Development of national transport master plan in Thailand

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Abstract

This paper provides an overview of history of the national transport strategies which have been based on the National Social and Economic Development Plans since the first plan in 1961. The paper also presents the recent Thailand National Transport Master Plan 2011-2020 (OTP, 2011) which is to provide a framework for all agencies within the Ministry of Transport to make investment plans and implementation plans. The master plan set a vision as “Towards Sustainable Transport”, and then goals, strategies, outcomes and key performance indicators. Lately, according to the master plan, investment strategies 2015-2022 (OTP, 2015) were developed for transport infrastructure investment. Finally, the paper provides conclusions on experiences of the master plan development in Thailand.

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Keywords: National transport master plan; transport infrastructure; Thailand

1. Introduction

In Thailand, both passenger and freight transport have been mainly depended on road transport. The proportion of domestic passengers travelling by road, rail, and air is at 74, 21 and 5 per cent, respectively, for freight transport, road, water and railway shares have accounted for 82, 15 and 3 per cent, respectively (NESDB, 2012a). This is because road network reaches to everywhere which door-to-door service can be provided easily, while other modes of transport are limited and low quality of services. However, currently all plans and strategies relating to transport infrastructure development aim to promote railway and water transport in order to compete with road transport.

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The recent Thailand National Transport Master Plan 2011-2020 (OTP, 2011) is to provide a framework for all agencies within the Ministry of Transport to make investment plans and implementation plans. The master plan set a vision as “Towards Sustainable Transport”, and then goals, strategies, outcomes and key performance indicators. Lately, according to the master plan, investment strategies 2015-2022 (OTP, 2015) were developed for transport infrastructure investment.

Thus, the objectives of this paper are to review history and process of the master plan development, and to provide lessons learnt from the master plan development in Thailand. This paper provides an overview of the history of national transport master plans, the investment strategies, and other transport related documents (in Section 2). The National Transport Master Plan 2011-2020 (OTP, 2011) is also summarised (in Section 3). Finally, the paper provides conclusions on experiences and lessons learnt from the master plan development in Thailand (in Section 4).

2. History of Thailand’s national transport master plans

In Thailand, the National Social and Economic Development Plans have been guidelines for the economic and social development of the country. It was the changing point of Thailand to Western style of development. In 1961, the first six-year National Economic Development Plan (1961-1966) has adopted. Subsequently the plan was for every five years and changed the name to the National Economic and Social Development Plan. The currently plan is the Eleventh National Economic and Social Development Plan (2012-2016).

The plans have been formulated by the Office of the National Economic and Social Development Board (NESDB). Every government agencies develops their plans according to the national economic and social development plans. Since the first plan, transport sector has been one of the main parts of the plans. These have been significantly influenced transport infrastructure developments in Thailand.

The First National Economic Development Plan (1961-1966) (NEDB, 1961) mainly focused on new construction and reconstruction of national highways. For railway, a new line was built (250 kms.).

In the Second Plan (1967-1971) (NEDB, 1967), highway construction was planned continually and even more than in the first plan. In addition, provincial and feeder roads were planned to build in remote areas to link the trunk routes and the national system. In total, distance of highways completed was over 13,000 kilometres. Railway was slightly improved by adding freight cars, diesel locomotives, and renovation of major railroads yards.

In the Third Plan (1972-1976) (NESDB, 1972), the highway development programme was remain high priority and receive a large share of the National Budget. Railway development was emphasis on improvement of the existing service efficiency and capacity. Construction of new rail lines was limited.

The first three plans were emphasised on economic growth. The development strategy provided priority to the provision of basic economic infrastructure services, e.g. the construction of highways, irrigation facilities and power systems. These contributed significantly to the increase in the high growth rate of GDP at an average rate of 7 per cent per annum. The most major national highways was completed during first two plans, the third plan was to develop farm-to-market road networks consisting of feeder roads, rural roads and local roads. However, in 1975 the ratio of length to square kilometre of cultivated land was still considered low.

