APPENDIX 2

Alternative Modes and Routes of Logistic Flow

1 General

This appendix is to be supplement of main volume Chapter 2.8. Main contents are explanation of the comparative analysis of alternative routes of the logistic flow. In this study, major logistic flow is picked up the following corridor:

(1) Phnom Penh ～ Bangkok

(2) Phnom Penh ～ Ho Chi Ming

(3) Phnom Penh ～ Sihanoukville

(4) Bangkok ～ Ho Chi Ming

They are as follows:

2 Phnom Penh - Bangkok

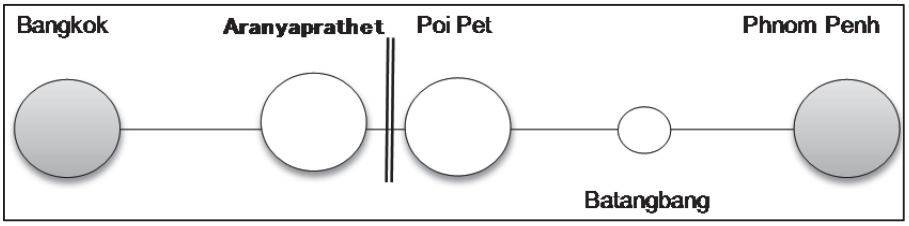
There are the following three (3) alternative routes. Alternative 2 route can be sub-divided into two (2):

- Alt.1 : By land transport (truck)
- Alt.2a) : By maritime transport and truck (Bangkok - Sihanoukville port - Phnom Penh)
- Alt.2b) : By maritime transport and rail (Bangkok - Sihanoukville port - Phnom Penh)
- Alt.3 : By maritime transport and inland water transport (Bangkok - Cai Mep port - Phnom Penh port)

Figure 2-1 Alternative Modes and Routes

(1) Land Transport by Truck

In case of the land transport route using truck between Phnom Penh and Bangkok, it starts from Phnom Penh, runs on NR 5 to Poi Pet via Batangbang. At the Poi Pet, export custom clearance of the transport goods is made and then import custom clearance at Aranyaphratet is made. After the import custom clearance, the truck passes through on NR 33 and arrives in Bangkok.



The transport time from Phnom Penh to Bangkok is about 25 hours including export and import custom clearance at Poi Pet/Aranyaprathate. Total logistic cost between the same sections is expensive compared with same distance logistics route. This is as following reasons:

Local trucking industry is poor

Additional administrative cost of Custom clearance is required

Road condition in Cambodia side is comparatively poor

There are high occurrence of traffic accident risk

Table 2-1 Transport Time and Cost between Bangkok and Phnom Penh

	Bangkok - Aranyapratheat	Custom Clearance	Poipet - Phnom Penh	Total
Distance (km)	250		410	660
Transport Time (hr)	5.0	6.0 - 9.0	14.0	25.0
Logistics Cost (US$)	1,400 - 1,850			

(2) Maritime transport and truck (Bangkok - Sihanoukville port - Phnom Penh)

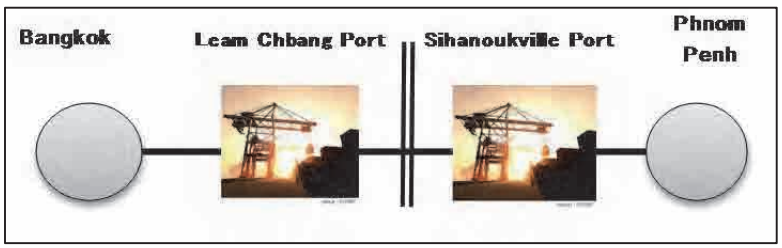


Table 2-2 Transport Time and Cost between Bangkok and Phnom Penh

	Transport from Bangkok to Leam Chabang Port	Custom Clearance at Leam Chabang	Transport from Leam Chabang to Sihanoukville Port	Custom Clearance at Sihanouk Port	Transport from Sihanoukville Port to Phnom Penh	Total
Distance (km)	150				230	
Transport Time (hr)	3.0	12.0	30.0	12.0	7.5	64.5
Logistics Cost (US$)	1,300 - 1,500					

1. Maritime Transport and Inland Water Transport (Bangkok - Cai Mep port - Phnom Penh port)

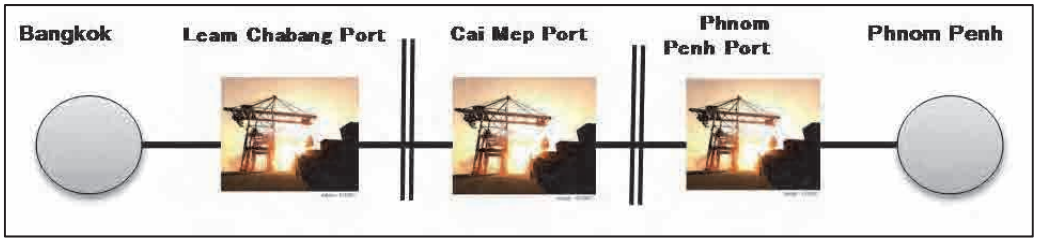


Table 2-3 Transport Time and Cost between Bangkok and Phnom Penh

	Transport from Bangkok to Leam Chabang Port	Custom Clearance at Leam Chabang	Transport from Leam Chabang to Cai Mep Port	Transport from Cai Mep Port to Phnom Penh Port	Custom Clearance at Phnom Penh Port	Transport from Phnom Penh Port to Phnom Penh	Total
Distance (km)	150					50	
Transport Time (hr)	3.0	12.0	30.0	20.0	6.0	2.0	65.0
Logistics Cost (US$)	1,200 - 1,300						

(3) Summary

Table 2-4 Transport Time and Cost between Bangkok and Phnom Penh

Alt.	Route	Transport Time (hr.)	Transport Cost (USD)
Alt.1	Land Transport by Truck	25	1,400 - 1,850
Alt. 2	Maritime and Land Transport by Truck	65 (3 day)	1,300 - 1,500
Alt.3	Maritime and Inland Water Transport	69 (3 day)	1,200 -1,300

3 Phnom Penh - Ho Chi Minh

(1) Alternative Modes and Routes

There are two alternative modes and routes as follows:

- Alt. 1: By land transport (truck)
- Alt. 2: By inland water transport

(2) Land Transport by Truck

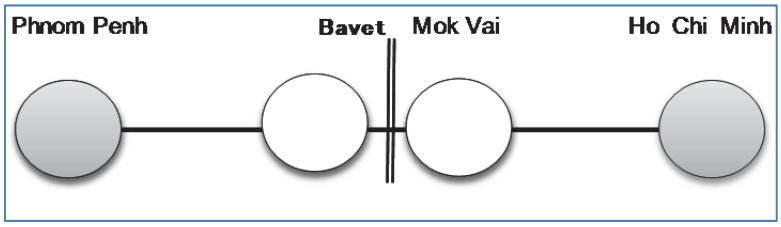


Table 3-1 Transport Time and Cost between Phnom Penh and Ho Chi Minh

	Phnom Penh - Bavet	Custom Clearance	Mok Bai - Ho Chi Minh	Total
Distance (km)	167	-	70	237
Transport Time (hr)	6.5	3.5 -5.0	3.0	13.0
Logistics Cost (US$)	750 - 1,050			

(3) Inland Water Transport by Berge

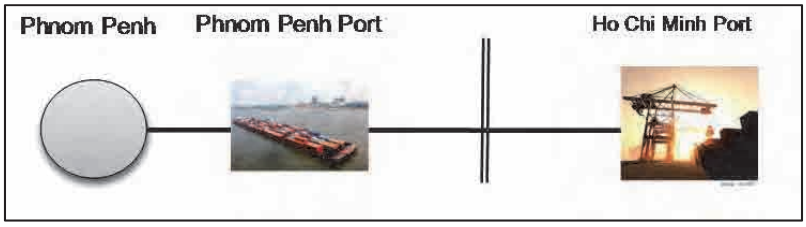


Table 3-2 Transport Time and Cost between Phnom Penh and Ho Chi Minh

	Phnom Penh - Border	Custom Clearance	Border - Ho Chi Minh Port	Total
Distance (km)	-	-	-	350
Transport Time (hr)	12.0	6.0	18.0	36.0
Logistics Cost (US$)	Transport cost Logistics cost Total (455～515) + (250～300) = 700～815			

4 Bangkok - Ho Chin Minh

(1) Alternative Route

There are two routes between Bangkok and Ho Chi Minh.

- Alt. 1: By land transport (truck)
- Alt. 2: By maritime transport

(2) Alt.1 Land Transport by Truck

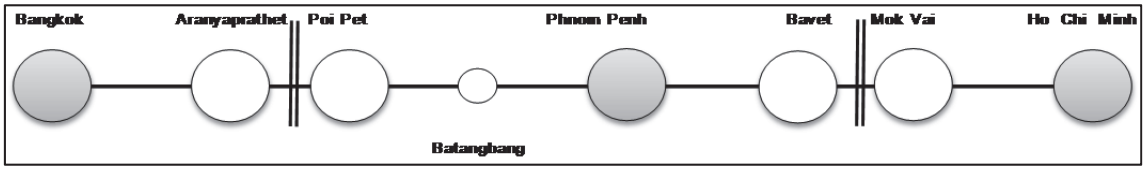


Table 4-1 Transport Time and Cost between Bangkok and Ho Chi Minh

	Bankok - Aranyaprathet	Custom Clearance	Poipet - Phnom Penh	Total	Phnom Penh - Bavet	Custom Clearance	Mok Bai - Ho Chi Minh	Total
Distance (km)	250		410	660	167	-	70	237
Transport Time (hr)	8.0	6.0 - 9.0	10.0	25.0	4.0	3.5 -5.0	5.0	13.0
Logistics Cost (US$)	1,400 - 1,850				750 - 1,050			

(3) Maritime Transport by Ship

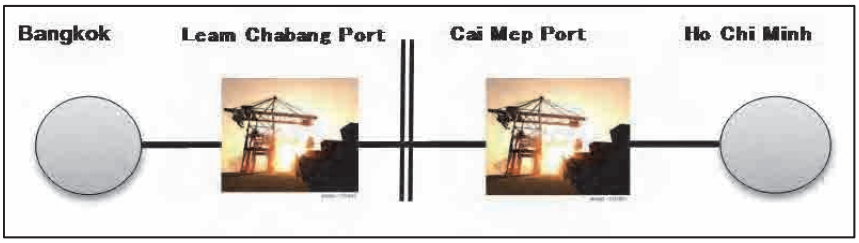


Table 4-2 Transport Time and Cost between Bangkok and Ho Chi Minh

	Transport from Bangkok to Leam Chabang Port	Custom Clearance at Leam Chabang	Transport from Leam Chabang to Cai Mep Port	Custom Clearance at Cai Mep Port	Transport from Cai Mep Port to Ho Chi Minh	Total
Distance (km)	150				80	
Transport Time (hr)	5.0	12.0	30.0	12.0	6.0	65.0
Logistics Cost (US$)	1,000 - 1,200					

