

# **WORKSHOPS**



# THE STUDY ON THE ROAD NETWORK DEVELOPMENT

## ATTENDANTS LIST OF 1st WORKSHOP

On 30 May 2005

No.	Name	Ministry
1	Mr. Hisatoshi Naito	JICA Study Team
2	Mr. Futoshi Mitsuhata	JICA Study Team
3	Mr. Cheam Sovanny	MPWT Planning
4	Mr. Koun Bun Thoeun	PWRC/ MPWT
5	Mr. Hir Samnang	JICA Cambodia
6	Mr. Tomohiro Ono	JICA Cambodia
7	Mr Khun Srun	PWRC/ MPWT
8	Mr. Chour Chhun Leng	DPWT Kandal
9	Mr. Moeung Sophan	DPWT PP
10	Mr. Kim Phun	RCC, HEC,MPWT
11	Mr. Kang Phirith	HEC MPWT
12	Mr. Prum Chan Sovannary	Dep.Dir. HEC.MPWT
13	Mr. Sar Sithan	Dep.Dir. HEC.MPWT
14	Mr. Nop Kilarith	MPWT
15	Mr. Yim Borin	MPWT
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The Study on the Road Network Development  
2<sup>nd</sup> WORKSHOP of Taskforce Teams

- (1) Date: 12 August (Friday), 2005, 8:30am—12:00am  
(2) Venue: MPWT, Conference Room at 1<sup>st</sup> floor  
(3) Schedule:

- 8:30-8:40am Welcome remark by Team Leader of Study Team  
8:40-8:45am Self-Introduction of the participants  
8:45-9:00am Explanation by Study Team
- Objective of Work Shop
  - Explanation of today's schedule
  - Distribution of Sheet for feedback

Session 1: Progress of the Activities by Working Groups

At the session 1, the working groups make presentations regarding their findings, Lessons Learned and Next steps for M/P within 20min., and then discuss the points within 10min.

- 9:00-9:30am Result of the Road Inventory Survey by Mr. Thira (MPWT)  
9:30-10:00am Result of the Traffic Survey by Mr. Yin Borin (MPWT)
- \*Tea break is provided during the workshop*
- 10:15-10:45am Result of the Survey on Traffic Accident by Mr. Kilarith (MPWT)  
10:45-11:15am Result of the Regional Development Survey by Mr. Sovanny (MPWT) and Mr. San Piset (MRD)

Session 2: Brainstorming/Mental Exercise

At the session 2, participants make groups to discuss the significant factors and its weight of criteria for prioritizing the road rehabilitation /maintenance.



- 11:15-11:55am Basic Idea of the Criteria for Priority Project
- Group Discussion (25min)
  - Presentation by Groups (15min)
- 11:55-12:00am Wrap up

- (4) Contact person:

Ms. Sokleap

Phone: 023-426-099




**KINGDOM OF CAMBODIA**  
 MINISTRY OF PUBLIC WORKS AND TRANSPORT 

**THE STUDY**  
**ON**  
**ROAD NETWORK DEVELOPMENT**

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**KINGDOM OF CAMBODIA**  
 MINISTRY OF PUBLIC WORKS AND TRANSPORT 

**Result of The Road Inventory Survey**

Presented by:  
**Mr.TAN THIRA**

2005/08/12

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**CONTENTS**

1. INTRODUCTION
2. METHODOLOGY
3. RESULTS
4. COMMENTS

3

**1. INTRODUCTION**

**1.1 OBJECTIVES**

The major objectives of road inventory and condition survey are:

- To review the existing inventory survey of road network
- To know the present road network condition
- To analyze the existing condition of road sector in order to identify the issue on road
- To update road inventory data

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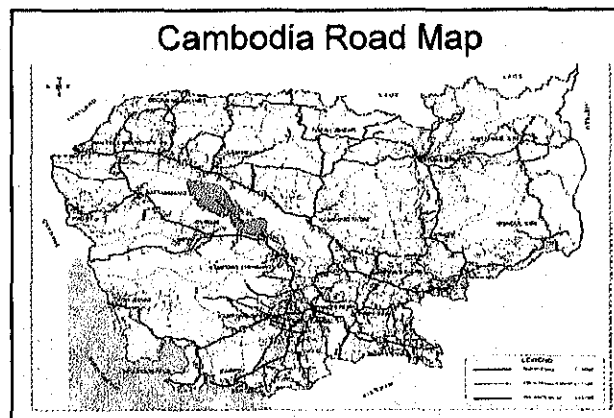
**1. INTRODUCTION**

**1.2 SCOPE**

The scope of road inventory and condition survey has covered all the national and provincial road including:

- > 1-Digit Roads (Primary National Roads)
- > 2- Digit Roads( Secondary National Roads)
- > 3 and 4-Digit Roads (Provincial Roads)

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## 1. INTRODUCTION

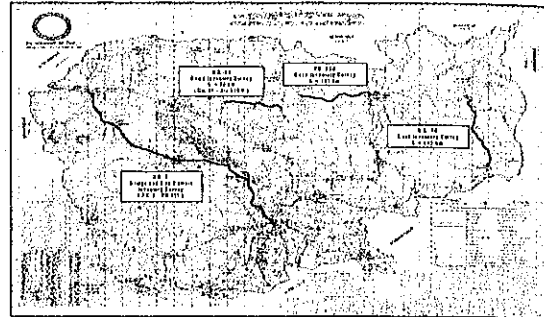
### 1.2 SCOPE (Con't)

The supplementary field survey was conducted to provide the additional data, which is not included in LRCS. The scope of supplementary road inventory survey consists the following:

- To conduct the road inventory on NR66, 76 and PR126
- To carry out the structure inventory survey on NR5

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## 1. INTRODUCTION



Location of Supplementary Road Inventory Survey.

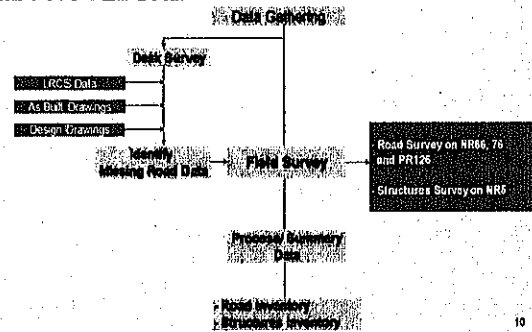
## 2. METHODOLOGY

### 2.1 SCHEDULE

Work Title	April				May				June			
	1st	2nd	3rd	4th	1st	2nd	3rd	4th	1st	2nd	3rd	4th
Data Gathering												
Site Survey												
Data Input												
Reporting												

## 2. METHODOLOGY

### 2.2 PROCEDURE



## 3. SURVEY RESULTS

### 3.1 ROAD INVENTORY

#### > Road Networks

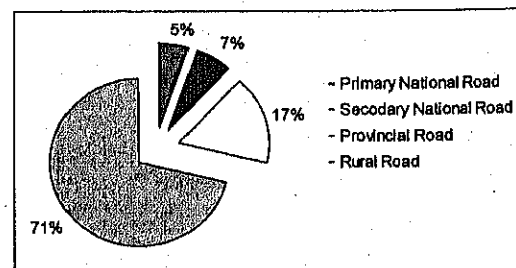
Road Classification	Road Length (km)
Primary National Road (1-Digit)	2052
Secondary National Road (2- Digit )	2608
Provincial Road (3 and 4-Digit)	6680
Rural or tertiary Road (MRD)	~ 28,000
Total Length	39,340

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## 3. SURVEY RESULTS

### 3.1 ROAD INVENTORY (Con't)

#### > Road Networks

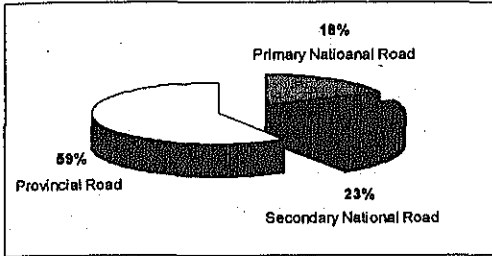




3. SURVEY RESULTS

3.1 ROAD INVENTORY (Con't)

> Road Networks Under Jurisdiction of MPWT



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3. SURVEY RESULTS

3.1 ROAD INVENTORY (Con't)

> Road Condition

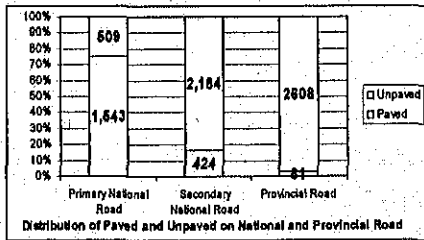
Road Classification	Paved Road (km)	Unpaved Road (km)	Total (km)
Primary National Road (1-digit)	1,543	509	2052
Secondary National Road (2-digit)	424	2,184	2608
Provincial Road (3,4-digit)	81	6,599	6680
Total (km)	2048	9292	11340

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3. SURVEY RESULTS

3.1 ROAD INVENTORY (Con't)

> Road Condition

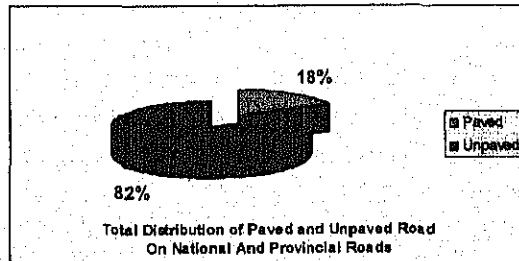


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3. SURVEY RESULTS

3.1 ROAD INVENTORY (Con't)

> Road Condition

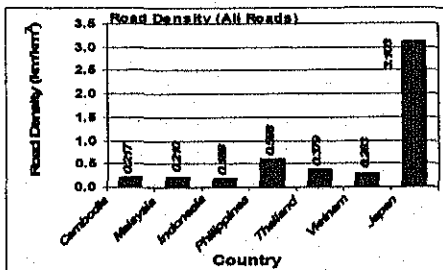


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3. SURVEY RESULTS

3.1 ROAD INVENTORY (Con't)

> Road Density and Road Density Index

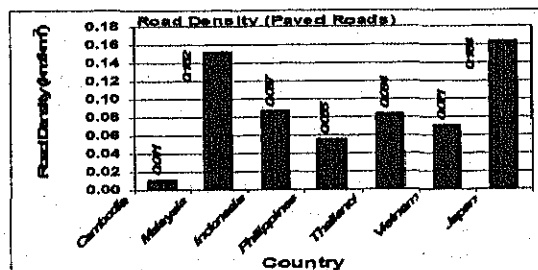


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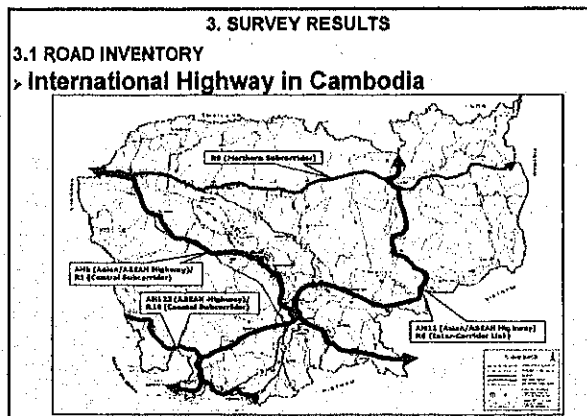
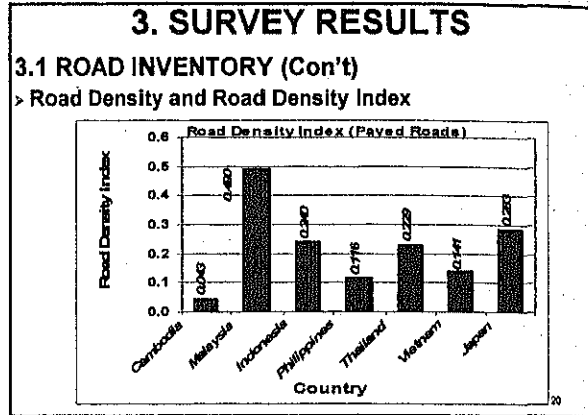
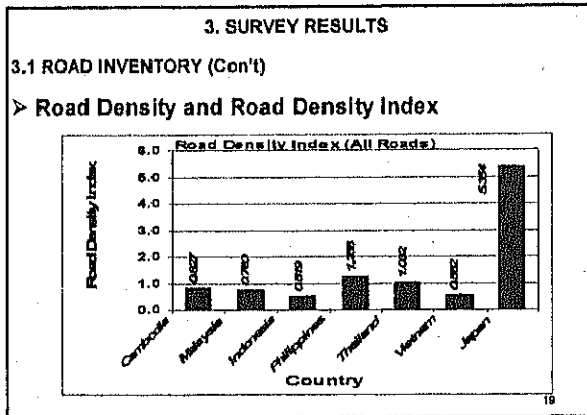
3. SURVEY RESULTS

3.1 ROAD INVENTORY (Con't)

> Road Density and Road Density Index



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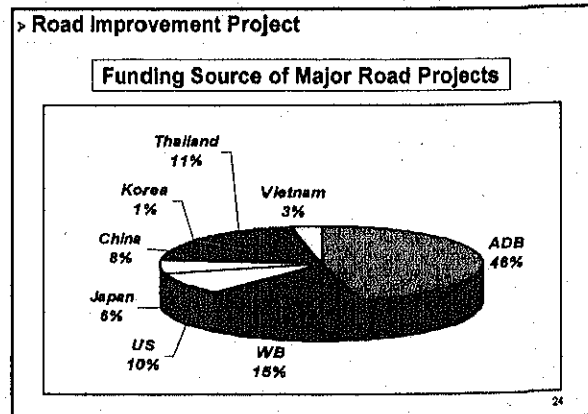
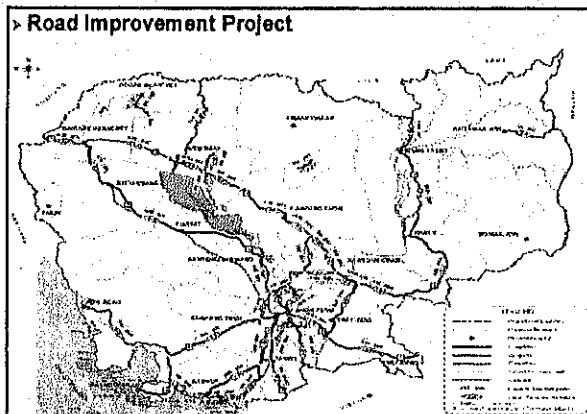


### 3. SURVEY RESULTS

#### 3.1 ROAD INVENTORY (con't)

##### > Status of International Highway in Cambodia

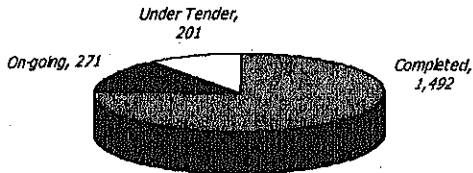
Route No.	Route Description	Length (km)	Primary	Class I	Class II	Class III	Below Class III	Maint # Links
AH1	Phnom Penh - Siem Reap - Phnom Penh - Bavet (NR1, NR6)	575.0			25.3	549.7		
AH11	Siem Reap - Phnom Penh - Kampong Cham - Stung Treng - Trapengkreol (NR4, NR6, NR7)	770.0			361.1	408.9		
AH123	Cham Yeam - Koh Kong - Phum Daung Bridge - Sra Ambel - Chamkar Leang (NR18, NR3, NR33)	161.5			10.5	11.0	140.1	
Northern Subcorridor	Siem Reap - Preah Vihear - Stung Treng - Rattanak Kiri - O Yadev Border (NR68, NR78)	464.9					464.9	
<b>Total Length (km)</b>		<b>1,971.4</b>			<b>306.9</b>	<b>989.6</b>	<b>605.0</b>	