The Fourth Plan (1977-1981) (NESDB, 1977) stressed on the importance of promoting social justice by reducing socio-economic disparities and improving mass welfare. At this time, the Bangkok Metropolis was more than 46 times larger than Chiang Mai, the second largest urban centre. The concentration of population, economic activities and the administrative systems in the Bangkok Metropolitan area led to serious traffic congestion problems in Bangkok. To solve the traffic problems in Bangkok, three expressways (28 kilometres) and mass transit routes (50 kilometres) were planned, together with the construction and renovation of various roads, building of car parking, and construction of flyovers at crossroads. For transport infrastructure development for the regions; national, provincial and rural roads were kept constructing and rehabilitating as the previous plans.

The development during the past 20 years pushed Thailand from the group of low income developing country into the group of “middle income” developing country. Transport development had been heavily emphasis on road transportation because at that time the country was in the “cheap oil era”. Road network was expanded rapidly from 8,500 km. in 1961 to 104,000 km. in 1981. Railway network was only 3,800 km. which was barely expanded from the original system. This was an evident from the allocation of the Fourth Plan’s transportation development budget,
which 90 per cent distributed for road construction. According to 1978 statistics, 93 million tons (85 per cent) of goods and 90,000 million persons-kilometres (93 per cent) of passengers were transported by road transport system. Road users were indirectly subsidised, as evident from the fact that the oil tax and vehicle tax was much lower than annual road construction and maintenance costs. Furthermore, the oil price structure was distorted; particularly the price of diesel. These demonstrated the imbalance in the structure of the transportation system due to too much emphasis on road transportation.

The Fifth Plan (1982-1986) (NESDB, 1982) was expected to transform Thailand into “a semi-industrialised country”, which the share of production and income from the manufacturing sector would be the same as that of the agriculture sector. For transportation sector, the construction was planned to be slowed down except for rural roads. Revenues from road tolls, vehicle tax and oil taxes were planned to use for the development and maintenance of highways as much as possible, in order to make them self-financing and fair to other forms of transport modes. It was also planned to improve long distance rail service for passenger and freight transport. For the Bangkok Metropolitan area, the plan attempted to encourage the use of public transport services by improving efficiency of public transport system, encouraging investment of electric mass transit system by private sector, and implementing measures to discourage the use of private vehicles e.g. increasing oil tax and vehicle tax, collecting tolls on certain roads, and charging entrance fee for certain inner-city zones.

During the Fifth Plan period, the national economic grew at an average annual rate only 4.4 per cent (comparing to 7 per cent average annual growth achieved during the previous plans, and 6.6 per cent target set in the Fifth Plan). This was because of depressed state of the world economy. The Sixth Plan reviewed that the development of transport infrastructure services during the period of the Fifth Plan was quite successful in road network, but other transport services were still inadequate. The attempt to restructure the transport system in order to reduce the use of roads and increase use of railways and waterways was not successful. The price structure of many infrastructure services was still distorted and cannot cover costs.

Thus, the Sixth Plan (1987-1991) (NESDB, 1987), which set the average rate of growth at a level not below 5 per cent, formulated the policy guidelines for developing infrastructure services by upgrading infrastructure service to international standard, adjusting the price structure and fee for infrastructure services on the basis of cost-recovery and self-reliance, expanding investment in infrastructure services by revising the policy on investment-sharing between the government, state enterprises, local authorities and the private sector, and unifying the administration of infrastructure services.

During the Sixth Plan period, the Thai economy had grown rapidly and become increasingly internationalised. The rate of GDP growth was at an average of 10.5 per cent per year, twice the plan target. The proportion of international trade of GDP increased from 60 per cent in 1986 to 80 per cent in 1991. The key factor of the high growth was the world economic conditions, which were conducive to Thailand’s economic expansion, together with comparative advantages in natural and human resources, and the reasonably low wages leading Thailand highly competitive in the world market and further expansion of investment and exports. This created the strong demand for infrastructure services. All types of basic infrastructure services were inadequate to meet the demand. The policy to develop infrastructure services by private sector was not been effectively implemented. Furthermore, the bureaucracy was unable to restructure and adjust itself to respond to the rapid change because of constraints in manpower, legal framework, rules and regulations, administrative system, and organisational structure of the government.

The situations during the Sixth Plan period showed that the exceptionally high growth of Thai economy led to the imbalances of development, which will be obstacles and constraints for high quality and sustainable development in the long term. Therefore, the Seventh Plan was designed an appropriate direction for well-balanced and sustainable growth.