5 Phnom Penh to World

(1) Phnom Penh ～ Japan or North America

There are three (3) alternative routes:

Phnom Penh - Phnom Penh Port - Cai Mep Port - Japan or North America

Phnom Penh - Sihanouk Port - Singapore - Japan or North America

Phnom Penh - Poipet -Aranyaprathet - Leam Chabang Port - Japan or North America

Table 5-1 Transport Time and Cost between Phnom Penh SEZ and Japan (Nagoya)

Route	Route 1 a	Route 1 b	Route 2	Route 3
	PP - PP Port -Cai Mep - Japan	**PP Bavet/Mokvai - Cai Mep Port ~ Japan**	**PP - Sihanouk Port - Singapore - Japan**	**PP Poipet -Aranyaprathet - Leam Chabang Port - Japan**
Transport Time (day)	16 ~ 19	15 ~18	19 ~23	n/a
Transport Cost (USD)	1,900	2,000	2,100	n/a
Shipping Service	・Frequent shipping service	・Frequent shipping service	・Not frequent shipping service between Sihanoukville to S'pore	・Frequent shipping service
Risk	・Flood of river ・Need to maintain shipping route	・Road condition of NR 1 ・Traffic accident risk	・Road condition of NR 1 ・Traffic accident risk	・Road condition of NR 5 ・Traffic accident risk
Evaluation	・Most popular route ・Cheaper route	・Second popular route ・Second cheaper route	・Not popular route ・Not cheaper route	・Not popular route ・Expensive route

Source: Logistics condition in Cambodia, T. Ito, July 2012.
JICA Survey Team

Phnom Penh SEZ ~ Nagoya Port

Route	Transshipment Place	Transport Time (days)	Transport Cost (USD)	Evaluation
1	Phnom Penh Port ~ Cai Mep Port ~ Nagoya Port	16~ 19 days	USD 1,900	◎
2	Sihanoukville Port ~ S'pore Port ~ Nagoya Port	19 ~ 23 days	USD 2,100	△

Notes: Export cargoes from Phnom Penh SEZ are transported using Route 1 due to cheaper transport cost
Source: Logistics condition in Cambodia, T. Ito, July 2012.

Phnom Penh SEZ ~ North America (Long Beach Port)

Route	Transshipment Place	Transport Time (days)	Transport Cost (USD)	Evaluation
1	Phnom Penh Port ~ Cai Mep Port ~ Long Beach Port	28~ 33 days	USD 4,100	○
2	Sihanoukville Port ~ S'pore Port ~ Long Beach Port	28 ~ 31 days	USD 4,000	◎

Notes: Export cargoes to North America from Phnom Penh SEZ are transported using Route 2 due to transport cost being cheaper (Transport capacity form S'pore is bigger).
Source: Logistics condition in Cambodia, T. Ito, July 2012.

(2) Phnom Penh ～ Europe

Route	Route 1 a	Route 1 b	Route 2	Route 3
	PP - PP Port -Cai Mep - Europe	**PP Bavet/Mokvai - Cai Mep Port -Europe**	**PP - Sihanouk Port - Singapore - Europe**	**PP Poipet -Aranyaprathet - Leam Chabang Port - Europe**
Transport Time (day)	n/a	n/a	28 -31	n/a
Transport Time (USD)	n/a	n/a	5,100	n/a
Shipping Service	・No frequent shipping service to Europe	・No frequent shipping service	・No frequent but convenient shipping service between Sihanoukville to S'pore	・Frequent shipping service
Risk	・Flood of river ・Need to maintain shipping route	・Road condition of NR 1 ・Traffic accident risk	・Road condition of NR 4 ・Traffic accident risk	・Road condition of NR 5 ・Traffic accident risk
Evaluation	・Popular route ・Not so cheaper route	・Popular route ・Not so cheaper route	・The most popular route ・Cheaper route	・Not popular route ・Expensive route

Source: JICA Survey team

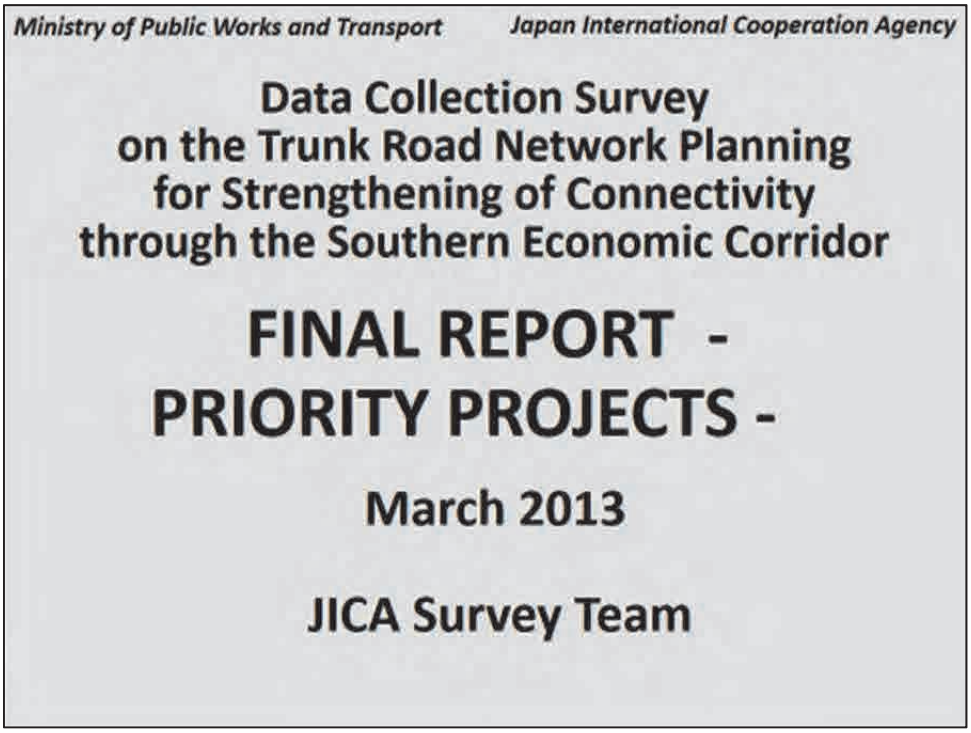
Phnom Penh SEZ ~ Europe (Rotterdam Port)

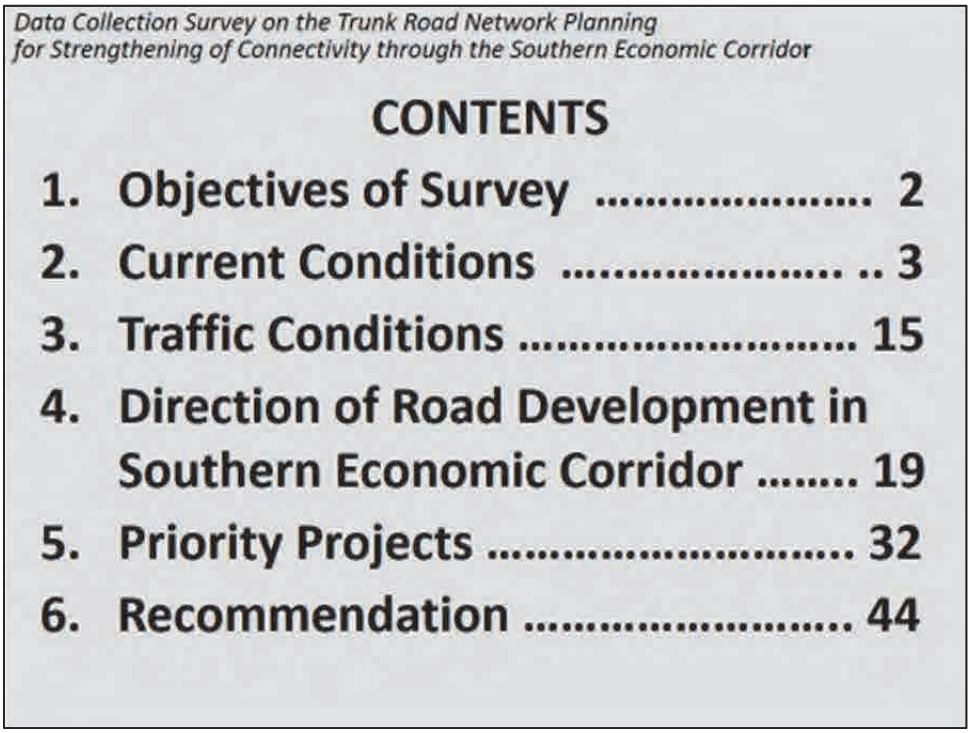
	Transport Time (days)	**Transport Cost (USD)**	**Evaluation**
Phnom Penh Port ~ Cai Mep Port ~ Rotterdam Port	n/a	n/a	n/a
Sihanoukville Port ~ S'pore Port ~ Rotterdam Port	28 ~ 31 days	USD 5,100	◎

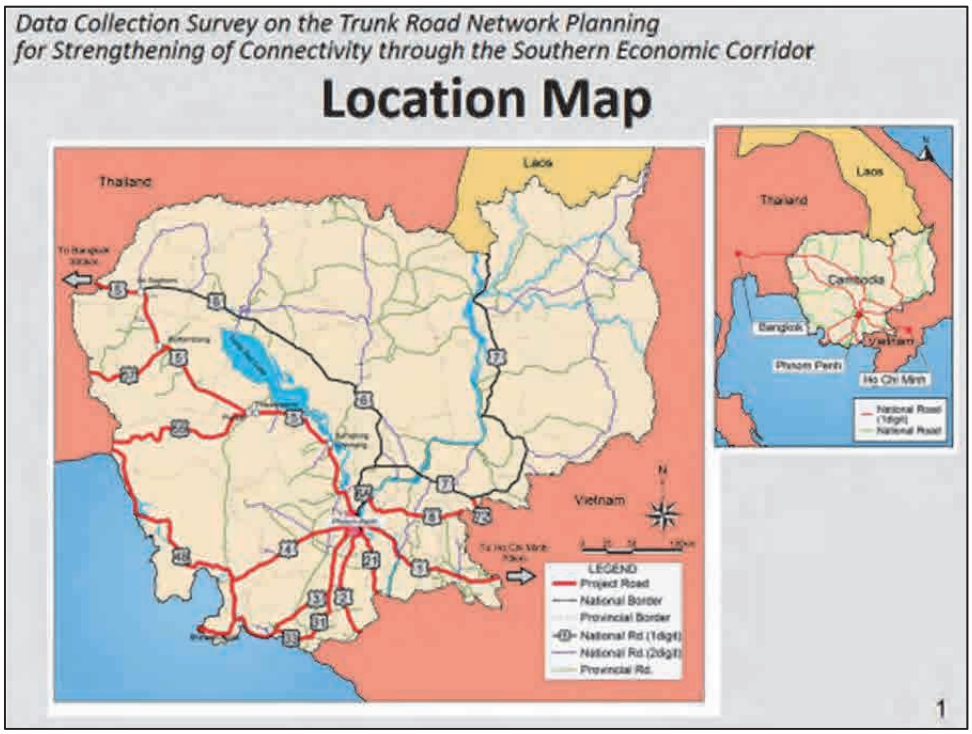
Source: Logistics condition in Cambodia, T. Ito, July 2012.

