Chapter 3 Transportation in and around Hanoi: current issues and challenges

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1. Introduction

Like other infrastructure services, transportation is an intermediate input, which helps to increase the productivity, economic growth, solve social problems such as poverty elimination and decreasing inequality gap among regions. In other words, transportation plays an importation part in economic development through increasing productivity, providing necessity, and improving living standards. For enterprises, the transportation system is very essential in their business activities. With a good system, enterprises can have lower business costs, and allows access to production resources like capital, labor, materials and consuming market.

Transportation system development will have impacts on the three aspects of sustainable development: economic, social and environmental development. (See Figure 1)

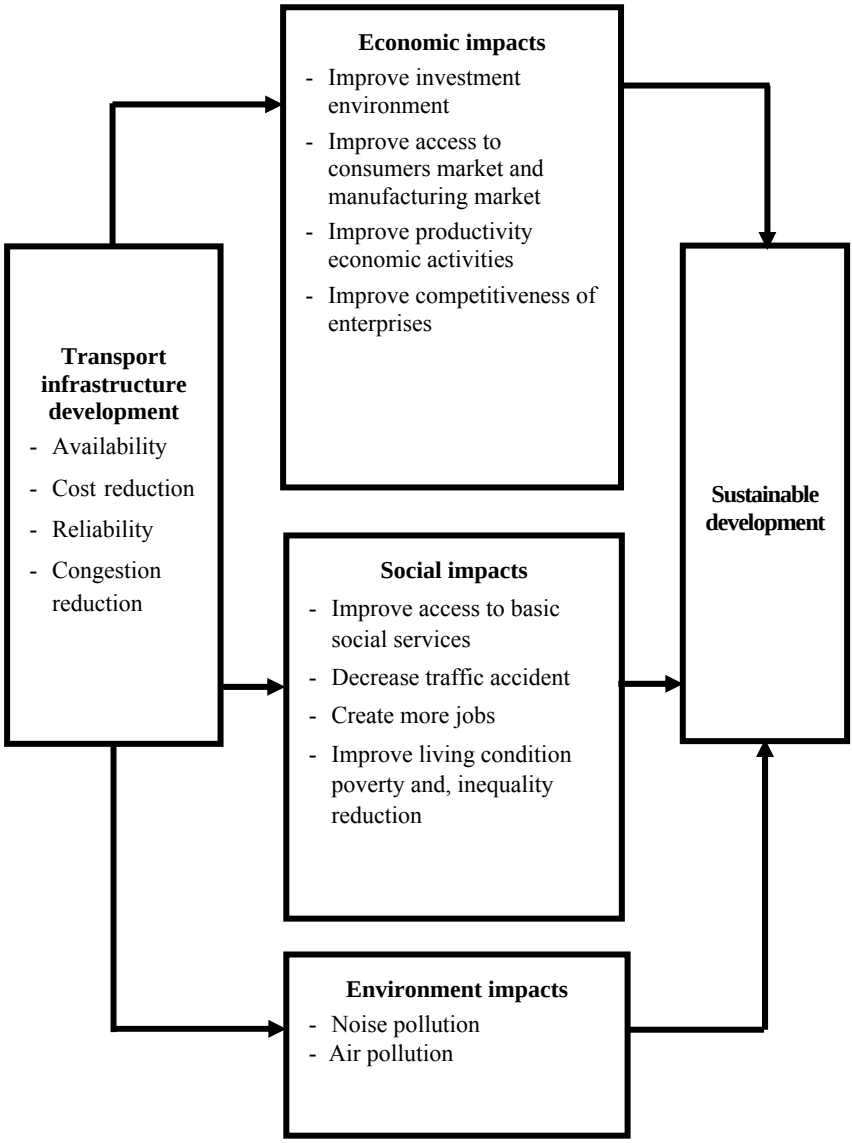
In short, we can see that transportation system development has a great impact on sustainable development of an urban area, a region or a country in general. Transportation is an essential element in the investment environment. Therefore, when choosing an investment location, investors

always consider transportation as one of the most important factors. According to the Investment Climate Survey of the World Bank 2005, transportation is considered the third constraint for business activities and enterprises. Moreover, transportation in Vietnam is seen as a greater constraint than neighboring countries like the Philippines, Indonesia, Malaysia, India and China (see Figure 2)[20]. According to this survey, there are 24% of enterprises in Vietnam think that transportation is a constraint for their business. The road quality makes the transportation cost increase significantly. That is one among many factors that enterprises worry about most. In Brazil, the structure of roads is very bad, so the transportation cost accounts for 20 – 40% of the product price. In Russia, due to low quality roads, transportation cost accounts for 15% of the price. In Western Europe and the US, the transportation cost share is 7 – 8%. In Vietnam, there is not an official assessment on the transportation cost, however, it is clear that the road infrastructure is no better than the mentioned above countries[21].

[20] Investment Climate Survey of the World Bank 2005 was conducted in 58 developing countries and transition economies. The Investment Climate Survey in Vietnam, conducted by the International Development Center of Japan and CONCETTI in the summer of 2005, has one of the biggest samples in the world. It comprises 1,150 firms located in 25 provinces across five of the eight regions of the country.

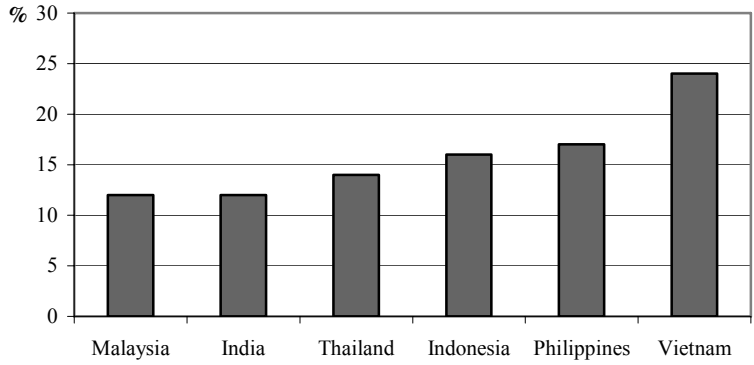
[21] The World Development Report 2005

Figure 1 The impact of transportation on sustainable development



Source: The author

Figure 2 Percentage of enterprises consider the transportation system is a constraint for their business in some Asian countries



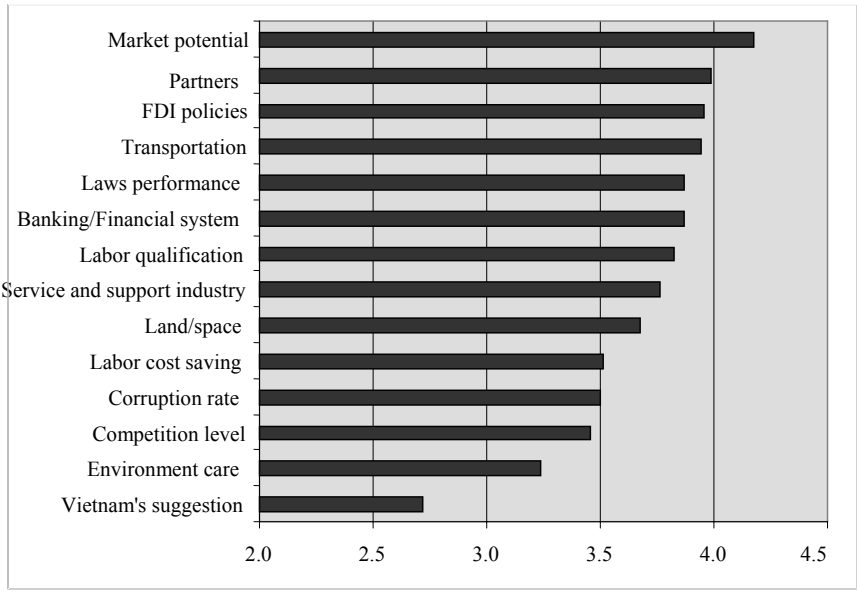
Source: Investment climate surveys in Vietnam, 2005

The survey on 66 enterprises in Hanoi conducted by VDF in 2005 also provides similar results[22]. According to this survey, transportation quality is one consideration of investors (Figure 3).

Hanoi is an important and strategic transportation point. It plays an essential role in socio-economic and security of the country. Like other modern capitals over the world, if Hanoi wants to improve its position equivalent to other capital cities in the region and to attract more investors, it first has to comprehensively improve its transportation system, in which the transportation network for socio-economic development and for commodity transport and public transport should be the core.

[22] The survey was conducted by VDF researchers (Pham Thi Huyen and Nguyen Ngoc Son) in 2005 and had done in the last six months of 2005, beyond 66 valuable responses. There are nine nations and territories: Australian (4 respondents), China (8 respondents), EU (9 respondents), Hong Kong (6 respondents), Japanese (10 respondents), Singapore (7 respondents), Taiwan (8 respondents) and the US (6 respondents).

Figure 3 Important factors in investors' consideration



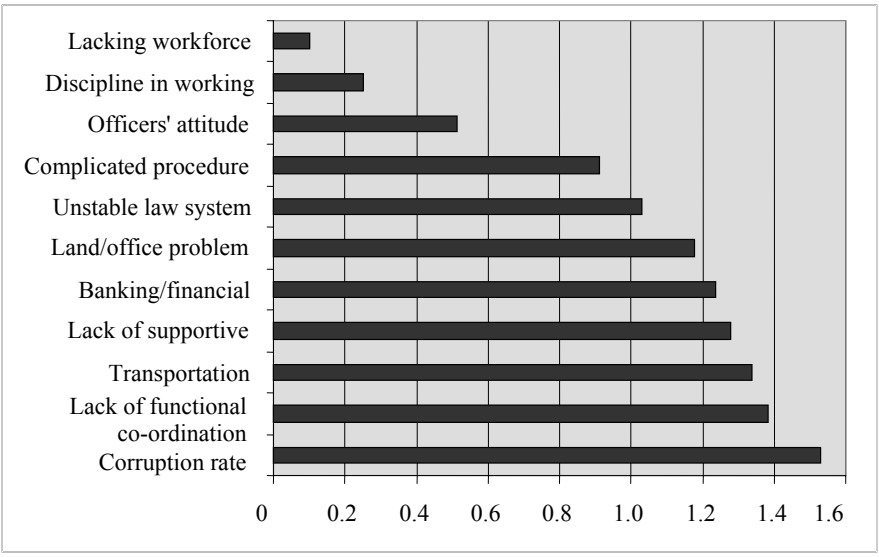
Source: VDF survey, 2005. This chart shows the importance of listed factors into the respondents' location choice.

The ranking of business environment conducted by The Economics (2006) partly shows the weakness of Hanoi's infrastructure. According to this evaluation, Hanoi stands at 112th among 127 cities, even after HCMC with the position of 105th. The quality of the domestic and international public transport network and travel distance to the nearest airport are also criteria to be considered (accounting for 20%). Hanoi also stands nearly at the last position in the list of good destinations for entrepreneurs in 2006. Also, due to the weaknesses of the transport system, Hanoi ranks 155th out of 255 cities in 2006, according to the ranking of MERCER, a Human Resource Consulting Company, located in New York. In the ranking list, Hanoi stands at nearly the last position in South East Asia, compared with Manila, Bangkok, Kuala Lumpur, Singapore and HCMC.

The survey of VDF also reveals that transportation is not only an important factor that investors have to consider but also the third constraint to

production and business activities of enterprises. Enterprises in Hanoi agree that Hanoi transportation system is the third obstacle of business constraints, and it is much more serious than that of the whole country.