> Road Improvement Project

**Status of Primary National Road Projects**

Primary National Road Improvement Projects  
(Total Length = 1,964km)



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**3. SURVEY RESULTS**

**3.2 Structures Inventory**

- > Bridge
- > Box Culvert

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**3. SURVEY RESULTS**

**3.2 Structures Inventory**

> Bridge

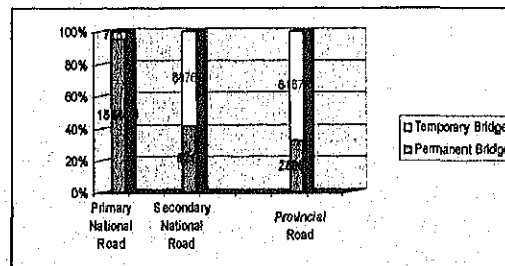
Structure	Length (m)			Number		
	1-Digit	2-Digit	3-Digit	1-Digit	2-Digit	3-Digit
Permanent Bridge	15,544	6,216	2895.2	391	128	147
Temporary Bridge	718.8	8876.8	8167.7	30	491	339
<b>Total</b>	<b>16263.2</b>	<b>15092.8</b>	<b>9062.5</b>	<b>421</b>	<b>619</b>	<b>486</b>

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**3. SURVEY RESULTS**

**3.2 Structures Inventory**

> Bridge Condition

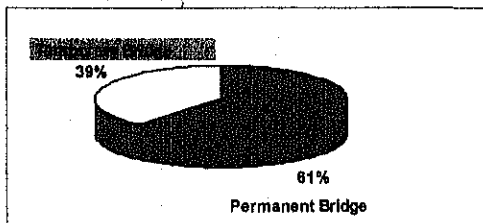


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**3. SURVEY RESULTS**

**3.2 Structures Inventory**

> Bridge Condition



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**3. SURVEY RESULTS**

**3.2 Structures Inventory**

> Box Culvert

Structure	Length (m)			Number		
	1-Digit	2-Digit	3-Digit	1-Digit	2-Digit	3-Digit
Box Culvert	2863.9	1311.2	1447.1	555	287	344
<b>Total</b>	<b>5,422.2</b>			<b>1,166</b>		

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#### 4. COMMENTS

- To create more new roads in order to link the whole territory of Cambodia as well as neighboring countries.
- To widen the carriageway of the international highway to meet the standard
- To upgrade all unpaved roads to paved roads, especially in 2-digit, 3 and 4-digit road.
- To replace all temporary structures with permanent structures
- To utilize this data as a significant input for the master plan.

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THANKS VERY MUCH !!!

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## Result of Traffic Survey



JICA Study Team  
on the Road Network Development in  
Cambodia

2005/8/12  
Road Infrastructure Team

## Contents

- Background
- Objective
- Survey Items
- Result
- Commend

### I. Background

- The Japan International Agency (JICA) study team is conducting the study on the road network development in Cambodia in cooperation with the Ministry of Public Works and Transport.
- Traffic survey shall be conducted along one and two digit national road and three digit provincial roads.
  - Traffic count - 60 stations
  - OD Survey - 41 Stations
  - Travel Time Survey-21 Stations

### II. Objectives of the survey

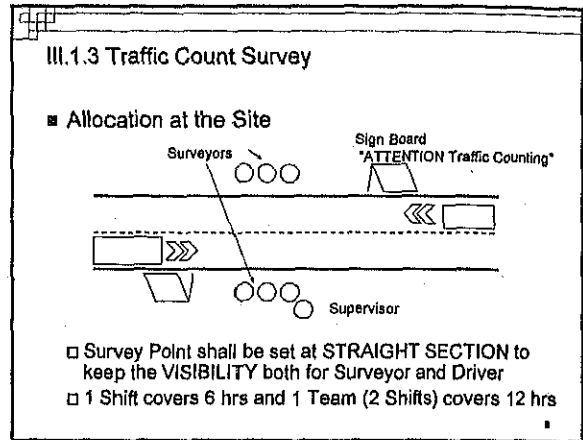
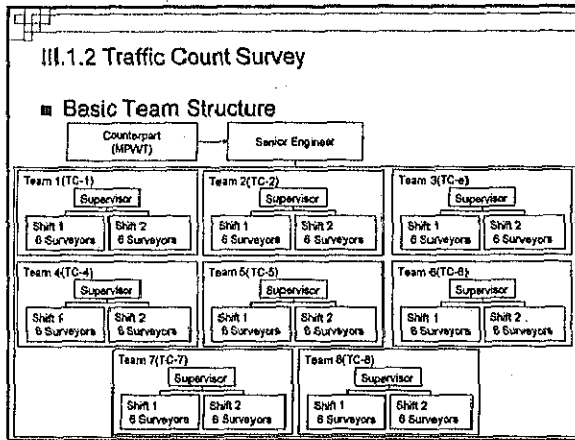
- To grasp the nationwide traffic movement and its volume both of passengers and commodity
- Collected data will be used for;
  - Future traffic demand forecast
  - Road network development plan
  - Road maintenance plan

### III. Survey Items

- **Traffic Count Survey**
  - Traffic volume by vehicle type, time and direction
- **Origin and Destination Interview Survey**
  - Movement of passengers and commodity
- **Travel Time Survey**
  - Travel time between major cities
- **Training of DPWT Staff**
  - Periodic survey implementation by the Government

#### III.1.1 Traffic Count Survey

- **Survey Item**
  - Vehicular traffic count by vehicle type and direction
    - Record the traffic volume in every 15 minutes
- **Survey Period**
  - 12 hrs (from 6:00 to 18:00) x 1 day - 42 stations
  - 24 hrs (from 6:00 to 6:00) x 1 day - 5 stations
  - 24 hrs (from 6:00 to 6:00) x 7 days- 1 station
  - Border Operating Hours x 1 day - 12 stations



### III.1.4 Traffic Count Survey

#### Survey Sheet

AT Traffic Count Survey

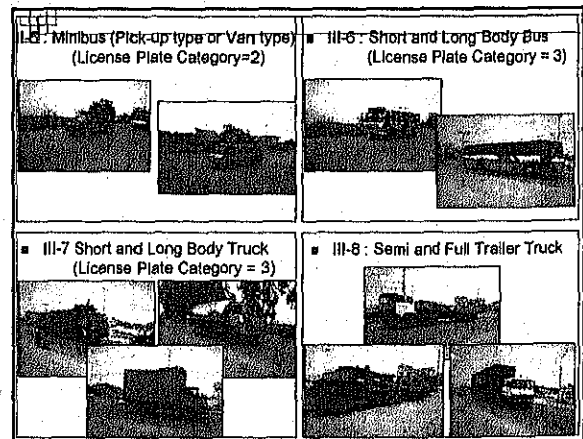
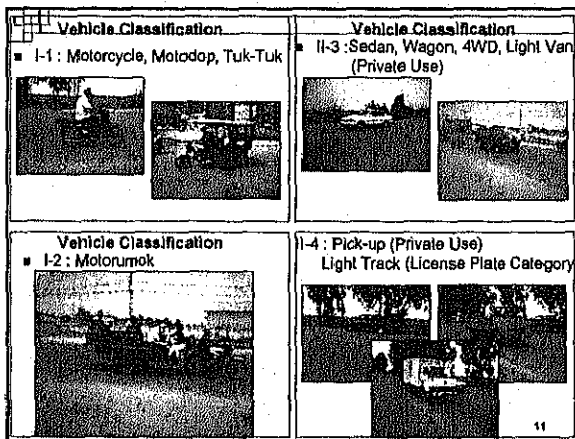
Shift	Vehicle Count Survey		Survey	Date
	Start	End		
1				
2				
3				

Vehicle Type	I. Motorcycle (MC)			II. Light Vehicle (LV)			III. Heavy Vehicle (HV)		
	Motorcycle	Sedan/Wagon/Light Van	Pick-up/Jeep/Light Truck	Short & Long Body Bus	Short & Long Body Truck	Semi & Full Trailer Truck			
Count									
Percentage									

### III.1.5 Traffic Count Survey

#### Vehicle Classification

I	Motor Cycle	1	Motorcycle, Motodop, Tuk-Tuk
		2	Motolumok
II	Light Vehicle	3	Sedan, Wagon, Light Van (for Private use)
		4	Pick-up, Jeep, Light Truck (for Private use)
		5	Minibus (Light Van & Pick-up for Public use)
III	Heavy Vehicle	6	Short and Long Body Bus
		7	Short and Long Body Truck
		8	Semi and Full Trailer Truck



III.2 OD Interview Survey.

**III.2.1 Survey Item**

- Origin and Destination of the trip
- Trip purpose
- Seating capacity and No. of passengers on board
- Major commodity
- Load factor
- Estimated travel time
- Whether the vehicle is registered or not

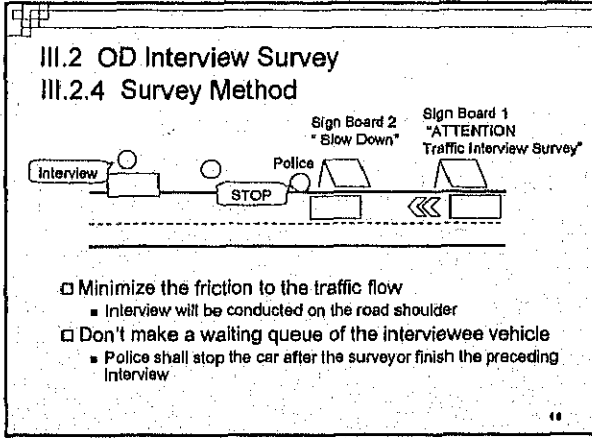
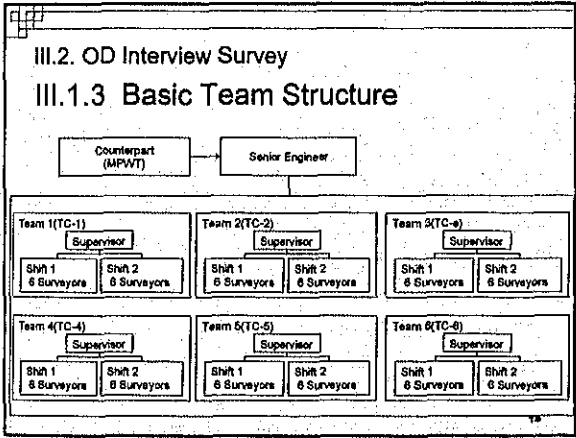
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III.2 OD Interview Survey.

**III.2.2 Survey Method**

- Courtesy talking makes interview quite smooth
  - At first, express the thanks to the interviewee for cooperating the survey, and explain the objective and contents of the survey
- The Interview Survey will be conducted at the same place and time with the Traffic Count Survey
- In selecting the sample vehicle, balance the vehicle type composition with the total traffic flow

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III.2 OD Interview Survey

- Interview Item
  - 1. Survey Time
  - 2. Vehicle Type
    - The same classification with Traffic Count
  - 3. Seating Capacity
    - Except for Truck and Trailer
  - 4. Number of Passengers on Board
    - Except for Truck and Trailer
    - Including the Driver
- Survey Sheet

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III.2 OD Interview Survey

- Interview Item
  - 5. Major Commodity
    - 1) Agriculture
      - Rice, Vegetable, Fruit, etc.
    - 2) Forest
      - Log, Timber, Plywood, etc.
    - 3) Marine
      - Fish, Shell, Seaweed, etc.
    - 4) Mineral
      - Coal, Copper, Iron, Salt, etc.
    - 5) Metal & Machine
      - Steel, Generator, Car & Bike, etc.
    - 6) Chemical
      - Cement, Petroleum, Alcohol, Acid, etc.
    - 7) Light Industry / Electronics
      - Machine Parts, IC Electronic Appliances, etc.
    - 8) Miscellaneous Industry
      - Garment, Shoes, etc.
    - 9) Construction
      - Sand, Gravel, Asphalt, Concrete, Re-Bar, Beam, etc.
    - 10) Others

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### III.2 OD Interview Survey

- Interview Item
  - 6. Load Factor
    - Truck and Trailer only
  - 7,8. Origin and Destination
    - The First Origin and the Final Destination of the Trip (Especially for Commodity)
    - City, District, Province (Country)
  - 9. Estimated Travel Time
    - Excluding the Rest Time

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### III.2 OD Interview Survey

OD Zone Code (Inside of Cambodia)

Code	Province	Code	Province	Code	Province	Code	Province
010	Phnom Penh	080	Krong Kaeb	150	Banteay Mean Chey	220	Mondul Kiri
020	Kandal	090	Krong Preah Sihanouk	160	Kampong Cham	230	Stoeng Treng
030	Prey Veaseng	100	Koh Kong	170	Kampong Thum	240	Ratanak Kiri
040	Svay Rieng	110	Kampong Chhnang	180	Preah Vihear		
050	Takaev	120	Pousal	190	Siem Reap		
060	Kampong Speu	130	Bat Dambang	200	Older Mean Chey		
070	Kampot	140	Pallin	210	Kracheh		

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### III.2 OD Interview Survey

OD Zone Code (Outside of Cambodia)

Code	Province	Code	Province	Code	Province
510	Vietnam via NR1	610	Thailand via NR5	710	Laos via NR7
520	Vietnam via NR2	620	Thailand via NR48	790	Laos via others
530	Vietnam via NR33	630	Thailand via NR57		
540	Vietnam via NR72	640	Thailand via NR67		
550	Vietnam via NR74	650	Thailand via NR68		
560	Vietnam via NR78	690	Thailand via others		
590	Vietnam via others				

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### III.3 Travel Time Survey

- Survey Item
  - Time of Departure and Arrival
  - Time of Passing Check Points
  - Time of Stop/Restart with reason of stopping
- Survey Method
  - Floating Car Method

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### III.3 Travel Time Survey

- Basic Team Structure
- Survey Sheet

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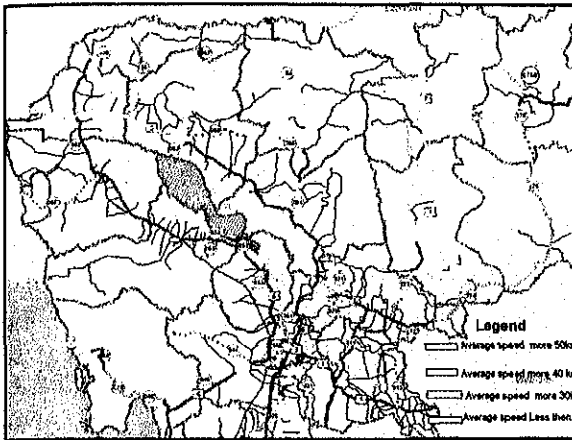
### III.3 Travel Time Survey

- Survey Route
  - 1 round trip survey for each route
  - Suspend the survey after sunset and restart in the next morning

