The state of Asian urban transport

Cities vary enormously in their urban transport systems.

Even within Asia there are great differences between the transport situation in different countries.

Japanese cities, where bicycles, urban rail and cars are all important, are in contrast with Vietnamese cities where motorcycles are now the number one mode of transport, or Chinese cities where bicycles dominate. In Hong Kong public transport is most important and this contrasts with Malaysian cities where cars and motorcycles now dominate travel and with Indian cities with their wide range of motorised and non-motorised transport types.

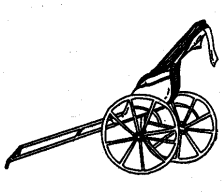
A brief history of transport in Asian cities

We sometimes forget that, whatever their current situation, every city has gone through great changes in its transport patterns over the course of this century. And change will certainly continue. This variety can remind us that the way our cities are now is not inevitable and that the future patterns depend on choices that we make.

Walking cities

In the late 19th century, the urban transport needs of the Asian cities were largely satisfied by walking. Other modes were poorly developed at that time (except water transport in some cities, like Bangkok) and most cities were small and compact.

Hand-pulled rickshaws



The first relatively affordable alternative to walking in many Asian cities arrived in the last decades of the 19th century when hand-pulled rickshaws began to appear. Hand-pulled rickshaws are two-wheeled vehicles pulled by a man and able to carry two passengers. These were apparently invented in Japan in the 1860s (named *jinrikisha*). They reached a peak in around 1900 in Tokyo and in the early 1920s in Hong Kong, Singapore, Kuala Lumpur and Bangkok.

Pony cabs

Horse-pulled vehicles offered taxi-like services in many Asian cities in the first half of this century (and earlier) but seem to have been most numerous in the Philippines (where they are known as *Calesa*) and in Indonesia (*Andong* or *Dokar*). In these places, hand-pulled rickshaws were not numerous.

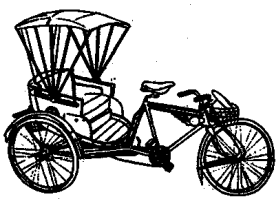
The first bicycle influx

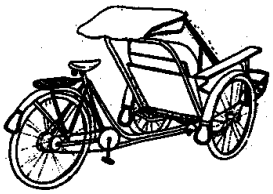
Surabaya, early 20th Century. Duparc (1972)

Bicycles had become popular in the West from the 1890s but they were initially expensive in Asia and few in numbers. However, Japan developed its own bicycle industry and they rapidly became widely used there. In other Asian countries in the 1920s, bicycles were still expensive and so were initially used by middle-income people. By the 1930s they were numerous in many Asian cities, giving concern to tram operators about the competition.

Pedicab = trishaw = pedal rickshaw = samlor = becak = beca = cyclo

📖 Gallagher (1992) "The Rickshaws of Bangladesh". Dhaka University Press.





Pedicabs were also slow to gain a foothold at first, partly because of resistance from the rickshaw pullers, partly due to the lack of smooth, hard road surfaces and partly due to the expense of imported bicycle components. In Asia, pedicabs were first introduced to Singapore in 1914 but did not catch on until 1929. They then quickly appeared in Bangkok in 1933, Jakarta in 1936, and Surabaya in 1942.

The invention of pedicabs has been attributed to various cities, including Bangkok and Jakarta. Gallagher (1992: 46) shows that they were invented in Europe not long after the bicycle but that they never caught on there. The various types suggest that they were probably independently invented in various places as a natural adaptation of the bicycle.

Pedicabs tended to displace hand-pulled rickshaws and horse-drawn cabs, although regulation also played a role in the decline of rickshaws. Pedicabs became numerous in Singapore, Bangkok and Jakarta in the 1930s but it was not until the 1950s that they existed in large numbers in many countries of Southeast Asia.

Trams

📖 Rimmer, P. J. (1986). Rikisha to Rapid Transit: Urban Public Transport Systems and Policy in Southeast Asia. Sydney: Pergamon Press.

💻🖱 TRAM VIEWS OF ASIA: Postcards and Photographs of the Early 20th Century Showing Trams in the Cities of Asia http://members.aol.com/trolleyana/tva.html

The period from about 1880 to 1940 saw the rise of trams, which were the most significant mode of motorised urban transport in large Asian cities between 1910 and the 1930s. There were trams in most Asian cities of more that a few hundred thousand people, including Tokyo, Osaka, Seoul, Bangkok, Manila, Jakarta, Calcutta, Mumbai, Georgetown in Penang, Singapore, Surabaya, Shanghai, Hong Kong, etc.