Figure 4 Constraints to business activities of enterprises

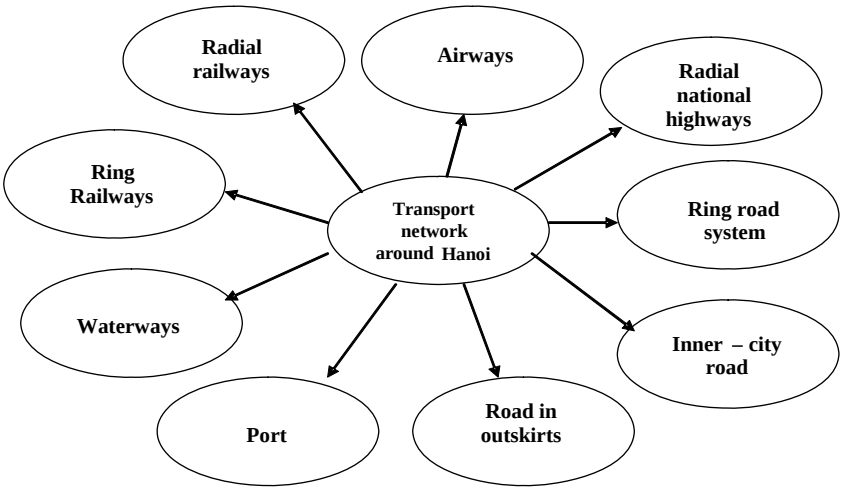


Source: VDF' survey, 2005. Respondents were asked to measure the negative aspect of Hanoi from 0 to 2. The higher scale means the bigger problem

The transportation network in Hanoi includes: national radial railways, western ring railways, airlines, national radial roads, ring roads, inner city roads, roads on outskirt, main ports in Hanoi, and river ways (see Figure 5).

In this chapter, the author mainly focuses on analyzing current problems and the challenges of urban transportation inside the city, from Hanoi to other provinces, and international transportation lines from Hanoi.

Figure 5 Transport network around Hanoi



Source: TEDI

2. Hanoi's internal transport problem

2.1. Poor transportation infrastructure

The Hanoi transportation network has not been completed. Road infrastructure in Hanoi center includes 326 streets, but the quality of roads is inadequate, the width of roads in the Old Quarter have limited width to only 6 to 8 meters, and the old streets have width of 12 - 18 meters with too many crossings, which create conflicts and decrease the speed of transportation. Distance to the crossroads is only 50 – 100 meters in the Old Quarter and 200 – 400 m in the old streets, leading to limited vehicle speed of only 17.7 – 27.7 km/h. Those streets all have big traffic volume; furthermore, it is mixed traffic including non – motorized vehicles, trishaws, cars and a number of motorcycles and bicycles. Intersections in the City including railways and roads and intersections between the main trunk road are all at grade,

adversely affecting the traffic; many of them lack traffic management equipment and facilities.

Road cross – sections are generally narrow, with limited possibility to expand the roads in the City center because of the land acquisition problems. Sidewalks are occupied for motorcycle keeping of business, leaving no room for pedestrians. There are so many intersections in the road network (in the area inside the Ring Road II, there is averagely one intersection every 380m). Important intersections at present are all at grade, some of them are now under improvement to be grade separate intersections. Usage of traffic lights or arrangement of roundabouts at the crossroads is unable to satisfy the traffic operation, causing congestion.

Table 1 Comparing Hanoi's road quality with other cities in Vietnam

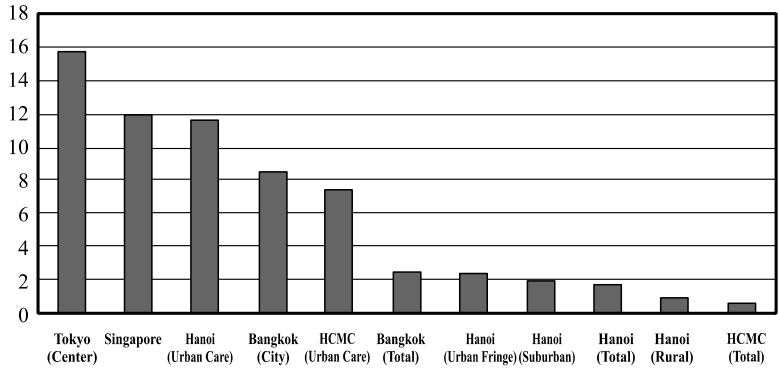
Criteria	**City**			
	Nationwide 2004	**Hanoi 2005**	**HCMC 2004**	**Danang 2004**
Area (km^2)	329, 241	927	2,095	1,256
Population (1000 persons)	82,032	2,793	5,037	728,8
Total length of roads (km)	72,926	1,423	1,658	433
Road density km/km^2	0.22	1.09	0.79	0.34
The rate of road area/total area (%)	0.62	7.00	6.00	4.20

Source: TDSI, MT

The Table 1 shows that the land fund reserved for transportation inside the city of Hanoi is too small, the road area is only 7% of total land area. Although this rate is still a little bit higher than that of HCMC and Da Nang, it is very low compared with 20 – 25% of other capitals over the world. The road density in Hanoi is $1.09km/km^2$ much lower than the rate of other capitals in the region and in the world, which are 5 – 6 km/km^2. It is not only

that the area is smaller but the road density is not equally allocated also. The rate of the transportation road is 12% in Hoan Kiem district, but it is only 5% for other districts. Several olds streets or urban centers have relatively road networks but are densely populated, with a high density of transport participants, while many other residential and urban areas including newly developed areas haven't had complete road networks. Road density is rather small in the outskirts, with inconvenient transport conditions resulting in population concentration in the City center, seriously affecting the traffic management and social services.

Figure 6 The road density in Hanoi in comparison with other capital in Asia (%)



Source: HAIDEP

To achieve the land area of 20 – 25% for transportation, Hanoi needs 15 million square meters; the cost for land clearance is USD14 million[23].

So if a focus in placed on the transportation infrastructure in the inner city, the people will be discouraged from moving to new urban areas. As a result, the land price will remain high and the population deconcentration program will not be effective. Therefore, Hanoi should invest in transportation infrastructure and develop new urban areas with diversified services, low priced housing. The area inside the ring road number II should be kept intact

[23] Provided that the price is equivalent to the compensation price used when clearing the Kim Lien – O Cho Dua area, the city must spend about USD14 billion to get 15 million square meters.

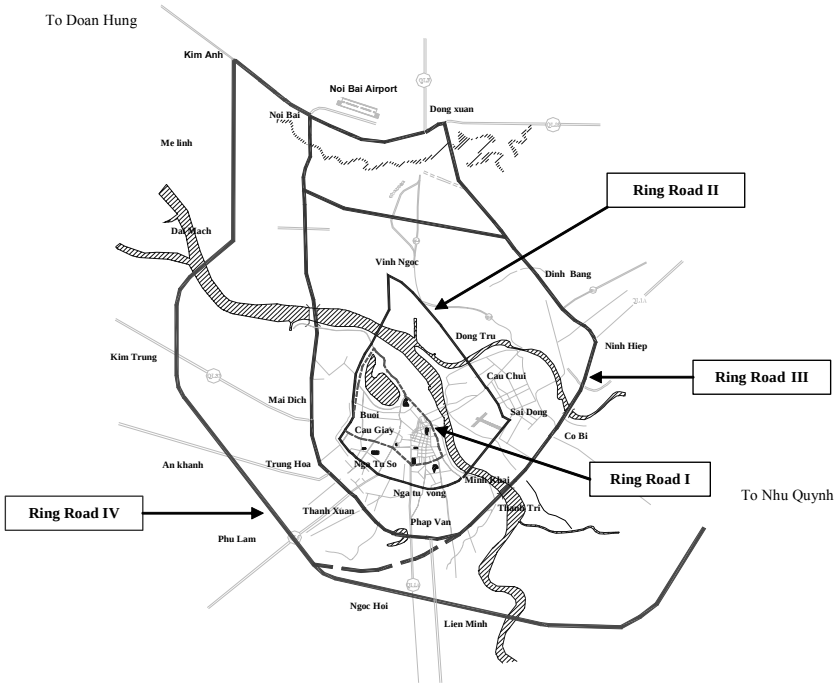
with small refurbishment. According to some economic experts, Hanoi can set up a new political, economic, educational, and medical center outside the ring road number III.

Moreover, urban development concentrates in the West and South West of the City are increasing the population density and traveling demands, while road networks haven't been developed adequately, leading to more and more serious traffic congestion at the gates to the city.

Inner and outer ring roads in combination with the radial highways create a complete road network, playing an important role in realizing the internal and external transport function of Hanoi Capital. Moreover, Hanoi does not have a complete ring road system, so the commodity and passenger vehicles all have to go through the center of Hanoi, which easily creates traffic congestions, and pressure on the traffic system inside the city. In the coming time, Hanoi should complete the ring roads numbers I, II and III, and build ring road number IV (see Map 1).

At present, there are only 3 bridges crossing the Red River: Thang Long, Chuong Duong, and Long Bien. But Long Bien Bridge has been seriously damaged and mainly used for bicycles and trains only. Bridges crossing the Red River are not enough to meet the transportation demand. Chuong Duong bridge is often overloaded. This is the reason for frequent congestion on the Eastern gateway of the Capital. Meanwhile, slow building progress of Thanh Tri Bridge and Vinh Tuy Bridge makes the congestion on the Eastern gateway more serious. In the future, Hanoi will build the ring road number 4 and there will be 7 bridges crossing the Red River.

Map 1 Ring roads in Hanoi

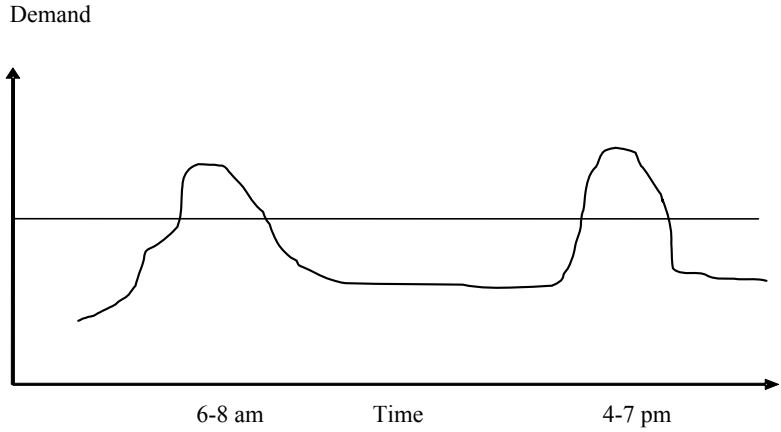


Source: TEDI

2.2. Traffic congestions getting more serious

Congestion is one of the most prevalent transport problems in large urban agglomerations. The essence of congestion is that the supply of transportation infrastructure can not meet the demand. As Figure 7, we see the demand for transportation system from 6 am to 8 am and from 4 pm to 7 pm is very high. Countries base on this demand and on the ability to satisfy this demand to make investment decisions in transportation system. If the countries have enough resources, they will invest to meet the highest demand. However, not all of the countries have enough resources. Hence they have to choose the satisfaction of medium demand or evenly lower level. As a result, congestion can not be avoided when they chose the lower project.

Figure 7 Demand for transportation infrastructure in day



Source: The author

Although the traffic congestions in Hanoi are not as serious as in other cities like Bangkok, Manila and Jakarta, it is beginning to have impacts on economic efficiency. At present, there are 70 traffic congestion points in Hanoi.

Like other East Asian countries, Hanoi also has 3 rush hour times: in the morning, during noon and in the afternoon. The rush hour times for trucks and vans are 8 am and after 10 pm. During the rush hours, trucks and vans make a long queue waiting for the allowed time to enter the city center and traffic congestions for trucks and vans happens very often. Traffic congestion in Hanoi increase in both density and time. According to a survey on 20.000 households in Hanoi conducted by Institute of Sociology funded by JICA, there were 63% who agreed that traffic congestion in Hanoi is very serious and 53% think that traffic congestions have gotten more serious in the last 5 years.

Table 2 Evaluation on traffic congestions in Hanoi

	Satisfaction of the Traffic Situation (Congestion)	
	Current condition (% bad)	**Compared to 5 year ago (% worse)**
Urban core	71	59
Urban Fringe	6	55
Suburban	62	52
Rural	45	40
Total	63	53

Source: The survey on 20,000 households in Hanoi conducted by the Institute of Sociology funded by JICA from January to March 2005

The following part will provide some explanation for traffic congestion in Hanoi.