Route No.	Start and End	Route No.	Start and End	Route No.	Start and End
1	P.P. to Border	11	NR1 to NR7	64	NR6 to Border
2	P.P. to Border	31	NR3 to NR33	67	NR6 to Border
3	P.P. to Veal Renh	33	NR3 to Border	68	NR6 to Border
4	P.P. to Bihanouk Ville	48	NR4 to Border	71	NR7 to NR6
5	P.P. to Polpat	51	NR5 to NR4	73 & 308	NR7 to Kracheh
6	P.P. to Staphon	56	NR5 to Samraong	76	NR7 to Sen Monorom
7	P.P. to Border	57	NR5 to Border	78	NR7 to Border

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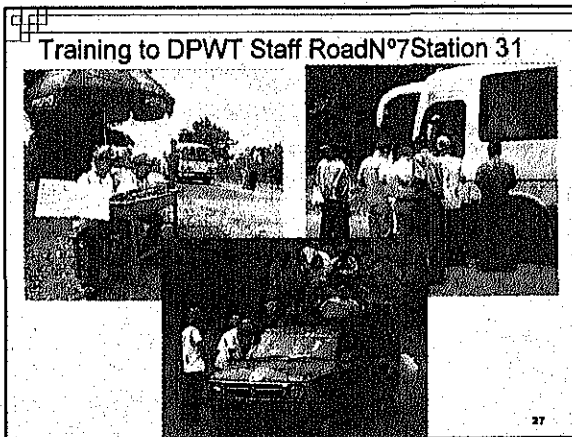




### III.4 Training to DPWT Staff

- Training Methodology
  - DPWT staff of each province shall come to the nearest survey site
  - Train from MPWT Counterpart and Senior Engineer, and join the survey for 1 hour
  - Submission of the training report to MPWT counterpart
  - No. of Training Point:  
(33,31,46,29,17,13,11,2,15,5)

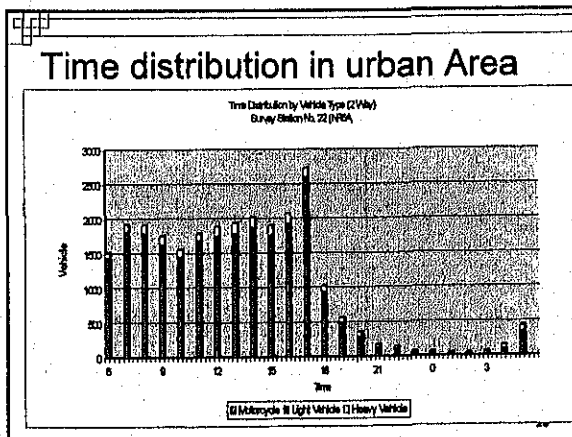
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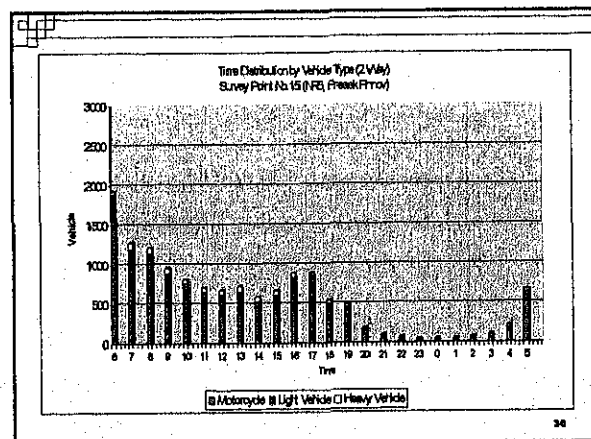
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## IV. Survey Result

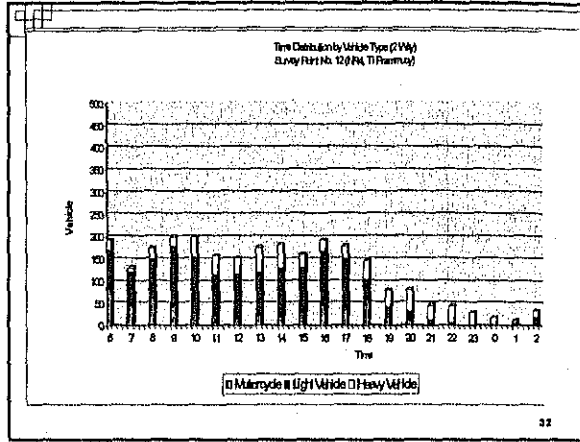
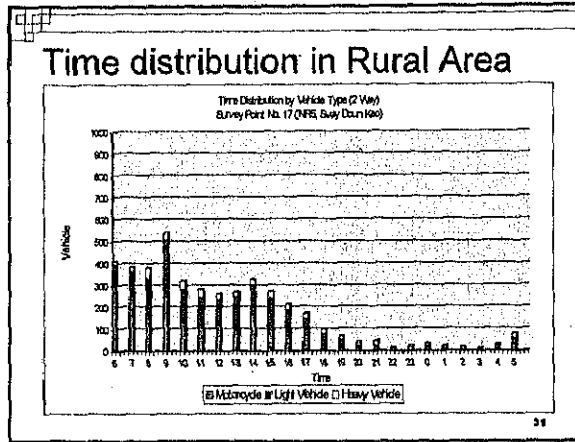
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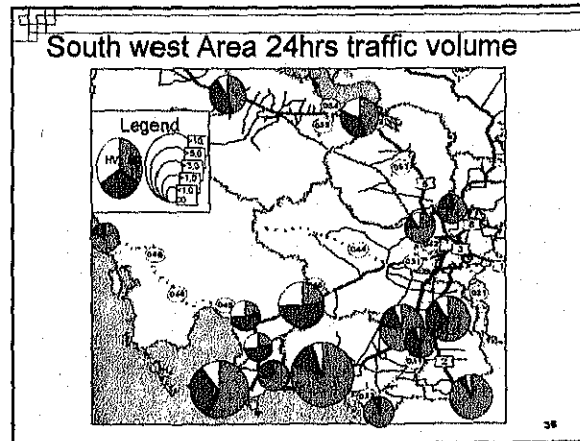
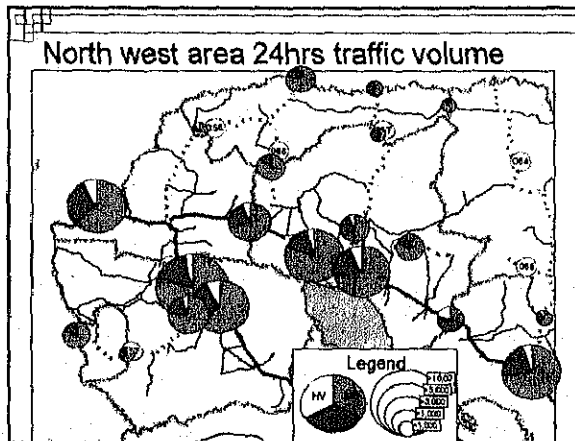
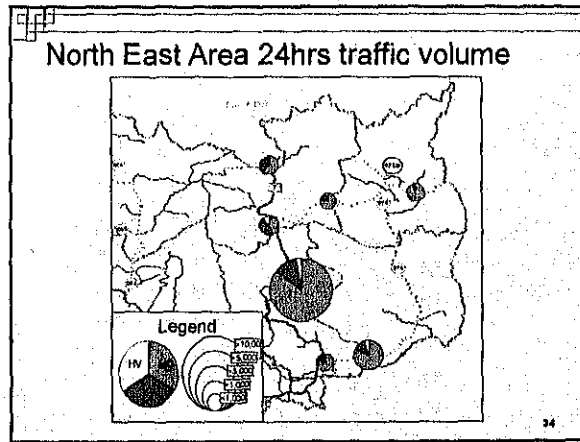


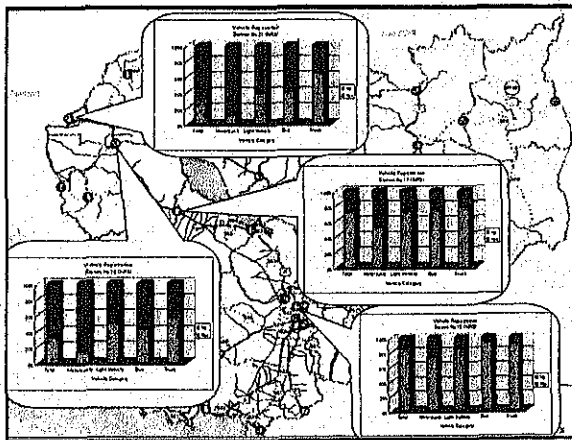
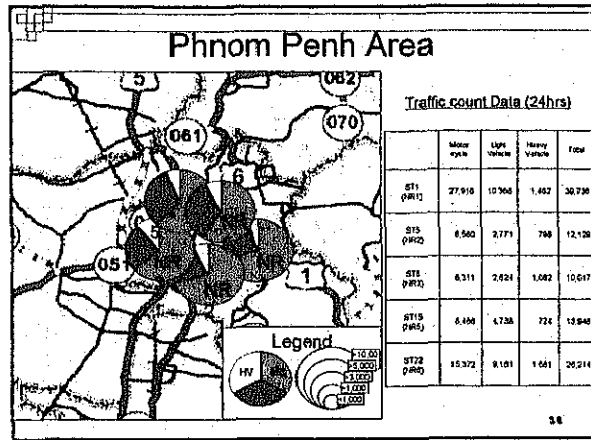
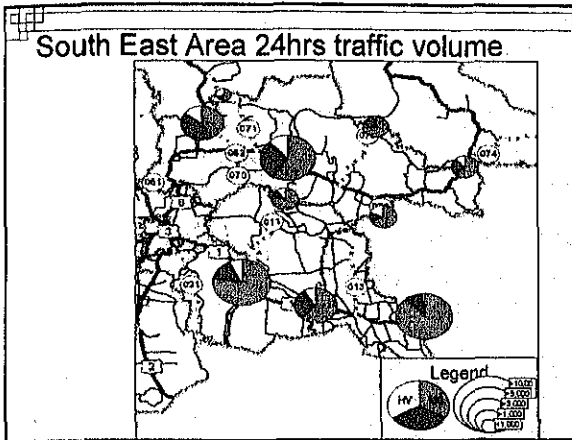
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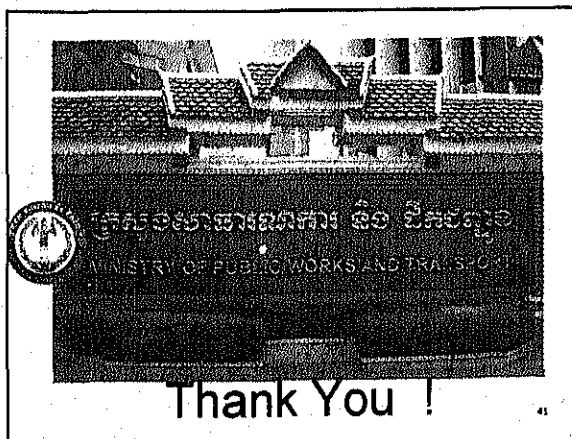
### Conversion factor of traffic volume by vehicle type from 12hrs data in to 24hrs data

	1. Motorcycle	2. Motorcycle + Trailer	3. Sedan	4. Pickup, Light Truck	5. Minibus	6. Bus	7. Truck	8. Trailer
Urban Area	1.20	1.32	1.21	1.34	1.18	1.08	1.28	1.84
Rural Area	1.21	1.03	1.13	1.19	1.18	1.01	1.61	1.83





- ### V. MPWT Data Management Problems
- Existing situation
  - No periodic traffic survey
  - Conducted project by project only
  - No centralized data Management
  - No common ownership of the data
  - Data update in appropriate period
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**KINGDOM OF CAMBODIA**  
Ministry of Public Works and Transport

**JICA Study Team for The Road  
Network Development in Cambodia**



Traffic Accident Survey



Workshop on the Traffic Accident Survey

Supported by MPWT & JICA Study Team  
Phnom Penh, 12 August, 2005  
Nop Kharith

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## I - Introduction

- The kingdom of Cambodia, with the increasing number of vehicles every year and with the effort of the Royal Government concentrating on construction and rehabilitation of road infrastructure to facilitate rapid and smooth transportation of goods and people in order to boosting national economy and particularly reducing people poverty, road accidents are also increasing in dramatically high rate.
- In Kingdom of Cambodia, road accidents are now being recognized as second big disaster after AIDS and have cause lost of life, lost of public and private properties.

### ➤ 1. Survey Objective

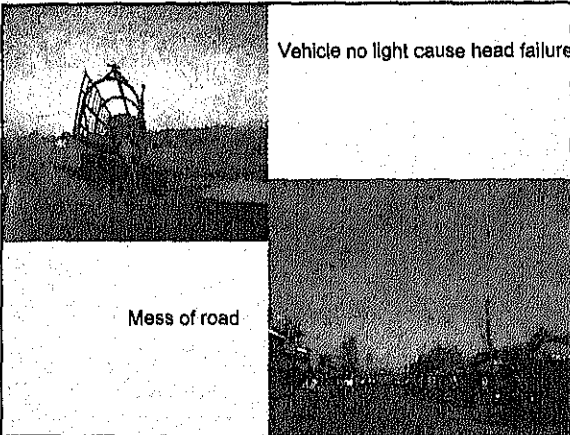
- Purpose of conducted survey to find out the road accident occurred in recently in Cambodia.
- Human Factor (Road users)
- Road Defect
- Vehicle Defect
- Inefficient and inadequate Legislation
- Weakness of Traffic law Enforcement
- Roads environment and road design.
- Road safety education for children.



Road accident has been caused by road users who driving faster than limit or driving careless.

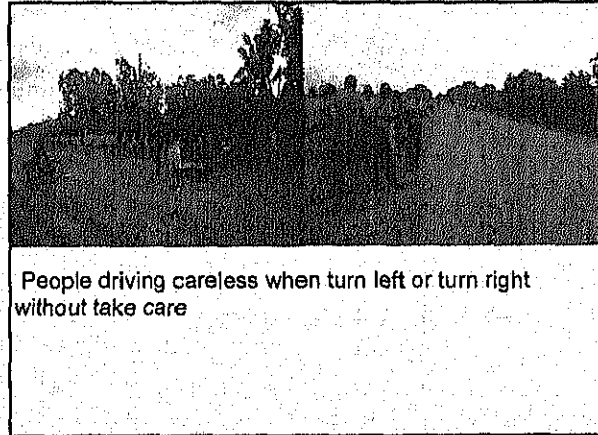


One part of road has been caused by road or bridge infrastructure, which is not yet in the appropriate safety standard.



Vehicle no light cause head failure

Mess of road



People driving careless when turn left or turn right without take care

## 2. Survey Scopes

- To identify the location where many accidents occurred in town and rural section.
- To identify the accidents type and cause to occurred on junction in town section.
- To identify the location where pedestrian and bicycle encounters accident in town section.
- To identify the location where school children encounter accident on going to school and coming home .
- To identify the location where vehicle collides oncoming car when it passes forward car.
- To identify the accident location where the vehicle collides motorbike.

## II. Survey Methodology

- The criteria to be selected the survey are.
- Data were collected from the provincial traffic police district. (destination, City, District, Province).
- Interviewee with local police and authorities destination.