Early car ownership

As early as the 1920s, cars had become commonplace among the elite in the Asian cities and had reached sufficient numbers to already be causing some congestion problems in city centres. Despite their use almost solely by the rich European elite, by the 1930s cars already dominated traffic in certain colonial Asian cities.

Buses and "mosquito" buses

Motor buses of various kinds began to become important in most Asian cities from the 1920s onwards. For example, Hong Kong bus services began in the 1920s. Bus services began in Seoul in 1928 but were not important until the post-war era. In Singapore and Kuala Lumpur, "mosquito buses", which were small 7-seater buses operated small enterprises became important by the 1920s. Jakarta and Surabaya also had motor bus services by the 1930s, provided by small vehicles in sufficient numbers that their competition caused concern to the tram operators.

The situation by the 1940s

By 1940, Asian cities tended to stretch 7 kilometres or less from their geographical centres. Thus, they remained compact and the bigger cities became very dense. Non-motorised vehicles were plentiful. Motorised modes of transport, especially trams and small buses, had made their presence felt but overall, these cities had rather low levels of motorised mobility, even by the standards of the time.

The end of the trams

The 1950s and 1960s saw the removal of tram services in most Asian cities, as was also occurring in most other regions of the world in the same period.

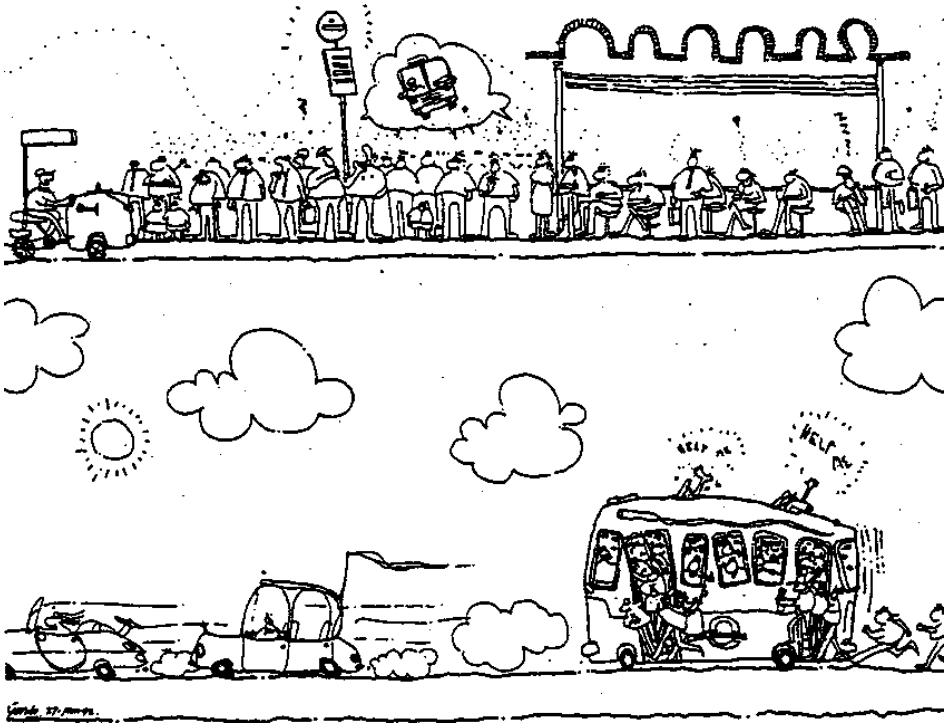
Walking remains very important

In any case, a large proportion of the population of many Asian cities still could not afford to use public transport regularly. Walking remained important in most Asian cities, especially the poorest of them, even up to the 1960s. For example, it was estimated that in around 1970, 60 percent of Jakarta's work trips were on foot. Even in much wealthier and larger Tokyo, walking and cycling still accounted for almost 51 percent of all trips in 1968.

Buses and jitneys

With the end of trams in most cities, buses and informal-sector minibuses (jitneys) became the major forms of urban public transport in most Asian cities. In most cases these were run by private sector companies or small operators. Only in large Japanese cities did urban rail (suburban rail and subways) become the main form of public transport.

Jitneys are small buses which operate on fixed routes like conventional buses. They are usually owned individually by small operators (which may cooperate through route collective). In many cities jitneys will stop on demand rather than at fixed bus stops. Manila's jeepneys, Jakarta's mikrolet and Thailand's silor lek are examples of jitneys.