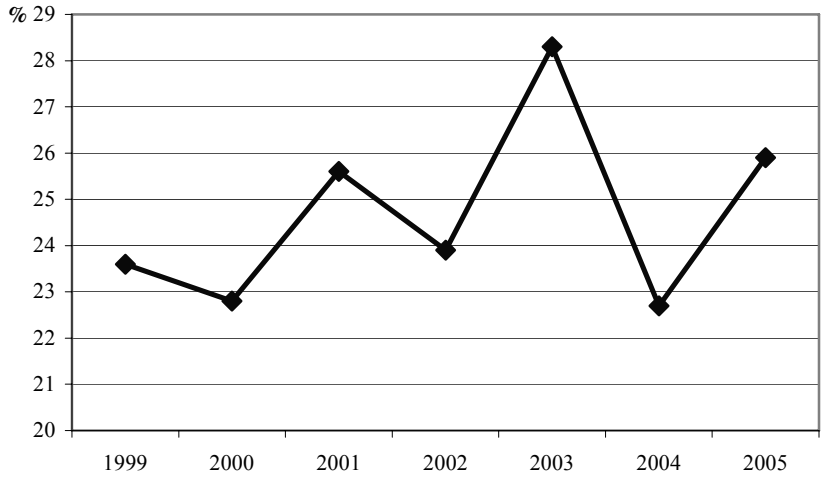
2.2.1 Fast increase in means of transportation, especially motorbike

Means of transportation in big cities like Hanoi, HCMC, Danang are mainly motorbikes, bicycles and cars. Rapid increasing numbers of motorbikes in Vietnam, especially in cities, leads to many consequences such as congestion, air and noise pollution and inefficiency. However, development of motorcycles in Vietnam is obvious due to the lack of Mass Rapid Transit (underground, sky-railroad…). Apart from that, with some special reasons, Hanoi still has cyclos, and three-wheel-vehicles carrying commodity moving around the city. The figure 8 shows that vehicle growth during the period 2000-2005 is 24.6% on average. And the main contribution is motorbike increase. In 1985, motorbikes only occupied for 7.5% of the private vehicles. But in 1992, the rate increased to 32.5% and to 59.6% in 2005. According to a household survey of HAIDEP in 2005, there are 80% of the interviewed households had a motorbike, and 45% had more than 1 motorbike. It means that in only 10 years, almost bicycles have been replaced by motorbikes (see

figure 10). The rate of motorbike owners in 2005 was 300 motorbikes/1000 people. This rate is much higher than those of other big cities in Asia. Figure 9 shows that the rate of motorbike owners in Vietnam will be rather stable but the rate of automobile owners will increase rapidly in the coming time. There is a trend of using automobiles instead of motorbikes.

When the decree number 12 of the government on importing second-hand automobile was passed, and the penetration of Chinese automobiles, and when Vietnam enters the WTO, the automobile demand of Vietnam will definitely increase rapidly. The increase in automobile demand will create a pressure on Hanoi urban transportation, and will be a high risk for traffic congestion. Until the end of 2005, there have been 152,000 automobiles and 1.6 million motorbikes in Hanoi. It means that 1 km road in Hanoi has to bear a weight of more than 4,000 automobiles and 40,000 motorbikes.

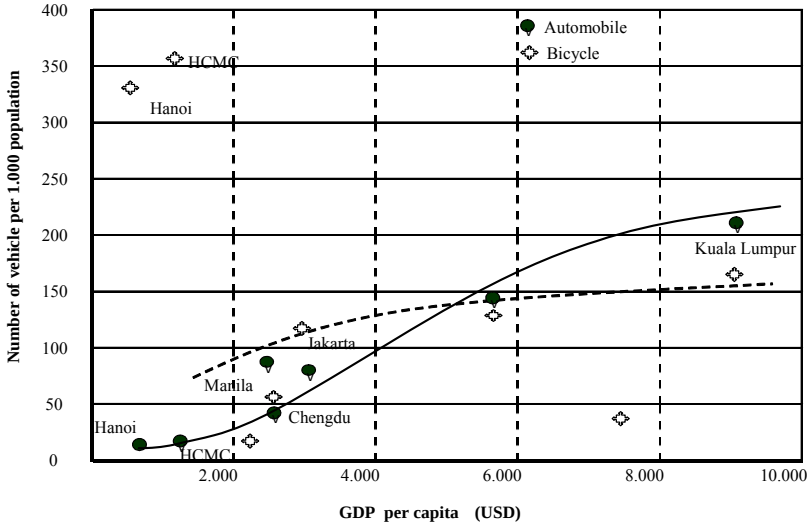
Figure 8 The rate of growth of registered means of transportation in Hanoi



Source: Vietnam Road Agency, MT

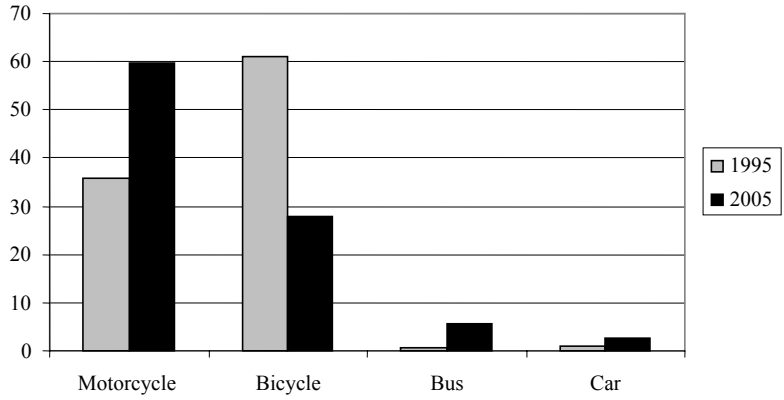
At present, the traffic demand of Hanoi City is 6.3 million person trips per day excluding walking. The share of motorcycle is 63.2%, followed by bicycle (23.3%), public transport (6.7%) and car (3.6%). In comparison with other cities in the region and in the world, the share of means of transportation in Hanoi is rather unreasonable. In other cities in the world, the public transportation is always about 30% while it is only 6.7% in Hanoi (see Figure 10 and 11).

Figure 9 The rates of vehicle ownership over GDP per capita in different cities



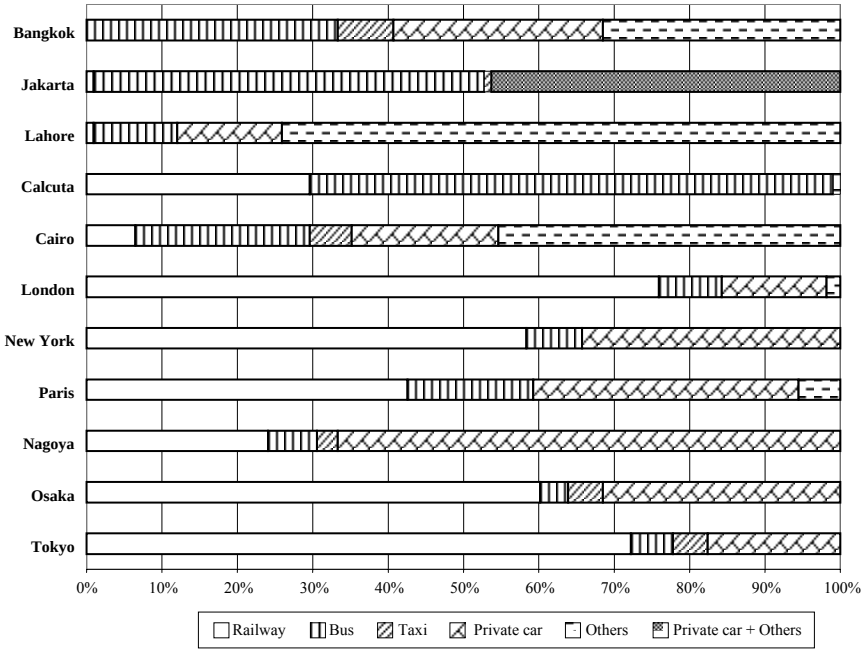
Source: Master plan and feasibility research on urban transportation in HCMC

Figure 10 Structure of means of transportation in Hanoi in 1995 and 2005



Source: HAIDEP study team, 2005

Figure 11 Structure of means of transportation in some big cities in the world



Source: TEDI

Rapid urbanization process in Hanoi has increased the average daily trips of each resident of the City. According to the surveys and investigations by different consultants, average trips and sharing ratios by different transportation means are as follows:

Table 3 The total trips of Hanoi

Criteria		1995	2005	Growth rate (%/year)
Populations (persons)		2,431,000	3,186,000	2.7
The total trips per day	Including Walking	6,223,000	8,721,000	3.4
	Excluding Walking	3,082,000	6,545,000	7.8
Trips rate (time/ person/day)	Including Walking	2.56	2.73	0.6
	Excluding Walking	1.27	2.01	4.7

Source: HOUTRANSS

Table 4 Comparison of Trip Rate among Cities in the Asia

	Year	Population (000 persons)	Trip Rate	
			Including Walking	Excluding Walking
Hanoi	2005	3,186	2.7	2.0
HCMC	2002	7,693	3.0	2.5
Manila	1996	13,565	2.2	1.8
Jakarta	2002	21,594	1.7	1.1
Kuala Lumpur	1998	2,000	2.5	NA
Bangkok	1995		2.3	NA
Tokyo	1998	34,000	2.3	NA

Source: HAIDEP

NA: not available

Table 3 shows that the total demand for transportation in Hanoi has been increasing for the past 10 years. One reason is the sharp increase in motorbike numbers. And the reason for increasing numbers of motorbike is population increase, financial improvement, loosened motorbike register regulations. Because of the increase in motorbike number, the movement rates of each person per day (the time a person join in the transportation system per day) also increased from 1.27 in 1995 to 2.01 in 2005. The rate is much higher than the rates of many other developed countries, though Vietnam is still in the group of low income countries (see table 4). With the current traveling structure, Hanoi is now facing to a big challenge in solving thoroughly the problems of urban public transportation by synchronic solutions, together with an actual revolution in changing the habits and transportation means by private facilities presently accepted.

2.2.2 Traffic law violence and shortage of land for stable transportation

At present, transport service and parking facilities (station, parking places) in Hanoi are still insufficient, inconvenient and cannot meet the parking demand of the people and enterprises. There are about 135 parking places in Hanoi, but only few of them are well-equipped, the others are very small and cannot meet the standards. Most parking places have limited capacity. Moreover, the parking places are not well-located. Land area for transport service and parking captures only 1% or 0.01 – 0.04 m2/ person (in the developed countries it is required 3 – 3.5 % of the urban land area for transport service and parking). It reveals that land area for transport service and parking satisfies only 10% of the demand; the other 90% is met by using other places like the pavements, roads, and the public gardens. In reality, space allocated to transport is used for other purposes. Many of the urban, suburban, village and inter-city roads are suffering from diminished capacity as a result of encroachment into the right-of-way. Encroachment is typically for commercial activity, but also for dwellings. Motorbike and automobile parking has significantly infringed on the pedestrian.

According to the inspection of the Department for Transport and Public Work of Hanoi, the parking and keeping locations in Hanoi occupy about

135,632 square meters of the pavements. The area with high parking demand like Hoan Kiem district, Hai Ba Trung District with the transportation density around 60% has very small parking area, 8% and 14% accordingly. Meanwhile, big parking places with large areas in My Dinh and Hai Boi are not used efficiently.

There are many offices, schools and universities located in the center of Hanoi. Therefore, a huge number of people travel into the center of the city to study and work daily. Especially it is a disaster for congestion when parents commonly transgress the road-bed to collect their children from school. Many offices and universities are not necessary to have location inside the city. They should be moved to Ring road II or Ring road III so that the traffic burden in the city can be released.

2.2.3. Heavy lorries, and inter - provincial buses going through the city

Hanoi is an important point of transportation system; it is the starting point of many roads in the region, connecting Hanoi with other provinces in the Red River Delta and the mountainous areas in the North. Due to unplanned and arbitrary development during different periods, the scale of the roads differ, leading to the problem of major routes intersecting with one another and obstructing speed. Those routes are overloaded so traffic congestions often take place at the gates entering the city. Moreover, Hanoi has not finished its road ring system yet, that is why inter-provincial vehicles still have to go through the center of the city.

