Chapter 9

Thailand Country Report

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CHAPTER 9

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Introduction

Infrastructure development in Thailand has seen considerable progress in key sectors such as energy, transport, and water supply, in past decades. In these, the public sector's role has been significant in the areas of planning, construction and operations, and recently, in infrastructure investment. In fact, plans on future development projects focus on the role of private sector investment in infrastructure. Since past infrastructure projects in Thailand through Public-Private Partnerships (PPP) had seen both success stories as well as failures, a study on these experiences in financing can help improve the processes the private sector undergoes and can serve as cases to learn from for other developing countries.

This study looks briefly into the infrastructure investment in the energy sector and then reviews in more detail the infrastructure development in the transport sector, with special attention on the private sector's participation. The next section highlights key information on infrastructure investment in Thailand. Section 3 then describes the sources of infrastructure financing while section 4 reviews the past experiences of the private participation [1] in transport

[1] For Thailand, the Act on Private Participation in State Undertaking or B.E. 2535 (1992) broadly defines the term "private participation" as any projects in which private individuals jointly invest with public authority by any means, or solely invest in a project by means of licensing, concession agreement, or rights granted in any manner whatsoever. Therefore, whether a project should follow the steps in the act depends on the case-by-case interpretation. Thailand's experience with the act suggests some hindrance and confusion caused by the definition, classification, and procedures expressed by the law. Thus, there have been some attempts to amend particular aspects of the act such as the definition of

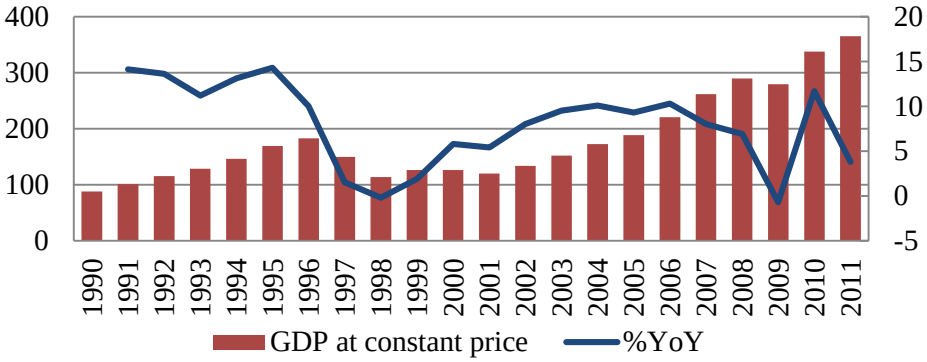
infrastructure projects in Thailand. Finally, Section 5 presents some issues and challenges in transport infrastructure financing via PPP.

Infrastructure Investment

Macroeconomic Statistics in Thailand

After slowing down in 1997-1998, Thailand's economy began to improve again. Figure 9.1 shows the growth in gross domestic product (GDP) during the 2000s except in 2009, which was partly due to the effect of the world economic crisis. The uptrend in Thailand's economy is expected to continue in future years.

Figure 9.1: Gross Domestic Product of Thailand (billion US$)

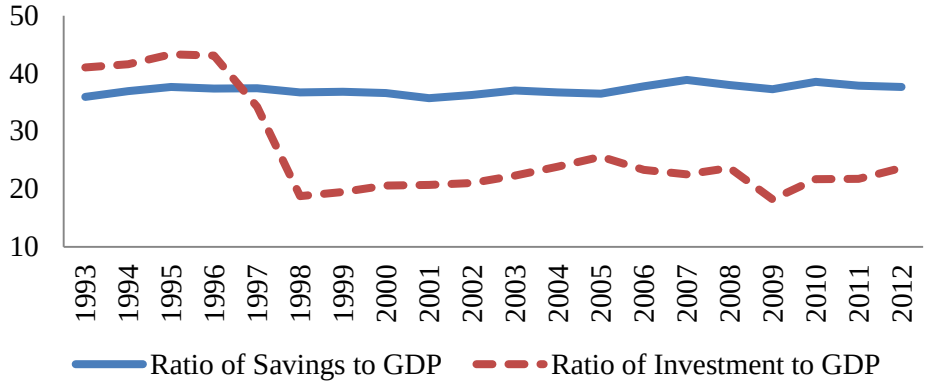


Source: Bank of Thailand.

Figure 9.2 presents the ratios on Thailand's national savings and investment to GDP. The savings-to-GDP ratio has been fairly stable at around 40 percent since 1993 while the national investment-to-GDP ratio remains low at around 20 percent, after dipping in the late 1990s. Therefore, as shown in Figure 9.3, Thailand saw a drop as well in its investments, both public and private, in physical infrastructure since the late 1990s. Table 9.1 presents Thailand's standing based on flow of funds indicators for the period 2007-2011.

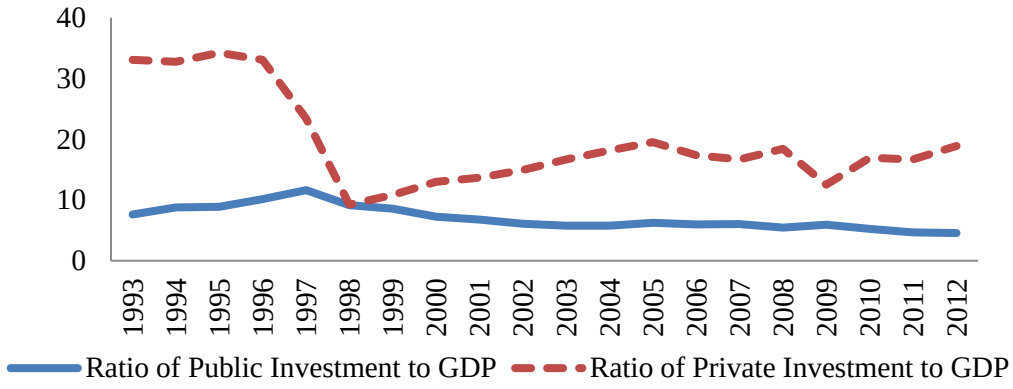
"participation" to include turnkey projects; the change in the minimum project value from 1 billion baht to 3 billion baht, etc.

Figure 9.2: Thailand National Savings and Investment to GDP, 1993-2012



Source: NESDB.

Figure 9.3: Thailand Public Savings and Investment to GDP, 1993-2012



Source: NESDB.

Table 9.1: Flow of Funds Indicators of Thailand

Indicators	2007	2008	2009	2010	2011
1. GDP growth (%)	5.4	1.7	-0.9	7.3	0.3
2. GDP at current price (US$ million)	261,510	289,557	279,287	337,530	364,727
3. Inflation rate (%)	2.3	5.5	-0.9	3.3	3.8
4. Investment growth (reference year 2002)					
- Private (%)	0.7	6.3	-17.4	16.7	9.0
- Public (%)	5.0	-8.3	8.9	-0.8	-8.6
5. Saving-investment gap to GDP (%)	6.0	0.7	7.9	3.9	1.5
- Non-financial Corporations Sector	-1.3	-4.1	3.9	-1.1	-2.1
- Financial corporations sector	1.9	1.4	2	2	0.6
- General government sector	0.4	-0.4	-2.6	-1.6	-0.4
- Households & non-profit Institution serving Households sector	4.9	3.8	4.5	4.5	3.4
6. Current account balance (US$ million)	15,598	2,020	21,996	9,863	5,924
7. Ratio of current account balance to GDP (%)	6.0	0.7	7.9	2.9	1.6
8. Net capital movement (US$ million)	-18,661	-11,777	-25,377	-6,295	-5,158
9. International reserve position (US$) mil	99,429	135,190	154,034	156,469	176,013
10. Loan ceiling (US$ million)	23,941	25,970	29,905	28,075	36,434
11. Change in public external debt	34,092	-134,537	-58,359	-16,469	2,232
- Government	-29,982	-19,588	-3,768	-2,375	-7,368
- State enterprises	64,074	-114,949	-54,591	-14,094	9,600

Source: Bank of Thailand, Ministry of Commerce, and NESDB.

As physical investment in Thailand has been low for quite a long while, it is about time to inject more into infrastructure as soon as possible so as to build up the country's capacity. Two main sectors in Thailand had seen much action in infrastructure investing: the energy and the transportation sectors.

Infrastructure Investment in Energy Sector

To encourage private investment in power generation, there were attempts to turn state enterprises into private companies. The idea was first conceived during the crafting of the Seventh National Economic and Social Development Plan (the Seventh Plan). Per the plan, the electricity sector would be liberalised to increase competition and to promote efficiency while reducing the weight of infrastructure expenditures on government's budget. To liberalise the power sector, the government took the following steps:

- Promoted Independent Power Producers (IPP) and Small Power Producers (SPP) starting in 1992;
- Issued a Cabinet resolution in 1996 to unbundle power generation, transmission and distribution activities of the Electricity Generating Authority of Thailand (EGAT), Metropolitan Electricity Authority (MEA), and Provincial Electricity Authority (PEA) and turned over these functions to various business units (BUs). The BUs will subsequently be corporatised and listed in the stock market;
- In 1998-2001, allowed EGAT to keep its single buyer role;
- In 2001-2003, allowed private power producers to make direct business contacts with customers by opening up EGAT's transmission lines to third parties' access;
- Beginning in 2003, full retail competition in power sector would be established via power pool. Also, an independent system operator and regulator would be established.

Note that after the change of government in 2001, the power pool plan was cancelled because the government deemed that this could potentially create price volatilities. However, the new government continued to pursue the

corporatisation plan of EGAT. It also established the Enhanced Single Buyer (ESB) scheme whereby EGAT would retain its monopoly on electricity purchase. In 2006, the privatisation of EGAT was suspended by the Supreme Administrative Court due to EGAT's violation of public hearing procedures. Since then, no administration has attempted to revisit the plan to liberalise EGAT, MEA or PEA.

