

議事録 2

Meeting on Explanation and Discussion of Inception Report

2012年3月15日

DRVN 会議室

MINUTES OF MEETING
ON
INCEPTION REPORT
FOR
PAVEMENT DATA COLLECTION SURVEY
IN
THE SOCIALIST REPUBLIC OF VIET NAM

Hanoi, March 15 2012



NGUYEN DUC CUONG
Director of TA PMU
Directorate for Roads of Vietnam
Ministry of Transport
The Socialist Republic of Vietnam



YUTAKA KOKUFU
Team Leader
Survey Team
Japan International Cooperation Agency
Japan

I. INTRODUCTION

The JICA Survey Team (hereinafter referred to as "the Survey Team") for the "Pavement Data Collection Survey", in The Socialist Republic of Vietnam (hereinafter referred to as "the Survey") dispatched by Japan International Cooperation Agency (hereinafter referred to as "JICA") and headed by Yutaka KOKUFU commenced the Survey in The Socialist Republic of Vietnam on March 5, 2012 for the data to be used in the project for Capacity Enhancement in Road Maintenance (hereinafter referred to as "the JICA Project").

The Survey Team presented and explained the contents of the Inception Report to the officials of Directorate for Roads of Vietnam (hereinafter referred to as "DRVN") as the counterpart agency on March 15, 2012.

The DRVN accepted the Inception Report and agreed the contents of the work plan, the work schedule, the survey methods and the outputs of the Survey.

II. COMMENTS AND REQUESTS

DRVN officials reviewed the Inception Report and raised comments and requests on the contents of the Survey:

A. On the Methodology

1. The Survey Team shall be confirmed the data items presented are sufficient for utilization in the JICA Project.
2. The Survey Team shall be confirmed that the indicators presented can be covered with the surveying car (Real Mini configuration).
3. The Survey Team shall be confirmed the format of pavement condition data file having proper utilization.
4. DRVN requested that the pavement condition data shall be made compatibility data with the databases of Project on Transportation Information System for the Road Sector of DRVN.
5. DRVN requested that pavement loading capacity data and pavement structure data should include on the items of pavement condition data for big repairs. (But They understood that it is out of scope of work or TOR of the survey team.)
6. DRVN requested that the pavement condition data includes the bearing capacity of national road structure items using FWD.

B. On Equipment

1. DRVN requested that the Survey Team shall be provided a equipment for pavement condition survey and a software for the Pavement condition analysis after the completion of the survey.

2. A car for the pavement condition survey shall be procured by the Survey Team as soon as possible, since available cars of the counterpart are not suitable for usage.

C. On Technology Transfer

1. DRVN made proposal that the number of participants to the training shall be increased.
2. DRVN requested on-the-job training shall be conducted since the beginning and during time of implementing the survey for ensuring efficient and sufficient technology transfer to the counterpart after the completion of the JICA project.
3. The Survey Team should prepare detailed manuals and guidelines to sustain the operation after the end of the survey .


D. Administration

1. DRVN requested financial support for the staff who work full time with the Survey Team. DRVN will also send a official request letter to JICA on financial support for staff working full time with the survey team.


The Survey Team acknowledged the comments and requests, and agreed to convey them to the JICA headquarters.

III. AGREEMENTS

Other than the comments and requests from the DRVN, both parties agreed on the following matters:

- A. Both sides agreed that the pavement condition Survey and data analysis shall be conducted in collaboration with DRVN and the Survey Team.
- B. DRVN shall be assigned staff from RRMU2 and DRVN for the collaboration work and workshop.
- C. DRVN shall be provided available maps and road management materials and ID cards/introduction letter necessary for the Survey Team. As for the digital maps, DRVN will be prepared a request letter to MONRE. 
- D. DRVN shall be supported to hold the Workshop.

IV. Attachments:

- A. Inception Report
 - B. Table of Collaboration Work Schedule and Members
 - C. List of Attendants
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Attachment A. Inception Report

THE PAVEMENT DATA COLLECTION SURVEY
IN
THE SOCIALIST REPUBLIC OF VIET NAM

INCEPTION REPORT

February, 2012

PASCO Corporation

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1. Background

The 9th Five-Year Socio-Economic Development Plan (2011-15), targeting sustainable development in an era of continuing high growth, the Socialist Republic of Vietnam (hereinafter referred to as "Vietnam") positions development of infrastructure management systems, including transportation infrastructure, as the highest issue to be tackled for further development. In line with the national development plan, rehabilitation and new construction of national road network are underway with the national budget and financial assistance from the Yen loans, the World Bank, the ADB and other international organizations. As a result, the national road network reached a total length of 17,385km in 2010, and the network is still expanding. Development of national roads is crucial in transport and traffic infrastructure and contributes to economic development.

While the road network has been steadily expanding, maintenance and management need to be strengthened including budget allocations and capacity development of relevant organizations and individuals nationwide. JICA has been committed to assist to enhancing quality of road maintenance and management through technical cooperation projects for national roads and expressways among other projects. Unfortunately, the results of the survey on pavement condition in 2004 and 2007 were not what would be required for future pavement management for their lack of survey items and inadequate data.

Under such circumstances, the pavement data collection survey aims to collect basic data for setting direction on road-related cooperation, and for the data to be used in the Project for Capacity Enhancement in Road Maintenance.

2. Outline of the Project

2.1 Objectives

Preparation of Survey Data File on Data Condition:

Based on the specifications, the data collection survey will be conducted to create pavement condition data file from the results.

Technical Support for the Usage of the Pavement Data:

The survey will be conducted with the Counterpart. Through the cooperative activities, the methods of survey and analysis will be transferred. The Survey Team will support the Counterpart on the usage of the data.

2.2 Targets

(1) The Target Route

The inspection will target national roads of 2,303km in both directions (4,606 km) in the north of the country under the jurisdiction of the Regional Road Management Unit 2 (RRMU2).

The area is in REGION 2. Within Region 2, three are the national roads with a total length of about 2,500 km, and other roads 4,500 km.

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Figure 1 Survey Area

(2) Technology Transfer

The Directorate for Roads of Vietnam (DRVN) of the Ministry of Transport is the target organization of technology transfer on the survey methods and data analysis. DRVN, the Planning and Investment Department, PRMU2, RTC-CENTRAL are the organizations target to support data utilization.

2.3 Assignment

The assignment schedule of the members is shown in the chart:

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Figure 2 Assignment Schedule

Title	Name	2012												2013			Man month						
		Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec	Jan	Feb	Mar	V.N.	JPN					
Team Leader	Yutaka KOKUFU			■			■									■				2.5			
Equipment Operation 1	Koroku SOMA			■	■		■						■			■				5.0			
Equipment Operation 2	Yoshiyasu TSUCHIYA			■	■	■				■	■	■								6.0			
Equipment Operation 3	Syaichi KITAGAWA				■	■		■	■														
Vehicle Setup and Calibration	Dr. Chikakuni MAEDA					■	■													1.0			
Data Analysis 1	Joel F. CRUZ			■			■		■	■		■				■				4.5			
Data Analysis 2	Kohel SAKAI							■	■	■			■	■	■					4.0			
Data Analysis 3	Gaku SAITO									■	■												
Coordinator/Survey Planning Assistant	Dr. Kazuya AOKI			■	■			■	■							■				2.5			
Administrative Assistant	Kensuke KIMURA			■				■	■							■							
Subtotal of Work in Vietnam																	25.5						
Team Leader	Yutaka KOKUFU		□															□				1.0	
Operation Management	Koroku SOMA		□															□				1.0	
Subtotal of Work in Japan																		2.0					
Reports	Submission		△					△										△					
	Work in Japan Total man-month		IR					Report on Field Survey									Report						
Total																	25.5	2.0					

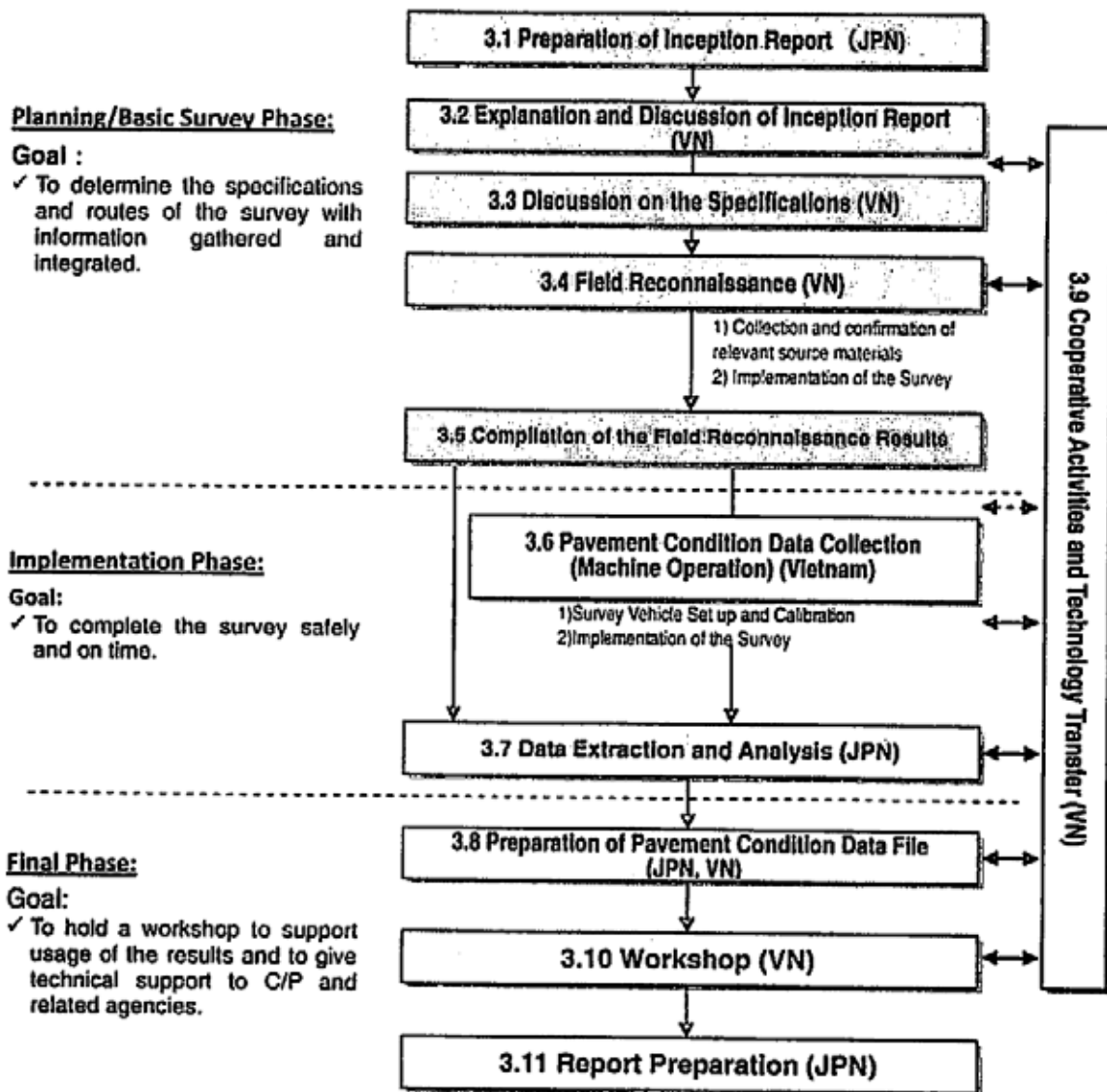
Legend ■ Work in Vietnam V.N. Vietnam
□ Work in Japan JPN: Japan

The Pavement Data Collection Survey

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2.4 Work Flow

The general work flow of the survey implementation and basic goals in three phases are shown in the following chart:



Note) JPN: Japan VN: Vietnam

Figure 3 Survey Flowchart

The operation schedule is shown in the following chart:

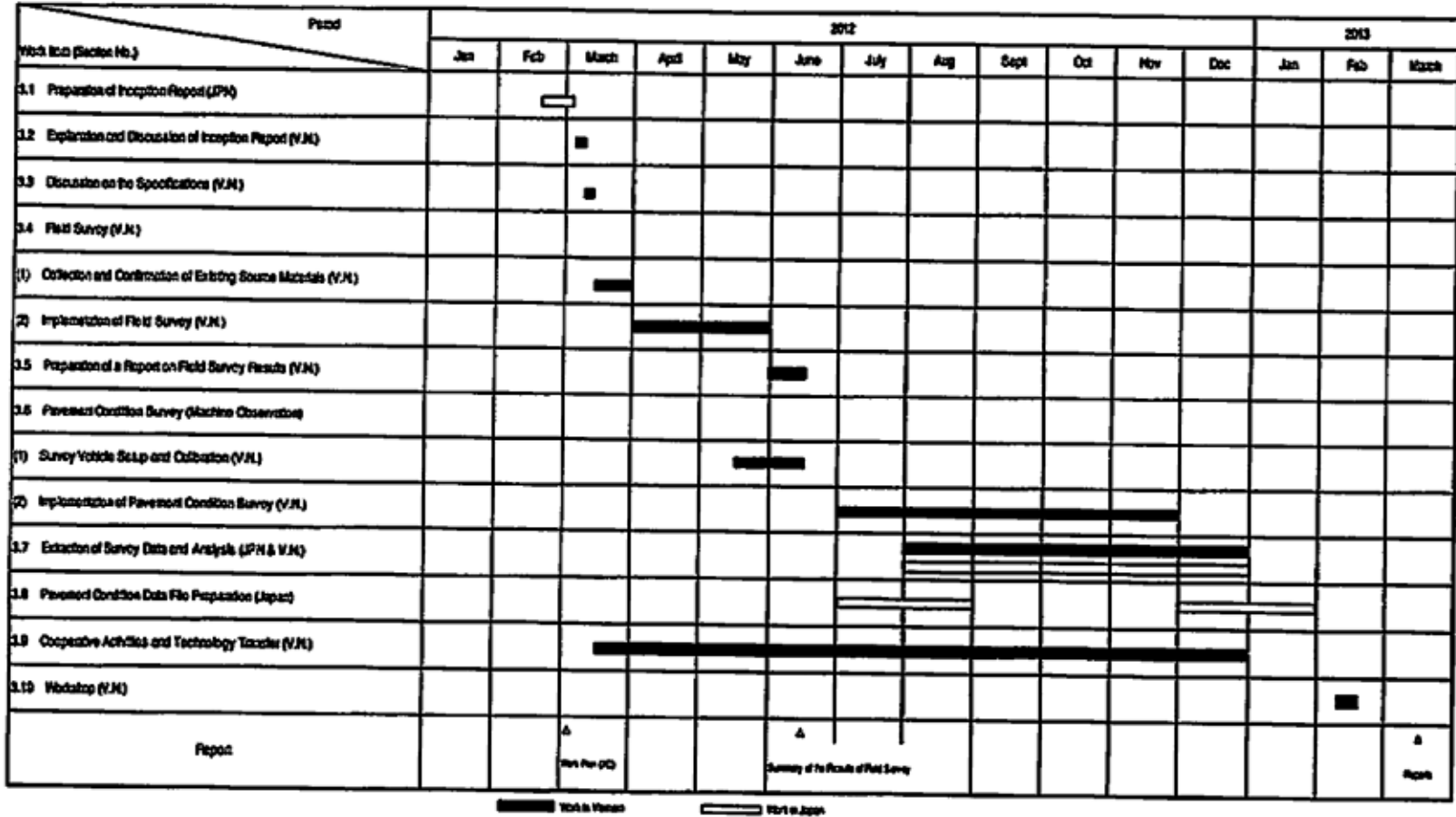


Figure 4 Operation Schedule

The Pavement Data Collection Survey

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2.5 Basic Policies

The basic policies for the survey implementation are listed as follows:

- (1) **Cooperation with officers of relevant organizations in field surveys, measurement and analytical work**

The work on the field survey, measurements and survey of pavement conditions and data extraction and analysis shall be conducted with the technical staff of the counterpart. During the work technology transfer will be conducted on: the method of survey; operation consideration during the survey; data usage after the survey; and implementation on the survey on pavement conditions.

- (2) **Clarification of the role of officers of the relevant organizations in the cooperative work**

The survey on pavement data collection has three major items: 1) Field survey (Field survey and measurement); 2) Operation and management of the survey vehicle; 3) Data analysis and application. The roles and responsibilities of the staff shall be clarified during the discussion on the Inception Report for the method to be used sustainably after the termination of the survey. The implementation plan for the cooperative work shall be prepared.

- (3) **Coordination and consultation among road-related organizations**

Data obtained in the survey will be used for the Project for Capacity Enhancement in Road Maintenance which is underway in Vietnam or for other projects; therefore, those that will use the data will be called and matters shall be discussed to define the data collection items and data application before implementation of the survey.

- (4) **Procurement of the Pavement Survey Vehicle**

The vehicle which will be used for the survey is registered at NETIS (New Technology Information System, Registration Number of the Ministry of Land, Infrastructure, Transport and Tourism: KT-110060-A), and has been technically highly evaluated.

The survey vehicle and equipment will be exported from Japan to Vietnam. The Survey Team will request administrative support in securing the import permit to JICA Vietnam Office and the counterpart.

- (5) **Maintenance and management of the survey vehicle**

The vehicle planned to be used during the survey is designed and prepared in Japan. The use of the vehicle increases the efficiency in data collection; however, when it malfunctions, the overall schedule may be delayed. To avoid unexpected problem, an expert is assigned to setup and calibrate the equipment and to maintain the vehicle regularly.

- (6) **Security arrangements for pavement survey vehicle**

Since the survey covers roads in a wide area in RRMU2, we intend to secure storage sites for the vehicle and survey devices to minimize the overall travel distance as well as to secure safe operation. At the same time, to prevent any substantial delay in schedule due to loss of or damage to the vehicles or devices, or any other accidental circumstances, we will enhance security arrangements by, for example, using security alarms and stationing security guards at the storage sites.

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(7) Method of creating data sheets on pavement condition

Versatile data formats (such as Microsoft Excel, CSV or other text formats) will be adopted so that the data obtained can be used for various purposes in future. The data formats will be discussed with the counterpart and determined.

(8) Preparation of an operation plan to avoid weather-related risks in the rainy season

The survey will be conducted when the weather is fine to secure accuracy of the survey. In Hanoi, the monthly rainfall peaks in August, when the survey is scheduled to commence. The weather may affect the schedule of the survey; therefore, weather conditions and reports will be studied to plan a flexible schedule to minimize the risk incurred by bad weather.

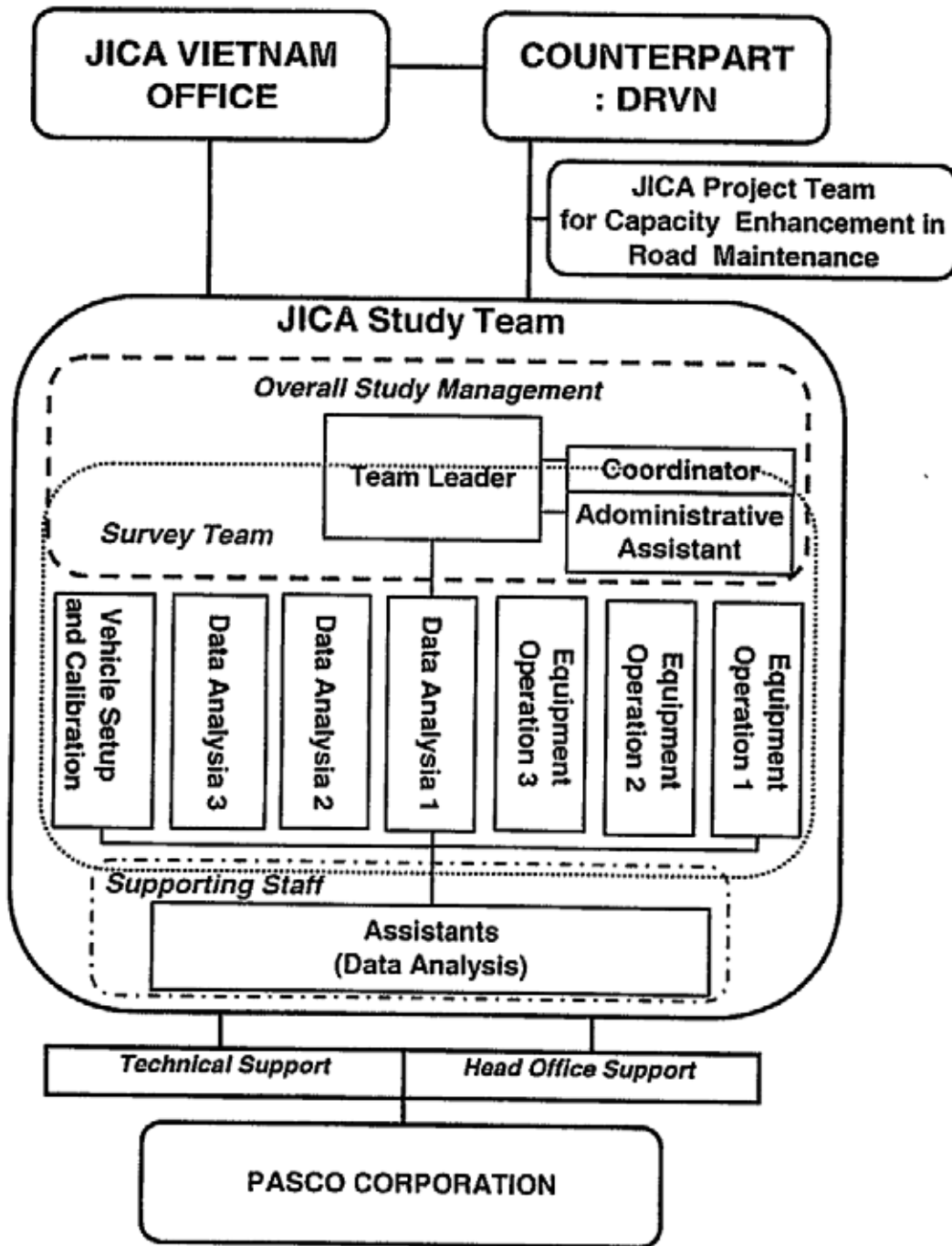
(9) Selection of routes and lengths

The routes and lengths of the survey will be determined during the discussion of the Inception Report. During the discussion, existing data and reference materials will be used to select the routes. The area is planned to be within the jurisdiction of RRMU2. The route planned is the national road with a length of 2,303 km—both ways are planned to be surveyed. The route will be confirmed with the counterpart, and the results will be summarized as a filed survey report (summary).

2.6 Operation Implementation Structure

The survey will be implemented by JICA, the counterpart, and the survey team. The following chart shows the structure of the survey implementation.

JICA



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Figure 5 Survey Implementation Structure

3. Methods

3.1 Preparation of Inception Report (Work in Japan)

The Inception Report is prepared based on the TOR of JICA and studying the reference materials to formulate the overall implementation method and schedule of the survey. The basic policies for implementation, survey method, operation plan, manning schedule and technology transfer (support) and other necessary items of the survey implementation are included in the Inception Report. In the Inception Report, responsibilities of the Vietnam side, to be discussed and agreed, are specified, also.

3.2 Explanation and Discussion on the Inception Report (Work in Vietnam)

The contents of the Inception Report is explained, discussed and agreed. Especially, selection of the routes is discussed with the counterpart. The target routes and lengths are confirmed. The operation plan for the cooperative activities is discussed and prepared to be attached to the Inception Report.

3.3 Discussion on the Specifications (Work in Vietnam)

The specifications of the pavement data files to be prepared during the survey shall be discussed with the counterpart and agreed. The principle of the specification shall be the Manual for Pavement Survey and Its Measuring Methods (Japan Road Association). The contents in Table 1 will be confirmed with the counterpart, also.

Table 1 Data Items to be Acquired

Category	Item to be acquired
Common	Code of RRMU
	Route number
	Classification of current, old and new roads
	Branch number
	Classification of upbound and downbound
	Kilometer posts (starting and ending points)
Road administration data	Classification of road administration (offices, local stations, etc.)
	Data concerning administrative classifications
	Data concerning distances among kilometer posts
Management attribute data	Traffic lane compositions
	Road structures
	Crossroads
Data by surface type	Surface type

3.4 Field Reconnaissance (Work in Vietnam)

(1) Collection and Review of Existing Reference Materials

Before the field reconnaissance, basic information--reference materials, inventory data and related maps--shall be collected and reviewed.

(2) Implementation of Field Reconnaissance

During the field reconnaissance, a vehicle, other than the specialized survey vehicle, is used to

record and confirm conditions such as segments of routes like locations of kilo-posts for: 1) the pavement data collection survey; 2) extraction and analysis of the survey data; and 3) preparation of the data files.

The data collection shall be conducted in accordance with Section 3.2 and 3.3.

3.5 Compilation of the Field Reconnaissance Results (Work in Vietnam)

A summary of the findings of the field reconnaissance include: implementation policy and the method of pavement data collection resulted after series of meetings with government officials and related parties with relevant projects; conditions of the routes; and points to be noted for implementation. Based on the results, selection of the routes are finalized with an agreement.

3.6 Pavement Condition Survey (Machine measurement) (Work in Vietnam)

(1) Set-up and calibration of the survey vehicles

Prior to the pavement data collection, the experts will set-up and calibrate the survey vehicle to meet conditions of the roads in Vietnam.

(2) Implementation of pavement data collection

With the survey vehicle, the pavement conditions (cracking rate, rutting depth (IRI: International Roughness Index)) will be measured and recorded. Training for the operation of the vehicle will be conducted by the Japanese experts to the counterpart. The function and accuracy of measurements and overview images of the vehicle are shown in Table 3 and Figure 2, respectively.

