

CONTENTS

	Page
Chapter 1 Introduction	1-1
1.1 Rationale	1-1
1.2 Objectives	1-1
1.3 Scope of the Study	1-2
1.4 The Project Organization	1-2
 Chapter 2 The Conformity of the Project	 2-1
2.1 The Policy Framework	2-1
2.1.1 The Conformity of the Project to the National Economic and Social Development Plan	2-1
2.1.2 The Conformity of the Project to the National Policy	2-3
2.1.3 The Conformity of the Project with The Special Development Policy or Development Policy in Specific Location	2-4
2.2 The Economic and Social Situation	2-6
2.2.1 Overview of the Operation and Service	2-6
2.2.1.1 The present situation and the development plans related to the Project	2-6
2.2.1.2 Problems/Obstacles and Solution Measures	2-6
2.2.2 The Economic and Social Situation	2-7
2.3 The Conformity of the Project with other Related Projects	2-10
2.3.1 Overview of the Conformity	2-10
2.3.2 The Conformity of the Project with other Related Projects	2-11
 Chapter 3 The Feasibility of the Project	 3-1
3.1 The Feasibility of the Project Locations	3-1
3.1.1 The Availability of the Location Preparation	3-1
3.1.2 The Availability of the Facilities at the Project Location	3-1
3.2 The Service Facilities	3-5
3.2.1 The Service Facilities related to the Project	3-5
3.3 The Steps and Operation Periods	3-6
3.4 The Technical Feasibility	3-9
3.4.1 The Feasibility of the Capacity to Service and Accommodate the Volume of Passengers and Cargo	3-10
3.4.1.1 The Specification of the Location of the Stations	3-10
3.4.1.2 Projection of the Passenger and Freight Volume	3-10
3.4.1.3 The Operation, Maintenance and Number of the Trains	3-22

CONTENTS (Cont'd)

	Page
3.4.2 The Engineering Feasibility	3-32
3.4.2.1 Track Structure	3-33
3.4.2.2 Permanent Way Structure	3-34
3.4.2.3 The Elevated Train Tracks	3-35
3.4.2.4 The Design of the Elevated Bridge	3-36
3.4.2.5 Types of the Bridge Structure	3-38
3.4.2.6 The Stations and the Compound	3-40
3.4.2.7 Signaling and Telecommunication System	3-63
3.4.2.8 Power Supply	3-70
3.4.2.9 The Drainage System	3-75
3.4.2.10 The Design of the Carriageway to Solve Crossing Point between the Tracks and the Road	3-86
3.4.2.11 The Estimate of the Construction Cost	3-86
3.5 The Economic Study	3-87
3.5.1 The Financial Assessment of the Capital Investment	3-87
3.5.2 The Financial Assessment of the Benefit	3-90
3.5.3 The Assessment of the Economic Indicator	3-91
3.5.4 The Results of The Financial Feasibility Study of the Project	3-91
3.5.5 Summary of the Economic Feasibility Study of the Project	3-94
3.6 The Financial Analysis	3-95
3.6.1 The Preparation of the Projection of Expenses of the Project Investment and operation	3-95
3.6.2 The Projection of the Project Revenue	3-100
3.6.3 The Results of the Financial Feasibility Study of the Project	3-100
Chapter 4 The Impact of the Project	4-1
4.1 The Environment, the Community and Service Users including Preventions and Solutions Measures of the Impact of the Project	4-1
4.1.1 Topographical Conditions	4-5
4.1.2 Soil Resources	4-5
4.1.3 Surface Hydrological Conditions and Drainage	4-6
4.1.4 Quality of Surface Water and Aquatic Ecosystem	4-7
4.1.5 Air Quality	4-8
4.1.6 Noise	4-9
4.1.7 Vibration	4-10
4.1.8 Transportation	4-10
4.1.9 Public Utilities and Facilities	4-11
4.1.10 Land Use	4-13

CONTENTS (Cont'd)

	Page
4.1.11 The Economic and Social Conditions	4-13
4.1.12 Relocation and Property Compensations	4-15
4.1.13 Separation	4-17
4.1.14 Public Health/ Sanitation and Safety	4-18
4.1.15 Safety of the Society	4-21
4.1.16 Sanitation	4-22
4.1.17 Aesthetics and Tourism	4-24
4.2 Impact on Politics and the National Security	4-25
4.3 Long Term Impact on the Project Operation of the Project Operator	4-28
4.3.1 Financial Status	4-28
4.3.2 The Business Plan of Passenger and Freight Transport Service	4-30
4.3.3 Long-Term Impact on Management of the Organization and Personnel of SRT	4-32
4.3.4 Long-Term Operation Plan	4-35
4.4 Impact from Complying with Law and Regulations besides Private Partnership in the State Enterprise Act 2013 and other related Law and Regulations	4-36
4.4.1 The operation under Private Partnership in the State Enterprise Act 1992	4-36
4.4.2 Complying with other related Law and regulations	4-36
Chapter 5 The Role of the Private Sector	5-1
5.1 The Comparative Study of Investment Types between the State and the Private Sector	5-1
5.2 Assessment of the Financial Indicators of the Analysis of the Investment Types	5-3
5.3 The Results of the PPP Analysis	5-3