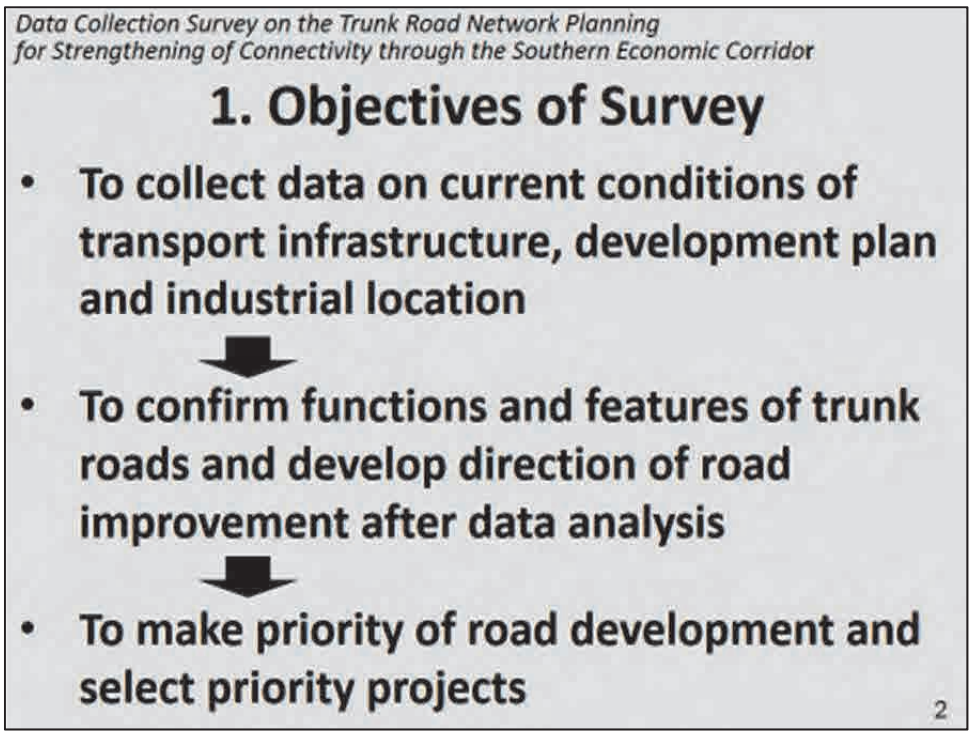
APPENDIX 3

Appendix 3 Presentation Documents






Data Collection Survey on the Trunk Road Network Planning
for Strengthening of Connectivity through the Southern Economic Corridor
Location Map
Thailand
Laos
Vietnam
Cambodia
Bangkok
Phnom Penh
Ho Chi Minh
LEGEND
Project Road
National Border
Provincial Border
National Rd (1digit)
National Rd (2digit)
Provincial Rd.
1


Data Collection Survey on the Trunk Road Network Planning
for Strengthening of Connectivity through the Southern Economic Corridor
1. Objectives of Survey
• To collect data on current conditions of transport infrastructure, development plan and industrial location
• To confirm functions and features of trunk roads and develop direction of road improvement after data analysis
• To make priority of road development and select priority projects
2

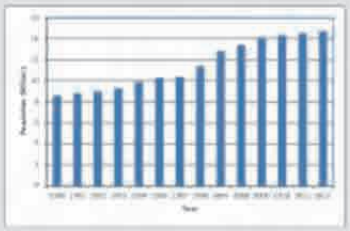
Data Collection Survey on the Trunk Road Network Planning
for Strengthening of Connectivity through the Southern Economic Corridor

2. Current Conditions
- Socio Economy (1) -

- **Population Trend**

  14.5million in 2012

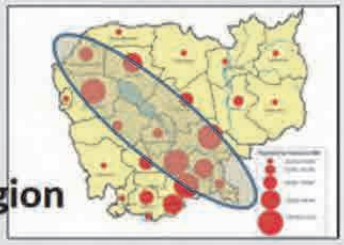
  Growth rate 2 % / year



- **Population Distribution**

  Population in SEC concentrated

  SEC: Plain & Tonle Sap Region



3

Data Collection Survey on the Trunk Road Network Planning
for Strengthening of Connectivity through the Southern Economic Corridor

2. Current Conditions
- Socio Economy (2) -

- **Gross Domestic Product (GDP)**

  USD 12,890 million in 2011

  Growth rate 13 % / year

- **GDP per Capita**

  USD 853 in 2011 Growth rate 11 % / year

item	2,002	2,003	2,004	2,005	2,006	2,007	2,008	2,009	2,010	2,011
GDP (USD million)	4,283	4,657	5,332	6,293	7,295	8,639	10,352	10,414	11,255	12,890
ditto Growth (%)	7.5	8.7	14.5	18.0	15.9	18.4	19.8	0.6	8.1	14.5
GDP per Capita (USD)	327	349	393	455	514	603	711	703	753	853
ditto Growth (%)	5.8	6.7	12.6	15.8	13.0	17.3	17.9	-1.1	7.1	13.3

4

Data Collection Survey on the Trunk Road Network Planning
for Strengthening of Connectivity through the Southern Economic Corridor

2. Current Conditions
- Socio Economy (3) -
Trade Amount & Trend

- **Total Trade increases 3 times from 2002 to 2011, average growth 13 % / year**
- **Trade with Thailand increases 5 times from 2002 to 2011, average growth 21 % / year**
- **Trade with Vietnam increases 12 times from 2002 to 2011, average growth 31 % / year**

unit million USD

item	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
Total Export	1,770	2,087	2,589	2,908	3,692	3,248	3,493	2,996	3,884	5,276
Export to Thailand	11	12	27	31	35	49	90	78	215	176
Export to Vietnam	65	95	131	160	170	206	214	197	277	430
Total Import	2,361	2,668	3,270	3,918	4,771	4,517	5,077	4,490	5,466	6,879
Import from Thailand	516	685	725	920	1,236	1,355	2,040	1,580	2,342	2,693
Import from Vietnam	178	267	384	556	781	1,041	1,531	1,167	1,564	2,406
Total Export+Import	4,131	4,755	5,859	6,826	8,463	7,765	8,570	7,486	9,350	12,155
Export+Import from Thailand	527	697	752	951	1,271	1,404	2,130	1,658	2,557	2,869
Export+Import from Vietnam	243	362	515	716	951	1,247	1,745	1,364	1,841	2,836

5

Data Collection Survey on the Trunk Road Network Planning
for Strengthening of Connectivity through the Southern Economic Corridor

2. Current Conditions
- Road (1) -
Length & Pavement Conditions

- **1-Digit Road: AC 33 % & DBST 65 %, mostly 2 lanes**
- **2-Digit Road: AC 4 %, DBST 66 % & unpaved 30 %**
- **3- & 4-Digit Road: unpaved 85 %**

Road Classification	Road Condition in 2008			Road Condition in 2012		
	Paved	Unpaved	Total	Paved	Unpaved	Total
1-Digit National Road	2,080 (99 %)	20 (1 %)	2,100 (100%)	2,244 (100 %)	0 (0 %)	2,244 (100 %)
2-Digit National Road	949 (30 %)	2,197 (79 %)	3,146 (100%)	2,358 (70 %)	1,002 (30 %)	3,360 (100 %)
Provincial Road (3&4 -Digit)	109 (2 %)	6,332 (98 %)	6,441 (100%)	1,196 (15 %)	6,545 (85 %)	7,741 (100 %)
Total (km)	3,138 (27 %)	8,549 (73 %)	11.687 (100 %)	5,798 (43 %)	7,547 (57 %)	13,345 (100 %)

6

Data Collection Survey on the Trunk Road Network Planning
for Strengthening of Connectivity through the Southern Economic Corridor

2. Current Conditions
- Road (2) -

Trunk Road Survey along SEC

- 1-Digit Road NR 1, 2, 3, 4, 5 and 8

  2-Digit Road NR 21, 31, 33, 48, 55, 57 and 72
- Thailand: Border to Bangkok/Leam Chabang

  2 lanes x 2 directions with median
- Vietnam: Border to Ho Chi Minh/Cai Mep

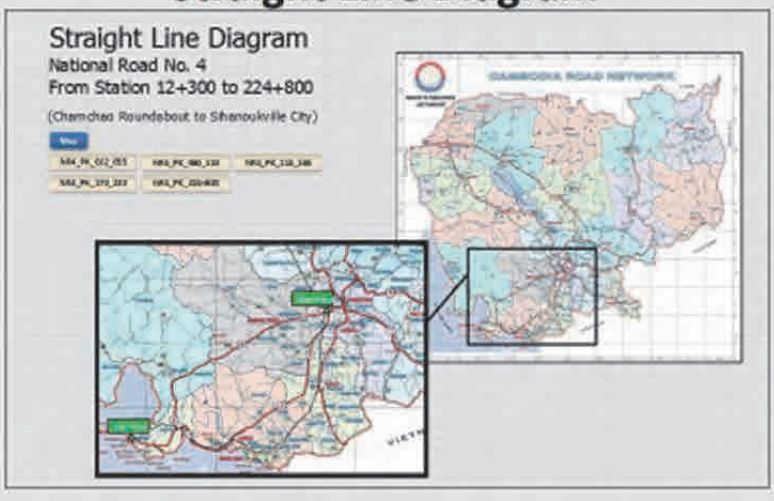
  2 lanes x 2 directions with median
- Road Data is compiled in Straight Line Diagram

7

Data Collection Survey on the Trunk Road Network Planning
for Strengthening of Connectivity through the Southern Economic Corridor

2. Current Conditions
- Road (3) -

Straight Line Diagram

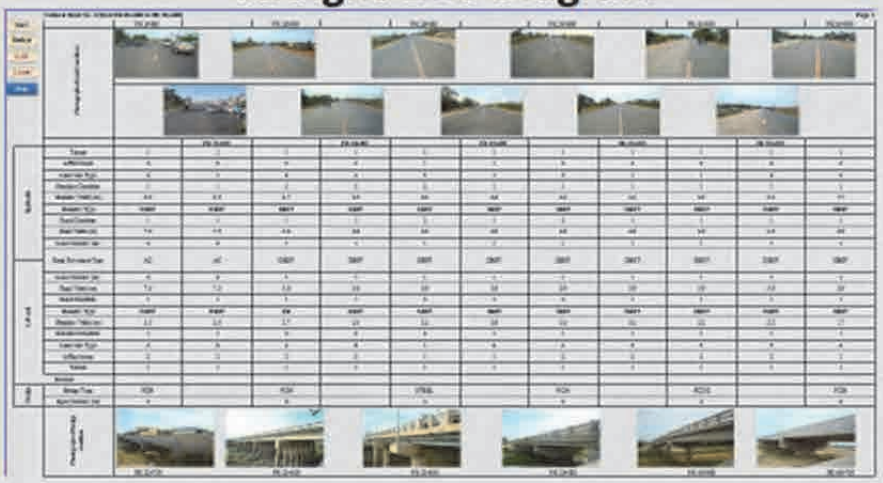


8

Data Collection Survey on the Trunk Road Network Planning
for Strengthening of Connectivity through the Southern Economic Corridor

