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Comparison Study of Thai-Lao Logistics Systems between using 1st Thai-Lao Friendship Bridge and Nongkhai-Tanalang Railway

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MLSC525012

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Comparison Study of Thai-Lao Logistics Systems between using 1st Thai-Lao Friendship Bridge and Nongkhai-Tanalang Railway

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MLSC525012

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มหาวิทยาลัยธรรมศาสตร์
คณะวิศวกรรมศาสตร์

วิทยานิพนธ์

ของ

นายธนิน ทรัพย์รุ่งโรจน์

เรื่อง

การศึกษาเปรียบเทียบระบบโลจิสติกส์การค้าไทย-ลาว ระหว่างผ่าน
สะพานมิตรภาพ แห่งที่ 1 และผ่านเส้นทางรถไฟ หนองคาย-ท่านาแล้ง

ได้รับการตรวจสอบและอนุมัติ ให้เป็นส่วนหนึ่งของการศึกษาตามหลักสูตร
วิศวกรรมศาสตรมหาบัณฑิต

เมื่อ วันที่ 20 พฤษภาคม 2553

ประธานกรรมการวิทยานิพนธ์ ____________________

(อาจารย์ ดร. วุฒิชัย วงษ์ทัศนีย์กร)

กรรมการและอาจารย์ที่ปรึกษาวิทยานิพนธ์ ____________________

(รองศาสตราจารย์ ดร. จิรรัตน์ ธีระวราพฤกษ์)

กรรมการวิทยานิพนธ์ ____________________

(อาจารย์ ดร. จิรพรรณ เลี่ยงโรคาพาธ)

คณบดี ____________________

(รองศาสตราจารย์ ดร. อุรุยา วีสกุล)

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2552

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2550-2551

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27 26 11 30

Abstract

Nowadays, 1st Thai-Lao Friendship bridge and Nongkhai-Tanalang railway are utilized as logistics systems between Thai and Lao People's Democratic Republic. However, the logistics system through 1st Thai-Lao Friendship bridge is used for trading purpose. Even though the Nongkhai-Tanalang railway is now the system for only passengers, there would be potential logistics system for trading. This paper analyses and comparies two logistics systems between Thai and Lao People's Democratic Republic passing through 1st Thai-Lao Friendship bridge and Nongkhai-Tanalang railway. This research considers only four products. Lumber and electrical wire are the main import products in 2007 – 2008 at Nongkhai Custom-House, whereas gasoline and private car are the main export products in 2007 – 2008 at Nongkhai Custom-House. Analyses and comparisons of the logistics distance, time, and costs between using road and rail modes are studied in this research.

It is found that by using road and rail modes, the distances are about the same. Using rail mode takes longer than using road mode, whereas using rail mode is more economical than using road mode. The logistics cost reduction when using rail mode are 27, 26, 11, and 30 percent for lumber, electrical wire, gasoline, and private car, respectively. Based on the result, using road mode would take less time with higher cost. In contrary, using rail mode would take more time with less cost. Trade-off between time and costs would be considered. Using road mode would be more expensive especially when fuel price is increased with quicker customer responsiveness. However, based on the trend of increasing fuel price, the logistics cost of using road mode may become amplified. Then, the rail mode would be a wise logistics system for trading purpose between Thailand and Lao People's Democratic Republic in the future.

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1.1

(-) 2543-2545 -
18,000 - 22,000
12,000 - 14,000 2548 40,092 2549
- 57,583.3 43.63 2548

25 - 27 2549 2
2553

1,810
11
36
13 2 21
- 2551
28,000 2550 7,000 (

2

31)

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(. .2549-2553)

17 2549

(Strategic Agenda)

(Trade Facilitation Enhancement)

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2552 -

3.5

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1.2

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3. -

1.3

1. -
   2550-2551
2.

3.

1.4

1.
- 1 (-)
2. - - 1
(-) -
3. - -
- 1 (-)
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4.

5. -
- 1 (-)
-
6. -

1.5

1. -
- 1
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2. -
- 1 -

3. -

1.1

(Gantt chart)

	2552 – 2553										
	2552							2553			
	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .
1.											
2. - - 1 (-) -											
3. - - -											
4.											
5. - - 1 (-) -											
6. -											

2

2 5 (1)
(2)
(3) (4) (5)

2.1

20

(Stock and Lambert, 2001)

(, 2548)

2.1

2

(, 2548) (1)
(2)

2.1

Inventory	Management of materials in motion and at rest	
Customer	Getting the right product, to the right customer, in the right quantity, in the right condition, at the right place, at the right time, and at the right cost (called the “seven Rs of Logistics”)	7
International Society of Logistics	The art and science of management, engineering, and technical activities concerned with requirements, design, and supplying and maintaining resources to support objectives, plans, and operations	
Utility / Value (ILT definition)	Providing time and place utility / value of materials and products in support to organization objectives	
Council of Logistics Management	That part of the supply chain process that plans, implements, and controls the efficient, effective flow and storage of goods, services, and related information from point of origin to point of consumption in order to meet customer requirements	

2.1

( )

Component Support	Supply management for the plant (inbound Logistics) and distribution management for the firm's customer (outbound Logistics)	( ) ( )
Functional Management	Material require determination, purchasing, transportation, inventory management, warehousing, materials handling, industrial packaging, facility location analysis, distribution, return goods handling, information management, customer service, and all other activities concerned with supporting the internal customer (manufacturing) with materials and the external customer (retail stores) with product	
Common culture	Handling the details of an activity	

: . "

" 1 (2547).

2.2

(Stock and Lambert,
2001) 12

7 (1) (Customer Service)
(2) (Order Processing) (3)
(Demand Forecasting) (4) (Inventory Management) (5)
(Traffic and Transportation) (6) (Warehousing and Storage)
(7) (Reverse Logistics)
5 (1)
(Parts and Service Support) (2) (Plant
and Warehouse Site Selection) (3) (Materials Handing) (4)
(Packaging) (5) (Logistics Communication)
2.2
(1)
(2)

4 (1)
(Commodity Market) (2) (Cost
Leader) (3) (Service Leader) (4)
(Cost & Service Leader)
2.1

2.2

(Customer Service)	
(Order Processing)	
(Demand Forecasting)	
(Inventory Management)	
(Traffic and Transportation)	
(Warehousing andStorage)	
(Reverse Logistics)	

2.2

( )

(Parts and Servicesupport)	
(Plant and Warehouse Site Selection)	
(Procurement)	
(Packaging)	
(Logistics Communication)	(EDI)

: . “

” 1 (2547)

(Service Leader)	(Cost &Service Leader)
(Commodity Market)	(Cost Leader)

2.1

: Christopher, 1998

- (Commodity Market)

(Cost Leader) (Productivity Advantage)

- (Cost Leader)

Commodity Market

- (Service Leader) Commodity Market (Value Advantage)

- (Cost & Service Leader)

12

2.3

(Gourdin, 2006)

5

(Mangan, 2008) 2.3

2.3.1

5 (Mangan, 2008)

(1) (2) (3) (4)

(5)

2.3

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- (
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: Gourdin, 2006

1.

(Point to Point)

(Rail)

(Origin

Point)

(Just in Time) (Single Track) 1

(Duo Track) 1.5-2

(Ship to Rail)

2.

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3.

100

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4.

24

5.

95

1 1 . 217

1 1 . 85

1 1 . 25

2.2

2.4

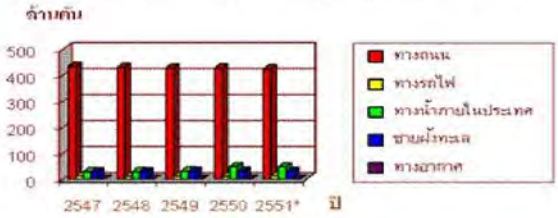
5 2.4.1

2.4.2

การขนส่งสินค้าภายในประเทศ

หน่วย : พันตัน

การขนส่งสินค้า	2542	2543	2544	2545	2546	2547	2548	2549	2550	2551
ทางถนน	392,244	397,976	400,241	434,918	440,018	435,147	430,275	427,581	428,123	424,456
ทางรถไฟ	9,264	9,171	8,776	8,889	10,521	12,883	11,760	11,579	11,055	12,807
ทางน้ำภายในประเทศ	17,910	25,235	17,833	25,043	29,024	29,135	29,569	31,074	47,755	47,687
ชายฝั่งทะเล	21,970	23,347	19,657	24,795	24,628	29,754	29,480	31,574	31,216	28,797
ทางอากาศ	97	104	110	107	103	114	120	122	110	106
รวม	441,485	455,833	446,617	493,752	504,294	507,033	501,204	501,930	518,259	513,853



2.2

: , 2552

2.4.1

5 (, 2550)

1.

2.

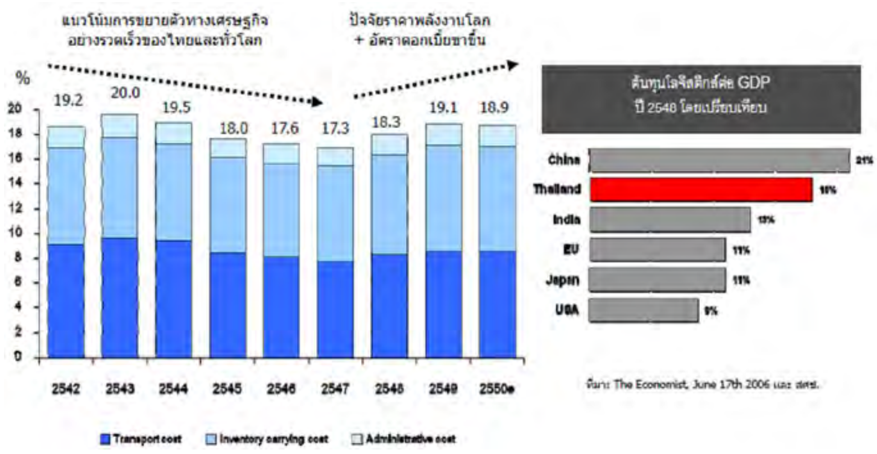
3.

4.

5.

(Capital cost) GDP 17-19

2.3



2.3

GDP

: , 2552

2.4.2 (Activity-Based Costing: ABC)

(Activity- Based Costing: ABC)
Activity-Based Costing “
” “ ”

“ ”
“ ”

-
(ABC)

1.

2.

3.

4. ABC

5. (ABC)
“ ” “Activities”

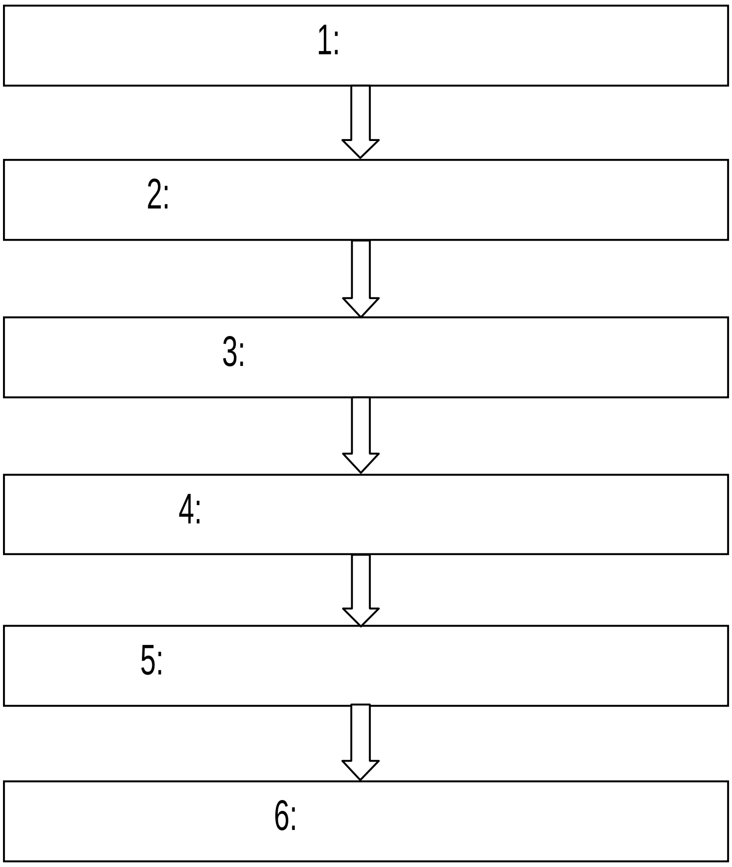
-

-

1.
2.
3.
4.
5.
6.
7.
8.
-

6

2.4



2.4

(Activity- Based Costing: ABC)

: , 2549

1: “ ”

“Activity”

(Image)

(Activity)

2:

Input 4

/

Input

1.

“ ” “

”

“ ” “ ”

“ ”

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-

-

-

2.

/

“ ” “ ”

-

-

-

-

-

3.

“

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-

-

4.

(Pallet)

-

-

-

3:

1

2 3

2

2.4

2.4

-	

: , 2549

1.

“

”

3

1:

26

2 - 3

2:

2.

3.

“ ”

(Forklift Truck)

Pallet Rack

100%

4.

“ ” “ ” “ ”

100%

4: 3

“ ” 1

2 Input

3

“ ”

5:

“

” “ ”

“ ”

“ ” “ ” “

”

(Picking List)

“ ”

“ ”

(Bar Code)

(Handy Terminal)

6:

“ ”

“ ”

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2.5

2.5

	110,000	7,235	15.2
	230,000	9,200	25

: , 2549

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/ “ ”

“ ” “ ” 40

100 “ 2 20 ”
2
20

“

2.5

(2549)
FTA –
2010:
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–

30

(2549)

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2

(High local Content)

(High value-added) 1

(Value Chain)

–

5 - 10

–

– (2549)

FTA –

2010

FTA -

(2549) -

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(2550)

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- –

(2551)

(2549)

C.P. 7-Eleven

7-Eleven

(2549)

( )

(2550)

RFID

RFID

RFID Stock

(Food Traceability)

(2551)

:

(Risk Management)

/ (Warehouse / Distribution Center Operation)

1-2

21

RFID

- (2547)

.

