

DIRECTORATE FOR ROADS OF VIETNAM (DRVN) MINISTRY OF TRANSPORT (MOT) THE SOCIALIST REPUBLIC OF VIETNAM



JAPAN INTERNATIONAL COOPERATION AGENCY

# THE PROJECT FOR CAPACITY ENHANCEMENT IN ROAD MAINTENANCE PHASE II

## FINAL REPORT

(Volume 2.2: System User Manual)

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## JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)

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## **VOLUME 2.2**

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- 2. USERS'S MANUAL FOR PMS DATASET FORMULATION
- 3. USERS'S MANUAL FOR PAVEMENT DETERIORATION EVALUATION MODULE
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## **USER'S MANUAL**

## WEB-BASED PMS DATA INPUTING SYSTEM



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#### **CHAPTER 1: GENERAL**

#### **I) INTRODUCTION OF SYSTEM**

Pavement Management System (hereinafter referred to as "PMS") has been developed under Activity-2: Enhancement of Planning Capacity for Road Information Management of the JICA Project on <u>Capacity Enhancement in Road Maintenance in Vietnam</u>.

PMS is a set of defined procedures for collecting, analyzing, maintaining and reporting pavement data, to assist the decision makers in finding optimum strategies for maintaining pavements in serviceable condition over a given period of time for the least cost. JICA Project Team in collaboration with DRVN has developed PMS by customizing into Vietnamese context.

PMS Data Input System is a system developed by JICA Project Team specifically for inputting PMS related data to prepare an error-free data.

#### **II) SUMMARY OF THE MAIN FUNCTIONS OF THE SYSTEM**

#### **II.1)** The system functions:

- 1. Manage and display "Scope Management" form
- 2. Add new
  - Add new the data of Road Inventory
  - Add new the data of Maintenance History
  - Add new the data of Traffic Volume

3. Manage and display three types of data on the Zoom area and the Horizontal Interactive area

- Display data on the Zoom area
- Display data for the Horizontal Interactive Area based on the gray area selected in the Zoom area
  - Edit the data of Road Inventory, Maintenance History and Traffic Volume
  - Delete the data of Road Inventory, Maintenance History and Traffic Volume
  - Copy the data of Road Inventory, Maintenance History and Traffic Volume



- Hover to display the Chainage for Road Inventory, Maintenance History and Traffic Volume
- Select lane to display data for the Integrated Data area
- Hide the data of Road Inventory, Maintenance History and Traffic Volume
- 4. Manage and display three types of data corresponding to the selected lane in the Horizontal Interactive area
  - Edit historical data Road Inventory, Maintenance History and Traffic Volume
  - Delete historical data Road Inventory, Maintenance History and Traffic Volume
- 5. Data review tool for Road Inventory, Maintenance History

#### **II.2**) Login to the system

- Purpose: Login to the system
- Operations:
  - Step 1: Access to the system at http://pms.drvn.gov.vn
  - Step 2: User selects "Login" at the top right hand corner, filling Username and Password



• Step 3: Click "Login" button to login

#### **II.3**) Language option



- User can select language: *English* or *Vietnamese*.
- Action: Click on the icon flag England or Vietnam to change language



#### **II.4)** Direction to input system (Inputting)

- The steps to enter the input system:
  - Step 1: Login success
  - Step 2: User selects "Home" at the top right hand corner
  - Step 3: User selects "Inputting System" module and selects "Inputting" screen





#### **CHAPTER 2: GUIDE FUNCTIONS**

After clicking on the "Inputting" link of the "Inputting System" module, the screen display default data of Road Management Bureau, Sub Bureau, Route Name and the first segment that the user belongs to.

#### I) DISPLAY THE DATA FOR SCOPE MANAGEMENT FORM

- Purpose: Display data, is interactive part of the Add new and display data for Zoom area, Horizontal Interactive area, and Integrated Data area.

C Home / Inputting System / Inputting		
Inputting System > Inputting		
Scope manage		- 2
Road Management Bureau	Sub Bureau	
RMB I	SB I.1	*
Route Name	Segment	
NH6: 00	Km38+0.00 - Km153+0.00: Hoa Binh - Son La	

- Sections list is shown based on user jurisdiction:
  - Level 1: Display all of RMBs and SBs
  - ▶ Level 2: Display of 1 RMB and all of SBs corresponding RMB
  - ▶ Level 3: Display of 1 RMB and 1 SB
- User selects RMB, the SBs, Route Name and Segment will change accordingly.
- If user have selected the RMB, but the user selects one other SB within the RMB, then the Route Name and Segment will change accordingly.
- If the RMB and SB has been selected, the user chooses a different Route Name, only the Segment changes accordingly.

#### II) ADD NEW

- In the "Add new" form, display 3 types of data that users want to add new: Road Inventory, Maintenance History and Traffic Volume



PMS - Pavement Management System			Millengilan (US) - moonWit MOT 🛠 🗏
Itanu Haveting Work Danning Takes and			
C Harne / Inputting System / Inputtings			
Hoputting System > nouting			
Scope manage		- 1	Add New -
Road Management Bureau	Sub Bureau		-
MMD 1	* SB(1		Road Inventory *
Route Name	Segment		Road Inventory Maintenance History
NHB; 00	<ul> <li>Km38+0,00 - Km153+0.00: Hoa Binh - Son La</li> </ul>		Traffic Volume
			Add New

#### II.1) Add new the data Road Inventory

- Purpose: Add new Road Inventory data for the selected "Scope Manage" form
- Operation:
  - Step 1: Click on "Add new" button, "Road Inventory" window appear
  - Step 2: Input the new information
  - Step 3: Click on "Submit" button to add new

RMB1			* S8 (.1				Road Inventory		*
Route Name			Segment						
NH6: 00			* Km38+0.	00 - Km153+0.00: Hoa Bi	nh - Son La		·		Contraction of the local division of the loc
									Add New
Need Text He	C Road Inventory							. e	- 2
km38+0.00	General Information							-	km153+0.00
	m Date Collection @		Terrain Type 🛛		Road Class Ø	Design Speed	0		
	2017-08-25		Flat	*	Expressway	• N/A (km/h)		-	
	Chainage and Position								
The chain	From			То					
	Km 😡	MØ		Km 🛛		Mø			
L1	Latitude (UTM, WGS 1984) 🚱	Longitude (UTM,	WGS 1984) 😡	Latitude (UTN	1, WGS 1984) Ø	Longitude (UTM	M, WGS 1984) 😰		-
• •	0	Distin		Devices		District			2
R 1	PIOVING	District		Flowinge		District	🕼 Submit 🗙 Car	icel	
R 2 Kni	ca u								Km 45+920
		V	Road Invento	ory 💽 📰 Mail	ntenance History 👿 🖻	Traffic Volume			

- Input Data for Road Inventory: Enter data road invenory
  - General Information
    - Date Collection: Click on the date collection to select Day, Month, Year
    - Terrain Type: Terrain type of road
    - Road Class: Click on the combobox of Road class to select
    - Design speed: Disable, autocalculate by Terrain Type and Road Class selected
  - Chainage and Position



- Km, M: Enter km, m of road, can be adjusted up or down by 1 unit up or down arrow in the text box.
- Latitude, Longitude: Enter latitude and longtitude of road
- Province, District, Ward: Select Province, District, Ward correspoding of road
- Length as per Chainage: Disable, autocalculate by km and m (unit: m)
- Information of Motorized Lane
  - Direction: Direction of road (Left, Right, Single)
  - Lane position number: The lane position toward selected direction
  - No lane: The number of lanes on that road
  - Lane Width: Width of road (unit: m)
- Other Information
  - Year/Month of Construction End, Year/Month of Service Open, Temperature(oC), Annual Precipitation (mm), Actual Length (m)
- Material layers in details
  - Enter data to manage material detail layer for the road.
  - For each material layer: Select Material Type, Thickness (cm), Description.
- After entering the data satisfying the conditions (wrote in the document ....), click "*Submit*" button, the data is added to the success or click "Cancel" button to close popup.

<u>Note:</u> Overlap of data Road Inventory: Consider on the same segment, direction, no lane, lane position number and overlapped chainage.

#### **II.2)** Add new the data of Maintenance History

- Purpose: Add new Maintenance History data for "Scope Manage" selected
- Operation:
  - Step 1: Click on "Add new" button, "Maintenance History" window appear
  - Step 2: Input the new information
  - Step 3: Click on "Submit" button to add new



oad Managemen	nt Bureau		Sub Bureau					
RMB (			SB 1.1		*		Maintenance History	Y
oute Name			Segment					
NH6: 00			Km38+0.0	00 - Km153+0.00: Hoa Binh - Son La		7		Parameter
	C Maintenance History							Add New
d Text Here	Consert Information							
38+0.00	General mornation		1			States in Long		km153+0.00
<b>E</b> .	Date Collection O		Completion dat	e <b>0</b>	Repair	Duration (month) 🛛		- A
	2017-08-25							_
-	Chainage and Position							
1.1	From			То				
e chainag	Km 🖸	MØ		Km 😡		M 😡		
L2	Latitude (UTM, WGS 1984) 😡	Longitude (UTM,	WGS 1984) 😡	Latitude (UTM, WGS	1984) 🖸	Longitude (UTM, W	GS 1984) Ø	
2 2 2	Province	District		Province		District		-
R1							C Submit X Cance	el 🔲
R2 Km 38	+0							Km 45+920

- Input data for Maintenance History: Enter data maintenance history
  - General Information
    - Date Collection: Click on the Date collection to select date, month, year
    - Completion date: Click on the Completion date to select date, month, year
    - Repair Duration (month): repair duration of road (unit: month)
  - Chainage and Position
    - Km, M: Enter km, m of road, can be adjusted up or down by 1 unit up or down arrow in the text box.
    - Latitude, Longitude: Enter latitude and longitude of road
    - Province, District, Ward: Select Province, District, Ward correspoding of road
    - Length as per Chainage: Disable, autocalculate by km and m (unit: m)
  - Information of Repair Section
    - Direction: Direction of road (Left, Right, Single)
    - Lane position number: The lane position toward selected direction
    - Actual Length: The actual length of the repair road
    - Total width of repair lane: The width of the repair road
  - Maintenance History Position
    - Maintenance History Position: Helps user indentify Maintenance History Position (Left or Right)



- Distance (m): The distance from the heart repair lane to the heart repairing lane.
- Repair Method Information
  - Enter Repair Method, Repair Classification, Repair Structtype and Remarks
- Material Detail
  - Import data to manage material layer detail for the road
  - For each material class: Choose the type of material, thickness (cm)
  - Reapair Category: Select repair category corresponding Surface
- After entering the data satisfying the conditions (wrote in the document ....), click
   "Submit" button, the data is added to the success or click "Cancel" button to close popup.

**<u>Note:</u>** Overlap of data Maintenance History: Consider on the same segment, the same direction, Lane position number and have repair duration, chainage of overlap.

#### II.3) Add new the data of Traffic Volume

- Purpose: Add new Traffic Volume data based on the Scope Management selected
- Operation:
  - Step 1: Click on "Add new" button, "Traffic Volume" window appear
  - Step 2: Input the new information
  - Step 3: Click on "Submit" button to add new

ad Managemen	nt Bureau			Sub Bureau						
RMBI			Υ.	5B (.1			7	Traffic \	/olume	
ute Name				Segment						
NH6: 00			Ŧ	Km38+0.00 - Km1	153+0.00: Hoa Binh - Son La		*			-
	🕼 Traffic Volume									Add
ed Text Here	Information Traffic									- km152+0
3810.00	🛗 Date Collection 🔞		Nam	e en Ø		Name vi 😡				Kin (35).0
R.	2017/08									
-	Km Station Ø				Latitude (UTM, WGS 1984) C					-
	M Station <b>O</b>				Longitude (UTM, WGS 1984)	0				
e chaina	Province		Distri	ict		Ward				
	Choose one item	~	Ch	oose one item	~	Choose one item			~	
12	Remark @									- mailes
L1										
0 								-		·
RI								C Submit	× Cancel	
22									_	



- Input data for Traffic Volume: Enter data traffic volume
  - Information Traffic
    - Date Collection: Click on the date collection to select date, month, year
    - Name en, Name vi: Enter Name en and Name vi of traffic volume
    - Km, M: Enter km, m of traffic volme
    - Latitude, Longitude: Enter latitude and longitude of traffic volume
    - Province, District, Ward: Select Province, District, Ward of traffic volume
    - Remarks: Enter data of traffic volume
  - ➢ Traffic Data
    - Enter the number on up, down của Car, Jeep, Light Truck, Medium Truck (2 Axles), Heavy Truck (3 Axles), Heavy Truck (>3 Axles), Small Bus, Large Bus, Tractor, Motobike including 3 Wheeler, Bicycle/Pedicab. Can be adjusted up or down by 1 unit up or down arrow in the text box.
- After entering the data satisfying the conditions (wrote in the document ....), click
   "Submit" button, the data is added to the success or click "Cancel" button to close popup.

<u>Note:</u> Overlap of data Traffic Volume: Consider on the same segment and have chainage of overlap

#### III) ZOOM AREA

- Purpose: Display the components in a segment, the user can drag, miniature-drag long the gray area and it's the display path in the extended interactive area (Horizontal Interactive Area)
- User interface, display data in the Zoom area and Gray area





- ✓ Display km, m of the chainage start location and the chainage finish location based on the segment selected.
- ✓ Gray area:
  - Always display the default gray area when the user changes the data in the Management Scope block.
  - User can drag, drag long miniature and this is the display path in the Horizontal Interactive Area

<u>Note:</u> When the user changes the gray area the chainage for the cross section changes accordingly.

 Display the data of Road Inventory, Maintenance History, Traffic Volume based on the segment selected.

#### IV) HORIZONTAL INTERACTIVE AREA

#### IV.1) Interface, Data was displayed based on gray area is selected

- Purpose: The area display data based on gray area is selected. If the gray area is moved, the horizontal interactive area will also change the data accordingly.