To avoid traffic congestions, heavy trucks (over 1.25 ton) are not allowed to enter into the city from 6:30 am to 8 am and from 4 pm to 8 pm. Heavy trucks from 1.25 ton to 2.5 ton are not allowed to enter into the city from 6 pm to 8 pm and heavy trucks over 2.5 ton are not allowed to enter into the city from 6 am to 9 pm. Moreover, HCMC does not apply restricted time for vans under 1.5 tons whereas the amount of vehicles and the transportation density in HCMC is much higher than in Hanoi.

Forbidding heavy vehicles to enter the city in order to eliminate traffic congestions is only a temporary solution, which in itself shows the inability of the authority in urban transportation management, and creates negative economic effects at the same time. First, the logistic activities of enterprises and the people are more difficult and it significantly affects production and business productivity, increases the business costs. Some enterprises decide to use 7-16 seat vans after removing seats to get space for loading and carrying commodity into the center of Hanoi. All transport enterprises claim that restriction of trucks entering the center limits commodity flows, increases the warehouse costs, parking costs. Carrying commodity by smaller vehicles increases the unit cost, and the number of smaller vehicles on roads. Many enterprises that cannot bear such a high transportation cost have to transport their commodity during the nighttime. The restriction has created chances for traffic policemen receiving bribes, and it becomes more common. Therefore, in the coming years, Hanoi's authority should consider this issue seriously, especially when constructing ring road number 4, it should pay attention to build commodity loading and unloading places, and feeder-roads outside the city.

2.2.4. Improper mechanism, organization, and transportation management

Problem of bad - traffic organizing is partly due to the lack of transportation infrastructure. Besides, Hanoi now doesn't have an efficient traffic management. Management and human resources capacities are lacking at local level. While municipalities are responsible for maintaining urban roads within their jurisdiction and providing for public transportation systems, they do not have enough technical officers to carry out various urban management and development functions. Hanoi also lacks adequate machinery and equipment to remove impediments, proper road up keeping is also very low. Organizing and managing transportation in Hanoi are still very weak. Traffic accidents, traffic congestions, and environment pollution all increase despite the fact that Hanoi authorities have made great efforts to control traffic activity. Experiences of other countries over the world have not been applied strictly in Hanoi. For example, using traffic lights and Area Traffic Control (ATC). One example is the traffic point Kim Ma – Daewoo hotel. This place

used to be a serious point of traffic congestions in the city, but since the traffic flows were re-arranged (the flows and the 3 phase-traffic lights), traffic congestions in this place have been eliminated effectively. It should be applied to all roads in Hanoi.

While roads are not enough and their quality is poor, building new roads, arranging traffic flows, building pavements are improper. Some problems naturally emerge that the roads are narrow whereas the pavement is too wide; lanes for bicycles are too wide whereas the roads for automobiles and motorbikes are narrow.

The unreasonable management must bear the blame for the traffic congestions. To solve this problem, authorities of the city should find feasible solutions as soon as possible. In the past, Department Traffic and Public work narrowed the pavements of Kham Thien, Chua Boc and Pham Ngoc Thach streets to get more space for traffic road, and then traffic congestions in those streets were partly solved.

Hanoi failed to build an effective management group and could not deal with the problem of fast increase in number of vehicles. In addition, punishment applied for traffic lawbreakers is not seriously run in the effect, traffic laws are not well respected and broken more and more.

On the other hand, mixed traffic flow with different speeds has been bringing out serious conflicts and reducing the road and street capacities. Traffic light system, traffic operation and management equipment are still insufficient, and several intersections are inappropriately arranged. Road carriageways and sidewalks are encroached in different ways. Organization of law and regulation observation to ensure traffic safety is not well conducted. Case-countermeasures are not made promptly for organizing and distributing the traffic volume at peak hours, for instance setting different working hours for offices and schools.

2.2.5 Inefficient public transportation

Big cities like Hanoi and HCMC cities must have Mass Rapid Transit such as underground, sky-rail and public bus system. Recently, Hanoi just has the public bus. However, efficiency are not brought into play due to the lack of infrastructure and to inappropriate transport vehicles.

Bus is the most popular public means of transportation in Hanoi. Although the number of buses and bus routes in Hanoi has been increased, they cannot meet the increasing demand for public transportation of the community. The number of routes is not enough. The density of the bus routes is only 0.5km/km2. The routes do not well connect to others, so they are inconvenient. As of, there are 46 bus routes (3 of them are socialized) with about 850 buses of 80, 45 and 24 seat, the transportation capacity of these lines is not high. Big buses are very cumbersome, and make the traffic congestions more serious. Moreover, in order to be on time, buses skip stops, drive carelessly, transgress onto the road of other vehicles, and sometimes cause traffic accidents. All of the disadvantages above make people afraid of traveling by bus. In the coming years, Hanoi authority should take the bus problems into consideration to decide which routes and what kinds of buses are suitable for the city. Moreover, with the current infrastructure conditions, the bus system could not be developed further. If the bus number is increased, traffic congestion is unavoidable.

Hanoi authorities still have to subsidize for bus service including bus purchase and its operating costs. In 2004, the turnover of bus services just covered 50% of the total cost.

Analysis of current bus itinerary in Hanoi has revealed the followings:

- Bus routes are arranged mainly for passenger transportation in the inner-city, passengers from the outskirts to the inner-city and vice versa on NH-1A, NH-32, NH-5 and NH-6, transiting passengers in the inter-provincial bus stations like South Bus Station, Gia Lam Bus Station, Long Bien Bus

Station, Kim Ma Bus Station, Ha Dong Bus Station; and railway stations like Hanoi, Gia Lam, Van Dien, Giap Bat and Ha Dong.

- Traffic assignment and management is still not appropriate on many routes. The routes are simple, with only radial and arterial routes and irregular routes. Ring and supporting routes haven't been formed in order to connect to the radial and arterial routes as well as connect to the major passenger generating points. This is the main reason the bus network in Hanoi is not well connected.

- Most of the current bus routes are short, less than 15km, or even less than 10km. This distance is not suitable compared to the population distribution, passenger generating and attracting points as well as the City area.

According to experts' forecast, the traveling demand of people in Hanoi will be around 2 billion passengers/year. And the target of Hanoi to 2010 is being able to meet 30 – 35% traveling demand (equivalent to 700 million passengers). The set target is too high and may be infeasible. In the future, Hanoi should develop more public means of transportation. Besides, Hanoi bus system should be improved, and the invested capital should be focused on Urban Mass Rapid Transit – MRT (urban railways and sky train).

East Asia' s (big and polluted) cities (Jakarta, Bangkok, Manila) have used urban train systems to solve their problems. MRT requires a high degree of vision and coordination of multiple parties to make it possible, usually involving several jurisdiction and complex financing arrangement. Of course, that doesn't mean that subsidized MRT will always be the best way of providing public transport, but in East Asia's wealthier, highly-congested and polluted mega cities it sometimes will be.

2.2.6. Poor awareness about traffic laws

The awareness about traffic laws of Hanoi people is not good. The more vehicles on roads, the more accidents there are and the more traffic laws are violated. Driving on the pavement is getting popular. When there is not

enough space, awareness of people is poor, they are very easy to break the laws. Motorbikes and bicycles often go on the pavements or go on the lanes for automobiles if there are traffic congestions, which make the traffic congestions more serious. When trucks are driven on the pavements they always cause traffic accidents and the image of urban civilization is destroyed. Although, there are many traffic policemen on the roads, they are not enough to deal with all the cases of traffic law violations.

In general, traffic congestions not only influence the life and work of people, but also affect the business of enterprises and investors.

2.3. Shortage of investment capital to develop traffic infrastructure

The investment on traffic infrastructure cannot catch up with the urban development and the increase of vehicles. Due to shortage of investment capital for traffic infrastructure, the infrastructure cannot meet the demand for socio-economic development. The share of investment capital for traffic infrastructure captures 17.0% of the total investment capital for infrastructure or 10.0 % of the total investment of the whole society. Moreover, the share decreased year to year, from 16.2% in 2000 to 10.0 % in 2004. Besides, capital for maintenance is much lower than capital for building new works. If this situation will not be improved, new projects' quality will not be as high as expected. One of the most important issues of transport industry is maintaining adequate and sustainable fund for road maintenance. Hanoi spends 6.5 % from its budget on maintenance that satisfies only 50% demanded, so it makes the quality of traffic work become worse and worse (see Figure 12).

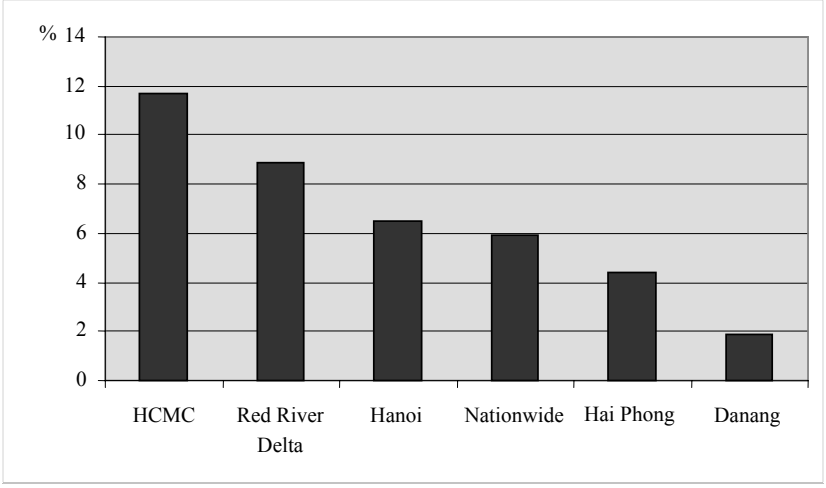
Table 6 Scale and share of investment capital for traffic infrastructure in Hanoi

	2000	2001	2002	2003	2004
Investment capital for development (million VND)	15,427	18,120	22,185	24,957	28,000
Investment for infrastructure (million VND)	766,417	831,715	1,317,755	1,498,984	1,638,970
Investment capital for traffic and transport (million VND)	250,749	228,656	276,962	308,344	278,938
Share of investment capital for transportation in total investment capital for infrastructure	32.8	27.5	21.0	20.6	17.0
Share of investment capital for transportation in total investment capital for socio-economic development	16.2	12.6	12.5	12.3	10.0

Source: Hanoi statistical yearbook, 2004

Before, the maintenance cost accounted for one half of the budget for road ways. Since 1998, the maintenance cost has been increased a little while the budget for road ways had been increased significantly. This is because of the Decree number 108/1998/TTg dated 20th June 1998. The decree set the target of increasing the road density of Hanoi to 20 – 25%. The construction clearly attracted more attention than the maintenance.

Figure12 Share of public expenditure for road maintenance in comparison with other cities and the whole country in 2004



Source: MT

2.4. Poor traffic and transport master plan in both building and carrying out steps

Urban traffic development plan building and implementation plays a very important part in attracting, using domestic and foreign resources for urban economic-social development.

At the moment, the planning frame in Vietnam includes a large number of development plans. Many of them overlap in location, scope, and area (national transportation plan, regional transportation plan, pivotal economic transportation plan, provincial transportation development plans). TDSI, MT is working on a national transportation plan for mid-term and long-term. Functional departments of the Ministry are mapping out the plan for transportation in each industry. Departments of Transportation in provinces prepare the plans for their provinces.

Besides, each economic region and 3 pivotal economic regions also have their regional plans. It is obvious that the national plans are not interconnected with each other as well as with provincial plans. Moreover, there is no proper mechanism to ensure the consistency between national plans and regional plans. The local nature of these plans results in waste of resources. The planning process is not really open and transparent with little contribution from the people. Slow implementation of these plans also raises the public opinion about the "open planning".

On the other hand, the architectural planning management function and construction function are not clearly defined. At the moment, there exist 2 departments: Department of Architecture planning and Department of Construction. Meanwhile, the Construction Law stipulates that the Department of Construction is the only State management agency in charge of architectural planning and construction. Therefore, the functions of these two departments overlap, which results in the poor efficiency in their operation.