➤ 1. Schedule

- The survey have been conducted 3 month one-digit National Road which hearing survey for the accident occurred in 2004 .
- Data collection at the police central district.

Nº	Province	District Name
1	Kandal	Ang Snoul
		Ponnear Lue
		Muk Kampoul
2	Kampong Speu	Samrong Tong
		Chabamon
		Phnom Srouch
3	Koh Kong	Kampong Sella
4	Sihanouk Ville	Prey Nop
		Meattapheap
5	Phnom Penh	Phnom Penh
6	Kampong Chhang	Sammeakki Meanchey
		Kampong Tralach
		Rolear Blear
		Kampong Chhang
		Rolear Blear
		Boribour

7	Pursat	Kroker
		Sampov Meas
8	Battam Bang	Bakan
		Sang Kee
		Battam Bang
9	Banteay Meanchey	Thmo Koull
		Ou Chrouv
		Monkoul Borel

KINGDOM OF CAMBODIA  
Nation Religion King

Ministry of public works and Transport  
Road Accident Interview  
Central Police station  
Province.....

1. Driver error Drunk driving Careless driving Traffic law breaking Over speed limit Other	8. Road Surface Dry Sandy Wet Oily	Between motorbike & cycle Between motorbike & car Between car & car Between car & pedestrian
2. Vehicle defect Break failure Tire blow-out Headlight failure Power steering failure Others	7. Time Accident Day time Night time & Place Accident in/ Public place Out skirts	11. Note from police
3. Road factors Merging Narrow Blind corner Bad condition	9. Type of Location Straight road Bend Sharp curve Bridge	
4. Pedestrian Particulars Walking on the footpath Walking along the road Veh traffic Against traffic Crossing the road	10. Type of Collision Single vehicle Between vehicle & pedestrian Between motorbike & motorbike	



Interviewee with traffic police and collected data



### Traffic Accident on Major National Road (2004)

Road No.	Province	Distance (km)	Number of Accident (Times)	Severity of Injury (persons)			
				Fatalities	Serious	Not Serious	Total
NR-1	Phnom Penh	3.0	24	4	29	9	38
	Kandal	44.3	22	5	22	23	45
	Pray Veng	48.6	52	17	89	45	114
	Bvay Rieng	84.7	78	20	80	59	119
	<b>Total</b>	<b>160.6</b>	<b>174</b>	<b>46</b>	<b>160</b>	<b>138</b>	<b>298</b>
Accident Rate (per km)				1.09	0.28	0.84	1.87
NR-4	Kandal	19.0	145	20	142	82	224
	Kompong Speu	77.7	173	81	178	153	332
	Koh Kong	49.3	22	3	11	39	55
	Sihanoukville	85.2	67	37	43	39	82
	<b>Total</b>	<b>211.2</b>	<b>402</b>	<b>141</b>	<b>378</b>	<b>323</b>	<b>698</b>
Accident Rate (per km)				1.89	0.54	0.87	3.28
NR-5	Phnom Penh	12.2	83	12	73	59	132
	Kandal	27.1	27	17	14	12	26
	Kompong Chhnang	93.5	180	31	85	135	230
	Pursat	97.2	122	34	80	64	164
	<b>Total</b>	<b>300.5</b>	<b>472</b>	<b>94</b>	<b>232</b>	<b>220</b>	<b>466</b>
Accident Rate (per km)				1.57	0.77	0.73	3.07
NR-6A	Phnom Penh	16.4	107	27	73	44	117
	Kandal	28.9	88	26	62	69	156
	<b>Total</b>	<b>45.3</b>	<b>195</b>	<b>53</b>	<b>135</b>	<b>113</b>	<b>273</b>
NR-6	Kompong Cham	199.4	427	112	399	372	771
	<b>Total</b>	<b>244.7</b>	<b>624</b>	<b>164</b>	<b>598</b>	<b>544</b>	<b>1,142</b>
Accident Rate (per km)				2.55	0.67	2.28	5.50
NR-7	Phnom Penh	1.93	107	27	73	44	117
	<b>Total</b>	<b>(2.00)</b>	<b>(0.69)</b>				<b>(3.38)</b>

Source : Provincial Traffic Police and District Traffic Police

### Traffic Condition no NR 1

Location	Unit	Motor-bike	Light Vehicle	Bus	Truck	Total
Nroth (PK 8.6)	Veh.	27,916 (70.3%)	8,764 (22.1%)	1,674 (4.2%)	1,382 (3.5%)	39,736
	PCU	8,375 (33.8%)	8,764 (35.4%)	4,185 (16.9%)	3,456 (13.9%)	24,779
Preaek Khsay Kha (PK 52.9)	Veh.	6,270 (77.9%)	742 (9.2%)	513 (6.4%)	526 (6.5%)	8,051
	PCU	1,881 (36.0%)	742 (14.2%)	1,283 (24.6%)	1,315 (25.2%)	5,221
Kraol Kou (PK101.5)	Veh.	2,182 (60.9%)	768 (21.5%)	407 (11.4%)	223 (6.2%)	3,580
	PCU	655 (21.8%)	768 (25.6%)	1,018 (33.9%)	558 (18.6%)	2,996
Vietnam Border (PK166.2)	Veh.	7,564 (88.9%)	780 (9.3%)	83 (1.0%)	70 (0.8%)	8,507
	PCU	2,269 (65.9%)	780 (23.0%)	208 (6.0%)	175 (5.1%)	3,442

Note : PCU Motorbike = 0.3, Light Vehicle = 1.0, Bus and Truck : 2  
Source : JICA Study 2005

### Collision Type on NR 5

Province District	Phnom Penh (PK 0.0 - PK 12.2)			Kampong Chhnang Bonbour (PK110.3 - PK133.2)		
	Accidents	Fatalities	Injuries	Accidents	Fatalities	Injuries
Motorbike & Pedestrian	6 (7.2%)	0	4 (3.0%)	1 (2.5%)	0	1 (2.1%)
Motorbike & Bicycle	15 (18.1%)	0	33 (25.0%)	0	0	0
Motorbike & Motorbike	24 (28.9%)	2 (10.7%)	32 (24.2%)	5 (14.3%)	1 (10.0%)	7 (14.9%)
Motorbike & Automobile	9 (10.8%)	6 (30.0%)	19 (14.4%)	4 (11.4%)	2 (20.0%)	4 (8.5%)
Motorbike & Pedestrian	5 (6.0%)	0	6 (4.3%)	6 (17.1%)	2 (20.0%)	4 (8.5%)
Automobile & Bicycle	1 (1.2%)	0	2 (1.5%)	4 (11.4%)	2 (20.0%)	3 (6.4%)
Automobile & Pedestrian	15 (18.1%)	2 (10.7%)	32 (24.2%)	14 (40.0%)	1 (10.0%)	24 (51.1%)
Automobile & Automobile	8 (9.6%)	2 (10.7%)	4 (3.0%)	1 (2.5%)	2 (20.0%)	4 (8.5%)
Other	3 (3.6%)	0	0	0	0	0
<b>Total</b>	<b>83</b>	<b>12</b>	<b>132</b>	<b>35</b>	<b>10</b>	<b>47</b>

Province District	Batam Bang (PK258.0 - PK305.5)			Kraol Kou (PK305.5 - PK342.1)		
	Accidents	Fatalities	Injuries	Accidents	Fatalities	Injuries
Motorbike & Pedestrian	4 (2.8%)	1 (4.2%)	4 (3.0%)	0	0	0
Motorbike & Bicycle	4 (2.8%)	0	5 (3.8%)	2 (3.2%)	0	2 (4.2%)
Motorbike & Motorbike	54 (37.8%)	9 (37.5%)	64 (48.0%)	15 (23.6%)	3 (20.0%)	23 (47.9%)
Motorbike & Automobile	59 (41.3%)	7 (28.2%)	59 (44.7%)	26 (44.4%)	4 (26.7%)	23 (47.9%)
Motorbike & Pedestrian	10 (7.0%)	4 (16.7%)	8 (6.0%)	5 (7.9%)	3 (20.0%)	2 (4.2%)
Automobile & Bicycle	4 (2.8%)	1 (4.2%)	4 (3.0%)	0	0	0
Automobile & Pedestrian	4 (2.8%)	0	0	13 (20.0%)	5 (33.3%)	8 (16.7%)
Automobile & Automobile	3 (2.1%)	2 (8.3%)	18 (13.2%)	0	0	0
Other	3 (2.1%)	2 (8.3%)	18 (13.2%)	0	0	0
<b>Total</b>	<b>143</b>	<b>24</b>	<b>151</b>	<b>65</b>	<b>15</b>	<b>48</b>

Source : District Traffic Police

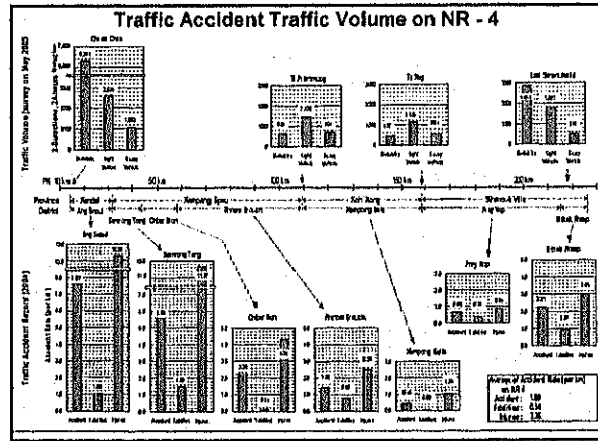
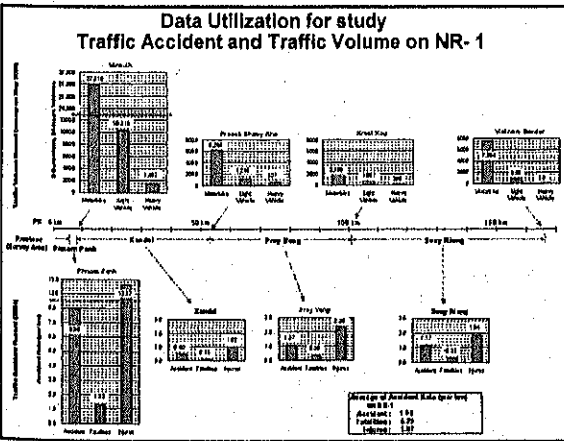
### Collision Type NR~ 6A, NR~6 and NR ~ 7 Year 2004

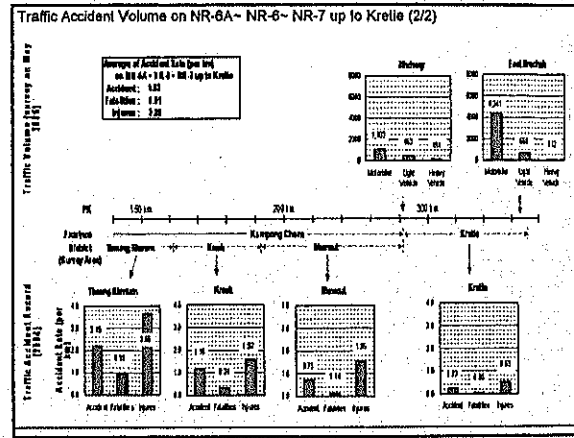
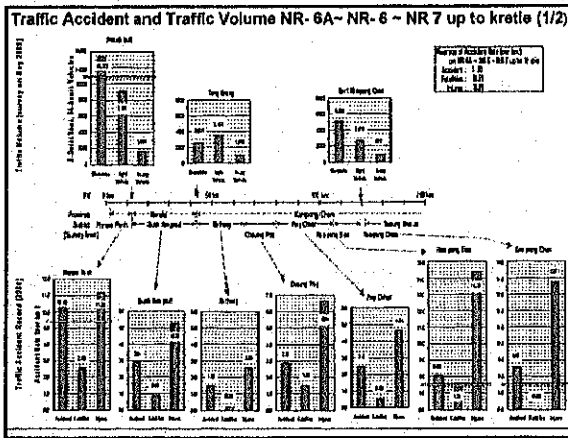
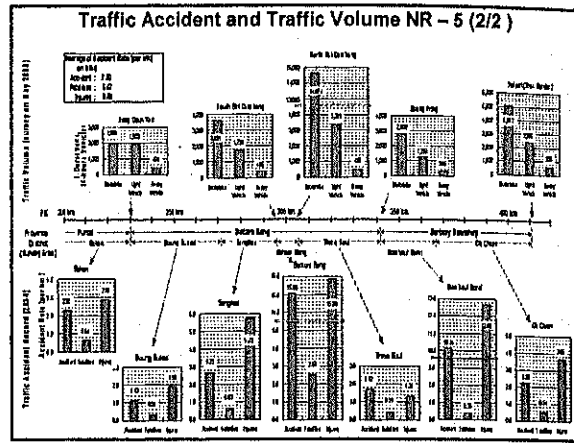
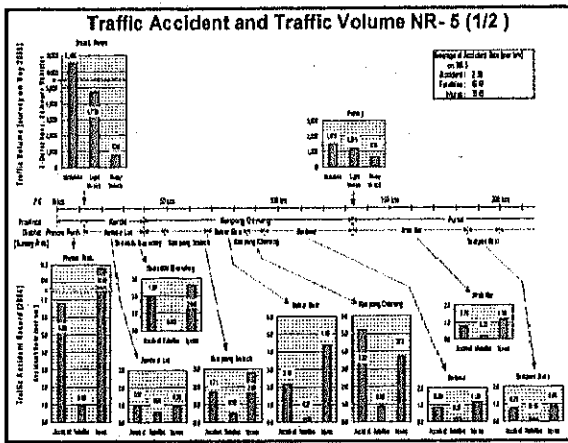
Province District	Phnom Penh (PK 2.1 - PK 12.5)			Kandal Muli Kampou (PK 12.5 - PK 42.4)		
	Accidents	Fatalities	Injuries	Accidents	Fatalities	Injuries
Motorbike & Pedestrian	3 (2.9%)	0	3 (2.6%)	11 (12.5%)	0	1 (1.7%)
Motorbike & Bicycle	2 (1.9%)	2 (7.4%)	4 (3.4%)	2 (2.3%)	1 (3.8%)	3 (2.1%)
Motorbike & Motorbike	61 (57.0%)	16 (59.3%)	68 (58.1%)	15 (17.0%)	1 (3.8%)	27 (18.0%)
Motorbike & Automobile	15 (14.0%)	7 (26.3%)	20 (17.1%)	38 (43.2%)	16 (61.9%)	63 (37.3%)
Motorbike & Pedestrian	5 (4.7%)	0	4 (3.4%)	3 (3.4%)	1 (3.8%)	2 (1.4%)
Automobile & Bicycle	1 (0.9%)	0	2 (1.7%)	5 (5.7%)	1 (3.8%)	5 (3.0%)
Automobile & Pedestrian	20 (18.7%)	2 (7.4%)	18 (13.7%)	11 (12.5%)	4 (15.4%)	27 (18.0%)
Automobile & Automobile	0	0	0	3 (3.4%)	2 (7.7%)	24 (16.0%)
Other	0	0	0	0	0	0
<b>Total</b>	<b>107</b>	<b>27</b>	<b>117</b>	<b>88</b>	<b>23</b>	<b>142</b>