- Data infomation
  - The chainage for the cross section: Show the start position and end position of chainage based on gray area is selected. This chainage will also change with the gray area change.
  - ▶ L1, L2: Helps users identify Direction (Left) and Lane Position Number (1, 2, 3...)
  - R1, R2: Helps users identify Direction (Right) and Lane Position Number (1, 2, 3...)
  - ➢ 0: Display the position of Single lane



- Road Inventory:
  - Note the color of Road Inventory on horizontal interactive area (Blue)
  - Road Inventory display based on Chainage, Direction, Lane Position Number and Lane Width
  - Select/Unselect for Show/Hidden Road Inventory data
- ➢ Maintenance History:
  - Note the color of Maintenance History on honrizontal interactive area (Red)
  - Maintenance History display based on Chainage, Direction, Lane Position Number, Repair Width, Maintenance History Position, Distance
  - Select/Unselect for Show/Hidden Maintenance History
- ➤ Traffic Volume:
  - Note the icon of Traffic Volume on horizontal interactive area (Green flag)
  - Select/Unselect for Show/Hidden Traffic Volume

#### IV.2) Edit the data of Road Inventory, Maintenance History, Traffic Volume

- Purpose: Helps users to easily edit data types with simple steps

#### IV.2.1) Edit data of Road Inventory (RI)

- Steps:
- ✓ Step 1: Click on the road to change the data

ne chainage for the cross section:	к	m49+859 - Km58+843	
··	m 50+0 - Km 58+844	Click on the road	
• 			
			Km 58+843
Km 49+859			

- ✓ Step 2: "Road Inventory" window appear, input the data you want to change
- ✓ Step 3: Click on "Edit" button to save change information



8+0.00	Road Inventory		Input	the data				9	km153+0.0
	General Information			Ĩ				Ť	
-	🛗 Date Collection 😡	Terr	ain Type 😡		Road Class Ø		Design Speed 🛛		-
	2017-06-06	F	lat	۲	Expressway	*	N/A (km/h)		
hainag	Chainage and Position								
1	From			То					
	Km 🕑	MØ		Km 🕑			Mø		
	50	0		60			0		
Km 49	Latitude (UTM, WGS 1984) O	Longitude (UTM, V	/GS 1984) 🛛	Latitude (UT	M, WGS 1984) 🕑		Longitude (UTM, V 984) @		58+843
	Province	District		Province			District	•	
rated Data							∎ Delete 🕼 Edit 🗙 Ca	ncel	V Traffic Volur

⇒Data that is successfully edit displays the message "Success"

he chainage for the cross section:	Km49+769 - Km58+753	Success

#### IV.2.2) Edit the data of Maintenance History (MH)

- Steps:
- $\checkmark$  Step 1: Click on the road to change the data

The chainage for the cross section:	Km49+769 - Km58+753
a la	
•	Km 53+0-Km 54+0 Click on the road
R1	
Km 49+769	Km 58+753

- ✓ Step 2: "Maintenance History" window appears, input the data you want to change
- ✓ Step 3: Click on "Edit" button to save change information



eed Text Here	Maintananca Liston		Input	the data		<i>c</i> .	-
n38+0.00	Le maintenance History		<u> </u>	0			km153+0.
E	General Information			Ĭ		Î	
L	🛗 Date Collection 📀		Completion date Ø	Y	Repair Duration (month) Ø		
_	2017-08-18		2017-08-01		2		
	Chainage and Position			շիդ			
ne chainag	From			то			
	Km 🕑	MØ		Km Ø	MO		
1	53	0		54	0		
н — — — — — — — — — — — — — — — — — — —	Latitude (UTM, WGS 1984) @	Longitude (U	JTM, WGS 1984) 🛛	Latitude (UTM, WGS 1984	4) O Longitude (UTM, W 38	34) <b>O</b>	
Km 49	Province	District		Province	District		ı 58+753
_					😭 Delete	× Cancel	
grated Data					© Road Inventory	itenance History	V Traffic Vol

#### ⇒Data that is successfully edit displays the message "Success"

he chainage for the cross section:	Km49+769 - Km58+753	V Success
u [		
A1		
Km 49+769		Km 58+753
	Road Inventory Maintenance History Tr	affic Volume

#### IV.2.3) Edit the data of Traffic Volume (TV)

- Steps:
- ✓ Step 1: Click on the icon of Traffic Volume to change the data

The chainage for the cross section:	Ki	m49+769 - Km68+906		
			Click on Traffic Volume	0 Rm 67+0
• • • • • •				
Km 49+769				Km 68+906
	Road Inventory	Maintenance History	🗹 🍍 Traffic Volume	

- ✓ Step 2: "Traffic Volume" window appear, input the data you want to change
- ✓ Step 3: Click on "Edit" button to save change information



Need Text Here			(-					
km38+0.00	Traffic Volume		Input	2			9	km153+0.00
<b>F</b>	Information Traffic			T				
-	🛗 Date Collection 😡		Name en 😡			Name vi 😡		
	2017/08		Traffic Volume			Tram dem		
	Km Station @			Latitude (UTM, WGS 1	984)	0		
The chainag	67							
The chamog	M Station @			Longitude (UTM, WGS	198	4) 😡		
havengestin	Ø							
	Province		District			Ward		
ð	Choose one item	*	Choose one item	~		Choose one item	*	
R 1	Remark O					(	8)	
Km 49							I	68+906
							¥-	-
						a Delete	Edit × Cancel	
Integrated Data							3	9 Traffic Volume

#### ⇒Data that is successfully edit displays message "Success"

The chainage for the cross section:	Km49+769 - Km68+906	V Success
Km 49+769		Km 68+906
]	Road Inventory Maintenance History	Traffic Volume

#### IV.3) Delete Road Inventory, Maintenance History, Traffic Volume

- Purpose: Helps users to easily delete data with simple steps

#### **IV.3.1)** Delete Road Inventory (RI)

- Steps:
- ✓ Step 1: Click on the road

The chainage for the cross section:	Km49+769 - Km68+906
L1 0 	Km 50+0 - Km 60+0
R1 Km 49+769	Km 68+906

- ✓ Step 2: "Road Inventory" window appears, click on "Delete" button
- ✓ Step 3: Click on "OK" button of popup



The chainage	for the cross section:		bjt.pms.ssgall.com says: kre you sure?		OK Cancel		
0 R 1 Km 49	General Information     Date Collection      2017-06-06		Terrain Type 😡 Mountainous		Road Class <b>O</b> Expresswáy	Design Speed 😡 N/A (km/h)	. €8+906
	<ul> <li>Chainage and Position</li> <li>From</li> </ul>			То			
Integrated Data	Km 🕑 50 Latitude (UTM, WGS 1984) 🕑	M 🕑 0 Longitude (	UTM, WGS 1984) Ø	Km 😡 60 Latitude (UT	M, WGS 1984) <b>O</b>	M @ 0 Longitude (UTM, WGS 1984) @	Viraffic Volume
	Province	District		Province		District.	incel

⇒Data that is successfully delete displays the message "Success"

 F
Km 68+906

#### IV.3.2) Delete Maintenance History (MH)

- Steps:
- $\checkmark$  Step 1: Click on the road

he chainage for the cross section:	Km49+769 - Km68+906	
u1		
•	Km 55+0 - Km 56+0	
Rt Km 49+769		Km 68+906
	Road Inventory Maintenance History Traff	fic Volume

- ✓ Step 2: "Maintenance History" window appears, click on "Delete" button
- ✓ Step 3: Click on "OK" button of popup



Need Text Here		ojt.pms.ssgall.com say	s:	×	
km38+0.00	G Maintenance History	Are you sure?	ОК	Cancel	km153+0.00
	<ul> <li>General Information</li> </ul>				
	🛗 Date Collection 🛛	🛗 Completion date 6	0	Repair Duration (month) Ø	
	2017-08-23	2017-04-30		2	
The chainag	Chainage and Position				
-L1	From		То		
	Km 🛛	M©	Km 😡	MØ	
	55	0	56	0	
R1 Km 49	Latitude (UTM, WGS 1984) @	Longitude (UTM, WGS 1984) Ø	Latitude (UTM, WGS 19	184) O Longitude (UTM, WGS 1984) O	68+906
	Province	District	Province	District	-
Integrated Data				🖀 Delete 🖉 Edit 🗙	Cancel 9 Traffic Volume

⇒Data that is successfully delete displays the message "Success"

The chainage for the cross section:	Km49+769 - Km68+906	Success
	· · · · · · · · · · · · · · · · · · ·	
Km 49+769		Km 68+906
V	Road Inventory	c Volume

#### IV.3.3) Delete Traffic Volume (TV)

• Steps:

✓ Step 1: Click on the icon of Traffic Volume

The chainage for the cross section:	Km49+7	69 - Km68+906	
L1		Click on Traffic Volume	
R1 Km 49+769		<b>1</b> Km 68	+906
	Road Inventory	Maintenance History 😿 🖺 Traffic Volume	

- ✓ Step 2: "Traffic Volume" window appears, click on "Delete" button
- ✓ Step 3: Click on "OK" button of popup



The chaina	e for the crocs cortion. Traffic Volume	ojt.pms.ssgall.com say Are you sure?	s:	x		
	Information Traffic					
0	Date Collection 😡	Name en 😡		Name vi 🖸		
R1	2017/08	sdfsfsd		dfsfss		
Km	Km Station Ø		Latitude (UTM, WGS 1984	0		Gm 68+906
	67					
	M Station @		Longitude (UTM, WGS 198	64) <b>O</b>		
Integrated Dat	Ú					Q Traffic Volume
	Province	District		Ward		
	Choose one item	∽ Choose one item	~	Choose one item	*	
	Remark 😡			0		
				Į.		
				1 Delete	Edit X Cancel	

#### ⇒Data that is successfully delete displays message "Success"

The chainage for the cross section:	Km49+769 - Km68+906	Success
н.	k	f - I
R 1 Km 49+769	ana ang ang ang ang ang ang ang ang ang	Km 68+906
	Road Inventory	Traffic Volume

#### IV.4) Copy the data of Road Inventory, Maintenance History, Traffic Volume

- Purpose: Copy data helps users save time, when entering the same data

#### IV.4.1) Copy data of Road Inventory (RI)

- Steps:
- ✓ Step 1: Right-click on the section, select "Copy"

The chainage for the cross section:	Km49+769 - Km68+906
L1 0 	Km 65+0- Km 68+906
	Road Inventory Maintenance History Traffic Volume

- ✓ Step 2: "Road Inventory" window appears, input the data
- ✓ Step 3: Click on "Submit" button to save information



8+0,00	C Road Inventory	Chang	ge the data to suitab purpose	le for		km153+0.0
6	General Information		0	-		-
	Date Collection	Terrain Type	• V	Road Class 🕢	Design Speed Ø	
	2013-09-07	Flat		Class III 🔹	80 (km/h)	
chainag	Chainage and Position					
	From		То			
	Km 😡	Mø	Km 😡		Mo	
	65	Û.	70		0	
	Latitude (UTM, WGS 1984) 🕑	Longitude (UTM, WGS 198	4) O Latitude (U	JTM, WGS 1984) 🛛	Longitude (UTM, WGS 1984) O	591006
Kill 42	Province	District	Province		District	*
trated Data			Tornee		Book X Submit × C	ancel

#### ⇒Data that is successfully create display the message "Success"

e chainage for the cross section:	Km49+769 - Km68+906	Success
		++++++++++++++++++++++++++++++++++
Km 49+769		Km 68+906

#### IV.4.2) Copy the data of Maintenance History (MH)

- Steps:
- ✓ Step 1: Right-click on the section, select "Copy"

The chainage for the cross section:	Km49+769 - Km68+906	
L1 0 R1 Km 50+0 - Km 51+0 Copy R1 Km 40+760		
	Road inventory Maintenance History	Traffic Volume

- ✓ Step 2: "Maintenance History" window appears, input the data
- ✓ Step 3: Click "Submit" button to save information



eed Text Here m38+0.00	C Maintenance History		Change the data to suitable for purpose	)		kr	m153+0.00
E	General Information		I			-	
	🛗 Date Collection 😡	🛗 Com	pletion date Ø	Repair D	Juration (month) 😡		
-	2017-08-18	2017-	04-25	3			
aa chainag	Chainage and Position						ł
ne chainag	From		То			1	
E1	Km 🖸	MØ	Km 😡		Mø		
u	50	0	51		0		
R1	Latitude (UTM, WGS 1984) O	Longitude (UTM, WGS	1984) 🛛 Latitude (U	TM, WGS 1984) 🛛	Longitude (UTM, WGS 1984) 🕑		
Km 49	Province	District	Province		District	• 68+4	906
					3 Cr Submit × Cr	ancel	
ntegrated Data					Noad Inventory	Trationy V Tra	affic Volume

#### ⇒Data that is successfully create displays the message "Success"

The chainage for the cross section:	Km49+769 - Km68+906	Success
n I		r (f
R1 Km 49+769		Km 68+906
	Road Inventory Maintenance History	Traffic Volume

#### IV.4.3) Copy the data of Traffic Volume (TV)

• Steps:

✓ Step 1: Right-click on the icon of Traffic Volume, select "Copy"

The chainage for the cross section:		Km49+769 - Km68+906		
u		0	Сору	
•				×
R t Km 49+769				Km 68+906
	Road Inventory	Maintenance History 🖌 🖷	Traffic Volume	

✓ Step 2: "Traffic Volume" window appears, input the data

✓ Step 3: Click on "Submit" button to save information



		:8+0.00	Traffic Volume Information Traffic		Change f	he data to suitable or purpose	)			km153+
2017/07     efsd     ssdsdsd       Km Station O     Latitude (UTM, WGS 1984) O       60     Longitude (UTM, WGS 1984) O       0     Longitude (UTM, WGS 1984) O	2017/07 efsd   e chain Km Station •   60 Latitude (UTM, WGS 1984) •   60 Longitude (UTM, WGS 1984) •   0 District   Province District   Vard   Choose one item	-	Date Collection	Na	ame en O	1		Name vi 😡		-
Km Station •     Latitude (UTM, WGS 1984) •       60     Longitude (UTM, WGS 1984) •       M Station •     Longitude (UTM, WGS 1984) •       0     Image: Comparison of the state of the	Km Station O Latitude (UTM, WGS 1984) O   60 Longitude (UTM, WGS 1984) O   M Station O Longitude (UTM, WGS 1984) O   0 District   Province District   Choose one item Choose one item		2017/07		efsd			ssdsdsd		
Chain     60       M Station O     Longitude (UTM, WGS 1984) O       0     Province	60     Longitude (UTM, WGS 1984) •       M Station •     Longitude (UTM, WGS 1984) •       0     Province       Province     District       Vard       Choose one item     Choose one item		Km Station O			Latitude (UTM, WG	S 1984)	Ø		
M Station  Longitude (UTM, WGS 1984)	M Station	chain	60							
0 District Ward	0     Province     District     Ward       Choose one item     Choose one item     Choose one item		M Station Ø			Longitude (UTM, W	GS 198	4) 😡		
Province District Ward	Province     District     Ward       Choose one item     Choose one item     Choose one item		0							
Porto Porto	Choose one item v Choose one item v		Province	Di	strict			Ward		
Choose one item v Choose one item v			Choose one item	* (	Choose one item		4	Choose one item	*	
Km Remark O	Km Remark ●	Km	Remark Ø							Km 68+906
										n=1.40.1

⇒Data that is successfully create displays the message "Success"

he chainage for the cross section:	Km49+769 - Km68+906	Success
u I		f
R1		
Km 49+769		Km 68+906
v	Road Inventory Maintenance History Traffic	Volume

#### IV.5) Hover to show chainage of Road Inventory, Maintenance History, Traffic Volume

- Purpose: Helps users to easily view chainage of Road Inventory, Maintenance History or Traffic Volume. By hovering your mouse over the area you want to show the chainage.
- Steps:
  - Show chainage of Road Inventory (RI)

The chainage for the cross section:	Km49+859 - Km58+843
	Km 50+0 - Km 57+0
Rt	
Km 497839	Road Inventory 🔽 Maintenance History 🔽 🖡 Traffic Volume

Show chainage of Maintenance History (MH)



The chainage for the cross section:	Km49+859 - Km58+843	
		h <del></del> .
	Km 52+3 - Km 54+4	
Km 49+859		Km 58+843
	Road Inventory 🖌 Maintenance History 🖌 🔭 Traffic Volume	

#### Show chainage of Traffic Volume (TV)

he chainage for the cross section:	Km49+949 - Km63+156
	Km 50+0
•	
Km 49+949	Km 63+156
	Road Inventory Maintenance History 🗹 🏲 Traffic Volume

#### **IV.6)** Select the lane to display Integrated Data

- Purpose: Helping users to easily view data types (Road Inventory, Maintenance History, Traffic Volume) base on lane selected.

Note: Only one lane can be selected at a time.