Planning activities are not paid due attention to. Besides, priority is not given on the budget and human resources for planning activities. Consequently, planning outcome is often poor and infeasible. Plans are not market driven and fail to predict changes due to external factors. Many plans originated from subjective desire.

Many plans are just situational with poor quality. These plans will be out of date after several years. Many roads like Nguyen Van Cu, Cau Giay, Chua Boc, Pham Van Dong have just been built within the past 10 years. However, they are now overloaded. In order to deal with the problem, these roads should be widened or new road should be opened. This reflects a short term and small scale planning. Some people compare planning activities in Vietnam to the "bottle". It is difficult to get in and even more difficult to get out. The development of transportation infrastructure is not associated with the development of drainage system, telephone network, electricity and underground cable system. It is common to see the separate development of

each system after the construction of new roads, resulting in a waste in the budget spending.

In developed countries, the development of transportation results in the development of new urban areas. It is reverse in Vietnam when new urban areas is developed before the development of transportation facility. For example, the Dinh Cong urban centre has been in operation for several years but by far there is no main road to this urban centre. People in Dinh Cong urban centre still have to use the old and degraded roads. Traffic congestion are very popular in the roads to this centre.

Transportation developments in Hanoi fail to catch up with the rapid urbanization. Consequently, the city is deteriorating and the investment environment is being negatively affected. Policy makers and functional authorities often give priority to building new constructions rather than upgrading existing roads. Many projects are approved not on the basis of efficiency.

Another outstanding issue in planning is the land use. The understanding about the land ownership rights of the government has been focused mainly on legal aspect not on the economic nature of the ownership right. In fact, confusing regulations in the implementation of land ownership rights cause many economic loses for the economy. One of the obvious economic loses is the expenditure from the government budget on land clearance. It is unreasonable that the government has to "buy" the state-owned land at a much higher price than the actual price of the land. There is proof showing that a huge development resource – land – is used in the least effective way. In December 2005, the government had to spend as much as VND600 billion instead of VND100 billion for 1,080 meters of compensation in the project Kim Lien – O Cho Dua (the ring road 1). In the year 2002, to get 550 meters at the road area Voi Phuc – Cau Giay District, Hanoi had to spend USD8 million (equivalent to VND113 billion). However, in fact the construction cost was only USD1 million (about VND13 billion), the other USD7 million were spent on land clearance. Due to high cost, almost all projects were not effective.

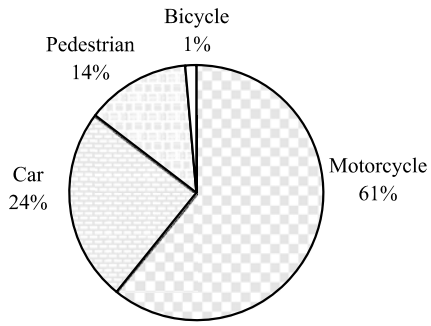
In short, transportation plans are following a series of transportation development requirements, infrastructure and pressure of investment for the socio-economic development. The weakness in urban planning and management in Hanoi is forcing responsible agencies to face to a dilemma. They are managed with short-term solutions instead of thinking about a basic and long-term solution.

2.5. Traffic accidents

Growing traffic in urban areas is linked with a growing number of accidents and facilities, especially in developing countries. As traffic increases, people feel less safe to use the streets. Traffic accidents are also a challenge for sustainable development of Hanoi and are getting worse, with more than 2 000 cases yearly in the City, making almost 400 people dead and more than 2000 people injured. In the year 2005, the rate of traffic accident death was 27 deaths/100,000 people, higher than the international average rate of 19 deaths/100,000 people. And the rate of traffic accident deaths over the total number of registered transportation means was 8.3, the rate of injured people over 10,000 registered transportation means was 10.7, the accident rate over registered transportation means was 12/10,000. It is obvious that the road system in Vietnam is one of the most dangerous systems in South East Asia and in the world. Compared with other provinces in Vietnam, Hanoi has the highest traffic accident death number.

Analysis of road accident in terms of road users, data shows that most of accident were made by motorcycle drivers (around 61% of total accidents in 2005). It is reasonable because motorcycle is the main transport mode in Vietnam (refer Figure 13).

Figure 13 Road user in traffic accident in 2005 in Hanoi



Source: Dr. Iwata Shizuo's presentation in the Second International Seminar on sustainable urban transport and land use planning in Hanoi 2006

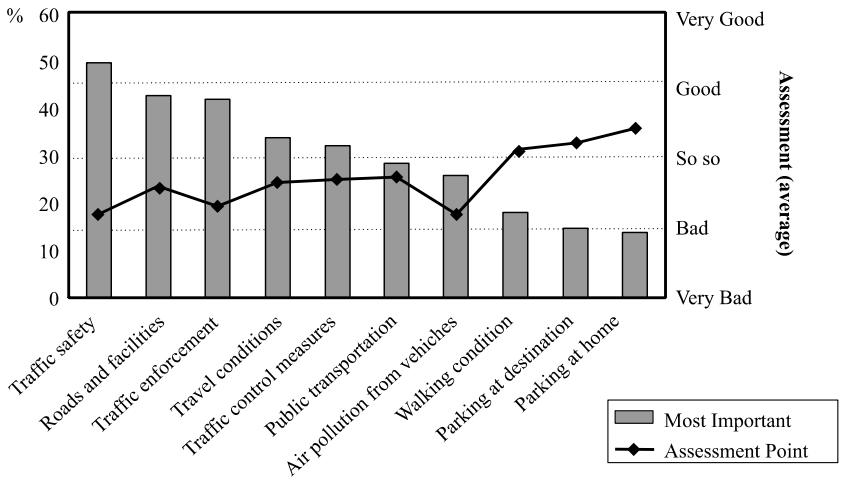
According to a survey on 20.000 households in Hanoi conducted by the Institute of Sociology funded by JICA, there are 56% motorcycle/ car users, 34% bicycle and 70% pedestrians agree that traffic safety in Hanoi is very dangerous and 43% think that traffic safety has gotten more dangerous in the last 5 years. Also accroding to result of the survey, traffic safety is the topic which people consider the most. (Table 7 and Figure 14).

Table 7 Assessment of Traffic safety (%)

	Satisfaction of the Traffic Safety			
	Current condition (% bad)			**Compared to 5 year ago (%Worse)**
	Motorcycle/ Car users	**Bicycle users**	**Pedestrians**	
Urban core	64	40	75	47
Urban Fringe	64	36	73	45
Suburban	62	29	72	44
Rural	63	24	60	36
Total	56	34	70	43

Source: The survey on 20.000 households in Hanoi conducted by the Institute of Sociology funded by JICA from January to March 2005

Figure 14 People's Opinions on urban transportation in Hanoi



Source: Dr. Iwata Shizuo' presentation in the Second International Seminar on sustainable urban transport & land use planning in Hanoi 2006

2.6. Environment pollution caused by traffic

Although Vietnam has successfully used lead-free petrol, Hanoi is facing a problem of air quality. Hanoi environment report showed that traffic is a considerable factor that releases PM10 and PM2.5, ozone, Carbon Monoxide (CO) partially. Because of high vehicle intensity (about 1,800-3,000 vehicles/hour), plus narrow roads, too much crossroad, low quantity and poorly arterialized roads, traffic-stream with all time changing speed and stop, poisoned air such as CO, SO_3, NO_2, C_2H_3, lead and dusty compound, smoke and noise released by trucks is so much that is pollutes environments around main roads and intersections. During congestion, the concentration of CO, SO_3, NO_2 and Voluntary Oxygen Compound (VOC) are all over the permitted standard. (See Table 8)

Table 8 Concentration of toxic compounds in case of traffic congestion in 2004

Street	Toxic gas concentration			
	NO_2 (mg/m^3)	SO_2 (mg/m^3)	CO_2 (mg/m^3)	VOC (mg/m^3)
Vong cross - road	3.9	3.6	360	170
Kim Lien cross - road	3.7	3.5	350	160
Nga Tu So cross - road	3.8	3.7	355	165
TCVN – 5937 - 1966	0.4	0.5	40	5.0

Source: The presentation on "motorbike use and urban air pollution" in VDF of Dr. Nguyen Thi Ha, Faculty of Environment sciences, HUS

3. Inter - provincial traffic network

The provincial traffic system passing through Hanoi is very important for not only Hanoi but also the whole Red River Delta. Located in the center of the Red River Delta, Hanoi is the gathering center of many important and strategic roads, railways, airlines and waterways. The road system includes the national road 1A, 5,18, 6, 32, 2, 3 and Lang – Hoa Lac Expressway. Hanoi is also an important economic center of the North. Therefore the traffic and transport system of Hanoi plays a very important role in the economic development of the country, and it is considered a gate of traffic network to foreign destinations.

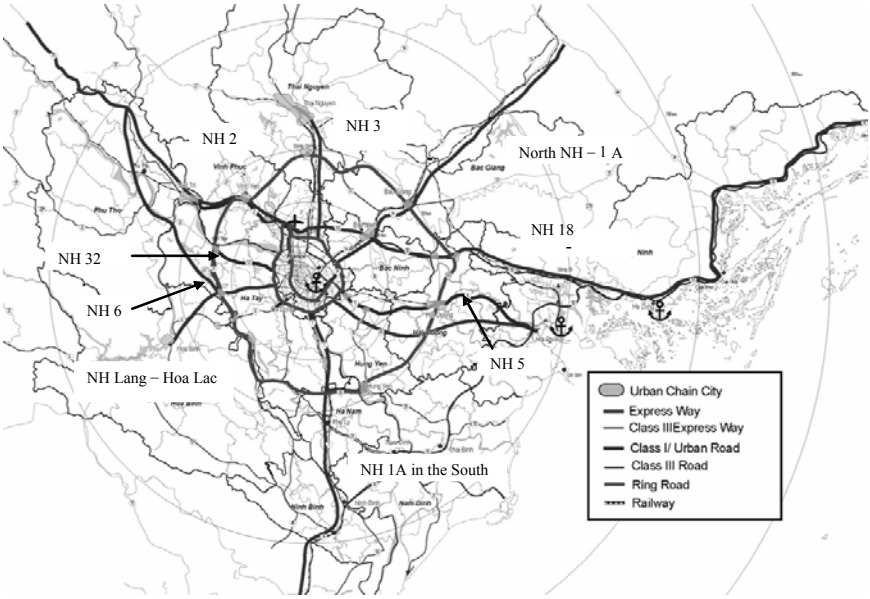
There are 7 corridors starting from Hanoi going to many provinces of Vietnam (see Map 2), they are: Hanoi - Lang Son, the North - South national road number 1A, Hanoi - Cao Bang - China, Hanoi - Viet Tri - Ha Giang - China, Hanoi - Viet Tri - Lao Cai - China, Hanoi - Hai Phong - Quang Ninh, and Hanoi - Dien Bien Phu - North of Laos corridor. These corridors are the important traffic route connecting Hanoi Capital to other provinces of the Red River Delta and the mountainous areas in the North.

The national road 1A has been improved to the standard level III (see Appendix 1), with two lanes. The road from Hanoi to Lang Son was upgraded to the standard level I, with four lanes and the part from Phap Van to Cau Gie is as good as the high way. However, the effectiveness of the new roads is not high because the part passing through Hanoi is being constructed very slowly. The progress of building Thanh Tri new bridge must be faster, so that Thanh Tri bridge can help to reduce the traffic congestions in Hanoi and share the vehicle flow pressure at Chuong Duong bridge.

The National road number 5 connecting Hanoi to Hai Phong has been improved to the standard level I. With the improvement of national road No. 5, the transport corridor has enhanced access of Hanoi to global markets by improving land and the sea transport. FDI to major industrial and export growth in the north. However, the traffic density at the National road number 5 is very high, 17,822 PCU/day. The crossings with the railway and the roads are all on the ground, which creates great effects on the traffic safety and the commodity flow. Therefore, in the coming time, the Hanoi-Hai Phong highway should be constructed as soon as possible. The national road number 18, standard level III, connecting the Noi Bai-Bac Ninh highway to Mong Cai, is very convenient for transportation from Hanoi to Cai Lan port and Mong Cai border.