Province District	Cheung Pray (PK 64.4 - PK 79.8)			Kompong Som (PK 105.5 - PK 118.4)		
	Accidents	Fatalities	Injuries	Accidents	Fatalities	Injuries
Motorbike & Pedestrian	3 (6.8%)	0	8 (7.8%)	10 (10.2%)	0	14 (7.7%)
Motorbike & Bicycle	5 (11.4%)	0	5 (4.9%)	10 (10.2%)	1 (8.9%)	13 (7.2%)
Motorbike & Motorbike	11 (25.0%)	3 (13.0%)	17 (16.7%)	20 (20.4%)	2 (12.9%)	47 (26.0%)
Motorbike & Automobile	13 (29.5%)	3 (13.0%)	25 (24.9%)	33 (33.7%)	7 (43.6%)	68 (37.6%)
Motorbike & Pedestrian	3 (6.8%)	1 (4.3%)	2 (2.0%)	3 (3.1%)	1 (8.3%)	2 (1.1%)
Automobile & Bicycle	1 (2.3%)	0	1 (1.0%)	5 (5.1%)	1 (8.3%)	10 (5.9%)
Automobile & Pedestrian	8 (18.2%)	16 (69.6%)	44 (43.1%)	9 (9.2%)	2 (12.9%)	16 (8.9%)
Automobile & Automobile	0	0	0	8 (8.2%)	2 (12.9%)	11 (6.1%)
Other	0	0	0	0	0	0
<b>Total</b>	<b>44</b>	<b>23</b>	<b>102</b>	<b>96</b>	<b>16</b>	<b>181</b>

Source : District Traffic Police





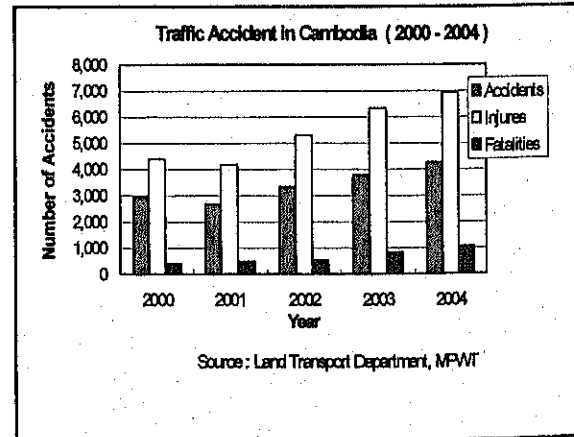
\*\*\* Survey Traffic Accident and Analysis  
\* Road Traffic Accident in Cambodia

From 2000 to 2004 road accident have increased up ( 4,265 road accident, 1,042 fatalities and 6,925 injuries)

**Road Traffic Accidents in Cambodia (2000-2004)**

Year	Number of Vehicle	Number of Accident (Times)	Severity of Injuries (persons)			Number of Damage by Type of Road User						Participation (persons)	
			Fatalities	Injuries		Number of Vehicle							
				Statistics	Not Statistics	Total	Light Vehicle	Heavy Vehicle	Motorcycle	Bicycle	Other		total
2000	331,604	2,681	401	1,968	2,369	4,369	684	242	2,171	-	219	3,457	80
2001	383,077	2,659	459	1,771	2,413	4,194	668	267	2,609	-	338	4,059	76
2002	410,027	3,335	535	2,113	3,188	5,301	1,309	340	3,509	187	223	5,708	108
2003	447,468	3,780	604	2,714	3,618	6,339	1,889	332	3,938	239	389	6,566	168
2004	485,612	4,265	1,042	3,185	3,740	6,925	2,001	438	4,331	392	370	7,698	203

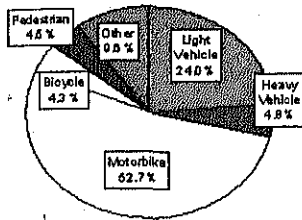
Source: Land Transport Department, MPWT





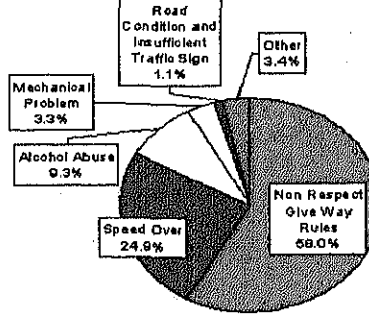
### Data Analysis

Damage by Type of Road User (2004)  
total number : 9,339



Source : Land Transport Department, MPWT

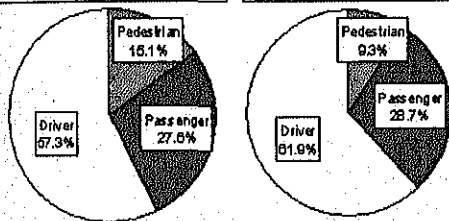
Cause of Accident (2004)  
total number of accident : 4,255



Source : Land Transport Department, MPWT

### Fatalities and Injuries by Type of Road User (2004)

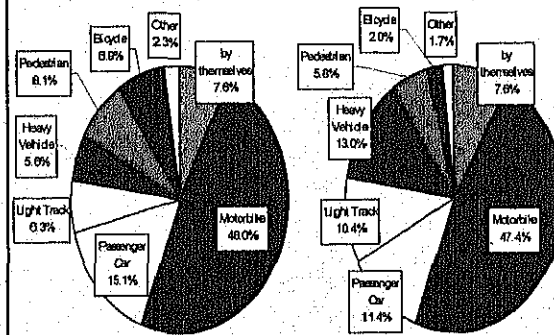
Fatalities (total : 1,042 persons) Injuries (total : 6,925 persons)



Source : Land Transport Department, MOW

### Collision Type of Motorbike Accident (2004)

Number of Accident (Total : 3,886) Number of Fatalities (Total : 901)



Source : Land Transport Department, MPWT

### IV. Comment

- According to conducted survey road accident in Kingdom of Cambodia, we has recognized that .
  - > Road accidents was increase up now.
  - > Road accidents happening in the country caused by the drivers, who do not respect the priorities and traffic law.
  - > Some people driving carelessly who cause traffic accidents themselves and to others, this leads to death or physical disability.
  - > Over speed driving careless, getting drunk during driving.

- > Road and bridges are also factors of road accident because In some place there are a lot of potholes and others place are narrow.
- > road wide but bridge are narrow and there no sign of narrow road at place.
- > Road are curving too harsh.

- > Difficult problem.
- > The traffic police at central district are not kind to cooperation with.
- > Data road accident district quite different from data province police.
- > Data road accident not only traffic police record also MILITARY police record too.
- > Road accident occurred far from central police couldn't record it cause lack of information.

**Thank You for attention!!**

**KINGDOM OF CAMBODIA**  
**MINISTRY OF PUBLIC WORKS AND TRANSPORT**

**JICA STUDY TEAM**  
**ON THE ROAD NETWORK**  
**DEVELOPMENT IN CAMBODIA**

**DEVELOPMENT STRATEGY TEAM**  
**WORK SHOP**  
**ON**  
**RESULT OF THE**  
**REGIONAL DEVELOPMENT SURVEY**



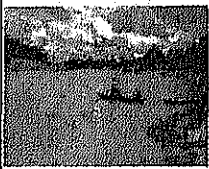
Supported by MPWT & JICA Study Team  
Phnom Penh, 12 August, 2005



## CONTENTS:



1. INTRODUCTION
2. SURVEY METHODOLOGY
3. SURVEY RESULTS
4. COMMENTS



## I. INTRODUCTION:

### 1.1 OBJECTIVE:

- ROAD CONDITION
- LIVING STANDARD
- REGIONAL ECONOMIC



### 1.1 OBJECTIVE

#### a) Road condition:

- How the people can reach to the main road.
- How the people can reach to the Market, hospital and School.
- What is the transportation do they use to their goal.
- How long do they take from home to destination.

#### b) Living Situation:

- How big of the family.
- What they are doing for living.
- In the family how many people working.
- What they are doing during wet season , dry season and go on.

#### c) Regional Economic:

- What is the potential product do they have.
- Where the product serve (Province or other)
- How do they earn income (enough or find other job?)

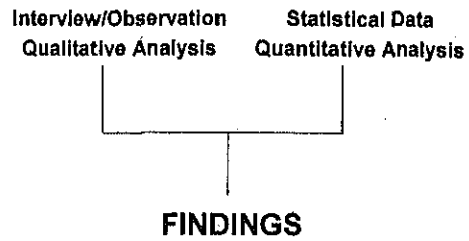
### Overall goal:

- To formulate a road network develop master plan for the hole country of Cambodia and prepare the implementation plan in the short term (2006-2010), middle (2011-2015) and long term (2016-2020).
- To carry out pre-feasibility study on the high priority project selection in the short term and
- To conduct technology transfer thought the study to the counterpart personal of MPWT and other agencies concerned.

## 1.2 SURVEY SCOPE:

- >PROVINCES: Pursat, Kandal, Kampong Chhnage, Stung Treng, Kampong Thom, Kratie, Rattanakiri, Mondul Kiri and Banleay Menchey.
- >MINISTRIES: Ministry of Rural Development (MRD), Ministry of Commerce, Ministry of Agriculture and Siela Programme.

## II. SURVEY METHODOLOGY:



## 2.1 Qualitative Survey:



### 1) Field Survey

- Meeting with Provincial Department of Rural Development Kandal Kampong Chhang.
- Interview people in Kampong Thom, Stung Treng, Rattanakiri along river Chinit, Tonle Kong and Tonle Sraepok.
- Participation of villagers during data survey.

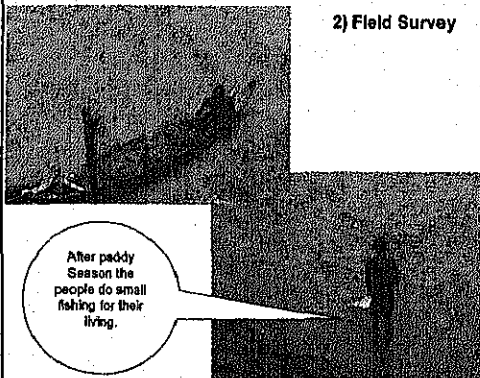
### Interview people in Kampong Thom along river Chinit

- > The way of life for people
- > Occupation
- > Potential products (Wet, Dry Season)
- > Transportation using from home to market and main road.
- > Time and Expense
- > Demand of people

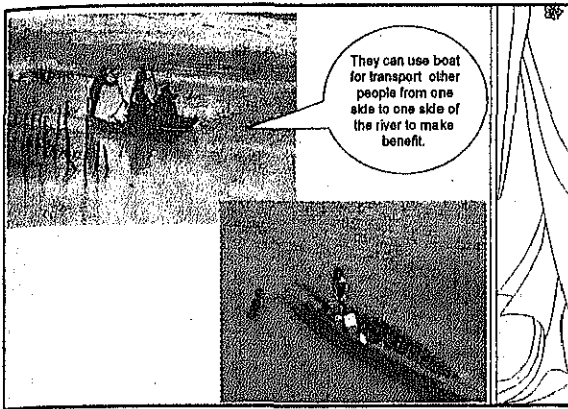
### Interview people in Stung Treng and Rattanakiri along Tonle Kong and Sraepok

- > Living of people
- > Potential products (Wet, Dry Season)
- > Transportation to market and main road.
- > Demand of people

### 2) Field Survey



During flood season the people go to work for pay far away from their house such as do rice field, Planting and cutting tree.



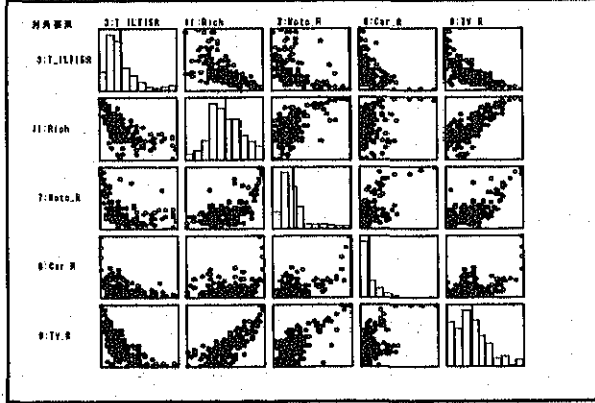
- ### 3. Discussion with relating Agencies
- Meeting with Provincial Department of Rural Development in Kandal
    - Budget Proposal to Government
    - Total length of rural road
    - Actual budget received from Government
    - Future Planning
  - Meeting with Provincial Department of Rural Development in Pursat
    - Budget Proposal to Government
    - Total length of rural road
    - Actual budget received from Government
    - Future Planning

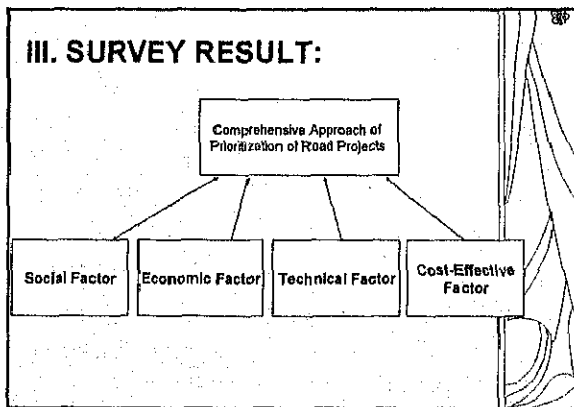
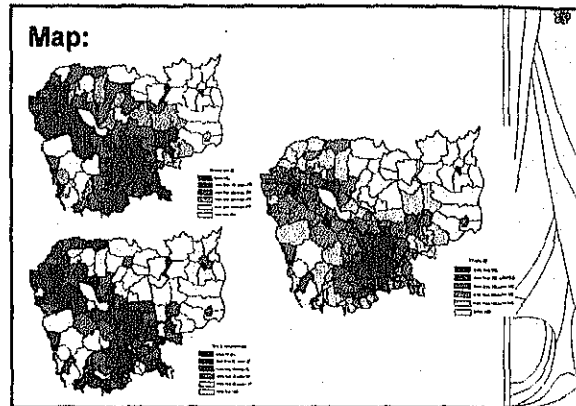
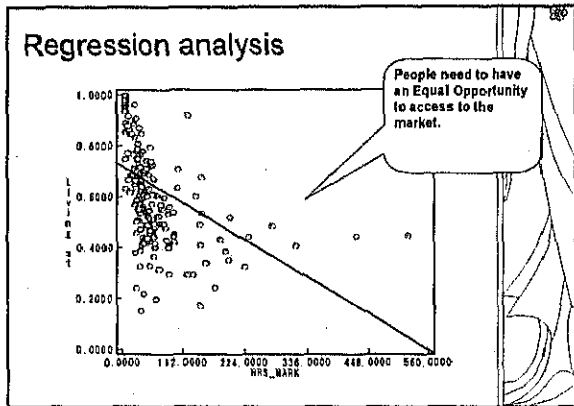
- ## 2.2 Qualitative Survey:
- ### 1. Collected Data
- Seila 2003
  - Agricultural Statistics
  - Cambodia Economic Watch
  - Map info
  - Planning Statistics
- To get Statistical data was very difficult !!!