(Inland Container Depot: ICD)

-

-

(2549)

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GMS ASEAN

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3

(, 2552) (1) (Strategic) (2) (Tactical)

(3) (Operation)

(1) (2)

(3)

–

-

(Transport Management, 2552)

(Vehicle

Operation Cost: VOC)

0.17 / /

0.88 / /

0.68 / /

3 (, 2552)

2553 (Transport Logistics, 2552)
7% 19.8% 5 21.4%

2
(Initial Cost)
(Operation Cost)
(Operation Cost)

(Running Cost)

27% 9%
67%
26% 7% 2 3

7 (, 2552)
(1) (2)
(Multimodal Transport) (3)
(4)
(5)
(6) (7)
-
1 -

(ABC) 1980 Cooper (1988 a,b), Cooper Kaplan (1988) Johnson Kaplan (1987)

(Tsai Kuo, 2004) Nachtmann Al-Rifai (2004) (ABC)

ABC (Zhuang Burns, 1992; Dhavale, 1993; Koltai et al., 2000; Ozbayrak et al., 2004; Kirche et al., 2005; Satoglu et al., 2006) (Berling, 2008), Stapleton et al. (2004) ABC Goldsby Closs (2000) ABC

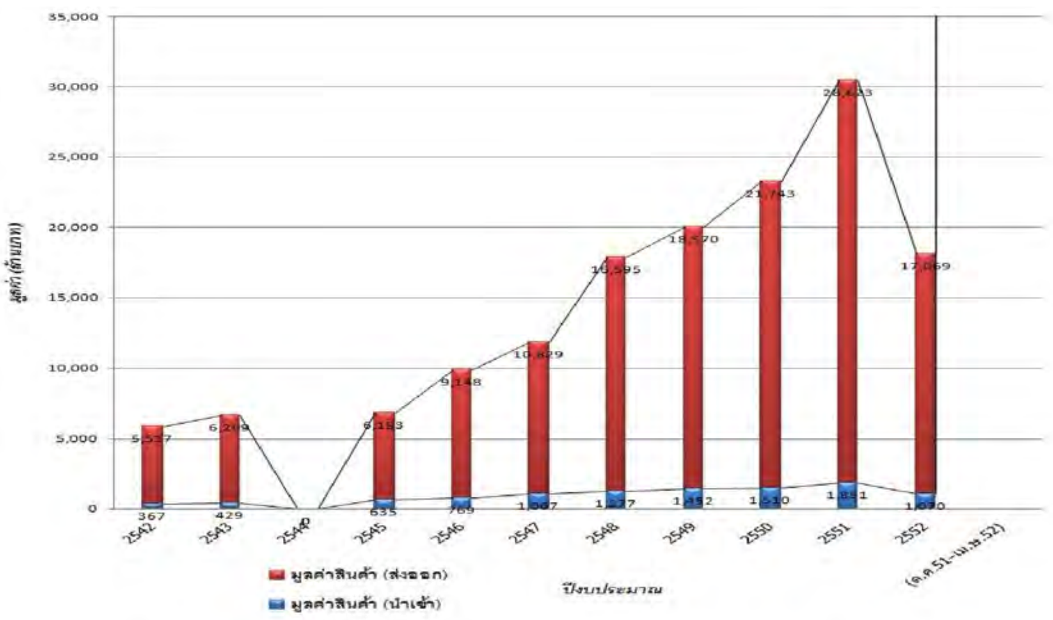
Van Damme and Van Der Zon (1999) Liberatore and Miller (1998) (AHP) Balanced scorecard Pohlen La Londe (1994) ABC ABC ABC ABC Themido et al. (2000) ABC ABC Third Party Logistics

3

3 6 (1)
(2) (3)
(4) -
(5) (6)

3.1

–
2542 - 2552 3.1 3.1



3.1
– 2542 - 2552
: , 2552 (2544)

3.1

– 2542 - 2552 ( )

	( )	( )	( )
2542	367,260,000	5,517,150,000	5,884,410,000
2543	429,080,000	6,209,930,000	6,639,010,000
2544	-	-	-
2545	635,360,212	6,193,928,802	6,829,289,014
2546	769,506,909	9,148,713,842	9,918,220,751
2547	1,067,596,272	10,829,551,807	11,897,148,080
2548	1,277,494,707	16,595,305,178	17,872,799,885
2549	1,452,441,330	18,570,562,017	20,023,003,348
2550	1,510,235,251	21,743,870,245	23,254,105,497
2551	1,851,773,208	28,623,868,101	30,475,641,309
2552 (. .51– . .52)	1,070,134,145	17,069,310,966	18,139,445,111
	10,430,882,037	140,502,190,961	150,933,072,999

: , 2552 (2544)

3.1 3.1 2542 –
5,884 2543 – 6,639 2545
– 6,829 – 2545 2542
16 2546 – 9,918 2547
– 11,897 – 2547
2545 76 2548 – 17,872
2549 – 20,023 – 2549
2547 68 2550 – 23,254
– 2550 2547 68 2551

– 30,475 2552 (, ,51 - . .52)
– 18,139 2552 –
2551 –
2542 - 2552

3.2

10 2550 - 2552 3.2 – 3.4
2543 - 2549

3.2
10 2550 ( )

2550 (49 – 50)		
		( )
1		566,736,649
2		85,465,984
3		41,320,643
4		27,656,111
5		18,329,718
6		-
7		16,841,799
8		15,793,107
9		13,695,678
10		11,814,106
		809,467,901

: , 2552

3.3

10 2551 ( )

2551 (50 – 51)		
		( )
1		460,031,602
2		297,893,484
3		171,394,592
4		92,695,170
5		60,441,477
6		43,109,636
7		41,410,963
8		28,567,145
9		26,905,098
10		25,899,195
		1,248,348,362

: , 2552

3.4

10 2552 ( )

2552 (51 - 52)		
		( )
1	,	214,992,545
2		115,870,051
3		96,216,117
4		85,052,005
5		56,721,544
6		31,057,818
7		27,322,316
8	65%	24,941,072
9		19,313,719
10		15,837,313
		687,324,500

: , 2552

3.2 3.3 (3.4 7
) 1 2
2550 - 2551 -

3.3

10
2550 - 2552 3.5 – 3.7 2543 - 2549

3.5
10 2550 ( )

2550 (49 – 50)		
		( )
1		3,627,752,122
2		1,632,144,470
3		813,491,467
4		553,877,944
5		240,619,151
6		173,966,435
7		133,236,407
8		129,294,941
9		128,930,066
10	,	126,777,385
		7,560,090,388

: , 2552

3.6

10 2551 ( )

2551 (50 – 51)		
		( )
1		6,780,588,258
2		1,465,619,367
3		1,459,329,023
4		809,520,477
5		295,578,876
6	,	229,031,088
7		190,539,589
8		187,525,184
9		171,863,126
10		167,856,473
		11,757,451,461

: , 2552

3.7

10 2552 ( )

2552 (. .2551 - . .2552)		
		( )
1		1,385,085,156
2		438,576,582
3	, ,	225,824,405
4	,	212,800,100
5		179,658,555
6		112,738,261
7		95,863,072
8		80,800,963
9		76,901,899
10		49,363,156
		2,857,612,149

: , 2552

3.5 3.6 (3.7 6
) 1 2
2550 - 2551 -

3.4 -

“ ”

1986 ASEAN (Association of Southeast Asian Nations) GMS (The Greater Mekong Subregion) ACMECS (Ayeyawady - Chao Phraya - Mekong Economic Cooperation Strategy)

WTO (World Trade Organization) GATT (The General Agreement on Tariffs and Trade)

UN (The United Nations)

33

3.4.1

2

(, 2552)

- . . 2469
15
(20) . .2548
- (144) . .2547
. . 2469

3.4.2

(.)
(.)
(Port to Door)
(Door to Port)
(
, 2552)

- ACMECS - -
0%

- GMS
( )

- AFTA
1999
0% 2010 10

- AEC
2015

(

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10

24 14 3 3.2

Trade across Borders	2006	2007	2008	2009
Rank		108	50	10
Document for export (number)	9	9	7	4
Time for export (days)	24	24	17	14
Cost to export (US$ per container)	848	848	615	625
Documents for import (number)	12	12	9	3
Time for import (days)	22	22	14	13
Cost to import (US$ per container)	1042	1042	786	795

3.2

: www.doingbusiness.org, 2009

3.5 (GMS)

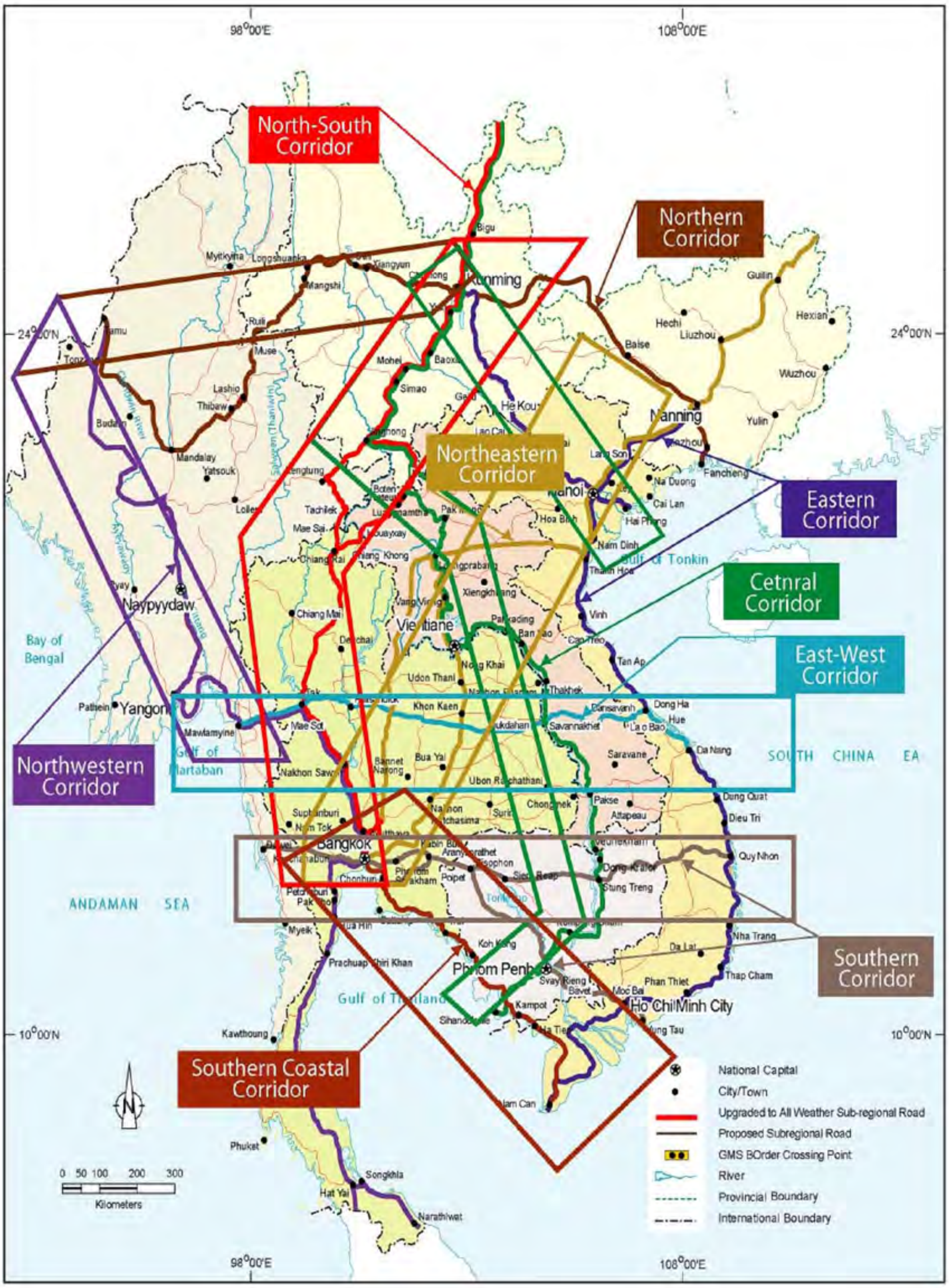
GMS 2535
(Asian Development Bank:
ADB) 6 .
( ) 2 3
250

3.3
GMS

GMS Summit 2 4-5 2548
GMS (Kunming Declaration)

GMS

(GMS Cross-Border Transport Agreement)
2548
(Economic Corridor) GMS 3
- (East West Economic Corridor: EWEC)
– (North South Economic Corridor: NSEC)
(Southern Economic Corridor)


North-South Corridor
Northern Corridor
Northeastern Corridor
Eastern Corridor
Cetnral Corridor
East-West Corridor
Northwestern Corridor
Southern Corridor
Southern Coastal Corridor
98°00'E
108°00'E
24°00'N
10°00'N
Kunming
Nanning
Hanoi
Vientiane
Bangkok
Phnom Penh
Ho Chi Minh City
Yangon
Naypyidaw
Bay of Bengal
ANDAMAN SEA
Gulf of Martaban
Gulf of Thailand
Gulf of Tonkin
SOUTH CHINA SEA
National Capital
City/Town
Upgraded to All Weather Sub-regional Road
Proposed Subregional Road
GMS BOrder Crossing Point
River
Provincial Boundary
International Boundary
0 50 100 200 300
Kilometers