National road number 32 is an important route connecting the East West Area to the Western gate of the capital. However, the quality of the route recently has downgraded, especially the quality of the road area near Hanoi (the T-crossing Nhon – Thang Long). Hanoi now is implementing a project to enlarge the national road number 32 at the area Cau Giay – Cau Dien. The enlarged road will have 4 lanes. However, 4 lane roads are not large enough to be the entering road to the West Gate of the capital.

Map 2 Inter-provincial roads



Source: HAIDEP

To December 2003, the total length of the roads in the Northern Economic Center is 19,141.5 km, the road density is 1.25 km/km^2 , which is higher than the national average rate, the rate of the Economic Areas in the Central and in the South. Due to the unplanned development, with too many periods, the scale and the width of the roads are not consistent. The main roads, and road crossings are all on the ground, there are no skyways, so the speed of vehicles is limited. Some roads are overloaded, which results to traffic congestions at the entering gates into the city. In general, the roads are still narrow, technical standard is not high, and capability cannot meet the demand, some roads, which have just been improved, are overloaded. Hanoi is a very important economic center, but the number of highways from Hanoi to other provinces is very small. There is only one part from Phap Van to Cau Gie, Noi Bai-Bac Ninh considered "pre-highways". There are 67.5% of two lane roads connecting Hanoi to other economic areas in the North; the others are roads of standard IV, and V, with poor quality safety corridors. The capacity of the road is still rather modest with limited technological standards. Moreover, the

transportation and traffic safety corridor is not standardized. Along the national roads, there are many houses occupying the road area. Therefore, land clearance for road construction is very difficult and costly. The urban traffic development is not consistent with the provincial traffic system. The weakness of the provincial traffic system is an obstacle to link with international traffic points like ports, airports, industrial zones, in land port ICD.

The ring roads number II and III are being gradually completed. However, the progress rate is still slow. Consequently, transportation means still have to go through the inner city, especially in the South East, putting a high pressure on the inner city transportation.

Only when the ring road numbered III and IV are finished, the inter-provincial traffic and transport can be separated from the traffic and transport inside the city, and the flows of heavy vehicles carrying commodity will not be allowed to enter into the city. When the ring road number 4 is built, the road connecting centers and the feeder roads should be set up to make the traffic and transport inter-provincial and inside Hanoi are more convenient. The coming in and going out commodity flows into and from Hanoi with the neighbor areas are also more convenient.

Almost all commodity transportation roads to and from industrial zones are under construction or have not been enlarged to meet the actual demand. This is a difficulty to transport commodity. Besides, most of industrial zones are located near the national roads. And there are not specialized roads, therefore, the transportation density is very high. Like Hanoi, Bac Ninh, Vinh Phuc, Hai Duong, Hung Yen and Ha Tay also have a condense industrial zone network. The whole Hanoi urban areas and industrial zones, with their departure point of commodity, will be a pressing force on the Hanoi traffic system.

On the other hand, commodity transportation from Hanoi to other neighboring areas is unprompted. Most of the commodity is gathered on the big roads, especially commodity in containers, which makes the road quality become lower and lower. Moreover, the role of transportation to connect all

means of transportation effectively has not been focused. The services are very poor. Due to low quality traffic system, the commodity transportation speed is still low, and the transportation cost is still very high. It causes a bad effect on Hanoi investment environment and the environment of the whole important economic area in the North.

4. The International network

The international traffic network of Hanoi includes roads, railways, airlines, and the waterways.

4.1. Transport by air

Noi Bai, the only international airport, is located in Hanoi, and it is 35 km away from central Hanoi to the North, details are in table 9.

The Noi Bai international airport plays an important role in the transportation of Hanoi in particular and the North in general. At the moment, there are two run-ways named 11L/29R (1A) with the dimension of 3,200m x 45m and 11R/29L (1B) with the dimension of 3,800m x 45m. The 1A run-way is in a very poor condition now and it has been closed. The 1B is the newly built run-way with good quality. It is the only run-way being used at the moment while the 1A is not in use.

Noi Bai airport has 24 parking lots, including 9 lots for B747 aircrafts, 3 lots for B767 or the like, 6 lots for A321 or the like, and 6 lots for ATR72 or the like. At present, the number of parking lots for big crafts like B747 fails to meet the demand. Furthermore, the parking lots in some areas are cracked and broken, especially in the area near the run-way. This may endanger the operation of air-crafts.

The Terminal T1 has been in operation since 2001 with the total area of 91,000m^2, including 5 storeys (one basement for technical equipment) for full function of an international airport. The current capacity of the terminal is

2,400 passengers/hour in rush hour, an equavalent of 4 million passengers per year. The terminal is being upgraded with new facility in order to raise the capacity to 6 million by early 2007. However, due to the unreasonable installation of the passenger bridges the full capacity can not be reached. (There are 10 passenger bridges to serve 10 big crafts at the same time but in practice only 7 can work at once. According to JETRO of Japan, in order to reach the capacity of 6 million passengers per year, at least 16 passenger bridges are needed).

The output growth of Noi Bai International Airport was fairly high during 2001-2005 with the annual growth rate of 17.8% in passenger number, 21.2% in cargo and post, and 16.2% in the number of flights. Despite the strong growth, Noi Bai airport is still behind many other international airports in the region. According to IATA statistics in 2005, the Bankok International Airport in Thailand served nearly 39 million passenger turns, ranking 18 in the top 30 airports in term of number of passengers. The Changi International airport of Singapore ranked 25 with 32.4 million passenger turns. Meanwhile, Noi Bai airport ranked 220 of the total 1650 airports from 176 countries and territories.

Therefore, the danger for the aviation service is that its infrastructure fails to catch up with the transportation demand once Vietnam has become a full member of WTO. For the development of infrastructure, the biggest difficulty is capital resource. It is necessary to improve the infrastructure and facility for the airport in order to attract international airlines to Vietnam. It is the challenge not only for Hanoi but also for Vietnam. Therefore, infrastructure should be the focus of investment in the coming time so as to enhance competitiveness of the airport in the course of industrialization and modernization as well as ecocomic integration.

Table 9 Information of Noi Bai international airport

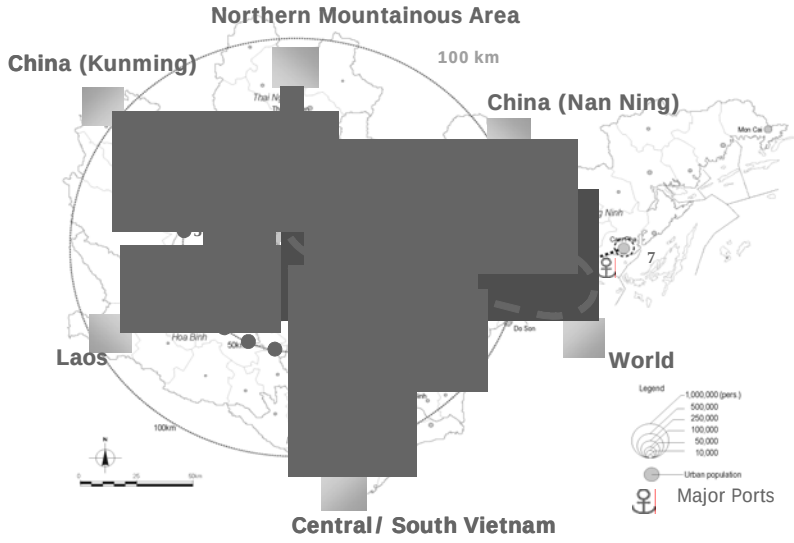
	2005	2010
Capacity		
- Passengers (mil.)	4	12
- Cargo (' 000 tons)	160	260
Runways (m)	3,200 x 45	3,800 x 45
	3,800 x 45	3,800 x 45
Terminal (units)	1	2
Max. Aircraft Size	Boeing 747 – 400	

Source: Civil Aviation Administration Vietnam

4.2. Overland transport and linkage to seaports

Hanoi is located on the East-West corridor from Kuala Lumpur to Bangkok, to Phnom Penh, HCMC; Hanoi - Lao Cai to Kunming and Hanoi – Lang Son – Nanning (see Appendix 2). Some roads both belong to the East-West Corridor and ASEAN roads. The East-West corridor goes through HCMC-Hanoi-Lang Son, Huu Nghi frontier gate, Hanoi-Son La-Tuan Giao, Hanoi–Hai Phong– Ha Noi–Viet Tri–Doan Hung. The roads, railways, and airlines mentioned above combining with Hai Phong international port creates an important corridor, in which Hai Phong international port and Noi Bai international airport are considered the gates transporting import – export commodity of Hanoi and the whole country.

Map 3 Roads connecting Hanoi to other countries



Source: HAIDEP

If the East-West corridor is operated, this is a good opportunity for Vietnam to improve the economy of the North. Commodity from other ASEAN countries will go in and out Vietnam, through Hai Phong and Cai Lan ports, or through the roads from Thailand, Cambodia, or Laos, to the South West of China quickly. This project provides convenient conditions for enterprises approaching the production resources from China, Thailand and Malaysia. The route from Nanning-Huu Nghi gate with the length of 179.2 km, in which 136.4 km are highways and 48.8 km is the national road level 1, an important commercial gate connecting China market to ASEAN markets have been completed. This route and the Kunming – Lao Cai – Hanoi – Hai Phong corridor are considered the main routes for commercial activities between China and ASEAN countries.

The national road number 1A connecting Hanoi to those routes is the gate to huge markets of Guangdong, Hunan, Guizhou, Jiangxi and Fujin of China for ASEAN countries to enter. Using the route from Nanning, the capital city of Guangxi province of China, going through Huu Nghi gate, and to the National road number 1A of Vietnam, it takes less than 2 hours, saving half of the time length than before, and it takes only 5 hours from Nanning to Hanoi. However, while the road part in China is very modern and well constructed with underground ways and bridges, the road part from Lang Son frontier, Huu Nghi gate, to Hanoi of Vietnam is under standards of Highways. It can be said that this route will be an economic, commercial and investment corridor for Hanoi and all North area, enhancing the commercial exchange between China and other ASEAN member countries, creating a free trade area of ASEAN – China which was discussed in 2002, and planned to fully complete in 2010. If the plan becomes true, this will be the biggest free trade area in the world with two billion people. Therefore the authorities of all Northern provinces of Vietnam must participate actively with a comprehensive program to assist enterprises to explore this huge market.

Another important flow of commodity transport to Hanoi is the transport by sea through Hai Phong and Cai Lan ports. Hanoi is connected to Hai Phong port by the national road number 5, to Cai Lan port by the national road number 5 and 18, or 1A and 18. Most of the imported - exported products of Hanoi go through Hai Phong port. The import – export commodity is transported through the Hanoi – Hai Phong corridor. After the roads were upgraded, people can save half of the time as before to go from Hanoi to Hai Phong (about 2 hours), and the amount of traffic of the national road number 5 increased two times during the period 1999 – 2004. However, the national road number 5 now is overloaded, and it affects the flows of transportation. The improved national road number 5, 18 and 10 strengthened the connection of the economic triangle North of Hanoi – Hai Phong – Quang Ninh in the North of Vietnam. When the above national roads and Hai Phong port are improved, it is easier for Hanoi to approach international markets. More than

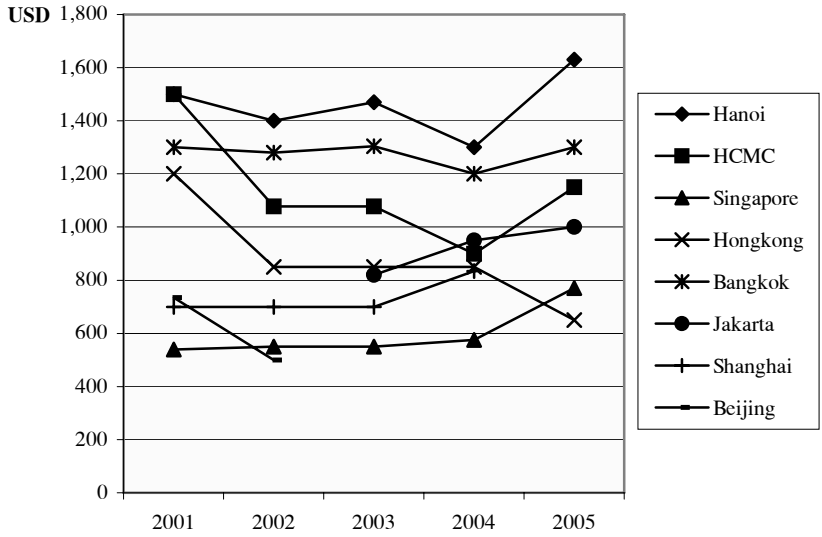
that, tourism industry of the Northern provinces is also better thanks to this corridor. Chinese tourists will be attracted, through Mong Cai frontier gate or Cai Lan port, going to Quang Ninh province and then to Hanoi and the neighbor provinces. However, the traffic capacity of the national road number 5, at present, is more than the designed capacity and creates bad effects on the commodity flows between Hanoi and Hai Phong.