- ## 2. Data Analyses
- ### Indicators
- A. Social factor
    - Literacy
  - B. Economy factor
    - TV, Type of roof, Car/Motor.
  - C. Infrastructure
    - Electricity
    - Road network access to Market

Table: Correlations among the factors

Verification	Literacy	Non-thatch roof	Paddy price	Hrs to market	Motor	Car	TV
Literacy	1	-0.628	-0.145	0.584	-0.378	-0.346	-0.697
Non-thatch roof	-0.628	1	0.237	-0.39	0.634	0.33	0.785
Paddy price	-0.145	0.237	1	-0.248	0.095	0.031	0.165
Hrs to market	0.584	-0.39	-0.248	1	-0.301	-0.247	-0.482
Motor	-0.378	0.634	0.095	-0.301	1	0.606	0.724
Car	-0.346	0.33	0.031	-0.247	0.606	1	0.501
TV	-0.697	0.785	0.165	-0.482	0.724	0.501	1





- ### IV. COMMENTS:
- After road construction, Living standard of people is better than before.
  - Encourage people to take care rural road in their villages.
  - Request to JICA team check the implementation of Master plan after finished project.
  - Developing ring road in Phnom Penh
  - Developing road network around border.



# THE STUDY ON THE ROAD NETWORK DEVELOPMENT

## ATTENDANTS LIST OF 2nd WORKSHOP OF TASKFORCE TEAMS

On 12 August 2005

No.	Name	Position	Organization
1	MR. H. SHINKAI	Team Leader	Study Team
2	MR. A. KOJIMA	Deputy T.L	Study Team
3	MR. J. SANTOS	Member	Study Team
4	MR. FUKUMA	Member	Study Team
5	MR. YUMITA	Member	Study Team
6	MR. S. YASHIRO	Member	Study Team
7	MR. T. MAKITA	Jica Expert	MPWT
8	MR. PAO CHHUN LIM	Staff	Dept. R. Infra
9	MR. SOPHEAK PHIBAL	Senior Technical Staff	Dept. R. Infra
10	MR. CHEA HOUR	Tech. Official	RCPWT
11	MR. SAN PISET	Counterpart	MRD
12	MS. CHEA SOVEASNA	Chief Office	Dept. Planning
13	MS. NHEM LYENG	Chief Office	Dept. Planning
14	MR. HOZUMI KATSUTA	Jica Expert	MPWT
15	MR. CHEAM SOVANNY	Deputy Director	MPWT
16	MR. YOU DARA	Technical Official	MPWT
17	MR. YIN BORIN	Technical Official	MPWT
18	MR. NOP KILARITH	Technical Official	MPWT
19	MR. SIM SOKHA	Jica Study team	Study Team
20	MS. MIKA MATSUMURA	Jica Study team	Study Team
21	MR. I IWAMOTO	Jica Study team	Study Team
22	MR. TAN THIRA	Counterpart	MPWT





The Study on the Road Network Development  
3<sup>rd</sup> WORKSHOP of Taskforce Teams

(1) Date: 30 September

(Friday), 2005, 8:30am–12:00am

(2) Venue: MPWT, Conference Room at 1<sup>st</sup> floor

(3) Schedule:

8:30-8:40am Welcome remark by Deputy Team Leader of JICA Study Team  
Mr. Takashi SHIMIZU

8:40-8:45am Self-Introduction of the participants

8:45-9:00am Explanation by Study Team

- Objective of Work Shop
- Explanation of today's schedule
- Distribution of Feedback Sheet

Session 1: Progress of the Activities by Working Groups

At this session, the working groups will make presentations regarding the assigned topics within 20min., and then discuss the points within 10min.

09:00-09:30am Introduction to the Ministry of Rural Development and Rural  
Road Department by Mr. San Piset (MRD)

09:30-10:00am Road Maintenance by Mr. You Dara (MPWT)

*10:00-10:15am Tea break is provided during the workshop*

10:15-10:45am Road Network Improvement by Mr. Nop Kilarith (MPWT)

10:45-11:15am Bridge and Structure by Mr. Yin Borin (MPWT)

11:15-11:30am Free Discussion and Wrap up





## Introduction to the Ministry of Rural Development and Rural Road Department

Phnom Penh, 30 September, 2005

Mr. San Piset (MRD)  
Counterpart of JICA Study Team

1

### CONTENTS:

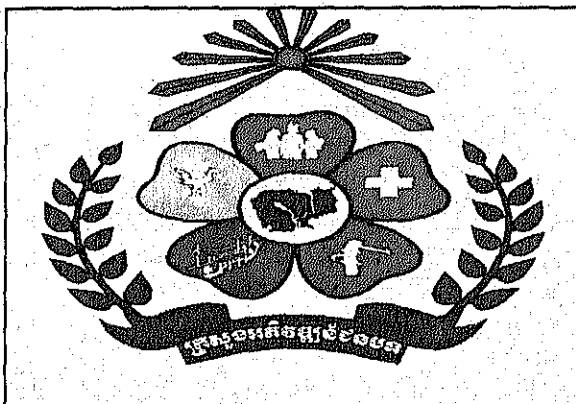
#### I. FUNCTION OF MRD:

1. INTRODUCTION
2. MANDATE
3. VISION
4. MISSION
5. OBJECTIVE
6. MAIN ACTIVITIES

#### II. STRUCTURE:

1. Structure of MRD and Number of staff
2. Organization and Function of DRR
  - A. Introduction of DRR
  - B. Duties of DRR
  - C. Structure of DRR
  - D. Accomplished work of DRR
  - E. Concluding remarks

2



#### I. FUNCTION OF MRD:

##### 1. Introduction:



The Ministry of Rural Development (MRD) has been established in 1993 with immediate tasks to meet the basic needs of all impoverished Cambodians and to safeguard the rights of the rural population to participate in plans affecting their future.

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#### 2. Mandate:

- > Rural development is critical to the eradication of poverty in Cambodia.
- > Poverty eradication should be focused on the rural areas and better targeted at the poor.
- > Attention is also being given to the strengthening and expansion of economic opportunities and creates employment in the rural area.
- > MRD will coordinate and implement the Rural Development Projects and Programs for sustainability, economic self-sufficiency, social improvement, and reduced poverty at rural areas.
- > MRD will help and assist rural communities to build the favorable environments.

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#### 3. Vision:

- o MRD has a clear vision of the happy, healthy and safe rural communities in sustainable manner.
- o This vision is in line with the Royal Government's long term vision, which is to have a socially connected, educationally advanced, and culturally vibrant Cambodia without poverty, illiteracy, and disease.

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#### 4. Mission:

MRD has two main function:

- o Provision of rural Infrastructure improvements, and
- o Coordination of rural economic and social Improvement activities with other line ministries and IO/NGOs.

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#### 5. Objective:

The key objectives are:

- o Strengthening rural communities through community-managed rural development structure to be able to manage their own development plans independently
- o Enhancing community participation in local development process
- o Mobilizing the MRD structure and resources for rural development program management.

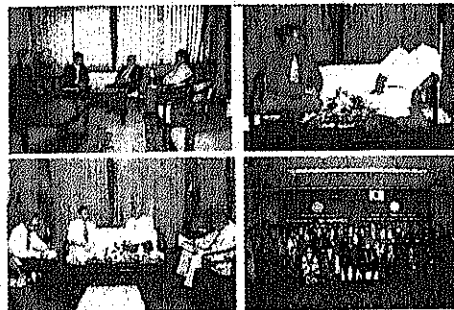
8

#### 6. Main Activities:

1. Role as catalyst and coordinator
2. MRD directly implements actions/Projects/Investments
  - o Rural Infrastructure and Community Assets Improvement Programmes
  - o Agricultural Development and Micro-economic Development

9

H.E LY LAY SRENG DUTY PRIMINISTER AND MINISTER OF MINISTRY OF RURAL DEVELOPMENT DISCUSSED WITH DEVELOPMENT PARTNERS ON RURAL DEVELOPMENT.



10

INSPECTION OF RURAL DEVELOPMENT IMPLEMENTATION WORKS IN PROVINCES



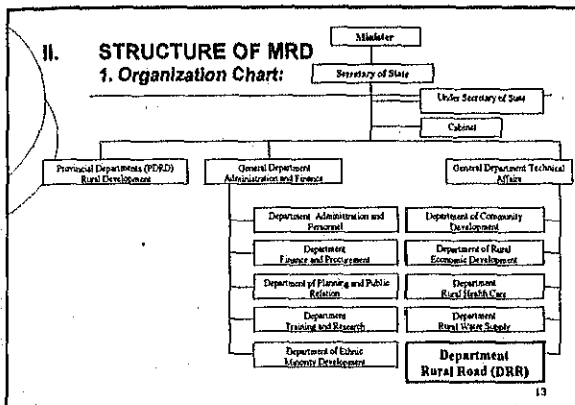
11

H.E LY LAY SRENG HONOR ON PROMOTION OF DEPUTY DIRECTOR OF KANDAL PROVINCIAL RURAL DEVELOPMENT DEPARTMENT



H.E LY LAY SRENG HONOR PARTICIPANT IN STAFF MANAGEMENT TRAINING

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### Human Resource for MRD

No.	Department	Master	Engineers	BBT	Admin	Acc.	Others	Total
1	General Director of Admin and Finance	1	3	1				5
2	General Director of Technical Affairs	2	1		1			4
3	General Inspector	3	2	2	1	1	14	23
4	Department of Administration	3	25	8	20	2	20	88
5	Training and Research Department	7	24	2	2	5	13	68
6	Rural Health Care department	7	16	5	4	3	12	62
7	Planning and Public Relation Department	10	20	2	3	3	10	68
8	Community Development Department	4	20	1	2	1	16	64
9	Rural Economy Development Department	2	10	2	8	2	7	28
10	Rural Water supply department	7	24	10	3	6	65	105
11	Rural Road department	1	8	2	6	2		19
12	Basic Community Development Department	3	12	2	1	1		20
13	Support department and finance	3	9	3	3	2	11	38
<b>Grand Total</b>		<b>63</b>	<b>201</b>	<b>82</b>	<b>64</b>	<b>28</b>	<b>187</b>	<b>595</b>

### Human Resource for Provinces (MRD)

1. Banteay Meanchey	52 ( staffs)
2. Battambang	105
3. Kampong Cham	140
4. Kampong Chhnang	74
5. Kampong Spue	111
6. Kampong Thom	89
7. Kampot	91
8. Kandal	109
9. Koh kong	18
10. Kratie	33
11. Mondul Kiri	13
12. Phnom Penh	23
13. Preah Vihear	15
14. Pny Veng	152
15. Pursat	45
16. Rattanak Kiri	16

### Human Resource for Provinces (MRD)

17. Siem Reap	62 (staffs)
18. Sihanouk Ville	23
19. Stung Treng	25
20. Svay Rieng	105
21. Takeo	153
22. Oddar Meanchey	36
23. Kep	16
24. Pailin	41
Sub Total	1,547 staffs
Grand Total	2,132 staffs

## 2. Department of Rural Road (DRR):

### A. Introduction:

The Department of Rural Road (DRR) is an organization under the direct supervision of the General Department for Technical Affairs of the Ministry of Rural Development, which shall have the role as agent to manage all rural roads in the Kingdom of Cambodia. The Department of Rural Road shall carry out its duties in compliance with the Rural Road Policy.

### B. Duties of Department Rural Road (DRR):

- To manage all rural roads in the Kingdom of Cambodia.
- To organize the rehabilitation, development and maintenance plan for rural roads for short, medium, and long term.
- To survey, research and design for rehabilitation, construction and maintenance of rural roads.
- To train the Provincial Rural Road Office (PRRO) staff and the private sector in up-to-date methods of rehabilitation, construction and maintenance of rural roads.
- To examine and submit to the relevant leader of the Ministry for approval the rehabilitation, construction and maintenance plans of the PRRO.

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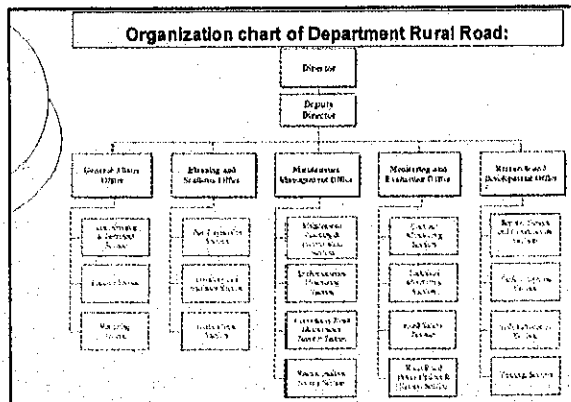
- o To monitor and evaluate the rehabilitation, construction and maintenance of all rural road projects.
- o To study, research and find out new surface options or techniques to rehabilitate and construct rural roads with high quality and long last.
- o To gather, analyze and monitor the traffic count data from each PRRO.
- o To collect data from all sources to make a national inventory of the rural roads.
- o To organize and update the Policy for rural Roads.

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cont.

- o To advise all agencies or private sectors involved with rural roads rehabilitation and construction to implement the Policy of rural roads.
- o To support and provide technical assistance to the Commune Council.
- o To organize the procedure related to the operation and maintenance of rural roads by the people living in the rural areas.

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### C. Organization Structure of DRR:

- o The organization Structure of the Department of Rural Road has 47 Staffs divided into five offices as in the followings:

#### 1. General Affairs Office:

- To organize, manage and circulate the administrative letters for the Department.
- To organize, keep the document for the department such as law, sub-decree, policy and other forms related to the Department.
- To manage the staff for the Department.
- To manage the revenue and expenditure budget for the Department.
- To manage the current and fix assets in the Department.
- To make monthly, quarterly, semester, nine months and annual report of the Department.

#### 2. Planning and Statistics Office:

- o Implement and assist the PRRO to carry out:
  - The counting and analysis of the traffic.
  - The inventory of all rural roads.
  - The socio-economic survey of rural roads by using IRAP planning too.
- o To manage the rural road data and statistics and organized development plans for short, medium and long term.
- o To follow up and evaluate the implementation plan of rural road development.

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#### 3. Maintenance Management Office:

- To identify, study, make research and prioritize the rural roads that need to be maintained through out the country.
- To follow-up and ensure the maintenance of the rural roads ins implemented according to the Implementation plan.
- To organize the procedure and encourage the establishment of rural road maintenance committees by the rural community for the maintenance of the rural roads where appropriate.

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#### 4. Monitoring and Evaluation Office:

- To monitor and evaluate the contract of rehabilitation and construction of rural roads and road structures.
- To monitor and evaluate the technical supervision implemented by technical staff from RRD and PRRO.
- To organize and upgrade the policy on rural road.
- To ensure that the most suitable technology is used to ensure sustainable rural development.
- To monitor and analyze road safety reports from the PRRO and to advise where relevant on measure to mitigate accidents.

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#### 5. Research and Development Office:

- To carry out and assist the PRRO to implement the survey, design and construction of rural roads and road structures.
- To assist the PRRO to manage and use equipment where necessary.
- To make soil tests for rural roads and foundation of road structures.
- To do research and experiment on the selection of pavement.
- To develop the skills of the RRD and PRRO staff and the private sector where relevant, through training, for the development of the rural roads.