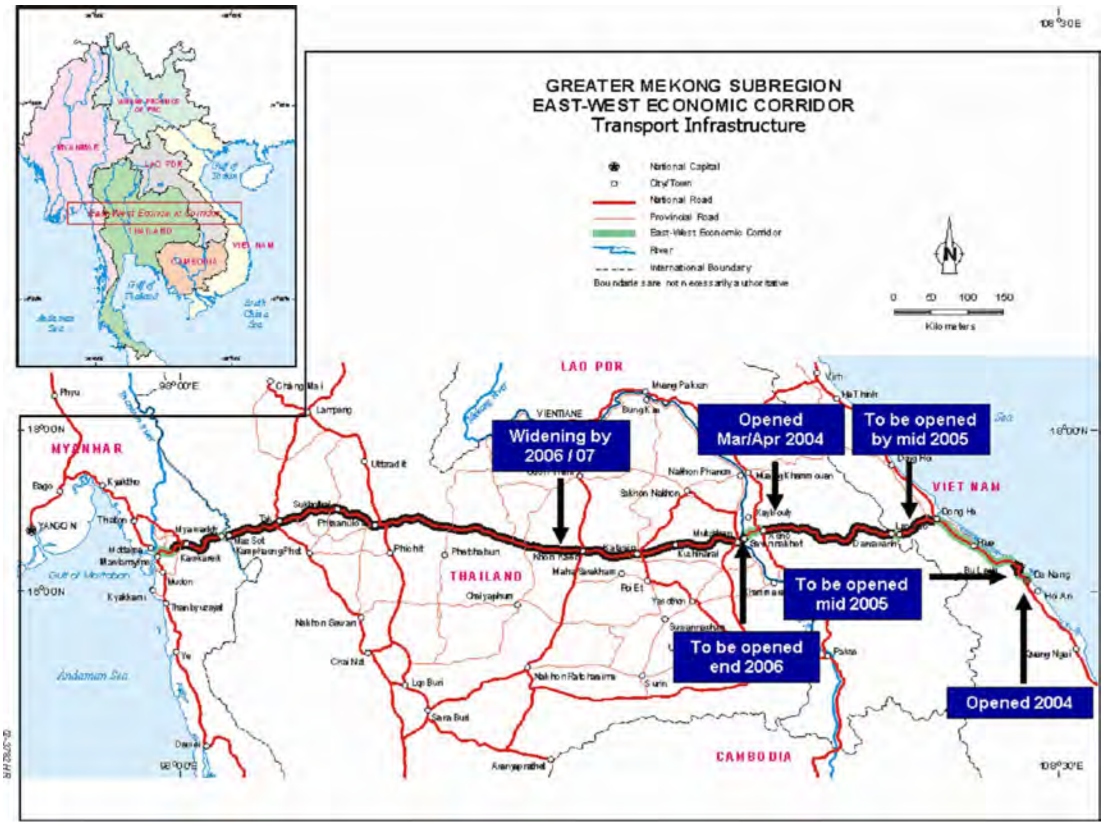
3.3

9

: , 2552

- - (East West Economic Corridor: EWEC) - - -
. R 9 2

1,450 3.4
R9 - ( ) –
– – – - ( ) – -
( )- – – - ( )
(i) : ( ) – ( )
(ii) : ( ) – ( )
(iii) : ( ) – ( )



3.4
-
: , 2550

- - (North South Economic Corridor: NSEC)
- / - NSEC 3
(1) R3E : – – – – –
– ( ) - – ( ) – – – – ( )
(i) : ( ) – ( )
(ii) : ( ) – ( )
(2) R3W : – ( ) – – – –
( )
(i) : ( ) – ( )
(3) R5 : – – – – –
( ) – – – ( )
(i) : ( ) – ( )
- (Southern Economic Corridor: SEC) -
- (Southern Economic Corridor: SEC)
- - 2
3.5
(1) R1
– – - – –
– – – ( ) - – – -
– – ( ) – - – ( )
(i) : ( ) – ( )
(ii) : ( ) – ( )
(2) R10
- – ( ) – - – – – ( )
– – – ( )
(i) : ( ) – ( )

North-South Economic Corridor

3.5

-

: , 2550

3.5.1

(GMS Cross Border Transport Agreement: GMS CBTA)

GMS (Trade Facilitation)

CBTA CBTA

CBTA 4 (, 2551)

(1) No Go – To Go:

GMS

- ( )
- (2)
- ( )
- ( )

(2) Transloading - Go Through:

- ( )
-

(3) Long Time – Short Time:

- (Single-Window)
- ( )
- (Risk Management)

(4) Pilot – Full Implementation:

CBTA GMS 3.7

(Customs Transit Systems -CTS) CBTA 29

– 1 2551

(Customs Transit and Temporary Admission System: CTS)
CBTA (
. , 2551)
(1)

(2) (Home country) Special
Drawing Right (SDR) (Host country)
SDR

(3) (Host country)
(Home country)
(Home country)

(4) (Host country)

(5)
- CTS Border Crossing Supervisor
CBTA
-
CTS Border Crossing Facilitator

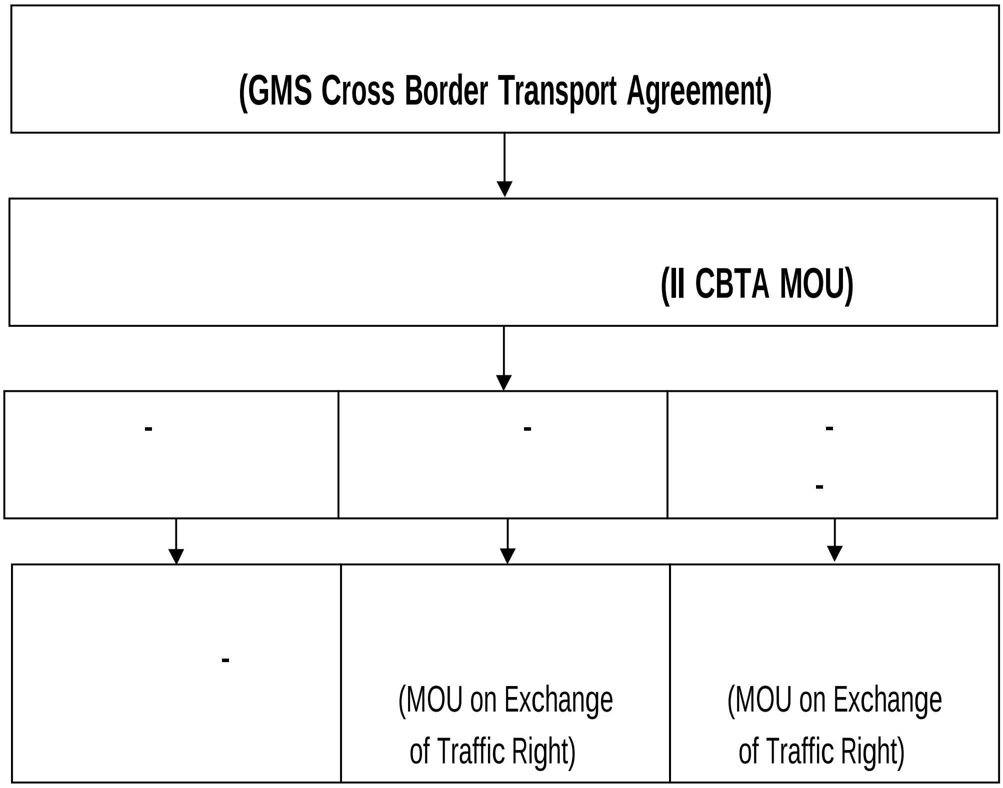
CBTA 3.8
3.6

3.8

CBTA

	CBTA
	- CBTA – - CBTA - CTS CTS - GMS
	- CTS CTS - GMS
.	- CTS CTS - GMS - CBTA
	- CTS CTS - 20 / - GMS
	- 20 / - CBTA – - CTS CTS - GMS
	- 3 / - CTS CTS - GMS

: , 2551


(GMS Cross Border Transport Agreement)
(II CBTA MOU)
-
-
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-
-
(MOU on Exchange of Traffic Right)
(MOU on Exchange of Traffic Right)

3.6

: , 2550

GMS

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- ( )

-

3.5.2 (ASEAN Free Trade Area: AFTA)

10

(Common Effective Preferential Tariff – CEPT)

AFTA

2535

1 2553

AFTA 6

0-5% 1 2553 4

( ) 0% 2558

AFTA

8,300 0-5%

2553 1,657 (20%)

1,657

2553

1,657 0% 1,644

13 5% (13

5% 4 (

)

( )

3.9 (Inclusion List)

3.10

2553

3.9
(Inclusion List)

/			
1. **(Inclusion List: IL)** **1.1 Fast Track** **- 20%** **- 20%**	0-5 % 0-5 %	2541 2543	15
1.2 Normal Track **- 20%** **- 20%** **2.** **(Temporary Exclusion List – TEL)**	0-5 % 0-5 % 0-5 %	2543 2546 2546	
3. **(Sensitive List)**	0-5 %	2553	2544-2546 2553
4. **(Highly Sensitive List)**	0-5 %	2553	2544-2548 2553
5. **(General Exclusion List)**			

: , 2553

3.10

2553

		( )
	489	(310), (179)
	330	(157), (173)
	160	(86), (27), (10), (37)
	159	(57), (48), (54)
	159	(155), (4)
	97	(97)
	89	(26), (25)
	82	Paper Board(60), (16), printed book(6)
	23	(23)
	21	(12), (19)
	19	(13), (8)
	17	(14), (3)
	7	(7)
	5	(5)
	1,657	

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3 4 , 2553

-

8,300 0 - 5%

AFTA

AFTA
WTO

2

(25%
) AFTA
0%

AFTA 2541
2551 (AFTA)

AFTA 4% 26.8%

MFN (Most-Favoured-Nation Treatment)
GATS AFTA
MFN MFN
AFTA

AFTA 1 2553

AFTA

2553 AFTA ASEAN - 0%

FTA ASEAN - 0% 90%

FTA ASEAN - FTA ASEAN+3

FTA AFTA FTA

FTA

FTA

FTA

3.6

3.5.1

3.5.2

3.6.1

5 (, 2552)

1. (Invoice)
(Service Counter)

2.

3.

2
(Green Line)
(Red Line)

- (Green Line)

- (Red Line)

4.
6

- IMPORT/EXPORT INVOICE LIST BY DECLARATION ITEM
- IMPORT/EXPORT INVOICE LIST BY INVOICE ITEM
- IMPORT/EXPORT INVOICE LIST

5.

-

9 (

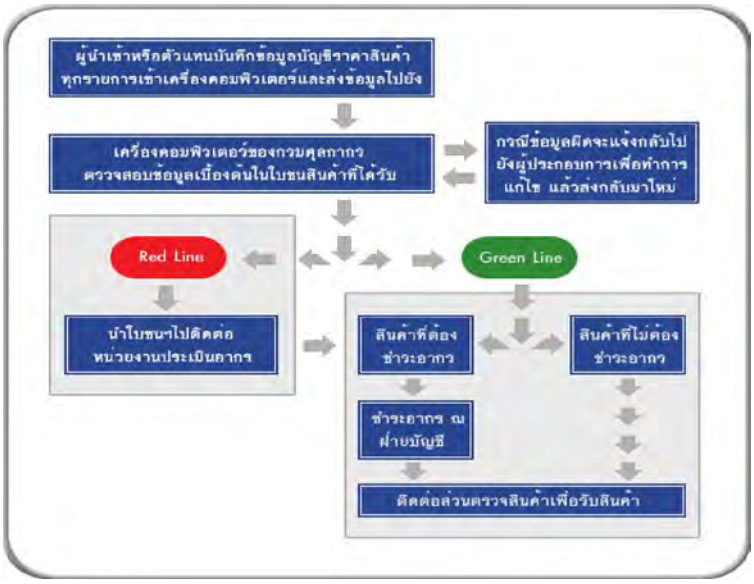
)

- 8

(

)

3.7



3.7

: , 2552

3.6.2

5 (, 2552)

1.

2.

2

- (Red Line)

- (Green Line)

( )

3.

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4

( )

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(1) (2) (3) (4)

(5) ( ) (

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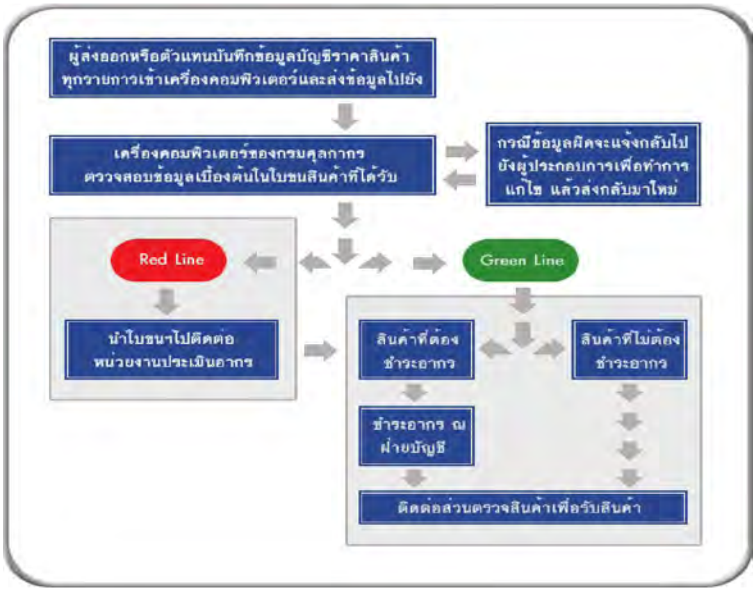
- 6 (

)

3.8


ผู้ส่งออกหรือตัวแทนบันทึกข้อมูลบัญชีราคาสินค้า
ทุกรายการเข้าเครื่องคอมพิวเตอร์และส่งข้อมูลไปยัง
เครื่องคอมพิวเตอร์ของกรมศุลกากร
ตรวจสอบข้อมูลเบื้องต้นในใบขนสินค้าที่ได้รับ
กรณีข้อมูลผิดจะแจ้งกลับไป
ยังผู้ประกอบการเพื่อทำการ
แก้ไข แล้วส่งกลับมาใหม่
Red Line
Green Line
นำใบขนฯไปติดต่อ
หน่วยงานประเมินอากร
สินค้าที่ต้อง
ชำระอากร
สินค้าที่ไม่ต้อง
ชำระอากร
ชำระอากร ณ
ฝ่ายบัญชี
ติดต่อส่วนตรวจสินค้าเพื่อรับสินค้า

3.8

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- (2)

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4.1.1

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18
4.1 10
4.2 4.3 .
4.4

4.5 4.6

4.7

4.8

4.9 –

1 4. 0 4. 1

4.12

4.13

4.14

4.15 Paperless 4.16

Paperless

5

4.17

18 10 1 ( )

4.1 1,451 41 30 14,510

21,765 36,275

4.1

18

4.2

4.3

( )

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4.10

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4.15

4.16
Paperless

4.17
1

4.1

1

1	18 ( )	-	1 .	-
2	-	5 .	15	50
3	( )	-	30	-
4	-	20 .	45	200
5	( )	-	1 . 30	-
6	–	5 .	15	50
7	( )	-	1 . 30	-
8	- 1	2 .	10	20
9	( )	-	1 .	-
10	–	5 .	15	50
11	( )	-	1 .	-
12	–	2 .	10	20
13	( )	-	30	-
14	-	690 .	15 .	6,900 (21,765)
15		-	45	-
16	-	690 .	15 .	6,900
17	( )	-	15	-
18	- 1	2 .	10	20
19	( )	-	30 .	-
20	-	30 .	1 .	300
		1,451 .	41 . 30	36,275