However, the Seventh Plan has succeeded in promoting private investments in Thailand's Energy Security Initiative (ESI). There has been no shortage of interests from private investors, local and abroad, to invest in power plants of all sizes as IPPs, SPPs and very small power producers (VSPPs). Furthermore, all private investments had been under the Build-Own-Operation (BOO) agreement, therefore avoiding the lengthy procedures normally required by Private Participation in State Undertaking Act B.E. 2535.

Infrastructure Investment in Transport Sector

Overview of Transport Sector

So as to understand the crucial role of the transport sector in the Thai economy, it is worthwhile to look at the demand volume in each mode of transport in Thailand.

Thailand's freight transport can be divided by modes of transport: namely, road, rail, water, and air transport. Domestic freight volume in 2012 was 520 million tonnes. Of this, freight transport by road accounted for about 83 percent of all domestic freight traffic. Table 9.2 shows statistics on the domestic freight transport. In terms of total freight ton-kilometres transported domestically, freight transport by road accounts for an even bigger share—about 96 percent of all transportation modes.

Table 9.2: Thailand Domestic Freight Volume (million tons)

Mode of Transport	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
Road	435	440	435	430	428	428	424	424	420	407	426
Railway	9	11	13	12	12	11	13	12	11	11	12
Inland waterway	31	30	43	42	40	47	48	42	48	47	47
Coastal shipping	28	27	37	34	32	31	36	36	37	41	35
Air	0.11	0.10	0.11	0.12	0.12	0.11	0.11	0.10	0.12	0.13	0.13
Total	**503**	**508**	**529**	**519**	**511**	**518**	**521**	**513**	**517**	**506**	**520**

Source: Ministry of Transport.

For international freight transport, most import/export of goods were via maritime transport. Table 9.3 shows that maritime transport accounts for almost 70 percent of international freight value while air transport comes second at around 25 percent of the international freight's value. When analysed by freight weight, maritime transport accounts for nearly 90 percent of the international freight. This means that air transport carried mostly high-value, low-weight goods while maritime carriers delivered low-value, high-weight items.

Table 9.3: Thailand International Freight Transport in 2011

Modes of Transport	Value of Trade (US$ Million)			Volume of Trade ('000 Tones)		
	Import	Export	Total	Import	Export	Total
Maritime transport	155,913	152,239	308,152	92,965	100,675	193,640
Road transport	13,547	19,548	33,095	12,689	10,779	23,468
Railway transport	21	326	347	13	133	146
Air transport	58,967	53,780	112,747	282	443	725
Mail, Parcel and others	271	297	568	2	1	3
Total	**228,719**	**226,190**	**454,909**	**113,618**	**102,996**	**216,614**

Source: Ministry of Transport.

Thus, the most important mode for domestic transport is by roadways while that for international transport is by sea. Railways play very little role in both domestic and international deliveries. Note that the international freight route

for rail transport is in the southern part of Thailand connecting to Malaysia.

Public Budget for the Transport Sector

The Ministry of Transport is the main agency that provides the transport infrastructure and regulates the sector. The focus of organisations within the Ministry of Transport can be grouped into four main categories; namely, the planning, policy, and administration; land transport; water transport; and air transport. The Office of the Permanent Secretary, and the Office of Transport and Traffic Policy and Planning comprise the planning, policy, and administration section. The rest are organised by transport modes and may either be government agencies or state enterprises. Table 9.4 provides the details on the organisations under the Ministry of Transport.

Table 9.4: Organisations Within the Ministry of Transport

Planning, Policy, and Administration	**Water Transport**
• Office of the Permanent Secretary • Office of Transport and Traffic Policy and Planning	Government Agencies
	• Marine Department
	State Enterprises
Land Transport	• Port Authority of Thailand
Government Agencies	**Air Transport**
• Department of Land Transport • Department of Highways • Department of Rural Roads	Government Agencies
	• Department of Civil Aviation
State Enterprises	State Enterprises
• Expressway and Rapid Transit Authority of Thailand • Bangkok Mass Transit Authority • Transport Company Limited • State Railway of Thailand • Mass Rapid Transit Authority of Thailand	• Civil Aviation Training Center • Airport of Thailand Public Company Limited • Thai Airways International Public Co.,Ltd. • Aeronautical Radio of Thailand Co., Ltd.

Generally, government agencies in each mode act as regulators as well as provide the necessary infrastructure. On the other hand, state enterprises usually provide transport services. In some cases, state enterprises may also provide infrastructure services. The roles of each organisation are included in Annex 1's discussion on the regulatory framework of Thailand's transport sector.

When it comes to public investment in the transport sector, Table 9.5 details the government budget for the Ministry of Transport's agencies. Note that some

state enterprises are not listed in the table because they operate on a commercial basis and are not regularly allocated a government budget.

Table 9.5: Allocated Public Budget for Transport Sector (US$ million)

Agency	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	Average Annual Growth (%)
Policy & Planning	**3.5**	**3.4**	**6.7**	**7.6**	**9.1**	**17.0**	**37.3**	**25.8**	**24.0**	**27.5**	**26.0**	**26.2**	**54.77**
Permanent Secretary Office	3.5	3.4	3.4	3.7	4.8	7.2	8.7	9.8	9.8	10.1	12.6	11.3	**18.84**
Office of Transport & Traffic Policy & Planning	0.0	0.0	3.3	3.9	4.3	9.8	28.6	16.0	14.2	17.3	13.4	14.9	**35.58***
Land Transport	**1,336.1**	**1,143.0**	**1,661.3**	**1,753.3**	**2,133.5**	**2,332.6**	**2,639.9**	**2,453.7**	**2,770.6**	**2,259.1**	**3,464.4**	**3,643.7**	**14.39**
Dept of Land Transport	28.1	31.0	32.0	36.9	40.9	47.6	57.5	68.9	67.9	68.2	69.6	74.7	**13.83**
Dept of Highways	922.2	708.8	689.9	778.0	1,062.5	990.3	1,303.6	1,216.5	1,179.7	831.6	1,600.5	1,622.1	**6.32**
Dept of Rural Roads	0.0	0.0	336.2	376.2	441.1	565.3	516.8	518.7	695.1	644.1	858.6	952.1	**18.32***
Expressway Authority	118.9	114.4	253.6	230.6	213.2	213.4	292.3	251.9	274.3	221.7	266.7	144.4	**1.79**
Bangkok Mass Transit Authority	9.6	9.9	5.2	0.0	0.0	0.0	0.0	0.0	18.9	0.7	42.9	147.0	**n.a.**
State Railway	187.1	214.5	208.4	213.3	194.9	247.4	209.5	227.6	304.1	290.5	376.1	455.1	**11.94**
Mass Rapid Transit Authority	70.2	64.3	136.0	118.4	181.0	268.5	260.3	170.0	230.6	202.4	250.1	248.3	**21.13**
Water Transport	**116.2**	**61.3**	**46.1**	**56.7**	**61.5**	**85.5**	**103.3**	**111.6**	**108.7**	**105.2**	**131.6**	**146.9**	**2.20**
Marine Department	54.4	49.7	46.1	56.7	61.5	85.5	103.3	111.6	108.7	105.2	131.6	146.9	**14.17**
Port Authority of Thailand	61.8	11.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	**n.a.**
Air Transport	**23.2**	**20.7**	**28.0**	**29.6**	**38.1**	**40.7**	**29.7**	**37.8**	**30.5**	**32.8**	**52.2**	**42.9**	**7.09**
Dept of Civil Aviation	21.8	19.1	25.8	27.1	34.9	35.7	22.9	27.2	26.9	26.7	44.3	36.4	**5.60**
Civil Aviation Training Centre	1.4	1.5	2.2	2.4	3.2	4.9	6.8	10.6	3.7	6.2	7.9	6.4	**30.76**
Total	**1,478.9**	**1,228.3**	**1,742.1**	**1,847.2**	**2,242.1**	**2,475.7**	**2,810.2**	**2,628.9**	**2,933.9**	**2,424.6**	**3,674.3**	**3,859.6**	**13.41**

*Note:** is average annual growth for 10 years.
Source: Ministry of Transport and Bureau of Budget.

Most of the government budget for the transport sector is for land transport and mainly allocated to road infrastructure agencies. The Department of Highways (DOH) and Department of Rural Roads (DRR) receive almost 70 percent of the total budget each year for construction and maintenance of roads. The budget assigned to the transport sector generally grows by around 7.7 percent annually, proof that the government still focuses on transport infrastructure development.

For road transport, the DOH and DRR are the key agencies. Only one state enterprise, Expressway Authority of Thailand (EXAT), provides road infrastructure services. Since the Ministry Of Transport has developed a Geographic Information System (GIS) for transport infrastructure in Thailand, road network data are coded into the system's database, which serves as a proxy of the road network's length. Table 6 indicates that the two main agencies, DOH and DRR, are responsible for around 64 percent of the network whereas local authorities account for 36 percent of the network.

Table 9.6: Length of Road Network in Thailand from GIS Database for 2009

Administrative Agencies	Route (km)	% of Road Length
Department of Highways	63,100	39%
Department of Rural Roads	39,255	25%
Road Inside the Municipality Area	16,274	10%
Road Outside the Municipality Area	41,286	26%
Total	**159,915**	**100%**

Source: Transport FGDS, Ministry of Transport.

For the railway infrastructure, the State Railway of Thailand (SRT) operates a network of 4,180 km of rail tracks that connect 46 provinces. The northernmost rail point is in Muang District, Chiang Mai Province, while the southernmost is in SuNgai Kolok District in Narathiwat province. The Muang districts of Nong Khai and Ubon Ratchathani provinces are the farthest northeastern points, while Map Ta Phut District in Rayong Province is the farthest eastern point. The westernmost point is at Sai Yok District in Kanchanaburi Province.

