INFLUENCE OF ASIAN TRANSPORT ON URBAN TRANSPORT POLICY AND PLANNING IN HA NOI, VIET NAM

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Abstract: The impressive performance of Asia in terms of economic development and the growth in population is causing the region to grapple with extremely rapid rates of urbanization. Urban population rate increased to about 24%, 2000 in Viet Nam. In Asia walking and cycling are often the sole means of gaining access to employment and social services for the urban poor. Vehicle emissions are increasingly being recognized as the dominant cause of localized air pollution. Transport accidents are increasing with the number of deaths increased to about 13,000, 2002 in Viet Nam. Bicycle use in Ha Noi reduced to about 37% passenger traffic demand in 2000, the public transport about 7%, 2002, while motorcycle about 56%, 2000. Through the paper, the author of this one would like to present the influence of Asian transport on urban policy and planning in Ha Noi.

Key Words: Transportation Policy and Planning

1. INTRODUCTION

In terms of economic growth, Asia is the most dynamic region in the world today. The impressive performance of Asia in terms of economic development and the growth in population is causing the region to grapple with extremely rapid rates of urbanization, of which urban population rate increased from about 20% in 1995 to 24% in 2000 in Viet Nam.

Nowadays, in Asia walking and cycling are often the sole means of gaining access to employment and social services for the urban poor who cannot afford public transport services. Vehicle emissions are increasingly being recognized as the dominant cause of localized air pollution and health problems, and the pressing demands for motorized forms of personal mobility are generating pressures on the road network and resulting in congestion and accidents, of which transport accidents are increasing with the number of deaths increased from about 6,000 in 1995 to 13,000 in 2002 in Viet Nam.

The intrinsic development of the urban transport sector and its response to the pace, scale and nature of the urbanization and economic development in the 1990s determined to a large extent the nature and form of Asian cities in the early twenty first century and Ha Noi is one of them.

Over the last 1000 years Ha Noi has under gone many changes. King Ly Cong UAN transferred the capital from Hoa Lu to Dai La in 1010. Its 1000th anniversary will be held in the year 2010. Ha Noi, the present name, was introduced in 1831 as the capital city. Viet Nam was a French colony from 1882 to 1954. After the French left in 1954, urban planning was a

new field for the authorities as well as the professionals. Ha Noi Master Plan was completed in 1965 and then 1984 with the assistance of USSR's planners, the third time in 1992 and then in 1998 by Vietnamese planners.

Ha Noi, one of two largest cities in Viet Nam, is the capital of the country. It is the center of politics, science and technology and for the past century has been a major economic and export center for the whole country. Ha Noi now has 7 inner districts and 5 outer districts with about 921 km^2 and 2.76 million inhabitants (inner city 84.3 km^2, 1.47 million inhabitants). The average population density in the inner city is about 175 persons per ha.

Unlike many Asian cities Ha Noi possesses a city structure of historical interest, based on both original Vietnamese and French colonial architecture. Hanoi's present historical heritage and its charm, enforced by tree-lined streets and lakes with high density of road network and major traffic mean is bicycle and motorcycle. The most important feature of traffic for the city is the mixture of the street function between motorized and non-motorized vehicles.

Through the paper, the author would like to present the influence of Asian urban transport to urban policy and planning in Ha Noi.