2. Current Conditions
- Road (4) -

Straight Line Diagram



9

Data Collection Survey on the Trunk Road Network Planning
for Strengthening of Connectivity through the Southern Economic Corridor

2. Current Conditions
- Railway -

- **Southern Line: Phnom Penh to Sihanoukville (266km) rehabilitated, start operation**
  <u>three trip / week</u>
- **Northern Line:**
  Sri Sophrn to Poipet
  complete, others not yet
- **East line to Vietnam etc.:**
  under study

10

Data Collection Survey on the Trunk Road Network Planning
for Strengthening of Connectivity through the Southern Economic Corridor

2. Current Conditions
- Port -

- **Port in Cambodia: Sihanoukville, Phnom Penh**
- **Container Throughput Quantity in each Port**

Unit: 1000 TEU

Item	2010	2011
Cambodia		
Sihanoukville Port	223	238
Phnom Penh Port	60	82
Neighboring Countries		
Cai- Mep Thi- Vai Port (Vietnam)	308	794
Ho Chi Minh Port (Vietnam)	3,861	3,631
Leam Chabang Port (Thailand)	9,175	n/a

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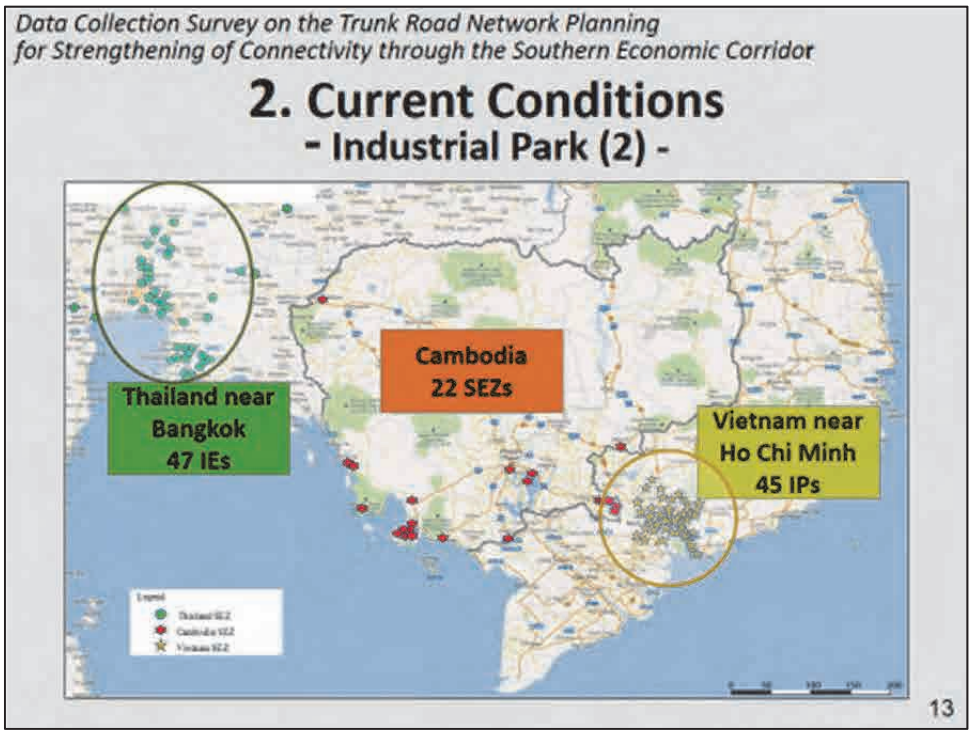
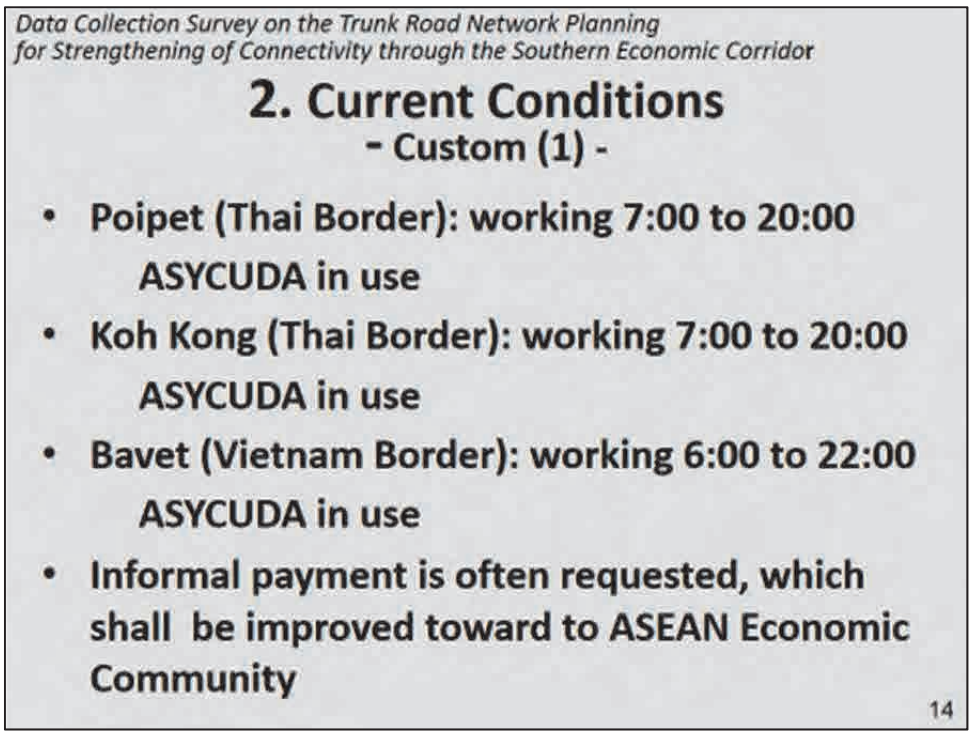
Data Collection Survey on the Trunk Road Network Planning
for Strengthening of Connectivity through the Southern Economic Corridor

2. Current Conditions
- Industrial Park (1) -

- **22 Special Economic Zones are approved.**
- **10 SEZs are in operation, and several SEZs (Phnom Pen, Sihanoukville, Bavet: Tai Seng & Manhattan) are active.**
- **SEZ near new Phnom Penh Port is under FS.**
- **47 Industrial Parks around Bangkok in Thailand**
- **45 Industrial Parks around Ho Chi Minh in Vietnam**

12

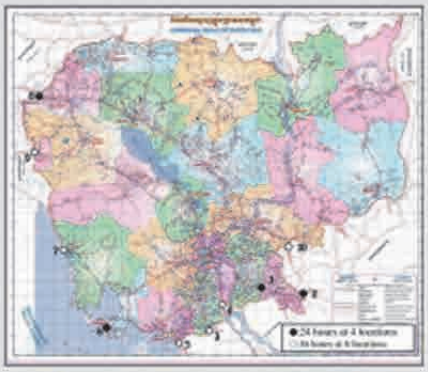

Data Collection Survey on the Trunk Road Network Planning
for Strengthening of Connectivity through the Southern Economic Corridor
2. Current Conditions
- Industrial Park (2) -
Thailand near
Bangkok
47 IEs
Cambodia
22 SEZs
Vietnam near
Ho Chi Minh
45 IPs
13


Data Collection Survey on the Trunk Road Network Planning
for Strengthening of Connectivity through the Southern Economic Corridor
2. Current Conditions
- Custom (1) -
• Poipet (Thai Border): working 7:00 to 20:00
ASYCUDA in use
• Koh Kong (Thai Border): working 7:00 to 20:00
ASYCUDA in use
• Bavet (Vietnam Border): working 6:00 to 22:00
ASYCUDA in use
• Informal payment is often requested, which shall be improved toward to ASEAN Economic Community
14

Data Collection Survey on the Trunk Road Network Planning
for Strengthening of Connectivity through the Southern Economic Corridor

3. Traffic Conditions
- Traffic Survey -

Traffic Survey Location



10 locations near borders conducted in January 2013

Location No.	Road No.	Survey Location	Survey Hours	Year 2013 and Survey Date
1	1	Provincial Boundary of Prey Veng and Svay Rieng	24	23 January (Wed.)
2	1	Vietnam Border (Bavet)	24	23 January (Wed.)
3	2	Vietnam Border	16	25 January (Fri.)
4	21	Vietnam Border	16	25 January(Fri.)
5	33	Vietnam Border	16	25 January(Fri.)
6	4	Near Sihanouk Port	24	29 January (Tue.)
7	48	Thai Border (Koh Kong)	16	29 January (Tue.)
8	5	Thai Border (Poipet)	24	29 January (Tue.)
9	57	Thai Border (Pailin)	16	31 January (Thu.)
10	72	Vietnam Border	16	23 January (Wed.)

Note: 16 hours : 5:00~21:00
24 hours : 5:00~5:00 (Next day)

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Data Collection Survey on the Trunk Road Network Planning
for Strengthening of Connectivity through the Southern Economic Corridor

3. Traffic Conditions
- Existing Traffic Conditions -
Survey Result

Location No.	Road No.	Survey Hours	MC				LV						HV						Grand Total
			Motobike & Motodop	Tuk-Tuk	Motorrimo	Total	Sedan, Wagon and Van	Taxi	Mini Bus	Light Truck and Pick Up	Truck(2axles	Total	Medium & Large Bus	Truck (More than 3axles)	Semi(Full Trailer(with container or not	(Without Container or not	Tuk-Tuk lorry	Total	
1	1	24	2,514	32	72	2,618	572	189	564	221	197	1,743	155	45	207	26	39	472	**4,833**
2	1	24	5,546	68	113	5,727	687	59	295	29	887	1,957	143	76	162	0	11	392	**8,076**
3	2	24	4,058	4	107	4,169	269	40	205	17	94	625	12	334	3	0	0	350	**5,143**
4	21	24	4,475	5	88	4,568	235	25	417	9	365	1,049	0	138	0	0	1	139	**5,757**
5	33	24	2,237	2	102	2,341	150	40	78	62	24	355	7	3	3	2	2	18	**2,713**
6	4	24	5,613	54	50	5,717	1,446	465	517	210	302	2,940	155	360	568	72	174	1,329	**9,986**
7	48	24	2,999	44	35	3,078	515	132	162	105	51	967	15	38	36	1	3	94	**4,138**
8	5	24	3,693	6	114	3,813	2,043	1,665	224	29	204	4,165	303	264	95	79	22	763	**8,741**
9	57	24	3,994	3	48	4,045	871	403	111	26	275	1,687	23	149	32	18	6	227	**5,959**
10	72	24	2,827	50	128	3,006	470	23	81	30	55	659	5	560	5	10	1	581	**4,246**