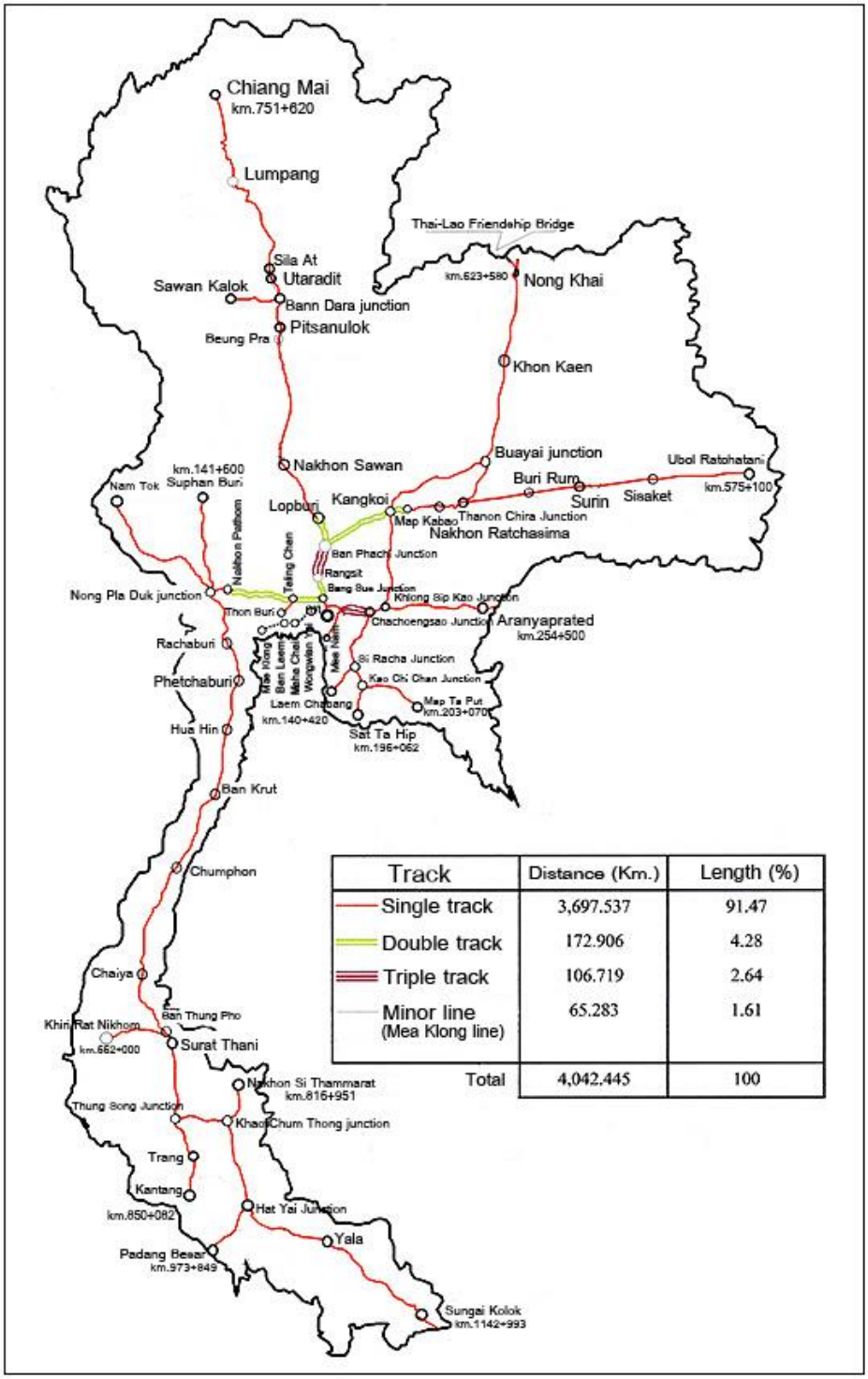
There is little development in terms of the network extension, as most projects were mere upgrades of some lines' single tracks into double tracks. There are currently three types of rail tracks: single, double, and triple tracks. Single tracks account for 3,901 km (93.3%) of total railways, while double and triple tracks constitute 220 km (5.3%) and 59 km (1.4%), respectively. The tracks have a width of one metre and can carry loads of 15-18 tons. Figure 9.4 shows the map of Thailand's whole railway network.

In general, rail routes have connections with highways and logistics facilities, but the most important hubs for distributing products are Bangkok Port, Laem Chabang Port, and Inland Container Deport (ICD) Lat Krabang. There are also rail connections with regional container storage areas such as Sila At District, Uttaradit Province; Tha Phra, Khon Kaen Province; Kudjik Station, Nakhon Ratchasima Province; and Ban Thung Pho, Surat Thani Province. These stations create logistics services in the form of hub and spokes; the road routes are used by feeders and trains as the trunk line for logistics over long distances. There are four rail routes that connect with neighbouring countries: Nong Khai station, which connects to Lao PDR; Aranyaprathet station, which links to Cambodia; and Padang Besar and SuNgai Kolok stations, which connect to Malaysia.

Thailand's water transport infrastructure involves a coastal length of around 2,614 km and domestic inland waterways of around 1,750 km. For the port infrastructure, the country has both international ports and coastal domestic ports. Of its eight deep-sea ports, the most important ones are Bangkok Port and Laem Chabang Port. Bangkok Port handles traffic of around 1 million TEU per year while Laem Chabang Port processes around 6.9 million TEU

per year. Both ports are operated by the Port Authority of Thailand (PAT).

Figure 9.4: Railway Network in Thailand



Source: Civil engineering division, SRT, 2008.

Thailand's air transport infrastructure features six international airports and 29 domestic airports. The international airports—namely, Suvarnabhumi Airport, Don Maung Airport (used for domestics flights only), Chiang Mai Airport, Chiang Rai Airport, Phuket Airport, and Hat Yai Airport—are the hubs for both domestic and international flights, with warehousing facilities for the transfer of goods through different transport modes. These are operated by the Department of Civil Aviation and the Airport of Thailand Company Limited (AOT). The Department of Civil Aviation operates most domestic airports while AOT manages and develops the six international airports. The AOT was corporatised from a state enterprise, the Airports Authority of Thailand (AAT) and then became a public limited company on 30 September 2002.

State Enterprises in the Transport Sector

State enterprises in the transport sector provide both infrastructure services and transport services. Some organisations operate for profit, while others do not because they are constrained by their mandate or public service duties. Currently, the Ministry of Transport has 13 state enterprises under its supervision, including five in the air transport sector, another five in the land transport sector, and two enterprises in the water transport sector.

According to the data collected by the National Economic and Social Development Board (NESDB), state enterprises under the Ministry of Transport lost about US$226.62 million in 2009. Most enterprises in the land transport sector, especially SRT and the Bangkok Mass Transit Authority, account for most of the deficit. Table 9.7 shows the overall financial status of these state enterprises.

Meanwhile, Table 9.8 presents the performance of selected state enterprises under the supervision of the Ministry of Transport. The enterprises performed considerably well except SRT and the Bangkok Mass Transit Authority.

Table 9.7: Overall Financial Status of State Enterprises of the Ministry of Transport (US$ million)

Item	Air Transport	Land Transport	Water Transport	Total
Revenue	7,800.99	1,025.53	298.91	9,125.43
Cost	7,418.64	1,692.02	241.39	9,352.06
Net Profit	382.35	-666.49	57.52	-226.62
Earnings Before Interest, Taxes, Depreciation and Amortisation (EBITDA)	1,712.56	-62.13	111.07	1,709.98
Retained Income (RI)	1,291.39	664.31	76.73	2,032.43

Sources: NESDB (2009).

Table 9.8: Net Profits or Losses of Select State Enterprises for Land Transport under the Ministry of Transport, 2003 – 2007

Organisations	2003	2004	2005	2006	2007
State Railway of Thailand	-136.39	-194.03	-152.77	-168.80	-227.58
Port Authority of Thailand[1/]	37.31	45.66	48.06	35.77	67.65
Mass Rapid Transit Authority[1/]	-23.77	-112.37	-13.11	171.27	50.84
Expressway Authority of Thailand[1/]	23.06	30.59	17.04	56.92	37.85
Bangkok Mass Transit Authority[1/]	-78.91	-117.37	-131.78	-165.23	-170.17
Civil Aviation Training Center[1/]	-2.23	-0.54	-0.18	-0.33	-0.22
Transport Co., Ltd.[1/]	4.41	5.50	1.16	6.09	6.28
Thai Maritime Navigation Co., Ltd.[1/]	0.03	-0.56	-0.49	-0.58	0.09
Aeronautical Radio of Ltd.[1/ 3/]	0	0	0	0.01	0.01
Thai Airways International Plc.[2/]	n.a.	250.23	168.28	237.06	53.21
Airports of Thailand Plc.[2/]	n.a.	118.46	183.98	273.62	31.68

Note: State Enterprise Policy Office (SEPO), 2013.
Source: TDRI (2009).

The performances of state enterprises reflect the nature of their business. This also spells an opportunity for private investors to come in—where it makes sense, that is. If the business is profiting—for example, the expressway business—then chances are the private sector would want to be involve in the projects. Conversely, if the business is consistently losing, then a reform of the sector may be needed to identify which part of the business presents opportunities for private sector's participation, and which part necessitates public subsidy.

Infrastructure Financing

Infrastructure projects can be financed by either the national budget or external sources.

National Sources

There are four types of internal financing sources for transport infrastructure: government budget, state enterprise's income, government loan, and private investment participation. Table 9.9 shows investment plans for transport infrastructure of select organisations under the Ministry of Transport for 2011-2020, based on data from the Office of Transport and Traffic Policy and Planning (2011). Most projects are financed by the government's budget, followed by government loan, and then by private financing participation. The Mass Rapid Transit Authority (MRTA) has the highest number of project financing by combining government loan and budget with private investment participation. The DOH and SRT are also financed by private participation but the highest proportion of financial investment comes from government loan (SRT) or government budget (DOH).