2. BACKGROUND

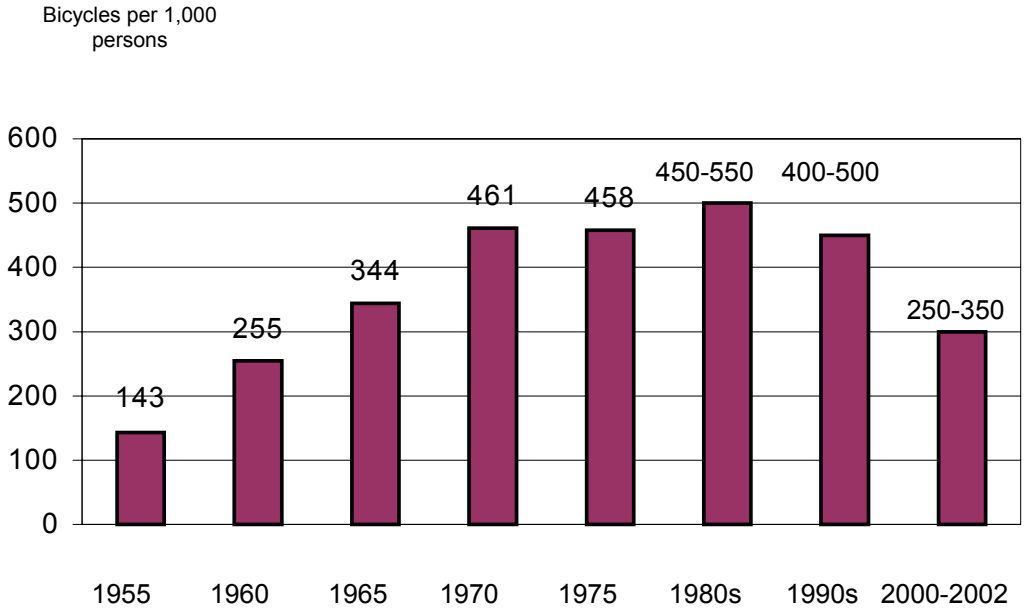
2.1 Non-motorized Transport

Asia has the widest variety of non-motorized forms of transport in the world. They form the backbone of the transport system for the poor in many cities for both personal and good movements. Bicycles are by far the most numerous. Exact numbers are hard to come by, but it is estimated that in 1990s there are some 300 million bicycles in China, 66 million in Japan, 45 million in India and six million in Korea. These four countries alone account for more than half of the world's estimated total bicycle population of 800 million. However the bicycle use in Ha Noi, which met more than 80% passenger traffic demand in 1980s, reduced about 37% passenger traffic demand in 2000 (JICA, 2001).

The first bicycle appeared in Ha Noi in about 1910 (L.D. Hai, 1976). From then on, the bicycle has for a long time been the fundamental basis for transportation not only in Ha Noi, but also in whole country. Beside providing personal mobility for the city, it has also been a very important traffic means of good transportation.

Bicycles in Ha Noi were earlier subject to registration, but after 1980 this has not been the case. The number of bicycles per 1,000 persons in Ha Noi changed by the time as follows (figure 1).

Ha Noi is a capital and typical "Velo City" or "Bicycle City" of Viet Nam. In 1950s and the first half of 1960s the number of bicycle grew at 22 percent annually in Ha Noi. At that time, the size of city and population were small.



Source: Ha Noi Traffic Police Division.

Figure 1. The number of bicycles per 1,000 persons in Ha Noi

Form 1970 to 1975 the number of bicycle grew at 7 percent annually. Then we could see cycleways in the residential quarters of Ha Noi and the streets reserving cycle lanes for cyclists appeared.

A new idea keeping safety for cyclists proposed in 1976 in Ha Noi, it is a kind of segregation, called "compulsory segregation" to help the cyclists implementing traffic law and keeping safety (L.D. Hai, 1976). However, up to the second half of the 1980s, this measure started applying in some roads in Ha Noi.

Figure 2. "Moveable segregation" - A new kind has been applied in Ha Noi since 1993. This experience came from China

In years later, the renewal process of country is impacting directly to the flow of vehicles which using the road. The number of bicycle using the road is decreasing at five to six percent annually.

To response to the new transport priorities, keeping safety for cyclists, another new kind of "compulsory segregation" has been applied in Ha Noi in 1993 using "moveable segregation" (figure 2). This experience came from China.

2.2 Motorization

Asia account for just over ten percent of the world's automobile population and over 25 percent of the global truck and bus fleet. Within Asia, in 1990 the majority of these vehicles are in Japan which accounts for 70 percent of the region's automobiles and 62 percent of trucks and buses. Motor cycles are increasing in numbers throughout the region as people strive for cheaper and more usable alternatives to the motor car for urban personal mobility. Fore some, the motorcycle is a logical progression from the bicycle and for others it offers a faster alternatives to slow and crowded buses.