The Seventh Plan (1992-1996) (NESDB, 1992) to meet the increase of demand from economic growth planned to invest more on transport infrastructure. To cope with traffic congestion in Bangkok, the solutions included construction of ring roads for bypassing the city, construction on secondary roads to fulfill the main road network, construction of a central passenger transit centre, construction of mass transit rail, introduction of restraint measures for reducing private vehicles, and construction of public truck depots. The plan for inter-city land transport included development of inter-urban expressways and highways, development of high speed rail, and improvement of road network to cope with demand of the expanding of industrial and agricultural sectors.
The Eighth Plan (1997-2001) (NESDB, 1997) aimed at enabling the country to be better prepared for sustainable development in the future and to become a fully developed country by the year 2020. The concept was shifted from an economic growth orientation to people-centred development. However, the plan relating to transport sector was similar to the previous plan. In Bangkok, traffic congestion was the major problem and planned to tackle by development of mass transit system (which was slow progress during the Seventh Plan), and improvement of road network. For inter-city land transport, the plan focused on improvement of connections among different transport modes to assist economic activity, particularly a comprehensive plan to develop road and rail networks connecting airports and sea ports in order to transport commodities and passengers to and from airports, sea ports, railway stations and cargo terminals.

The economic crisis took place in 1997 (the first year of the Eighth Plan) had seriously effects for the whole country. Particularly, the growing public debt and budget deficits were a major constraint for future resource allocation. There was a need to revise the plan in order to solve the national crisis.

In the Ninth Plan (2002-2006) (NESDB, 2002), the strategic plan was developed with consideration of the previous economic crisis, existing change and future global trend. This plan adopted the philosophy of sufficiency economy bestowed by His Majesty the King of Thailand. Major emphasis was placed on balanced development of human, social, economic and environmental resources. One of the main targets was development of Thailand as an economic gateway to enhance linkages with neighbouring countries and the region by building infrastructure and communication networks in the various economic areas of the country.

In the Tenth Plan (2007-2011) (NESDB, 2007), facing the context of ever faster and more complex change under globalization, one of the strategies is for national development in order to strengthen domestic structures for competitiveness and to reform the structure of the economy for balance and sustainability. To promote fair competition and fair distribution of the benefits of development, infrastructure development was planned to extend to the regions, to give people access to services everywhere, and to be adequate and appropriate to the demands of the area. The strategy aimed to develop infrastructure in transportation and logistics management that are modern and effective as follows: (1) setting up an integrated network of logistics domestically and connect it with international networks by developing various forms of multimodal transportation, feeder, and commodity distribution centers; (2) fostering the modes and methods of transportation that conserve energy, particularly track, water, and pipeline transportations, along with adjusting energy consumption in the transport sector towards a low-cost mode; and (3) developing mass transportation network in Bangkok for convenience, quickness, safety, time saving, and a decrease in energy consumption.

The Eleventh National Economic and Social Development Plan (2012 – 2016) (NESDB, 2012b) had a strategy that relates to transport infrastructure development. The strategy is for creating regional connectivity for social and economic stability. This was to develop connectivity in transport and logistics systems under regional cooperation frameworks. This was suggested to be achieved through the development of efficient transport and logistics services that meet international standards. Multimodal transport could play as a key role to achieve the objective.

The above review of the National Social and Economic Development Plans since 1961 shows the change of ideas in developing transport strategies from road-based transportation to alternative modes. All current plans and strategies relating to transport infrastructure development aim to promote railway and water transport for inter-city transport network, and mass transit system for Bangkok.
3. National Transport Master Plan 2011-2020

In accordance with the Eleventh National Economic and Social Development Plan, the National Transport and Traffic Master Plan (2011-2020) (OTP, 2011a) was developed by Ministry of Transport. This plan defines vision and objectives, as well as, provides a master plan for each transport sector in Thailand. Together with the strategic plans for Logistics Development in Thailand Volume 1 (2007-2011) (NESDB, 2007) and Volume 2 (2012-2017) (NESDB, 2012b) mentions on development of transport services to improve efficiency of logistics network on main corridors. Rail, water and air transport need to be improved and integrated.

The master plan has been using as a framework for all agencies within the ministry to perform their tasks integrally and in the same direction.