The chainage for the cross section:	Km49+949 - Km63+156
• • • • • • • • • • • • • • • • • • • •	
Km 49+949	Km 63+156 Road Inventory 🕑 Maintenance History 🕑 Traffic Volume
Integrated Data	Road Inventory     DMaintenance History     Traffic Volume
Km 49+949	Km 63+156
Latest	•
2017	

- Steps: Click on one lane to display information, corresponding data of that lane will be displayed at the Integrated Data block.
   Integrated Data block:
  - Vertical axis: Show the timeline of the data (History data)
  - Horizontal axis: Display chainage of the chainage for the cross section



- Road Inventory: Display Integrated Data of Road Inventory of selected lane.
- Maintenance History: Display Integrated Data of Maintenance History of selected lane.
- Traffic Volume: Display Integrated Data of Traffic Volume with all selected lanes (Traffic Volume has no regulations on Direction and Lane Position Number)

#### IV.7) Hidden/Show data of Road Inventory, Maintenance History, Traffic Volume

- Purpose: It helps users to easily distinguish the data they are interested in.
- Steps:

The chainage for the cross section:	Km49+949 - Km63+156
L1 0 R1 Km 49+949	Km 63+156
	Road inventory Maintenance History 🗹 🏲 Traffic Volume

Road Inventory: Select/Unselect to Show/Hidden Road Inventory on Hirozontal Interactive area and Integrated Data block.

he chainage for the cross section:	Km38+0 - Km51+835
az Km 38+0	Km 51+835
	Road Inventory Maintenance History Traffic Volume

Maintenance History: Select/Unselect to Show/Hidden Maintenance History on Hirozontal Interactive area and Integrated Data block.



The chainage for the cross section:
Km49+949 - Km63+785

Image: Section:
Km63+785

Image: Section:
Image: Section:

Traffic Volume: Select/Unselect to Show/Hidden Traffic Volume on Hirozontal Interactive area and Integrated Data block.

The chainage for the cross section:	Km49+949 - Km63+335
Km 49+949	Km 63+335
	Road Inventory Maintenance History

#### V) INTEGRATED DATA

#### V.1) Interface, display data

- Purpose: Display data according to timeline of three types of data: Road Inventory, Maintenance History and Traffic Volume based on the selected lane in the Horizontal Interactive Area.
- Data information
  - Road Inventory

			NOU-	u niven	tory	1		antena	nce history	N C 16	affic Volume		
grated Data											O Road Inventory	D Maintenance History	🖗 Traffic Volur
Km 38+0													Km 153+0
		1		1	Ш	1							
atest		1	11	11		i.	1	1	-				1
2013	. Es					1				_			



- Chainage: Display the chainage start location and the chainage finish location based on the chainage for the cross section (gray area) of the selected lane.
- Latest: Road Inventory data at the current time based on the lane selected.
- Year (2017, 2016....): Display all of the road segments in the corresponding time series based on the selected lane in the Horizontal Interactive Area.

	Road Inventory	Maintenance History	Traffic Volume	Server Street Start	
			Tell- manie volume		
tegrated Data			Road Inventory	ා Maintenance History	Traffic Volu
Km 38+0				K	Sm 153+0
ЦЦ					
atest					
2017					
2017 <b>1</b>					
2017					
2017 H H					
2017					
2017 2016					

- Chainage: Display the chainage start location and the chainage finish location based on the chainage for the cross section (gray area) of the selected lane.
- Latest: Maintenance History data at the current time based on the lane selected.
- Year (2017, 2016....): Display all of the road segments in the corresponding time series based on the selected lane in the Horizontal Interactive Area.
- Traffic Volume

➢ Maintenance History



		Road Inventory	Maintenance Histo	ry 🕑 🗂 Traffic Volume		
grated Data				Road Inventory	ා Maintenance History	♀ Traffic Volur
Km 38+0						Km 153+0
itest	Ē		E.E.			
017	Ē	Ē	E E			
011		F				

- Chainage: Display the chainage start location and the chainage finish location based on the chainage for the cross section (gray area) of the selected lane.
- Latest: Traffic Volume data at the current time based on the lane selected.
- Year (2017, 2016....): Display all of the road in the corresponding time series based on the selected lane in the Horizontal Interactive Area.

#### V.2) Edit history data of Road Inventory

- Steps:
  - Step 1: In the "Integrated Data" block, select "Road Inventory" tab.

$\leftarrow$ $\rightarrow$ O $\mid$ ojt.pms.ssgall.com/inputting		□ ☆   :	
L2			
	بالاستعاد بالأستاذ ووعاد فتابو ويابع وعاده		
Rt			~
R 2 Km 38+0			Km 153+0
	Road Inventory		
Integrated Data	1. Select the Road O Road Inventory	D Maintenance Histor	y 🛛 🖗 Traffic Volume
	Inventory fab		Vm 152+0
Latest			
2013			



Step 2: Click on the Road Inventory that you want to edit.

	Koad invent	ory 🕑 🗖	Maintenance histor	y P Trattic Volume		
grated Data				Road Inventory	S Maintenance History	♀ Traffic Volur
Km 38+0						Km 153+0
atest						
2013				A '		
				វ		
			1. Click	on the road segment		
			that y	ou want to delete		

Note: Can not edit the data of "Latest", only edit the road data with time series.

• Step 3: "Road Inventory - Survey" window appear, enter the data you want to edit.

RS	Traffic volume - Survey				
Km 38+	Information Traffic				u 46+582
	Date Collection	Name en Ø		Name vi 🚱	
	2017/08	c1		fa	
tegrated Data	Km Station @		Latitude (UTM, WGS 1984) @		9 Traffic Volum
	40				
Km 31	M Station @		Longitude (UTM, WGS 1984)	0	m 46+582
	0				
Latest	Province	District		Ward	0+1111+2-
2017	~		~	*	
	Remark Ø				
					10

• Step 4: Click the "Edit" button to complete the edit Road Inventory.



	Road Inventory - Survey						*
grated Data	General Information						@ Traffic Vol
	Date Collection @		Terrain Type 😡		Road Class O	Design Speed @	
Kr	m 2013-09-08		Mountainous	~	Class III 🛛 🗸	60 (km/h)	Km 153+0
2013	Chainage and Position     From			То			
1	Km 😡	MO		Km 😡		<ol> <li>Click the MO</li> </ol>	e "Edit" button
	105	0		121		0	
	Latitude (UTM, WGS 1984) 🚱	Longitude (l	JTM, WGS 1984) 😡	Latitude (UTI	M, WGS 1984) 😡	Longitude (UTM, WGS 1984) @	
	Province	District		Province		District	-

#### V.3) Edit history data of Maintenance History

- Steps:
  - Step 1: In the "Integrated Data" block, select "Maintenance History" tab.

→ O   ojt.pms.ssgall.com/input	ng	□□ ☆   = L છ Km153+0
	Road Inventory Maintenance	History 🗹 🏾 Traffic Volume
itegrated Data		Road Inventory     Maintenance History     PTraffic Volume
Km 38+0		Km 153+0
Latest		1. Select the Maintenance
2017		History tab
2010		

• Step 2: Click on the Maintenance History that you want to edit.



	Koad inventory	] β. i raπic volume		
grated Data		Road Inventory	ා Maintenance History	9 Traffic Volum
Km 38+0			4	Km 153+0
taat				
2017				
2016				
1				
2. Click on the maintenance				
<ol> <li>Click on the maintenance history that you want to edit</li> </ol>				

Note: Can not edit the data of "Latest", only edit the road segment data with time series.

• Step 3: "Maintenance History - Survey" window appear, enter the data you want to edit.

	Maintenance History - Sur	VAV					
	La Maintenance mistory Sur	v=y					
grated Data	<ul> <li>General Information</li> </ul>						P Traffic V
Km 31	Date Collection		Completion date		Rep	pair Duration (month) 😡	m 46+582
-	2012-08-18		2017-08-07		1	t	-
est en est							
17	<ul> <li>Chainage and Position</li> </ul>						
	From			То			
012							
	38	0		40		0	
1	atitude (UTM_WGS 1984) @	Longitude	UTM WGS 1984) @	Latitude (LITM_WGS 1	984) @	Longitude (LITM, WCS 1984)	1
		Longhada					1
	Province	District		Province		District	
							21

• Step 4: Click on "Edit" to complete the edit Maintenance History.



	C Maintenance History - Sur	vey						
tegrated Data	General Information							P Traffic Volu
A Km 3	Date Collection		Completion date @		Rep	air Duration (month) 😡		m 153+0
	2016-08-01		2017-05-29		2			
2017	Chainage and Position     From			То			4. Click "Edit" to	
2016	Km®	MØ		Km		ме	complete	
	52	3		54		4		
1	Latitude (UTM, WGS 1984) 🚱	Longitude	(UTM, WGS 1984) 🚱	Latitude (UTM, WGS	S 1984) 😡	Longitude (	UTM, WGS 1984) @	
	Province	District		Province		District	X	

#### V.4) Edit history data of Traffic Volume

- Steps:
  - Step 1: In the "Integrated Data" block, select "Traffic Volume" tab.

		Road Inventory	Maintenance History	Traffic Values		
	v	Road inventory	Maintenance History	I rame volume		
grated Data				Road Inventory	S Maintenance History	9 Traffic Volum
Km 38+0					Į.	m 153+0
est	c RFC		E. E.		L	
017	5		.E.F		<ol> <li>Select the Maintenau History tab</li> </ol>	nce
)11						

• Step 2: Click on the Traffic Volume that you want to edit.



Note: Can not edit the data of "Latest", only edit the Traffic Volume data with time series.

• Step 3: "Traffic Volume- Survey" window appear, enter the data you want to edit.

Rm 35+     Information Traffic       Image: State Collection @     Name en @		n 46+582	
Km 38+     O Information Traffic     Date Collection	Newsyl	u 46+582.1	
Date Collection      Name en	Name of O		
and and a second s	Name vi G		
2017/08 C1	c1		
egrated Data Km Station @	Latitude (UTM, WGS 1984) @	9 Traffic Volum	
40			
Km 31 M Station Ø	Longitude (UTM, WGS 1984) Ø		
0			
Province District	Ward	0.000	
2017	*	•	
Remark @			
		10	
	i Delete	Certedit X Cancel	

• Step 4: Click on "Edit" button to complete the edit Traffic Volume.



	C Traffic volume - Survey				
tegrated Data	Information Traffic				9 Traffic Volur
<b>♦</b> Km 31	Date Collection	Name en @		Name vi 🚱	m 153+0
	2011/02	trafficvolume		trạm đểm	>
atest	Km Station @		Latitude (UTM, WGS 1984)	9	
	72				
2017	M Station Ø		Longitude (UTM, WGS 1984	0	
2011	0				
	Province	District		Ward	
		· •	×.	4. Click "Edit" to ~	
	Remark Ø			complete	
				44	
				X	14 A

#### V.5) Delete history data of Road Inventory

- Steps:
  - Step 1: In the "Integrated Data" block, select "Road Inventory" tab.

$\leftrightarrow$ $\rightarrow$ O $\mid$ ojt.pms.ssgall.com/inputting	□ ☆	=	RE	2.
14 11		1		
R2  Km 38+0		Km 1	153+0	
Road Inventory 🖉 🖬 Maintenance History 🗹 🎙 Traffic Volume				
Integrated Data  1. Select the Road Inventory tab	ා Maintenance Hir	story (	Traffic Vol	ume
Km 38+0		Kn	153+0	
			1	
2013				

• Step 2: Click on the Road Segment that you want to delete.


grated Data				Road Inventory	C Maintenance History	♥ Traffic Volum
Km 38+0						Km 153+0
			1			
Latest			-			
2013						
3			1	1		
		1	. Click on the	road segment		
			that you want	to delete		

Note: Can not edit the data of "Latest", only edit the Road Inventory data with time series.

• Step 3: "Road Inventory - Survey" window appear, click on "Delete" button and click on "OK" button of popup.

	🕼 Road Inventory - Survey						
egrated Data	General Information						9 Traffic Volu
	Date Collection O		Terrain Type 😡		Road Class O	Design Speed @	
Km	2013-09-08		Mountainous	×.	Class III	- 60 (km/h)	Km 153+0
2013	From	MØ		То		MÐ	
	Km @	MØ		Km 😡		MØ	
	Latitude (UTM, WGS 1984) @	Longitude (	UTM, WGS 1984) 🕑	Latitude (UT	M, WGS 1984) 🖗	Longitude (UTM, WGS 1984) Ø	-
	Province	District		Province		District	

V.6) Delete history data of Maintenance History

- Steps:
  - Step 1: In the "Integrated Data" block, select "Maintenance History" tab.



1111 3010		Kiirijiyu
	Road Inventory	Maintenance History 🗹 🖺 Traffic Volume
grated Data		Road Inventory     SMaintenance History     © Traffic
Km 38+0		Km 153+0
iest H		
117		1. Select the Maintenance History tab
o16		

• Step 2: Click on the Maintenance History that you want to delete.

Note: Can not edit the data of "Latest", only edit the Maintenance History data with time series.

	Road Inventory	Maintenance History	💽 🚆 Traffic Volume		
egrated Data			Road Inventory	ා Maintenance History	9 Traffic Volu
Km 38+0					Km 153+0
ater					
() [ ] [ ] [ ] [ ]					
2016					
1 分					
2. Click on the maintenance					
2. Click on the maintenance history that you want to delete					



• Step 3: "Maintenance History - Survey" window appear, click on "Delete"

button and click on "OK" button of popup.

	C Maintenance History - Sur	vey					
egrated Data	General Information						₽ Traffic Vol
A	Date Collection      Completion				Repai	r Duration (month) 🚱	m 153+0
	2016-08-01		2017-05-29		2		
atest	Chainage and Position						
2017	From			То			
2016	Km 🥑	MØ		Km 🖸		MØ	
	52	3		54		4	
1	Latitude (UTM, WGS 1984) 😡	Longitude (	UTM, WGS 1984) 😡	Latitude (UTM, WGS	984) 😡	Longitude (UTM, WGS 1984) @	1
	Province	District		Province		District	

# V.7) Delete history data of Traffic Volume

- Steps:
  - Step 1: In the "Integrated Data" block, select "Traffic Volume" tab.

	1	Road Inventory	Mainten	ance History 🕑 🏝 Traffic Volur	ne		
rated Data				Road	Inventory Diaintenar	ice History	raffic Vol
Km 38+0						Km	3+0
est	R. 85		5.5				r.
17	<u>e</u>		<u></u>		1. Select th 	e Maintenance story tab	
				************************			nin

• Step 2: Click on the Traffic Volume that you want to delete.



Note: Can not edit the data of "Latest", only edit the Traffic Volume data with time series.

• Step 3: "Traffic Volume - Survey" window appear, click on "Delete" button and click on "OK" button of popup.