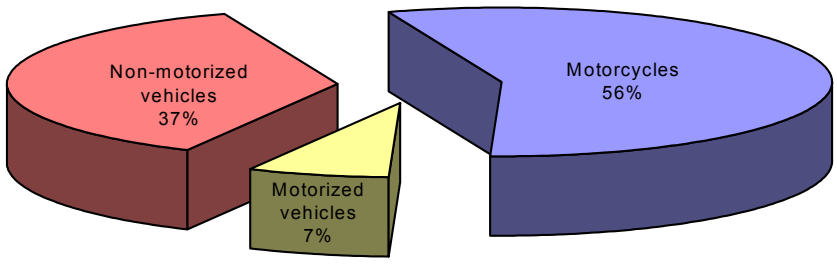
In Ha Noi the public transport system met about 7% passenger traffic demand in 2002 while motorcycle use met about 56%, 2000 (JICA, 2001). The new kind of motorized traffic mean in Ha Noi is motorcycle which has increased tremendously since the introduction of economic renewal policies in Viet Nam. That is why motorcycle use is one of main causes resulting in accidents.

The annual numbers of motorcycles in the past and at present operating in Ha Noi are shown in table 1 (whole city, but about 2/3 refer to inner city). Judging from the number, there are 953,087 motorcycles in the city in 2000 or 348 motorcycles per 1,000 person. The number of motorcycle using the road is increasing unexpectedly at about 15 percent annually.

Table 1. The development of motorcycles and cars in Ha Noi

Year	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000
Motorcycle	195.447	273.633	346.977	420.353	498.468	570.544	626.565	702.349	807.701	953.087
Car	42.318	45.364	49.006	52.535	60.231	70.880	86.436	100.170	113.692	130.746

Source: Ha Noi Traffic Police Division.



Source: JICA - 2001.

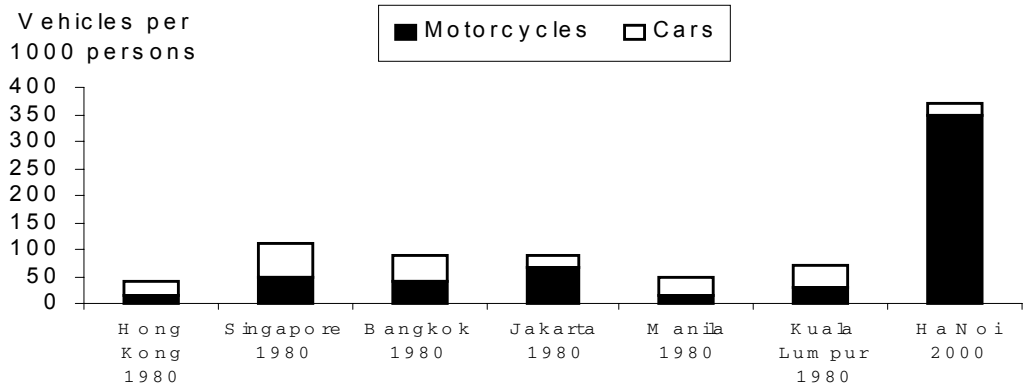
Figure 3. Motorization in Ha Noi traffic year 2000

Motorcycles in Viet Nam were imported mainly from Asian countries such as Japan, China, etc. The motorcycles have quickly become dominant in Hanoi's traffic and must be considered in the urban transport planning.

The third important mode of Hanoi's traffic mean is car. Private car ownership is still insignificant in the city. Most of the passenger cars are government owned or company cars. The annual numbers of cars in the city are shown in table 1 (whole city, but about 2/3 refer to the inner city). Judging from the numbers, there are about 130,746 cars in the city or 21 cars per 1,000 persons in 2000. Cars made up 12% of all motorized vehicles.