FIGURE CONTENTS

	Page
Figure 1.4-1 Six Locations of Overpass U-Turns	1-4
Figure 1.4-2 15 Locations of Underpass Box	1-5
Figure 1.4-3 10 Locations of Elevated Railway	1-5
Figure 1.4-4 The Scenic landscape of Thung Lung Station	1-6
Figure 1.4-5 The Scenic landscape of Khlong Ngae Station	1-6
Figure 1.4-6 The Scenic landscape of Padang Besar 2 Station	1-7
Figure 2.3-1 The Location of the Cargo Transport Train Connecting between The Gulf of Thailand Coast and The Andaman Coast	2-14
Figure 3.1-1 The Present Location of Thung Lung Station	3-2
Figure 3.1-2 The Location of the Present Khlong Ngae Station	3-3
Figure 3.1-3 The Location of Padang Besar 2 Station (On the Thai border)	3-4
Figure 3.4-1 The Sub-Divisions of the Study Area	3-12
Figure 3.4-2 The Multi-Modal Transportation Model	3-13
Figure 3.4-3 The Results of the Model Comparison	3-14
Figure 3.4-4 The Stop Plan for each Train Type	3-27
Figure 3.4-5 The Train Operation Diagram in 2050	3-29
Figure 3.4-6 The Structure of Ballasted Tracks	3-33
Figure 3.4-7 The Ground Level Track Structure	3-34
Figure 3.4-8 The Structure of the Elevated Tracks	3-36
Figure 3.4-9 The Bridge Structure with Cast In-Situ Reinforced Concrete Slabs	3-39
Figure 3.4-10 The Bridge Structure of Pre-Stressed Concrete Slabs	3-39
Figure 3.4-11 The Steel Bridge Structure	3-40
Figure 3.4-12 The Architectural Concept of the Project Train Station	3-44
Figure 3.4-13 The Sala Thung Lung Station Plan	3-47
Figure 3.4-14 The Front View of Sala Thung Lung Station	3-48
Figure 3.4-15 The Side View of Sala Thung Lung Station	3-48
Figure 3.4-16 The View of the Platform at Sala Thung Lung Station	3-49
Figure 3.4-17 The View of the Platform at Sala Thung Lung Station	3-49
Figure 3.4-18 Khlong Ngae Station Plan	3-51
Figure 3.4-19 The Front View of Khlong Ngae Station	3-52
Figure 3.4-20 The Front View of Khlong Ngae Station	3-52
Figure 3.4-21 The Panorama View of Khlong Ngae Station	3-52
Figure 3.4-22 The Outlook of the Slope Area at Khlong Ngae Station	3-53
Figure 3.4-23 The Outlook of the Ground Floor Walkway at Khlong Ngae Station	3-53
Figure 3.4-24 The Staff Lodge Type-A Plan at Khlong Ngae Station	3-54
Figure 3.4-25 The Side View of the Staff Lodge Type A at Khlong Ngae Station	3-54
Figure 3.4-26 The Staff Lodge Type-B Plan at Khlong Ngae Station	3-55

FIGURE CONTENTS (Cont'd)

	Page
Figure 3.4-27 The Side View of the Staff Lodge Type B at Khlong Ngae Station	3-55
Figure 3.4-28 Concourse Plan of Pradang Bezar 2 Station	3-56
Figure 3.4-29 Platform Plan of Padang Bezar 2 Station	3-57
Figure 3.4-30 The Side View of Padang Bezar 2 Station	3-57
Figure 3.4-31 The Cross Sectional View of Padang Bezar 2 Station	3-58
Figure 3.4-32 The Panoramic View of the Exterior of Padang Bezar 2 Station	3-59
Figure 3.4-33 The Staff Lodge Type A Plan, Padang Bezar 2 Station	3-60
Figure 3.4-34 The Side View of the Staff Lodge Type A Plan, Padang Bezar 2 Station	3-60
Figure 3.4-35 The Staff Lodge RUNNING ROOM Plan, Padang Bezar 2 Station	3-61
Figure 3.4-36 The Side View of the Staff Lodge RUNNING ROOM Plan, Padang Bezar 2 Station	3-62
Figure 3.4-37 The Development of the Signaling System	3-63
Figure 3.4-38 The Present Signaling System at Padang Bezar Station	3-64
Figure 3.4-39 Malaysian Signaling Poles System	3-65
Figure 3.4-40 The Telecommunication System at Padang Bezar Station	3-68
Figure 3.4-41 Master Clock	3-68
Figure 3.4-42 CCTV System	3-69
Figure 3.4-43 The Infotainment System on the Train	3-69
Figure 3.4-44 Feeding Diagram of the Project	3-71
Figure 3.4-45 The Details of the Feeder Station (FS)	3-72
Figure 3.4-46 The Example of the Feeder Station(FS) from The Electric Train Project Overseas	3-72
Figure 3.4-47 The Details of TCBL at Hat Yai Station and Padang Bezar Station	3-73
Figure 3.4-48 The Example of TCBL from the Electric Train Project Overseas	3-73
Figure 3.4-49 The Water Retaining Area in Songkhla Lake Lowland	3-75
Figure 3.4-50 Canals and Public Streams on U Ta Pao Canal Lowland (The purple line refers to the Hat Yai-Padang Bezar Train Route)	3-76
Figure 3.4-51 The Topographical Condition of the Lowland Area (The red number refers to the Ground Level Value of the previous level in that area)	3-77
Figure 3.4-52 The Correlation Graph of the Rainfall Intensity and Duration and IDF at Songkhla Rainfall Monitoring Station	3-78