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4.1.2

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4.18 6

4.19 5

4. 0 7 1 4 1 1

336 4. 1 4.22

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6

8 1 ( ) 4.3

1,489 40 50 11,912 23,824

35,736

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4.20

12 1

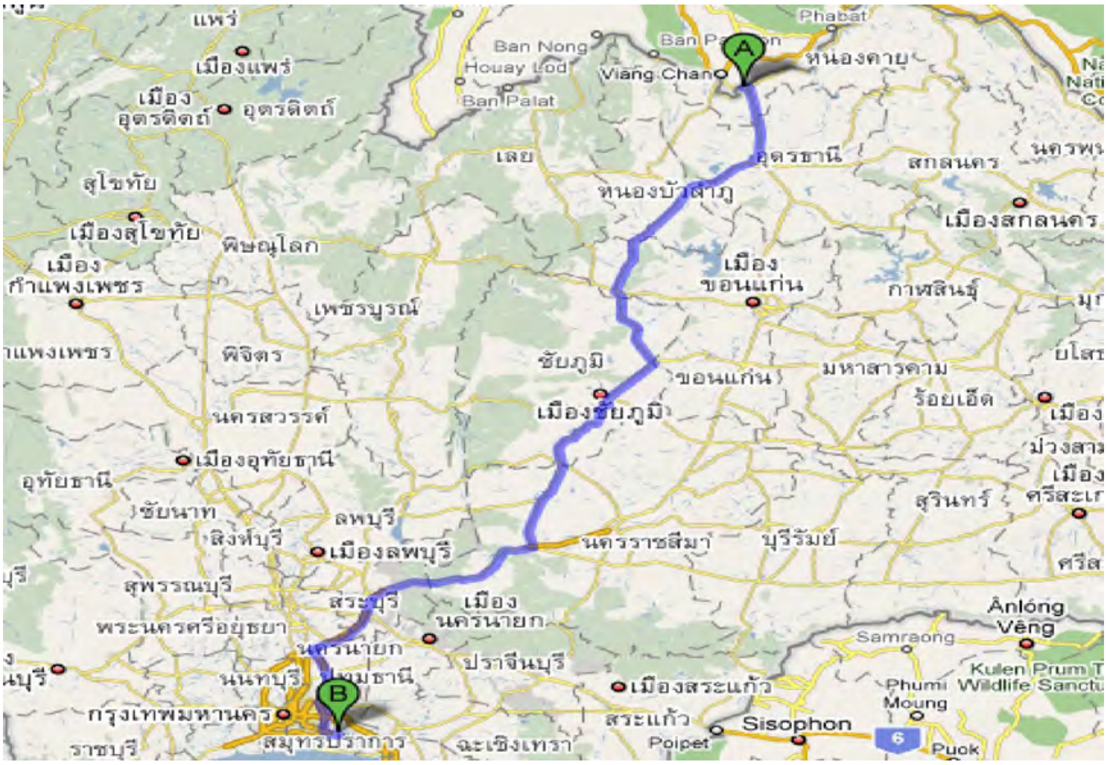

TAP1-C
TAP1 - A
TAP1-A
TAP1-A
TAP1-A
TAP1-A
TAP1-A
1 10 2009

4.21

7 1


TAP
TAP
TAP
1 10 2009

4.22


A
B
Viang Chan
Ban Nong
Houay Lod
Ban Palat
Phabat
หนองคาย
อุดรธานี
สกลนคร
เมืองสกลนคร
เลย
หนองบัวลำภู
เมือง
ขอนแก่น
กาฬสินธุ์
ชัยภูมิ
เมืองชัยภูมิ
ขอนแก่น
มหาสารคาม
ร้อยเอ็ด
สุรินทร์
บุรีรัมย์
นครราชสีมา
แพร่
เมืองแพร่
อุตรดิตถ์
สุโขทัย
เมืองสุโขทัย
พิษณุโลก
กำแพงเพชร
เพชรบูรณ์
พิจิตร
นครสวรรค์
เมืองอุทัยธานี
อุทัยธานี
ชัยนาท
สิงห์บุรี
ลพบุรี
เมืองลพบุรี
สุพรรณบุรี
พระนครศรีอยุธยา
สระบุรี
เมือง
นครนายก
ปราจีนบุรี
เมืองสระแก้ว
สระแก้ว
นนทบุรี
กรุงเทพมหานคร
สมุทรปราการ
ฉะเชิงเทรา
ราชบุรี
Ânlóng
Vêng
Samraong
Phumi
Moung
Kulen Prum
Sisophon
Poipet
Puok
6

4.23

2

4.2

2

1	6 5 12 = 336 ( )	-	1 .	-
2	–	25 .	45	200
3	( )	-	1 . 30	-
4	–	5 .	15	40
5	( )	-	1 . 30	-
6	- 1	2 .	10	16
7	( )	-	1 .	-
8	–	5 .	15	40
9	( )	-	1 .	-
10	-	710 .	15 . 30	5,680 (23,824)
11		-	30	-
12	–	710 .	15 . 30	5,680
13	( )	-	15	-
14	- 1	2 .	10	16
15	( )	-	30	-
16	-	30 .	1 .	240
		1,489 .	40 . 50	35,736

: ,

2552

4.1.3

(, 2553)

. ( ) (, 2552) (Houakhong Trading co.,ltd A Subsidiary of PTT Public Company Limited) . ( )

1 - 2552

38,000 4.24

4

4.25 4.26

- 1

4

4.27 4.28 .

4.29

5 1 ( ) 4.3

1,600 39 55 8,000

24,000 32,000

4.24

4.25

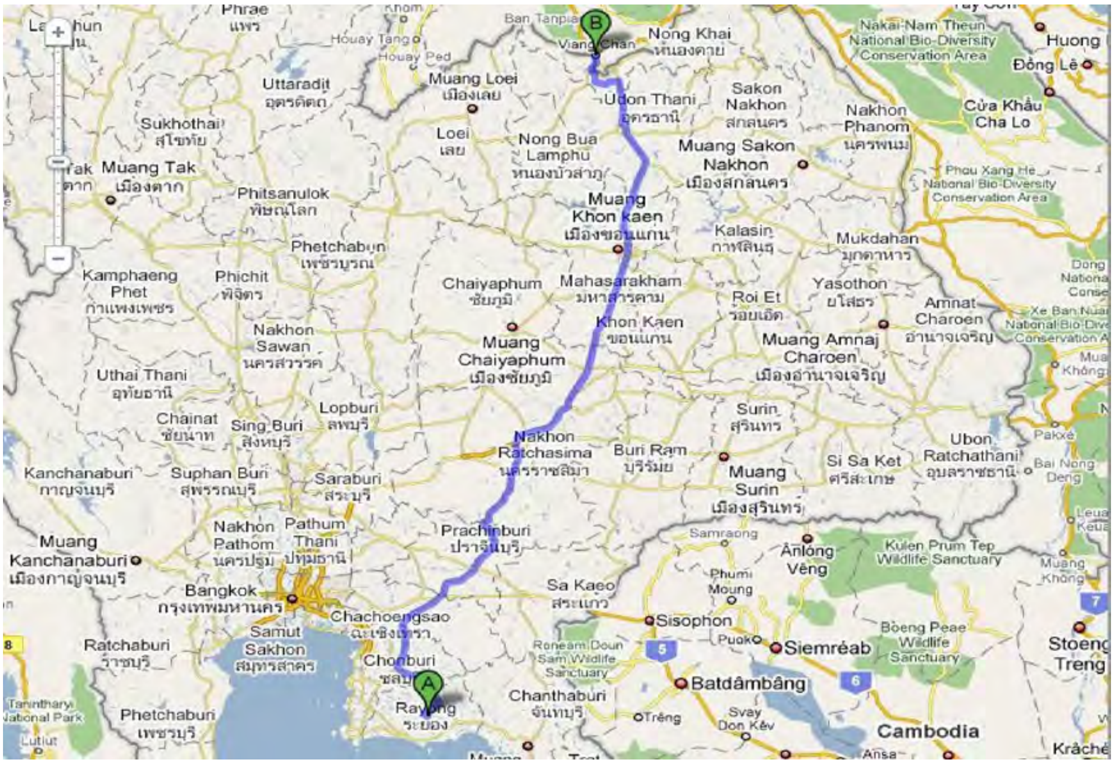
4.26

4.27

. .

4.28

. .



Phrae
Uttaradit
Sukhothai
Muang Tak
Phitsanulok
Muang Loei
Loei
Nong Bua Lamphu
Udon Thani
Nong Khai
Viang Chan
Sakon Nakhon
Muang Sakon Nakhon
Nakhon Phanom
Muang Khon Kaen
Kalasin
Mukdahan
Phetchabun
Kamphaeng Phet
Phichit
Chaiyaphum
Mahasarakham
Roi Et
Yasothon
Amnat Charoen
Nakhon Sawan
Khon Kaen
Muang Chaiyaphum
Muang Amnaj Charoen
Uthai Thani
Chainat
Sing Buri
Lopburi
Nakhon Ratchasima
Buri Ram
Surin
Muang Surin
Si Sa Ket
Ubon Ratchathani
Kanchanaburi
Suphan Buri
Saraburi
Nakhon Pathom
Pathum Thani
Prachinburi
Muang Kanchanaburi
Bangkok
Chachoengsao
Sa Kaeo
Sisophon
Siemréab
Samut Sakhon
Ratchaburi
Chonburi
Rayong
Chanthaburi
Batdâmbâng
Phetchaburi
Cambodia
Stoeng Treng
Kulen Prum Tep Wildlife Sanctuary
Boeng Peae Wildlife Sanctuary
Nakai-Nam Theun National Bio-Diversity Conservation Area
Huong
Đồng Lê
Cửa Khẩu Cha Lo

4.29

1

4.3

1

1	38,000 ( )	-	1 .	-
2	( )	-	10	-
3	–	750 .	15 . 15	3,750 (24,000)
4	Paperless ( )	-	1 .	-
5	- 1	2 .	10	10
6	( )	-	1 . 30	-
7	– . . ( )	48 .	1 . 30	240
8		-	30	-
9		-	10	-
10		-	1 .	-
11	(. .)	-	10	-
12	. . –	48 .	1 . 30	240
13	( )	-	30	-
14	- 1	2 .	10	10
15	( )	-	15	-
16	-	750 .	15 . 15	3,750
		1,600 .	40 . 5	32,000

: . ( ), 2552

4.1.4

(, 2553)

1 - 2552

7

4. 0 4

4 4. 1

4.32 3

4.33

- 1

4

4.34

10 1 (

) 4.4 1,505 40 55

15,050 22,575 37,625

4.30

18

4.31

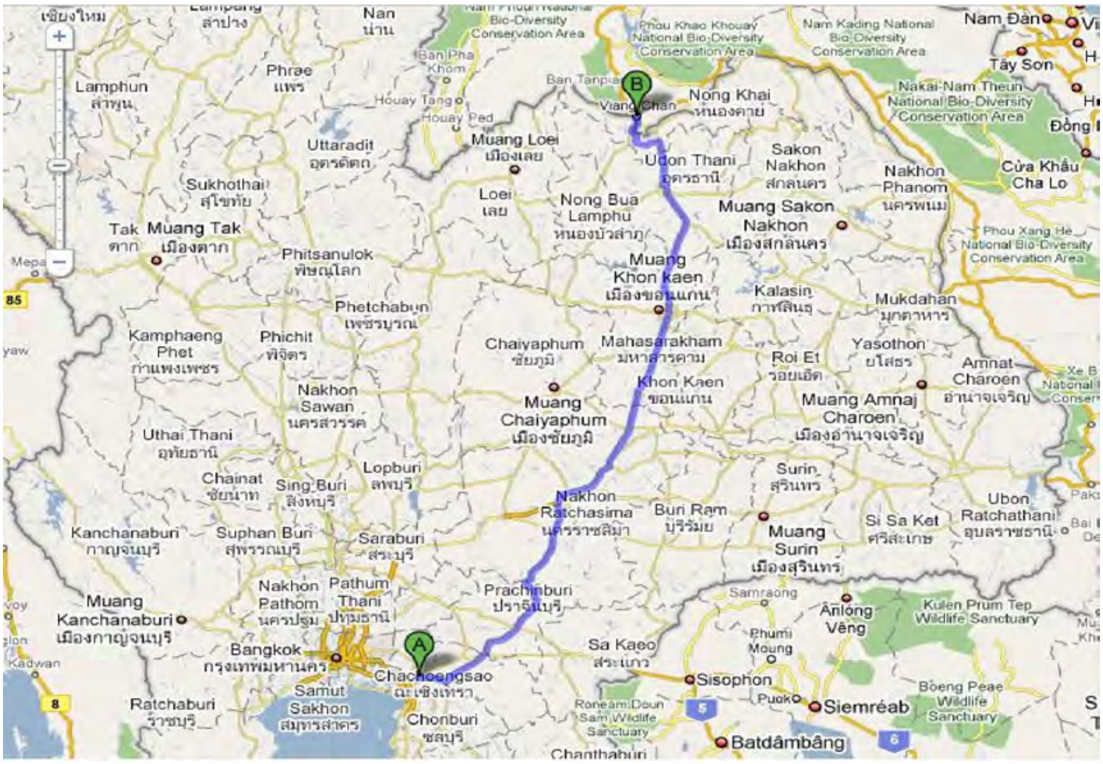
4

4.32


TOYOTA
31/03/2010

4.33

3


Nan
Phrae
Lamphun
Uttaradit
Sukhothai
Tak
Muang Tak
Phitsanulok
Phetchabun
Kamphaeng Phet
Phichit
Nakhon Sawan
Uthai Thani
Chainat
Sing Buri
Lopburi
Kanchanaburi
Suphan Buri
Saraburi
Muang Kanchanaburi
Nakhon Pathom
Pathum Thani
Bangkok
Samut Sakhon
Ratchaburi
Chachoengsao
Chonburi
Prachinburi
Sa Kaeo
Nakhon Ratchasima
Buri Ram
Chaiyaphum
Muang Chaiyaphum
Mahasarakham
Khon Kaen
Muang Khon kaen
Kalasin
Roi Et
Yasothon
Mukdahan
Amnat Charoen
Muang Amnaj Charoen
Surin
Muang Surin
Si Sa Ket
Ubon Ratchathani
Udon Thani
Nong Khai
Nong Bua Lamphu
Loei
Muang Loei
Sakon Nakhon
Muang Sakon Nakhon
Nakhon Phanom
Viang Chan
Sisophon
Siemréab
Batdâmbâng
Chanthaburi
Anlong Vêng
Samraong
Nam Đàn
Tây Son
Cửa Khẩu Cha Lo
Kulen Prum Tep Wildlife Sanctuary
Boeng Peae Wildlife Sanctuary
Phou Xang He National Bio-Diversity Conservation Area
Nakai-Nam Theun National Bio-Diversity Conservation Area
Nam Kading National Bio-Diversity Conservation Area
Phou Khao Khouay National Bio-Diversity Conservation Area

4.34

2

4.4

2

1	7 ( )	-	1 .	-
2	–	717 .	15 . 30	7,170 (22,575)
3	( )	-	1 .	-
4	–	5 .	15	50
5	( )	-	1 .	-
6	- 1	2 .	10	20
7	( )	-	1 . 30	-
8	–	5 .	20	50
9	( )	-	1 .	-
10	–	25 .	45	250
11	( )	-	1 .	-
12	-	30 .	1 .	300
13	( )	-	30	-
14	- 1	2 .	10	20
15	( )	-	15	-
16	-	717 .	15 . 30	7,170
		1,505 .	40 . 55	37,625

: , 2552

4.2

5 (

, 2552)

(1)

(2) 4.35

. ( ) ( )

- 1.4 /
- 471 /
- 800 (684)
- ( )
-

- 10

(3)

(4)

(5) 4.36

“ ”

- 2 (-)
- 4 (-)
- 4 (-)

3 (

, 2552) (1) (2) (3)

(1)

- 4 (.) (.)
13,500 . – 15,000 . 4.37
- 8 (.)
25,000 . – 36,000 . 4.38

(2)

4 8
- 4 (.) 13,500 .
- 4 (.) 15,000 .
- 8 (.)
23,000 . – 24,000 .
- 8 (.)
28,000 . 4.39
- 8 (.) 26,000
. – 28,000 . 3.40

(3)

- (.) 25,000 .
- (.) 24,000 . –
38,000 .