The proportion of motorized and non-motorized vehicles observed in the centre of Ha Noi is shown in figure 3. The number of non-motorized vehicles (bicycles and cyclos) indicating that Ha Noi is still a Velo-city in Asia.

Mortorization rate in Ha Noi 2000 in comparison with motorization rates in South East Asian capitals 1980 are shown in figure 4.



Source: SIDA - 1993, L.D. Hai - 2000.

Figure 4. Motorization rates in South East Asian capitals 1980 and Ha Noi 2000

2.3 Public Transport

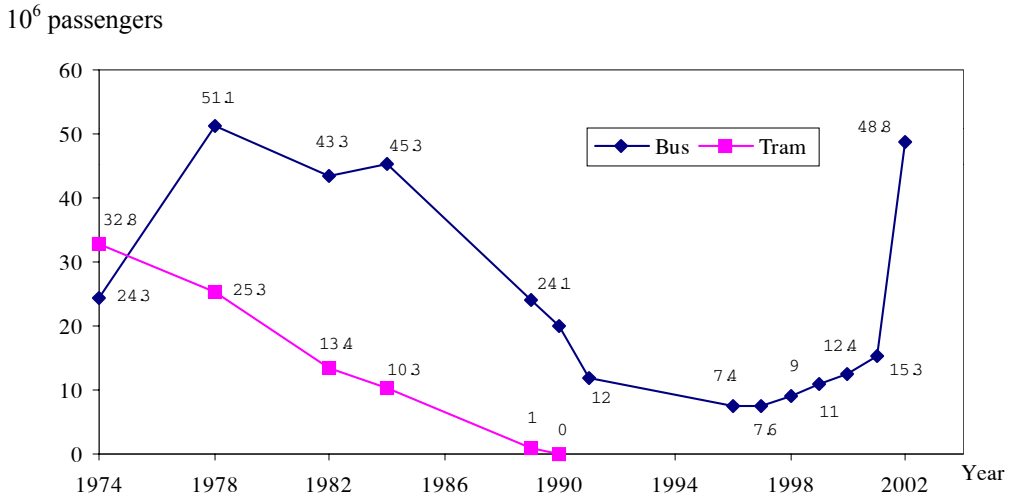
Ha Noi once had a tramway system of the "streetcar" type integrated with other traffic, but the system was relinquished in 1990. Its operation is shown in figure 5.

Ha Noi also possessed trolleybus system which converted from the tramway system, each unit requiring a crew of four, but all of them in the experimental period only, from 1990 to 1992.

Ha Noi has a good supply of electricity, which is a non-polluting form of energy and as good as bicycle use. So from this point of view, electrical public transport would appear in Ha Noi in the future (electrical light trail, underground system, etc.).

For above reasons, the bus system becomes the sole system of public transport belonging to the government sector. The former Thong Nhat Bus Company was reorganized in 1992 and split into three new companies, the new Ha Noi Bus Company for urban bus transport and two others for long distance traffic.

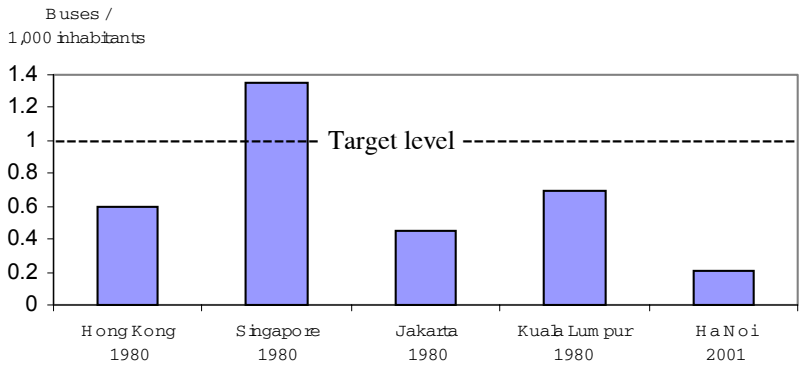
The public transport in the inner city is not yet paid proper attention. By 1996, the number of buses in the inner city public transport is 187 for 13 routes. The main transport unit is the Ha Noi Bus Company. The number of inner city bus routes goes up, from 13 (1996), 25 (1998) to 31 (2002). The number of vehicles increases from 187 (1996), 281 (1998) to 412 (2002).