Table 9.9: Thailand Land Transport Infrastructure Investment Details of Selected Organisations under the Ministry of Transport Plan in 2011-2020

Organisation	Financing in Fiscal Year 2011-2015 (US$ million)					Financing in Fiscal Year 2016-2020 (US$ million)					Total
	Gov't Budget	State Enterprise	Gov't Loan	PPP	Total	Gov't Budget	State Enterprise	Gov't Loan	PPP	Total	
Dept of Land Transport	**243**	**0**	**0**	**0**	**243**	**93**	**0**	**0**	**0**	**93**	**336**
Number of projects	6	-	-	-	6	-	-	-	-	0	6
Dept of Highways	**4,184**	**0**	**0**	**3,537**	**7,721**	**5,052**	**0**	**0**	**4,618**	**9,670**	**17,391**
Number of projects	11	-	-	1	12	5	-	-	1	6	11
Dept of Rural Roads	**1,710**	**0**	**0**	**0**	**1,710**	**1,923**	**0**	**0**	**0**	**1,923**	**3,633**
Number of projects	8	-	-	-	8	5				5	8
State Railways	**1,305**	**0**	**7,962**	**0**	**9,267**	**0**	**0**	**2,814**	**804**	**3,618**	**12,885**
Number of projects	2*	-	24	-	24	-	-	6	1	7	27
Expressway Authority	**188**	**0**	**0**	**0**	**188**	**0**	**0**	**0**	**0**	**0**	**188**
Number of projects	1	-	-	-	1	-	-	-	-	0	1
Mass Rapid Transit Authority	**1,080**	**0**	**7,117***	**1,832**	**10,029**	**8**	**0**	**4,441**	**59**	**4,508**	**14,538**
Number of projects	8		8	5	21	4	-	7	4	15	8
Bangkok Mass Transit Authority	**0**	**767**	**31**	**0**	**799**	**0**	**1,023**	**0**	**0**	**1,023**	**1,822**
Number of projects	-	1	2	-	3	-	1	-	-	1	3
Transport Co., Ltd.	**0**	**170**	**0**	**0**	**170**	**0**	**16**	**0**	**0**	**16**	**187**
Number of projects	-	1	-	-	1	-	1	-	-	1	1
Marine Department	**393**	**0**	**259**	**0**	**651**	**52**	**0**	**209**	**0**	**262**	**913**
Number of projects	16	-	2	-	16	2	-	2	-	2	16
Dept of Civil Aviation	**24**	**0**	**0**	**0**	**24**	**0**	**0**	**0**	**0**	**0**	**24**
Number of projects	5	-	-	-	5	-	-	-	-	-	5
Port Authority	**0**	**97**	**0**	**0**	**97**	**0**	**223**	**772**	**0**	**995**	**1,092**
Number of projects	-	3	-	-	3	-	2	1	-	2	3

Organisation	Financing in Fiscal Year 2011-2015 (US$ million)					Financing in Fiscal Year 2016-2020 (US$ million)					Total
	Gov't Budget	State Enterprise	Gov't Loan	PPP	Total	Gov't Budget	State Enterprise	Gov't Loan	PPP	Total	
Aeronautical Radio of Thailand Co., Ltd.	**227**	**60**	**0**	**0**	**287**	**0**	**0**	**0**	**0**	**0**	**287**
Number of projects	4	2	-	-	4	-	-	-	-	-	4
Thai Airways Intl Plc.	**0**	**2,958**	**0**	**0**	**2,958**	**0**	**1,449**	**0**	**0**	**1,449**	**4,407**
Number of projects	-	3	-	-	3	-	1	-	-	1	3
Airport of Thailand Plc	**0**	**1,447**	**383**	**0**	**1,830**	**0**	**188**	**178**	**0**	**366**	**2,196**
Number of projects	-	2	1	-	2	-	1	1	-	1	2
Total	**9,354**	**5,500**	**15,752**	**5,369**	**35,976**	**7,128**	**2,899**	**8,415**	**5,482**	**23,923**	**59,899**
	61	**12**	**37**	**6**	**98**	**17**	**6**	**17**	**6**	**32**	**104**

Note:* means financial sources of one project are not diversified.
Source: Office of Transport and Traffic Policy and Planning (2011).

External Sources of Financing

Based on the fiscal budget for 2012, total public debt as of 30 June 2012 is mostly internal debt. Specifically, 98.65 percent of government debt and 76.71 percent of state enterprise debt are internal debt (Table 9.10).

If one were to drill down, one can see that the internal public debt for the same period is US$129,304 million (Table 9.11), of which 86.07 percent are direct government internal debt (or US$111,295.8 million) and 13.93 percent are state enterprise internal debt (or US$18,008.2 million). In Table 9.11, internal financing sources are either the Bank of Thailand, commercial banks, and those that fall under Others.

External public debt as of 30 June 2012 amounts to US$6,825.7 million, which consists of the US$1,485.4 million external debt of the government and the US$5,340.3 million external debt of state enterprises. Table 9.12's external financial institutions are Japan International Cooperation Agency (JICA), foreign financial markets, Asian Development Bank (ADB), and World Bank. Most (78.24%) of the total external debt is owned by state enterprises.

In the transport sector, most state enterprises (i.e., except MRTA and AOT) are likewise financed by external debt, as shown in Table 9.13.

Table 9.10: Thailand Public Debt as of 30 June 2012 (US$ million)

Types of Debt	Government	State Enterprise	Total
Internal Debt	111,295.8	18,008.2	129,304.0
	(98.65%)	(76.71%)	(94.87%)
External Debt	1,521.1	5,468.5	6,989.6
	(1.35%)	(23.29%)	(5.13%)
Total	112,816.9	23,476.7	136,293.6

Source: Bureau of Budget (2012).

Table 9.11: Thailand Internal Public Debt as of 30 June 2012 (US$ million)

Sources	Government	State Enterprise	Total
Bank of Thailand	11,877.2 (81.86%)	2,631.3 (18.14%)	14,508.5
Commercial Bank	27,106.4 (87.75%)	3,782.6 (12.25%)	30,888.9
Others	72,312.3 (86.18%)	11,594.3 (13.82%)	83,906.6
Total	111,295.8 (86.07%)	18,008.2 (13.93%)	129,304.0

Source: Bureau of Budget (2012).

Table 9.12: Thailand External Public Debt as of 30 June 2012 (US$ million)

Financial Institution	Government	State Enterprise	Total
JICA	789.1 (13.27%)	5,156.90 (86.73%)	5,946.00
Foreign Financial Market	418.4 (93.87%)	27.3 (6.13%)	445.7
ADB	200.1 (100.00%)	-	200.1
World Bank	63.4 (100.00%)	-	63.4
Others	14.4 (8.45%)	156.1 (91.55%)	170.5
Total	**1,485.4** (21.76%)	**5,340.3** (78.24%)	**6,825.7**

Source: Bureau of Budget (2012).

Table 9.13: Proportion of Internal and External Debts in Selected Land Transport Sector's State Enterprises (US$ million)

Organisation	Types of Debt	Dec 2010	Dec 2011	Dec 2012	Mar 2013*
Bangkok Mass Transit	External	0	0	0	0
	Internal	1,937.05	2,328.39	2,319.66	2,460.21
Expressway Authority of	External	0	0	0	0
Thailand	Internal	2,255.18	2,051.95	1,659.56	1,718.31
Mass Rapid Transit	External	2,361.68	2,845.89	2,486.39	2,305.83
Authority	Internal	94.15	32.80	32.17	33.50
Port Authority of Thailand	External	0	0	0	0
	Internal	0	0	0	0
State Railways of Thailand	External	137.47	140.95	107.95	94.75
	Internal	2,929.78	3,439.18	3,543.55	3,789.96
Aeronautical Radio of	External	0	0	0	0
Thailand Co., Ltd.	Internal	174.66	159.31	148.39	153.10
Airport of Thailand Plc.	External	1,870.33	1,981.64	1,547.44	1,385.48
	Internal	0	0	0	0
Thai Airways International	External	0	0	0	0
Plc.	Internal	2,538.31	2,728.13	2,763.76	2,804.46
Civil Aviation Training	External	0	0	0	0
Centre	Internal	0.69	0	0	0

Source: Public Debt Management Office.

Public Private Participation: Thailand's Participation

The private sector's participation in PPP projects in the transport sector was predominately in three sub-sectors: the toll road/expressway, mass transit, and port projects. Most are concession projects from state enterprises EXAT, MRTA, and PAT. Only two projects are under the government agencies: the Don Muang Tollway Project under DOH and the BTS project under the Bangkok Metropolitan Authority.

Past PPP Projects

Table 9.14 summarises the PPP projects in the transport sector:

Table 9.14: Thailand PPP Projects in the Transport Sector

Project	Agency	Project Description	Cost (US$ billion)
Toll Road and Express Way			
Si Rat Expressway, 2nd Stage (BECL)	Expressway Authority of Thailand	Build-Transfer-Operate (BTO). Consists of four sections around Bangkok and urban areas; 37 km	0.77
Burapavitee Expressway (Bang na – Bangpakong) – (BBCD)	Expressway Authority of Thailand	Build-Transfer-Operate (BTO)	0.77
Udornrataya Expressway (Bang pa in – Pak ket) – (BECL)	Expressway Authority of Thailand	Build-Transfer-Operate (BTO)	0.48
Don Muang Tollway	Department of Highways	Design-Build-Operate- Maintain (DBOM); Central to North Bangkok, 28 km	0.39
Mass Transit			
BTS Skytrain and its extension	Bangkok Metropolitan Authority	Build-Own-Transfer (BOT) *Dark Green Line:* 17 km *Light Green Line:* 6.5 km	1.67
Metropolitan Rapid Transit Chaloem Ratchamongkhon Line, MRT Blue Line (BMCL)	Mass Rapid Transit Authority	Design-Build-Operate- Maintain (DBOM) *Line:* Bangsue-Hualamphong, 20 km	4.05
Port			
Leam Chabang Port	Port Authority of Thailand	Lease contracts, Build-Transfer-Operate Eight deep sea ports nationwide in Bangkok and Eastern Seaboard	0.03 (per port, estimation)

Note: 31.0848 Baht for 1 US$.