	B traine volume - survey				×
grated Data	Information Traffic				♀ Traffic Volu
<b>↑</b> Km 31	Date Collection	Name en 😡	Name vi 🕼		m 153+0
	2011/02	trafficvolume	trạm để	m	
E.	Km Station 🕑		Latitude (UTM, WGS 1984) 🕑		
boat in the	72				
017	M Station 😡		Longitude (UTM, WGS 1984) Ø		anti-strat
011	٥				antentañ.
	Province	District	Ward		
			~	÷.	
	Remark @				

# **VI) DATA REVIEW TOOL**

VI.1) Data review tool for Road Inventory



#### The Project for Capacity Enhancement in Road Maintenance in Viet Nam Phase II

PMS - Pavement Management System					Shi English (US) 9 userivit - Mot 🕺 🖌
Hanna Batting Were Duming Bats ers "	Line Analyse menutemas				
😔 Hor 🧿 Inputting 🛛 🗸		-			
Road Inventory b	Section List	-			
RC mansanancemitted	mpart				
	h Export				
Setup t Pavement Condition	🖥 Data Review Tool	-			-
Check Location Data	Osta Review Tool	Check Lane Width D	ata based on value domain	Check Temperatur	e Data based on value domain
Check Overlap chainage or invalid Check Overlap section Check Actual length Data (null or invalid)		Min (m):	Max (m):	Min (aC):	Max(oC):
Check Time Data (null or invalid)		Check Annual Precip	pitation based on value domain		
Vear/Month Construct Year		Min (mm):	Max (mm):		
					Submi

### VI.1.1) Setup test data

- Purpose: Review the sections have error data in the database
- Operations:
  - Check Location Data:
    - Step 1: Choose data to check location data: Overlap chainage, Actual length...
    - Step 2: Click "Submit" button

Setup test data				-
Check Location Data	Check Lane Widt	n Data based on value domain	Check Temperate	ure Data based on value domain
Oreck Overlap chainage or invalid     Oreck Overlap section     Check Actual fength Data (null or invalid)	Min (m1)	fillex (m):	Min (oC):	Max (oC):
Check Time Data (null or invalid)	Check Annual Pre	cipitation based on value domain	C	
C roar/Month Enstruct Year Wear/Month Service Start Year	Adire (1999):	Max (mm):		

- Check Lane Width Data based on value domain
  - Step 1: Input data: Min (m), Max (m) to review Lane Width data
  - Step 2: Click "Submit" button

Note: Values beyond the filter range are invalid values



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etup test data					-
Check Location Data	Check Lane Widt	h Data based on value do	main	Check Temperat	ure Data based on value domain
Check Overlap chainage or invalid Check Overlap section Check Actual length Data front or invalid)		Max (m):	*	win (oC):	Max (oc):
Check Time Data (null or invalid)	Check Annual Pro	ecipitation based on value	e domain		
Vear/Month Construct Year Your/Month Sorvico Start Year	(מיזידי)). (גערידי))	Max (mm):			

- Check Temperature Data based on value domain
  - Step 1: Input data: Min (oC), Max (oC) to review Temperature data
  - Step 2: Click "Submit" button

Note: Values beyond the filter range are invalid values

Setup test data				
Check Location Data	Check Lane Widtl	h Data based on value domain	Check Temperat	ture Data based on value domain
Check Overlap chainage or invalid Check Overlap settour Check Actual length Data (null or invalid)	KART (M);	M## (m):	Alin Jock	MaxinCl:
Check Time Data (null or invalid)	Check Annual Pre	cipitation based on value domain		
Year/Month Construct Year Year/Month Service Start Year	Min.mmc	Max/mm):		

- Check Time Data (null or invalid)
  - Step 1: Choose data to check time data: Year/Month construct Year, Year/Month Service Start Year
  - Step 2: Click "Submit" button

Setup lest data				÷ 2
Check Location Data	Check Lane Width	Data based on value domain	Check Temperate	ure Data based on value domain
Check Overlap chainage or invalid Check Overlap section Check Actual length Dara (null or invalid)	Min (m).	Max (m);-	Min (ct.)	Max (oCi:
Check Time Data (null or invalid)	Check Annual Pre	cipitation based on value domai	'n	
Vear/Month Construct Year	Min (mm):	Max (mm):		
				2 Submit

- Check Annual Precipitation based on value domain
  - Step 1: Input data: Min (mm), Max (mm) to review Annual Precipitation data
  - Step 2: Click "Submit" button

Note: Values beyond the filter range are invalid values



etup test data				-
Check Location Data	Check Lane Widt	h Data based on value domain	Check Temperatu	ire Data based on value domain
Check Overlap, chainage isr (nvail0) Chick Overlap, cottom Check Actual length Data (null or invalid)	Mirr (rr):	Max (m):	Mirt(oCli	Wen (oC):
Check Time Data (null or invalid)	Check Annual Pr	ecipitation based on value domain	n	
Year/Month Construct Year	Minimmt	Max (mm):		
Vear/Month Service Start Year	1 1200	1500	•	

 $\Rightarrow$ Users can review more than one data at a time for Road Inventory

#### VI.1.2) Sections list after reviewing data

- Purpose: Show the list of the section of the line of data or error (red) after the user in the step "Steup test data". Total errors or error information could be displayed in the column "Error found" of sections list

Setu	up test data														
Ch	eck Locatio	on Data				Check Lar	ne Width [	Data bas	ed on val	ue domain	Chec	k Temperature D	ata bas	ed on value d	omain
	Check Overlap cl	hainage or Invalid				Min (m):			Max (m):		Min (o	C):	M	ax (oC):	
	Check Overlap se Check Actual len	ection gth Data (null or i	nvalid)			2			5						
Ch	eck Time D	ata (null or	invalid)			Check An	nual Preci	pitation	based or	n value doma	in				
	Year/Month Con	struct Year				Min (mm):			Max (mm):						
	Year/Month Serv	ice Start Year				1200			1500						
															Submit
Sec	tion List														Submit
Sec	tion List														Submit – • Display Item
Sec	tion List	All ~		All ~	All	From km	From m	To km	To mi	All	All	Lane Position Nurr	All	Lane width (	Submit Display Item
Sec	tion List	All ~ Segment Name	Branch Number	All ~ RMB	All ~ Sub-bureau	From km From km	From m	To km	Tom	All v Province (From)	All v	Lane Position Num Lane Position Number	All	Lane width (	Submit Display Item Error found
Sec	tion List All v Route name A NH1	All Segment Name NH1 (Can Tho Bridge)	Branch Number 00	All V RMB RMB IV	All ~ Sub-bureau SB IV.7	From km From km 2068	From m From m 960	To km To km 2069	To m To m 625	All v Province (From) Can Tho	All v Province (To) Can Tho	Lane Position Num Lane Position Number 1	All , Direction Left	Lane width (m) 3.5	Submit Display item Error found Annual Precipitation
Sector	tion List All v Route name A NH1 NH1	All v Segment Name NH1 (Can Tho Bridge) NH1 (Can Tho Bridge)	Branch Number 00 00	AII ~ RMB IV RMB IV	All Sub-bureau SB IV.7 SB IV.7	From km From km 2068 2068	From m 960 960	To km To km 2069 2069	Tom Tom 625 625	All v Province (From) Can Tho Can Tho	All v Province (To) Can Tho Can Tho	Lane Position Num Lane Position Number 1 2	All Direction Left Left	Lane width ( Lane width (m) 3.5 3.5	Submit Display item Error found Annual Precipitation Annual Precipitation

- Operations:
  - Filter data: At the Sections list form, user can filter data (Route Name, Segment name, RMB, SB, Chainage, Province (from), Province (to), Lane position number, Direction, Lane width (m))



															Display Item
	All 🗠	All		All ~	All ~	From kir	From m	To.km	Tem	All	All	Lane Position Num	All ~	Lane width (	
	Route name *	Segment Name	Branch Number	RMB	Sub-bureau	From km	From m	To km	To m	Province (From)	Province (To)	Lane Position Number	Direction	Lane width (m)	Error found
0	NH1	NH1 (Can Tho Bridge)	00	RMB IV	58 IV,7	2068	960	2069	625	Can Tho	Can Tho	1	Left	3.5	Annual Precipitation
0	NH1	NH1 (Can Tho Bridge)	00	RMB IV	SB IV.7	2068	960	2069	625	Can Tho	Can Tho	2	Left	3.5	Annual Precipitation
0	NH1	NH1 (Can Tho Bridge)	ÓÖ	RMB IV	SB IV,7	2068	960	2069	625	Can Tho	Can Tho	2	Right	3.5	Annual Precipitation
0	NH3	NH1 (Can Tho Bridge)	00	RMB IV	SB IV.7	2065	800	2066	210	Can Tho	Can Thó	2	Right	3.5	Annual Precipitation
0	NH1	NH1 (Can Tho Bridge)	00	RMB. IV	58 IV.7	2065	800	2066	210	Can Tho	Can Tho	4.	Right	3.5	Annual Precipitation
0	NH1	NH1 (Can Tho Bridge)	00	RMB. IV	SB IV.7	2065	800	2066	210	Can Tho	Can Tho	4	Left	3.5	Annual Precipitation
0	NH1	NH1 (Can Tho Bridge)	00	RMB IV	SB IV.7	2065	800	2066	210	Can Tho	Can Tho	2	Left	3.5	Annual Precipitation
0	NH1	NH1 (Can Tho Bridge)	00	RMB IV	SB IV.7	2069	625	2070	75	Can Tho	Can Tho	2	Left	3.5	Annual Precipitation

# Export: At the Sections List form, click "Export" button to export wrong records

etu	p test data															-
Ch	eck Loca	atio	on Data				Check La	ne Width	Data ba	sed on va	lue domain	Chec	k Temperature D	ata base	d on value d	omain
	heck Overl	ap ci	hainage or Invalid				Min (m):			Max (m):		Min (oC	D:	Max	(oC):	
0	heck Overla	ap se	ection				3.5									
h	heck Actua	n D	igth Data (null or in	invalid)			Chack An	nual Proc	initatio	n hacad a	a value dema	in				
	eck min	eD	ata (nun or	invanu)			CHECK AI	nuarriec	ipitatio	n based of	i value doma	ių.				
1	'ear/Month	Con	struct Year				Min (mm):			Max (mm):						
1.3	'ear/Month	Serv	vice Start Year				150									
																Subr
ct	ion List															-
	T.u.		U.			1	0		Lanta	0 0		1	0		6	)
	All		All		All G	All	From Kri	From m	1.a km	ia m	All	All	Lane Position Num		Lane width (	
	Route nam	e *	Segment Name	Branch Number	RMB	Sub-bureau	From km	From m	To km	Tom	Province (From)	Province (To)	Lane Position Number	Direction	Lane width (m)	Error foun
	NH14G		(Q.Nam - DN)	00	RMB III	SB IU.1	38	73	43	560	Da Nang	Quang Nam	1	Left	3.5	Annual Precipita
	NH1		NH1 (N.Thuan - B.Thuan)	00	RMB IV	SB IV.1	1589	300	1642	D	Ninh Thuan	Binh Thuan	3	Right	2,5	Lane Wid Annual Precipita
	NH1		NH1 (N.Thuan - B.Thuan)	00	RMB IV	SB IV.1	1692	0	1720	800	Ninh Thuan	Binh Thuan	1	Left	3.5	Annual Precipitat
	NH1		NH1 (N.Thuan - B.Thuan)	00	RMB IV	SB IV,1	1692	0	1720	800	Ninh Thuan	Binh Thuan	2	Left	3.5	Annual Precipitat
	NH1		NH1 (N.Thuan - B.Thuan)	00	RMB IV	SB IV.1	1589	300	1642	Q	Ninh Thuan	Binh Thuan	1	Right	3.5	Annual Precipitat
	NH1		NH1 (N.Thuan - B.Thuan)	00	RMB. IV	SB IV.1	1588	500	1589	300	Ninh Thuan	Binh Thuan	2	Left	3.5	Annual Precipitat
	NH1		NH1 (N.Thuan - B.Thuan)	00	RMB IV	SB IV.1	1588	500	1589	300	Ninh Thuan	Binh Thuan	3	Left	2.5	Lane Wid Annual Precipitat
	NH1		NH1 (D.Nai - B.Duong)	00	RMB. IV	SB IV.2	1871	150	1873	50	Dong Nai	Binh Duong	2	Left	3.75	Annual Precipitat
	NH1K		NH1K (D.Nai - B.Duong)	00	RMB IV	SB IV.2	2	456	11	404	Dong Nai	Binh Duong	1	Right	3.5	Annual Precipitat
	NH1		NH1 (N.Thuan - B.Thuan)	00	RMB IV	SB IV.1	1586	Q	1588	500	Ninh Thuan	Binh Thuan	3	Right	2.5	Lane Wic Annual Precipita
	NH1		NH1 (Long An)	00	RMB IV	SB IV.3	1950	939	1954	790	Long An	Long An	3	Left	3.5	Annual Precipitat
													manuala			40 11-

> View detail information of section: Click <sup>(C)</sup> of section to view detail information

- 2



Sect	tion List														- 2
															Display Item
	× IIA	All		All ~	All	→ From kr	From m	To km	Tem	AII	~ All ~	Lane Position Nurt	Ali 🔶	Lane width (	0
	Route name 🛎	Segment Name	Branch Number	RMB	Sub-bureau	J From km	From m	To km	Tom	Province (From	) Province (To)	Lane Position Number	Direction	Lane width (m)	Error found
•	NH14G	NH14G (Q.Nam - DN)	00	RMB III	58 Wi.1	38	73	43	560	Da Nang	Quang Nam	3	Left	3.5	Annual Precipitation
Dat	e Collection:		2015-12-15			Construct Year:			2003/01		Annual Precipitat	ion (mm):		120 m	าก
Terr	ain Type:		Mountainous			Service Start Yes	ar:		2003/01		Actual length (m):			5487	m
Roa	d Class:		Class V			Temperature(o	:):		27		No lane:			6	
0	NH14G	NH14G (Q.Nam - DN)	00	RMB III	SB III.1	1	0	15	0	Da Nang	Quang Nam	4	Left	3,5	Annual Precipitation
0	NH14G	NH14G (Q.Nam - DN)	00	RMB	58 111.1	25	185	33	845	Da Nang	Quang Nam	2	Right	3.5	Annual Precipitation
0	NH14G	NH14G (Q.Nam - DN)	00	RMB III	SB 111.1	37	500	38	0	Da Nang	Quang Nam	3	Left	3.5	Annual Precipitation
0	NH14G	NH14G (Q.Nam - DN)	00	RMB III	58 111.1	33	880	37	465	Da Nang	Quang Nam	3	Left	3.5	Annual Precipitation
0	NH14G	NH14G (Q.Nam - DN)	00	RMB	SB III.1	37	465	37	500	Da Nang	Quang Nam	1	Left	3.5	Annual Precipitation

- ➢ View/Hide data
  - Step 1: At the Section List form, click "Display Item"
  - Step 2: Choose field to view/hide

Sec	tion List														
												1. Click "Display ite	m" 🛑	-	Display Item
	All ~	All		All ~	All	From kar	Fromm	Tp km	Tem	All	All	Lane Position Nurr	All		Route name
	Route name 🔺	Segment Name	Branch Number	RMB	Sub-bureau	From km	From m	To km	To m	Province (From)	Province (To)	Lane Position Number	Direction	La	Segment Name Branch Number
0	NH14G	NH14G (Q.Nam - DN)	00	RMB III	SB (II,1	38	73	43	560	Da Nang	Quang Nam	3	Left	а,	RMB Sub-bureau
0	NH14G	NH14G (Q.Nam - DN)	00	RMB III	58.00.1	1	0	15	ò	Da Nang	Quang Nam	à	Left	3.	From km From m
0	NH14G	NH14G (Q.Nam - DN)	00	RMB III	SB 111.1	25	185	33	845	Da Nang	2. Choose view/	e field to hide	Right	-	To km To m
0	NH14G	NH14G (Q.Nam - DN)	00	RMB	SB 111.1	37	500	38	0	Da Nang	Quang Nam	1	Left	з,	Province (From) Province (To)
0	NH14G	NH14G (Q,Nam - DN)	00	RMB III	5B 10.1	33	880	37	465	Da Nang	Quang Nam	4	Left	3.	Direction Lane width (m)
0	NH14G	NH14G (Q.Nam - DN)	00	RMB III	SB III.1	37	465	37	500	Da Nang	Quang Nam	1	Left	3	Error found
0	NH14G	NH14G (Q.Nam - DN)	00	RMB III	:SB III.1	25	0	25	185	Da Nang	Quang Nam	ì	Left	3,5	Annual Precipitation
0	NH1	NH1 (Vinh Long)	00	RMB IV	58 IV.4	2062	200	2063	120	Vinh Long	Vinh Long	٦	Right	5.5	Annual Precipitation
0	NH1	NH1 (N.Thuan - B.Thuan)	00	RMB IV	58 IV.1	1720	800	1770	734	Ninh Thuan	Binh Thuan	1	Right	3,5	Annual Precipitation