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Data Collection Survey on the Trunk Road Network Planning
for Strengthening of Connectivity through the Southern Economic Corridor

3. Traffic Conditions - Traffic Demand Forecast -

Road	Section	Location	2020	2030
NR 1	1-2	Monibong Bridge - KP 9	29,868	44,696
	1-3	KP 9 - KP 30	25,958	39,552
	1-4	KP 30- Neak Leuong	14,762	43,890
	1-5	1st Neak Leung Bridge	9,074	24,494
	1-6	2nd Neak Leung Bridge	6,725	22,744
	1-7	Neak Leung- Bavet	8,014	18,507
Phnom Penh Ring Road 3	RR 3-1	NR 1 KP 30 - NR 2	19,275	34,786
	RR 3-2	NR 2 - NR 5 PK 12	16,020	26,306
NR 2	2-1	Wat Phnom -Takhmau Roundabout	26,358	48,893
	2-2	TakhmauRoudabout- Takeo	12,667	15,070
	2-3	Takeo- PhnomDen	2,876	3,940
NR 3	3-1	Wat Phnom -Chaom Chao	39,727	57,416
	3-2	Chaom Chao- Kampot	12,979	16,858
	3-3	Kampot- Veal Rinh	3,299	5,321
NR 4	4-1	KP 12.0 - KP18	27,939	55,851
	4-2	KP 18 - KamponSpeu (KP48)	26,748	50,878
	4-3	Kampong Speu- KP 78	19,273	41,134
	4-4	KP 78 - KP 144	13,199	31,693
	4-5	KP 144 - Sihanoukville	12,248	23,514
NR 5	5-1	Wat Phnom - PrekKdam	36,925	51,744
	5-2	PrekKdam – ThleaM'am	18,121	36,864
	5-3	ThleaM'am - Battambong	14,368	30,344
	5-4	Battambang- Sri Sophorn	11,772	21,490
	5-5	Sri Sophorn- Poipet	13,951	21,703

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Data Collection Survey on the Trunk Road Network Planning
for Strengthening of Connectivity through the Southern Economic Corridor

3. Traffic Conditions
- Function and Characteristic of Trunk Road

Road No.	Road Section	Road Characteristics	Remarks
1	Watt Phnom – Neak Leung	· Livelihood road	· Expect to be logistic route after completion of Neak Louang Bridge
	Neak Leung- Bavet	· Agricultural / industrial road	
RR 3-1	NR 1 PK 30 - NR 2 (Bypass of NR 1/5)	· Livelihood / industrial road	
RR 3-2	NR 2 - NR 5 PK PK 12 (Bypass of NR 1/5)	· Livelihood / industrial road	
2	Wat Phnom -Takhmau Roundabout	· Livelihood road	
	Takhmau Roundabout- Takeo - Phnom Den	· Agriculture road	
3	Wat Phnom -Chaom Chao	· Industrial road	
	Chaom Chao- Kampot	· Agriculture road	
	Kampot- Veal Rinh	· Industrial / tourism road	
4	PK 12.0 - PK18 - Kampong Speu (PK48) - PK78	· Industrial road	· Continue to be logistic route
	PK 78 - PK 144	· Agriculture road	
	PK 144 - Sihanoukville	· Industrial / tourism road	
5	Wat Phnom - PrekKdam	· Livelihood / industrial road	· Expect to be logistic route
	Prek Kdam – ThleaM' am - Battambang - Sri Sophorn	· Agriculture road	
	Sri Sophorn- Poipet	· Industrial /Agriculture road	

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Data Collection Survey on the Trunk Road Network Planning
for Strengthening of Connectivity through the Southern Economic Corridor

4. Direction of Road Development in SEC

(1) Major Issues for Road Development

a. To cope with ASEAN's Goals, ASEAN Community and Connectivity

b. To develop transport infrastructure for increasing foreign investment

c. To improve trunk road network for development of South Economic Corridor

d. Road appurtenance on International Roads is poor

e. Increasing transport risks and traffic accident risks

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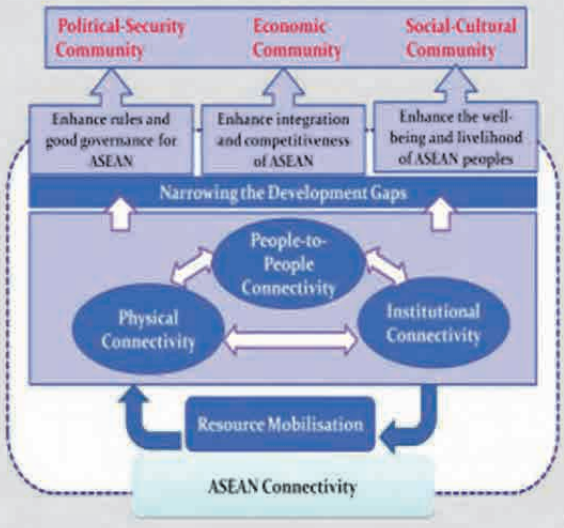
Data Collection Survey on the Trunk Road Network Planning
for Strengthening of Connectivity through the Southern Economic Corridor

4. Direction of Road Development in SEC

(1) Major Issues for Road Development

a. ASEAN Community and Connectivity



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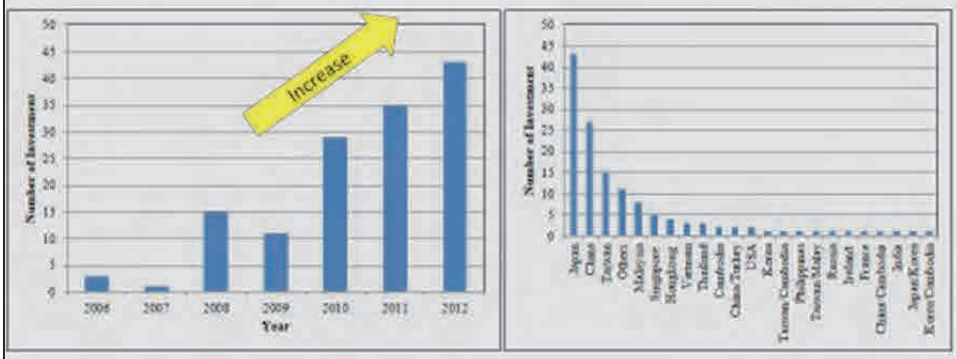
Data Collection Survey on the Trunk Road Network Planning
for Strengthening of Connectivity through the Southern Economic Corridor

4. Direction of Road Development in SEC
(1) Major Issues for Road Development
b. Increasing Foreign Investment to SEZ



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Data Collection Survey on the Trunk Road Network Planning
for Strengthening of Connectivity through the Southern Economic Corridor

4. Direction of Road Development in SEC
(1) Major Issues for Road Development
c. Need to improve road network condition

			AC/ Concrete	DBST	Gravel / Earth	Total
Vietnam 2009	National Road	Km	11,118	4,999	641	16,758
		%	**66.3%**	**29.8%**	3.8%	100.0%
	Provincial Road	Km	5,018	14,904	5,527	25,449
		%	19.7%	58.6%	21.7%	100.0%
Cambodia 2012	1-Digit NR	Km	786	1,457	0	2,244
		%	**35.0%**	**65.0%**	0.0%	100.0%
	2-Digit NR	Km	144	2,214	951	3,360
		%	4.3%	65.9%	28.3%	100.0%

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Data Collection Survey on the Trunk Road Network Planning
for Strengthening of Connectivity through the Southern Economic Corridor

4. Direction of Road Development in SEC
(2) Strategy of Road Development
Strategy 1: AEAN Community & Connectivity

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Data Collection Survey on the Trunk Road Network Planning
for Strengthening of Connectivity through the Southern Economic Corridor

4. Direction of Road Development in SEC
(2) Strategy of Road Development
Strategy 2: Strengthen of Infrastructure Linking for Increasing Direct Investment to Cambodia

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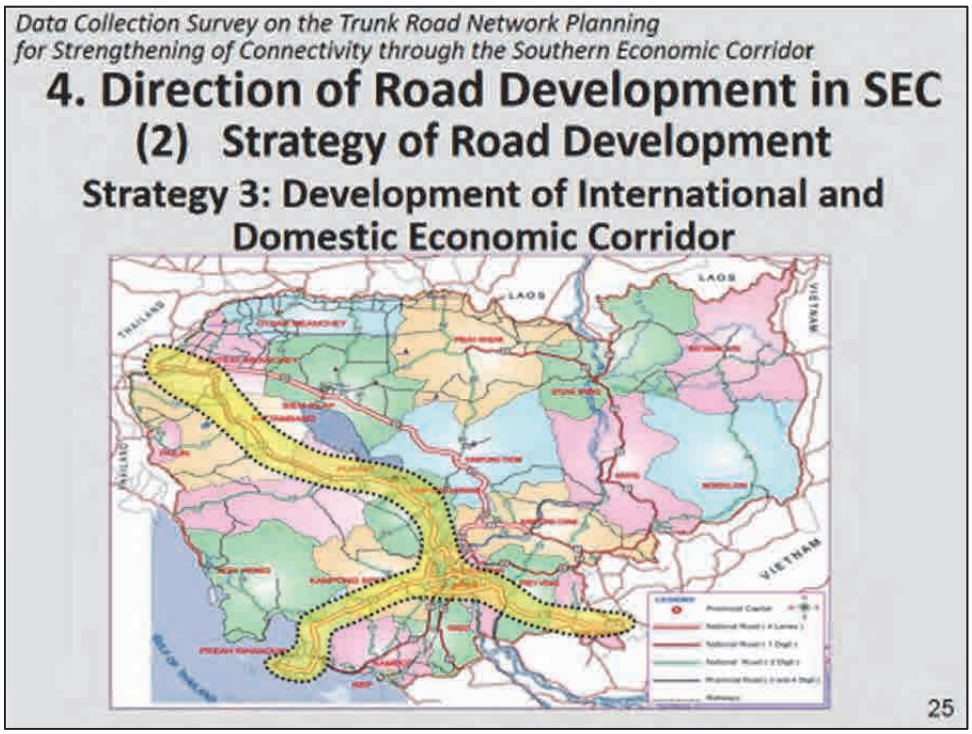
Data Collection Survey on the Trunk Road Network Planning
for Strengthening of Connectivity through the Southern Economic Corridor
4. Direction of Road Development in SEC
(2) Strategy of Road Development
Strategy 3: Development of International and Domestic Economic Corridor
LAOS
VIETNAM
THAILAND
25