Projects in these sub-sectors proved to be considerably successful in terms of the operation and the investment of the private sector. Although some faced financial difficulties during their early phases because of the overestimated demand (which will be discussed in the next section), all projects survived.

It should be noted, however, that except for the mass transit, there is no PPP project in the railway transport sector. The government has plans to

implement the PPP arrangements in the railway sector, but unless reforms in the said sector are not realised, the private participant's role will remain uncertain. To remove this impasse, clear policies on how to reform the railway sector are needed.

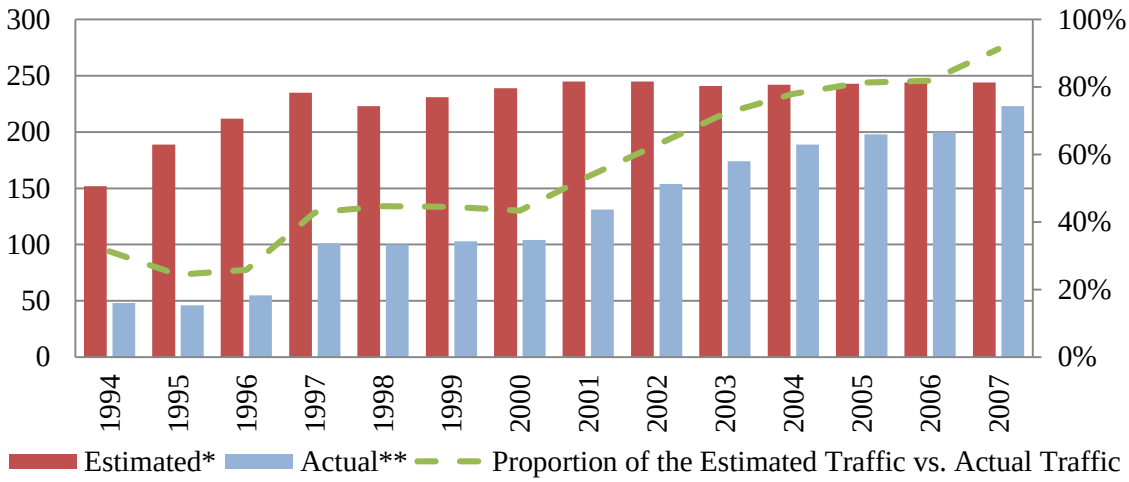
Lessons from the PPP projects

There are three main issues that can be regarded as important lessons from past PPP projects. These issues are demand prediction, system integration, and inconsistent transport policy.

Forecasts on Demand. During the planning process of any transport sector mega-project, the estimated demand would generally be very high. This is true for toll road projects, and more so for mass transit projects.

Figure 9.5 compares the estimated and actual traffic volume of the Sri Rat Expressway. It shows that it took more than 10 years before the actual traffic reached 80 percent of the estimated traffic volume for the expressway. Although this graph now predicts with more confidence that the actual volume will eventually exceed the estimated volume in the near future, it still drives home the message that care should always be taken in the way traffic is estimated. Predicting the demand is part of the issue of risk allocation. After all, traffic volume is closely related to the expressway's toll level and other government policies.

Figure 9.5: Comparison between Estimated and Actual Traffic Volume of the Sri Rat Expressway



Note: *Estimated traffic volume taken from the annex of the concession contract of the Expressway Stage 2 (million trips per year)

** Actual traffic calculated from the EXAT annual report and adjusted to the passenger car unit (pcu) (million trips per year)

The problem of demand prediction seems to be more serious in the mass transit project. Table 9.15 presents a comparison between estimated and actual passenger volume of the Metropolitan Rapid Transit Chaloem Ratchamonkhon Line (MRT Blue Line). Recent actual traffic volume stands at around 200,000 trips per day and is expected to growth at only 4 percent annually. This number is less than 30 percent of the estimated traffic volume. Table 9.15 also shows that from 2003 to 2009, the actual passenger volume was equivalent to about 21 percent to 28 percent of the estimated volume. Thus, nowhere will the estimated passenger volume be reached within the concession period.

Table 9.15: Comparison between Estimated and Actual Passenger Volume of Metropolitan Rapid Transit Chaloem Ratchamongkhon Line

		2003	2004	2005	2006	2007	2008	2009
Passenger volume per day (thousand trip)	Estimated*	430	520	600	650	680	790	630**
	Actual*	-	147***	163	158	164	170	174
Proportion of the Estimated Volume vs. Actual Volume			28%	27%	24%	23%	21%	28%

Note: * Estimated traffic volume taken from the annex of the concession contract and actual traffic taken from BMCL Annual report
** Traffic forecast in year 2009 is lower than in 2008 because the State Railway of Thailand (SRT) mass transit project (Red Line) was assumed to start its operations that year.
*** 2004 is the first year of operation (182 days).

Reasons for the overestimated demand for the transport project may be two-fold. First, the transport demand model was still unfamiliar with the new types of transport projects. This is the case for both the expressway and mass rapid transit projects. Traffic along the Sri-Rat Expressway was expected to rise rapidly because of the economic boom in the early 1990s—around the time the expressway was being built. However, because both the land use and economic activity were not well represented in the transport model—and later, because the economy reversed after the 1997 crisis—the actual traffic volume came out lower than the estimated demand.

Second, in the case of the mass transit project, demand was initially overestimated because during the time of the project's feasibility study, no mass transit system was operating in Bangkok—reason enough for stakeholders to assume that many passengers will shift from both car and bus, to the mass transit system. This was later found to be not the case, and the revised forecasts on the volume seem to have finally factored this in. The Office of Transport and Traffic Policy and Planning expected that volume for the Blue Line in 2008 would be about 197,000 passenger-trips

per day. For 2014, the expected passenger volume is about 373,000 passenger-trips per day.

There were lessons learned from the Blue Line project's failure to reach the expected demand, and government eventually was able to drive back the private sector into the mass transit project. The concession contract for the new Purple line is now redesigned. That is, from what was initially a Net Cost contract, where the operator has to bear the risk of passenger-volume, the concession agreement shifted to the Gross Cost contract, where the operator will bear the risk for the operating cost only (i.e., factor input price and management risk of the system). The public transport authority, i.e. MRTA, will be responsible for the fare collection and bear the deficit in the project—i.e., the different between operating cost and fare revenue—which hopefully will be covered by the government budget.

The question around project feasibility when the passenger volume cannot be accurately predicted has always been asked. The weakness in the reliability of the transport model is due to several reasons, including the assumptions made and the data used in calibrating the model. Assumptions made in the model in each study vary depending on the study's purpose. Critical assumptions are on economic growth (employment numbers), land use change, transport cost change (i.e., change of fuel price and car tax), and price of public transport (bus fare and mass transit fare). These assumptions produce various outcomes that can make or break the project.

Furthermore, data used in the model are usually from *ad-hoc* surveys, which is in contrast to international cities' (such as London and Hong Kong) practice of implementing a detailed travel survey every five years. One advantage of such regular surveys to these international cities is that these provide information useful in calibrating and updating countries' transport models. Thus, for Thailand, its current transport model should be used with caution when attempting to do a feasibility study in the future, particularly if there is no major update in its data collected.

System integration. Transport is all about the network. The benefit from transport infrastructure spreads when different projects' infrastructure is interconnected seamlessly. For now, the PPP projects, especially in the

mass transit sector, are done piece by piece or project by project, without any careful plan for system integration. For example, the BTS and MRT Blue Line, which have been operating for more than five years together, could not even get the common ticketing system in place. Such lack of integration reduces the benefits to customers and private sector investors as well as the potential revenue from the network effect.

Inconsistent Transport Policy. All transport modes in the country are connected in terms of the impact on each other. A policy change in one transport mode can affect the demand for other modes. For example, the implementation of the free bus rides in Bangkok may reduce the volume of passengers taking the mass transit system. A drop in the fuel tax may induce more expressway traffic and, in turn, cut the number of passengers taking the mass transit system. Thus, any transport policy must be consistent and reasonable in terms of its impact on the whole transport system. A mechanism where projects' private sector participants are compensated for every discriminatory change the government makes on its policies should be in place.

Issues and Challenges

In the offing are Thailand's PPP master plan and committee that will play a key role in determining PPP projects for various sectors. The regulatory framework for each industry, especially the sector monopolised by state enterprises, has to change to promote more competition and increase the private sector's role. One of the expected results is an improved planning process, including the quality of the project feasibility study.

Also, B.E. 2556 (the latest act on PPP) replaces B.E. 2535. Table 9.16 compares the two directives and highlights the disadvantageous provisions in B.E. 2535.

The State Enterprise Policy Office (SEPO) is working on the PPP intelligence plan with consultants and on centralising some government

projects, especially those in the transportation sector. The next PPP plan will focus on social welfare projects such as education and public health since there are no current plans in place yet.

Table 9.16: The Comparison between the Act on PPP B.E. 2535 and 2556

Problems of Private Participation in State Undertaking B.E. 2535	Advantages of Private Participation in State Undertaking B.E. 2556
All government projects are not centralised by any specific authority.	PPP B.E. 2556 directs that all projects with private participants be centralised by the SEPO from October 2013. Examples of these projects are BTS, Don Muang Toll way, and Bang Yai-Kanchanaburee motorway.
There were some problems in law enforcement and interpretation, especially project value calculation in PPP projects' defining process by the Office of the Council of State (i.e., no standardised way of interpretation).	The new act on PPP B.E. 2556 provides clearer means for law enforcement and interpretation, allowing SEPO as an authority to interpret consistently all regulations. The new law defines PPP project by the involvement of the private sector in every types of contracts instead of project value. However, the less-than-billion baht projects are reconsidered by other criteria. The new act on PPP B.E. 2556 attempts to enact ancillary laws to be more straightforward by including relevant projects in all sectors, and then consider the project value.