Table 2 Functions and Performance of Pavement Survey Vehicle

Functions	Performance
Distance	Accuracy to within $\pm 0.5\%$ for values actually measured by tape
Cracking	Accuracy to be able to detect any crack of 2 mm or more in width
Rutting	Accuracy to within $\pm 5\text{mm}$ for values actually measured in the cross-sectional profile graphs
International Roughness Index, IRI	Devices to measure cross-sectional profiles satisfy the accuracy of Class 2, (complying with the "Handbook for Pavement Survey and Test Methods")
Road images	Full high-vision CCD cameras (1,920 (w) x 1,080 (h))
GPS data	Accuracy of point positioning, and measurement of longitude, latitude and altitude

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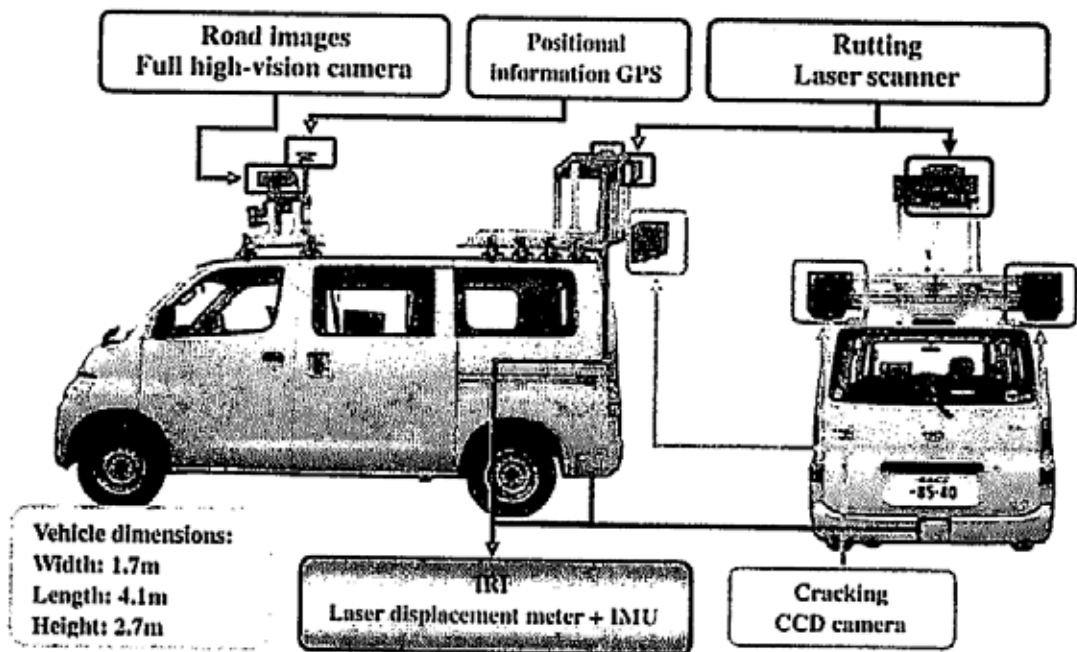


Figure 6 Overview Image of the Pavement Survey Vehicle

3.7 Data Extraction and Analysis (Work in Japan and Vietnam)

The data will be extracted and analyzed. The method for analysis will be in accordance with the specifications determined during the discussion on the specification.

The analysis of data concerning the pavement conditions will be carried out simultaneously both in Japan and Vietnam to process large amount of data in a limited time period and for the technology to be used in future in Vietnam.

For data analysis in Vietnam, a multiple sets of analytical systems will be adopted for efficient implementation. At the same time, operation manuals for the analytical systems will be prepared, and training for data extraction and analysis will be conducted to standardize the operation and to transfer the technology.

For the analysis of data on pavement conditions, the analytical system shown in Figure 8 will be used. The system can view both the images of pavement and the front view allowing confirmation of surrounding areas.

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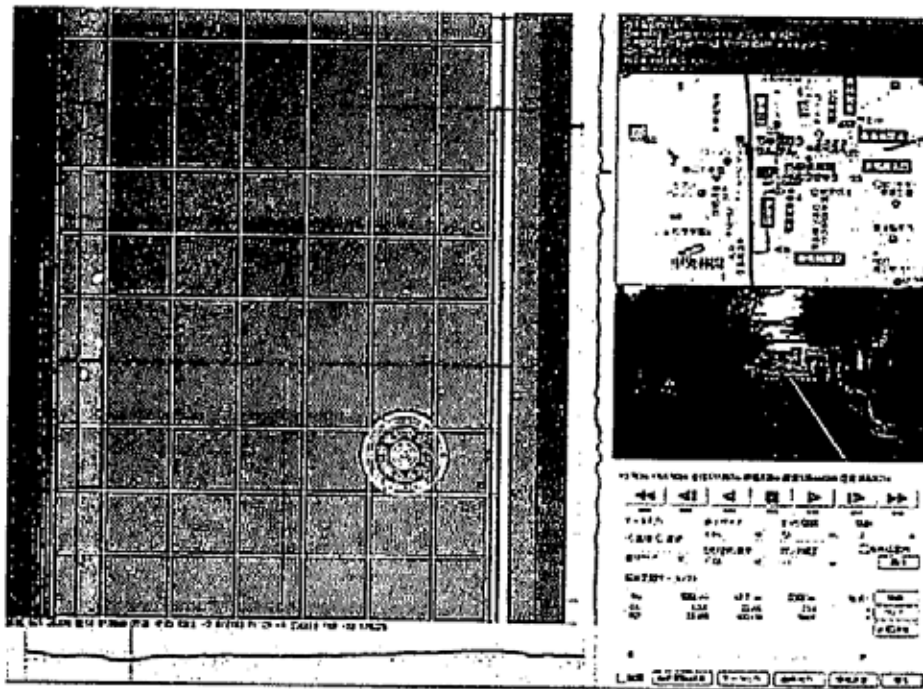


Figure 7 Pavement Data Analysis System (Screen Image)

3.8 Preparation of Data Files on Pavement Conditions

Data files on pavement conditions will be prepared by combining the field reconnaissance (road administration data, data concerning special characteristics for administration, data by nature of pavement, etc.) and analysis (cracking, rutting and IRI data). Data concerning road images will be edited by route with GPS data. Table 3 shows the contents of the data file.

Table 3 Format of Data Files for Pavement Conditions (Example)

Office code	Local station code	Local station	Route			Upbound or downbound	No. of lanes subject to surveys	No of lanes	Zone			Structure		Point name	Province
			No.	Branch No	Current, Old or New				Starting point (m)	Ending point (m)	Zone length (m)	1	2		
30	83	National Road Maintenance	10			Downbound	2	2	34k 115	34k 165	50				
30	83	National Road Maintenance	19			Downbound	2	2	34k 165	34k 200	35				
30	83	National Road Maintenance	19			Downbound	2	2	34k 200	34k 300	100				
30	83	National Road Maintenance	19			Downbound	2	2	34k 300	34k 390	90				
30	83	National Road Maintenance	19			Downbound	2	2	34k 390	34k 400	10	B			
30	83	National Road Maintenance	19			Downbound	2	2	34k 400	34k 405	5	B			
30	83	National Road Maintenance	19			Downbound	2	2	34k 405	34k 500	95				
30	83	National Road Maintenance	19			Downbound	2	2	34k 500	34k 600	100				
30	83	National Road Maintenance	19			Downbound	2	2	34k 600	34k 700	100				
30	83	National Road Maintenance	19			Downbound	2	2	34k 700	34k 800	100				
30	83	National Road Maintenance	19			Downbound	2	2	34k 800	34k 900	100				
30	83	National Road Maintenance	19			Downbound	2	2	34k 900	34k 960	60				
30	83	National Road Maintenance	19			Downbound	2	2	34k 960	34k 1000	40				
30	83	National Road Maintenance	19			Downbound	2	2	34k 1000	34k 1005	5				
30	83	National Road Maintenance	19			Downbound	2	2	35k 0	35k 10	10				
30	83	National Road Maintenance	19			Downbound	2	2	35k 10	35k 60	50				
30	83	National Road Maintenance	19			Downbound	2	2	35k 60	35k 100	40				
30	83	National Road Maintenance	19			Downbound	2	2	35k 100	35k 200	100				
30	83	National Road Maintenance	19			Downbound	2	2	35k 200	35k 300	100				
30	83	National Road Maintenance	19			Downbound	2	2	35k 300	35k 315	15	B			
30	83	National Road Maintenance	19			Downbound	2	2	35k 315	35k 400	85				
30	83	National Road Maintenance	19			Downbound	2	2	35k 400	35k 445	45				

3.9 Cooperative Activities and Technology Transfer (Work in Vietnam)

The field reconnaissance, pavement survey, and extraction and analysis of the data will be implemented together with engineers in Vietnam for them to learn the survey methods and uses of data among other matters in operation. Manuals and other documents necessary for the cooperative activities will be prepared both in English and Vietnamese.

Prior to the pavement survey and extraction/analysis of the data, basic training on the survey and operation using the vehicle will be carried out for engineers from relevant organizations in Vietnam.

3.10 Workshop (Work in Vietnam)

The workshop will be held with the counterpart to proliferate the method to be used continuously in Vietnam. The contents of the workshop include: the contents of the data files and their uses; implementation procedure of the survey for pavement data collection; results of the survey; and findings of the survey operation.

The vehicle, equipment and system will be presented and demonstrated to enhance knowledge on the survey and uses of the data.

A workshop will be held in around February, 2012, when data files of the pavement conditions are completed. About 50 will be invited to take part in the event. Participation from the Planning & Investment Department, the Infrastructure Department, the Directorate for Roads, RRMU2, and the RTC-CENTRAL of the Ministry of Transport, as well as academics are expected.

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3.11 Report Preparation (Work in Japan)

The outputs of the survey are listed in Table 4. The final outputs will be the items (2) and (3).

Table 4 Outputs

Outputs, etc.	Notes	No. of copies	Submission
(1) Work plan (Inception Report)	Basic policy, methods and work schedule, personnel plan and other implementation plans	10 Copies (Japanese) 10 copies to be submitted to the Vietnam government out of 15 copies (English)	At the time of commencement of the survey
(2) Field Reconnaissance Report (Summary)	Results study and review; results of discussion on the survey and analysis with the Vietnam side until the end of the field reconnaissance	10 Copies (Japanese)	During the last ten days of June
(3) Survey report	Overall outputs of the survey, and achievements of technical transfer	10 Copies (Japanese) 15 Copies (English)	During the middle ten days of March, 2013
(4) Data file for pavement conditions	A set of data from the survey	One (1) CD-R submitted to the Vietnam government out of three CD-R: discs.	Mid-March, 2013

4. Requests to the Vietnam Side

For smooth implementation of the survey, the following items will be requested from the Survey Team to the Vietnam side.

Table 5 Requests to the Vietnam Side

Item	Descriptions
Providing data and information for route selection; providing IDs for the members	To implement the field reconnaissance survey and the data collection, the Vietnam side shall provide following materials: (1) Road management documents and maps (2) Road ledger and related forms (3) Digital topographic maps (MONRE) (3) IDs for the team members (4) Others that are deemed necessary
Administrative support on importing and operating the vehicle and equipment	Administrative support in importing the vehicle and equipment Supporting procedural requirements for operating the survey vehicle and conducting the survey to appropriate government agencies.
Providing staff for cooperative activities and technology transfer	Staff for cooperative activities and technology transfer: (1) Field reconnaissance—two (2) persons (2) Pavement data collection—one (1) person (3) Survey data extraction and analysis—eight (8) persons
Supporting the Workshop	Invitation to the workshop to participants: the Planning & Investment Department; the Infrastructure Department, the Directorate for Roads; RRMU2; and RTC-CENTRAL of the Ministry of Transport. Preparation of a participant list. Other supporting activities for holding the workshop such as registration.

Attachment B.