The master plan set a vision as “Towards Sustainable Transport”, and then goals, strategies, outcomes and key performance indicators (Figure 1).

Six goals of transport development master plan are:
- to make Thailand a hub for connectivity,
- to provide efficient transport system, good level of service and accessibility to economic zones and communities,
- to improve and increase safety in passenger travel and freight transport,
- to promote energy savings and environmentally friendly transport,
- to upgrade the accessibility and increase the use of public transport, and
- to increase mobility in passenger travel and freight transport.

![Figure 1 Essence of the master plan](image-url)

To achieve the goals, strategies, as well as expected outcomes and impacts of the strategies, were set as shown in Table 1.
<table>
<thead>
<tr>
<th>Goals</th>
<th>Strategies</th>
<th>Outcomes</th>
<th>Impacts</th>
</tr>
</thead>
<tbody>
<tr>
<td>G1) to make Thailand a hub for connectivity</td>
<td>1.1) Development and improvement to increase network capacity to become international transport hub</td>
<td>• Increased volume of transport via Thailand</td>
<td>• Increased GDP</td>
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<td></td>
<td>1.2) Strengthening of competition of Thai entrepreneurs</td>
<td>• Increased volume of goods transport via Thailand</td>
<td>• Expansion of international trade</td>
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<td>• Increased economic role in the region</td>
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<tr>
<td>G2) to provide efficient transport system, good level of service and accessibility to economic zones and communities</td>
<td>2.1) Development and improvement of transport system efficiency to promote the expansion of development area to the region</td>
<td>• More convenient, fast and reliable transport on main routes linking economic zones</td>
<td>• Fast and sustainable growth of economy in the region</td>
</tr>
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<td></td>
<td></td>
<td>• Increased level of satisfaction of transport users</td>
<td>• Increased opportunities in business operations</td>
</tr>
<tr>
<td>G3) to improve and increase safety in passenger travel and freight transport</td>
<td>3.1) Improvement of infrastructure, vehicle standards and environment to provide qualified and safe transport</td>
<td>• Decreased number of accidents from transport</td>
<td>• Improved standard of living</td>
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<tr>
<td></td>
<td>3.2) Adjustment of behavior of concerned people to have knowledge, understanding, consciousness and skills on transport safety</td>
<td>• Decreased number of deaths from transport accidents</td>
<td>• Decreased economic and social loss from accidents</td>
</tr>
<tr>
<td>G4) to promote energy savings and environmentally friendly transport</td>
<td>4.1) Encouragement and support to shift mode of transport to rail and water transport</td>
<td>• Decreased ratio and volume of energy consumption in the transport sector</td>
<td>• Reduced impacts to global warming</td>
</tr>
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<td></td>
<td>4.2) Promotion and development of technology to provide a use of clean and environmentally friendly energy and vehicles</td>
<td>• Decreased pollution from the transport sector</td>
<td>• Reduced fuel import dependence</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>• Increased competitive capacity</td>
</tr>
<tr>
<td>G5) to upgrade the accessibility and increase the use of public transport</td>
<td>5.1) Development of infrastructure and equal accessibility to public transport</td>
<td>• Increased number of passengers using public transport</td>
<td>• Increased social equality</td>
</tr>
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<td></td>
<td></td>
<td></td>
<td>• Improved standard of living</td>
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<td></td>
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<td></td>
<td>• Better community of living</td>
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<tr>
<td>G6) to increase mobility in passenger travel and freight transport</td>
<td>6.1) Improvement and development of infrastructure to reduce bottleneck and traffic problems</td>
<td>• Better average speed in travel and freight transport</td>
<td>• Alleviated traffic congestion</td>
</tr>
<tr>
<td></td>
<td>6.2) Increased in efficiency of traffic management</td>
<td></td>
<td>• Decreased economic loss from transport and traffic problems</td>
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</table>
According to the average investment proportion, the budget proportion for rail transportation is very low during 2006-2010 (18%), compared to the proportion during 2011-2020 (46%). For the investment on road transportation was reduced significantly from 77% during 2006-2010 to 39% during 2011-2020, as shown in Figure 2.