VI.2) Data review tool for Maintenance History



PMS - Pavement Management System	(Bij English (US) - Keerleit - MOK 🕺 🛔
Home System Very Haming Tack even Tegram.	
S Kar O Inputting History	
A faid Investory	- /
Check Location Data	Check Repair Width Data based on value domain
Check Overlap chainage nr invalia     Check Overlap section     Check Actual length Data (null or invalid)	Min-(m): Slax (m):
Check Time Data (null or invalid)	Check Distance Data based on value domain
Completion Date     Repair Duration (month)	Min (m): Max (m):
	Subroit

### VI.2.1) Setup test data

- Purpose: Review the sections (maintenance history) have error data in the database
- Operations:
  - Check Location Data:
    - Step 1: Choose data to check location data: Overlap chainage, Actual length...
    - Step 2: Click "Submit" button

etup test data			- /
heck Location Data	Check Repair Width Da	a based on value domain	
Check Overlap chainage or invalid	Micconte	Max (m):	
Check Overlap section			
Check Actual length Data (null or invalid)			
Check Time Data (null or invalid)	Check Distance Data ba	sed on value domain	
Completion Date	Min (m):	Max (m):	
Repair Duration (month)			

- Check Repair Width Data based on value domain
  - Step 1: Input data: Min (m), Max (m) to review Repair Width data
  - Step 2: Click "Submit" button

Note: Values beyond the filter range are invalid values



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setup test data			- /
Check Location Data	Check Repair Width Dat	ta based on value domain	
Check Dverlap chainage or invalid.	Min (m):	Max (m):	
Check Overlap section     Check Actual length Data (null or invalid)	0 *	3	:
Check Time Data (null or invalid)	Check Distance Data ba	ased on value domain	
Completion Data	Miles (my):-	Max (m)	
Repair Duration (month)			

- Check Time Data (null or invalid)
  - Step 1: Choose data to check time data: Completion Date, Repair Duration (month)
  - Step 2: Click "Submit" button

etup test data			
Check Location Data	Check Repair Width Dat	a based on value domain	
Check Overlap chainage or invalid.	Min (m):	(viax (m))	
Check Overlap section Check Actual length Data inull or invalid)		1	3
Check Time Data (null or invalid)	Check Distance Data ba	sed on value domain	
a completion Date	(Alin (m))	Max (m):	
Pepair Duration (month)			

- Check Distance Data based on value domain
  - Step 1: Input data: Min (m), Max (m) to review Distance data
  - Step 2: Click "Submit" button

Note: Values beyond the filter range are invalid values

Setup têst data			-
Check Location Data	Check Repair Width Dat	ta based on value domain	
Check Overlap chainage or invalid Check Overlap section Check Actual length Data (null or invalid)	Siles (m):	Max (m):	
Check Time Data (null or invalid)	Check Distance Data ba	ised on value domain	
Completion Date	Min (m):	Max (m):	
Repair Duration (month)		*	:

⇒Users can review more than one data at a time for Road Inventory



# VI.2.2) Sections list after reviewing data

- Purpose: Show the list of the section (maintenance history) of the line of data or error (red) after the user in the step "Steup test data". Total errors or error information could be displayed in the column "Error found" of sections list

Set	up test data														
Ch	ieck Locatio	on Data							Check R	epair Width	Data based	on value domain			
	Check Overlap cl Check Overlap s Check Actual ler	hainage or Invalid ection neth Data (null or i	nvalid)						Min (m):			Max (m):			
Ch	neck Time D	ata (null or	invalid)						Check D	istance Data	based on v	alue domain			
	Completion Date	e							Min (m):			Max (m):			
	Repair Duration	(month)							2			3			
Sec	tion List														Submit
															Display Item
	All ~	All ~		All ~	All v	From km	From m	To km	Tom	All	Ali ~	Lane Position Nurr	Ali ~	Repair width	2
	Route name 🔺	Segment Name	Branch Number	RMB	Sub-bureau	From km	From m	To km	To m	Province (From)	Province (To)	Lane Position Number 🛇	Direction	Repair width (m)	Error found
~	HCM	HCM - Quang Binh	00	RMB II	SB 11.4	1031	0	1031	50	Quang Binh	Quang Binh	1	Left	3.5	Distance
0		UCH OWNER	00	0140	CDILA	1030	956	1030	993	Quang Binh	Quang Binh	1	Left	3.5	Distance
0	HCM	Binh	00	II	50 11.4	1050	550			444.18 6.111	den Penn			5.5	

- Operations:
  - Filter data: At the Sections list form, user can filter data (Route Name, Segment name, RMB, SB, Chainage, Province (from), Province (to), Lane position number, Direction, Repair width (m))

Sec	tion List														$\rightarrow 2$
															Display Item
	Ali 👻	Ali		Aŭ 🗸	All Y	From krr	Fromm	Ta km	Тат	All ~	All ~	Lane Position Nurr	♥ IIA	Repair width	Ø
	Route name 📥	Segment Name	Branch Number	RMB	Sub-bureau	From km	From m	To km	Tom	Province (From)	Province (To)	Lane Position Number	Direction	Repair width (m)	Error found
0	HCM	HCM - Quang Binh	00	RMB II	5B II.4	1031	0	1031	50	Quang Binh	Quang Binh	4	Left	3,5	Distance
0	HCM	HCM - Quang Binh	00	RMB 11	SB (1.4	1030	956	1,030	993	Quang Binh	Quang Binh	ř.	Left	3.5	Distance
0	HCM	HCM - Quang Binh	00	RMB (I	5B II,4	1030	917	1030	936	Quang Binh	Quang Binh	1	Left	3.5	Distance
0	нсм	HCM - Quang Binh	00	RMB II	SB 0.4	1031	60	1031	77	Quang Binh	Quang Binh	T	Left	3.5	Distance
0	HCM	HCM - Quang Binh	00	RMB II	5B II.4	1031	60	1031	77	Quang Binh	Quang Binh	1	Right	3.5	Distance
0	HCM	HCM - Quang Binh	00	RMB 10	SB 11.4	1031	157	1031	166	Quang Binh	Quang Binh	đ.	Left	3.5	Distance
0	HCM	HCM - Quang Binh	00	RMB II	5B II.4	1031	80	1031	98	Quang Binh	Quang Binh	1	Left	3,5	Distance
ø	HCM	HCM - Quang Binh	00	RMB //	SB 11.4	1030	821	1030	860	Quang Binh	Quang Binh	1	Left	3.5	Distance

Export: At the Sections List form, click "Export" button to export wrong records



setu	p test data															75
Ch	eck Locati	on Data							Check R	epair Width [	ata based	on value	domain			
	Theck Overlap o	hainage or invalid							Min (m):				Max (m):			
	heck Overlap s	ection	the second se													
ch	heck Actual ler	igth Data (null or ii	invalid)						Chock D	istanco Data	hased on v	alua dan	nin			
-11	eck nine L		invanu)						CHECK D	istance Data	based off v	alue uon	am			
	Completion Dat	2							Min (m):				Max (m):			
1.6	Repair Duration	(month)							2				3			
																Subr
ort	ion List															_
cer	ion List															Display Ite
	All	All		All ~	All	From kg	From m	To km	Tom	All	All ~	Lane Pos	ition Nurr	All ~	Repair width	ø
	Route name 🔺	Segment Name	Branch Number	RMB	Sub-bureau	From km	From m	To km	To m	Province (From)	Province (To)	Lane Positio	on Number	Direction	Repair width (m)	Error fou
>	нсм	HCM - Quang Binh	00	RMB II	SB 11.4	1031	0	1031	50	Quang Binh	Quang Binh	1		Left	3.5	Distance
>	нсм	HCM - Quang Binh	00	RMB II	SB 11.4	1023	44	1023	232	Quang Binh	Quang Binh	1		Left	3.5	Distance
>	HCM	HCM - Quang Binh	00	RMB II	5B  I.4	1023	0	1023	14	Quang Binh	Quang Binh	t		Left	3.5	Distance
>	НСМ	HCM - Quang Binh	00	RMB II	SB II.4	1020	971	1020	983	Quang Binh	Quang Binh	1		Left	3.5	Distance
>	нсм	HCM - Quang Binh	00	RMB II	5B11.4	1020	929	1020	940	Quang Binh	Quang Binh	2		Left	3.5	Distance
>	нсм	HCM - Quang Binh	00	RMB II	SB 11.4	1022	336	1022	401	Quang Binh	Quang Binh	1		Left	3.5	Distance
2	HCM	HCM - Quang Binh	00	RMB II	5B II.4	1022	429	1022	455	Quang Binh	Quang Binh	1		Left	3.5	Distance
>	НСМ	HCM - Quang Binh	00	RMB II	SB 11.4	1022	874	1022	1000	Quang Binh	Quang Binh	1		Left	3.5	Distance
•	HCM	HCM - Quang Binh	00	RMB II	SB II.4	1022	596	1022	609	Quang Binh	Quang Binh	1		Left	3.5	Distanc
	нсм	HCM - Quang Binh	00.	RMB II	5B11.4	1024	155	1024	353	Quang Binh	Quang Binh	3		Right	3.5	Distanc
•	HCM	HCM - Quang Binh	00	RMB	5B II.4	1024	393	1024	449	Quang Binh	Quang Binh	1		Left	3.5	Distanc
>	НСМ	HCM - Quang Binh	00	RMB (I	SB II.4	1029	601	1029	609	Quang Binh	Quang Binh	1		Left	3.5	Distanc
													Desiviour		7 1 5	22 NJ

# > View detail information of section: Click <sup>(C)</sup> of section to view detail information

Sect	ion List														- 2
															Display item
	All	All ~		All Y	All is	Fram kar	Prom m	Talem	Tom	All	All	Lane Position Num	↔ IIA 9	Repair width	0
	Route name +	Segment Name	Branch Number	RMB	Sub-bureau	From km	From m	To km	To m	Province (From)	Province (To)	Lane Position Number	Direction	Repair width (m)	Error found
•	HCM	HCM - Quang Binh	00	RMB II	5B II.4	1031	0	1031	50	Quang Binh	Quang Binh	1	Left	3.5	Distance
Date	Collection:			2016-	08-27			Co	mpletion dat	e:	2015-10-25	Repair Duratio	on (month):		4
Repa	air Method:							Re	pair structyp	e:		Actual length	(m):		50 m
Repa	air Classificatio	in:		Period	dic Maintenance	- Medium		Re	pair Categor	<i>r</i> :					
Maii	ntenance Histo	ry Position:		Left				Dis	stance (m):		0				
0	HCM	HCM - Quang Binh	00	RMB II	5B II.4	1030	956	1030	993	Quang Binh	Quang Binh	.1	Left	3.5	Distance
o	HCM	HCM - Quang Binh	00	RMB 11	SB 11.4	1030	917	1.030	936	Quang Binh	Quang Binh	τ.	Left	3.5	Distance
9	HCM	HCM - Quang Binh	00	RMB II	5B II,4	1031	60	1031	77	Quang Binh	Quang Binh	1	Left	3.5	Distance
0	HCM	HCM - Quang	00	RMB	SB 0.4	1031	60	1031	77	Quang Binh	Quang Binh	1	Right	B.5	Distance

- ➢ View/Hide data
  - Step 1: At the Section List form, click "Display Item"
  - Step 2: Choose field to view/hide



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Sect	tion List									_					-
										1	Choose "Dis	play Item"	-		Display Iten
	All	All ~		AII ~	All	From km	Erom m	To km	Tom	All ~	All 🗸	Lane Position Num	Ali ~		Route name
	Route name #	Segment Name	Branch Number	RMB	Sub-bureau	From km	From m	To km	To m	Province (From)	Province (To)	Lane Position Number	Direction	Réj	Segment Name Branch Number
ò	НСМ	HCM - Quang Binh	00	RMB II	58 II.4	1031	Q	1031	50	Quang Binh	Quang Bình	1	Left	3.5	RMB Sub-bureau
0	HCM	HCM - Quang Binh	00	RMB II	SB 11.4	1030	956	1030	993	Quang Binh	Quang Binh	1	Left	3.5	From km From m
0	НСМ	HCM - Quang Binh	00	RMB II	58.11.4	1030	917	1030	936	Quang Binh	Quang Bình	1	Left	3.8	To km To m
0	HCM	HCM - Quang Binh	00	RMB II	SB (1.4	1031	60	1031	77	Quang Binh	2. Cho vi	oose field to ew/hide	core		Province (From) Province (To)
0	нсм	HCM - Quang Binh	00	RMB II	5B II.4	1031	60	1031	77	Quang Binh	Quang Bình	1	Right	3,5	Direction Repair width (m)
0	нсм	HCM - Quang Binh	00	RMB II	5B II.4	1031	157	1031	166	Quang Binh	Quang Binh	1	Left	3.5	Error found
0	HCM	HCM - Quang Binh	00	RMB II	58 11.4	1031	80	1031	98	Quang Binh	Quang Binh	1	Left	3.5	Distance
C	HCM	HCM - Quang Binh	00	RMB II	SB II.4	1030	821	1030	860	Quang Binh	Quang Binh	1	Left	3.5	Distance
0	НСМ	HCM - Quang Binh	00	RMB	5B //.4	1030	740	1030	792	Quang Binh	Quang Binh	t	Left	3.5	Distance

# **USER'S MANUAL**

# **PMS DATASET FORMULATION MODULE**



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## **CHAPTER 1: INTRODUCTION**

# I) General

Pavement Management System (hereinafter referred to as "PMS") has been developed under Activity-2: Enhancement of Planning Capacity for Road Information Management of the JICA Project on **Capacity Enhancement in Road Maintenance in Vietnam**. This operation manual is prepared to explain the step-by-step procedure to run the Pavement Management System (PMS). Since PMS is still under development, the operation manual will be updated in parallel with system development and the full-version of operation manual will be finalized together with PMS software.

PMS Dataset, which contains road inventory data, pavement condition data, maintenance history data, traffic volume data and some repair work unit cost, has been formulated to fulfill the requirement of PMS. Since only some specific data are required for PMS, a conversion software is developed to extract data from road database and formulate the PMS dataset in the desired format. The conversion software can run independently from the PMS software. A separate user manual is prepared for conversion software. General flow of pms dataset formulation is illustrated in figure below.

### **II) Process overview**

### **II.1) Main functions:**

- Formulate PMS dataset

#### II.2) Login to the system

- User can log in to the system from "http://pms.drvn.gov.vn"

Login	
Username	
Username	4
Password	
Password	
🖌 Remember me	
	(and the second s
	Login

- User enter Username and Password



- Remember me: User can tick box Remember me to save login information for later time.
- Login: User can press button Login or press Enter

# **III) HOMESCREEN**

The main screen is the display after successful login. On the main screen displays all the data and functions related to the logged in user, depending on the role and permissions of the login user. Also, screen can switch between two languages English and Vietnamese Treng Viet (VI). Display screen:

PMS		🎟 English (US) 🗸 🔀	
Image: Constance         Image: Constance<			
<b>2</b> Ноте			
🖀 Home			
Home		PMSs	system
	Deterioration	Budget Simulation	
	About	About	
	User Manual	User Manual	L
	Plant		
	Start	Staft	ļ.