Data Collection Survey on the Trunk Road Network Planning
for Strengthening of Connectivity through the Southern Economic Corridor
4. Direction of Road Development in SEC
(3) Proposed Road Development Plan
THAILAND
VIETNAM
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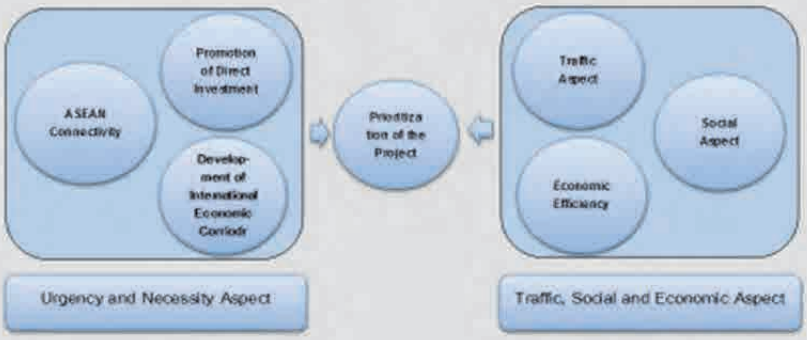
Data Collection Survey on the Trunk Road Network Planning
for Strengthening of Connectivity through the Southern Economic Corridor

4. Direction of Road Development in SEC

(3) Evaluation of Road Development Project

Evaluation Factors in Urgency & Necessity and Traffic, Social and Economic Aspect



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Data Collection Survey on the Trunk Road Network Planning
for Strengthening of Connectivity through the Southern Economic Corridor

4. Direction of Road Development in SEC

(3) Evaluation of Road Development Project

(Example)

Road	Location	Length	Urgency & Necessity Points				Technical, Economic and Social Points				
			A-1 Contribution to ASEAN connectivity	A-2 Promotion to Direct Investment	A-3 Economic Corridor Development	S-Total	B-1 Traffic Volume Trip Length	B-2 Social Aspect	B-3 Economic Efficiency	S-Total	S-Total
NR1	Phnom Penh- Vietnam Border	167									
1-1	Wat Phnom – Monivong Bridge	5									
1-2	Monivong Bridge - KP 9	4	4	5	5	14	5	5	5	15	29
1-3	KP 9 - KP 30	21									
1-4	KP 30- Neak Leoung	30	4	5	5	14	4	3	5	12	26
1-5	Int Neak Leung Bridge	5.5									
1-6	2nd Neak Leung Bridge	5.5	4	5	5	14	4	3	5	12	26
1-7	Neak Leung- Bavet	107	3	5	5	14	4	3	5	12	26
PP RR 5		60									
RR5-1	NR 1 KP 10 - NR 2 (Bypass of NR 1/5)	30	4	5	5	14	4	5	5	14	28
RR 5-2	NR 2 - NR 5 PK PK 12 (Bypass of NR 1/5)	10	4	5	5	14	4	5	5	14	28

High Score & High Priority: NR 1, 4 and 5

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Data Collection Survey on the Trunk Road Network Planning
for Strengthening of Connectivity through the Southern Economic Corridor

4. Direction of Road Development in SEC

(4) Selection of Priority Projects

no	Road	Location	Length
(a)	NR 1	Neak Loeung to Bavet	107 km
(b)	NR 1	2nd Neak Loeung Bridge	5.5 km
(c)	NR 1	New PP Port to Neak Loeung	30 km
	RR 3	New PP Port to NR 2	30 km
(d)	NR 5	Sri Sophorn to Poipet	47 km

Providing that

- NR 5: Prek Kdam to Sri Sophorn to be rehabilitated under JICA
- NR 4: to be developed by AZI or possible PPP operator

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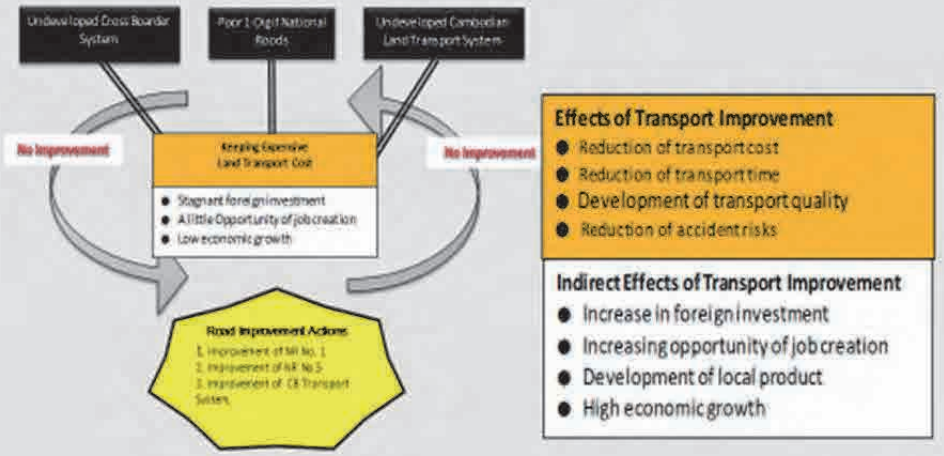
Data Collection Survey on the Trunk Road Network Planning
for Strengthening of Connectivity through the Southern Economic Corridor

4. Direction of Road Development in SEC

(4) Effects of Priority Project



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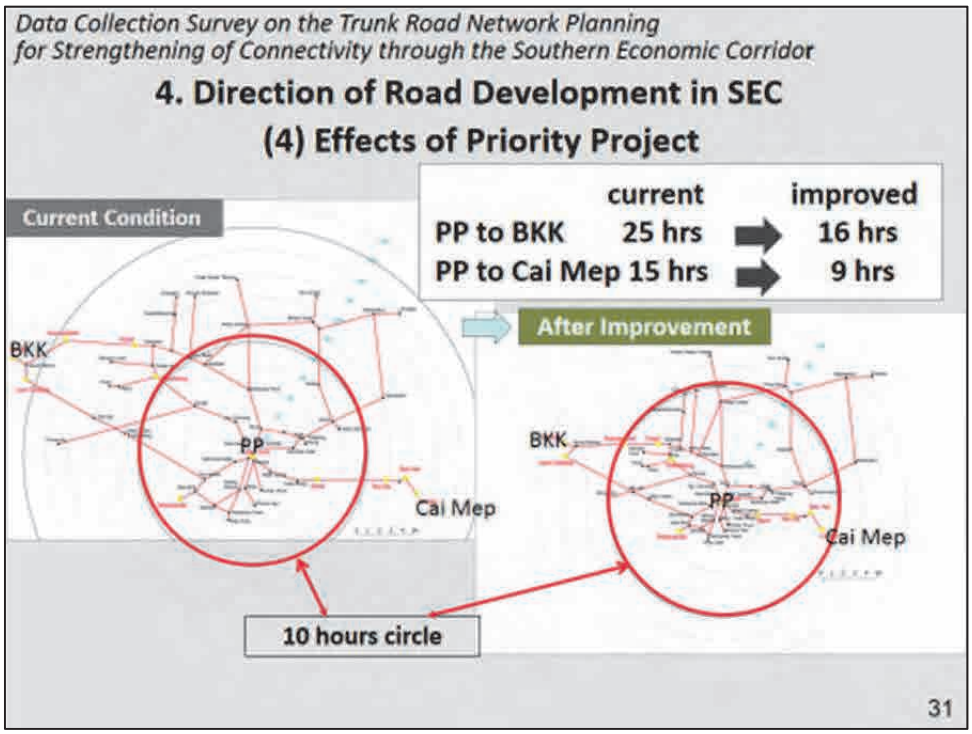
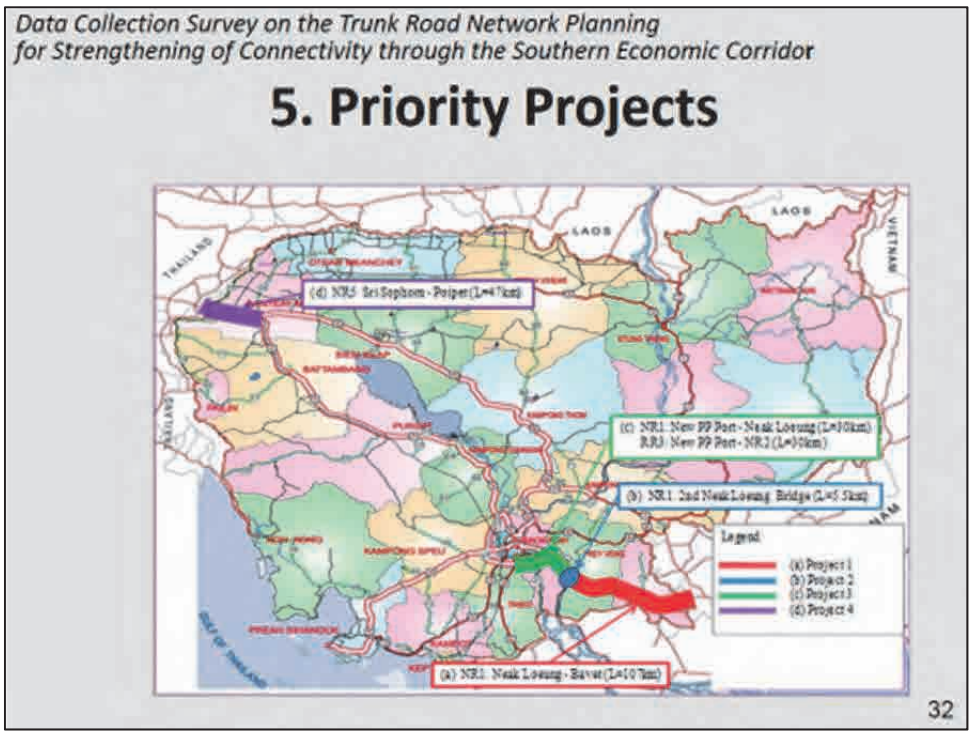

Data Collection Survey on the Trunk Road Network Planning
for Strengthening of Connectivity through the Southern Economic Corridor
4. Direction of Road Development in SEC
(4) Effects of Priority Project
current
improved
PP to BKK 25 hrs 16 hrs
PP to Cai Mep 15 hrs 9 hrs
Current Condition
After Improvement
BKK
PP
Cai Mep
BKK
PP
Cai Mep
10 hours circle
31


Data Collection Survey on the Trunk Road Network Planning
for Strengthening of Connectivity through the Southern Economic Corridor
5. Priority Projects
LAOS
THAILAND
VIETNAM
Legend
32

Data Collection Survey on the Trunk Road Network Planning
for Strengthening of Connectivity through the Southern Economic Corridor

5. Priority Project

no	Road	Location	Length	Current conditions	Development
(a)	NR 1	Neak Loeung to Bavet	107 km	1 lane x 2 directions	2 lanes x 2 directions
(b)	NR 1	2nd Neak Loeung Bridge	5.5 km	1st bridge to complete in 2015	(3 lanes or 2lanes +bike) x 2 directions
(c)	NR 1	New PP Port to Neak Loeung	30 km	(1 lane + bike) x 2 directions	2 lanes x 2 directions
	RR 3	New PP Port to NR 2	30 km	-	2 lanes x 2 directions
(d)	NR 5	Sri Sophorn to Poipet	47 km	(1 lane + bike) x 2 directions	2 lanes x 2 directions

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Data Collection Survey on the Trunk Road Network Planning
for Strengthening of Connectivity through the Southern Economic Corridor

5. Priority Projects

Project 1 Neak Loeung to Bavet (107 km)