Problems of Private Participation in State Undertaking B.E. 2535	Advantages of Private Participation in State Undertaking B.E. 2556
The improvement of the act on PPP B.E. 2535 was temporary. Project participants struggled with abiding by B.E. 2535 as early as the infrastructure planning phase since the regulation dictates that the project be operated and authorised by the government sector. Thus, private sector lost its opportunity to invest and share the risks from the beginning. This was the case of the project in the southern expressway and of the Airport Rail Link project.	The PPP B.E. 2556 adopted many best practices on PPP from foreign countries such as creating a master plan or intelligence plan, calculating by value-for-money method between government and private sectors, and having a governance structure.

Source: Interviews with State Enterprise Policy Office (2013).

However, the PPP master plan still has some constraints that need to be resolved:

- All projects in rural areas were not included in the plan since the local authorities were required to first propose their projects to their ministries before reporting such to the SEPO, making their process too meticulous. Such has to be redesigned for the next master plan;
- Many transportation regulators, especially those on the railway system, have unclear authority to define planning, management, pricing, and subsidy; and
- Government officers still misunderstand about the concept of PPP.

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Annex 1: Regulatory Framework of Transport Infrastructure

The regulatory structure of the transport sector can be divided into three aspects: policy, regulation, and service operations. Generally, the Ministry of Transport and the Office of Transport and Traffic Policy and Planning are responsible for the policy, planning, and administration of all modes of transport. Meanwhile, each mode of transport has its own regulation and service operation structure. Table 9.A.1 shows details on the regulatory framework of the transport sector in Thailand.

Table 9.A.1: Regulatory Framework of the Transport Sector in Thailand

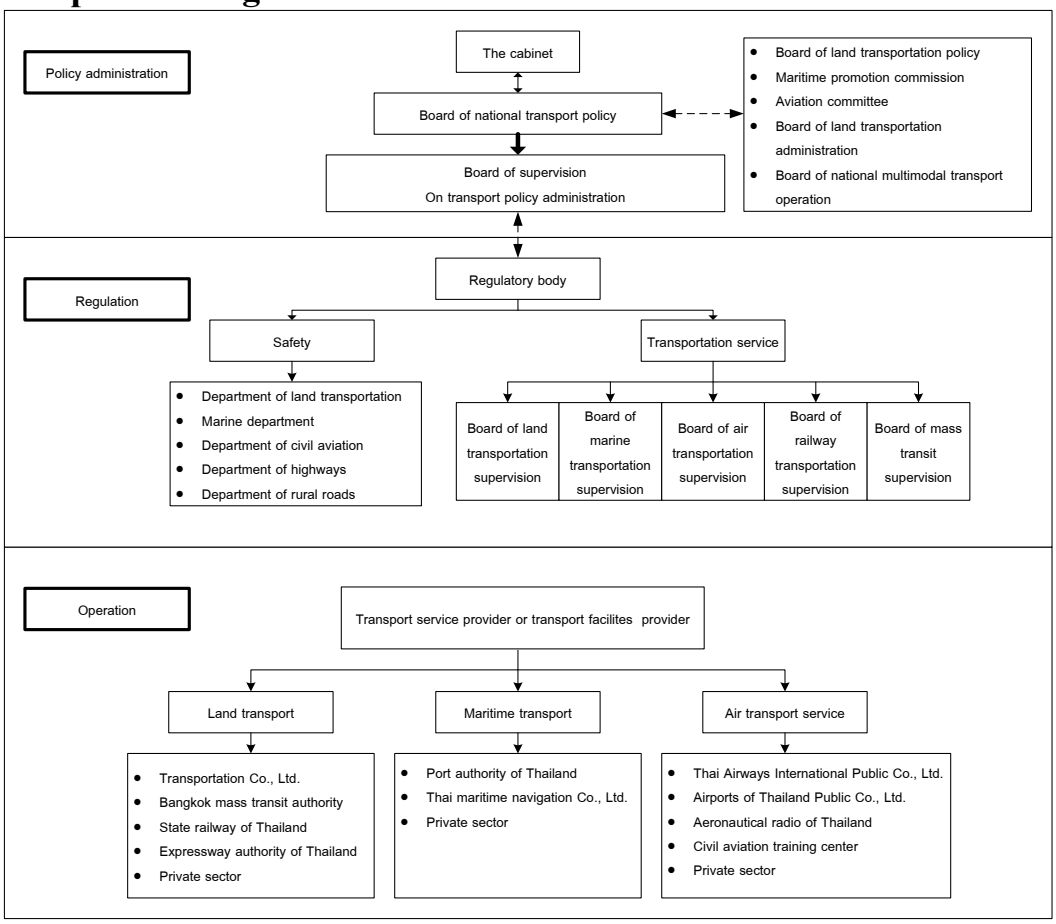
Agency	Policy	Regulation	Services Operation
Policy and Planning in all modes			
Ministry of Transport (Office of the Permanent Secretary)	√		
Office of Transport and Traffic Policy and Planning	√		
Land Transport			
Department of Land Transport		√	Some Passenger Terminals
Department of Highways		√	Infrastructure Services
Department of Rural Roads			Infrastructure Services
Expressway and Rapid Transit Authority of Thailand		√	Infrastructure Services (Tolled Road)
Bangkok Mass Transit Authority		√	Transport Services (Passenger)
Transport Company Limited		√	Transport Services (Passenger)
State Railway of Thailand		√	Infrastructure and Transport Services (Freight and Passenger)
Mass Rapid Transit Authority of Thailand		√	Infrastructure and Transport Services (Passenger)
Water Transport			
Marine Department		√	Infrastructure Services
Port Authority of Thailand		√	Infrastructure Services
Air Transport			
Department of Civil Aviation		√	Infrastructure Services (Regional airports)
Civil Aviation Training Centre			√
Airport of Thailand Public Company Limited		√	Infrastructure Services (International Airports)
Thai Airways International Public Co. Ltd.			Transport Services (Freight and Passenger)
Aeronautical Radio of Thailand Co. Ltd.			√

Source: Adapted from NESDB and World Bank (2008).

In general, government agencies are the regulators in certain areas of their sector. For example, the Department of Highways is both the regulator of the highway use and the infrastructure service provider as well. Likewise, state enterprises could be both regulator and operator. Conflicts, however, can arise if a state enterprise competes with private providers in offering transport services.

Recently, the Ministry of Transport has undertaken reforms in the transport sector. It began the process of separating its administrative functions into policy planning, regulations, and service provisions so as to increase its efficiency in resource management and in enhancement of domestic competition. Such is expected to bring better transport services quality, which is crucial in strengthening local service providers' competitiveness *vis-a-vis* their foreign counterparts. Figure 9.A.1 shows the structure of the transport sector as specified in the Transport Management Act approved by the Thai Cabinet on 5 June 2007.

Figure 9.A.1 Structure of the Transport Sector Per the Proposed Transport Management Act



Source: TDRI (2009).

In the proposal, the regulator is separated from the operator, especially for the transport service operation, where competition should promote efficiency in the market.

At the same time, the Ministry of Transport also attempted to restructure the railway market. It was aware that the State Railway of Thailand (SRT) has long history as the country's sole railway operator has made it difficult for private involvement to be realised.

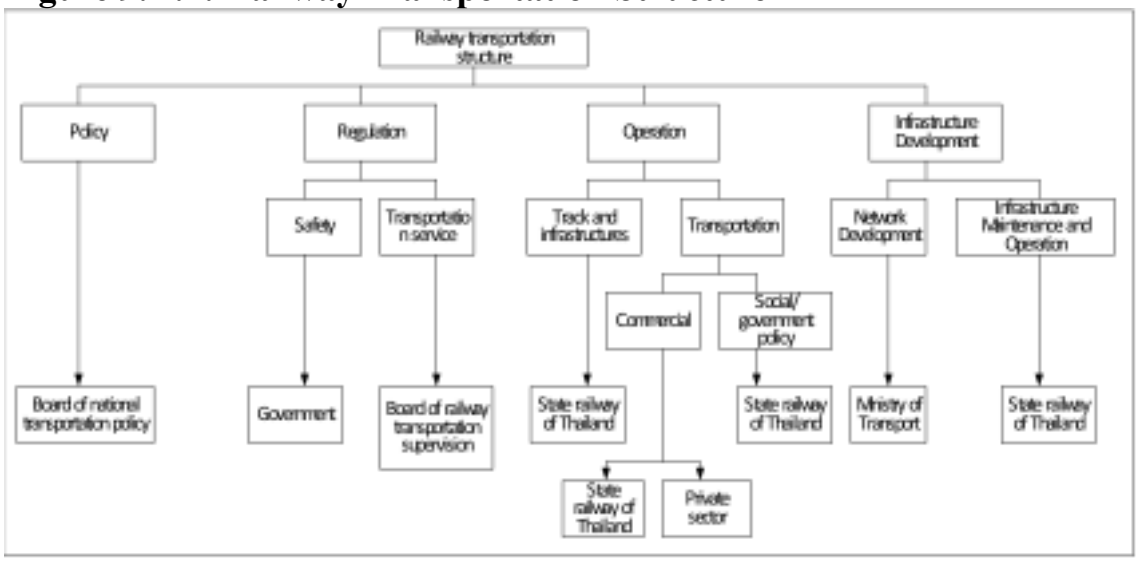
On 24 July 2007, the cabinet approved the principal framework of the railway sector, which called for separating government's role in developing the country’s railway sector from the SRT's other functions. The government will allocate a budget for network development such as

double track construction, new network construction, track improvement and signalling improvement in new networks, while the SRT will account for Infrastructure Maintenance and Operation (IMO). Besides the SRT, the private sector may provide railway services as well. Both the government and SRT will determine the subsidy and budgeting frameworks to support the Public Service Obligation of the railway transport service.