TABLE CONTENTS

	Page
Table 1.4-1	Passenger Volume 1-3
Table 1.4-2	Cargo Volume on Hat Yai-Padang Besar Train Route 1-3
Table 1.4-3	Train Operation Time according to Types of Service and Set Speed capacity 1-3
Table 1.4-4	The Estimates of the Construction Costs 1-8
Table 2.2-1	The Number of Domestic Passengers during 2009-2013 2-9
Table 2.2-2	Records of Vehicle Registration during 2009-2013 2-9
Table 2.2-3	Records of Domestic Cargo Transport during 2009-2013 2-10
Table 2.3-1	The Development Plan of the Doublel Tracks Train System 2-12
Table 3.3-1	The Construction Plan 3-8
Table 3.4-1	Summary of the Modifications of the Roles of the Stations and Development Guidelines of the Station Compound 3-10
Table 3.4-2	The Present Types of Transportation 3-14
Table 3.4-3	Travel Volume According to Types of Transportation 3-15
Table 3.4-4	The Projection of Passenger Number 3-16
Table 3.4-5	The Projection of Southward Passenger Number 3-17
Table 3.4-6	The Projection of Northward Passenger Number 3-17
Table 3.4-7	The Records of Freight Transport on the Hat Yai-Padang Besar Train Route 3-19
Table 3.4-8	The Summary of Rail Transport on the Hat Yai-Padang Besar Train Route 3-20
Table 3.4-9	The Summary of Rail Transport on the Northbound and Southbound Hat Yai-Padang Besar Train Route 3-21
Table 3.4-10	Train Operation Schedule at a Various Speed 3-24
Table 3.4-11	The Projection of Line Load of the Northbound Passengers 3-25
Table 3.4-12	The Projection of Line Load of the Southbound Passengers 3-25
Table 3.4-13	The Projection of the Freight Volume 3-25
Table 3.4-14	The Suitable Number of Trips with the Electrified Train System 3-28
Table 3.4-15	The Suitable Number of Trips without the Electrified System 3-28
Table 3.4-16	The Suitable Number of Trains for Each Route 3-30
Table 3.4-17	The Suitable Number of Rolling Stock of each Type for the Train Operation 3-30
Table 3.4-18	The Cost of the Train Operation with the Electrified System 3-31
Table 3.4-19	The Cost of the Train Operation without the Electrified System 3-31
Table 3.4-20	The Geometric Requirement of the Track System 3-32
Table 3.4-21	Summary of the Project Track System 3-34
Table 3.4-22	Summary of the Train Bridge 3-36
Table 3.4-23	Modifications of Roles and Functions of the Stations and Development Guidelines of the Station Compound 3-41
Table 3.4-24	The Recommended Size of the Draining Pipe along the Train Route 3-79
Table 3.4-25	The Construction Cost Estimate of the Project 3-86

TABLE CONTENTS (Cont'd)

	Page
Table 3.5-1 The Economic Value of the Electrified Train Project	3-88
Table 3.5-2 The Economic Value of the Diesel Train Project	3-89
Table 3.5-3 The Economic Value of the Electrified Train Project	3-90
Table 3.5-4 The Economic Value of the Diesel Train Project	3-90
Table 3.5-5 The Results of the Financial Feasibility Study of the Electrified Train Project	3-92
Table 3.5-6 The Results of the Financial Feasibility Study of the Diesel Train Project	3-93
Table 3.5-7 Summary of the Economic Feasibility Study of the Project	3-94
Table 3.6-1 The Economic value of the Investment Cost on the Electrified Train Project	3-97
Table 3.6-2 The Economic value of the Investment Cost on the Diesel Train Project`	3-98
Table 3.6-3 The Hypothesis in the Financial Feasibility of the Project	3-99
Table 3.6-4 The Project Revenue of the Electrified Train Project	3-100
Table 3.6-5 The Project Revenue of the Diesel Train Project	3-100
Table 3.6-6 The Results of the Financial Feasibility Study of the Project	3-101
Table 4.1-1 Summary of the Present Environmental Conditions along the Hat Yai- Padang Bezar Train Route	4-1
Table 4.3-1 The Results of the Operation and the Financial Status	4-29
Table 5.1-1 Investment Guidelines for the Project	5-1
Table 5.1-2 Hypothesis and Financial Indicators in the Analysis of Investment Types	5-2
Table 5.3-1 The Financial Returns from PPP for the Electrified Train Project	5-3
Table 5.3-2 The Financial Returns from PPP for the Diesel Train Project	5-4