### **CHAPTER 2: FORMULATE PMS DATASET OPERATION**

#### I) FORMULATE PMS DATASET

- Purpose: Formulate PMS dataset for the system to perform processes such as Deterioration, Budget Simulation, Work planning.
- User select menu **Formulate PMS Dataset**, display screen:

PMS				Millengenh (US) - 🗙 😑
Home Formulate MS Dataset	Colorisoutor Sector Sec	<u>k</u>		
S Formulate P	MS Dataset - List PMS Process			
Information for PMS D	lataset			- /
Q.				
Year	+ Progress		Created at	
2017	100%		2017-05-05 11:25:51	
2007	100%		2017-05-09 23:55:50	
2006	100%		2017-05-10 00:31:18	
2001	TOON	ampese	2017-05-09 19:09:41	
Showing 1 to 4 of 4 peter	ies.			Pressail 1 Net
				Run new process

- ⇒ Display of PMS datasets has been setup year by year with % complete and showing the Created at corresponding to each dataset created.
- **4** Information for functions
  - Search function: Input information to search by properties: Year, Progress, Created at
    - Step 1: In the "Information for PMS dataset" form, choose Search function
    - Step 2: Input information to search

PMS			Salenjosh (US) - 🗙 😑
Formulate Howe PMS Dataset	Coversionality Straight Norsealities		
😌 Home / Farmalab	e PMS Dataset		
S Formulate F	PMS Dataset - List PMS Process		
Information for PMS	Dataset		- /
Q	Input informa	ation to search	
Year	* Progress	Created at	
2017	100%	2017-05-05 11:25.51	
2007	100%	2017-05-09 23:55:50	
2006	100%	2017-05-10 00(31/18	
2001	100%	- avrance 2017-05-09 19:09:41	
Showing 1 in 4 of 4 out	tries		Presail 1 Mai
			Run new process

- Example: Seach for Year is "2006"



Information for PMS D	lataset			-
Q 2006				
Year	→ Progress		Created at	
2006	100%	- ndimplete	2017-05-10-00;31:18	
Shawing 1 to 1 of 1 entr	ies (filtered from 4 total entries)			Paertous 1 Nex
				Run new proces

- Run new process function
  - Step 1: In the "Information for PMS dataset", choose button "Run new process"
  - Step 2: Choose "Year to generate"
  - Step 3: Click button Run

PMS				Mill English (U	si~ X ≡
Formulate Plats Detained	Noncombon Streadling Backers, Work Standing				
😂 Home / Formulate Pl	MS Dataset				
E Formulate PM	AS Dataset > List MS Process				
Information for PMS Dat	racat.				- 1
Q	(03E)				
Year	* Progress		Created at		
2017	100%	-1.00010742	2017-05-05 11:25:51		
2007	100%	- 200p=18	2017-05-09 23:55:50		
2006	100%	- and perty	2017-05-10 00:33118		
2001	100%	- and part of	2017-05-09 19:09:41		
showing 1 to 4 of 4 entrie	1			Print	1 Tiese
			1. Choose "Run new process" button		in new process
			Information for PMS Dataset		- 1
			Year to generate		
			2001	2	*
			Attention You con downer extend out sort year in averyour 25 Aute		
			3. Click	Run button	Run

Note: You can choose existed dataset year to overwrite its data

Other information: In the "Information for PMS datadet" form, user also can search "Year to generate" in the search row



e Formulate Deterioration System Simulation Work planning	
Home / Formulate PMS Dataset	
Formulate PMS Dataset > List PMS Process	
formation for PMS Dataset	- 2
ear to generate	
2001	×
8	Q
008	-
028	
038	
2058	
2068	1.10
2078	
2080	
2081	

# **USER'S MANUAL**

# PAVEMENT DETERIORATION EVALUATION MODULE



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V) Setting the charts of deterioration routes
V.1) Process export data of the type Crack and the type AC ALL
V.2) Process export data of the type Rutting depth and the type AC ALL
V.3) Process export data of the type IRI and the type AC ALL
VI) Setting the charts of deterioration sections
VI.1) Process export data of the type Crack and the type AC ALL
VI.2) Process export data of the type Rut and the type AC ALL
VI.3) Process export data of the type IRI and the type AC ALL
VII) Show history
VIII) List of evaluated regions



# **CHAPTER 1: INTRODUCTION**

# I) General

Pavement Management System (hereinafter referred to as "PMS") has been developed under Activity-2: Enhancement of Planning Capacity for Road Information Management of the JICA Project on **Capacity Enhancement in Road Maintenance in Vietnam**. This operation manual is prepared to explain the step-by-step procedure to run the Pavement Management System (PMS). Since PMS is still under development, the operation manual will be updated in parallel with system development and the full-version of operation manual will be finalized together with PMS software.

PMS Dataset, which contains road inventory data, pavement condition data, maintenance history data, traffic volume data and some repair work unit cost, has been formulated to fulfill the requirement of PMS. Since only some specific data are required for PMS, a conversion software is developed to extract data from road database and formulate the PMS dataset in the desired format. The conversion software can run independently from the PMS software. A separate user manual is prepared for conversion software. General flow of pms dataset formulation is illustrated in figure below.

### **II) Process overview**

### **II.1) Main functions**

- Setting Pavement Deterioration Evaluation Dataset
- Setting the ranks for Crack, Rutting and IRI
- Setting data of Pavement Deterioration according to Bench marking Module
- Setting data charts of pavement deterioration
- Setting the charts of deterioration routes
- Setting the charts of deterioration sections
- Show history
- List of evaluated regions
- View notifications

### **II.2**) Login to the system



- User can log in to the system from "http://pms.drvn.gov.vn"

- Enter Username and Password

pac(her()c	
	1.2
Password	1.0
Password	19
Remember me	

- Remember me: User can tick box Remember me to save login information for later time.
- Login: User can press button Login or press Enter

# **III) HOMESCREEN**

The main screen is the display after successful login. On the main screen displays all the data and functions related to the logged in user, depending on the role and permissions of the login user. Also, user can switch between two languages English and Vietnamese Treng Viet (VI). Display screen:



in the second se			PN
Personal time(res)	Detenoration Evaluation About Lifer Manual		Budger Simulation About User Manual
	Work Planning About Lifert Maintaid		Janu Inputting System About Idwar Mannad
	Start Display data on the map About	Date	Slart
	User Manual Start		



## **CHAPTER 2: PAVEMENT DETERIORATION EVALUATION OPERATION**

### I) SETTING PAVEMENT DETERIORATION EVALUATION DATASET

- Purpose: Select data Target Region and Year evaluation
- User select menu **Deterioration**, click on **Start new process** submenu.

Dataset import	-
Target Region	
RMB I	*
Year	
2017	*

- User select value of **Target Region** and **Year**. Then press button.

icess In	fo											
Та	rget Region: RM	31										
Ye	ar: 2017											
rackin	g ratio											
		AC BST		т	co			To	tal		Condition Rank fo	
	Condition rank	Before	After	Before	After	Before	After	Be	fore	A	fter	Estimation
1	C = 0	11060	6022	1	0	11	з	11072	97,49%	6025	53.05%	
2	0 < C < 10	238	2892	1	1	0	2	239	2.10%	2895	25.49%	
3	10 ≤ C < 20	32	888	0	1	0	1	32	0.28%	890	7.83%	
4	20 ≤ C < 30	7	479	2	0	0	2	9	0.07%	481	4.23%	V
5	30 ≤ C < 40	1	332	1	0	0	2	2	0.01%	334	2.94%	
6	40 ≤ C < 50	0	240	0	0	0	0	0	0%	240	2.1196	2
7	C≥50	0	485	3	6	0	1	3	0.02%	492	4.33%	
	Total		11000				**			11257		

### **II) SETTING THE RANKS FOR CRACK, RUTTING AND IRI**

- Purpose: Select the ranks for crack, rutting, iri to draw charts
- After the dataset process, user select the ranks for crack, rutting and iri to estimate:
  - Step 1: Set the Crack ratio

At the form "1. Crack ratio ", user select the condition rank, then ticked the Condition Rank is selected in the column" Condition rank for Estimation"

Module dataset import



	Cana	distant analy	A	.c	BS	т	C	c			Fotal		Condition F	Condition Rank for	
	conc	artion rank	Before	After	Before	After	Before	After	Bef	ore		After	Estima	ation	
ţ.		C = 0	21409	15390	714	92	1333	1116	23456	100%	16598	70.76%		8	
ź		0 < C < 10	0	4734	0	172	O	169	D	095	5075	96			
8		10≤C<20	0	679	0	119	0	24	0	09b	822	2. Ticked %		5	
1	1	20≤C<30	0.	292	0	90	0	17	0	096	399	condition 6		1	
5		30 ≤ C < 40	0	136	o	70	0	6	0	096	212	Crack ratio			
5		40 ≤ C < 50	0	96	0	55	a	t	0	095	152			1	
		C≥50	0	82	0	116	0	0	0	096	198	0.84%	۲	8	
		Total	100 a.C. 10	21409		714		1333			23456			1	

# Note: You must choose at least 5 crack ratio

• Step 2: Set the Rutting depth

At the form "2. **Rutting depth**", user select the condition rank, then ticked the Condition Rack is selected in the column "Condition rank for Estimation"

	and falan same	A	c	BS	T	E			1	otal		Conditio	
	onucion rank	Before	After	Before	Before After Before After Before			After	Estimation				
1	0≤R<5	21409	1762	714	77	1333	319	23456	100%	1958	8.3496		
£.	5 \$ R < 10	0	3231	0	8	0	.97	0	096	3336	14.2296		
	10≤R<15	0	5211	0	58	0	427	0	096	5696	24.28%		
L.	15 S R < 20	0	4093	0	125	0	316	0	096	4534	2 Ticked choose condition rack for rutting depth		
	20 ≤ R < 25	ò	2680	0	121	0	153	a	096	2954		-	
	25≤R<30	0	1739	0	108	0	84	0	096	1931		for rutting	-
	30 ≤ R < 35	0	1090	0	66	0	57	0	096	1213	depui		
	35≤ R < 40	0	802	0	75	0	37.	0	Q96	914	3.89%		
	$40 \le R \le 45$	0	460	Q	43	D	19	0	096	522	2.22%		
0	45 ≤ R < 50	0	287	0	30	0	19	0	096	336	1.43%		
1	R≥50	0	54	0	3	0	5	0	096	52	0.26%		8
	Total	4	21409	-	714	-	1333		-	23456	1		

Note: You must choose at least 5 rutting depth

• Step 3: Set the IRI

At the form "**3. IRI**", user select the condition rank, then ticked the Condition Rack is selected in the column "Condition rank for Estimation"

Condition rank		and some	Α.	C	BS	τ	C	5		1	fotal		Condition Rank
		tion rank	Before	After	Before	After	Before	After	Befo	ore		After	Estimation
	ſ	0 ≤ IRI < 2	21409	1930	714	74	1333	119	23456	100%	2123	9.05%	R
		$2 \leq  \mathbf{R}  \leq 4$	0	8204	0	7	Ø	27	0	096	8238	35.12%	2
p.		4≤  R  ≤ 6	0	6574	0	70	0	210	0	096	6854	2. Ticked 296	
	1	6≤ IRI ≤ 8	0	2817	Q	136	0	431	۵	096	3384	Condition and the	
		8 ≤ IRI < 10	0	1224	a	159	0	365	Q	096	1748	IRI <sub>%</sub>	
		10≤ IRI < 12	0	426	Q	118	0	136	0.	096	680	2.89%	
		IRI≥12	0	234	0.	150	0	45	0	096	429	1.82%	
	т	fotal	-	21409	-	714	-	1333			23456	-	

### Note: You must choose at least 5 IRI

• Step 4: Then press "Estimate" button





Other information: User can "Back" button to return to the "Dataset import" screen

# III) SETTING DATA OF PAVEMENT DETERIORATION ACCORDING TO BENCH MARKING MODULE

- Purpose: Draw charts
  - After chosing the ranks, user press **Estimate** button.

Bench-Marking Case		- 2				Performance Curve	Transition Markov Matrix -
Bench-Marking Case					Per	formance Curve	
Target Region:	RMBI		ų.	5	ΤQ	15 20	25 30
Year of PMS dataset:	2017						
Distress Type:	Cracking ratio	•	5				×
Estimation result - Be	ench-mark case		10				1
Hazard Paramete	rs		æ <sup>20</sup>				
Condition Rank	Hazard Parameters	t-value	D 25				
1	0.0690	69.8330	Lister 20				$\mathbf{\lambda}$
2	0.1390	42.7424	0 30				/
3	0.3879	27.3539	35				
4	0.6101	20.1311	40				ł
5	0.7203	16.2576	16				
б	0.7754	13.4634	40				
			50			— вм	

- User choose evaluates, then choose chart to view
- Performance Curve, Probabilities Transition, Makov Transition Probabilites matrix.

Button	Function
Back to Data Summary for Estimation	Back to previous screen
Export	Save information by excel file
Next to Pavement Type	Go to next screen

# III.1) Process export data of the type Crack

- Step 01: Select distress type "Cracking ratio"

m Phase II
÷
7

# ↓ Performance Curve chart displays



# ✤ Probabilities Transition chart displays





**Warkov Transition Probabilities Matrix displays.** 

			Per	formance Curve	Transition	Markov Matrix	- 2
		Markov T	ransition Prob	abilities Mat	rix		
0.933341	0.062184	0.003939	0.000461	0.000065	0.000009	0.000001	1
0	0.870244	0.10707	0.018538	0.003463	0.000586	0.000099	
0	σ	0.67848	0.235997	0.066892	0.015261	0.003371	
0	Ō	Ó	0.543311	0.313846	0.108927	0.033916	
0	C.	0	Q	0.48661	0.340848	0.172541	
0	.0	0	0	o	0.460056	0.539944	
0	0.	0	o.	o	σ	3	
			Back to Data Si	ummary for Estima	tion Export	Next to Pavemer	nt Type

- Step 02: Press "Export" button to save
- Step 03: Check file output data.

# III.2) Process export data of the type Rutting Depth

- Step 01: Select distress type "Rutting depth"



Target region :	RMB I	
Year of dataset :	2016	
Distress type :	Rutting depth	\$

# ↓ Performance Curve chart displays



# ✤ Probabilities Transition chart displays



The Project for Capacity Enhancement in Road Maintenance in Viet Nam Phase II



**4** Markov Transition Probabilities Matrix displays.



					Perfo	ormance Cun	ve Trans	sition M	arkov Matri	× -
			Markov	/ Transiti	on Proba	abilities N	Aatrix			
0.001468	0.64002	0.296954	0,055941	0.005164	0.00041	0.000039	0.000003	0	0.000002	-0.0000
0	0.589673	0.329922	0.072142	0.007525	0.000662	0.000069	0.000006	0.000001	0.000002	-0.0000
0	0	0.660942	0.288629	0,044544	0.005141	0,000667	0,000071	0.000006	0	0
0	o	0	0.734388	0.220865	0.037382	0.00642	0.000846	0.000091	0.000008	0.00000
0	Ō	0	Q	0.696795	0.231269	0.059791	0.010555	0.001419	0.000155	0.0000
0	0	σ	0	Ø	0.586692	0.312024	0.083801	0.015154	0.002076	0.00025
0	0	0	0	0	0	0.583572	0.31346	0,085026	0.015529	0.00241
0	σ	σ	σ	Ø.	σ	0	0.580437	0.314885	0.086265	0.01841
0	0	0	Ō	0	0	0	Ō	0.577289	0.3163	0.10641
	0	σ	O.	Ø	Q	O'	0	σ	0.574126	0.42587
0										

- Step 02: Press "Export" button to save
- Step 03: Check file output data.