Moreover, on 25 September 2007, the Cabinet approved in principle the proposed State Railway of Thailand Act. The proposal restructures the market of the railway transport service so as to allow competition in land, maritime, and air transport. The SRT will separate its activities and revenues related to rail transport from those related to rail services. For the first time, SRT will be able to run a new business and earn additional revenue from the use of railway tracks such as rail access charges, which are similar to expressway toll fees. Moreover, the proposed act confirms SRT's right to receive subsidy as compensation for losses incurred from having to provide services as directed by the Public Service Obligation or other special government policies.

Figure 9.A.2 illustrates the organisation of the railway sector as proposed in the Act and approved by the Cabinet.

Figure 9.A.2: Railway Transportation Structure



Source: TDRI (2009).

However, the reform of the transport sector continues to be a challenge. The bill on the Transport Management Act is pending approval of the parliament. The process of creating a clearer regulatory structure is not yet complete. Thus, the current regulatory structure is the one still in place. The scenario where there is private sector participation has to be based on the current structure, at least for the time being.

The Railway Reform Study (TDRI, 2009) proposes further details on the railway reform process. In the past, SRT's performances on passenger and freight transport had declined and its debts had risen. To increase Thailand's competitiveness, rail transport as an essential mode in the logistics system should reduce overall logistics cost. In reality, SRT had done little toward this objective. Ergo, the railway reform should first look at restructuring SRT. Eventually, the restructuring process proceeded through the cooperation of the Ministry of Finance and the Ministry of Transport.

In the initial phase of the reform, a subsidiary company will be established under the restructuring plan, to perform passenger services (both commercial and social services) and freight services, the operation of Airport Rail Link project (ARL), and to operate the new Red Line route. Another subsidiary company will also be established to manage the assets not associated with the railway infrastructure.

Along with the structural changes are the personnel movements that need to be considered as well. Human resource departments of the government and SRT need to identify and manage the possible transferees who are a good fit for the roles and responsibilities in the new structures, as well as the SRT staff who cannot be transferred elsewhere. The transfer of SRT's personnel will be done on a voluntary basis. Regulations regarding the access to infrastructure will be arranged, including the access charge rate.

At the ministerial level, the Department of Railways will be established and directed to set up the strategic vision for railway development and to allocate resources to improve railway infrastructure.

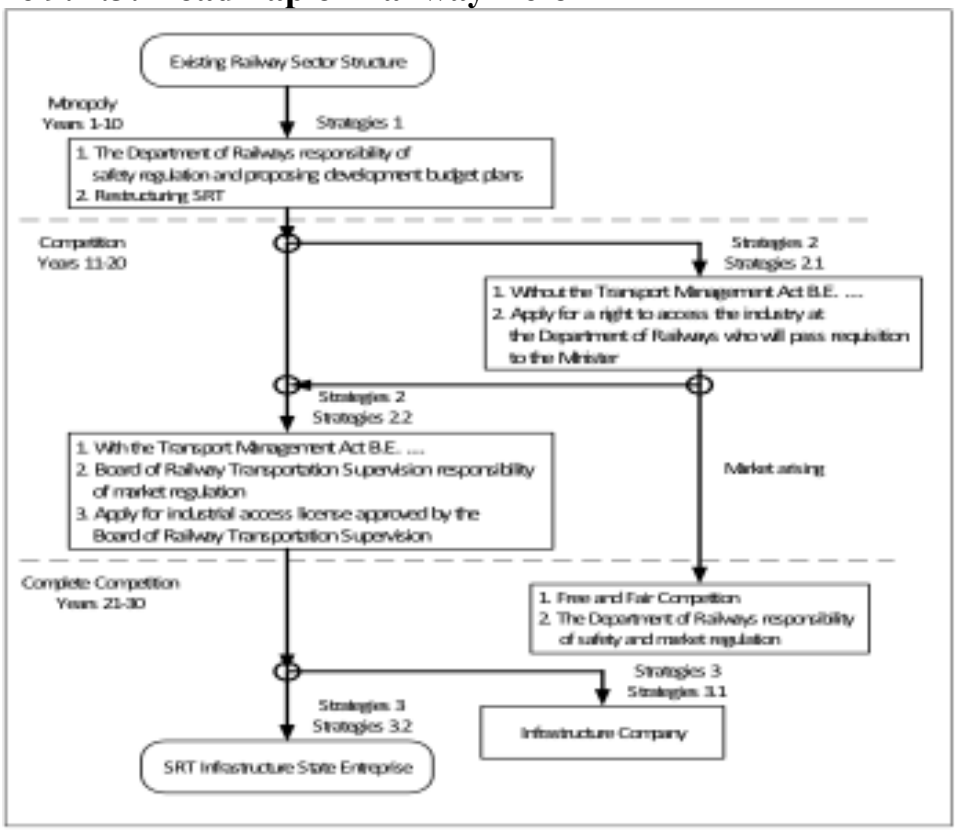
In the later phase, the railway reform aims for a competitive railway market. That is, the private sector will have opportunities to develop the

railway infrastructure along with the public sector as well as operate railway services, both for passengers and for freight.

An overview of the important aspects, observations, and conditions at different points in time according to the strategies are outlined below. The roadmap on how to reform the railway transportation system, along with the regulations and other details, are presented in Figure 9.A.3.

Shortage Phase. According to Strategy 1, the reform of the country's railway system will initially entail establishing the Board of Railway Transportation, which will then take charge of overseeing all policy and budgetary matters on railway infrastructure. Its foundational structure will include Policy Management, Budgetary and Financial Management, and Infrastructure Management, including the set up, monitoring and evaluation of safety standards. In establishing this board, it is important to seek out qualified personnel with technical expertise and knowledge from the Ministry of Transport, Ministry of Finance, as well as the SRT.

Figure 9.A.3: Roadmap of Railway Reform



Source: TDRI (2009).

The setup of the Board of Railway Transportation also entails introducing a State Administration Act to establish the Department of Railways. The implementation of the act, which will undergo the process of outlining necessary laws and require the participation of the government's Cabinet, is expected to take time. Therefore, from the initial meeting of all relevant parties, it was recommended that either the Department of Highways or Department of Rural Highways—which are part of the Ministry of Transport—handle responsibilities related to the engineering aspects of the railway system for the meantime that the Cabinet has not yet approved the establishment of the Board of Railway Transportation.

However, upon the advisory committee's review of the functions of the Department of Rural Highways, it found that the department already had sufficient authority and responsibilities over the development and renovation of state highways. Should it be decided that the Department of Rural Highways should take up the responsibility of developing the country's railway infrastructure as well, it could find itself with more work than it could handle, given that it has limited personnel with skills and knowledge needed for such tasks.

Therefore, the Ministry should push for the Cabinet's approval on the act to establish the Department of Railways within the first year and the Board of Railway Transportation within three years as outlined in Strategy 1. This will also involve setting the responsibilities for the railway system's infrastructure development, and transferring SRT personnel who have the required knowledge and expertise to the new entity.

On the other hand, the state's responsibility is to develop the railway system's infrastructure by hiring private sector businesses to undertake the construction side of projects. This would require creating contracts based on the work that needs to be done; for example, constructing the base of the rails, laying down the rails, and setting up appropriate transportation communication channels and systems. To ensure that the businesses hired to undertake such tasks are qualified and efficient and that competition and pricing are fair, the Ministry can set up a special unit to take care of the initial implementation of the railway reforms.

Meanwhile, there is some urgency to restructure the SRT organisation into one where its management now represents two subsidiary companies—one to handle public transportation; and the other to serve as an asset management company—and where the infrastructure unit is separated from the operations unit. This activity will be in line with the proposal that the State Enterprises Policy Committee presented during a Cabinet meeting on 3 June 2008 and was approved.

Initial Competition Phase: Strategy 2, approach 2.2 in Figure 9.A.3 involves encouraging the private sector to participate in and manage the operations unit of the railway system. However, such cannot succeed without first pushing for the approval of the Transport Management Act. The strategy also requires setting up a management board to take care of economic aspects such as issuing licenses for private sector businesses, while ensuring fair competition so as to attract private sector participants.

Should the approval of the Transport Management Act be not happening anytime soon, the Ministry of Transport can proceed to Strategy 2 approach 2.1 by tapping the Board of Railway Transportation to take its cause up to the government Cabinet level and to seek the latter's go-ahead to involve the private sector in the operations of the railway system. The point is that even without the Transport Management Act, the private sector can still be involved in railway system projects while SRT takes charge of hiring railway operators. In the event that demand for freights transportation increases, the market becomes bigger, thus attracting more private businesses to come and compete. Such can be the positive outcome of railway reforms.

Competition Phase: In carrying out Strategy 3 in Figure 9.A.3, approach 3.2 involves clearly delineating roles and responsibilities. To effect this, the railway system's infrastructure unit should be separated from the system's operations unit. The infrastructure unit can then be renamed to SRT Infrastructure State Enterprise while the operations unit can be managed by one of SRT's subsidiary companies and SRT assumes its role as the holding company.

The new structure as well as the clearly defined roles and responsibilities

will enhance transparency and help create a healthy competition with the private sector. It will also allow the organisation to better respond to current and future market situations. On the other hand, there might be some challenges involved in changing the laws and dealing with resistance from SRT's personnel who feel unsure about their security of tenure during the organisational change.

Should there indeed be resistance from SRT's personnel, the restructuring can proceed under Strategy 3, approach 3.1. Under this strategy, the infrastructure unit will be split from the original structure and turned into a subsidiary company. One possible downside of such a organisational change is that conflict of interests might ensue. For example, the reaping of benefits between businesses within the organisation can cause discriminatory practices.