GTZ Thailand

In Manila, the demise of the trams in the war and the lack of buses in the immediate post-war period left a need that was filled by the conversion of war-surplus jeeps to serve as minibuses. At first, they had a capacity of only seven passengers but this has gradually been increased over the years and by 1970 many had a passenger capacity of 13. They became known as "jeepneys" and have been the predominant form of public transport ever since, although conventional buses have also become important.

Some bus systems, such as Seoul's, were successful. However, many cities' bus services deteriorated as traffic conditions worsened and in the face of a hostile or restrictive regulatory and taxation environment. In many Asian cities in the 1960s buses began to fall far short of meeting demand. This happened in Singapore, Bangkok, Kuala Lumpur and many other cities. Sometimes government stepped in and set up government-owned services. However in most cases this failed to solve the problem.

In cities where regulation was not too severe, jitney operations were able to step in to help fill the demand for affordable and plentiful public transport. This happened in many places, including Hong Kong and on a large scale in Philippine and Indonesian cities.

Bicycle and pedicab boom and decline

Surabaya, Indonesia, early 1950s. Duparc (1972)

By the 1950s, bicycles had become important in most Asian cities. For example, in 1960 Singapore had 268,000 bicycles, compared with only 63,000 cars and 19,000 motorcycles. There were also more bicycles than private cars in Jakarta and in Seoul in around 1970. Photographs from the 1950s of Jakarta, Bangkok and Surabaya street scenes show large numbers of bicycles and pedicabs sharing the streets with small numbers of motor vehicles. In Tokyo, bicycles continued to gain in numbers, despite rising motorisation.

However, by the 1960s, there was a trend among decision-makers to view pedicabs in a negative light and their use began to be restricted. For example, they were banned from Bangkok in 1961 and gradually restricted in Singapore and Kuala Lumpur from the early 1960s so that their numbers began to drop quickly. Restrictions on pedicabs came later in the Indonesian cities.

By the 1970s, bicycle use also started to drop drastically in many cities where car and motorcycle ownership were rising quickly, such as the middle-income cities of Malaysia, Thailand and Taiwan.

However, bicycle use continued to rise in Japan, in South Asia and especially in the communist countries of China and Vietnam – where the bicycle became the primary mode of transport.

Big road plans

The influence of car-oriented planning began to be felt throughout the region during the 1950s and 1960s. The prestige of the United States tended to cause local elites all over the world to see highways and cars as the way of the future. The influence of Western car-oriented ideas was also felt directly, through foreign aid for highway development, as for example American financing for major highways between Bangkok and regional centres in Thailand.

Another influence was through the Western consulting firms that conducted most transport or urban planning studies in Asian cities in this period. They used the standard urban transport planning (UTP) process that had been developed in and for American car-oriented, suburban-style cities. Prior to the early 1970s, UTP was especially weighted towards roads and car-oriented approaches. It simply attempted to supply all of the road capacity needed to match the predicted traffic demand.

📖 Dimitriou, H. T. (1992). "Urban Transport Planning: A Developmental Approach." London and New York: Routledge.

Many studies recommended grandiose road-building plans. One example was the 1964 First Kuala Lumpur Transportation Study by an Australian firm, which emphasised capital intensive road building projects but had no measures to encourage public transport. Another example was the 1960 Greater Bangkok Plan by American consulting firms which proposed the construction of three ring roads around Bangkok, two expressways to pass through Bangkok's inner area, and thirty-eight new main roads.

📖 Poboon, C. (1997) "Anatomy of a Traffic Disaster: Towards a Sustainable Solution to Bangkok's Transport Problems." Doctor of Philosophy Thesis, Murdoch University.

Car and motorcycle invasion

In the 1950s only a small elite owned private vehicles. In 1960, private vehicle ownership was still low in all of the Asian cities with less than 50 cars per 1000 people. By comparison, many European cities already had over 100 cars per 1000 and American cities had around 400 cars per 1000 persons by 1960.

However, by 1970 the beginnings of an upsurge towards mass car and motorcycle ownership could be seen in a few of the wealthier Asian cities, including Tokyo, Singapore, Hong Kong and Kuala Lumpur. By 1970, Bangkok, Kuala Lumpur and Singapore each had more than 50 cars per 1000 people and Tokyo's car numbers had shot up from only 16 per 1000 people in 1960 to just over 100 cars per 1000 people in 1970. In 1960 motorcycles were still unimportant in Asian cities but by 1970 motorcycle ownership had risen dramatically in Singapore, Kuala Lumpur, Taiwanese and Indonesian cities. Already by 1970, congestion was a serious problem in Bangkok, Manila and Tokyo as vehicle numbers rose.