# III.3) Process export data of the type IRI

- Step 01: Select distress type "IRI"

Target region :	RMB I	
Year of dataset :	2016	
Distress type :	IRI 🗘	

↓ Performance Curve chart displays



The Project for Capacity Enhancement in Road Maintenance in Viet Nam Phase II



✤ Probabilities Transition chart displays





ф.	Markov	Transition	Probabilities	Matrix	displays
----	--------	------------	---------------	--------	----------

			Per	formance Curve	Transition	Markov Matrix 🗧
		Markov Tr	ansition Prob	abilities Mat	rix	
0.766609	0.223098	0.009633	0.000619	0.000039	0,000003	o
0	0.916685	0.075535	0.007137	0.000588	0.00005	0.000005
0	0	0.821659	0.156523	0.019345	0,002178	0.000295
0	o	Ø	0.772518	0.189749	0.03182	0.005913
0	0	0	0	0.699057	0.232575	0.068368
0	σ	a	o	o	0.602549	0.397451
0	Ö	Ó	0	o	0	1

- Step 02: Press "Export" button to save
- Step 03: Check file output data


### IV) SETTING DATA CHARTS OF PAVEMENT DETERIORATION

- Purpose: Draw charts
- At the Bench Marking case screen, user press "Next to Pavement Type" button. Display screen:

Pavement Type		- /		AC	* Perfor	mance Curve	Transition Mark	ov Matrix All Curves	
Pavement Type					Perfor	namce Curve - Ré Vear	ate		
Target Region:	RMB		0	ń	ta:	15	20	29	30
Year of PMS dataset:	2017						~		
Distress Type:	Charking zatio	<b>e</b> ,	5				1		
Estimation result -	Pav. type		10				*		
Dispersion para	meter		3 70					1	
(D) =	5,437065		19781 25						
Log-Likelihood+	-15358,499489		CT BOAR					ł	
Heterogeneity p	parameters		35					/	
AC -	0.999560		40					+	
857 -	1,280985		45					/	
cc	0.979934		86						1

IV.1) Process export data of the type Crack and the type AC stress (BST, CC stress)

- Step 01: Select distress type "Cracking ratio"

Pavement Type		-	2
Pavement Type			
Target Region:	RME I		
Year of PMS dataset	2017		
Distress Type:	Cracking ratio		•



The Project for Capacity Enhancement in Road Maintenance in Viet Nam Phase II



✤ Probabilities Transition chart displays





🖊 Markov Transition Probabilities Matrix displays

		AC *	Performance Curve	Transition	Markov Matrix	All Curves	
		Markov	Transition Proba	abilities Ma	trix		
0.933355	0.062173	0.003938	0.00046	0,000065	0,000009	0.000001	1
Ö.	0,870281	0.107048	0.018527	0.00346	0.000585	0.000099	
0	Ō	0.678596	0.235941	0.066852	0.015245	0.003366	
0	Ō	Ō	0.543442	0.313808	0.108869	0.03388	
0	o	O	D	0.48676	0,340814	0.172425	
0	Ó	Q	D	ò	0.460216	0.539784	
0	o	O	D	0	0	- 3	- 1

♣ All Curves displays



The Project for Capacity Enhancement in Road Maintenance in Viet Nam Phase II



- Step 02: Press "Export" button to save
- Step 03: Check file output data

# IV.2) Process export data of the type Ruting depth and the type AC stress (BST, CC stress)

- Step 01: Select distress type "Rutting depth"

Pavement Type		- 2
Pavement Type		
Target Region:	RMB	
Year of PMS dataset:	2017	
Distress Type:	Rutting depth	•



The Project for Capacity Enhancement in Road Maintenance in Viet Nam Phase II



✤ Probabilities Transition chart displays



The Project for Capacity Enhancement in Road Maintenance in Viet Nam Phase II



🖊 Markov Transition Probabilities Matrix displays



		AC		Performa	ance Curve	Transition	n Marke	ov Matrix	All Curves	
			Markov	/ Transiti	on Proba	abilities N	Aatrix			
0.001465	0.63992	0,29702	0.055974	0.005169	0.00041	0,000039	0.000003	0	0.000001	-0.0000
0	0.589577	0.329976	0.072178	0.007531	0.000663	0.000069	0.000006	0	ō.	0
0	0	0.660857	0.28869	0,044563	0.005145	0.000668	0.000071	0.000006	0	0
0	0	0	0.734336	0.220892	0.0374	0.006425	0.000847	0.000091	0.000008	0.00000
0	0	0	0	0.696698	0.231319	0.059826	0.010565	0.001421	0.000155	0.00001
0	0	O	O	0	0.586576	0.312083	0.083843	0.015167	0.002078	0.00025
0	0	0	0	0	0	0.583475	0.313502	0.085067	0.015541	0.00241
0	Q	0	Q	0	Q	0	0.580332	0.314939	0.086302	0.01842
0	0	0	0	0	0	0	0	0.577206	0,316336	0,10645
	0	0	0	0	ō	0	0	0	0.574039	0.42596
0										

4 All Curves displays





- Step 02: Press "Export" button to save
- Step 03: Check file output data

### IV.3) Process export data of the type IRI and the type AC stress (BST, CC stress)

- Step 01: Select distress type "Cracking ratio"

Pavement Type		- 2
Pavement Type		
Target Region:	RMB I	
Year of PMS dataset:	2017	
Distress Type:	IRI	,



The Project for Capacity Enhancement in Road Maintenance in Viet Nam Phase II



✤ Probabilities Transition chart displays





ф.	Markov	Transition	Probabilities	Matrix	displays
----	--------	------------	---------------	--------	----------

		AC .	Performance Curve	Transition	Markov Matrix	All Curves -
		Markov	Transition Proba	abilities Ma	trîx	
0.766889	0.222844	0.009609	0.000616	0.000039	0.000003	o
o	0.916793	0.075449	0,007118	0.000585	0.000049	0.000005
0	0	0.821919	0.156325	0.019294	0.002169	0.000293
Ó.	0	0	0.772808	0.18956	0.031743	0.005889
0	Q	Q	O'	0.699438	0.232368	0.068194
o	0	0	0	o	0.602985	0.397015
0.	0	o	σ.	0	o	1

4 All Curves displays





- Step 02: Press "Export" button to save
- Step 03: Check file output data

### Note: BST or CC route is the same AC route

### V) SETTING THE CHARTS OF DETERIORATION ROUTES

- Purepose: Draw charts
- At the Pavement deterioration screen, user press "Next to Route" button



Route			- 🖌 Ferformance Curve - Rouce		
Route					
Target Region:	RMBI		i i i i i i i i i i i i i i i i i i i		*
Vaer of PSE dataset:	2012		1 10 1		
District Type	Dreading read		· · · · · · · · · · · · · · · · · · ·		
Estimation result - Rout				1	~
Dispersion paramet	er		* # //// #		1
	0. 345080			11.00	1
Log Livin	15352,199489				X
				$\Pi$ /	1
Hecerogeneicy parameters			· · · ·		1
9		24	ovi u 🕐 ecoles		
1111	Data municipa	- taster			1
BM.	773.0	1			1
helis	3120	1,4,15258			1
NH1	2900	0.570395	-		
tiH()	1982	0.0942729			1
NH3	1066	0.481277	· · · · · · · · · · · · · · · · · · ·	tt -	1
NHS	856	0.547027			\
NHIG	597	0.123966	-a -		1
NH35	588	1.750748			1
NHU3.	532	1.099133		11	
HEM	121	1 601072	- BALAC	AND THE NOT THE PARTY NOTION AND AND AND AND	- 14(B) - 566 - 16(M
No. 104 4 1. Weat 11			A REAL PROPERTY AND A REAL		Back to Revenuent Type Export Next to Se

### V.1) Process export data of the type Crack and the type AC ALL

- Step 01: Select distress type "Cracking ratio" and route type: AC ALL.

loute			<ul> <li>Ferformance Curve - Rouce</li> </ul>		14
Route					
Targe: Region:	RUEI		A		
Valer of PSES dataset:	2012		1111		
Distriets Type	Emissionig antid				
Estimation result - Soute				1	
Dispersion parameter					
	3,41096				1
Log Live incode	15352,499429			11	
fecerogeneity parameters		a • •	· · · ·	11.1	
Q.		Show is + e	nois i		
wite	Data estelate	- types	2		
e	TUN	1	- 11	1	
46	3120	1415258			
H1	2900	0.570395	-		
Hg	1562	0.6%2729			
на	1066	0.481277	- + + + + + + + + + + + + + + + + + + +	11	
HS	306	0.5-37027			
Hig	2012.	0.123966	- 10		
H36	588	1.750748			
MA2	234	7.029123		14 14 140 1000 - 1000 - 1000 - 1000 - 1000 - 1000 - 100	- 10-
r 1.4	2012				





- Step 02: Press "Export" button to Save
- Step 03: Check file output data

### V.2) Process export data of the type Rutting depth and the type AC ALL

- Step 01: Select distress type "Rutting depth"

Route		-	2
Route			
Target Région:	RMB (		
Year of PMS dataset:	2017		
Distress Type:	Rutting depth		•



Per	forman	ce Curve - Route		AC	all	• -	2
	0	10	Year 20	30	11	N	45
	Ť	10	20	59			45
	5						
	10						
	15						
mm).	20	ANN -					
g depth(	25	1 HIH	11				
Ruttin	30	HHH	1111				
	35	1111	1 1 1 4 1				
	40	14/	H H /	11			
	45	1	1441				
	50	BM_AC — NH2 — NH3 NH6 -	- NH10 - NH15 - NH38B -	NH43 — NH279	— NH1 — NH38 —	NH5 — Н	СМ
			Back	to Pavement Type	Export Next to	Section (1k	(m)

- Step 02: Press "Export" button to save
- Step 03: Check file output data

### V.3) Process export data of the type IRI and the type AC ALL

- Step 01: Select distress type "Cracking ratio"

Route		- 2
Route		
Target Region:	RMB I	
Year of PMS dataset:	2017	
Distress Type:	(R)	





- Step 02: Press "Export" button to save
- Step 03: Check file output data

Note: Others are the same AC ALL route.

### VI) SETTING THE CHARTS OF DETERIORATION SECTIONS

- Purpose: Export data
- At the route screen, user press **Next to Section** (1km) button



Section				-	C Heterogeneity pa	aramet	ter			AS	5 V -
Route					Search:					Show	10 v entries
Target region :	RMB I				Target Region	*	Route	Right/Left	КМ	Data number	Epsilon
Year of dataset :	2016				1000600_131_2					10	0.559923
Distress type :	Cracking rati	D	÷		1000600_132_2					11	0.432392
Faster etter versite 1	D				1000600_133_2					10	0.559924
Estimation result -	Route				1000600_134_2					11	0.559231
Dispersion para	meter				1000600_135_2					11	1.175333
Φ=	2.010251				1000600_136_2					11	1.567481
	2,919331				1000600_137_2					11	1.438385
Log-Likelihood=	-50595.6913	43			1000600_138_2					8	0.956460
					1000600_139_2					11	1.444933
					1000600_140_2					10	0.903190
					Showing 1 to 10 of	100 en	tries			< 1 2 3	10 >
					Back		Sa	ve	Export to	admin DB	Exit
Back to Ro	oute	Back to before scre	een								
Export		Export data									
Export to ad	lmin DB	Update data in data	abase								
Exit		Back to init screen									

### VI.1) Process export data of the type Crack and the type AC ALL

- Step 01: Select distress type "Cracking ratio"

Section (1km)		- 2
Route		
Target Region:	RMBI	
Year of PMS dataset:	2017	
Distress Type:	Cracking rátio	Ŧ



Q				1	Show 10 T entries
Target Region	* Route	Right/Left	км	Data number	Epsilon
BM				11338	4
RMBI	NH2	Left	34	1	0.926071
RMBI	NH2	Left	35	3	1,103576
RMBI	NH2	Left	36	1	0.926074
RMBI	NH2	Left	48	1	0.774461
RMBI	NH2	Left	49	i )	0.774461
RMBI	NH2	Left	50	1	0.736252
RMBI	NH2	Left	51	3	0.651886
RMB	NH2	Left	52	6	0,658809
RMBI	NH2	Left	53	3	0.536921
Showing 1 to 70 of 1.	d13 entries			< 1 2	3 142 >

- Step 02: User can press Export, Back to Route, Export to admin DB or Exit button.
  - Press "Back to Route" Button: System will back to before Screen.
  - Press "Export" button: Export file excel.
  - Press "Export to admin DB" button: There is a message "Update is successful"
  - Press "Exit" button: System will back to HomeScreen
- Step 03: Check file output data

### VI.2) Process export data of the type Rut and the type AC ALL

- Step 01: Select distress type "Rutting depth"

Section (1km)		- 2
Route		
Target Region:	RMBI	
Year of PMS dataset:	2017	
Distress Type:	Rutting depth	



1201					
a			_		Snow 10 * entries
Target Region	A Route	Right/Left	КМ	Data number	Epsilon
BM				11338	1
RMB1	NH2	Left	34	1	0.740577
RMB (	NH2	Left	35	3	0.530676
RMB I	NH2	Left	36	1	0.730357
RMB (	NH2	Left	48	1	0.552335
RMB1	NH2	Left	49	4	0.730365
RMB (	NH2	Left	50	1	0.529412
RMBI	NH2	Left	51	3	0.746085
RMB (	NH2	Left	52	6	1.042731
RMBT	NH2	Left	53	3	0.752926
Showing 1 to 10 of 1	.413 entries			1 1 2	3 142 >
			Back to Rout	e Export Expor	t to admin DR Fxit

- Step 02: User can press Export, Back to Route, Export to admin DB or Exit button.
  - Press "Back to Route" Button: System will back to before Screen.
  - Press "Export" button: Export file excel.
  - Press "Export to admin DB" button: There is a message "Update is successful"
  - Press "Exit" button: System will back to HomeScreen
- Step 03: Check file output data

### VI.3) Process export data of the type IRI and the type AC ALL

- Step 01: Select distress type "IRI"

Section (1km)		- 7
Route		
Target Region:	RMBI	
Year of PMS dataset:	2017	
Distress Type:	IRI	- <b>x</b>



Q				5	how 10 + entries
Target Region	A Route	Right/Left	км	Data number	Epsilon
BM				11338	f
RMB (	NH2	Left	34	1	0.93479
RMBI	NH2	Left	35	з	0.945594
RMBI	NH2	Left	36	1	0.934797
RMBI	NH2	Left	48	i i	0.897231
RMBI	NH2	Left	49	1	1.028167
RMBI	NH2	Left	50	1	0.934791
RMBI	NH2	Left	51	3	1.045462
RMBI	NH2	Left	52	6	0.841759
RMBI	NH2	Left	53	3	0.711089
Showing 1 to 10 of 1	1.413 entries			< 1 2	3 _ 142 >

- Step 02: User can press Export, Back to Route, Export to admin DB or Exit button.
  - Press "Back to Route" Button: System will back to before Screen.
  - Press "Export" button: Export file excel.
  - Press "Export to admin DB" button: There is a message "Update is successful"
  - Press "Exit" button: System will back to HomeScreen.
- Step 03: Check file output data

### VII) SHOW HISTORY

- Purpose: View the created process





### The screen displays:

\_

Show history			
Q			
Created at	Target Region	Year	
reated at	▼ Target Region	Year	Progress CAction
017-09-12 11:43:45	RMB I	2017	100% complete View
017-09-12 10:09:55	RMB I	2017	100% complete View
017-09-05 10:17:47	RMB II	2017	100% complete View
017-09-04 10:07:19	RMB II	2017	100% complete View
017-09-01 16:42:17	RMB II	2017	100% complete View
017-09-01 16:42:06	RMBI	2017	0 % View

- Information for functions:
- Search function
  - Step 1: At the "Show history" form, user choose Search function
  - Step 2: Input information to search to properties: Creatd at, Target Region, Year

Show history			-
٩			
Created at	Target Region	Year	
reated at	▼ Target Region	Year	Progress Action
017-09-12 11:43:45	RMB I	2017	100% complete View
117-09-12 10:09:55	RMB I	2017	100% complete View
17-09-05 10:17:47	RMB II	2017	100% complete View
17-09-04 10:07:19	RMB II	2017	100% complete View
017-09-01 16:42:17	RMB II	2017	100% complete View
2017-09-01 16:42:06	RMB I	2017	0 % View

Example: Search information of Target Region is "RMB III"



Show history			
Q, RAVER III			
Created an	Totyon Dayar		
Crwateri as	+ Target Region	Ypar	Progress Action
2017-09-01 16:05:03	RMB III	2017	Die View
2017-08-16 15:36:16	RMBIII	2017	10204 Doctmany Next
Showing 1 to 2 of 2 entries (filtered from 16 total univers)			from t