Investments on transport infrastructure in Thailand have been heavily relied on government loans and budget. During the first period of the master plan, 70% of the investment budget is from government loans and budget; however, it is planned to reduce by increasing proportion of investment from private sector (Figure 3).
Lately, in order to push forward the development of transport infrastructure in to practice, the strategies to improve transportation infrastructure in Thailand (2015-2022) (OTP, 2015) were developed by the government. The strategies are set to tackle some defined challenging issues; including:
(1) modal shift from road transport to alternative modes which provide lower transport cost per unit,
(2) connectivity of neighbouring countries,
(3) mobility of people and commodity throughout the country, and
(4) enhancement of laws and regulations relating transport and logistics services.

These lead to several mega-projects which can be categorised into five groups; including:
(1) intercity rail infrastructure,
(2) mass transit system in Bangkok,
(3) road infrastructure,
(4) water transport infrastructure, and
(5) air transport infrastructure.

4. Lessons learnt from the master plan development in Thailand

This paper has provided an overview of history of the national transport strategies which have been based on the National Social and Economic Development Plans since the first plan in 1961. The paper has also presented the recent Thailand National Transport Master Plan 2011-2020 (OTP, 2011) which is to provide a framework for all agencies within the Ministry of Transport to make investment plans and implementation plans. The master plan set a vision as “Towards Sustainable Transport”, and then goals, strategies, outcomes and key performance indicators. Lately, according to the master plan, investment strategies 2015-2022 (OTP, 2015) were developed for transport infrastructure investment.

The review shows the change of ideas in developing transport strategies from road-based transportation to alternative modes. All current plans and strategies relating to transport infrastructure development aim to promote railway and water transport for inter-city transport network, and mass transit system for Bangkok. However, due to road transport has been developed for long time, alternative transport modes are significant lack behind.

Currently, the highway in Thailand is classified into five categories: special highway, national highway, rural road, local road and concession highway. The length of all is 204,201 kilometres. Most of them are paved by concrete and asphalt. Roads linking economic areas are at least 4 lanes. So far, the Thai government has been mainly developed and extended road network and related infrastructure to cover all over the country. This results more than 80% of cargos in Thailand was transported by trucks on roads.

Railway network covers total distance of 4,043 kilometres (all are 1-metre gauge). Most of the network (93%) is single track. Tracks and locomotives are rather old. These causes slow speed of service. At present, State Railway of Thailand (SRT) has projects to build double-track railways, replace old tracks, and buy new locomotives.

Road transport is the most convenient to move people and cargos from origins to destinations. Transport by rail is unreliable. This is because the development of alternative forms of transport has been limited. Facilities at the connection points between the transport modes are still lack of efficiency. As a result, multi-modal transport in Thailand has not been successful.

For the Bangkok Metropolitan Region in 2010 had population of 11.5 million and will increase to 12.7 million in 2020. Mass Rapid Transport only covers inner areas of Bangkok. Expressways cover wider areas. Most of travelling relies on road transports, so traffic congestion is the main problem. Car restraint measures have been included in the national transport strategies, but until now they have never been implemented.

Some key points that can be summarised from review of the master plan development in Thailand; including:
- Railway was first built over 100 years ago (long time before road development).
- In the early stage of new (Western style) development of the country (since 1960), in order to achieve the target of “increasing quality of life”, roads and highways were rapidly improved and expanded to rural areas. These could increase accessibility to natural resources.
Road transport becomes more and more convenient, while railway has almost been forgotten since the new era of development. As well as roads and highways were not developed to integrate with the railway network (which was first developed).

Also in Bangkok, even in the beginning (1960s), roads and expressways, mass transit, and land use were planned together; only roads and expressways have been progress rapidly. The fist MRT line (the “Sky train”) in Bangkok was started to operate in 1999 (about 30 years behind the first elevated expressway).

These unbalance developments lead to serious transport problems and reduce quality of life in long terms.

Later although the direction of transport development plan was change to favour alternative transport modes, implementation has been slowly progress. This is because the society is already dominated by private vehicles (motorcycles, cars, and trucks).

The key challenge for Thailand (and also likely for other developing countries) is how to shifting travellers and cargos to alternative transport modes, in the situation that private vehicles are dominant. Also this paradigm shift can be achieved by planning and implementation with agreement from the society as a whole; or if it too late, the worse situations will force to have the paradigm shift with high costs for the society.

References