Barter

The influx of cars and motorcycles came much later to South Asia, beginning in earnest only in the 1980s. Certain other countries, especially Vietnam have seen a surge in motorcycle ownership in the 1990s, since economic reforms. China is only now facing the beginnings of a surge in vehicle ownership.

Different reactions to motorisation

Since the early 1970s, different middle-income and high-income cities that have had to face rising car and motorcycle ownership have had very divergent reactions to this predicament. As dense cities, all of them found that the influx of vehicles quickly caused problems.

One response was to discourage private vehicles and encourage the alternatives. Several cities reacted by firmly acting to slow down the growth in vehicle ownership and by discouraging private vehicle use. They also took decisive action to promote and improve public transport, firstly by improving bus systems and later by building or expanding urban rail systems, when they became affordable. The most famous examples of Asian cities that have adopted this kind of strategy are Singapore, Hong Kong, Tokyo and Seoul. In general, this strategy has been very successful.

To welcome cars or resist them?

Two very different Asian responses to increasing car and motorcycle ownership.

📖 Barter, P. A. (1999) "An International Comparative Perspective on Urban Transport and Urban Form in Pacific Asia: The Challenge of Rapid Motorisation in Dense Cities". Unpublished PhD. Thesis, Murdoch University, Western Australia, Perth.

The second main response has been to allow car and motorcycle ownership to rise quickly and to try to cope with it through road building and other reactive measures. The most obvious examples in Asia of this response are Bangkok, Taipei and Kuala Lumpur. Unfortunately, this response has been more or less disastrous for traffic conditions, the urban environment and the viability of public transport in these cities.

Many cities in Asia still have a choice of which of these models to follow (or to choose other models altogether).

The current state of urban transport in Asia

Asian cities are very diverse in their urban transport characteristics. Nevertheless, it is possible to make some broad generalisations about Asian urban transport when compared with European cities and American cities (see the **table below**). These generalisations apply to rich Asian cities as well as lower-income ones.

On average, Asian cities have much lower vehicle ownership than the other regions. Car use in Asian cities is much lower than in the other two regions shown here. The energy used by Asian urban transport is accordingly much lower than in the European or American cities. The Asian cities also have much lower levels of road provision per person. However, it is difficult for them to squeeze more roads in because of their high urban densities. Notice that the Asian cities already have a rather high level of road length per hectare (or "road density"). Asian cities have a high role for non-motorised transport and a high role for public transport.

Notice that even though American cities and European cities are both wealthy places, they have many contrasts in their transport characteristics. The American cities are far more "car dependent".

📖 Kenworthy, J. R. and Laube, F.B. with Peter Newman, Paul Barter, Tamim Raad, Chamlong Poboon and Benedicto Guia (Jr) (1999) "An International Sourcebook of Automobile Dependence in Cities, 1960-1990". University Press of Colorado, Boulder.

International comparisons of urban transport patterns in 1990

	Asian cities	European cities	American cities
Car Ownership (passenger cars per 1000 people)	109	392	608
Vehicle Ownership (total vehicles per 1000 people)	224	452	749
Roads per person (metres per capita)	1.1	2.4	6.7
Road Density (metres of road per urban hectare)	122	115	89
Role of non-motorised transport (walk+bicycle+pedicab % of work trips)	19	18	5
Role of public transport (public transport % of all passenger km)	48	23	3
Car use per person (km per capita per year)	1,397	4,519	11,155
Energy use per person (private passenger transport energy per capita (MJ))	6,969	17,218	55,807

Note: the Asian cities included in this average are Tokyo, Singapore, Hong Kong, Seoul, Kuala Lumpur, Bangkok, Jakarta, Surabaya and Manila. Source: Kenworthy and Laube, et al., 1999

Motorisation = Modernisation?

"Non-motorised transport is associated with poverty, and this association tends to make it something 'planned against' rather than 'planned for'" (World Bank 1996:76).

Privately owned automobiles have become a powerful symbol of class and wealth. In many places, walking, cycling and public transport have become stigmatised as inferior or lower class ways of travelling. For instance, in Dhaka in Bangladesh, middle-class people are embarrassed to be seen on bicycles because of their association with poverty. Ironically, bicycles are too expensive for the poorest households in Dhaka.

The stigma against certain modes of transport has been reinforced by public policies that dedicate funds to highway projects while neglecting pedestrian, cycling and public transport. As a result, lower-income residents who depend heavily on these ways of getting around

are being disadvantaged. These spending patterns not only neglect, but actually displace, non-motorised transport and reduce the variety of public transport options.