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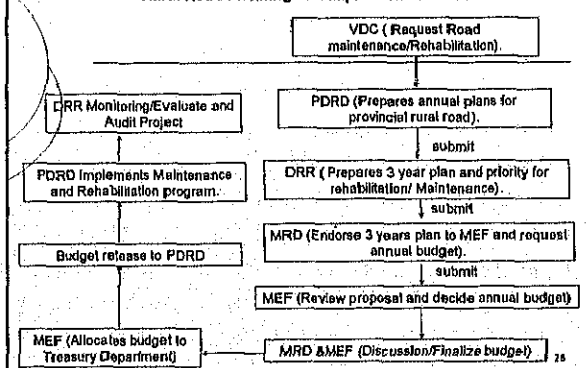
#### D. Accomplished work of DRR (MRD) :

##### Rehabilitated and Constructed:

- Rehabilitated and constructed around 28,000 km (with earth fill and laterite surfacing).
- Trafficable Road: 15,369km (about 4,000km is Earth Road and 7,000 km is Laterite but some of the roads have already been damaged due to the lack of maintenance).
- RDD has 3 years planning (06,07,08) to Maintenance for Rural Road length around 2,500 km (1,500km Routine maintenance and 1,000 km for Periodic Maintenance) for each years.

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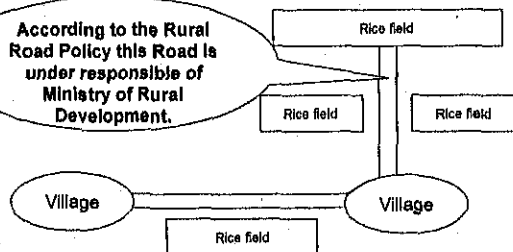
#### Rural Road Planning and Implementation Procedure



28

#### Rural Road Policy:

According to the Rural Road Policy this Road is under responsible of Ministry of Rural Development.



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#### Study & Survey New Rural Road:



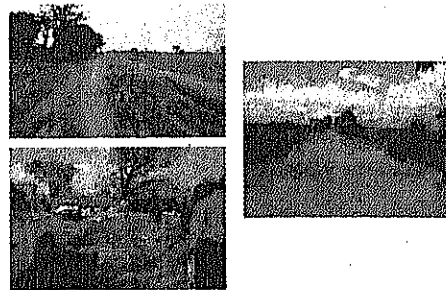
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### Rural Road under construction and completed:



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### Rural Road damage after construction:



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### E. Concluding Remarks :

#### Problems:

- o DRR has experience to manage the rural road for less than 10 years.
- o Lack of transportations and budget to the field for survey or collecting Rural Road Data.
- o Lack of equipments for Implementation works.
- o Lack of Human resource in DRR
- o No National Standard for Rural Road construction.
- o National budget not enough for Rural Road Maintenance.
- o MRD could not control maintenance budget because of MEF regulation.
- o No inventory system for Rural Road.

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#### Comments:

To solve this problem DRR has to do as below:

- Need Technical Advisor for Training to the staffs.
- Need JICA Expert work closely with DRR.
- Should be have its own account for rural road maintenance
- The necessary cost for maintenance is estimated 9 million dollars per year but DRR got only 2.6 million dollars.
- Need National Standard for Rural Road construction.
- Dept. of Rural Road is proposing to up-grade the road specification from laterite to DBST.
- Need more training about checking road construction and rehabilitation.
- Need Plan designer and Technical equipments.
- MRD will make a meeting talking about budget agreement with MEF.

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# Thank you !

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## JICA Study Team

The Study on Road Network Development in Cambodia  
Maintenance Management Team

30 September 2005

Road Maintenance in Cambodia  
By You Dara, MPWT

## Outline of Presentation

1. Road Administration and Organization
2. Existing Road Maintenance and Operation
3. Finance Procurement for Road Maintenance
4. Concept of Maintenance Mechanism Development
5. Problem Identification Finding

### 1. Road Administration and Organization

- ♦ MPWT manage and maintains for national roads in 1 and 2 digit and provincial roads in 3 and 4 digit;
- ♦ Tertiary roads which are considered by MPWT, acting in consultation with Ministry of Rural Development; and
- ♦ In compliance with jointed declaration between MPWT and MRD on June 2000, the MPWT is also responsible to manage rural road which has number of traffic flow more than 50 vehicles per day.

### 1. Road Administration and Organization (Conti. 1)

#### Legislation

- For the purpose of road administration, there are generally three (3) essential matters to be stipulated by law or similar rule.
- ♦ Responsibilities, obligations, rights and interests of the state on road;
  - ♦ Definition of roads to be constructed, rehabilitated and maintained by the road authorities; and
  - ♦ Application and enforcement of Traffic rules.

### 1. Road Administration and Organization (Cont.2)

#### The Fund for Road Maintenance and Repair (FRMR)

- (1) Inter-Ministries Prakas of June 28, 2000 on Formation FRMR
- (2) Sub-Decree of May 6, 2002 on Transferring of the Management of Budgetary Credit
- (3) Circular of October 2, 2003 on Procedure and Law of Using FRMR

- ♦ FRMR shall be used for the routine and periodic maintenance
- ♦ Repair of the national, provincial and rural roads which are under the management of MPWT, MRD and other road authorities
- ♦ Do not allow using this FRMR for a subject of mission out of repairing and maintenance road
- ♦ The management of FRMR shall be transferred under the direct management of the Prime Ministers and MEF.

### 1. Road Administration and Organization (Cont.3)

#### Law on Road Traffic

#### Law on Road Traffic, 1991

The current law was enacted in 1991. The Traffic law is aimed at:

- 1) raising the prestige and the effectiveness in protecting traffic safety;
- 2) maintaining public security and social order; protecting public properties, lives and legal interests of the citizens;
- 4) educating the citizens to respect the law; and
- 5) opposing and cracking down on traffic offenses and traffic orders.

## 2. Existing Road Maintenance and Operation

### Type of Maintenance Works

Maintenance works are classified as following three types from budgetary point of view in Cambodia:

- 1) Routine maintenance
- 2) Periodical maintenance
- 3) Other maintenance

## 2. Existing Road Maintenance and Operation (Cont. 1)

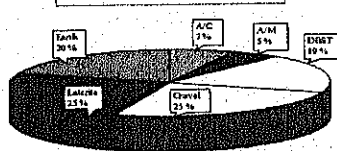
- ◆ Total length of classified roads maintained by MPWT, MRD and other road authorities. Those are currently maintaining 2,061 km of 1 digit national roads, 2,902 km of 2 digits roads, 4,749 km of 3 digits roads and 2,924 km of 4 digits roads; and
- ◆ Although MPWT has adopted new road number system recently but can not identify the total length of each classified road yet.

## 2. Existing Road Maintenance and Operation (Cont. 2)

Total Length of Roads in Km

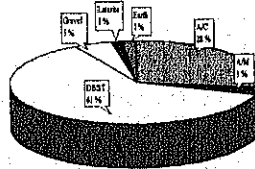
Classified Road	1 Digit	2 Digits	3 Digits	4 Digits	Total
Total	2,061.3	2,902.0	4,749.4	2,923.8	12,636.7

Percentage by Surface (MPWT)

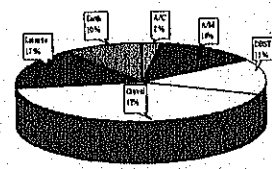


## 2. Existing Road Maintenance and Operation (Cont. 3)

Percentage by Surface at 1Digit NR (MPWT)

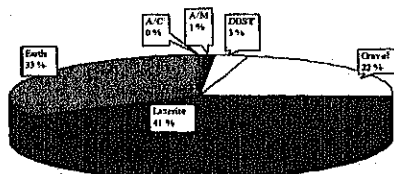


Percentage by Surface at 2Digit NR (MPWT)



## 2. Existing Road Maintenance and Operation (Cont. 4)

Percentage by Surface at 3Digit NR (MPWT)



## 2. Existing Road Maintenance and Operation (Cont. 5)

### Procurement of Maintenance Works

MPWT has basically adopted two kinds of procurement methods, one is outsourcing (contract out) and another is force account; In addition to the prescribed methods Army corps also joins the maintenance works; and

The demarcation on procurement procedure of those agencies is not transparent. After obtaining the budgetary approval, MPWT calls this budget as Contract which allocated to DPWT.

### Maintenance Operation Agency

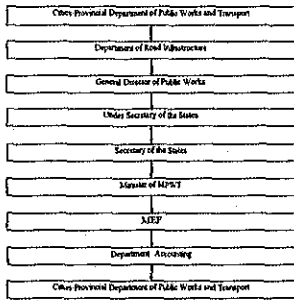
Department of Public Works and Transport is the maintenance agency under the management of MPWT;

MPWT has 24 Cities-Provinces Department of Public Works and Transport; and

DPWT is responsible for 1 digit, 2 digits, and 3 digits national road.

## 2. Existing Road Maintenance and Operation (Cont. 6)

### Budget Request and Allocation and Maintenance



## 3. Finance Procurement for Road Maintenance

- ♦ Road Budget and Administration;
- ♦ Total budget for MPWT in 2005 is 15,460 million Riel (\$1.6 million); and
- ♦ About 30% of MPWT is for maintenance of the roads.

Ministry and Section Chapter	1998		1999		2000		2001		2002		2003		2004		2005	
	Actual	Estim.	Actual	Estim.	Actual	Estim.	Actual	Estim.	Actual	Estim.	Actual	Estim.	Actual	Estim.	Actual	Estim.
Ministry of Public Works and Transport	13,063	20,246	7,284	91,591	157,056	117,593	15,200	16,686	15,460	15,460	15,460	15,460	15,460	15,460	15,460	15,460
1-Ministry	8,663	23,730	67,401	65,889	146,420	100,271	7,620	7,342	7,620	7,620	7,620	7,620	7,620	7,620	7,620	7,620
Sub-Total's Capital Expenditure	3,213	3,392	14,824	15,311	8,348	8,342	7,820	7,342	7,820	7,820	7,820	7,820	7,820	7,820	7,820	7,820
Ch. 10 Salaries and Allowances	1,234	1,343	1,532	1,487	2,223	2,223	2,445	2,427	2,445	2,445	2,445	2,445	2,445	2,445	2,445	2,445
Ch. 11 Capital Costs	452	521	1,432	2,671	2,350	2,258	3,351	3,411	3,661	3,661	3,661	3,661	3,661	3,661	3,661	3,661
Ch. 20 Economic transfer payments	1,321	1,645	11,859	8,999	651	672	1,750	1,415	1,100	1,100	1,100	1,100	1,100	1,100	1,100	1,100
Ch. 21 Social transfer payments	7	16	26	2,886	18	26	60	60	78	78	78	78	78	78	78	78
Ch. 22 Transfer to international organizations				8	72											
Sub-Total's Capital Expenditure	8,690	10,810	32,257	20,555	144,142	100,930										
Ch. 001 Construction and Equipment	8,690	10,810	32,257	20,555	144,142	100,930										
Ch. 002 Current on-Operational Expenses					12,259	2,459	25,071									
Ch. 003 Investment by Importers							15,368	16,692								

## 3. Finance Procurement for Road Maintenance (Cont. 1)

### Procurement Plan of Road Maintenance Funds

- ♦ Added Tax;
- ♦ Special Tax;
- ♦ Vehicle User Special Tax;
- ♦ Vehicle Purchasing Tax;
- ♦ Vehicle Registration Tax and Vehicle Tax; and
- ♦ Traffic Penalty.

## 3. Finance Procurement for Road Maintenance (Cont. 2)

- ♦ Issues in Road Financing in Cambodia
- ♦ Absolute shortage of budget;
- ♦ Inefficiency in financing procedure; and
- ♦ Complexity in procedure of application and allocation.

## 4. Concept of Maintenance Mechanism Development

### Reform Measure to Secure Maintenance Budget

- ♦ To secure the maintenance budget from Special Tax and Added Tax those already imposed on importers and collected by tax office;
- ♦ To reorganize but also capacity development the executing agency those belong to MPWT and DPWT; and
- ♦ To establish the Road Board for smooth budget allocation with securing transparency.

## 4. Concept of Maintenance Mechanism Development (Cont. 1)

### Budget Source

- ♦ Special Tax: 33.33% of imported price of gasoline is imposed on importers;
- ♦ Added Tax: 2.78 (only 2.00) cent per liter for gasoline and 4.46 (4.00) cent per liter are imposed on importers;
- ♦ Purchase Tax: 60 % of purchased present price is imposed on buyer;
- ♦ Holding Tax: Maximum of 200 \$ is imposed on car owner annually for 5 years for brand new sedan; and
- ♦ Traffic Offense Fine: In connection with legislative issue and practical budget source, the Study Team pay attention Added Tax as sources.

#### 4. Concept of Maintenance Mechanism Development (Cont. 2)

##### Reorganization of Executing Agency

- In order to carry out the satisfied maintenance, it is suggested to distinguish the responsibility of Department of Roads as follows:
- Responsible for planning on road and bridge improvement and management;
- Function to receive and review the request for budget prepared by City-Provincial DPWT;
- Function to request and negotiate the budget with Road Board; and
- Function to receive the maintenance budget from Road Board and disburse to City-Provincial DPWT.

#### 4. Concept of Maintenance Mechanism Development (Cont. 3)

##### Establishment of the Road Board (RB)

- 1) To determine allocation of the road maintenance budget;
- 2) To assess the maintenance program;
- 3) To apportion, disburse and monitor usage of the FRMR;
- 4) To provide sound and timely accounts and reports; and
- 5) To conduct financial and technical audits.

#### 5. Problems Identification Finding

- ◆ Insufficient job descriptions for department and provincial offices;
- ◆ Lack of coordination within MPWT and between DPWT and MPWT;
- ◆ Insufficient accumulation of data/information and usage of computerized system;
- ◆ Insufficient Capability of the DPWT; and
- ◆ Shortage of budget for maintenance.

Thank You !  
Comment or Question?, Please

**KINGDOM OF CAMBODIA**  
Ministry of Public Works and Transport

**JICA Study Team for The Road Network  
Development in Cambodia**



**JICA Study Team**



**Road network Improvement**

Supported by MPWT & JICA Study Team  
Phnom Penh, 30 September, 2005

Mr. NOP KILARITH

- I. **Road Network Improvement**
1. **Present Road network Condition**
  2. **Problems with the Present Road Network**
  3. **Possible Road network Improvement measure**
    - 3.1 identification of Road improvement
    - 3.2 Work Improvement Types
  4. **Road Network Improvement section**

**1. Present Road Network Condition**

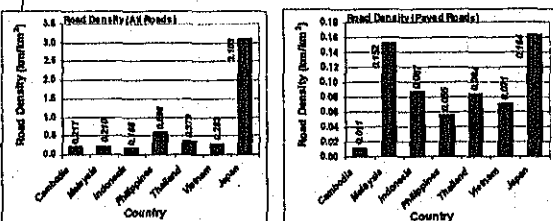
- \* National Road network links up provincial and Capital
- \* Provincial Road from the basic network within province and links to provincial, Capital to district center.
- \* Rural Road within the rural areas and serve mainly local trips.

**Road Length by Classification**

Road Classification	Road Length (km)
1-Digit National Road	2,052
2-Digit National Road	2,6493
Provincial road	6,61
Road or Tertiary Road	~28,000
<b>Total</b>	<b>39,310</b>

**Road Density**

Total road network density of 0.217km<sup>2</sup> and road density index of 0.827 are comparable with others Asian countries.