Table of Collaboration Work Schedule and Members

**PAVEMENT DATA COLLECTION SURVEY
IN
THE SOCIALIST REPUBLIC OF VIET NAM**

**WORK SCHEDULE
FOR
COLLABRATION WORKS
AND
TECHNOLOGY TRANSFER**

March 2012

PASCO Corporation

① Work Volume

Table of expected work volume

ID	Route Name	From (km)	To (km)	R_Length (km)	Work days (50km/day)
1-0	NH.1	0	285.4	285.4	6
1-1	Connecting route between NH.1 and NH.6(Cau tau)	0	2.7	2.7	1
2	NH.2	30.6	312.5	281.9	6
3	NH.3	33.3	344.4	311.1	7
4	NH.3B	0	129.0	129	3
5	NH.4E	0	44.2	44.2	1
6	NH.5	11.1	92.5	81.4	2
7	NH.6	38	383.3	345.3	7
8	NH.10	0	173.3	173.3	4
9	NH.15	0	20.0	20.0	1
10	NH.18	0	48.3	48.3	1
11	NH.37	61	88.2	37.2	1
12	NH.38	0	84.5	84.5	2
13	NH.43	26	79.7	53.7	2
14	NH.70	0	198.1	198.1	4
15	NH.279	0	118.0	116.0	3
17	NB-BN	0	31.1	31.1	1
18	HCM	409	503.0	94.0	2
1-2	PVCG	181.8	213.6	32.0	1
20	NH.38B	0	45.0	45.0	1
	Total	-	-	2412.2	58

② Work Schedule

Table of work schedule

Group1		1st W Apr.	2nd W Apr.	3rd W Apr.	4th W Apr.	1st W May	2nd W May	3rd W May	4th W May	5th W May
1.Training of Field Reconnaissance										
2.Field Reconnaissance										
<u>R Name</u>	<u>R Length(km)</u>									
NH.2	201.9									
NH.3	311.1									
NH.3B	129									
NH.4E	44.2									
NH.6	345.3									
NH.15	20.0									
NH.43	53.7									
NH.70	198.1									
NH.279	116.0									
Total	1,498									
3.Compilation of the Field Reconnaissance Results										

Group2		1st W Apr.	2nd W Apr.	3rd W Apr.	4th W Apr.	1st W May	2nd W May	3rd W May	4th W May	5th W May
1.Training of Field Reconnaissance										
2.Field Reconnaissance										
<u>R Name</u>	<u>R Length(km)</u>									
NH.1	285									
Connecting route between NH.1 and NH.6(Cau tau)	2.7									
NH.5	81.4									
NH.10	173.3									
NH.18	48.3									
NH.37	37.2									
NH.38	84.5									
NB-BH	31.1									
HCM	94.0									
PVCG	32.0									
NH.38D	45.0									
Total	912.9									
3.Compilation of the Field Reconnaissance Results										

③ Assignment Members

Group1	Members
Group Leader	Syoichi KITAGAWA
Counterpart (DRVN/RRMU2)	
Interpreter	Pham Quang Son
Driver	Nguyae Quang Tuan

Group2	Members
Group Leader	Yoshiyasu TSUCHIYA
Counterpart (DRVN/RRMU2)	
Interpreter	Do Hong Phong
Driver	Vu Hong Quang

1-2 Pavement Condition Survey

① Work Volume

Table of expected work volume

ID	Route Name	From (km)	To (km)	S_Length (km)	Work days (50km/day)
1-0	NH.1	0	285.4	570.8	12
1-1	Connecting route between NH.1 and NH.6(Cau Lau)	0	2.7	5.4	1
2	NH.2	30.6	312.5	563.8	12
3	NH.3	33.3	344.4	622.2	13
4	NH.3B	0	129.0	258	6
5	NH.4E	0	41.2	88.4	2
6	NH.5	11.1	92.5	162.8	4
7	NH.6	38	383.3	690.6	14
8	NH.10	0	173.3	346.6	7
9	NH.15	0	20.0	40	1
10	NH.18	0	46.3	92.6	2
11	NH.37	61	98.2	74.4	2
12	NH.38	0	84.5	169	4
13	NH.43	28	79.7	107.4	3
14	NH.70	0	198.1	396.2	8
15	NH.279	0	116.0	232	5
17	NB-BN	0	31.1	62.2	2
18	HCM	409	503.0	188	4
1-2	PVCG	181.6	213.6	64	2
20	NH.38B	0	45.0	90	2
	Total	-	-	4,824	106

② Work Schedule

Table of work schedule

Pavement condition Survey		Jun.	Jul.	Aug.	Sep.	Oct.	Nov.
1.Training of Pavement condition Survey		■					
2.Pavement condition Survey							
R_Name	Survey Length(km)						
NH.2	570.8	■					
NH.3	5.4	■					
NH.3B	563.8		■				
NH.4E	622.2			■			
NH.6	258.0			■			
NH.15	88.4				■		
NH.43	162.8				■		
NH.70	690.6				■		
NH.279	346.6				■		
Total	40.0				■		
Connecting route between NH.1 and NH.6(Cau Lau)	92.6				■		
NH.5	74.4					■	
NH.10	169.0					■	
NH.18	107.4					■	
NH.37	396.2					■	
NH.38	232.0					■	
NB-BN	62.2					■	
HCM	188.0					■	
PVCG	64.0						■
NH.38B	90.0						■
Total	1,476.8						■
3.Compilation of the Pavement condition Survey							■

③ Assignment Members

Group1	Members
Group Leader	Yoshiyasu TSUCHIYA(3M/M), Syoichi KITAGAWA(2M/M)
Counterpart (DRVN/RRMU2)	
Interpreter	Pham Quang Son
Driver	Nguyae Quang Tuan

1-3 Data Analysis

Data Acquisition Item

Data Analysis

RMSD	Material name	Equipment	Access Point				Station length (m)	Max. Area (m ²)	Station ID	Station Level	Station Type	Contract (Days)						Total	
			From	To	Start	End						Date	Working Hours			Billing Days			BI (Days)
													Contract	Package	Total	Max	Ass		
RMSD2	RMSD2A	05.1	02	04	02	10	56	35	Down	1	AC	2012	01	00	1.0	15	0	15	
	RMSD2B	05.1	05	06	12	30	95	30	Down	1	AC	2012	04	20	2.0	6	0	12	
	RMSD2C	05.1	07	08	02	10	10	30	Down	1	AC	2012	04	00	0.0	6	0	6	
	RMSD2D	05.1	08	08	04	20	80	30	Down	1	AC	2012	09	00	1.2	5	0	23	

① Work Volume

Table of expected work volume

ID	Route Name	From (km)	To (km)	S_Length (km)	Work days 25km/(8members*day)
1-0	NH.1	0	285.4	570.8	23
1-1	Connecting route between NH.1 and NH.6(Cau Lau)	0	2.7	5.4	1
2	NH.2	30.6	312.5	563.8	23
3	NH.3	33.3	344.4	622.2	25
4	NH.3B	0	129.0	258	11
5	NH.4E	0	44.2	88.4	4
6	NH.5	11.1	92.5	162.8	7
7	NH.6	38	383.3	690.6	28
8	NH.10	0	173.3	346.6	14
9	NH.15	0	20.0	40	2
10	NH.18	0	46.3	92.6	4
11	NH.37	61	98.2	74.4	3
12	NH.38	0	84.5	169	7
13	NH.43	26	79.7	107.4	5
14	NH.70	0	198.1	396.2	16
15	NH.279	0	116.0	232	10
17	NB-BN	0	31.1	62.2	3
18	HCM	409	503.0	188	8
1-2	PVCG	181.6	213.6	64	3
20	NH.38B	0	45.0	90	4
	Total	-	-	4,824	201

② Work Schedule

Table of work schedule

Group1		July	August	September	October	November	December
1.Training of Data Analysis							
2.Data analysis							
B_Name	Analysis Length(km)						
NH2	563.9						
NH3B	258						
NH4E	89.4						
NH6	850.6						
NH15	40.0						
NH43	107.4						
NH70	399.2						
NH279	232.0						
Total	2,376						
3.Compilation of the Data Analysis Results							

Group2		July	August	September	October	November	December
1.Training of Field Reconnaissance							
2.Field Reconnaissance							
B_Name	Analysis Length(km)						
NH1	571						
Connecting route between NH.1 and NH6(Cau Lau)	5.4						
NH3	622.2						
NH5	162.8						
NH10	348.6						
NH18	32.6						
NH37	72.4						
NH39	169.0						
ND-BN	62.2						
HCM	188.0						
PVCG	64.0						
NH380	90.0						
Total	2,448.0						
3.Compilation of the Field Reconnaissance Results							

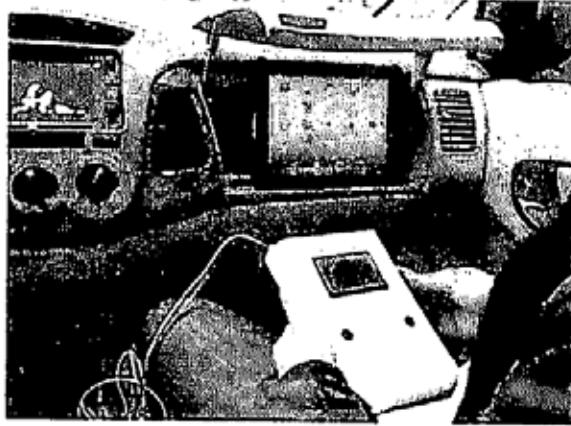
③ Assignment Members

Group1(JPN)		Group2(VN)	
	Members		Members
Group Leader	Kaoru SAWADA	Group Leader	Joel F.CRUZ , Kohei SAKAI and Gaku SAITO
Analyzing Operator	Eight(8)members	Counterpart 1 (DRVN/RRMU2)	
		Counterpart 2 (DRVN/RRMU2)	
		Counterpart 3 (DRVN/RRMU2)	
		Counterpart 4 (DRVN/RRMU2)	
		Counterpart 5 (DRVN/RRMU2)	
		Counterpart 6 (DRVN/RRMU2)	
		Counterpart 7 (DRVN/RRMU2)	
		Counterpart 8 (DRVN/RRMU2)	
		Interpritor	Do Hong Phong

List of Equipments

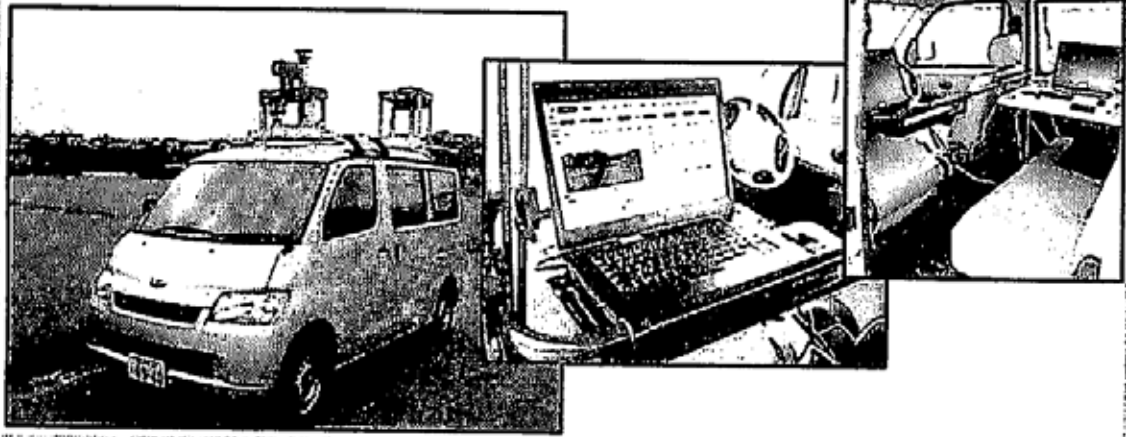
1. Field Reconnaissance

○ Trip Meter



2. Pavement Condition Survey

○ Real Mini Surveying System



3. Data Analysis

○ Real Mini Analyzing Software



Attachment A. List of Attendants

DANH SÁCH ĐẠI BIỂU THAM DỰ CUỘC HỌP

Hà Nội, ngày 27 tháng 3 năm 2012

- Chủ trì: Ông Nguyễn Đức Cường

- Nội dung: Báo cáo chi tiết công tác thi công - khảo sát

..... P. AS. CO. báo cáo.....

STT	Họ và tên	Chức vụ	Ký nhận
1	Nguyễn Đức Cường	PVT - Vụ QLGT - (PMU) - PRM	
2	Đinh Thị Thanh Huyền	Vụ KHCN-MT-HYGT-ĐCĐ	
3	Thần Đức Long	PVT - Vụ KHCN-MT-HYGT-ĐCĐ	
4	Ông Công Tuấn	CĐ-Tổng Giám Đốc	
5	Châu Văn Lương	PP QLGT - KHCN QLĐT	
6	Từ Minh Phương	CV P. QLGT - -	
7	Minh Khoa	PVT - Vụ KHCN-MT	
8	Dr. Bhoj Raj Panth	Researcher, JICA	
9	Mr. Kashi Yasushi Aoki	- do -	
10	Kisashi Hori	"	
11	Le Van Thuan	TSI Hq Hq	
12	Yoshiyasu Iguchiya	PRCO	
13	Kazuya Aoki	"	
14	Yutaka Kokuchi	"	
15	Karaku Sanao	"	
16			
17			
18			
19			
20			
21			
22			

DANH SÁCH ĐẠI BIỂU THAM DỰ CUỘC HỌP

Hà Nội, ngày 27 tháng 3 năm 2012

- Chủ trì: Ông Nguyễn Đức Cường
 - Nội dung: báo cáo Chủ đầu tư kỹ thuật khai thác
 PAS.CO báo cáo

STT	Họ và tên	Chức vụ	Ký nhận
1	Nguyễn Thanh Tâm	Chi lý ECHT	9
2	Quang Văn Khoa	Kỹ thuật viên ECHT	3
3	Hoàng Việt Hà	Ban QLDA HTKT	Việt Hà
4	Tạ Thị Thuý	CV - Vụ KHĐT	Thuý
5	Nguyễn Chí Hải Hà	CV - Vụ KHĐT	Chí Hải
6	Trần Xuân Sinh	CV - Vụ KHĐT	
7	Lưu Quang Tuấn	CV - TTKTĐB	Quang Tuấn
8	Đinh Duy Tiên	CV - TTKTĐB	Đinh Tiên
9	Nguyễn Văn Hoàn	CV - TTKTĐB	
10	Nguyễn Vũ Mạnh	KCP - TTKTĐB	Nguyễn Mạnh
11	Nguyễn Anh Thảo	Tica	Nguyễn Thảo
12	Nguyễn Thị Bích Linh	Pasco	Nguyễn Bích Linh
13			
14			
15			
16			
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18			
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22			

DANH SÁCH ĐẠI BIỂU THAM DỰ CUỘC HỌP

Hà Nội, ngày 15 tháng 3 năm 2012

- Chủ trì: P.ks Tổng Cục Trưởng
- Nội dung: Tư vấn PASCO trước khi bắt đầu các đơn kỹ
- khảo sát mặt đường