The road improvement were carried out very fast, the national road number 1A from Lang Son to Hanoi, and the national road number 18, and the national road number 10 all upgraded. Followers are Hai Duong, Bac Ninh and Vinh Phuc provinces. Thanks to the improvement, the road from Bac Ninh province to Noi Bai international airport is only 30 km, and it takes only 2-2.5 hours from Bac Ninh to Hai Phong port, and 3-4 hours to Cai Lan port, Bac Ninh has become an attractive destination for investors. There are some foreign companies moving their business locations to Bac Ninh like Canon company. Although Canon did have a factory in Hanoi, it decided to choose Bac Ninh to locate the second factory instead of Hanoi. Moreover, Vietnam has no international container terminal like the terminal in Hong Kong where the imported – exported commodity of the North of Vietnam are transshipped. As the imported – exported commodity of Hanoi must be transported by big ships, they must be transshipped in Hong Kong international container terminal. Due to that, the transport cost becomes higher, and the price of Hanoi commodity also gets higher and so less competitive.

4.3. Marine transport

Both domestic and foreign companies agree that the container shipping cost from Hanoi to international destination is much higher than that from HCMC and from the neighbor countries like Thailand, Malaysia, Singapore, the Philippines and China.

Figure 15 40-feet-container shipping cost from Asian cities to Yokohama, Japan



Source: Calculated by the author, basing on data of JETRO in 2001 – 2005

This is due to many reasons. First, containers from Hanoi shipping to other countries have to transport to Hai Phong, and then shipped to Hong Kong, Singapore or Kaoshung (Taiwan), and then shipped to the destination countries (See the "Hub and Spoke" firgure). According to the chart, Vietnam ports all belong to the sub-corridor of the port system in the region. Therefore there are more disadvantages than the hub ports and the ports of main corridor. Moreover, Vietnam's ports are located near the estuaries. Hai Phong and Cai Lan ports are located only 20 – 70 km far away from buoy number zero. Therefore, if the ports of Vietnam are not improved, they will not be able to receive bigger ships. Second, commodity from Hanoi to Hai Phong has to bear the cost of USD 150 – 200 per/TEU[24] and the transported

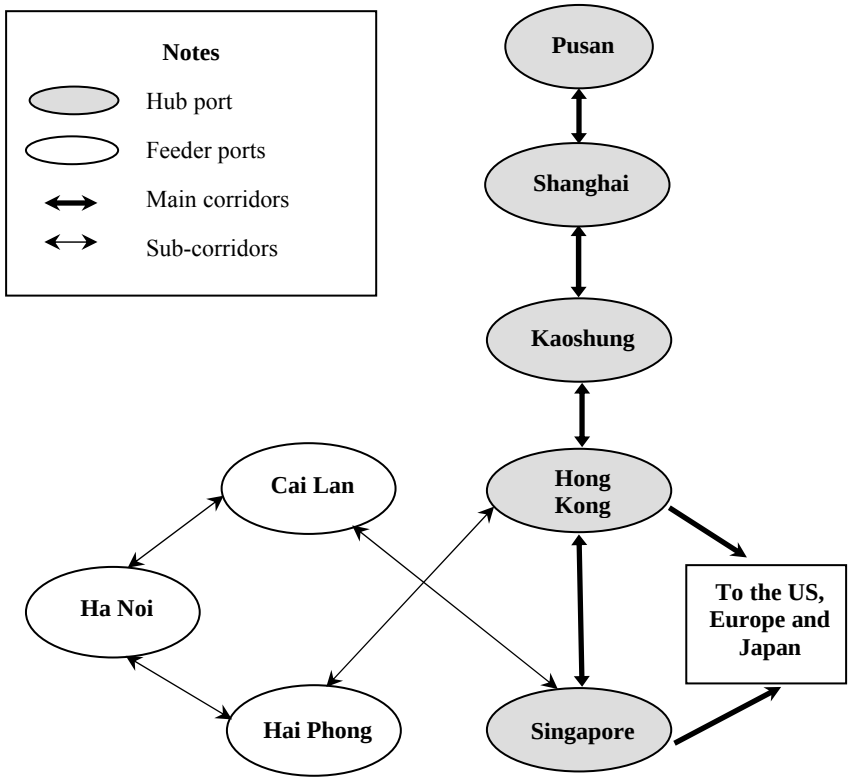
[24] TEU – Twenty feet Equivalent Units

commodity to Hanoi is very little than the commodity amount transported to HCMC.

On the other hand, the imported goods to HCMC are very huge, and so empty containers can be used to transport commodity on the returning ways. In general, Northern ports are less competitive than those in the South. The main factor of logistic costs in Vietnam at present is the shipping costs, which are double as that to Malaysia and Indonesia. Another reason is the productivity of Hai Phong port (as same as other ports of Vietnam) is very low compared with other ASEAN countries' ports, they are only higher than the productivity of ports in Brunei and Cambodia, as high as that of Philippine ports, but lower than that of Indonesian ports and much lower than in Malaysia, Thailand and Singapore. Container terminals are divided into two groups. One is the feeder port, the gate of a country with the annual shipment of 1 million TEU. Hai Phong port is one of the best in Vietnam, but it cannot meet the standards of the port level 2[25]. Therefore, Vietnam stands at the nearly last position in the list of shipping ports in ASEAN. Therefore the container shipping cost of Vietnam compared with other ASEAN countries is much higher. At present, there is 6800 TEU ship (equivalent 950,000 DWT[26]) in 2011 there will be 12,000 TEU ship in the world. But as planned, in 2010 the biggest ships Vietnam ports will be able to receive are ships of a maximum 3,600 TEU in Cai Lan and Cai Mep ports, and in 2020, 5,700 TEU. So in 2020, Vietnam can receive the biggest ships born before 1996 and the capacity of Vietnam's ports then will be equivalent to the capacity of ports in the region in 2010. So in the future, the container shipping cost from Hanoi to other countries may be improved.

[25] Container ports are divided into two grades. The first is considered "grade 1", which has at least and not over 2,000,000 TEU/year. The second port is feeder port of a nation which has the commodity getting through is highest, more than 1,000,000 TEU/year.
[26] DWT – Deadweight tons

Figure 16 Hubs and spokes



Source: The author

5. Suggestion

Like other Asian cities, Hanoi have unique transport problems. Promoting and realizing sustainable development is difficult task requiring long term policy commitment and efforts of the Hanoi Government and good understanding and support of the people and society as a whole. Urban area is a complicated system in which everything is related to each other. Transport, drainage, water supply, land – use and environment are also closely related

that construction of a road brings about haphazard land development along the road and creates environmental problems unless it is properly managed. Demand and supply gaps in urban transportation infrastructure and transport services have been widening due to rapid urbanization. Although the situation in Hanoi becoming critical Hanoi still has a good chance to improve the situation and place the city on sustainable development path unlike other big cities in the region such as Bangkok, Manila and Jakarta which have lost the timing. Suggestions for this include the following:

5.1 Traffic management

The first solution to transportation problems in urban areas is the further use of existing public transportation system and adequate traffic management.

In term of capacity, safety, enviromentanl issues, it is important to induce passengers to use large – or medium – scale public transportation facilities such as bus, railways in municipal areas as much as possible. The following need to achieve this goal:

- Elevation of the functions of public transportation facilities such as raiways and buses
- Controls on passenger cars and motorcycle
- New fare systems to encourage use of public transportation
- Provision of information about using public transportation

It is necessary to apply international traffic managements in practices and develop new ones in Hanoi. Traffic organization will improve with the implementation of the proposed national transport safety strategy. There is also a need to create culture in traffic management based on pilots and a willingness to experiment. A requisite for creating such a culture is coordination between the Department of Public Work and the Traffic police.

The inter-provincial traffic should be separated from the city road system by completing the ring roads and limiting the heavy vehicles to enter the city. The linking centers also should be built to link the city traffic and the inter-provincial traffic.

It is necessary to improve the managing ability in order to use the current traffic system more efficiently. The most common methods of traffic management are exclusive lanes and preferential lanes for buses. One – way traffic and reversible lanes are also effectively in some places. Besides, we should pay attention to set up and upgrade the traffic lights and parking places inside the city.

Promoting better understanding of urban issues by the people: solving urban problems is not only the responsibility of the government but also need good understanding of problems and issues as well as support to government policies by the people. The people must be more deeply involved in the process of urban planning and project development. For example, traffic congestions can be reduced with traffic management. Yet, effective traffic management can not be done without disciplined manner of users.

5.2 Planning and Institutional issues

For sustainable urban development, planning method and implementation should be changed. First, it is necessary to change from the traditional method to other modern methods like City Development Strategy, intergrated strategic planning, Multi Sectoral Investment planning, and participatory Approach (see Appendix 3). A national outcome oriented planning procedure will direct the targets of the nation, the cities and services to the right track.

Second, it is essential to cooperate with international organizations in training, construction capability improvement, planning, land use policy, infrastructure development, and urban transportation. Besides, the management of land use for transportation in approved projects should be

well implemented. The State should also make proper amendments on the current land use policies, including infrastructure development policies.

Urban development is inevitable to meet the demand of population growth as well as to regulate population density. The refurbishment of the centre and sub-centre areas of Hanoi helps increase the land use coeffient instead of reducing population density. Thus, the expansion of Hanoi must meet the demands of economic structure shift, population reallocation, and density adjustment. In order to encourage the people to move away from the centre area, the State administrative agencies, hospitals, and schools must be the pioneer. At the same time, the social and technical infrastructure of new urban areas should be comprehensively developed (market place, hospital, school, banking service, entertainment facility, etc).

On the other hand, regional associations should be set up (Hanoi and neighbouring provinces) to coordinate the activities of all the local authorities in administrative boundary, transportation, water supply, environmental pollution and other issues.

Despite many progresses in land use, the lack of an effective land market has been distorting land prices and imposing many hurdles to planning process. A big shortcoming in transportation infrastructure development is land clearance and resettlement for the people. In order to make it effective, the resettlement process should deal with the following problems: the proper rate of compensation should be set, the budget for compensation should be proper spent on the three targets of building new residential places, establishing new production premises, and training for the resettlers.

The authority should also focus on the completion of ring roads number II and III, especially the road linking the My Dinh Stadium - Thanh Xuan - Thanh Tri bridge and Gia Lam in ring road number III.

Ring road III takes an important role in separating interprovincial traffic from urban traffic. Ring road III fuctions as the urban ring due to widely surrounding inner urban area, crossing most districts and centripetal national roads. Finishing Ring road III will help arterialize from far and decrease traffic density going into inner city.

In long-term, it's necessary to process constructing Ring road IV. This is Ring road crossing most of provinces contiguous to Hanoi, satellite urbans, highways and centripetal national road. Ring road IV will take the role of inter-regional traffic and decreasing traffic pressure under Ring road III.

Regarding Red River crossing bridges: we need to concerntrate in finishing Thanh Tri Bridge and Vinh Tuy, Nhat Tan Bridges to lessen traffic flow going through Chuong Duong Bridge, to solve the demand of inter-provincial traffic going through Hanoi and to develop urban area toward the North of Red River.