Income is not the only explanation for different transport systems

It is widely recognised that rising income levels can unleash the **potential** for high levels of vehicle use. High levels of vehicle use are not possible in very low-income cities where vehicles are not affordable to most people. However, it must not be taken for granted that increasing incomes will inevitability cause more and more private vehicle travel. Around the world, high-income cities vary enormously in their levels of vehicle usage.

Cycling is popular in wealthy Japan. Photo: Barter

Many rich cities in Asia and elsewhere have successfully nurtured cycling and public transport. Some of the most modern and economically successful cities in Asia, such as Singapore, Tokyo, Hong Kong and Seoul, have placed public transport planning and development ahead of planning for cars.

Japanese cities have also created an environment in which cycling is flourishing. Singapore is now also making an effort to promote cycling. Some of Europe's richest countries, such as Denmark, Switzerland and the Netherlands, have also made great efforts to promote and protect urban cycling and public transport.

Diversity in Asian Urban Transport

We have looked at the average transport situation in Asia but it should not be forgotten that there are very wide variations between different cities across the continent. The situation ranges from the expressways and high-speed car and motorcycle traffic in Kuala Lumpur to Mumbai where most people walk or use public transport. Singapore with its strict control of cars and focus on public transport contrasts with extremely congested situation in Bangkok. Hong Kong with very high use of public transport contrasts with Taiwanese and Vietnamese cities with their very high motorcycle ownership. Dhaka is dominated by pedicabs and Manila has very high levels of jitney use (in the form of its famous "jeepneys"). Tokyo is the most rail-oriented city in the world and most people know that many Chinese cities still have the highest levels of bicycle usage in the world.

A joke from Bangkok:

At the height of the economic boom in 1995 a wealthy business tycoon is travelling along a busy street in Bangkok. She notices a friend walking in the same direction. Pulling over she calls out, "Hey, do you want a lift?" The pedestrian friend looks at the car and the traffic situation and replies, "Sorry, not today. I'm in a hurry."

Asian Cities = Dense Cities

Since transport and patterns of urban land-use are so interconnected, all cities must make sure to plan their transport in harmony with the realities of their city's actual form.

Part of Seoul. Photo: Barter

Appearances can be deceptive. Many developing Asian cities have a low-rise urban form, with a large proportion of the population living in informal settlements. But the population densities of these cities (within their built-up areas) are typically between 100 and 250 people per hectare.

Urban densities around the world:

USA and Australian cities: 10 to 25 people per hectare

Canadian cities: 20 to 50 people per hectare

European and Japanese cities: 40 to 100 people per hectare

Latin American cities: 60 to 150 people per hectare

Korean, Chinese and Vietnamese cities: 150 to 250 people per hectare

Indonesian and Philippine cities: 100 to 180 people per hectare

Indian cities: 130 to 250 people per hectare

Thai cities: 90 to 150 people per hectare

Cities in Asia also usually have intense mixing of different land uses at a fine scale, especially in the inner areas of the city. Planners sometimes complain about this but the new trend in the West is to encourage more mixing together of different activities because it encourages more walking, cycling and convenience for residents and workers.

The land-use features of developing Asian cities have developed along with transport systems that have been dominated by walking, cycling, pedicabs, buses and jitneys. So they developed in ways that minimised the need for expensive motorised travel. This heritage can be a positive asset that can be built upon.

New land-use trends associated with motorisation have begun to threaten the accessible and travel-minimising features of some Asian cities. Real estate developers increasingly build new developments with segregated land uses and in locations that are accessible only by private vehicle, even if this leaves them inaccessible by public transport and non-motorised transport. New high-speed, high-capacity roads in some places have encouraged haphazard development in long corridors, resulting in longer trip distances for residents.

Nevertheless, these trends are only beginning and most Asian cities still have high densities, especially in their inner areas.

Cars and dense cities don't mix

It is physically impossible for a dense city to have a high level of road capacity per person

High-density cities are unsuited to high rates of private car use. It is physically impossible for a dense city to have a high levels of road capacity per person (Barter, 1999). Cars take up a huge amount of space when in motion AND for parking. In dense cities, space is a valuable commodity. Congestion and parking problems can therefore become very serious in dense cities even when only a few percent of people own cars.

Walking, cycling and public transport can flourish in dense cities - but they need to be actively encouraged

Public transport, walking and cycling are very much more space-efficient than private vehicles, especially cars. The most successful urban transport systems in Asia are those that have encouraged walking, cycling and public transport.