- 1 lane x 2 with DBST ➡ 2 lanes x 2 with AC
- Bavet area in front of SEZs
  to provide parking lane for commuters
  to coordinate with ADB (SEC Towns Project)
- Bavet area near custom
  to provide facilities
- Bypass for Svay Rieng

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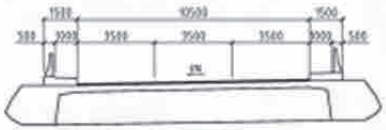
Data Collection Survey on the Trunk Road Network Planning
for Strengthening of Connectivity through the Southern Economic Corridor

5. Priority Projects

Project 2 Second Neak Loeung Bridge

- First Neak Loeung Br. (1 lane + bike) x 2

- Two Neak Loeung Br.
  (2 lanes+ bike) or 3 lanes



Second Bridge to be wider or double deck bridge to accommodate more traffic, possibly for future expressway

Modified to one way direction

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Data Collection Survey on the Trunk Road Network Planning
for Strengthening of Connectivity through the Southern Economic Corridor

5. Priority Projects

Project 3 NR 1/Bypass new Port to Neak Loeung (30km)
RR 3 new PP Port to NR 2 (30 km)

New PP SEZ

NR 1/Bypass (30 km)
(1lane+bike) x2 AC
➡ 2 lanes x 2 AC
RR 3 (30 km)
new road, 2lanes x 2 AC
PP SEZ to transport goods to SV Port, new PP Port or HCM easily
New PP Port SEZ to transport goods to new PP Port, SV Port or HCM easily

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Data Collection Survey on the Trunk Road Network Planning
for Strengthening of Connectivity through the Southern Economic Corridor

5. Priority Projects

Project 4 Sri Sophorn to Poipet (47 km)

- (1lane+bike)x 2 with AC ➡ 2 lanes x 2 with AC
- Poipet area in front of SEZs
  to provide parking lane for commuters
- Poipet area near custom
  to provide facilities
- Bypass for Sri Sophorn
  (Provided by north section
  Improvement)

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Data Collection Survey on the Trunk Road Network Planning
for Strengthening of Connectivity through the Southern Economic Corridor

5. Priority Projects

Implementation Program

		Items		2013	2014	2015	2016	2017	2018	2019	2020
(a)	NR 1	Neak Loeung to Bavet	107 km	feasibility study	loan agreement / design / tender			construction			
(b)	NR 1	2nd Neak Loeung Bridge	5.5 km	feasibility study	loan agreement / design / tender				construction		
(c)	NR 1	New PP Port to Neak Loeung	30 km	feasibility study	loan agreement / design / tender			construction			
	RR3	New PP Port to NR 2	30 km								
(d)	NR 5	Sri Sophorn to Poipet (can be integrated with the Middle section Project)	47 km	feasibility study	loan agreement / design / tender			construction			

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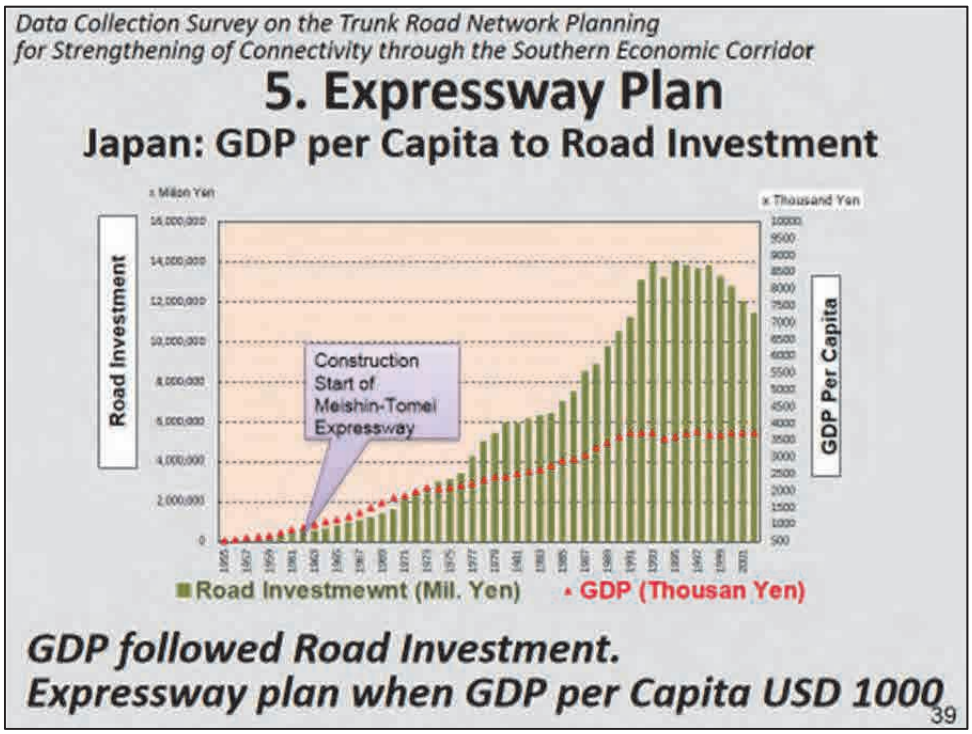
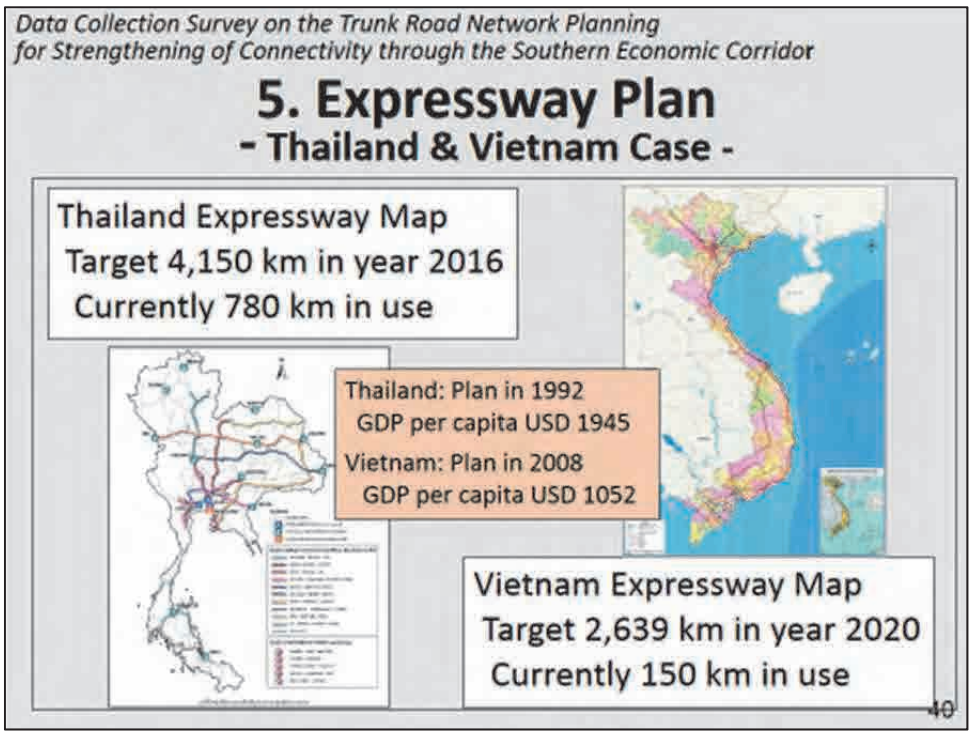
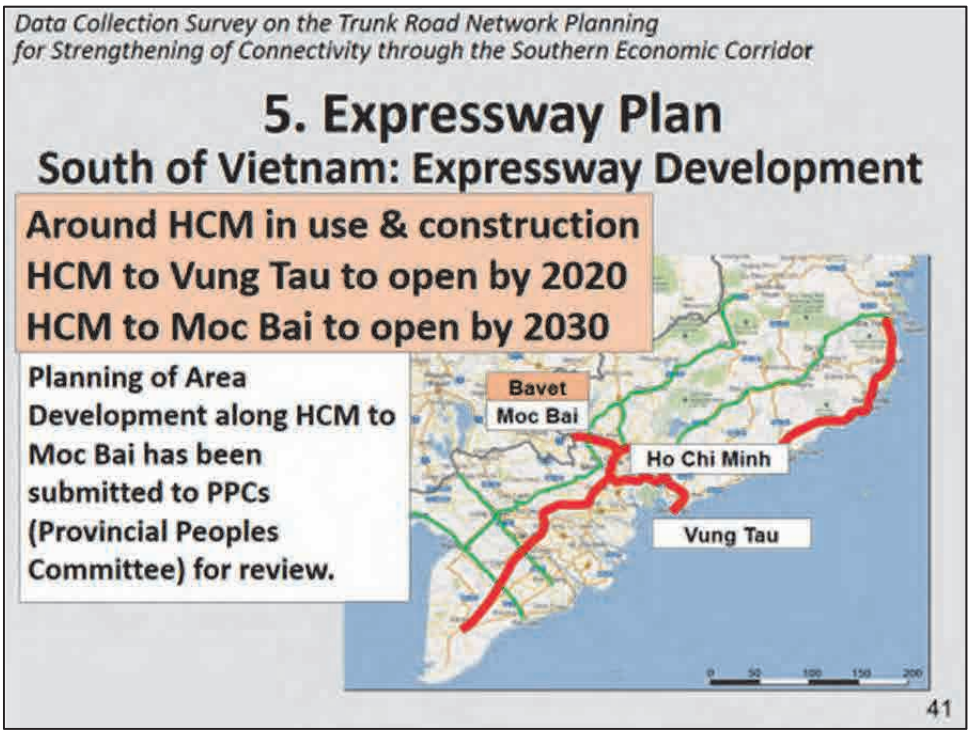
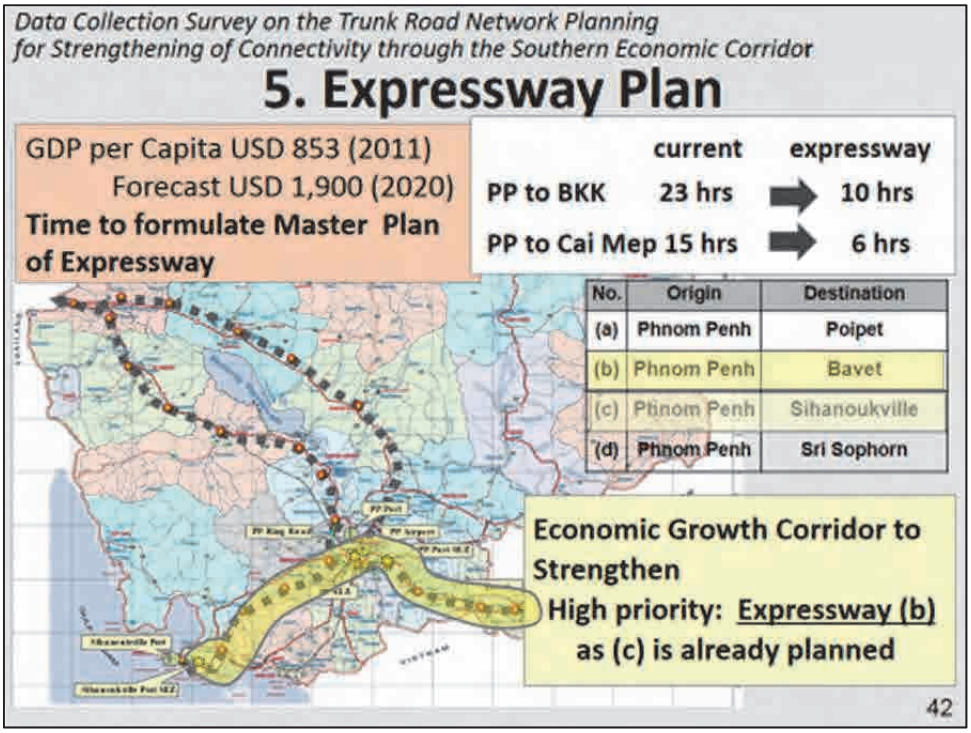