In conclusion, reforming the railway system enhances its competitiveness with other transportation modes and increases organisational efficiency. If one were to drill down to the root causes of the system's problems, one can trace it to the lack of development in the sales side. These problems also steam from the weak government support in developing the railway system. Reforming the railway system is one of the solutions to these problems, although it requires a government that is ready and driven to undertake such reform. Thus, clarity of the roles and responsibilities of all agencies involved is an all-important prerequisite. An agency that oversees the investment of the railway structure (similar to the function of the agency in charge of the country's road construction) has to be created, leaving the SRT to focus on overseeing all operations.

Annex 2: Forms of Private Participation

Although the Public–Private Partnership (PPP) provides technical and financial benefits for the government, it will change the government's traditional role from provider of public services to that of a regulator and provider of support for the PPP projects. However, the level of private involvement depends very much on the type of PPP scheme. According to the World Bank (2001), PPP can generally be structured into six contract types: subcontract, management contract, lease contract, concession, joint venture, and divesture (TDRI, 2009). This annex focuses the following discussion on three main types of contract normally used in Thailand[2]:

1) ***Management contract*** is a contract form where the public sector contracts out some of its obligations and responsibilities on daily management and operation of public services to the private sector. This form can further be sub-categorised into three main types: service contract, maintenance contract, and operation contract.

   In general, this type of contract is short in duration, about three to five years but no longer than 10 years. The private sector receives fixed fees or predetermined rates in return. The government may also provide incentives in the form of additional payment when the contracting partner achieves certain performance targets. This kind of profit-sharing scheme is an efficient tool of managing operational and commercial risk, and incentivises the private sector to efficiently perform by controlling costs and improving service quality. Under this arrangement, the public authority is still responsible for investment and ownership control over the project assets.

   As mentioned earlier, this scheme is good for improving the efficiency in public service activities and can be the first step for inducing private participation in public projects. However, this type

[2] For more information, please refer to the detailed study in the *Strategic Plan for Infrastructure Development to Enhance National Competitiveness* (in Thai), which is a collaboration-project between the Thailand Development Research Institute and the Faculty of Economics, Thammasat University.

of PPP scheme is not appropriate if the government is constrained by limited budgets for new investments.

2) ***Lease contract*** is a form of PPP wherein the private sector leases infrastructure facilities from the government. The private sector is responsible for the provision of services and maintenance of the leased assets while the government still has control of the assets and is responsible for the capital investment. Under this arrangement, the private sector obtains returns or losses based on its ability to generate income from services and to control overall operational costs, as well as based on the amount of leased payment. In a lease contract, the private sector is exposed to higher commercial risks compared with one under a management contract arrangement. In general, the lease contract is an appropriate option for the government to improve its operating efficiency for existing assets while being able to transfer sufficient commercial risk to the contracting partner. Average contract duration is about eight to 15 years.

3) ***Concession*** is a form of PPP where the private contracting partner takes relatively high risks because it assumes high responsibility for many important tasks ranging from construction and rehabilitation of project assets, service operation and management, and maintenance of assets. Normally, the private partner is granted the right to operate the project assets over a concession period. After a concession contract ends, project assets such as infrastructure facilities will be transferred to the property of the government. On average, the duration of concession arrangement is about 25-30 years.

Under concession arrangements, the public authority will call for a bid of the PPP project by issuing an invitation to tender. Following the tendering process, qualified candidates will compete among one another. The government uses bidding price and other qualifications as criteria in the selection of its partner. The bidder who is financially sound, has the technical capability and offers the lowest cost for undertaking the project and the highest return to the government will be selected. Contract life normally lasts for a number of years based on the useful life of the constructed

infrastructure and facilities. Given quite a long contract life, the concession contract must be designed to cover all important issues and conditions such as targeted performance, level of service and service quality, technical and service standards, capital investment and management, pricing and payment mechanisms, dispute settlement measures, etc. While a concession arrangement allows the public sector to transfer many types of risks to the private contracting partner, this type of PPP provides the partner a monopoly over the use of the project infrastructure. To prevent the private company from taking advantage of its concession rights at a cost to the government and society, public regulatory authorities must have good monitoring systems and evaluate the performance of the contracting partner closely. Regulations, together with efficient and transparent monitoring mechanisms, are needed. In general, concession-type contracts can be subcategorised into many other forms. The following are some variants of concession-type arrangements:

- **Build-Transfer-and-Operate contract (BTO):** Under this contract, the private company is responsible for investment in building infrastructure facilities, which will be transferred to the government immediately after the construction is completed. The private contracting partner is allowed to obtain a return on its investment and other benefits at a predetermined rate. Examples of BTO projects include the Si Rat Second-Stage Expressway system and Bang Pa-in – Pak Kret Expressway.
- **Build-Operate-and-Transfer contract (BOT):** Under this contract, the private company takes full responsibility for investing, constructing, and maintaining infrastructure facilities, has the right to operate over a specified period, takes most of the project risks, and collects service fees as agreed in the contract. After the contract ends, the private partner transfers all infrastructure facilities in the project to the contracting authority. An example is the Bangkok Mass Transit System (BTS).
- **Build-Lease-Transfer contract (BLT):** The private sector builds and owns infrastructure facilities, which will be leased to the government for a specified period of time, after which the

titles of the assets revert back to the government.

- **Rehabilitate-Operate-Transfer contract (ROT):** A public authority transfers to or leases existing project assets to private partner. The private partner is obligated to improve and maintain the quality of all the facilities and to provide services for a specified period of time. At the end of the contract life, all the project assets under this arrangement will be transferred to the government.
- **Contract-Add-Operate (CAO):** A public authority leases existing infrastructure facilities and allows the private partner to make additional investments and use the facilities for income-generating activities for a specified period of time, after which the facilities are transferred to the property of the public authority.
- **Rehabilitate-Own-Operate contract (ROO):** A public authority transfers existing infrastructure facilities to a private partner who is responsible for improving and maintaining the facilities. Then, the private company can use the facilities to provide services in perpetuity as long as it does not breach the contract.
- **Build-Own-Operate contract (BOO):** Similar to the Rehabilitate-Own-Operate contract, the private company has the right to use the project's infrastructure facilities for income generation, normally in the form of service fees and rents. However, it differs from the ROO in that its contract arrangement is for new investment in facilities. Some examples are the Independent Power Producers (IPP) and Small Power Producers (SPP) programmes carried out between the Electricity Generating Authority of Thailand (EGAT) and private power producers.

Under all the seven forms of concession-type contracts, the private company has to take high risks in both investments and operation. But the risks are highest under the BOO and ROO arrangements since the private partner owns the infrastructure facilities, is not obligated to transfer the

title to the government, and its right to use the facilities is not constrained by any contract duration. The role of the government will be mainly on regulating, supervising and monitoring the activities.

The contracts can be categorised into three main groups based on the transfer of ownership: (1) A group of contracts in which the private sector must transfer constructed facilities to the government once the construction is completed; (2) A group of contracts in which the private partner must transfer all the facilities to the government immediately at the end of contract; and (3) A group of contracts in which the private partner does not have to transfer the title of facilities to the government. In the last group, the private sector takes the highest risk as it is responsible for all functions such as financing, constructing and marketing. The faster the transfer of ownership to the government, the lower the private sector assumes project risks. However, a low-risk project also means lower returns.

To operate project assets, the private partner may be contracted under any of the two forms:

1) ***Gross Cost Contract.*** The private company takes operational risks in providing railway services while the public authority takes income risks mainly on the collection of income from services. Under this contract term, the public authority will make payment to the private operator for running the services. This kind of contract may include any of the following conditions that will help drive efficiency in operations:
    - *Shared production risk*: The private partner takes operational risks but the government will share part of the risk. For example, if the oil price or the interest rate increases, the government will compensate for the additional cost of production.
    - *Revenue incentive*: This condition aims at providing additional return in case the operator increases the number of ridership and operates to earn more revenue.
    - *Revenue incentive and shared production risk*: The contract is designed in such a way that the public authority shares

additional profits to and operational risk with the private partner.

2) ***Net Cost Contract.*** The concessionaire takes both operational and income risks and is allowed to collect service fees and manage the operations itself. The public authority may increase the incentives for private sector's involvement by any of the following actions:
    - *Shared revenue risk*: The public authority sets minimum guaranteed revenues or gives compensation to a private partner when the operation is running below the expected level.
    - *Shared production risk*: The authority shares operational risks with a private company.
    - *Shared revenue and production risk*: The authority shares the private partner's risk of having higher operational cost or lower income.

Based on global experiences, there is no one best form of PPP. The choice of PPP arrangements depends on market conditions and many other factors. For example, on the scenario where there is high uncertainty in generating income, the government may share the risks. Each kind of contract has a specific purpose, too.

The bidding process under the Gross Cost contract is quite simple as it sets minimum requirements such as useful life and performance of the trains/cars while the Net Cost contract is more complicated. Under a Net Cost contract, the authority will assign the area, and a private company will design the network of services to provide. The private company also has to calculate its income based on parameters such as the government's financial support, the number of operating hours, the peak service hours, etc.

Although the authority can transfer both production and revenue risks to its private partner under a Net Cost contract, it does not mean that such form of contract is appropriate under all situations. In certain cases, Gross Cost contracts may have an advantage over Net Cost contracts,

particularly in terms of competition, cost, operational incentives, and contract management.

There is no clear conclusion about the form of participation as well as the role of public and private sectors. Should it be a mixture of PPP and the Gross Cost contract? Or should it be the PPP and the Net Cost contract? The answers here are up for discussions. In Thailand, for example, there was an attempt to identify which form of participation—whether gross-cost or net-cost forms—must apply under the Act on Private Participation in State Undertaking B.E. 2535 (1992). The National Legislative Assembly simply declared that the Gross Cost contract and modified Gross Cost contract shall not be subjected to a complicated structure under the Act (TDRI, 2009).