4.35

4.36

4.37

4.38

4.39

4.40

3 (, 2552) (1)

(2) (3)

4.5 - 4.7

4.5

(:)

(.)	
50	45.70
100	91.30
150	137.00
200	182.60
300	260.30
500	406.90
700	544.70
1,000	751.40

: , 2552

4.6

(: 1)

(.)	20		20	
1-100	1,000	1,500	1,400	2,100
101-200	1,900	2,850	2,660	3,990
201-300	2,700	4,050	3,780	5,670
301-400	3,420	5,130	4,788	7,182
401-500	4,070	6,105	5,698	8,547
501-600	4,720	7,080	6,608	9,912
601-700	5,370	8,055	7,518	11,277
701-800	6,020	9,030	8,428	12,642
801-900	6,670	10,005	9,338	14,007
901-1,000	7,320	10,980	10,248	15,372

: , 2552

4.7

(: 1)

(.)			
50	42.50	56.60	39.60
100	84.90	113.10	79.20
150	127.40	169.70	118.80
200	169.80	226.20	158.40
300	245.90	327.60	229.40
400	322.00	429.00	300.40
500	389.30	518.70	363.20
600	456.60	608.40	426.00
700	523.90	698.10	488.80
800	591.20	787.70	551.60
900	658.50	877.50	614.40
1,000	725.80	967.20	677.20

: , 2552

2

( )

4.8

1 2

1

15 - 20

4.5 - 4.7

( ) 30

627.5 . 16,341 (

) 15 627.5 . 8,171

38,000 766.5 . 26,604

15 627.5 . 5,654

4.1 - 4.4

4.9 – 4.12

4.8

	(.)	–	16,341 30
	(.)	–	8,171 15
		–	26,604 38 (38,000)
	(.)	–	5,654 10.38 (7)

: , 2552

4.9

1

1	18 10 30 . . ( )	-	1 .	-
2	-	5 .	15	50
3	( )	-	30	-
4	–	20 .	45	200
5	( )	-	1 . 30	-
6	-	5 .	15	50
7		-	1 .	-
8	– (18)	30 .	1 . 15	300
9	( )	-	1 .	-
10		-	1 .	-
11	–	3.5 .	15	-
12	( )	-	30	-
13	-	624 .	15 . 45	16,341
14	10	-	1 .	-
15	-	627.5 .	16 .	-
16	10	-	1 .	-
17	-	30 .	1 . 15	300
18		-	45	-
19	-	30 .	1 . 15	300
		1,375 .	47 . 15	17,541

: . ,
2552

4.10

2

1	6 5 12 = 336 ( )	-	1 .	-
2	–	25 .	45	200
3	( )	-	1 . 30	-
4	–	5 .	15	40
5		-	45	-
6	–	30 .	1 .	240
7	( )	-	1 .	-
8		-	45	-
9	–	3.5 .	15	-
10	( )	-	30	-
11	-	624 .	15 . 45	8,171
12		-	45	-
13	-	627.5 .	16 .	-
14		-	45	-
15	-	50 .	1 . 30	400
16		-	45	-
17	-	50 .	1 . 30	400
		1,415 .	44 . 45	9,451

:

, 2552

4.11

1

1	38,000 ( )	-	1 .	-
2	( )	-	10	-
3	-	10 .	30	50
4	( )	-	1 .	-
5	–	10 .	30	50
6	( )	-	1 .	-
7	-	763 .	19 .	26,604
8	( )	-	30	-
9	–	3.5 .	15	-
10	( )	-	1 .	-
11	( )	-	1 .	-
12	–	766.5 .	19 . 15	-
13	38,000 ( )	-	1 .	-
14	- . .	48 .	1 . 30	240
15		-	1 .	-
16	(. .)	-	10	-
17	. .–	48 .	1 . 30	240
		1,649 .	51 . 20	27,184

: . ( ), 2552

4.12

2

1	7 ( )	-	1 .	-
2	-	45 .	1 . 30	550
3		-	1 .	-
4	–	45 .	1 . 30	550
5	( )	-	1 .	-
6	6 ( )	-	1 .	-
7	–	624 .	15 . 30	5,654
8	( )	-	30	-
9	–	3.5 .	15	-
10	( )	-	1 .	-
11	–	627.5 .	15 . 45	-
12		-	1 .	-
13	6	-	1 .	-
14	–	5 .	20	50
15	( )	-	1 .	-
16	–	25 .	45	250
17	( )	-	1 .	-
18	–	30 .	1 .	300
		1,485 .	46 . 5	7,354

:

, 2552

5

5 4 (1)
(2)
(3)
(4)

5.1

4
2 (1) (2)
(3) (4) 5.1.1 -5.1.4

5.1.1

3 (, 2553) (1) (Initial Cost)
(2) (Operating Cost) (3) (Running Cost)
(1) (Initial Cost) 18 (
) 2,650,000 (.)
12,000 / (.) 500 / (.)
750,000 /
(2) (Operating Cost)
4
. 200 / / 0.42 / /
250 / / 0.52 / /
(8 / 60 /)
. (:
DDFI) 13.99 / / 0.001 / /

(www.land.co.th) 100 /
/ 0.01 / /
( ) 500 / / 0.05 / /
(20 / 8 / 60 /)
(www.jib.co.th) 30,000 /
5 0.05 / / (20 / 8 / 60 /)
18 2,650,000 10
120 22,083 / 1.02 / (12 / 30
/ 12 / 60 /) (Utilization)
70 1.73 /
12,000 / 1 200 / 60
/ 1,000 / 1 200
/ 5 / 750,000 /
10 500 / 150 /
(3) (Running Cost)
18 6.57 / / 30 (
30) 5.91 / /
2 / 1 /

4

5.1 5.2

3,412,500
19,058

5.1

			( )	( )
1	18 ( )	/ 1 - 0.42 x 10 x 60	252	320.6
		/ 1 - 0.001 x 60 . . x 60	3.6	
		/ 1 - 60 + 5	65	
2	-	/ 1 - 0.52 x 1 x 15	7.8	81.60
		18 / - 1.73 x 15	25.95	
		/ 30 . . - 6.57 x 5	32.85	
		/ 30 . . - 2 x 5	10	
		/ 30 . . - 1 x 5	5	
3	( )	/ 1 - 0.42 x 2 x 30	25.2	29.1
		/ 1 - 0.001 x 30 . . x 30	0.9	
		/ 1 - 0.05 x 2 x 30	3	
4	-	/ 1 - 0.52 x 1 x 45	23.4	292.65
		18 / - 1.73 x 45	77.85	
		/ 30 . . - 6.57 x 20	131.40	
		/ 30 . . - 2 x 20	40	
		/ 30 . . - 1 x 20	20	

5.1

( )

			( )	( )
5	( )	/ 1 - 0.42 x 2 x 90	75.6	87.3
		/ 1 - 0.001 x 30 . . x 90	2.7	
		/ 1 - 0.05 x 2 x 90	9	
6	-	/ 1 - 0.52 x 1 x 15	7.8	81.60
		18 / - 1.73 x 15	25.95	
		/ 30 . . - 6.57 x 5	32.85	
		/ 30 . . - 2 x 5	10	
		/ 30 . . - 1 x 5	5	
7	( )	/ 1 - 0.42 x 2 x 90	75.6	87.3
		/ 1 - 0.001 x 30 . . x 90	2.7	
		/ 1 - 0.05 x 2 x 90	9	
8	- 1	/ 1 - 0.52 x 1 x 10	5.2	41.64
		18 / - 1.73 x 10	17.30	
		/ 30 . . - 6.57 x 2	13.14	
		/ 30 . . - 2 x 2	4	
		/ 30 . . - 1 x 2	2	

5.1

( )

			( )	( )
9	( )	/ 1 - 0.52 x 2 x 60	62.4	86.4
		/ 1 - 0.01 x 30 . . x 60	18	
		/ 1 - 0.05 x 2 x 60	6	
10	-	/ 1 - 0.52 x 1 x 15	7.8	81.60
		18 / - 1.73 x 15	25.95	
		/ 30 . . - 6.57 x 5	32.85	
		/ 30 . . - 2 x 5	10	
		/ 30 . . - 1 x 5	5	
11	( )	/ 1 - 0.52 x 2 x 60	62.4	86.4
		/ 1 - 0.01 x 30 . . x 60	18	
		/ 1 - 0.05 x 2 x 60	6	
12	-	/ 1 - 0.52 x 1 x 10	5.2	41.64
		18 / - 1.73 x 10	17.30	
		/ 30 . . - 6.57 x 2	13.14	
		/ 30 . . - 2 x 5	4	
		/ 30 . . - 1 x 5	2	

5.1

( )

			( )	( )
13	( )	/ 1 - 0.52 x 2 x 30	31.2	43.2
		/ 1 - 0.01 x 30 . . x 30	9	
		/ 1 - 0.05 x 2 x 30	3	
14	-	/ 1 - 0.52 x 1 x 900	468	8,628.3
		18 / - 1.73 x 900	1,557	
		/ 30 . . - 6.57 x 690 .	4,533.3	
		/ 30 . . - 2 x 690	1,380	
		/ 30 . . - 1 x 690	690	
15		/ 1 - 0.52 x 5 x 45	117	402
		/ 1 - 0.05 x 60 . . x 45	135	
		/ 1 - 150	150	
16	-	/ 1 - 0.52 x 1 x 900	468	8,173
		18 / - 1.73 x 900	1,557	
		/ - 5.91 x 690 .	4,078	
		/ - 2 x 690	1,380	
		/ - 1 x 690	690	

5.1

( )

			( )	( )
17	( )	/ 1 - 0.52 x 2 x 15	15.6	21.6
		/ 1 - 0.01 x 30 . . x 15	4.5	
		/ 1 - 0.05 x 2 x 15	1.5	
18	- 1	/ 1 - 0.52 x 1 x 10	5.2	40.32
		18 / - 1.73 x 10	17.3	
		/ - 5.91 x 2 .	11.82	
		/ - 2 x 2	4	
		/ - 1 x 1	2	
19	( )	/ 1 - 0.42 x 2 x 30	25.2	29.1
		/ 1 - 0.001 x 30 . . x 30	0.9	
		/ 1 - 0.05 x 2 x 30	3	
20	-	/ 1 - 0.52 x 1 x 60	31.2	402.3
		18 / - 1.73 x 60	103.8	
		/ - 5.91 x 30 .	177.3	
		/ - 2 x 30	60	
		/ - 1 x 30	30	
				19,058

5.2

.		
-	2,650,000	/
-	762,500	/
	3,412,500	
2.		
2.1		
-	1,772	/ (-)
-	195	/ (-)
-	41	/ (-)
-	3,425	/ (-)
-	-	/ (-)
-	215	/ (-)
	5,648	/ (-)
2.2		
-	9,057	/ (-)
-	-	/ (-)
-	2,902	/ (-)
-	-	/ (-)
-	1,451	/ (-)
	13,410	/ (-)
	19,058	

5.1.2

3 (1) (Initial Cost) (2)
(Operating Cost) (3) (Running Cost)
(1) (Initial Cost) 6 (
) 1,860,000 **(**
) 350 / (www. .com) 150 /
(www.truckthai.com) 350,000 / 500 /
(2) (Operating Cost)
4
. 200 / / 0.42 / /
250 / / 0.52 / /
(8 / 60 /)
. (:
DDFI) 13.99 / / 0.001 / /
(www.land.co.th) 100 /
/ 0.01 / /
( ) 350 / / 0.04
/ / (20 / 8 / 60 /)
(www.jib.co.th) 30,000 /
5 0.05 / / (20 / 8 / 60 /
)
6 1,860,000 10
120 15,500 / 0.72 / (12 / 30 /
12 / 60 /) (Utilization)
70 1.22 /
350 / 1 200 / 1.75
/ 150 / 1 200

/ 0.75 / 500

/ 1 200 / 2.5 /

350,000 / 10 500

/ 70 /

(3) (Running Cost) 6

6.24 / / 15

5.62 / / 1.8 /

1 /

4

5.3

5.4

2,329,900

17,949

5.3

			( )	( )
1	6 5 12 = 336 ( )	/ 1 - 0.42 x 5 x 60	126	728.5
		/ 1 - 0.001 x 50 . . x 60	3	
		/ 1 * - (1.75x336) + (0.75x12) + 2.5	599.50	
2	-	/ 1 - 0.52 x 1 x 45	23.4	304.3
		6 / - 1.22 x 45	54.90	
		/ 15 - 6.24 x 25 .	156	
		/ 15 - 1.8 x 25	45	
		/ 15 - 1 x 25	25	
3	( )	/ 1 - 0.42 x 2 x 90	75.6	87.3
		/ 1 - 0.001 x 30 . . x 90	2.7	
		/ 1 - 0.05 x 2 x 90	9	
4	–	/ 1 - 0.52 x 1 x 15	7.8	71.3
		6 / - 1.22 x 15	18.3	
		/ 15 - 6.24 x 5 .	31.2	
		/ 15 - 1.8 x 5	9	
		/ 15 - 1 x 5	5	

