. (1994), "The effect of institutional change on stage bus performance in Harare, Zimbabwe", *Transport Reviews* 14 (2), 151-65.
- Qian, L.X. (1997), "Jing-Jiu trunk line boosts north-south capacity", *Railway Gazette International* 153, 455-8.
- Railway Gazette International* (1996, 1998), Rail Business Report (supplement issues).
- Rimmer, P.J. (1977), "A conceptual framework for examining urban and regional transport needs in south-east Asia", *Pacific Viewpoint* 18, 133-47.
- Rukuni, M. and Eicher, C.K. (1994), *Zimbabwe's agricultural revolution* (Harare: University of Zimbabwe Publications).
- Rutz, W.O.A. and Coull, J.R. (1996), "Inter-island passenger shipping in Indonesia: development of the system, present characteristics and future requirements", *Journal of Transport Geography* 4 (4), 275-86.
- Slack, B. (1993), "The impacts of deregulation and the US-Canada free trade agreement on Canadian transportation modes", *Journal of Transport Geography* 1 (3), 150-5.
- Smith, J.A. (1988), "The Beira Corridor Project", *Geography* 73 (3), 258-61.
- Smith, J.A. (1989), "Transport and marketing of horticultural crops by communal farmers in Harare", *Geographical Journal of Zimbabwe* 20, 1-15.
- Spence, J.D. (1990), *The search for modern China* (London: Hutchinson).
- Taaffe, E.J., Morrill, R.L. and Gould, P.R. (1963), "Transport expansion in underdeveloped countries: a comparative analysis", *Geographical Review* 53, 503-29.
- Todd, D. (1996), "North-south energy resource transfers in China and the port intermediary", *Tijdschrift voor Economische en Sociale Geografie* 87, 195-208.
- Trent, J.E., Young, R. and Lachapelle, G. (eds) (1996), *Québec-Canada: nouveaux sentiers vers l'avenir* (Ottawa: University of Ottawa Press).
- Turton, B.J. (1991), "The role of the RMS in the rural road transport sector in Zimbabwe", *Geographical Journal of Zimbabwe* 22, 46-61.
- Vance, J.E. (1970), *The merchant's world: the geography of wholesaling* (Englewood Cliffs, NJ: Prentice Hall).
- Van Goor, J. (1996), "Dutch factories in Asia, 1600-1800: bridgeheads of political, economic and cultural interaction", in Everaert, J. and Parmentier, J. (eds), *Shipping, factories and colonization* (Brussels: Académie Royale des Sciences d'Outre-Mer), 71-92.
- Waddell, E. (1987), "Cultural hearth, continental diaspora: the place of Québec in North America", in McCann, L.D. (ed.), *Heartland and hinterland: a geography of Canada* (Scarborough, Ontario: Prentice Hall Canada), 149-72.
- Wei, Q.Y. (1987), "The development of water transport in China", *Transport Reviews* 7, 1-15.
- Williams, E.T. (1920), "The open ports of China", *Geographical Review* 9, 306-34.
- World Bank (1985), *China: long-term development courses and options* (Baltimore: Johns Hopkins University Press).
- Yang, D.L. (1990), "Patterns of China's regional development strategy", *China Quarterly* 122, 230-57.
- Yeates, M. (1975), *Main street: Windsor to Québec City* (Toronto: Macmillan).
- Zhao, S.X.B. (1996), "Spatial disparities and economic development in China, 1953-92: a comparative study", *Development and Change* 27, 131-63.