STT	Họ và tên	Chức vụ	Ký nhận
1	Phùng Thị Hồng	TPNông KINH - KINH QUẢN	
2	Trần Xuân Sinh	CV - KINH TẾ QUẢN LÝ	
3	Vũ An Tuấn	RTC DRVN	
4	Phạm Thanh Bình	Vụ kỹ thuật	
5	Nguyễn Xuân Cường (Phó Tổng Cục Trưởng)	DR VV	
6	Đinh Thị Thanh Huyền	DR VV PMU	
7	Nguyễn Bắc Cường	DR VV - PMU	
8	Thần Đức Long	Vụ KHON MT-HIQT-DRVN	
9	Nguyễn Anh Quân	KINH QUẢN ĐBT	
10	Nguyễn Anh Tuấn		
11	Phùng Thị Hằng		
12	Nguyễn Khánh Toàn	CV Vụ KINH QUẢN TGT	
13	Hoàng Việt Hải	DRVN - PMU	
14	Nguyễn Việt Tuấn	Vụ KHON, MT, HIQT - DRVN	
15	Toshiya MATSUDA	JICA CERM	
16	Hideyuki KANOSHIMA	JICA CERM	
17	Kisaku Hori	JICA CERM	
18	Yutaka Kakuju	PASCO	
19	Kensuke KIMURA	PASCO	
20	Koroku SOFIA	PASCO	

議事録 3

Meeting on Discussion of draft Specifications

2012年3月16日

道路維持管理能力強化プロジェクト会議室

MINUTES OF MEETING

Activity	Activity 2-1
Target:	Pavement Condition Survey
Time:	16 th March 2012, Time: 15:00 – 17:00
Location	JICA Study Team Office
Participant	- Pavement Condition Survey (PCS) Team 1. Mr. Kokufu, Team Leader 2. Mr. Soma, Equipment Operation 1 3. Mr. Tsuchiya, Equipment Operation 2 4. Mr. K.Aoki, Coordinator - JICA study (CERM) team: Mr.Kanazawa, Mr. Mori, Mr.Pantha, Mr. Matsuda,
Handover material:	From PCS Team: Output Specification Updated Version (Japanese)

Major contents of meeting

CERM and PCS teams had a meeting on Friday 16th March, 2012 to confirm previous discussion held on 09th March 2012. The major contents are as follows:

1. Discussed the following terms/words to be used by PCS team:
 - 5) Up (km10... to km0) and Down (km0... to km10...) instead of Right or Left lane,
 - 9) & 10) PCS team said that measurement of Pavement and Carriageway widths are not conducted since the items are not included in their contract.
 - 11) Number of lanes will be estimated by visual survey if the road is not marking,
 - 12) Lane number will be recorded as Up 1, 2, 3... (count from center of the road) and Down 1, 2, 3...,
 - 13) Road facilities i.e. Bridge (measure at expansion joints at start and end points), Intersection (all national roads connected target roads – CERM opinion, and national roads which are included RRMU2 only – PCS team), Roundabout (as a point), Railway crossing (as a point), Viaduct (at start and end points).
 - 14) Road image data included video, longitude, latitude and elevation. Vertical curve is not included.
2. Regarding 5) Potholes, PCS team explained that it will be measured as Crack (unit: area m2) and it will not be separately recorded as Pothole and Crack.
3. Mr. Kokufu informed that the site reconnaissance will start by two teams from 1st April 2012. He also added that Specification meeting will be conduct next week at DRVN and the date will fix after submission of their letter.

The meeting was adjourned at 17:00.

議事録 4

Meeting on Discussion of Pavement Condition Survey

2012年3月22日

路面性状基礎情報収集・確認調査チーム会議室

MINUTES OF MEETING

Activity	Activity 2-1
Target:	Pavement Condition Survey (Technical Meeting)
Time:	22 nd March 2012, Time: 13:30 – 15:00
Location	PCS Team Office; 12th Floor Daeha Business Center, 360 Kim Ma
Participant	- Pavement Condition Survey (PCS) Team 1. Mr. Kokufu, Team Leader 2. Mr. Soma, Equipment Operation 1 3. Mr. Tsuchiya, Equipment Operation 2 4. Mr. K.Aoki, Coordinator - JICA study (CERM) team: Mr.Kanazawa, Mr. Mori, Mr.Pantha, Mr. Matsuda,
Handover material:	From PCS Team: List of expect items to be discussed during Technical Meeting (TM)

Major contents of meeting

CERM and PCS teams had discussed about results of pavement condition survey to be conducted during Technical Meeting of PCS on 26th March 2012. The summary of discussion is as follows:

1. Discussed based on a list of expected items to be discussed during TM prepared by PCS team. They are as follows:
 - 1) Evaluation result map of pavement condition
 Replied a question by CERM team about update the map, PCS team said that it is difficult to update. Although the difficult to update, those maps are important Mr. Kanazawa stated.
 - 2) Visual viewer system (linked map and video in the same screen)
 Mr. Kokufu expressed his opinion that item 1) and 2) can be integrated.
 - 3) Establishment of database for pavement condition
 Mr. Kanazawa explained that the data base will be established by CERM team as PMS and PMOS. Therefore, it will not necessary to prepare by PCS team.
 - 4) Index of pavement condition
 Mr. Aoki explained, this is same as Maintenance Control Index (MCI) using in Japan. Mr. Kanazawa said that it will be covered by WG3.
 - 5) Selection of FWD testing place
 Both teams concluded that it will be studied if the request made by DRVN.
 - 6) Conduct FWD test
 Both teams concluded that it will be studied if the request made by DRVN.
 - 7) Pavement condition repairing work method
 Mr. Mori explained that FWD is generally required. However, necessity of FWD for PMS should be decided based on discussion with WG3 and DRVN, he added.

8) Identification of location of traffic count survey

Mr. Pantha explained that they have already been prepared by available data provided by DRVN. There are following problems such as i) locations of traffic count stations are different in 2004, 2007, 2010 and 2011, and ii) data conversion from point to section data.

2. Other matters discussed are as follows:

1) Road width

Both teams are agreed to use in data by RoSy Base in 2007 for road width.

2) Potholes

As explained by PCS team during the previous meeting, pot holes will be measured as crack. However, CERM team insisted that they should be recorded separately since the repairing method and cost will be different.

3) Patching rate

CERM team explained the necessity of data for patching rate. To measure the patching rate or not will be answer from PCS team later on.

4) Measurement of Intersection

CERM team suggested to measure only major intersections with signal or roundabout of national roads and the name of the connected road are refer to maps with scale of 1:50,000. Moreover, they will be mentioned as Others if the names are not identify in the map,.

The meeting was adjourned at 15:00.

PAVEMENT DATA COLLECTION SURVEY

Minutes of Meeting

Subject	Technical Meeting of CERM and PDCS Team		
Date	March 22, 2012	Time	13:30 pm
Place	PASCO Office, Room No. 1208, 12 th Floor, Daeha Business Center		
Participants	JICA Study (CERM) Team	Mr.Toshiya MATSUDA Mr.Toshinori KANAZAWA Mr.Hisashi MORI Dr.Bhoj Ray Pantha	
	Pavement Data Collection Survey (PDCS)Team	Mr.Yutaka KOKUFU - Team Leader Dr. Kazuya AOKI Mr.Koroku SOMA Mr.Yoshiyasu TSUCHIYA	
Agenda	1) Discussion of Pavement Condition Survey		

SUMMARY

- Both teams discussed and confirmed the following data items on Pavement Condition through Pavement Data Collection Survey.

Data Base Items(Draft) by CERM Team	Data File Items by PDCS Team (Yes or N/A)	Remarks of Data Files
• Road Inventory Data		
- Administrative Organization		
RRMU2	Yes	
RRMC	Yes	
- Administration Boundary		
Province	Yes	
- Route No.	Yes	
- Route Blanch No.	Yes	
- Light Lane or Left Lane	Yes	UP:Bound & DOWN:Bound
- Mile(kilo meter) post	Yes	
- Longitude, Latitude	N/A	
- Distance in section	Yes	
- Carriageway Width	N/A	
- Pavement width	N/A	
- No. of Lane	Yes	Visual judgment
- No. of Lane Inspected	Yes	
- Road Facilities	Yes	
Bridge, Tunnel, Intersection, Roundabout, Railway Crossing, Viaduct	Yes	Intersection with Signal, Round-about, Viaduct
- Vertical Curve	N/A	
• Pavement Condition Data		
- Date to be inspected	Yes	
- Paved Type	Yes	
Cement Concrete, Asphalt concrete, Bituminous surface treatment, gravel, Earth	Yes	Asphalt Concrete, Cement Concrete, Un-Paved
- Crack rate (%)	Yes	Cracking Ratio(%),Cracking Index(cm/ m ²)
- Patching Rate (%)	Yes	Patching Ratio(%),Patching Index(cm/ m ²)
- Pothole	Yes	Include Cracking

PAVEMENT DATA COLLECTION SURVEY

Minutes of Meeting

		Evaluation(%)
- Rut Volume (mm)	Yes	Rutting Depth, MAX, and Average
- IRI (mm/m)	Yes	
- Image data for each road route will relate with GPS data.	Yes	

▪ Meeting Adjourned 15:00pm. Prepared by Yutaka .KOKUFU

議事録 5

Meeting on Discussion of Specifications

2012年3月27日

DRVN 会議室

Title	Presentation on Specifications and discussion between DRVN and JICA study team		
Date	March 27, 2012	Time	14:00 pm
Place	Directorate for Roads of Vietnam (DRVN)		
Participants	DRVN	Ông Nguyễn Đức Cường Bà Đinh Thị Thanh Huyền Ông Thiệu Đức Long Ông Đặng Công Chiến Ông Chu Văn Lương Bà Từ Minh Phương Ông Lê Văn Thanh Ông Nguyễn Khánh Toàn Ông Quách Văn Khoa Ông Hoàng Việt Hà Bà Tạ Thị Thủy Bà Nguyễn Thị Hải Hà Ông Trịnh Xuân Sinh Ông Lưu Quang Tuấn Ông Đinh Duy Tiên Ông Nguyễn Văn Hoàn Ông Nguyễn Vũ Tuấn	
	PROJECT FOR CAPACITY ENHANCEMENT IN ROAD MAINTENANCE	Yasushi Aoki - Deputy Team Leader MORI, Hisashi Bhoj Ray Pantha - Road Database Expert Nguyen Dinh THAO (Interpreter)	
	PASCO Team Members	Yutaka KOKUFU - Team Leader Koroku SOMA Yoshiyasu TSUCHIYA Dr. Kazuya AOKI Nguyen Thi Dieu LINH (Secretary)	
Agenda	1) Explanation and discussion of Specifications 2) Discussion of Pavement Condition Survey Routes (RRMU2 National Roads) 3) Confirm of Collaboration Work, Schedule with DRVN members 4) Others		

SUMMARY

- Mr. Kokufu thanked DRVN members and guests for coming to the meeting today.
- Mr. Aoki made a brief presentation on Specifications.
- Mr. Luong confirmed all the survey routes with the survey team. The survey team requested another meeting with RRMU2 to confirm the route no.10 and no.38B.
- Mr. Tuan had some comments and requests
 - To avoid misunderstanding between the route number and route name, the survey team should use the definition of route name only.
 - In Vietnam the starting point from km 0 is usually placed on the left side and the

9/4
JICA

- direction of upbound and downbound is opposite with the presented one.
- The survey team should supplement some data in a road section. For example, in 100m, there should have data of field section or embankment, urban section or not.etc
 - The survey team confirmed the question of Mr. Khoa that the survey team only collects data for road pavement. Other data of road management or other system are not included in their contract.
 - Mr Tuan recommended the following points
 - to avoid unexpected problem, the survey team should conduct pilot survey for some routes and then expand for the whole national roads
 - it is necessary to give training to transfer technology to DRVN members before the survey. The project should support to make DRVN members understand about the technology transfer.
 - Mr. Cuong requested the survey team to make clear about the detail work schedule and expenditure for the counterpart staff so that DRVN has a basis to assign suitable number of staffs to work full time with the survey team.
 - Mr. Kokufu agreed that all comments and requirements of DRVN shall be reported to JICA if there is any information out of the contract between the survey team and JICA. He requested another meeting to explain more detail about the work schedule.
 - Mr. Cuong requested a letter and handouts needed to be sent to DRVN before the next meeting.
 - Meeting terminated around 5:30pm.
 - The handout of the presentation on Specifications is attached with this minute of meeting.