5.3

( )

			( )	( )
5	( )	/ 1 - 0.42 x 2 x 90	75.6	87.3
		/ 1 - 0.001 x 30 . . x 90	2.7	
		/ 1 - 0.05 x 2 x 90	9	
6	- 1	/ 1 - 0.52 x 1 x 10	5.2	35.48
		6 / - 1.22 x 10	12.2	
		/ 15 - 6.24 x 2 .	12.48	
		/ 15 - 1.8 x 2	3.6	
		/ 15 - 1 x 2	2	
7	( )	/ 1 - 0.52 x 2 x 60	62.4	156
		/ 1 - 0.01 x 30 . . x 60	18	
		/ 1 - 0.05 x 2 x 60	75.6	
8	-	/ 1 - 0.52 x 1 x 15	7.8	71.3
		6 / - 1.22 x 15	18.3	
		/ 15 - 6.24 x 5 .	31.2	
		/ 15 - 1.8 x 5	9	
		/ 15 - 1 x 5	5	

5.3

( )

			( )	( )
9	( )	/ 1 - 0.52 x 2 x 60	62.4	156
		/ 1 - 0.01 x 30 . . x 60	18	
		/ 1 - 0.05 x 2 x 60	75.6	
10	–	/ 1 - 0.52 x 1 x 930	483.6	8,036.6
		6 / - 1.22 x 930	1,134.6	
		/ 15 - 6.24 x 710 .	4,430.4	
		/ 15 - 1.8 x 710	1,278	
		/ 15 - 1 x 710	710	
11		/ 1 - 0.52 x 3 x 30	46.8	176.80
		/ 1 - 0.04 x 50 . . x 30	60	
		/ 1 - 70	70	
12	-	/ 1 - 0.52 x 1 x 930	483.6	7,596
		6 / - 1.22 x 930	1,134.6	
		/ - 5.62 x 710 .	3,990	
		/ - 1.8 x 710	1,278	
		/ - 1 x 710	710	

5.3

( )

			( )	( )
13	( )	/ 1 - 0.52 x 2 x 15	15.6	21.6
		/ 1 - 0.01 x 30 . . x 15	4.5	
		/ 1 - 0.05 x 2 x 15	1.5	
14	- 1	/ 1 - 0.52 x 1 x 10	5.2	34.24
		6 / - 1.22 x 10	12.2	
		/ - 5.62 x 2 .	11.24	
		/ - 1.8 x 2	3.6	
		/ - 1 x 2	2	
15	( )	/ 1 - 0.42 x 2 x 30	25.2	29.1
		/ 1 - 0.001 x 30 . . x 30	0.9	
		/ 1 - 0.05 x 2 x 30	3	
16	-	/ 1 - 0.52 x 1 x 60	31.2	357
		6 / - 1.22 x 10	73.2	
		/ - 5.62 x 2 .	168.6	
		/ - 1.8 x 2	54	
		/ - 1 x 2	30	
				17,949

5.4

.		
-	1,860,000	/
-	469,900	/
	2,329,900	
2.		
2.1		
-	1,537	/ (-)
-	110	/ (-)
-	244	/ (-)
-	2,458	/ (-)
-	-	/ (-)
-	600	/ (-)
	4,949	/ (-)
2.2		
-	8,831	/ (-)
-	-	/ (-)
-	2,680	/ (-)
-	-	/ (-)
-	1,489	/ (-)
	13,001	/ (-)
	17,949	

5.1.3

3 (1) (Initial Cost) (2) (Operating Cost) (3) (Running Cost)

(1) (Initial Cost) (truckthai.com) 1,200,000 (( )) 145,000 /

(2) (Operating Cost)

4

. 200 / / 0.42 / / 250 / / 0.52 / / (8 / 60 /)

. (: DDFI) 13.99 / / 0.001 / /

(www.land.co.th) 100 / / 0.01 / / (www.land.co.th) 300 / / 0.03 / / (20 / 8 / 60 /)

(www.jib.co.th) 30,000 / 5 0.05 / / (20 / 8 / 60 /)

1,200,000 10 120 10,000 / 0.46 / (12 / 30 / 12 / 60 /) (Utilization) 70 0.78 /

145,000 / 10 500 / 29 /

(3) (Running Cost)

4.73 / / 38,000

4.26 / / 1.8 /
1 /

4

5.5 5.6

1,345,000
14,886

5.5

			( )	( )
1	( )	/ 1 - 0.52 x 3 x 60	93.6	212.6
		/ 1 - 0.03 x 50 . . x 60	90	
		/ 1 - 29	29	
2	( )	/ 1 - 0.52 x 2 x 10	10.4	20.4
		/ 1 - 0.03 x 30 . . x 10	9	
		/ 1 - 0.05 x 2 x 10	1	
3	-	/ 1 - 0.52 x 1 x 915	475.8	6,837
		/ - 0.78 x 915	713.7	
		/ 38,000 - 4.73 x 750 .	3,547.5	
		/ 38,000 - 1.8 x 750	1,350	
		/ 38,000 - 1 x 750	750	
4	Paperless ( )	/ 1 - 0.52 x 2 x 60	62.4	86.4
		/ 1 - 0.01 x 30 . . x 60	18	
		/ 1 - 0.05 x 2 x 60	6	

5.5

( )

			( )	( )
5	- 1	/ 1 - 0.52 x 1 x 10	5.2	28.06
		/ - 0.78 x 10	7.8	
		/ 38,000 - 4.73 x 2 .	9.46	
		/ 38,000 - 1.8 x 2	3.6	
		/ 38,000 - 1 x 2	2	
6	( )	/ 1 - 0.42 x 2 x 90	75.6	87.3
		/ 1 - 0.001 x 30 . . x 90	2.7	
		/ 1 - 0.05 x 2 x 90	9	
7	- . . ( )	/ 1 - 0.52 x 1 x 90	46.8	478.44
		/ - 0.78 x 90	70.2	
		/ 38,000 - 4.73 x 48 .	227.04	
		/ 38,000 - 1.8 x 48	86.4	
		/ 38,000 - 1 x 48	48	
8		/ 1 - 0.52 x 1 x 30	15.6	16.5
		/ 1 - 0.001 x 30 . . x 30	0.9	
9		/ 1 - 0.42 x 2 x 10	8.4	8.7

5.5

( )

			( )	( )
		/ 1 - 0.001 x 30 . . x 10	0.3	
10		/ 1 - 0.42 x 2 x 60	50.4	82.4
		/ 1 - 0.001 x 50 . . x 60	3	
		/ 1 - 29	29	
11	(. .)	/ 1 - 0.42 x 2 x 10	8.4	9.7
		/ 1 - 0.001 x 30 . . x 10	0.3	
		/ 1 - 0.05 x 2 x 10	1	
12	. . –	/ 1 - 0.52 x 1 x 90	46.8	455.88
		/ - 0.78 x 90	70.2	
		/ - 4.26 x 48 .	204.48	
		/ - 1.8 x 48	86.4	
		/ - 1 x 48	48	
13	( )	/ 1 - 0.42 x 2 x 30	25.2	29.1
		/ 1 - 0.001 x 30 . . x 30	0.9	
		/ 1 - 0.05 x 2 x 30	3	

5.5

( )

			( )	( )
14	- 1	/ 1 - 0.52 x 1 x 10	5.2	27.12
		/ - 0.78 x 10	7.8	
		/ - 4.26 x 2 .	8.52	
		/ - 1.8 x 2	3.6	
		/ - 1 x 2	2	
15	( )	/ 1 - 0.52 x 2 x 15	15.6	21.6
		/ 1 - 0.01 x 30 . . x 15	4.5	
		/ 1 - 0.05 x 2 x 15	1.5	
16	-	/ 1 - 0.52 x 1 x 915	475.8	6,484.5
		/ - 0.78 x 915	713.7	
		/ - 4.26 x 750 .	3,195	
		/ - 1.8 x 750	1,350	
		/ - 1 x 750	750	
				14,886

5.6

.		
-	1,200,000	/
-	145,000	/
	1,345,000	
2.		
2.1		
-	1,421	/ (-)
-	130	/ (-)
-	22	/ (-)
-	1,583	/ (-)
-	-	/ (-)
-	58	/ (-)
	3,214	/ (-)
2.2		
-	7,192	/ (-)
-	-	/ (-)
-	2,880	/ (-)
-	-	/ (-)
-	1,600	/ (-)
	11,672	/ (-)
	14,886	

5.1.4

3 (1) (Initial Cost) (2) (Operating Cost) (3) (Running Cost)

(1) (Initial Cost)

(www.truckthai.com) 1,800,000

(2) (Operating Cost)

4

. 200 / / 0.42 / /

250 / / 0.52 / /

(8 / 60 /)

. (:

DDFI) 13.99 / / 0.001 / /

(www.land.co.th)

( ) 350 /

/ 0.04 / / (20 / 8 / 60 /

) (www.jib.co.th)

30,000 / 5 0.05 / / (20 /

8 / 60 /)

2,450,000

10 120 20,417 / 0.95 / (12

/ 30 / 12 / 60 /)

(Utilization) 70 1.62 /

(3) (Running Cost)

18 6.57 / / 30

5.91 / / 2 /

1 /

120

4

5.7 5.8

1,800,000
17,604

5.7

			( )	( )
1	7 ( )	/ 1 - 0.52 x 4 x 60	124.8	244.8
		/ 1 - 0.04 x 50 . . x 60	120	
2	-	/ 1 - 0.52 x 1 x 930	483.6	8,851.89
		/ - 1.62 x 930	1,506.6	
		/ 7 - 6.57 x 717 .	4,710.69	
		/ 7 - 2 x 717	1,434	
		/ 7 - 1 x 717	717	
3	( )	/ 1 - 0.52 x 2 x 60	62.4	86.4
		/ 1 - 0.01 x 30 . . x 60	18	
		/ 1 - 0.05 x 2 x 60	6	
4	-	/ 1 - 0.52 x 1 x 15	7.8	79.95
		/ - 1.62 x 15	24.3	
		/ 7 - 6.57 x 5 .	32.85	
		/ 7 - 2 x 5	10	
		/ 7 - 1 x 5	5	

5.7

( )

			( )	( )
5	( )	/ 1 - 0.52 x 2 x 60	62.4	86.4
		/ 1 - 0.01 x 30 . . x 60	18	
		/ 1 - 0.05 x 2 x 60	6	
6	- 1	/ 1 - 0.52 x 1 x 10	5.2	40.54
		/ - 1.62 x 10	16.2	
		/ 7 - 6.57 x 2 .	13.14	
		/ 7 - 2 x 2	4	
		/ 7 - 1 x 2	2	
7	( )	/ 1 - 0.42 x 2 x 90	75.6	87.3
		/ 1 - 0.001 x 30 . . x 90	2.7	
		/ 1 - 0.05 x 2 x 90	9	
8	-	/ 1 - 0.52 x 1 x 20	10.4	90.65
		/ - 1.62 x 20	32.4	
		/ 7 - 6.57 x 5 .	32.85	
		/ 7 - 2 x 5	10	
		/ 7 - 1 x 5	5	

5.7

( )

			( )	( )
9	( )	/ 1 - 0.42 x 2 x 60	50.4	58.2
		/ 1 - 0.001 x 30 . . x 60	1.8	
		/ 1 - 0.05 x 2 x 60	6	
10	-	/ 1 - 0.52 x 1 x 45	23.4	335.55
		/ - 1.62 x 45	72.9	
		/ 7 - 6.57 x 25 .	164.25	
		/ 7 - 2 x 25	50	
		/ 7 - 1 x 25	25	
11	( )	/ 1 - 0.42 x 4 x 60	100.8	104.4
		/ 1 - 0.001 x 60 . . x 60	3.6	
12	-	/ 1 - 0.52 x 1 x 60	31.2	395.7
		/ - 1.62 x 60	97.2	
		/ - 5.91 x 30 .	177.3	
		/ - 2 x 30	60	
		/ - 1 x 30	30	

5.7

( )

			( )	( )
13	( )	/ 1 - 0.42 x 2 x 30	25.2	29.1
		/ 1 - 0.001 x 30 . . x 30	0.9	
		/ 1 - 0.05 x 2 x 30	3	
14	- 1	/ 1 - 0.52 x 1 x 10	5.2	39.22
		/ - 1.62 x 10	16.2	
		/ - 5.91 x 2 .	11.82	
		/ - 2 x 2	4	
		/ - 1 x 2	2	
15	( )	/ 1 - 0.52 x 2 x 15	15.6	21.6
		/ 1 - 0.01 x 30 . . x 15	4.5	
		/ 1 - 0.05 x 2 x 15	1.5	
16	-	/ 1 - 0.52 x 1 x 930	483.6	7,052.22
		/ - 1.62 x 930	1,506.6	
		/ - 5.91 x 717 .	3,054.42	
		/ - 2 x 717	1,290.6	
		/ - 1 x 717	717	
				17,604

5.8

.		
-	1,800,000	/
-	-	/
	1,800,000	
2.		
2.1		
-	1,568	/ (-)
-	170	/ (-)
-	32	/ (-)
-	3,272	/ (-)
-	-	/ (-)
-	-	/ (-)
	5,041	/ (-)
2.2		
-	8,197	/ (-)
-	-	/ (-)
-	2,863	/ (-)
-	-	/ (-)
-	1,503	/ (-)
	12,563	/ (-)
	17,604	

5.2

4 4.1
5.1

5.9

5.9

( )	36,275	35,736	32,000	37,625
( )	19,058	17,949	14,886	17,604

5.3

4
2 (1)

(2) (3) (4)
5.3.1 - 5.3.4
5.3.1

3 (, 2553) (1) (Initial Cost)
(2) (Operating Cost) (3) (Running Cost)
(1) (Initial Cost) 18 (
) 2,650,000 (.)
12,000 / (.) 500 / (.)
750,000 / (ALS.) 4101-4154 (
) 11,060,252 (.) ( )
1,200,000
(2) (Operating Cost)
4
. 200 / / 0.42 / /
250 / / 0.52 / /
(8 / 60 /)
. (:
DDFI) 13.99 / / 0.001 / /
(www.land.co.th) 100 /
/ 0.01 / /
( ) 500 / / 0.05 / /
(20 / 8 / 60 /)
(www.jib.co.th) 30,000 /
5 0.05 / / (20 / 8 / 60 /)
18 2,650,000 10
120 22,083 / 1.02 / (12 / 30
/ 12 / 60 /) (Utilization)
70 1.73 /

