

Chapter 1

Introduction

1.1 Rationale

On July 29th, 2014, the National Council of Peace and Order has endorsed the Development Strategies on Thailand Transportation Infrastructure 2015-2023 to move forward concrete operations on development strategies related to the infrastructure development of the rail system and trading network development between major regional cities which includes the Hat Yai-Padang Besar Double Tracks Train System already incorporated in the 2015 Transportation Development Project.

On 12 July 2014, the Cabinet has announced its National Policy and under Item 7 : Promotion of Role and Opportunity in the AEC, Item 7: Promotion of Economic Networking on Trading and Investment in the ASEAN Region and other neighboring countries through Transportation and Telecommunication Network; Item 7.4:Promotion of Transportation and Logistics Development in the sub-region and the ASEAN countries; Item 7.5: Linkage of transportation routes and logistics from the production base in the community to the manufacturing base for added value products nationally and among the ASEAN countries; and Item 7.6: Development of special economic zone starting from border trading and transportation network at the major trading gateways to support manufacturing and investment networking across the borders. This includes the development of National Single Window (NSW) and facilitations on trading and transportation across the borders. In the beginning phase, the focus is on 6 major border crossing points: Padang Besar, Sadao, Aranyaprathet, Mae Sot, Ban Klong Luek and Ban Klong Yai to effectively facilitate transportation and logistics with the neighboring countries and accommodate future volume of traffic and transportation from the merging of AEC.

From the set policy, Office of Traffic and Transportation Policy and Planning has moved forward with the Study and Design of the Hat Yai-Padang Besar Double Tracks Electric Train which will extends the existing network at Padang Besar border crossing point between Thailand and Malaysia connecting with the Ipoh-Padang Besar Double l Tracks Electric Train of 329 kilometers presently under construction and expected to be completed in November 2014 and open for service connecting with Hat Yai Depot. This will support transportation of goods and passengers and expansion of future trading between the two countries and moreover, promote travelling by the rail system and support economic and inter-cities growth consistent with the National Policy.

1.2 Objectives

- To conduct the Feasibility Study of the Hat Yai-Padang Besar Doublel Tracks Electric Train System by identifying the route and the area along the Project, the necessary infrastructure

and the design to efficiently connect the system and the infrastructure with other transportation modes.

- To conduct the Economic, Social, Financial and Investment Feasibility Study and the Study on the Environment Impact
- To develop the design, project the cost estimates and prepare necessary document for construction bidding.

1.3 Scope of the Study

The study covers the following 4 aspects:

- Survey, data collection, study results of other related projects
- Analysis and Feasibility Study of Engineering, Economics, Social Aspect, Financial Aspect and Investment Guideline
- Detailed Design and construction bidding document
- Report on Environmental Impact and Public Participation

1.4 The Project Organization

The Study and the Design of the Padang Besar Project includes the Study of the Route, Projection of Passengers and Freight Volume and Train Operation Plan, the Engineering Study, the Investment Costs, the Financial Returns, the Study of the Environment Impact and Public Participation.

1) The Project Route and the Positioning of the Stations

The route starts at Hat Yai Depot (km.928+580) to Padang Besar (km.972+900) of 44.50 kilometers which incorporates the existing train route and 4 stations: Hat Yai Depot, Sala Thoong Song Depot, Klong Ngae Depot, Padang Besar Depot; 3 stopping points: Ban Phru, Klong Rum, Tha Khoy. The land under expropriation along the route starts from km.966+100 to km.967+500 at Thoong Mor sub-district and Padang Besar sub-district, Sadao district, Songkhla province covering an area of 21.98 rais

2) The Projection of Passenger and Freight Volume and the Train Operation Plan

The Projection of Passenger and Freight Volume and the Train Operation Plan can be summed up as follow:

Table 1.4-1 Passenger Volume (persons-trip/day)

Year	Passenger Volume (person/day)
2021	4,732
2030	7,405
2040	10,857
2050	15,470

Table 1.4-2 Cargo Volume on Hat Yai-Padang Besar Train Route

Route	2021	2030	2040	2050
External (BKK)	978,545	1,237,712	1,571,919	1,969,740
Hat Yai	246,096	296,524	354,111	414,361
Padang Besar	1,224,641	1,534,236	1,926,030	2,384,101

The train operation time and line load has been included in the Infrastructure data analysis for various possible speeds of the train: 140, 120, 100 and 80 km./hour in conjunction with the train route data in order to derive appropriate train operation. The following results have been concluded:

Table 1.4-3 Train Operation Time according to Types of Service and Set Speed capacity

Station/Stopping Points	Location	Distance (km)	Operation Time (min, Excluding stopping)				Station Size
			80 Km/hr	100 Km/hr	120 Km/hr	140 Km/hr	
Hat Yai Station	928+580	0.000	–	–	–	–	Large station
Ban Phru Stop	935+925	7.345	6:19	5:32	5:2	3:39	Stop
Thoong Loong Station (Phatong)	944+887.5	8.963	7:41	7:41	5:33	5:7	Small station
Klong Ngae Station	952+625	7.738	5:50	6:11	4:25	4:31	Small station
KLong Rum Stop	961+100	8.475	6:22	6:35	4:45	4:24	Stop
Tha Khoy Stop	967+450	7.350	5:1	5:27	3:48	3:8	Stop
Padang Besar Station	972+900	4.450	4:20	4:16	3:39	2:45	Medium station
Total		44.320	37:26	37:10	28:56	24:44	

The fare rates can be classified as follow

First Class car: 0.86 baht/person/km

Second Class car: 0.42 baht/person/km

Third Class car: 0.18 baht/person/km

The revenues from the passenger fares will be charged 53.48% and 1.83 baht per ton/km for freight transport.