5.3. Establishing a sustainable financing framework for the transportation system

In the next decade, Hanoi will need to develop effective mass transport systems and significantly expand highway networks. This is costly. Hanoi has to develop a sustainable plan to finance public transport and develop a framework for participation of the private sector in infrastructure finance. The contribution of private capital to transport infrastructure in Vietnam and Hanoi is now low.

This source of financing can play a more prominent role in financing highways, public transport. Key to taping this source is the development of a framework for private participation. The framework needs to set the principles for efficient risk sharing, to define how contingent liabilities will be managed, and to identify appropriate institutional and regulatory

structures. Within the parameters of the framework, the different model of private participation can be considered and used.

Moreover, Hanoi has to develop a framework for the use of municipal bonds and for municipal finance. At present, municipal finance is utilized some success in Hanoi. This source can continue to make significant contributions to infrastructure in large cities. A sound framework for municipal finance is necessary for development of this market. It enables Hanoi to keep mobilizing local funds in sustainable and present manner and helps Hanoi develop its capacity to be able to realize those financial sources such as municipal bonds and local development investment funds.

Attraction and effective usage of the investment fund for the right purposes is one of the important factors to speed up the socioeconomic development of the Capital. Using the investment fund with high efficiency will facilitate the mobilization of investment fund. Therefore, the most important requirement to Hanoi is how and where to use each mobilized funding source in order to ensure the efficiency of the investment fund as well as to create new attraction for the increase of the investment fund.

In order to get a strong investment fund for Hanoi, it is required to not only rely on one source but to mobilize from all available economic components inside and outside of Hanoi. However, in the immediate stage, it is advisable to give higher importance to FDI fund for the transport and urban infrastructure development. At present, Hanoi has high FDI ratio, but still much lower than that of HCMC and its own potential. Another important source with strategic significance is the local economic components, and this should be regarded as an important and long-term source for Hanoi.

In some countries, the national infrastructure is being built and operated by businesses from more advanced countries and the resulting service is used to enhance the economic level of the people. Since the facility is built (B) and operated (O) by a foreign business and is then transferred (T) to the

beneficiary country after a certain period of time (30 years, for example), this increasingly popular method is called the BOT system. This method has been used in some motorway construction projects. If it were applied to railway construction, it would be most important to make certain that the enterprise has the right to make decisions about fares. At the same time, options for future development of areas along the railway, investment and subsidies from the government, and all other items that need to be guaranteed by the government, must be clarified. Such a method allows Hanoi to achieve urban development with out spending its own money.

5.4 Institutional and human capacity development

For sustainable transportation development, comprehensive innovation should be conducted. To avoid temporary and superficial innovation, the municipal authority of Hanoi should map out a realistic framework for its activities in long term basis. The framework should meet the demand of 3 levels: providing an enabling environment, institutional development, and human resourse development.

It is also important to improve the technical capacity and administrative capacity of functional departments in Hanoi in order to promote cooperation and urban management, especially those issues on land and transportation planning.

The capacity/authority of public agency in Hanoi needs to be strengthened. The capacity of regulatory agency needs to be developed to meet its new responsibilities. Hanoi has to develop a policy for managing congestion. There is a need to develop a comprehensive policy on managing congestion that includes consideration on promoting public transport, a parking policy, promotion non-motorized modes for short trips,more effective traffic management and consideration of restrictions on ownership and use of both motorcycles and cars. Motorization levels are rising, and even a small

increase in auto traffic will significantly increase congestion. In the long term, Hanoi needs to consider market-based methods to manage private vehicle ownership and usage (congestion charge, parking charge).

An increase in user charges for infrastructure services needs proper understanding of the people, too. Singapore has a unique toll on passenger cars entering the downtown area. The number of passenger cars increased drastically during Singapore's economic development, creating terrible traffic congestions. To solve the problem, the government introduced tolls to control passenger cars entering the city as early as the 1970s.

When the toll was first introduced, passenger cars with four or more people were allowed to enter the city freely, but those with three or fewer people were forced to pay a toll . The control was made even stricter in 1988. Today, all cars, whether passenger cars or taxis, must pay USD2.4 per car and attach the receipt (permit) to the windscreen before entering the business center in the city. This method of traffic control is called area licensing. Malaysia has a more total urban policy. Passenger cars entering the business center in Kuala Lumpur must pay a special fee according to a payment schedule that varies by area and time.

Regarding environment pollution caused by traffic, Hanoi needs to build a strategy to control pollution including encouraing use of vehicles that release less pollution, establishing programs of auditing and maintaining, taking a pollution charges from vehicles.

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APPENDIXES

Appendix 1:

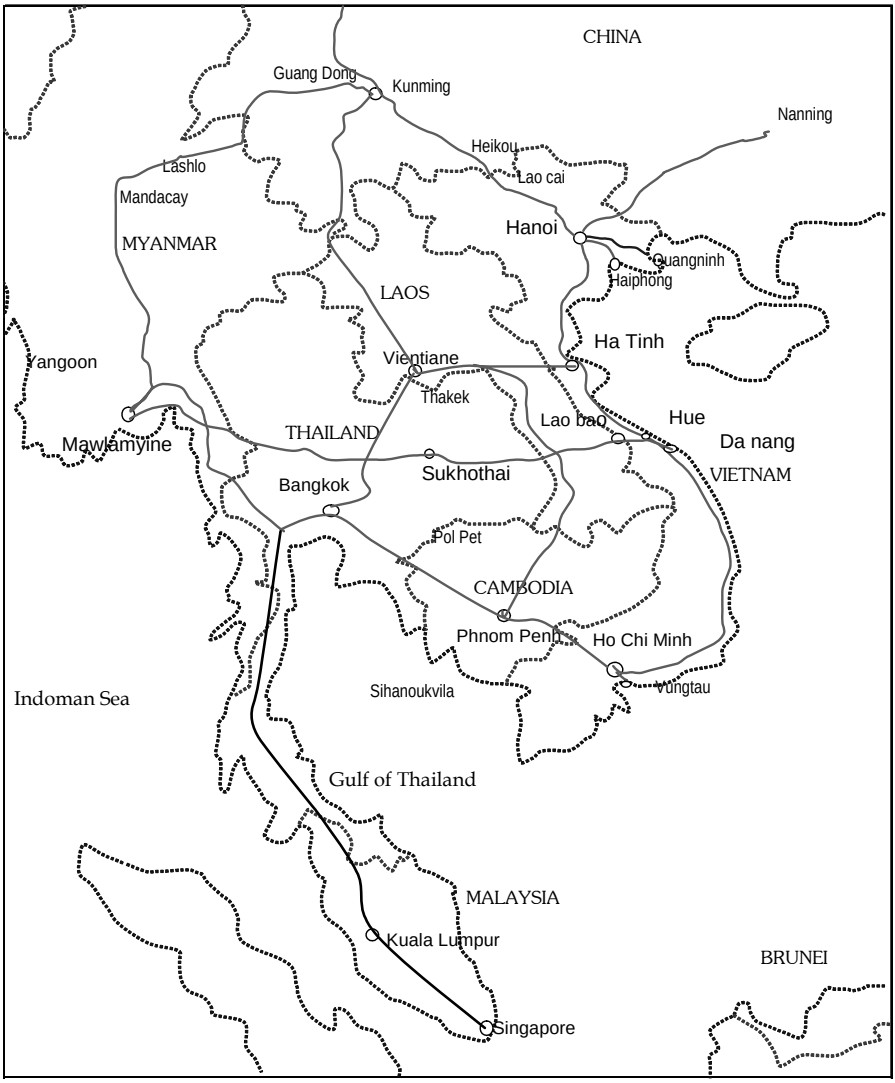
Table 1 Technological standards of road ways

Road types	Highways	Level I	Level II	Level III
Speed	80 - 100	60 - 80	50 - 60	30 - 50
Width		4 or more	2 lanes	2 lanes (2 narrow lanes)
Type of road surface	Concrete surface road, asphalt roads	Concrete surface road asphalt roads	Concrete surface road asphalt roads	Asphalt double coated road
Safety corridor	40 – 70	40 - 60	30 - 40	-
Number of lanes	4 or more	4	2	2 narrow lanes
Lane width	3.75	3.5 – 3.75	3.5 – 3.75	3.0
The minimum vertical flexure radius	230	120	75	50

Source: Vietnam Road Agency, MT

Appendix 2

Map 3 East – West Corridor and ASEAN Road



Source: The author

Appendix 3

City Development Strategy – CDS, Integrated strategic planning, Multi Sectoral Investment planning and Participatory Approach

City Development Strategy – CDS was mentioned by City Allience and the World Bank in 2000 to develop cities according to 4 categories of sustainable development (good living environment, financial balance, competitiveness and good government management). There are 4 stages in CDS:

The first stage: Where we are?

In this stage, the current situation will be analysed and evaluated, the stakeholders will be identified. Strength, weakness, opportunity and threat of the urban development are also identified in this stage through SWOT matrix. Based on the current situation analysis, planned issues will be proposed.

The second stage: Where do we want to go?

Stakeholders will identify the vision, scenario and targets for urban development in the future.

The third stage: Which problems should be settled?

The strategic plan will improve the current situation to achieve the expected targets in the future based on SWOT analysis. This stage will produce a "Strategic report".

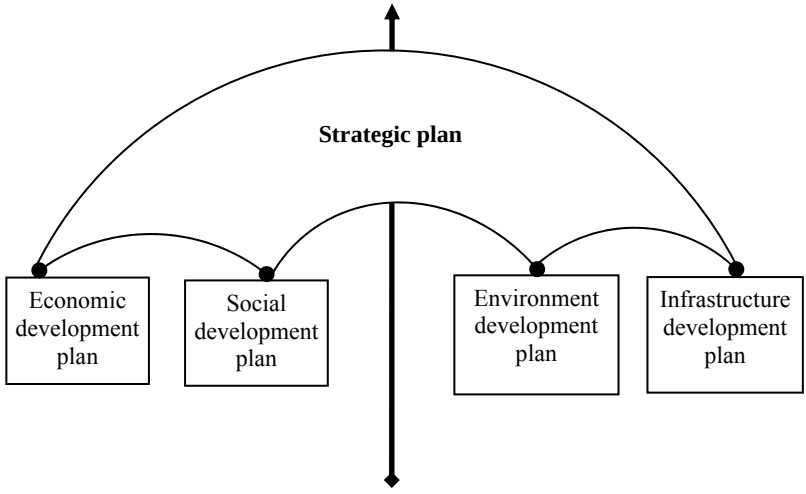
The forth stage: Which activities should be conducted?

Implementing all strategies into plans and projects, investment capital programs. Besides, operation activities, feedbacks and adjustments, management should be conducted too.

Integrated strategic planning

Integrated strategic planning is a mixed plan, integrating all related plans in city development plan, which include: socio-economic development plan, space plan and environment plan. It is clear that the most appropriate master plan for a city is the plan in which government, the community and private sector can cooperated. When the government applies this kind of master plan, the "urban master plan setting" has been changed into "city master plan setting".

Figure 2 Integrated strategy master plan



Source*:* Nguyen Dang Son, New approach to urban plan and management, Construction Publishing House, 2005

Multi Sectoral Investment Planning

The multi sectoral investment planning is the cooperation process among related departments and industries to set up plans with priority for infrastructure. This plan changes the mid-term and long-term plans into annual investment plan. The inputs of the multi sectoral investment plan are the outputs of the integrated strategy plan and development plans.

Participatory Approach

Participatory approach help master plan makers to get more information to set up feasible master plans. And when these master plans are implemented, they will receive more support from the community. The community will benefits more from the master plan because they can take initiatives in setting up house construction plans and other economic plans of their families. Therefore, the master plan makers should study well the community opinions when the master plan is built. They should support the community and have propaganda programs in the community. The master plan makers should consider the community and the community representatives as not only their customers but also their partners in planning. At present, this new methodology has been applied in Vietnam by international organizations in setting up master plans for Hanoi (HAIDEP project, funded by JICA) and for HCMC (HOUTRANSS project, funded by JICA). This new methodology should be applied widely in other cities of Vietnam also.