(ALS.) 4101-4154 11,060,252 30 360
30,723 / 1.42
/ (12 / 30 / 12 / 60 /)
(Utilization) 70 2.41 /
(.) 1,200,000 30 360
3,333 / 0.15 /
(Utilization) 70 0.26 /
12,000 / 1 200 /
60 / 1,000 / 1
200 / 5 /
750,000 / 10 500 /
150 /
(3) (Running Cost)
18 6.57 / / 30
5.91 / / 2 /
1 /
0.80 / / 30 0.65 /
/ 2 /

4

5.10 5.11

15,672,752
13,980

5.10

			( )	( )
1	18 ( )	/ 1 - 0.42 x 10 x 60	252	320.6
		/ 1 - 0.001 x 60 . . x 60	3.6	
		/ 1 - 60 + 5	65	
2	–	/ 1 - 0.52 x 1 x 15	7.8	81.6
		18 / - 1.73 x 15	25.95	
		/ 30 . . - 6.57 x 5	32.85	
		/ 30 . . - 2 x 5	10	
		/ 30 . . - 1 x 5	5	
3	( )	/ 1 - 0.42 x 2 x 30	25.2	29.1
		/ 1 - 0.001 x 30 . . x 30	0.29	
		/ 1 - 0.05 x 2 x 30	3	
4	-	/ 1 - 0.52 x 1 x 45	23.4	292.65
		18 / - 1.73 x 45	77.85	
		/ 30 . . - 6.57 x 20	131.40	
		/ 30 . . - 2 x 20	40	
		/ 30 . . - 1 x 20	20	

5.10

( )

			( )	( )
5	( )	/ 1 - 0.42 x 2 x 90	75.6	87.3
		/ 1 - 0.001 x 30 . . x 90	2.7	
		/ 1 - 0.05 x 2 x 90	9	
6	–	/ 1 - 0.52 x 1 x 15	7.8	81.6
		18 / - 1.73 x 15	25.95	
		/ 30 . . - 6.57 x 5	32.85	
		/ 30 . . - 2 x 5	10	
		/ 30 . . - 1 x 5	5	
7	10	/ 1 - 0.42 x 10 x 60	252	255.6
		/ 1 - 0.001 x 60 . . x 60	3.6	
8	- (18)	/ 1 - 0.52 x 1 x 90	46.8	469.8
		18 / - 1.73 x 90	155.7	
		/ - 5.91 x 30	177.3	
		/ - 2 x 30	60	
		/ - 1 x 30	30	

5.10

( )

			( )	( )
9	( )	/ 1 - 0.42 x 2 x 60	50.4	58.2
		/ 1 - 0.001 x 30 . . x 60	1.8	
		/ 1 - 0.05 x 2 x 60	6	
10		/ 1 - 0.42 x 10 x 60	252	255.6
		/ 1 - 0.001 x 60 . . x 60	3.6	
11	-	/ 1 - 0.52 x 1 x 15	7.8	57.65
		/ - 2.67 x 15	40.05	
		/ 30 . . - 0.8 x 3.5	2.8	
		/ 30 . . - 2 x 3.5	7	
12	( )	/ 1 - 0.52 x 2 x 30	31.2	43.2
		/ 1 - 0.01 x 30 . . x 30	9	
		/ 1 - 0.05 x 2 x 30	3	
13	-	/ 1 - 0.52 x 1 x 945	491.4	4,761.75
		/ - 2.67 x 945	2,523.15	
		/ 30 . . - 0.8 x 624	499.2	
		/ 30 . . - 2 x 624	1,248	

5.10

( )

			( )	( )
14	10	/ 1 - 0.52 x 10 x 60	312	492
		/ 1 - 0.05 x 60 . . x 60	180	
15	-	/ 1 - 0.52 x 1 x 960	499.2	4,725.28
		/ - 2.67 x 960	2,563.2	
		/ 30 . . - 0.65 x 627.5 .	407.88	
		/ 30 . . - 2 x 627.5	1,255	
16	10	/ 1 - 0.52 x 10 x 60	312	557
		/ 1 - 0.05 x 60 . . x 60	180	
		/ 1 - 60 + 5	65	
17	-	/ 1 - 0.52 x 1 x 75	39	455.85
		18 / - 1.73 x 75	129.75	
		/ 30 . . - 6.57 x 30	197.1	
		/ 30 . . - 2 x 30	60	
		/ 30 . . - 1 x 30	30	

5.10

( )

			( )	( )
18		/ 1 - 0.52 x 10 x 45	234	519
		/ 1 - 0.05 x 60 . . x 45	135	
		/ 1 - 150	150	
19	-	/ 1 - 0.52 x 1 x 75	39	436.05
		18 / - 1.73 x 75	129.75	
		/ - 5.91 x 30 .	177.3	
		/ - 2 x 30	60	
		/ - 1 x 30	30	
				13,980

5.11

.		
-	2,650,000	/
-	12,260,252	/
-	762,500	/
	15,672,752	
2.		
2.1		
-	2,959	/ (-)
-	520	/ (-)
-	86	/ (-)
-	545	/ (-)
-	5,126	/ (-)
-	215	/ (-)
	9,451	/ (-)
2.2		
-	749	/ (-)
-	910	/ (-)
-	240	/ (-)
-	2,510	/ (-)
-	120	/ (-)
	4,529	/ (-)
	13,980	

5.3.2

3 (1) (Initial Cost) (2)
(Operating Cost) (3) (Running Cost)
(1) (Initial Cost) 6 (
) 1,860,000 **(**
) 350 / (www. .com) 150 /
(www.truckthai.com) 350,000 / 500 /
(ALS.) 4101-4154 ( )
11,060,252 (.) ( ) 1,200,000
(2) (Operating Cost)
4
. 200 / / 0.42 / /
250 / / 0.52 / /
(8 / 60 /)
. (:
DDFI) 13.99 / / 0.001 / /
(www.land.co.th) 100 /
/ 0.01 / /
( ) 350 / / 0.04
/ / (20 / 8 / 60 /)
(www.jib.co.th) 30,000 /
5 0.05 / / (20 / 8 / 60 /
)
6 1,860,000 10
120 15,500 / 0.72 / (12 / 30 /
12 / 60 /) (Utilization)
70 1.22 /
(ALS.) 4101-4154 11,060,252 30 360

30,723 / 1.42
/ (12 / 30 / 12 / 60 /)
(Utilization) 70 2.41 /
(.) 1,200,000 30 360
3,333 / 0.15 /
(Utilization) 70 0.26 /
350 / 1 200 /
1.75 / 150 / 1
200 / 0.75 /
500 / 1 200 /
2.5 / 350,000 / 10
500 / 70 /
(3) (Running Cost) 6
6.24 / / 15
5.62 / / 1.8 /
1 /
0.70 / / 15 0.65 /
/ 2 /

4

5.12
5.13

14,590,152
13,338

5.12

			( )	( )
1	6 5 12 = 336 ( )	/ 1 - 0.42 x 5 x 60	126	728.5
		/ 1 - 0.001 x 50 . . x 60	3	
		/ 1 - (1.75x336) + (0.75x12) + 2.5	599.5	
2	-	/ 1 - 0.52 x 1 x 45	23.4	304.3
		6 / - 1.22 x 45	54.90	
		/ 15 - 6.24 x 25 .	156	
		/ 15 - 1.8 x 25	45	
		/ 15 - 1 x 25	25	
3	( )	/ 1 - 0.42 x 2 x 90	75.6	87.3
		/ 1 - 0.001 x 30 . . x 90	2.7	
		/ 1 - 0.05 x 2 x 90	9	
4	-	/ 1 - 0.52 x 1 x 15	7.8	71.3
		6 / - 1.22 x 15	18.3	
		/ 15 - 6.24 x 5 .	31.2	
		/ 15 - 1.8 x 5	9	
		/ 15 - 1 x 5	5	

5.12

( )

			( )	( )
5		/ 1 - 0.42 x 5 x 45	94.5	96.75
		/ 1 - 0.001 x 50 . . x 45	2.25	
6	-	/ 1 - 0.52 x 1 x 60	31.2	357
		6 / - 1.22 x 60	73.2	
		/ - 5.62 x 30 .	168.6	
		/ - 1.8 x 30	54	
		/ - 1 x 30	30	
7	( )	/ 1 - 0.42 x 2 x 60	50.4	58.2
		/ 1 - 0.001 x 30 . . x 60	1.8	
		/ 1 - 0.05 x 2 x 60	6	
8		/ 1 - 0.42 x 5 x 45	94.5	97.2
		/ 1 - 0.001 x 60 . . x 45	2.7	
9	-	/ 1 - 0.52 x 1 x 15	7.8	57.3
		/ - 2.67 x 15	40.05	
		/ 15 - 0.7 x 3.5	2.45	
		/ 15 - 2 x 3.5	7	

5.12

( )

			( )	( )
10	( )	/ 1 - 0.52 x 2 x 30	31.2	43.2
		/ 1 - 0.01 x 30 . . x 30	9	
		/ 1 - 0.05 x 2 x 30	3	
11	-	/ 1 - 0.52 x 1 x 945	491.4	4,699.35
		/ - 2.67 x 945	2,523.15	
		/ 15 - 0.7 x 624 .	436.8	
		/ 15 - 2 x 624	1,248	
12		/ 1 - 0.52 x 5 x 45	117	252
		/ 1 - 0.05 x 60 . . x 45	135	
13	-	/ 1 - 0.52 x 1 x 960	499.2	4,725.28
		/ - 2.67 x 960	2,563.2	
		/ 15 - 0.65 x 627.5 .	407.88	
		/ 15 - 2 x 627.5	1,255	
14		/ 1 - 0.52 x 5 x 45	117	252
		/ 1 - 0.05 x 60 . . x 45	135	

5.12

( )

			( )	( )
15	-	/ 1 - 0.52 x 1 x 90	46.8	608.6
		6 / - 1.22 x 90	109.8	
		/ 15 - 6.24 x 50 .	312	
		/ 15 - 1.8 x 50	90	
		/ 15 - 1 x 50	50	
16		/ 1 - 0.52 x 5 x 45	117	322
		/ 1 - 0.05 x 60 . . x 45	135	
		/ 1 - 70	70	
17	-	/ 1 - 0.52 x 1 x 90	46.8	577.6
		6 / - 1.22 x 90	109.8	
		/ - 5.62 x 50 .	281	
		/ - 1.8 x 50	90	
		/ - 1 x 50	50	
				13,338

5.13

.		
-	1,860,000	/
-	12,260,252	/
-	469,900	/
	14,590,152	
2.		
2.1		
-	1,978	/ (-)
-	426	/ (-)
-	18	/ (-)
-	366	/ (-)
-	5,126	/ (-)
-	670	/ (-)
	8,584	/ (-)
2.2		
-	949	/ (-)
-	847	/ (-)
-	288	/ (-)
-	2,510	/ (-)
-	160	/ (-)
	4,754	/ (-)
	13,338	

5.3.3

3 (1) (Initial Cost) (2) (Operating Cost) (3) (Running Cost)

(1) (Initial Cost) (truckthai.com) 1,200,000 (( )) 145,000 / (ALS.) 4101-4154 ( ) 11,060,252 (, 2553) 1,000,000

(2) (Operating Cost) 4 . 200 / / 0.42 / / 250 / / 0.52 / / (8 / 60 /)

. (: DDFI) 13.99 / / 0.001 / / (www.land.co.th) 100 / / 0.01 / / (www.land.co.th) 300 / / 0.03 / / (20 / 8 / 60 /)

(www.jib.co.th) 30,000 / 5 0.05 / / (20 / 8 / 60 /)

1,200,000 10 120 10,000 / 0.46 / (12 / 30 / 12 / 60 /) (Utilization) 70 0.78 /

145,000 / 10 500 / 29 / (ALS.) 4101-4154 11,060,252 30 360

30,723 / 1.42 / (12 / 30 /
12 / 60 /) (Utilization)
70 2.41 / (.)
1,200,000 30 360 3,333
/ 0.15 / (Utilization)
70 0.26 /
(3) (Running Cost)
4.73 / / 38,000
4.26 / / 1.8 /
1 /
0.70 / / 15
0.65 / / 2 /

4

5.14 5.15

13,405,252
13,320

5.14

			( )	( )
1	38,000 ( )	/ 1 - 0.52 x 3 x 60	93.6	212.6
		/ 1 - 0.03 x 50 . . x 60	90	
		/ 1 - 29	29	
2	( )	/ 1 - 0.52 x 2 x 10	10.4	20.4
		/ 1 - 0.03 x 30 . . x 10	9	
		/ 1 - 0.05 x 2 x 10	1	
3	–	/ 1 - 0.52 x 1 x 120	62.4	645.45
		/ - 0.78 x 120	93.6	
		/ 38,000 - 4.73 x 65 .	307.45	
		/ 38,000 - 1.8 x 65	117	
		/ 38,000 - 1 x 65	65	
4	( )	/ 1 - 0.52 x 3 x 60	93.6	212.6
		/ 1 - 0.03 x 50 . . x 60	90	
		/ 1 - 29	29	

5.14

( )

			( )	( )
5	–	/ 1 - 0.52 x 1 x 60	31.2	289.8
		/ - 0.78 x 60	46.8	
		/ - 4.26 x 30 .	127.8	
		/ - 1.8 x 30	54	
		/ - 1 x 30	30	
6	( )	/ 1 - 0.52 x 3 x 60	93.6	212.6
		/ 1 - 0.03 x 50 . . x 60	90	
		/ 1 - 29	29	
7	-	/ 1 - 0.52 x 1 x 1,140	592.8	5,696.7
		/ - 2.67 x 1,140	3,043.8	
		/ 38,000 - 0.7 x 763 .	534.1	
		/ 38,000 - 2 x 763	1,526	
8	( )	/ 1 - 0.52 x 2 x 30	31.2	43.2
		/ 1 - 0.01 x 30 . . x 30	9	
		/ 1 - 0.05 x 2 x 30	3	

5.14

( )

			( )	( )
9	-	/ 1 - 0.52 x 1 x 15	7.8	57.3
		/ - 2.67 x 15	40.05	
		/ 38,000 - 0.7 x 3.5 .	2.45	
		/ 38,000 - 2 x 3.5	7	
10	( )	/ 1 - 0.52 x 2 x 60	62.4	70.2
		/ 1 - 0.01 x 30 . . x 60	1.8	
		/ 1 - 0.05 x 2 x 60	6	
11	38,000 ( )	/ 1 - 0.52 x 3 x 60	50.4	82.4
		/ 1 - 0.001 x 50 . . x 60	3	
		/ 1 - 29	29	
12	–	/ 1 - 0.52 x 1 x 1,155	499.2	4,725.28
		/ - 2.67 x 1,155	2,563.2	
		/ - 0.65 x 766.5 .	407.88	
		/ - 2 x 766.5	1,255	