Representative of DRVN

Nguyễn Đức Cường

Representative of The Survey Team

Yutaka Kokufu

**PAVEMENT DATA COLLECTION SURVEY
INCEPTION REPORT
- SPECIFICATIONS MEETING -**

March 27, 2012

PASCO CORPORATION

Agenda

1. Explanation and Discussion of Specifications
2. Discussion of Pavement Condition Survey Routes (RRMU 2 National Roads)
3. Confirmation of Collaboration Work Schedule and Members
4. Others

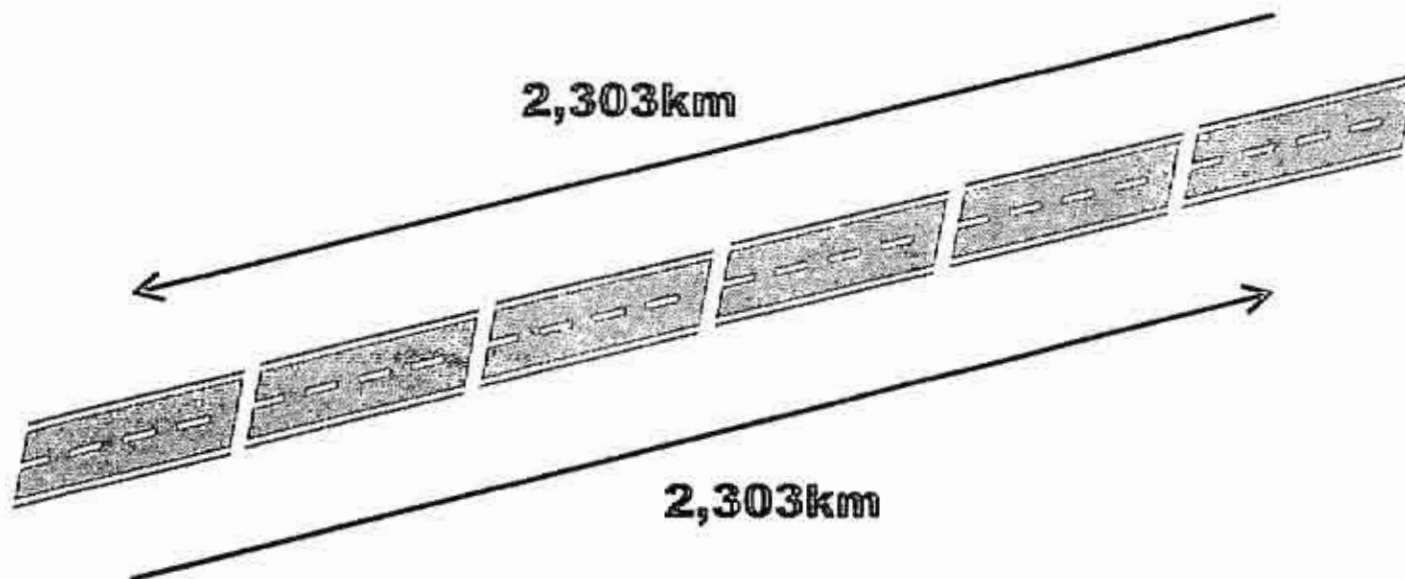
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1. Specifications

JK

Target Routes

- National Roads under the jurisdiction of RRMU2
 - 2,303km in both directions (4,606km)



Total survey length = 4,606 km

Data items measured by Field Reconnaissance

- Road Attributes
 - Maintenance Company
 - Route Number
 - Branch Number
 - Route Name
 - Kilo-meter Post
 - Section length(m)
 - Analysis Area
 - Structure
 - Number of Lane (up-bound / down-bound)
 - Survey Lane Number
 - Surface Type

Definition of Data item

- Road attributes
 - Maintenance Company
 - Company name to manage the road for each section

CODE	Company Name
232	RRMC.232
236	RRMC.236
238	RRMC.238
240	RRMC.240
***	Hà Nội q.lý
~	~

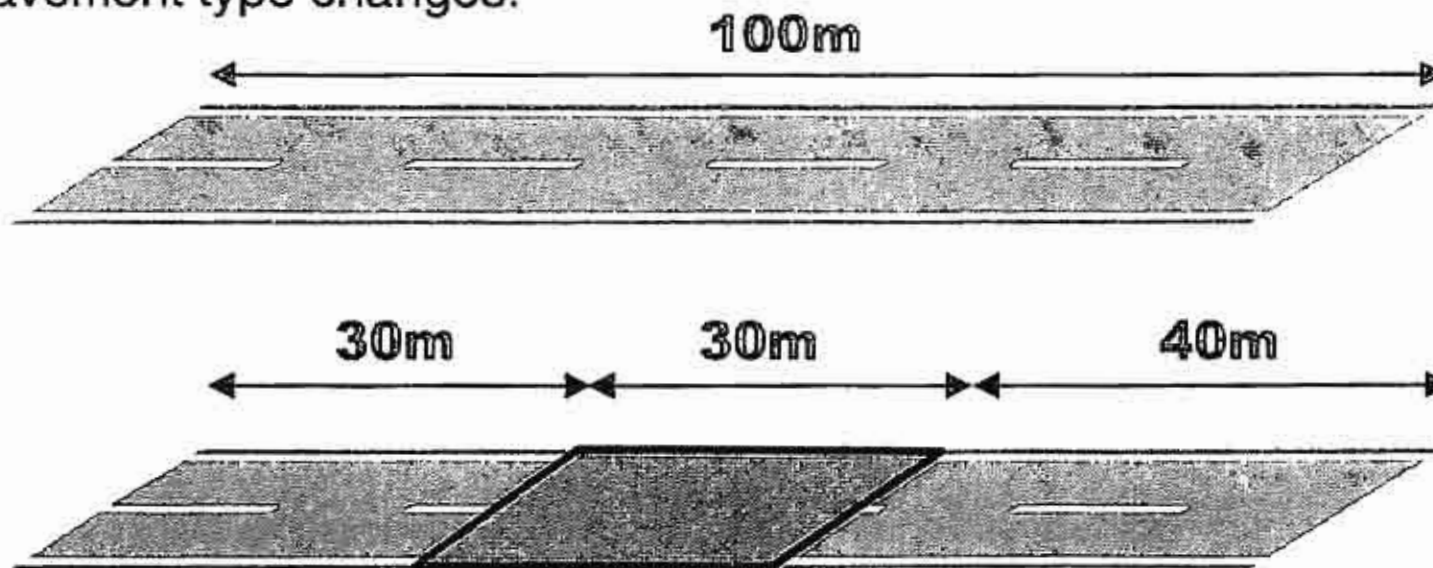
Definition of Data item

- Road attributes
 - Route Number / Branch Number / Route Name
 - Definition of the routes
 - Branch Number : When multi-route in the same route number

Route Number	Branch Number	Route Name	Route Number	Branch Number	Route Name
1	0	QL.1	18	0	QL.18
2	0	QL.2	37	0	QL.37
3	0	QL.3	38	0	QL.38
3	1	QL.3B	43	0	QL.43
4	0	QL.4E	70	0	QL.70
5	0	QL.5	279	0	QL.279
6	0	QL.6	?	0	HCM
10	0	QL.10	?	0	NBBN
15	0	QL.15	1	1	PVCG

Definition of Data item

- Road attributes
 - Kilo-meter Post / From(km,m) and To(km,m) / Section length(m)
- Evaluation unit length
 - 100m as general
 - Section is divided at the location with a bridge and Tunnel or where pavement type changes.



Bridge and Tunnel or different pavement type

Definition of Data item

- Road attributes
 - Structure
 - With or without of structure within each section

CODE	Structure
B	Bridge
T	Tunnel
R	Rock Shed
C	Railway Crossing
I	Intersection
RB	Roundabout
V	Viaduct

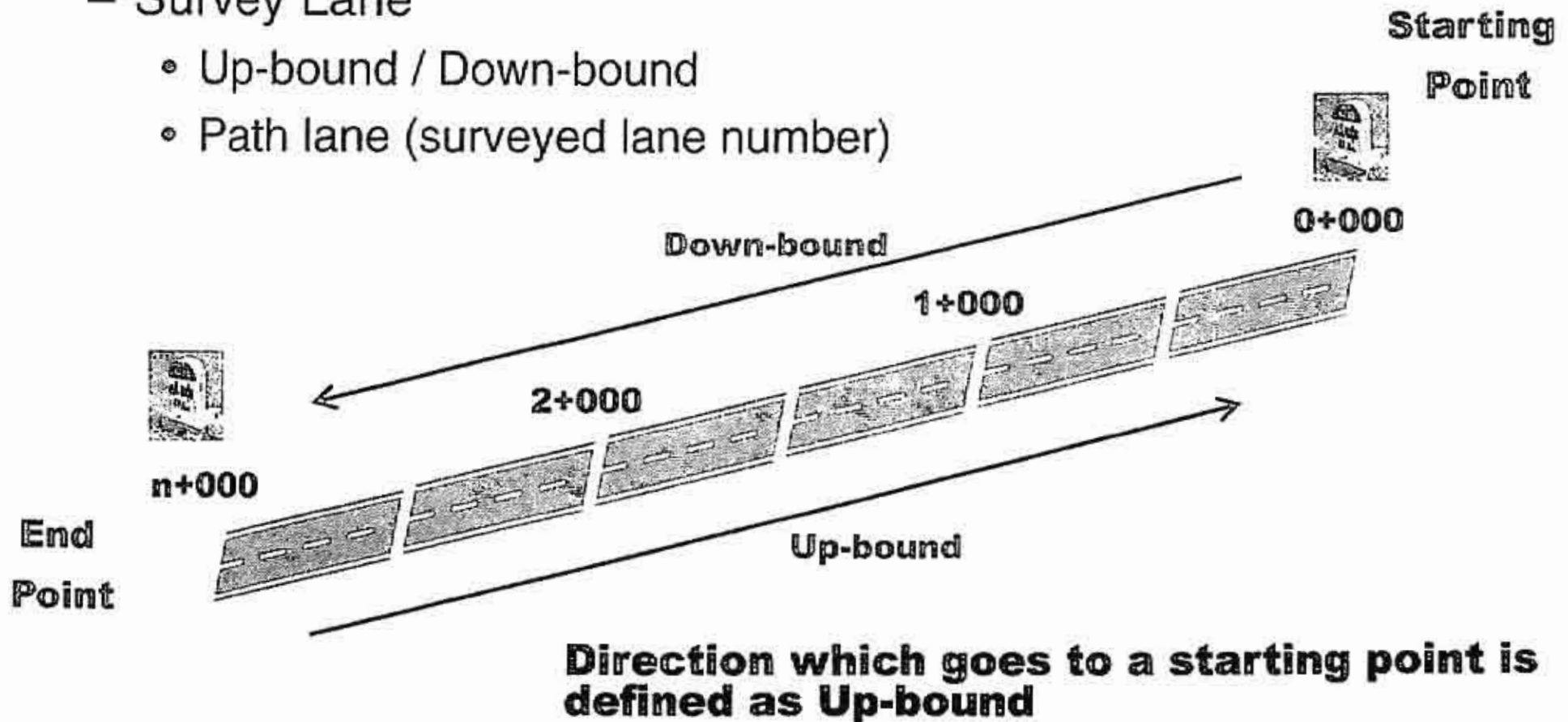
- Intersection : at which main road (with traffic light or roundabout)

Definition of Data item

- Road attributes
 - Number of Lane
 - With a lane mark
 - Confirm the number of lane by visual check
 - Without a lane mark
 - Assume the number of lane(average width of one lane is 3.5m)

Definition of Data item

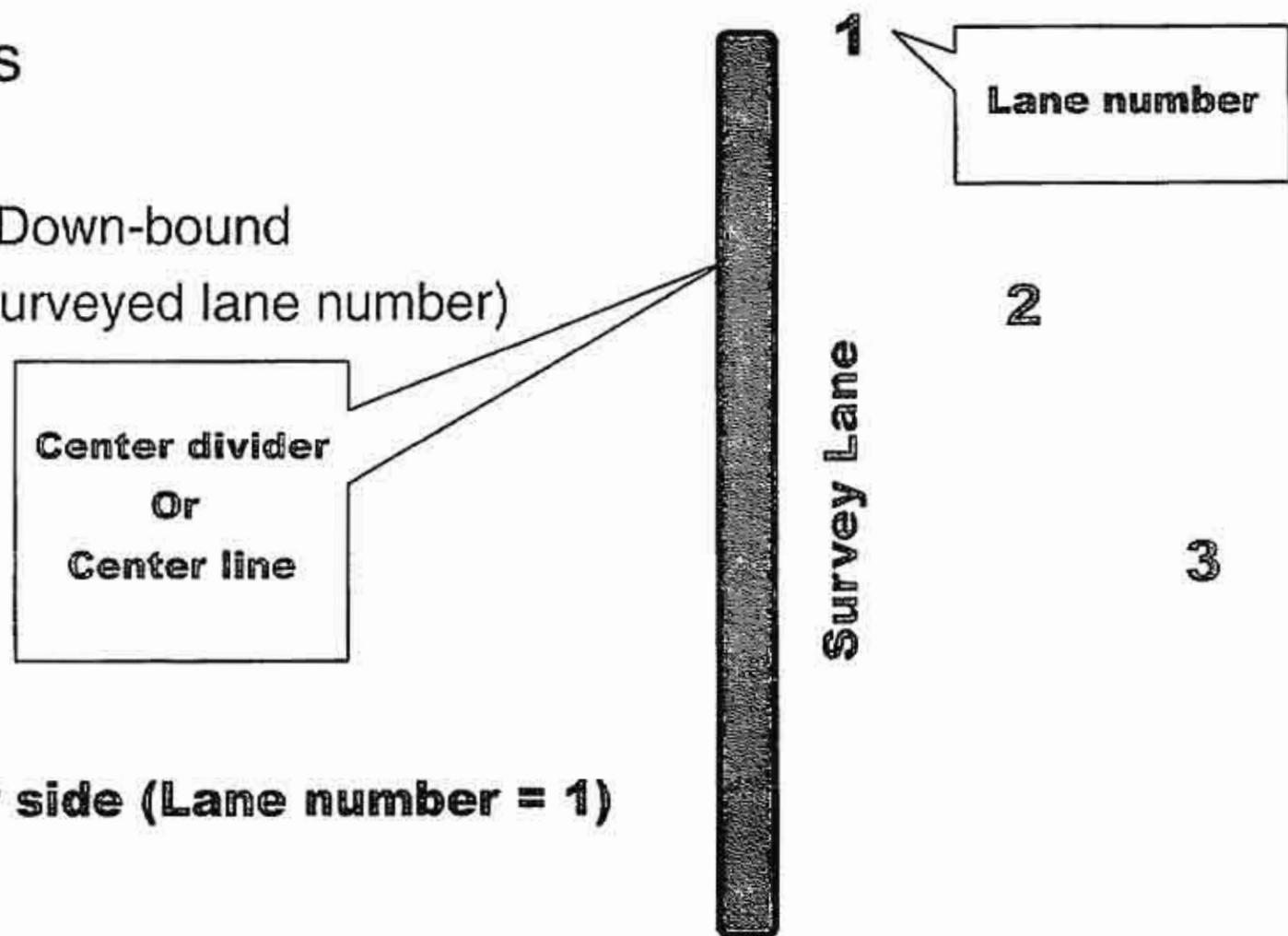
- Road attributes
 - Survey Lane
 - Up-bound / Down-bound
 - Path lane (surveyed lane number)