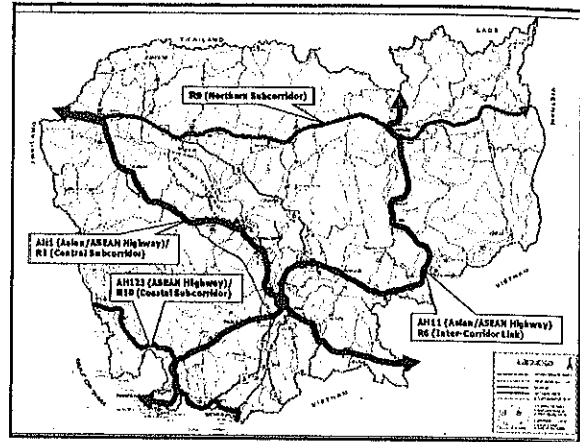


**I. Problems with the present Road Network**

- \* poor pavement condition National Road and provincial roads paved
- \* Narrow road some section of 1-digit road needs motorbike lanes, 2-digit and provincial road needs to be widened to accommodate 2-lanes with sufficient width
- \* upgrading to international class NR- 1,4,5,6,7 need to be upgraded to Asian/ASEAN class, NR-48, 3,33, & NR- 66, 78 need to be improved to ASEAN/GMS class
- \* Insufficient slope protection roads along flood plain should have sufficient embankment slope protection. Temporary and narrow bridge will have replace by permanent bridge

- Low pavement road for 2-digit and provincial road need to be increased
- traffic congestion on major cities/ areas- bypass will need to be build to serve through traffic
- Vulnerability to flood on some section

Flooded NR.6  
 Muddy NR.6  
 Stuck by Mud NR.7  
 Chrouy Changyar bridge  
 Flood NR.6  
 Big pothole NR.7



- International Highway Route
- 1-digit national highway becomes part of international highway network
- AH1- NR-1, NR-5
- AH- NR-4, NR-6, NR-7
- AH123- NR-48, NR-3, NR-33
- GMS Route - NR-66, NR-78

Status of International Highway Route

Route No	Length (km)	Class II	Class III	Below Class III
AH1	572.4	11.2	561.2*	-
AH111	755.0	364.0	391.00**	-
AH123	163.3	2.4	8.7	152.2
Northern Sub corridor	464.9	-	-	464.9
Total	1,955.6	377.6	960.9	617.1

### 3. Possible Road Network Improvement Measure

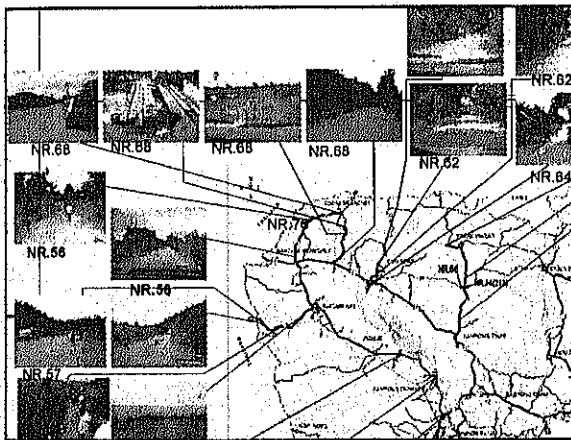
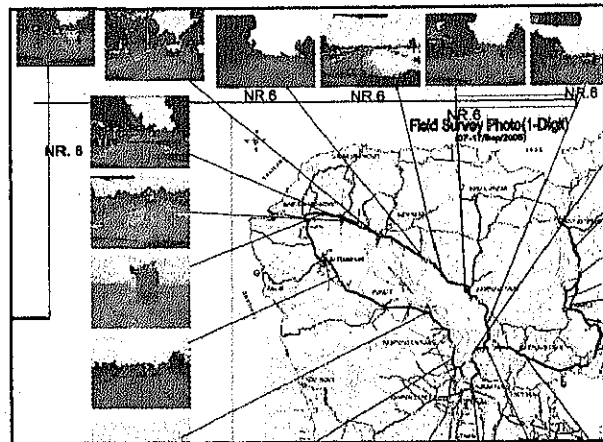
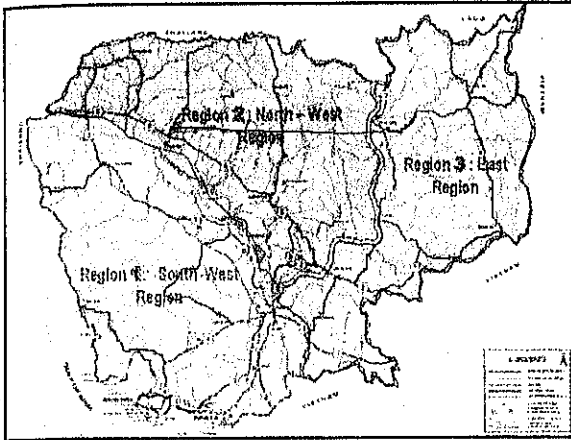
- \* Completion of road network connection to provincial center, development centers and improvement areas.
- \* Road widening and road structure improvement
- \* Rehabilitation, Upgrading existing road network
- \* Road safety and road facilities improvement
- \* Improvement of route connection to agriculture and agro-industrial areas
- \* Improvement of rural road condition to traffic level

### 3.1. Identification of Road Improvement

- Based on development objective
- Based on traffic demand and future road network plan
- Existing road width and structure below standard
- Existing road pavement type is laterite/gravel/earth
- Existing road pavement (AC, DBST, etc.) is poor or very poor condition
- Existing road has other problems such as none or narrow shoulder or sidewalk, poor drainage
- Existing road has other embankment slope problems such as scouring, settlement stability
- Existing road has no bridge or temporary bridge
- Existing road has narrow permanent bridge

### 3.2. Work Improvement Type

- New road construction
- New bypass construction
- Upgrading road structure and geometry to minimum standard (local or international, as required) and pavement type
- Improvement of pavement to AC or DBST
- Pavement rehabilitation
- Road widening, if possible
- Road section and drainage improvement
- Improvement of slop stability and protection
- Provide bridge and bridge replacement
- Bridge widening



**Possible for Road Development**

Road No	Length (Km)	Existing Condition		Proposed Improvement Works		
		Road Width	Pavement Condition	Road Section	Pavement Type	Lane
3	202.69	8-10m	DBST	Pk12.6v - Pk147.7	AC	2 Lanes@3.5m/lane 2m motorbike lane
6	45.04	10m	AC	PK1.4 - PK46.44	AC	4 Lanes@3.5m/lane
	374.54	10m	AC	PK46.44 - PK417.24	AC	2 Lanes@3.5m/lane
33	51.65	6.5-9m	DBST/ Laterite	PK148.1 - PK199.7	DBST	2 Lanes@3.5m/lane
57	101	6-8m	DBST/ Laterite	Pk00.0 - Pk101.0	DBST	2 Lanes@3.5m/lane
62	128	7-9m	Laterite	Pk00.0 - Pk128.0	DBST	2 Lanes@3.5m/lane
66	334.92	4.5-7.5m	Laterite	Pk00.0 - Pk334.92	DBST	2 Lanes@3.5m/lane
68	117.3	5-6.5m	Laterite	Pk00.0 - Pk117.3	DBST	2 Lanes@3.5m/lane

**THANK YOU!**

## Bridge And Structures Improvement



**JICA Study Team  
on the Road Network Development in  
Cambodia**

**2005/9/30  
Road Infrastructure Team**

Mr. YIN BORIN

## Contents

- Bridge And Structure Condition
- Problems Bridge And Structures
- Possible Bridge And Structures Improvement Measures
- Bridge And Structure Scenario

### Bridge And Structure Condition

#### Function/Definition

- **Bridges.** Bridges are defined as structures crossing waterways with aggregate opening greater than 6.0m, other structures with less than 6.0m opening are considered as culverts.
- **Permanent Bridges.** Permanent bridges are defined as structures other than temporary bridges, either with concrete or steel as the basic structural component of the superstructure, with complete bridge structural elements including abutments.

#### Bridge Inventory

- A review of the data from LRCS 2004 inventory was conducted to determine the existing bridges along Cambodia road network. This inventory was supplemented by the Study Inventory of bridge and culverts along national road NR-5, NR-66, NR-76 and PR-216.

**Table :1 Bridge Inventory Along 2-Digit National Road and Provincial Road**

Road Class	No Existing Bridge No. (Length, m)	Temporary Bridge No. (Length, m)	Permanent Bridges No. (Length, m)					Total
			Type	w<4.5m	4.5m<w<7m	7m<w<10m	w>10.0m	
2-Digit National Road	95 (1,492.5)	453 (6,669.0)	Concrete Girder	38 (378.9)	24 (925.5)	53 (2,745.5)	13 (133.2)	188 (4,183.1)
			Concrete Truss	-	8 (156.0)	6 (162.0)	-	14 (318.0)
			Steel Girder	7 (186.0)	7 (132.0)	-	-	14 (318.0)
			Steel Truss	-	8 (314.9)	-	-	8 (314.9)
			Others	1 (5.5.0)	7 (128.0)	5 (146.0)	-	13 (279.5)
			<b>Total</b>	46 (6,199)	114 (1,655.9)	64 (3,053.5)	13 (133.2)	230 (7,669.5)
Provincial Road	3 (99.0)	521 (10,679.1)	Concrete	255 (3,712.8)	120 (1,731.2)	5 (75.5)	-	380 (5,519.5)
			<b>Total</b>	255 (3,712.8)	120 (1,731.2)	5 (75.5)	-	380 (5,519.5)

Source: LRCS Inventory, 2004

### Bridge Condition Problems

- 110 and 10 location of non-existing bridges along the secondary and provincial roads
- 62, 453, and 355 temporary bridges along primary, secondary, and provincial roads respectively
- 61, 61, and 112 narrow bridges in 1-digit, 2-digit, 3-digit roads respectively
- 18 and 10 ancient bridges along 2-digit and 3 digit roads



**Table :2 Bridge Inventory Along 1-Digit National Road**

Road No.	Temporary Bridge No (Length, m)	Type	Permanent Bridge - No. (Length, m)				Total
			<4.5m	4.5m-7m	7m-10m	>10m	
NR-1	-	Concrete	-	-	3(172.4)	18(264.7)	24 (1,239.3)
NR-1	12 (118.1)	Steel Girder	-	-	-	3(295.8)	21 (413.1)
NR-2	-	Concrete	-	7(61.1)	14(143.9)	-	21 (205.0)
NR-2	14 (219.1)	Steel Girder	-	-	-	-	14 (161.0)
NR-3	-	Concrete	-	27(201.9)	17(143.9)	-	44 (345.8)
NR-3	14 (219.1)	Steel Girder	-	-	1(200.0)	-	15 (161.0)
NR-4	-	Concrete	-	-	40(1,072.7)	-	40 (1,072.7)
NR-4	1 (19.4)	Steel Girder	-	-	-	-	1 (19.4)
NR-4	-	Concrete	-	1(11.0)	117(1,714.1)	22(1,847.8)	130 (1,972.9)
NR-4	-	Steel Girder	-	-	3(107.1)	-	3 (30.8)
NR-4	-	Steel Truss	-	-	3(38.2)	-	3 (38.2)
NR-4	-	Ancient	-	-	-	1(9.7)	1 (9.7)
NR-7	1 (19.4)	Concrete	-	8(119.2)	76(1,864.6)	-	85 (2,003.2)
NR-7	1 (19.4)	Steel Girder	-	-	-	-	1 (19.4)
Total	36 (117.2)	Concrete	-	41(118.7)	235(1,645.1)	72(1,750.0)	348 (1,487.3)
Total	-	Steel	-	-	23(2,023.0)	3(295.8)	26 (2,318.8)
Total	-	Others	-	-	-	1(19.7)	1 (19.7)
Total	-	Total	31(269.4)	241(1,983.3)	76(1,230.0)	229(1,658.1)	578 (2,500.8)

**Table: 3 Permanent Bridge Condition Along 1-Digit National Road**

- Table :3 indicates about 30 bridges (total length of 713m) are still considered as temporary of bailey bridge type and will have to be upgraded to permanent bridges in the long term. Moreover, 35 bridges have carriageway of less than 7.0m wide with 1 bridge less than 4.5m wide.
- The conditions of the permanent bridges are presented in Table :3. It is seen that 88.4% of the permanent bridges along 1-digit national roads are in good condition with 11.6% in fair condition and requiring minor repair and maintenance.

**Table 3 Permanent Bridge Condition Along 1-Digit National Road**

Road No.	Bridge Condition - No. (Length, m)		
	Good	Fair	Poor
NR-1	24 (1,229.3)	-	-
NR-2	14 (362.0)	7 (61.1)	-
NR-3	27 (1240.4)	34 (369.9)	-
NR-4	40 (1,072.7)	-	-
NR-5	154 (2,860.2)	10 (161.3)	-
NR-6	104 (3285.0)	27 (880.2)	17 (340.5)
NR-7	71 (4196.4)	-	-
Total	434 (14245.8)	78 (1,472.5)	17 (340.5)

The 2-digit national road and provincial road bridge inventory and bridge conditions are summarized in Table :4 and Table , respectively. As presented in Table :4 there are no bridges on 95 waterways (with a total length of 1,493m) along 2-digit national roads while 453 locations (total bridge length of 8,46.0m) have temporary bridges. Among the permanent bridges, 45 bridges (length of 5,613m) are still narrow with carriageway width less than 4.5m and 95 bridges (1,443m) have carriageway width less than 7m. Moreover, about 13 bridges with a total length of about 279.5m are identified to be of ancient type

or historic bridges. Such historic bridges may need preservation and may require realignment and new bridge construction. However, in Table :3, 76 bridges (total length of 1,016m) along 2-digit national roads are found to be in poor condition necessitating major repairs while 65 bridges (length of 1,223m) in fair condition requiring minor repairs and maintenance.

**Table 4 Permanent Bridge Condition Along 2-Digit National Road and Provincial Roads**

Road Class	Bridge Condition - No. (Length, m)		
	Good	Fair	Poor
2-Digit National Road	109 (5,529.4)	65 (1,223.7)	76 (1,016.2)
Provincial Road	349 (4,961.1)	193 (252.4)	6 (150.5)
Total	458 (10,490.5)	258 (1,476.1)	82 (1,166.7)

### Bridge and Culvert Condition Problems and Countermeasures

- No Existing Bridge/Waterway
- Temporary Bridges
- Narrow Permanent Bridge
- Ancient/Historical Bridge

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### Possible Bridge And Structure Improvement Measures

#### 1-Identification of Bridge Implement

- There is no Bridge along the Existing Road very poor Condition.
- There is a temporary Bridge
- There is a Narrow Width of The Bridge(Lessthen Existing Road Width)

#### 2-Type Of Work for Bridge Improvement

- To provide Bridge along the Existing There Is Waterway.
- To replace poor Condition Bridge by Permanent Bridge.

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Table 5 Bridge Improvement Scenario

Road Class	No.Of Bridge Location	Existing Condition	Propose Imprment work
1Digit	529	Temporary Bridge-62Location	Replacement/Premanent62(L=5376.9m)
		Narrow Bridge51	Bridge widening 61(L=1138.7m)
2Digit	229	No Bridge 110 Location	Provide New Bridge:110(L=1723.3m)
		Temporary Bridge-453Location	Replacement/Premanent1453(L=8469m)
		Narrow Bridge51	Bridge widening 61(L=1138.7m)
3Digit	242	No Bridge 10 Location	Provide New Bridge:10(L=120m)
		Temporary Bridge-355Location	Replacement/Premanent355(L=6980m)
		Narrow Bridge112	Bridge widening 61(L=1501.3m)



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