Source: Ha Noi Bus Company - 1993, Transport Management and Operation Center - 1/2003.

Figure 5. The operation of buses and trams in Ha Noi

As a result of reduced subsidies, a cut-off of spare parts supply from Eastern Europe bus manufacturers and the abandoning of the outdated tram system, public transport dropped from serving 25.5% of the population 1975 to only 2-3% 1993. Today, public transport served about 11.6% of the population in the year 2002. It is in fact remarkable that Ha Noi is probably the one in South East Asia offering least options in the public forms of transportation. Nowadays, Ha Noi is far from able to provide the equivalent to one bus per 1,000 inhabitants (an average of 0.21 bus/1,000 inhabitants in 2001) which is often referred to as a rule of thumb of Asian countries (figure 6).



Source: SIDA - 1993, L.D. Hai - 2001.

Figure 6. Bus supply in Asian selected cities

The present modal spit was estimated and indicated an almost complete reliance on private transport first by bicycle, motorcycle and then by car. This situation is extraordinary for Asian developing countries as well as for Asian developed ones. In other bicycle-oriented countries such as China, India and Pakistan, the dependence on private two-wheeler traffic is usually balanced by public transport.

2.4 Traffic Congestion

The substantial growth in vehicle fleets is clearly evident in the urban areas throughout the region in the form of increasing traffic congestion. Not only does such congestion promote greater fuel consumption, and the resulting increase in the air pollution, but the severe increase in transit times can have substantial impact on economic productivity. Few countries in the region have made a serious effort to reduce congestion and even fewer have succeeded. There is an argument that all major cities suffer from traffic congestion and that traffic will always grow to the same level of congestion independently of the network improvements introduced. It is often said that as no city has found a solution, congestion is a way of life that has to be accepted.

Figure 7. Traffic congestion in Ha Noi

Ha Noi is one of the two large cities of Viet Nam where traffic congestion have occurred most frequently. There are usually 27 places of congestion, of which the most serious places take place at the city gates and the crossroads with railway. The national railway system that crosses the city is affecting negatively to the traffic issues. The crossroad between railways and roads take place essentially at the same altitude, which are also important junctions of congestion during the rush-hours.

The urban road system of Ha Noi is also facing problems. In Ha Noi there are above 300 streets of which those with carriage-way of 7-11 m account for 85%. The grade junctions are near from each other (in the inner city the average distance is 380 m), the congestion often happens and cause conflicts. The proportion of land for transport in the land fund is low, just only about more or less 8%, meanwhile the similar percentage in the world is about 25%. There are above 580 traffic junctions but all of them are intersections with same level.
The urban transport infrastructure has been improved at much lower rate than development of traffic means and needs. It is frequent in Ha Noi that two-wheel vehicles fill in all the space on roads, making cars and buses obstacle against traffic, especially at intersections. On the other hand, the public transport system can't meet the needs only and the development of private traffic means also caused traffic congestion.

2.5 Traffic Accident

The Traffic accident situation in Ha Noi is very serious, is concentrates in road accident as about 96% among registered traffic accidents. According to the recorded data, during recently

5 years, traffic accident in Ha Noi has been increasing strongly with accident indexes are very high. In 1998, the total deaths per total traffic accidents by 45%, number of accidents per 10,000 vehicles was in 54.83 and total deaths per 10,000 vehicles by 6.28.

In Ha Noi, the traffic accident is one of main reasons caused the deaths and significant economic loss. According to the Ha Noi Viet-Duc (Vietnam-Germany) Hospital' statistics, in 1998 the number of traffic accident deaths occupied between 65 to 70% of all the people died and appropriated 85.7% of deaths from all kinds of accidents in the hospital. And the people crippled from traffic accidents occupy more than 70% of crippled from every reasons.