Definition of Data item

- Road attributes
 - Survey Lane
 - Up-bound / Down-bound
 - Path lane (surveyed lane number)

Center divider
Or
Center line



The diagram shows a vertical road lane. A box labeled 'Center divider Or Center line' has two lines pointing to the center of the lane. To the right of the lane, the numbers 1, 2, and 3 are arranged vertically. A box labeled 'Lane number' has a line pointing to the number 1. The text 'Survey Lane' is written vertically to the left of the lane.

**The lane of center side (Lane number = 1)
is surveyed**

Definition of Data item

- Road attributes
 - Surface Type
 - Confirmation of surface type by visual check
 - Asphalt Concrete
 - Cement Concrete
 - Un-paved

Data items measured by Pavement Condition Survey

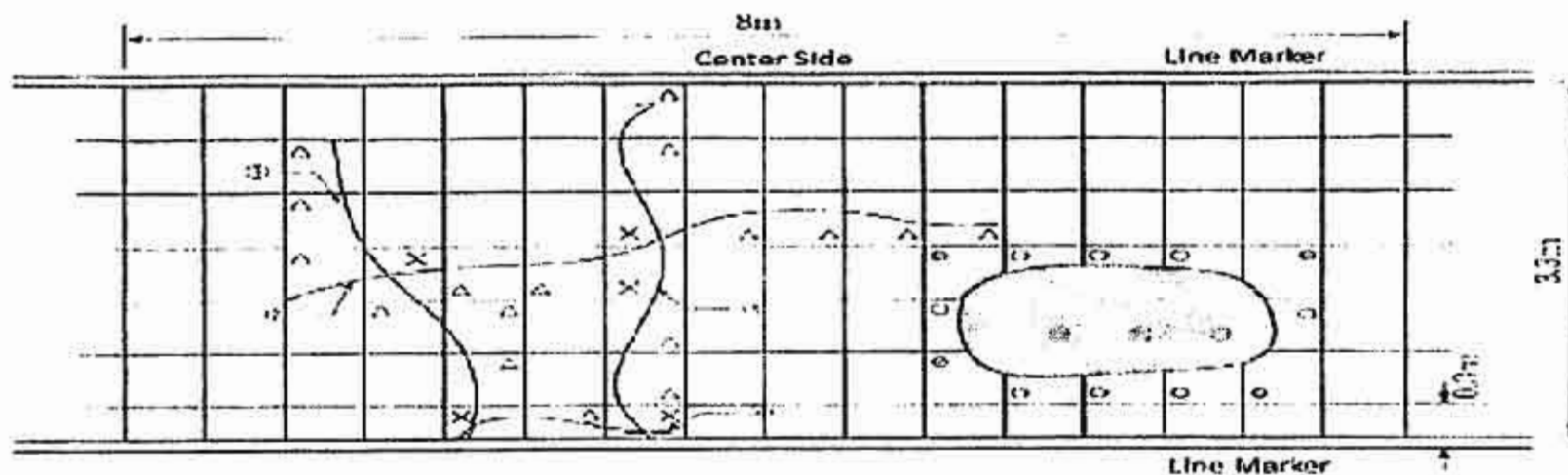
- Pavement conditions (Surface conditions)
 - Cracking ratio / Cracking length
 - Rutting Depth
 - IRI
 - Road images with GPS data

Definition of Data item

- Pavement conditions (Surface conditions)
 - Cracking
 - A road section is divided by grid and existence of a crack is checked by visual.
 - Two or more cracks (including Pothole)
 - One crack
 - Patch area

Definition of Data item

Example of survey section is 8 x 2.3m



Asphalt Pavement

Crack area

Two or more cracks	$0.25\text{m}^2 \times 3 \text{ grids} = 0.75 \text{ m}^2$
	$0.15\text{m}^2 \times 2 \text{ grids} = 0.30 \text{ m}^2$
One crack	$0.15\text{m}^2 \times 16 \text{ grids} = 2.40\text{m}^2$
	$0.09\text{m}^2 \times 1 \text{ grid} = 0.09\text{m}^2$

Patch area

0% - 25%	$0\text{m}^2 \times 4 \text{ grids} = 0\text{m}^2$
25% - 75 %	$0.125\text{m}^2 \times 8 \text{ grids} = 1.00\text{m}^2$
75 % or more	$0.25\text{m}^2 \times 3 \text{ grids} = 0.75\text{m}^2$

$$\text{Crack ratio} = 5.29/26.4 \times 100 = 20.0\%$$

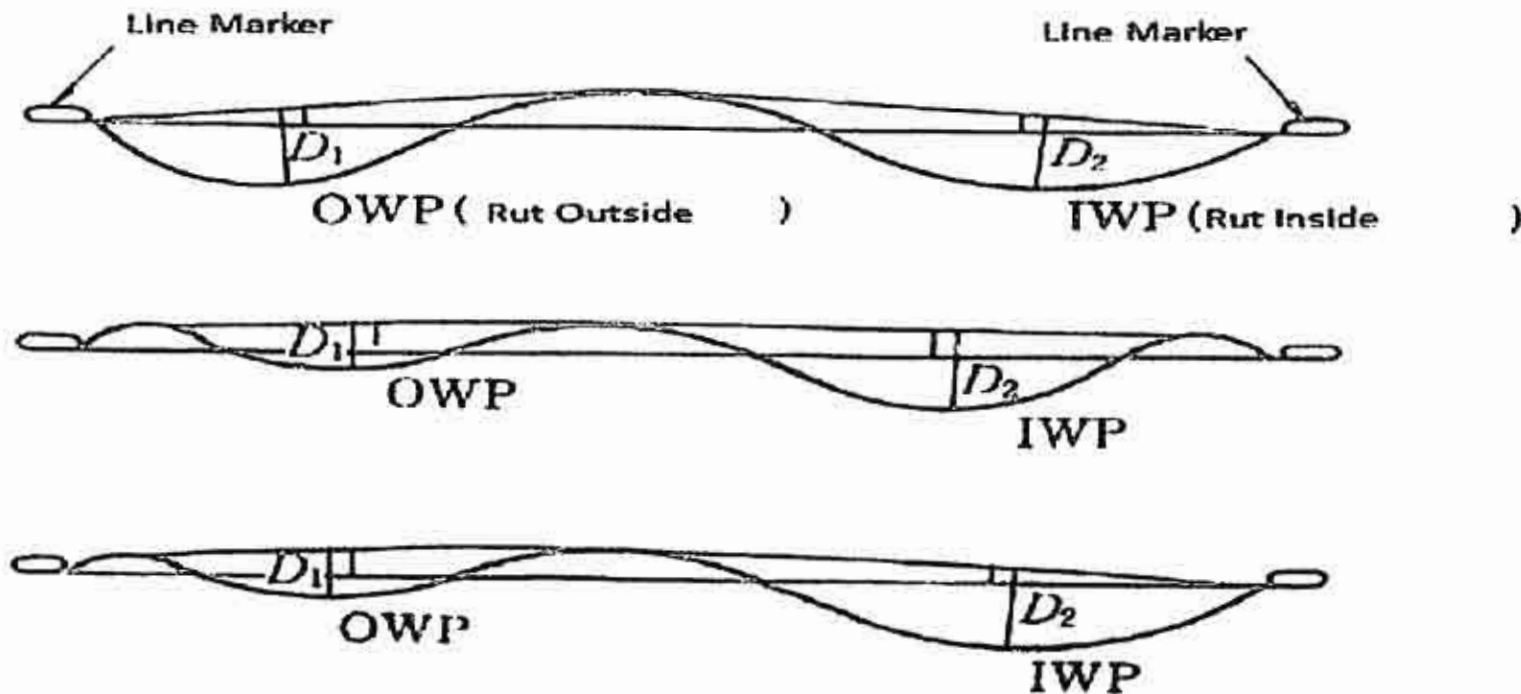
Handwritten signature

Definition of Data item

- Pavement conditions (Surface conditions)

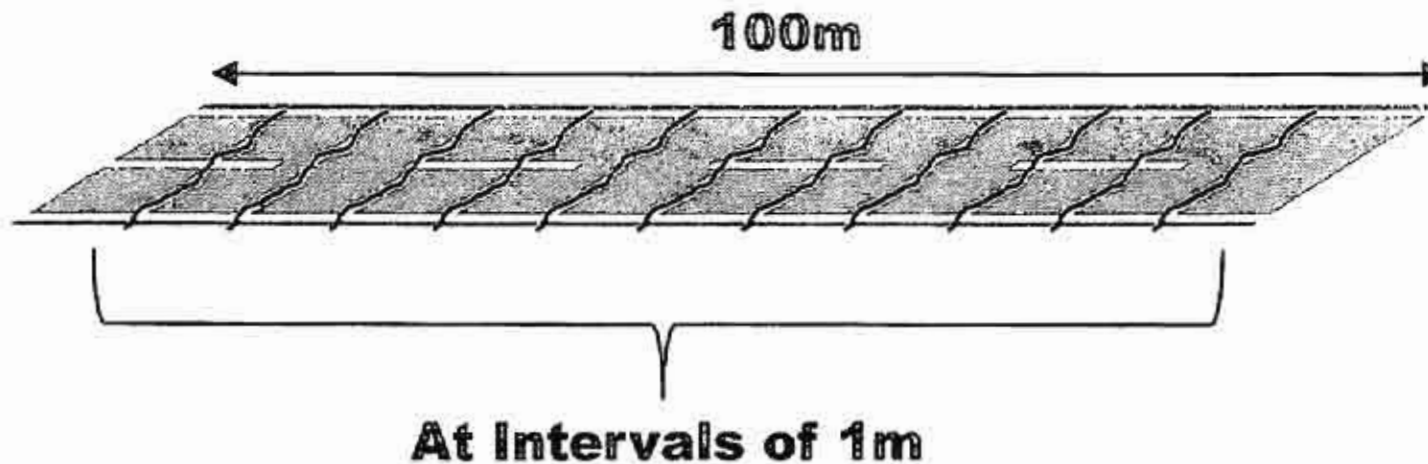
- Rutting Depth

- When the convex in the middle of the lane is higher than the convex of both the shoulder and the center side lines, the values of the rut depth will be measured as D_1 and D_2 in millimeter