Data Collection Survey on the Trunk Road Network Planning
for Strengthening of Connectivity through the Southern Economic Corridor
5. Expressway Plan
Japan: GDP per Capita to Road Investment
x Milion Yen
x Thousand Yen
Road Investment
GDP Per Capita
Construction Start of Meishin-Tomei Expressway
Road Investmewnt (Mil. Yen)
GDP (Thousan Yen)
GDP followed Road Investment.
Expressway plan when GDP per Capita USD 1000
39


Data Collection Survey on the Trunk Road Network Planning
for Strengthening of Connectivity through the Southern Economic Corridor
5. Expressway Plan
- Thailand & Vietnam Case -
Thailand Expressway Map
Target 4,150 km in year 2016
Currently 780 km in use
Thailand: Plan in 1992
GDP per capita USD 1945
Vietnam: Plan in 2008
GDP per capita USD 1052
Vietnam Expressway Map
Target 2,639 km in year 2020
Currently 150 km in use
40


Data Collection Survey on the Trunk Road Network Planning
for Strengthening of Connectivity through the Southern Economic Corridor
5. Expressway Plan
South of Vietnam: Expressway Development
Around HCM in use & construction
HCM to Vung Tau to open by 2020
HCM to Moc Bai to open by 2030
Planning of Area Development along HCM to Moc Bai has been submitted to PPCs (Provincial Peoples Committee) for review.
Bavet
Moc Bai
Ho Chi Minh
Vung Tau
41

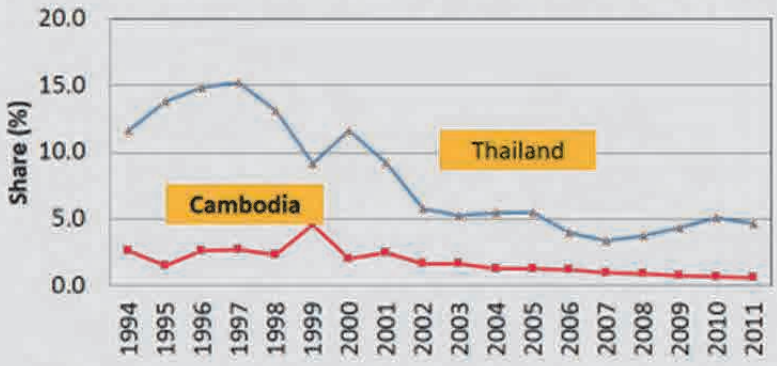

Data Collection Survey on the Trunk Road Network Planning
for Strengthening of Connectivity through the Southern Economic Corridor
5. Expressway Plan
GDP per Capita USD 853 (2011)
Forecast USD 1,900 (2020)
Time to formulate Master Plan of Expressway
current
expressway
PP to BKK 23 hrs 10 hrs
PP to Cai Mep 15 hrs 6 hrs
No. Origin Destination
(a) Phnom Penh Poipet
(b) Phnom Penh Bavet
(c) Phnom Penh Sihanoukville
(d) Phnom Penh Sri Sophorn
Economic Growth Corridor to Strengthen
High priority: Expressway (b)
as (c) is already planned
42

Data Collection Survey on the Trunk Road Network Planning
for Strengthening of Connectivity through the Southern Economic Corridor

5. Expressway Plan

■ Financial Consideration

▪ Share of transport expenditure/Government Expenditure



Cambodia 1.8 % <<< Thailand 8.2 %

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Data Collection Survey on the Trunk Road Network Planning
for Strengthening of Connectivity through the Southern Economic Corridor

5. Priority Projects

Implementation Program with Expressway

Items				2013	2014	2015	2016	2017	2018	2019	2020
(a)	NR 1	Neak Loeung to Bavet	107 km	feasibility study	loan agreement / design / tender				construction		
(b)	NR 1	2nd Neak Loeung Bridge	5.6 km		feasibility study	loan agreement / design / tender			construction		
(c)	NR 1	New PP Port to Neak Loeung	30 km	feasibility study	loan agreement / design / tender				construction		
	RR3	New PP Port to NR 2	30 km	feasibility study	loan agreement / design / tender				construction		
(d)	NR 6	Sri Sophom to Poipet (can be integrated with the Middle section Project)	47 km	feasibility study	loan agreement / design / tender				construction		
(e)		Expressway			master plan		feasibility study	loan agreement / design / tender		construction	

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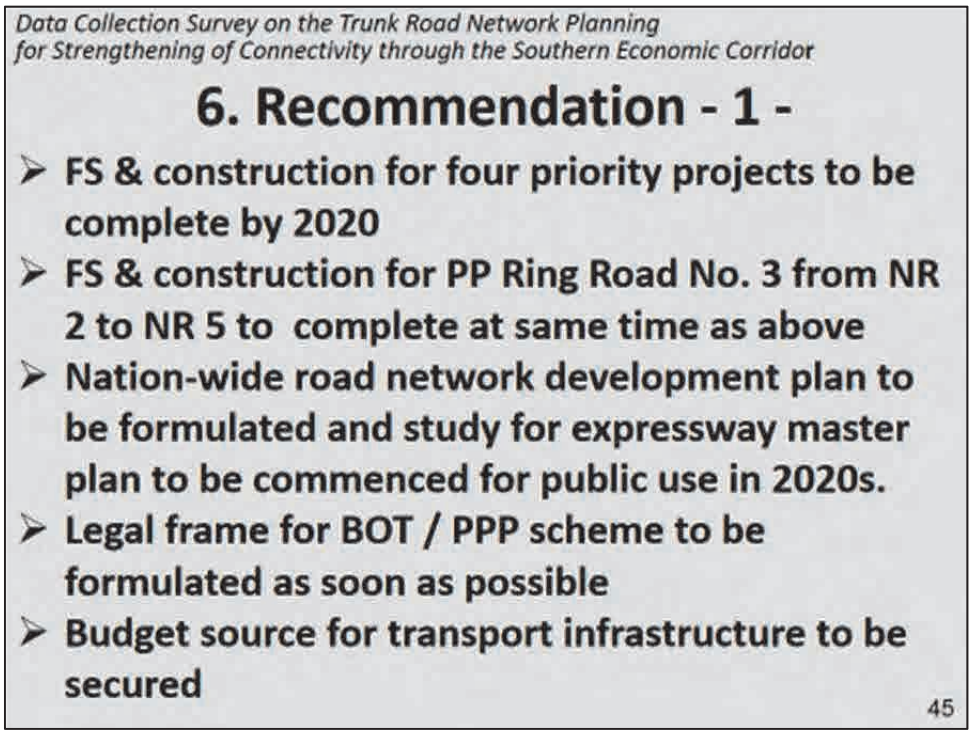
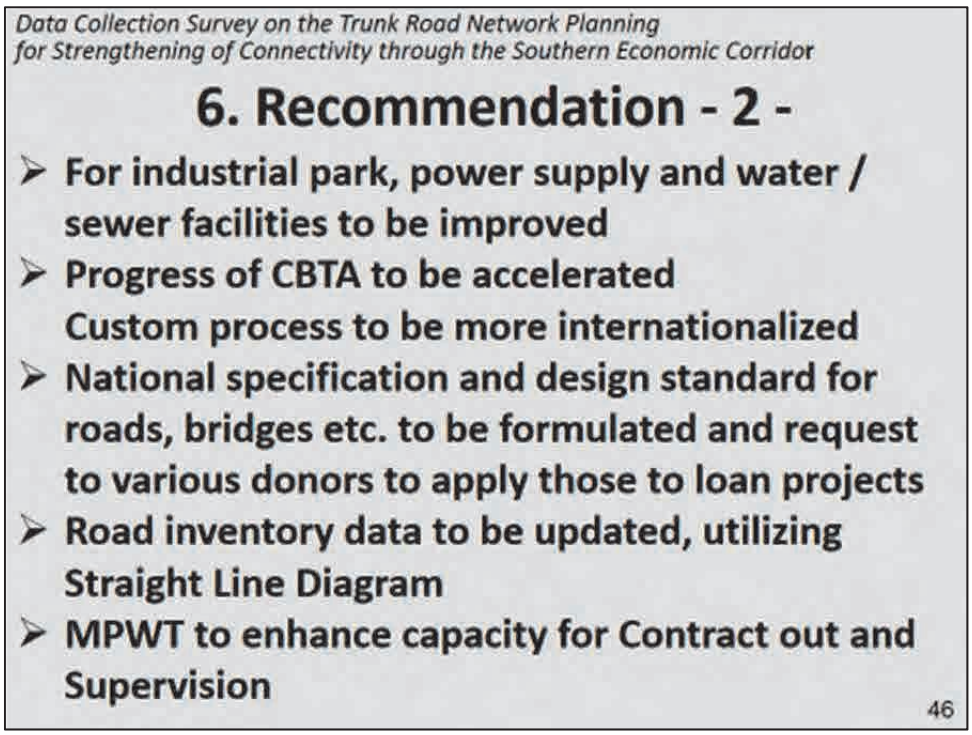

Data Collection Survey on the Trunk Road Network Planning
for Strengthening of Connectivity through the Southern Economic Corridor
6. Recommendation - 1 -
FS & construction for four priority projects to be complete by 2020
FS & construction for PP Ring Road No. 3 from NR 2 to NR 5 to complete at same time as above
Nation-wide road network development plan to be formulated and study for expressway master plan to be commenced for public use in 2020s.
Legal frame for BOT / PPP scheme to be formulated as soon as possible
Budget source for transport infrastructure to be secured
45


Data Collection Survey on the Trunk Road Network Planning
for Strengthening of Connectivity through the Southern Economic Corridor
6. Recommendation - 2 -
For industrial park, power supply and water / sewer facilities to be improved
Progress of CBTA to be accelerated
Custom process to be more internationalized
National specification and design standard for roads, bridges etc. to be formulated and request to various donors to apply those to loan projects
Road inventory data to be updated, utilizing Straight Line Diagram
MPWT to enhance capacity for Contract out and Supervision
46