3) The Engineering Study

The Hat Yai-Padang Besar Double Tracks Electric Train of 44.5 km. has been designed with double tracks of 1.00 Meter Gauge with ground level single track system of 45 km. running parallel with double tracks system of about 7 km and elevated double tracks of 5 km. Two ground level stations and three stops will be constructed along with one elevated Electric Train station (Khlung Ngae Station) to solve the problematic 31 crossing points. The Consultant Team has designed overpass crossing points and tunnels with a total of 33 crossing points along the existing route with 2 overpass crossings and 31 same level crossings. The solutions can be summed up as follows:



Figure 1.4-1 Six Locations of Overpass U-Turns



Figure 1.4-2 15 Locations of Underpass Box



Figure 1.4-3 10 Locations of Elevated Railway

The design concept of the stations and platforms has been set in harmony with the locations, travel functions and access of the local community along with future business development and connections with other transportation modes. The 3 stations are:

1. Thung Lung Station



Figure 1.4-4 The Scenic landscape of Thung Lung Station

2. Khlong Ngae Station



Figure 1.4-5 The Scenic landscape of Khlong Ngae Station

3. Padang Besar 2 Station



Figure 1.4-6 The Scenic landscape of Padang Besar 2 Station

The Design of the Drainage System along the Project route considers appropriate underpass draining pipes to sustain flooding of 100 years record peak and suitable length of the bridge across the river to prevent blocking the current

The Train Operation System consists of Signaling System, Telecom System and Train Operation Control System complied with ECTS Level 1 standard.

The Power Supply System for the train operation will employ Overhead Catenary System: OCS with alternating current of 25 kilowatts and the Electrical Station will be built at Klong Ngae Station.

4) The Project Investment Costs

From the estimates of the construction cost which includes the construction of the train tracks, drainage stations, track crossing points, transit points, fencing along both sides of the train tracks, telecommunication system, electrical system, signaling system, land expropriation and building compensation fees, the Consultants' fees, the total cost will be 13,341.00 Million baht.

Table 1.4-4
The Estimates of the Construction Costs

No.	Items	Total Investment Capital	Factor F	Construction Cost 2015	Notes
1	GENERAL REQUIREMENTS	98,809,189.08	1.0000	98,809,189.08	Factor F requirements
2	EARTHWORKS	416,413,133.11	1.1606	483,289,082.28	- 10% advanced capital
3	ROAD AND STATION YARDS	685,059,191.28	1.1606	801,244,454.10	- 10% collateral
4	STRUCTURES	2,141,783,197.22	1.1479	2,458,552,932.08	- 7% loan interest
5	BUILDING	522,699,547.14	1.1781	615,792,336.48	- 7% VAT
6	PIPE AND DRAINAGE	117,359,980.00	1.1479	134,717,521.04	
7	UTILITIES	4,157,961.12	1.0000	4,157,961.12	
8	TRACK WORKS	991,124,653.83	1.1606	1,150,299,273.23	
9	SIGNALLING AND TELECOMMUNICATIONS	554,902,444.55	1.1606	644,019,777.14	
10	POWER SUPPLY	1,143,796,770.00	1.1606	1,327,490,531.26	
	Total construction costs	6,676,106,067.32		7,718,373,057.83	
11	The Consultants' fees 4%			308,734,922.31	
12	Rolling Stock			5,263,000,000.00	
13	Land expropriation fees and relocation of resident			50,645,052.94	
Total	The construction costs estimates (Thirteen billion three hundred and forty one million baths)			13,341,000,000.00	

5) The Study of Economic and Financial Internal Rate of Returns

From the Study, it was found that the Economic Internal Rate of Return: EIRR can be divided into 2 cases: EIRR of the diesel-powered train is 18.24% and EIRR of the electrified train is 18.78%

As for FIRR, FIRR of the diesel-powered train is -2.43% and FIRR of the electrified train is 0.30%

6) The Study of Environmental Impact and Public Participation

The Environmental Impact Study indicated that the Project development could cause major impact such as on topographical condition, ground resources, surface hydrological condition and draining, air quality, noise, vibration, transportation, use of land, relocation and property compensation. However, after the train operation starts, the overall impact would be at a low level and in turn, would yield positive social impact such as offering a new transportation option to reduce energy cost, promoting tourism, creating jobs and income for economic boost.

The Project has delegated information to the local community, those who might be affected and all stakeholders through various media channels. The first seminar was held on 25 March 2015 at Lee Garden Plaza, Hat Yai, Songkhla and the second seminar was held on 10 September 2015 at Lee Garden Plaza, Hat Yai, Songkhla and the third seminar was held at Lee Garden Plaza, Hat Yai, Songkhla. Moreover, small meeting sessions to illicit public opinion were organized: the first group meeting was held from 19-21 May 2015 and 11 June 2015 and the second group meeting was held from 3-5 October 2015