Definition of Data item

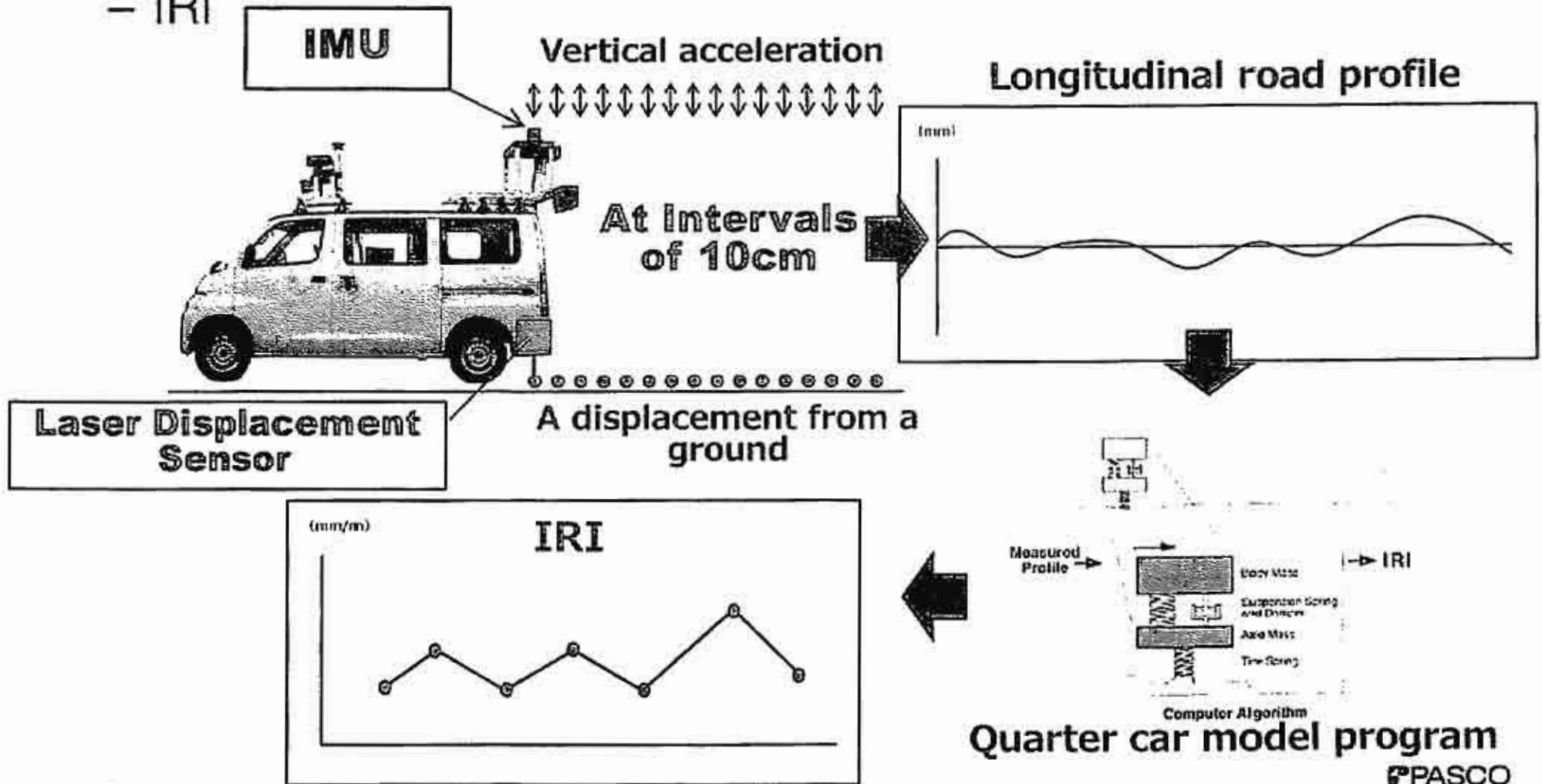
- Pavement conditions (Surface conditions)
 - Rutting Depth
 - Max Value
 - Maximum value of rutting volume within unit section
 - Average Value
 - Average value of rutting volume for all value within unit section



Definition of Data item

- Pavement conditions (Surface conditions)

- IRI



Handwritten signature

Definition of Data item

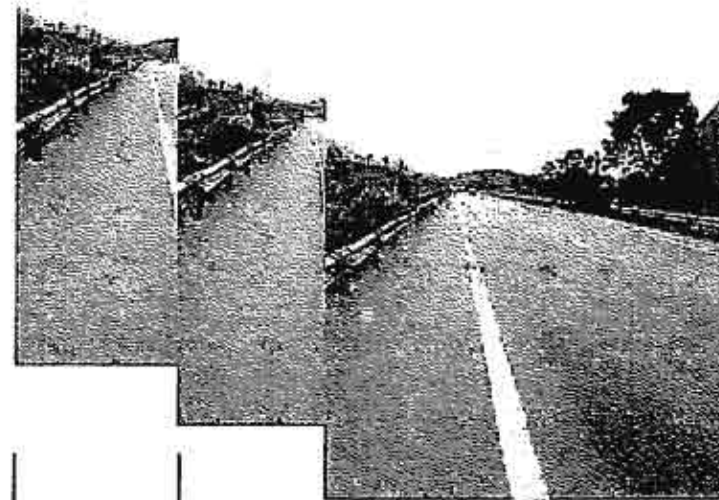
- Pavement conditions (Surface conditions)
 - IRI

Table 3 Surface Roughness Measuring Methods and IRI calculation Methods

Class	Surface Roughness Measuring Method	IRI Calculation Method
1	Rod and level survey	Measure the longitudinal profile with less than 250 mm interval by using rod and level survey. IRI is calculated by QC simulation.
2	Arbitral longitudinal profile survey devices	Measure the longitudinal profile by the arbitral longitudinal profile survey device . IRI is calculated by QC simulation.
3	RTRRMS (Response type road roughness meters)	Measure an arbitrary roughness index by RTRRMS. It changes into IRI using correlation equations.
4	Rating by surveyors' physical feeling and eye sight	IRI is obtained by surveyors' physical feeling and eye sight while in the vehicle.

Definition of Data item

- Pavement conditions (Surface conditions)
 - Road image with GPS data



5m

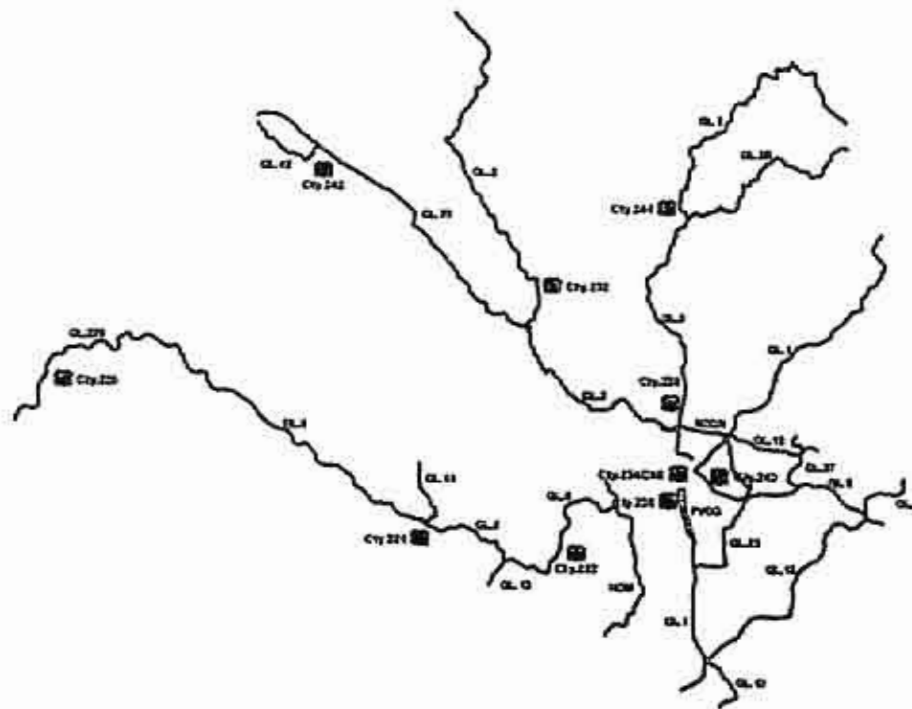
At Intervals of 5m

2. Pavement Condition Survey Routes

Confirmation of Target routes

- <http://kqldb2.gov.vn/Upload/File-2.pdf>

CÁC TUYẾN QUỐC LỘ DO KHU QUẢN LÝ



STT	Tên tuyến	Độ dài (km)	Đơn vị quản lý
1	Quốc lộ 1	2.173	Bộ GTVT
2	Quốc lộ 2	1.000	Bộ GTVT
3	Quốc lộ 3	1.000	Bộ GTVT
4	Quốc lộ 4	1.000	Bộ GTVT
5	Quốc lộ 5	1.000	Bộ GTVT
6	Quốc lộ 6	1.000	Bộ GTVT
7	Quốc lộ 7	1.000	Bộ GTVT
8	Quốc lộ 8	1.000	Bộ GTVT
9	Quốc lộ 9	1.000	Bộ GTVT
10	Quốc lộ 10	1.000	Bộ GTVT
11	Quốc lộ 11	1.000	Bộ GTVT
12	Quốc lộ 12	1.000	Bộ GTVT
13	Quốc lộ 13	1.000	Bộ GTVT
14	Quốc lộ 14	1.000	Bộ GTVT
15	Quốc lộ 15	1.000	Bộ GTVT
16	Quốc lộ 16	1.000	Bộ GTVT
17	Quốc lộ 17	1.000	Bộ GTVT
18	Quốc lộ 18	1.000	Bộ GTVT
19	Quốc lộ 19	1.000	Bộ GTVT
20	Quốc lộ 20	1.000	Bộ GTVT
21	Quốc lộ 21	1.000	Bộ GTVT
22	Quốc lộ 22	1.000	Bộ GTVT
23	Quốc lộ 23	1.000	Bộ GTVT
24	Quốc lộ 24	1.000	Bộ GTVT
25	Quốc lộ 25	1.000	Bộ GTVT
26	Quốc lộ 26	1.000	Bộ GTVT
27	Quốc lộ 27	1.000	Bộ GTVT
28	Quốc lộ 28	1.000	Bộ GTVT
29	Quốc lộ 29	1.000	Bộ GTVT
30	Quốc lộ 30	1.000	Bộ GTVT
31	Quốc lộ 31	1.000	Bộ GTVT
32	Quốc lộ 32	1.000	Bộ GTVT
33	Quốc lộ 33	1.000	Bộ GTVT
34	Quốc lộ 34	1.000	Bộ GTVT
35	Quốc lộ 35	1.000	Bộ GTVT
36	Quốc lộ 36	1.000	Bộ GTVT
37	Quốc lộ 37	1.000	Bộ GTVT
38	Quốc lộ 38	1.000	Bộ GTVT
39	Quốc lộ 39	1.000	Bộ GTVT
40	Quốc lộ 40	1.000	Bộ GTVT
41	Quốc lộ 41	1.000	Bộ GTVT
42	Quốc lộ 42	1.000	Bộ GTVT
43	Quốc lộ 43	1.000	Bộ GTVT
44	Quốc lộ 44	1.000	Bộ GTVT
45	Quốc lộ 45	1.000	Bộ GTVT
46	Quốc lộ 46	1.000	Bộ GTVT
47	Quốc lộ 47	1.000	Bộ GTVT
48	Quốc lộ 48	1.000	Bộ GTVT
49	Quốc lộ 49	1.000	Bộ GTVT
50	Quốc lộ 50	1.000	Bộ GTVT

Nguyen

3. Collaboration Work Schedule and Members

JK

Collaboration Work Schedule and Members

	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Descriptions
Field Reconnaissance											Two(2) persons 2 months From RRMU2
Pavement Condition Data Collection											One(1)person 5 months
Data Extraction and Analysis											Eight(8)persons 5 months

DANH SÁCH ĐẠI BIỂU THAM DỰ CUỘC HỌP

Hà Nội, ngày 27 tháng 3 năm 2012

- Chủ trì: Ông Nguyễn Đức Cường
 - Nội dung: Báo cáo chủ đề: Các kỹ thuật khai thác P.A.S.GD báo cáo

STT	Họ và tên	Chức vụ	Ký nhận
1	Nguyễn Đức Cường	PVT - Vụ QLST - (P.ML) - PR.M	
2	Đoàn Thị Thanh Huyền	Vụ KHCN-ME-HĐT-PRM	
3	Thần Đức Long	PVT - Vụ KHCN-ME-HĐT-PRM	
4	Ông Công Chiến	CTD-Tung Tâm Thông Tin	
5	Châu Văn Lương	PP QLST - KIM QLST	
6	Từ Minh Phương	CV P. QLST - -	
7	Phạm Khoa	PVT - Vụ KHCN-ME-HĐT-PRM	
8	Dr. Bhoj Raj Panthri	Ronchakakis expert, JECT team	
9	Mr. Yasushi Aoki	- do -	
10	Kisashi Hori		
11	Tō Vahō Kuroki	77 Ki Jyo Jyo	
12	Yoshiyoshi Ischiyama	DRSCO	
13	Kazuya Aoki	"	
14	Yutaka Kakiue	"	
15	Kazuki Sano	"	
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DANH SÁCH ĐẠI BIỂU THAM DỰ CUỘC HỌP

Hà Nội, ngày 27 tháng 3 năm 2012

- Chủ trì: Ông Nguyễn Đức Cường
 - Nội dung: Bài cáo Thủ lĩnh Kỹ Thuật Khái quát
 P.A.S.C.D. kết cấu

STT	Họ và tên	Chức vụ	Ký nhận
1	Nguyễn Thanh Tâm	CV. Vụ KCHT	2
2	Đương Văn Khương	CV. Vụ KCHT	3
3	Hoàng Việt Hải	Ban QLDA-HTKT	
4	Tô Chí Cường	CV - Vụ KHĐT	2 Cường
5	Nguyễn Chí Hải Hải	CV - Vụ KHĐT	2 Hải
6	Trần Xuân Sinh	CV - Vụ KHĐT	
7	Lưu Quang Tuấn	CV TT/TP	
8	Đinh Duy Tiên	CV-TT/STĐB	
9	Nguyễn Văn Thìn	CV - TT KT ĐB	
10	Nguyễn Vũ Hoàn	KCP - TT KT ĐB	
11	Nguyễn Đức Thọ	Tica	
12	Nguyễn Thị Bình Linh	PASCO	
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