With the few-segregation between the motorized and non-motorized traffic in the urban streets and intersection, and the lack of an efficient traffic control system combining safety facilities, it is expected that there is a high rate of traffic accidents. There is an increase in the trend of the number of all types of accidents in urban centers. This situation has been improving since the early of 2003. The accidents caused by motorbikes are rapidly increasing, for which urgent countermeasure should be taken. Especially in Ha Noi where the number of recorded deaths per year is over 200-300. The most common causes of accidents are reported to be: reckless driving, poor traffic discipline, poor braking system and encroachment. The data on the traffic accidents can be seen in table 2.

Table 2. Traffic accident data in Ha Noi (1991-2000)

Year	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000
Road accidents	617	678	672	656	2,094	3,517	2,937	2,614	2,494	2,444
Deaths	260	239	247	297	325	353	284	281	291	385
Wounders	512	634	567	447	2,114	3,727	3,201	2,970	2,856	2,670

Source: Ha Noi Traffic Police Division.

2.6 Environmental Impacts

The air environmental quality surveys in Ha Noi indicated that air pollution has happened on all urban roads. However, air pollution is still low level, suspended particulate is main pollutant. According to Viet Nam Critical Environmental Standards, total suspended particulate concentrated in air environment on major urban roads is overpass from 3.5 to 4 times. Especially in rush hours, air environment were polluted heavy level at main intersections, concentrated air pollutants were overpass Viet Nam Critical Environmental Standards, such as: Nitrous dioxide (NO_2) were over to 9 times, Sulfur dioxide (SO_2) to 7 times, Carbon dioxide (CO_2) to 8.5 times, vapoured organic compounds (VOC) to 9 times.

Based on late results from road noise level surveys in Ha Noi indicated that road noise level were much higher than Viet Nam Urban Noise Standards. Daily-time average road noise level were approximate 77 dB(A) and 24 hours average road noise level were 70 dB(A). A lot of residential areas are much higher than standards from 8 dB(A) to 12 dB(A) and highest for areas along urban road-sides, along rail-way sides. Especially, road noise pollution level were happened more higher than on highways across inner-city areas night-time.
Increasingly, the urban transport sector is generating adverse environmental conditions in many countries in the region and Viet Nam is one of them. Vehicle emissions are polluting the atmosphere, motorized vehicles are generating intolerable noise levels, traffic accidents are claiming more lives and the road infrastructure being built to accommodate urban traffic.

3. INFLUENCE OF ASIAN TRANSPORT ON URBAN TRANSPORT POLICY AND PLANNING IN HA NOI

3.1 Influence of Asian Transport to Approved Urban Transport Planning in Ha Noi

A general (or master) planning (including urban transport general/master planning) of Ha Noi to the year of 2020 approved by Prime Minister in 1998 with some main indicators as follows:

- Urban population: 2.5 million people in 2020.
- Urban area: 250 km^2.
- Land fund for urban transport: 25%.
- Urban road average density: 4.7 km/km^2 (main roads); 7.8-13.3 km/km^2 (other roads).
- Public transport: to meet 50-60% of travelling demand.
- Bus standard: 1 bus per 1,000 people, etc.

It is obviously that bus standard of one bus per 1,000 people in approved urban transport planning of Ha Noi relies on a rule of thumb of Asian countries (see figure 6).

3.2 Influence of Asian Transport to Proposed Urban Transport Policy in Ha Noi

For a sustainable society, a better environment not only for the present generation but also for future generations, we suggest that Ha Noi should formulate and develop a comprehensive urban transport policy. Some of the elements in such a policy are as follows:

3.2.1 Improving the Traffic Management

The most common causes of traffic accidents and congestion are reported to be: reckless driving, poor traffic discipline, poor braking systems and encroachment, and bad behavior of road users. The contains of traffic management include (L.D. Hai, 1996):

- Improved traffic regulation and enforcement are specially important and should be improved where mixed traffic occurs.
- Rules and regulation policies should be improved and combined with more efficient enforcement.
- Traffic restriction policies should be prepared and implemented in sensitive areas. The early priorities are the old central areas in large cities.
- Development restriction policies of motorized vehicles should be considered immediately to protect the urban environment.