5.14

( )

			( )	( )
13	- . . ( )	/ 1 - 0.52 x 1 x 90	46.8	478.44
		/ - 0.78 x 90	70.2	
		/ 38,000 - 4.73 x 48 .	227.04	
		/ 38,000 - 1.8 x 48	86.4	
		/ 38,000 - 1 x 48	48	
14		/ 1 - 0.42 x 3 x 60	75.6	107.6
		/ 1 - 0.001 x 50 . . x 60	3	
		/ 1 - 29	29	
15	. . ( )	/ 1 - 0.42 x 2 x 10	8.4	9.7
		/ 1 - 0.001 x 30 . . x 10	0.3	
		/ 1 - 0.05 x 2 x 10	1	
16	–	/ 1 - 0.52 x 1 x 90	46.8	455.88
		/ - 0.78 x 90	70.2	
		/ - 4.26 x 48 .	204.48	
		/ - 1.8 x 48	86.4	
		/ - 1 x 48	48	
				13,320

5.15

.		
-	1,200,000	/
-	12,060,252	/
-	145,000	/
	13,405,252	
2.		
2.1		
-	1,806	/ (-)
-	296	/ (-)
-	11	/ (-)
-	281	/ (-)
-	5,647	/ (-)
-	145	/ (-)
	8,186	/ (-)
2.2		
-	867	/ (-)
-	944	/ (-)
-	344	/ (-)
-	2,788	/ (-)
-	191	/ (-)
	5,134	/ (-)
	13,320	

5.3.4

3 (1) (Initial Cost) (2) (Operating Cost) (3) (Running Cost)

(1) (Initial Cost)

(www.truckthai.com) 1,800,000 (ALS.) 4101-4154 ( ) 11,060,252 (.) (, 2553) 800,000

(2) (Operating Cost)

2

. 200 / / 0.42 / /

250 / / 0.52 / /

(8 / 60 /)

. (:

DDFI) 13.99 / / 0.001 / /

(www.land.co.th)

( ) 350 /

/ 0.04 / / (20 / 8 / 60 /

) (www.jib.co.th)

30,000 / 5 0.05 / / (20 /

8 / 60 /)

2,450,000

10 120 20,417 / 0.95 / (12

/ 30 / 12 / 60 /)

(Utilization) 70 1.62 /

(ALS.) 4101-4154 11,060,252 30

360 30,723 /

1.42 / (12 / 30 / 12 / 60 /)

(Utilization) 70 2.41 /

150

(.) 800,000 30 360
2,222 / 0.1 /
(Utilization) 70 0.17 /
(3) (Running Cost)
18 6.57 / / 30
5.91 / / 2 /
1 /
30 0.80 /
0.65 / 2 /

4

5.16 5.17

2,662,500
12,246

5.16

			( )	( )
1	7 ( )	/ 1 - 0.52 x 3 x 60	93.6	183.6
		/ 1 - 0.03 x 50 . . x 60	90	
2	-	/ 1 - 0.52 x 1 x 90	46.8	718.95
		/ - 1.62 x 90	145.8	
		/ 7 - 6.57 x 55 .	361.35	
		/ 7 - 2 x 55	110	
		/ 7 - 1 x 55	55	
3		/ 1 - 0.52 x 3 x 60	93.6	243.6
		/ 1 - 0.05 x 50 . . x 60	150	
4	–	/ 1 - 0.52 x 1 x 90	46.8	682.65
		/ - 1.62 x 90	145.8	
		/ - 5.91 x 55 .	325.05	
		/ - 2 x 55	110	
		/ - 1 x 55	55	

5.16

( )

			( )	( )
5	( )	/ 1 - 0.52 x 2 x 60	62.4	158.4
		/ 1 - 0.05 x 30 . . x 60	90	
		/ 1 - 0.05 x 2 x 60	6	
6	7 ( )	/ 1 - 0.52 x 3 x 60	93.6	243.6
		/ 1 - 0.05 x 50 . . x 60	150	
7	-	/ 1 - 0.52 x 1 x 930	483.6	4,630.2
		/ - 2.58 x 930	2,399.4	
		/ 7 - 0.8 x 624 .	499.2	
		/ 7 - 2 x 624	1,248	
8	( )	/ 1 - 0.52 x 2 x 30	31.2	43.2
		/ 1 - 0.01 x 30 . . x 30	9	
		/ 1 - 0.05 x 2 x 30	3	
9	-	/ 1 - 0.52 x 1 x 15	7.8	56.3
		/ - 2.58 x 15	38.7	
		/ 7 - 0.8 x 3.5 .	2.8	
		/ 7 - 2 x 3.5	7	

5.16

( )

			( )	( )
10	( )	/ 1 - 0.42 x 2 x 60	62.4	70.2
		/ 1 - 0.001 x 30 . . x 60	1.8	
		/ 1 - 0.05 x 2 x 60	6	
11	–	/ 1 - 0.52 x 1 x 945	491.4	4,592.38
		/ - 2.58 x 945	2,438.1	
		/ - 0.65 x 627.5 .	407.88	
		/ - 2 x 627.5	1,255	
12		/ 1 - 0.52 x 3 x 60	50.4	53.4
		/ 1 - 0.001 x 50 . . x 60	3	
13	6	/ 1 - 0.52 x 3 x 60	50.4	53.4
		/ 1 - 0.001 x 50 . . x 60	3	
14	-	/ 1 - 0.52 x 1 x 20	10.4	90.65
		/ - 1.62 x 20	32.4	
		/ 7 - 6.57 x 5 .	32.85	
		/ 7 - 2 x 5	10	
		/ 7 - 1 x 5	5	

5.16

( )

			( )	( )
15	( )	/ 1 - 0.42 x 2 x 60	50.4	58.2
		/ 1 - 0.001 x 30 . . x 60	1.8	
		/ 1 - 0.05 x 2 x 60	6	
16	-	/ 1 - 0.52 x 1 x 60	31.2	367.65
		/ - 1.62 x 60	97.2	
		/ 7 - 6.57 x 25 .	164.25	
		/ 7 - 2 x 25	50	
		/ 7 - 2 x 25	25	
17	( )	/ 1 - 0.42 x 3 x 60	50.4	53.4
		/ 1 - 0.001 x 50 . . x 60	3	
18	–	/ 1 - 0.52 x 1 x 60	31.2	395.7
		/ - 1.62 x 60	97.2	
		/ - 5.91 x 30 .	177.3	
		/ - 2 x 30	60	
		/ - 1 x 30	30	
				12,246

5.17

.		
-	1,800,000	/
-	11,860,252	/
-	-	/
	13,660,252	
2.		
2.1		
-	1,706	/ (-)
-	499	/ (-)
-	21	/ (-)
-	421	/ (-)
-	4,876	/ (-)
-	-	/ (-)
	7,523	/ (-)
2.2		
-	884	/ (-)
-	910	/ (-)
-	280	/ (-)
-	2,510	/ (-)
-	140	/ (-)
	4,723	/ (-)
	12,246	

5.4

4 4.2

5.3

5.18

5.18

( )	17,541	9,451	27,184	7,354
( )	13,980	13,338	13,320	12,246

6

6 2 (1)

- - -

(2)

6.1

2

6.1

6.2 -

- -

6.1 6.2

1,451 41 30 1,375

47 15 19,058

13,980

1,489 40 50

1,415 44 45

17,949 13,338

1,600 40 5

6.1

1.								
1.1								
-	1,772	2,959	1,537	1,978	1,421	1,806	1,568	1,706
-	195	520	110	426	130	296	170	499
-	41	86	244	18	22	11	32	21
-	3,425	545	2,458	366	1,583	281	3,272	421
-	-	5,126	-	5,126	-	5,647	-	4,876
-	215	215	600	670	58	145	-	-
	5,648	9,451	4,949	8,584	3,214	8,186	5,041	7,523
1.2								
-	9,057	749	8,831	949	7,192	867	8,197	884
-	-	910	-	847	-	944	-	910
-	2,902	240	2,680	288	2,880	344	2,863	280
-	-	2,510	-	2,510	-	2,788	-	2,510
-	1,451	120	1,489	160	1,600	191	1,503	140
	13,410	4,529	13,001	4,754	11,672	5,134	12,563	4,723
	19,058	**13,980**	**17,949**	**13,338**	**14,886**	**13,320**	**17,604**	**12,246**

6.2

(.)	1,451	1,375	1,489	1,415	1,600	1,649	1,505	1,485
( )	2,490	2,835	2,450	2,685	2,405	3,080	2,455	2,765
( )	19,058	13,980	17,949	13,338	14,886	13,320	17,604	12,246

1,649 51 20
14,886
13,320 1,505
40 55 1,485
46 5 17,604
12,246 6.1

(
)
( )
( )
( )

5
3
7
1

160

12

9

1

11

80 50

(Door to Door)

(Multimodal)

27

26

11

30

6.2

-

(Responsiveness)

(Holding Cost)

(Opportunity Cost)

(360 / 24 / 60 /) 5

30
75,000 (Holding Cost)
2.48 13,980
13,982.48
19,058 336
504,000 (Holding Cost)
11.28
13,338 13,349.28
17,949 38,000
1,444,000 (Holding
Cost) 93.83
13,320 13,413.83
14,886 7
4,760,000
(Holding Cost) 142.32
12,246 12,388.32
17,604 6.3

27

6.3

(Holding Cost)

( )	19,058	13,982	17,949	13,349	14,886	13,414	17,604	12,388

26 9
30

25
4 1
0.37
19
3 0.93
0.26

2551 3.3 3.6
, ,
, , , , ,
, , ,
115,007,901 8,936,805 67,805,882
5,569,354 197,319,942
31
2
80,033,342
277,353,284

243,924,290

33,428,994 12

4 (-

)

23,715,000 8,537,400,000 (360)

75 25

2,134,350,000

50

3,201,525,000

6.2

2553 AFTA

-

6.4

	( )										
( )	30	35	40	45	50	55	60	65	70	75	80
	19,058	20,201	21,414	22,698	24,060	25,504	27,034	28,656	30,376	32,198	34,130
	13,980	14,260	14,545	14,836	15,132	15,435	15,744	16,059	16,379	16,707	17,042
	17,949	19,026	20,167	21,378	22,660	24,020	25,461	26,989	28,608	30,324	32,144
	13,338	13,605	13,877	14,154	14,437	14,726	15,021	15,321	15,628	15,940	16,259
	14,886	15,779	16,726	17,729	18,793	19,921	21,116	22,383	23,726	25,150	26,659
	13,320	13,586	13,858	14,135	14,418	14,706	15,000	15,300	15,607	15,919	16,237
	17,604	18,660	19,780	20,967	22,225	23,558	24,972	26,470	28,058	29,742	31,526
	12,246	12,491	12,741	12,996	13,255	13,521	13,791	14,067	14,348	14,635	14,928

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10 2543 - 2549

10 2543 ( )

2543		
		( )
1		230,165,618
2		50,130,837
3		32,083,563
4		17,295,505
5		15,076,196
6		10,820,779
7		4,815,362
8		2,206,661
9		2,134,317
10		1,984,080

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10 2544 ( )

2544		
		( )
1		362,348,343
2	37%	85,978,592
3		52,214,860
4		33,283,892
5		25,007,212
6		11,233,164
7		10,189,911
8		9,012,522
9		7,329,499
10		5,824,860

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10 2545 ( )

2545		
		( )
1		421,201,941
2		39,217,959
3		27,197,793
4		16,643,845
5		12,238,283
6		9,806,886
7		8,793,098
8		6,331,655
9	37%	5,979,090
10		5,576,129

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10 2546 ( )

2546		
		( )
1		428,270,502
2		67,439,991
3		48,015,719
4		32,087,943
5		18,980,468
6		14,724,022
7		11,866,722
8		10,929,777
9		9,306,410
10		8,984,648

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10 2547 ( )

2547		
		( )
1		201,542,794
2		94,951,752
3		35,418,628
4		10,973,039
5		9,366,699
6		8,840,724
7		7,226,386
8		6,743,740
9		6,117,500
10	-	5,083,671

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10 2548 ( )

2548		
		( )
1		667,417,697
2		189,942,163
3		82,033,783
4	-	60,488,427
5		44,559,647
6		43,277,397
7		18,475,482
8		17,237,816
9		14,221,281
10		11,919,900

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10 2549 ( )

2549		
		( )
1		749,352,829
2		81,616,953
3		59,072,446
4		24,037,514
5		18,813,436
6		17,493,389
7		15,679,695
8		14,931,397
9		13,541,274
10		12,528,578

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10 2543 ( )

2543		
		( )
1		599,426,582
2		336,510,734
3		225,304,326
4		225,105,056
5		205,392,548
6		167,932,507
7		137,950,288
8		89,931,221
9		86,855,023
10		77,079,352

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10 2544 ( )

2544		
		( )
1		1,634,490,882
2		502,601,670
3		143,120,929
4		123,335,487
5		122,986,788
6		85,678,907
7		80,700,674
8		61,299,336
9		44,804,101
10		38,669,956

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10 2545 ( )

2545		
		( )
1		1,297,751,692
2		729,602,264
3	/	207,942,772
4		119,633,290
5		85,788,612
6		66,613,199
7		55,290,391
8		53,704,893
9		46,349,849
10		34,487,257

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10 2546 ( )

2546		
		( )
1		1,492,023,215
2		394,579,112
3		270,168,593
4		131,239,257
5		123,047,000
6		113,004,432
7		109,452,797
8		84,199,416
9		82,790,923
10		58,125,443

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10 2547 ( )

2547		
		( )
1		1,368,870,690
2	,	805,621,725
3		174,102,210
4		143,655,497
5		115,470,620
6		96,877,252
7		95,769,206
8		88,073,313
9	100%	87,958,054
10		84,608,424

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10 2548 ( )

2548		
		( )
1		2,791,468,919
2		648,983,596
3		607,169,688
4		388,627,040
5		276,084,021
6		228,377,559
7	2	223,994,899
8		214,919,740
9		207,701,415
10		175,526,383

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10 2549 ( )

2549		
		( )
1		3,278,394,278
2		1,124,150,245
3		1,013,665,446
4		933,646,434
5		660,186,034
6		282,676,165
7		273,741,254
8		230,987,964
9		230,614,153
10		225,402,939

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