This policy relied on proposals of JICA (1996) and SIDA (1993).

3.2.2 Improving and Expending the Public Transport System

The present modal split was estimated and indicated an almost complete reliance on private transport first by bicycle and then by motorcycle and car. This situation is extraordinary for Asian developing countries as well as for Asian developed ones. In other bicycle-oriented countries, the dependence on private two-wheel traffic is usually balanced by public transport. In case of Ha Noi, Cycle (or Cyclo)-and-Bus-Ride can be proposed, considering the following points (F. Nakamura and P.N. Thach 1993; L.D. Hai 1993):

- Main streets are coverred by the routes with large buses.
- Bus stop spacing is short in CBD and a little longer in suburban areas.
- Bicycle and cyclo can be used as feeder modes.
- Formulate and develop a comprehensive urban transport policy based on the supply leading approach; and
- Meet 40% passenger traffic demand by public transport in the year 2010, from restarting point of 2-3% (1992).

3.2.3 Better Provision for Improvement and Expansion of the Urban Road Network

Cities in Asia lack adequate road space to accommodate the increasing demands for mobility of people and goods. Most Asian cities have road network densities per thousand inhabitants in the 400 meters (Jakarta) to 600 meters (Manila). The exceptions are Singapore, with as much as 2.7 kilometers per thousand, and Hong Kong with as little as 230 meters per thousand (The World Bank, 1991).

On the basis of Asian experience and of urban transport policy relied on the supply leading approach should be a planned relation between road and street development on one hand, and the development of the urban traffic means on the other, suggested that to the year 2010 as follow:

- The criteria of road network in inner city urban areas, where at 1992 in 180 meters per 1,000 inhabitants, 235 meters per 1,000 inhabitants in 2000, should be 300 meters or more, per 1,000 inhabitants, try to keep pace of that regional countries (400-600 meters) (L.D. Hai, 1996 and 2003).

3.2.4 Improving the Telecommunication System to Reduce the Total Volume of Traffic

There is a growing recognition that long-range planning of the transport sector needs to take into account the recent developments in the field of communication. About half the population of post-industrial societies in the developed and newly industrialising countries are today engaged in generating, processing and transferring information. These development will have far reaching impact on the demand for urban travel in future, and need to be understood and reflected in urban development policies (University of Singapore, 1995).

The telephone system is poorly developed in terms of coverage in most urban areas. This coverage has been increasing very rapidly now. The average telephone coverage throughout the country was 1.04 units per 100 people by the end of 1995, 4.23 units per 100 people by 2000 and 6,9 units per 100 people by 2002. The average telephone coverage in Ha Noi was 6 units per 100 people by 1995, 18 by 2000 and 27 by 2002 (Hanoi's Post Office, 2/2003).

- Improving the telecommunication system would be a good multi-purpose measure to reduce the travel needs of the urban people (L.D. Hai, 1996 and 2003).

3.2.5 Better Provision for Cyclists and Pedestrians

Take Tianjin in China as an example Chinese planners proposed to promote public transport playing the major role and to take cycle traffic playing the minor role, reducing bicycle use to meet 80% passenger traffic demand in 1984 to 60% (1990) and 40% (2000) (D. Forbes, 1988).

The habit of walking would be increased in the country where the public transport system is good. By the year 2010, the public transport will meet 40% passenger traffic demand. Then the remaining 60% will be met by other transport means (L.D. Hai, 1993), of which:

- Better provision for cyclists and pedestrians to maintain bicycle use of 30%, others of 5% (three-wheel "cyclo", pedestrians, etc.), motorbikes 20% and car 5%. These are feasible portions which can be implemented by government and private sectors to reduce traffic congestion in large cities and to protect the urban environment in the future.
- Infrastructure development should be made with a view accomplish separate systems: motorized system and non-motorized system (bicycle and pedestrian paths).

Chinese urban planner's ideas influenced Vietnamese urban planners and policy makers.

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