- Filter function
  - Step 1: At the "Show history" form, user choose Filter function for properties: Created at, Target Region and Year
  - Step 2: Input information to filter

Show history			
٩			
Created at	Target Region	Year	
Created at		Year	Progress Action
2017-09-12 11:43:45	RMB I	2017	100% complete View
2017-09-12 10:09:55	RMB I	2017	100% complete View
2017-09-05 10:17:47	RMB II	2017	100% complete View
2017-09-04 10:07:19	RMB II	2017	100% complete Vrew
2017-09-01 16:42:17	RMB II	2017	100% complete View
2017-09-01 16:42:06	RMBI	2017	0 % View

### Note: User can choose in once information of 3 properties

Example: Filter of "Target region" filed is "RMB II", "Year" field is "2017" and "Created at" is "2017-09-05"

show history			-
α			
2017-09-05	EMB U	2017	
reated at	* Target Region	Year	Progress Action
017-09-05 10:17:47	RMBIN	2017	100% View

- View function
  - Step 1: At the "Show history" form, choose one process to view
  - o Step 2: Choose "View" button



Deterioration > Show histo	ý				
Show history					- 2
Q					
Created at	Target Region		Year		
Created at	▼ Target Region	1. Choose process to view	Year	2 Click "View" button	Action
2017-05-10 09:13:34	RMB II		2017		View
2017-05-10 09:13:11	RMB II	+	2017	0.96	View
2017-05-10 09:02:26	RMB II		2017	0.96	View
2017-05-10 09:01:48	RMB II		2017	0.96	View
2017-05-10 09:01:32	RMB (		2017	0.96	View
2017-05-10 08:48:20	RMB I		2017	0.95	View
2017-05-10 01:48:31	RMB IV		2017	0.96	View
2017-05-10 00:41:49	RMB II		2017	0.96	View
2017-05-10 00:41:39	RMBI		2001	D 96	View

The screen dislay, then user click View button:

cess In	fo											-
Ta	rget Region: RMI	31										
Ye	ar:2017											
ackin	g ratio											
		A	AC .	BS	π	co			1	Total		Condition Bank
	Condition rank	Before	After	Before	After	Before	After	Bef	ore	A	fter	Estimation
r I	C = 0	21409	15390	714	92	1333	1116	23456	10096	16598	70.76%	Ø
	0 < C < 10	0	4734	0	172	0	169	0	096	5075	21.63%	
	10 ≤ C < 20	0	679	0	119	0	24	0	0%	822	3.50%	
	20 ≤ C < 30	0	292	0	90	0	17	0	095	399	1.70%	
	30 ≤ C < 40	0	136	0	70	o	6	0	096	212	0.90%	
	40 ≤ C < 50	Q	96	0	55	0	1	0	096	152	0.64%	<b>N</b>
	C≥50	0	82	D	116	0	0	0	0%	198	0.84%	
7	C ≥ 50	0	82	D	116	0	0	0	096	198	0.84%	

Note: Users can view all the setup but can not edit.

- User click to delete history process. There is a message:

Are you sure to delete?			
		Yes	No

### **VIII) LIST OF EVALUATED REGIONS**

- Purpose: Show successfully running processes
- The user selects the "Deterioration" category and selects the "List of evaluated regions" screen, the display:



PMS			Illia English (US)/- 🗙 🚖
Home Karmuldens SAM. Decentoration Inguiling III	agent Wors stamming		
Home / Deteniora   Start new process			
Show History			
List of Evaluated Regions			- 2
Q			
Year	Targel Region	Uprikazid as	
Year	+ Target Region	Updated at	
2017	RME II	2017-05-07 22:18:11	
Showing 1 to 1 of 1 entries			President 4 desir

⇒ User can view Year, Target Region was successfully evaluated.

## **USER'S MANUAL**

## STRATEGIC BUDGET SIMULATION MODULE



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### **CHAPTER 1: INTRODUCTION**

### I) General

Pavement Management System (hereinafter referred to as "PMS") has been developed under Activity-2: Enhancement of Planning Capacity for Road Information Management of the JICA Project on **Capacity Enhancement in Road Maintenance in Vietnam**. This operation manual is prepared to explain the step-by-step procedure to run the Pavement Management System (PMS). Since PMS is still under development, the operation manual will be updated in parallel with system development and the full-version of operation manual will be finalized together with PMS software.

PMS Dataset, which contains road inventory data, pavement condition data, maintenance history data, traffic volume data and some repair work unit cost, has been formulated to fulfill the requirement of PMS. Since only some specific data are required for PMS, a conversion software is developed to extract data from road database and formulate the PMS dataset in the desired format. The conversion software can run independently from the PMS software. A separate user manual is prepared for conversion software. General flow of pms dataset formulation is illustrated in figure below.

#### **II) Process overview**

### **II.1) Main functions:**

- Setting Budget Simulation Dataset
- Setting Repair Matrix
- Setting Repair Condition
- Setting Scenario
- Show History

### **II.2**) Login to the system



-	User	can	log	in	to	the	system
from	"http	://pm	s.dr	vn.	gov	v.vn'	,

Login	
Username	
Username	4
Password	
Password	
🖌 Remember me	
	-
	Login

- User enter Username and Password
- Remember me: User can tick box Remember me to save login information for later time.
- Login: User can press button Login or press Enter

### **III) HOMESCREEN**

The main screen is the display after successful login. On the main screen displays all the data and functions related to the logged in user, depending on the role and permissions of the login user. Also, user can switch between two languages English and Vietnamese Tieng Viet (VI). Display screen:



			PMS sys
A diama di antico di antic	Detenioration Evaluation About Iteer Manual Start		Budget Simulation About User Manual Start
	Work Planning Abour Lifer Manual		Inputting Bystem About Duer Manual
	Start Display data on the map Atout User Manual	1 Sam	Start



### **CHAPTER 2: BUDGET SIMULATION OPERATION**

#### **I) SETTING BUDGET SIMULATION DATASET**

- ➡ Purpose: Set Year of PMS dataset, Taget Region and Target Route to budget simulation
- **User select menu Budget Simulation**, click on **Start New Process** submenu.

init	
Year of PMS dataset	
Choose year of PMS dataset	*
Target Region	
Selected Regions	
Target Route	
Selected Routes	*

### User select value: Year of PMS dataset, Taget Region and Target Route.

Init			H 7
Year of PMS datase	t		
2017			*
Target Region			
RMB			
Target Route			
Selected Routes			*
Search			
select all			
NH1	NH5	NH38	I HCM
NH2	E NH6	NH38B	NH3_N
NH3	NH10	🔲 NH43	🗐 NH18 (NB - BN)
NH3B	III NH15	NH70	
NH4E	NH18	NH279	



Note: User can select one or more Target Region of the selected Year of PMS dataset. And user can also select one or more Target Route corresponding to the Target Region previously selected by the user.

Budge	t Simulatior	) > Dataset Impo	rt									
Information												-
Targe	et Region: RM	/B.II										
A Targe	Pt Route: NH	I NHR NH1 7R	atan Rridge . N	la Vet Vien Rrid	ee, Run NH1	Tran Hund Da	a St. (Hind)					
MA Voor	of DMC date		azari briuge- n	Bahar way puo	Re- ph-b' vici i	- Hall Hung Da	a pri (HOE)					
Tear	OI PIVIS CIALA	aset, 2017										
ataset Impor	rt											÷
Show first 1	00 rows											
itest_Cracking	Latest_Rutting_m	Latest_Condition_	Section_Length	Pavement_Width	Latest_Pavement	Road_Category_II	Road_Class_ID	TV_Total TV_Heavy	Jurisdiction_Code	Route_ID	det_no_c	det_no_
ntest_Cracking <u>*</u> 00	Latest_Rutting_m 21.00	Latest_Condition_ 2016	Section_Length	Pavement_Width 3.50	Latest_Pavement	Road_Category_II	Road_Class_ID 3	TV_Total TV_Heavy 12972.85	Jurisdiction_Code	Route_ID 201001000	det_no_c 1	det_no_
atest_Crackin <u>¢</u> .00 .00	Latest_Rutting_m 21.00 17.00	Latest_Condition_ 2016 2016	Section_Length 100 85	Pavement_Width 3.50 3.50	Latest_Pavement	Road_Category_II 1 1	Road_Class_ID 3 3	TV_Total         TV_Heavy           12972.85         12972.89	Jurisdiction_Code	Route_ID 201001000 201001000	det_no_c 1 1	det_no_ 1 1
atest_Crackin <u>d</u> 00 00 00	Latest_Rutting_m 21.00 17.00 22.00	Latest_Condition_ 2016 2016 2016	Section_Length 100 85 100	Pavement_Width 3.50 3.50 3.50	Latest_Pavement	Road_Category_II	Road_Class_ID 3 3 3	TV_Total         TV_Heavy           12972.85         12972.89           12982.96         12982.96	Jurisdiction_Code 20 20 20	Route_ID 201001000 201001000 201001000	det_no_c 1 1 1	det_no_ 1 1 1
atest_Cracking 00 00 00 00	Latest_Rutting_m 21.00 17.00 22.00 17.00	Latest_Condition_ 2016 2016 2016 2016 2016	Section_Length 100 85 100 100	Pavement_Width 3.50 3.50 3.50 3.50 3.50	Latest_Pavement	Road_Category_II 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	Road_Class_ID 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3	TV_Total         TV_Heavy           12972.85         12972.89           12982.96         12983.00	Jurisdiction_Code 20 20 20 20 20	Route_ID 201001000 201001000 201001000 201001000	det_no_c 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	det_no_ 1 1 1 1
atest_Cracking 00 00 00 00 00	Latest_Rutting_m 21.00 17.00 22.00 17.00 8.00	Latest_Condition_ 2016 2016 2016 2016 2016 2016	Section_Length 100 85 100 100 100	Pavement_Width 3.50 3.50 3.50 3.50 3.50 3.50	Latest_Pavement 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	Road_Category_II 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	Road_Class_ID 3 3 3 3 3 3 3	TV_Total         TV_Heavy           12972.85         12972.89           12982.96         12983.00           12983.03         12983.01	Jurisdiction_Code           20           20           20           20           20           20           20           20           20           20           20           20           20	Route_ID 201001000 201001000 201001000 201001000 201001000	det_no_c 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	det_no_ 1 1 1 1 1 1
ttest_Cracking 00 00 00 00 00 00 00	Latest_Rutting_m 21.00 17.00 22.00 17.00 8.00 7.00	Latest_Condition_ 2016 2016 2016 2016 2016 2016 2016	Section_Length 100 85 100 100 100 100 100 100	Pavement_Width 3.50 3.50 3.50 3.50 3.50 3.50 3.50	Latest_Pavement 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	Road_Category_II 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	Road_Class_JD 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3	TV_Total         TV_Heavy           12972.85         12972.89           12982.96         12983.00           12983.03         12983.06	Jurisdiction_Code           20	Route_D 201001000 201001000 201001000 201001000 201001000 201001000	det_no_c 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	det_no_ 1 1 1 1 1 1 1 1
ttest_Cracking 00 00 00 00 00 00 00 00	Latest_Rutting_m 21.00 17.00 22.00 17.00 8.00 7.00 7.00	Latest_Condition_ 2016 2016 2016 2016 2016 2016 2016 2016	Section_Length 100 85 100 100 100 100 100 100 100 100 100 10	Pavement_Width 3.50 3.50 3.50 3.50 3.50 3.50 3.50 3.50	Latest_Pavement 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	Road_Category_II 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	Road_Class_ID 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3	TV_Total         TV_Heavy           12972.85         12972.89           12982.96         12983.00           12983.03         12983.06           12983.10         12983.10	Jurisdiction_Code 20 20 20 20 20 20 20 20 20	Route_ID           201001000           201001000           201001000           201001000           201001000           201001000           201001000           201001000           201001000           201001000           201001000	det_no_c 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	det_no_ 1 1 1 1 1 1 1 1 1 1
ttest_Cracking 00 00 00 00 00 00 00 00 00 00	Latest_Rutling_m 21.00 17.00 22.00 17.00 8.00 7.00 7.00 8.00	Latest_Condition_ 2016 2016 2016 2016 2016 2016 2016 2016	Section_Length 100 85 100 100 100 100 100 100 100 100 100 10	Pavement_Width 3.50 3.50 3.50 3.50 3.50 3.50 3.50 3.50	Latest_Pavement 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	Road_Category_II 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	Road_Class_ID 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3	TV_Total         TV_Heavy           12972.85         12972.89           12982.96         12983.00           12983.00         12983.00           12983.00         12983.00           12983.01         12983.00           12983.02         12983.00           12983.10         12983.13	Jurisdiction_Code 20 20 20 20 20 20 20 20 20 20	Route_ID           201001000           201001000           201001000           201001000           201001000           201001000           201001000           201001000           201001000           201001000           201001000           201001000           201001000           201001000	det_no_c 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	det_no_ 1 1 1 1 1 1 1 1 1 1 1
atest_Cracking .00 .00 .00 .00 .00 .00 .00 .0	Latest_Rutling_m 21.00 17.00 22.00 17.00 8.00 7.00 8.00 6.00	Latest_Condition_ 2016 2016 2016 2016 2016 2016 2016 2016	Section_Length 100 85 100 100 100 100 100 100 100 100 100 10	Pavement_Width 3.50 3.50 3.50 3.50 3.50 3.50 3.50 3.50	Latest_Pavement 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	Road_Category_II 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	Road_Class_JD 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3	TV_Total         TV_Heavy           12972 85	Jurisdiction_Code 20 20 20 20 20 20 20 20 20 20 20 20	Route_JD           201001000           201001000           201001000           201001000           201001000           201001000           201001000           201001000           201001000           201001000           201001000           201001000           201001000           201001000	det_no_c 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	det_no_ 1 1 1 1 1 1 1 1 1 1 1 1 1

↓ User can view data in table, then click on Next button.

### **II) SETTING REPAIR MATRIX**

- ↓ Purpose: Select repair matrix to budget simulation
- ↓ After the data set up process, the system swithes to the Repair matrix screen



Formulate PMS Deterioration	Budget Simulation	Work planning.				
Budget Simulation > Repair Matri	<					
ormation						
Target Region: RMB II						
Target Route: NHT						
Year of PMS dataset: 2017						
						Check Unit Cost
atrix parameters	N	Natrix parameters				
ad Category		Hump Cutting (<30mm)	100	Crack Sealing	1	Hump Cutting + Crack Seal
Please select an item	~				1	
ad Class	_	Very Thin Overlay (micro-surfacing)	100	Very Thin Overlay (TL 2000)	1000	Hump Cutting + Very Thin Overlay (MS)
Please select an item	*	Hump Cutting + Very Thin Overlay (TL2000)		Cut Surface Course and Replacement		Cut Surface Course and Replacement
vement Type	-			(**mm)		(120mm)
AC	~	Cut Surface Course and Replacement		Cut Surface Course and Replacement		Single Bitiminous Surface Treatement (DBST)
Remove customzation and back to default n	natrix	(70mm)		(50mm)	-	
						Double Bitiminous Surface Treatement (DBST)
		Triple Bitiminous Surface Treatement (TBST)	-	Repair of Macadam of 10cm thick and TBST		Repair of Macadam of 15cm thick and TBST
			1000	Localized Papair (2)	100	Penlacement of Concrete Slabs 22cm thick

Description:

- Information form: Information on the Target Region, Target Route and Year of PMS dataset that the user selected in the Init step.
- "Check Unit Cost": User click "Check Unit Cost" link to view information detail for repair method (Repair Method Name, Pavement Type, Unit Cost, Repair Classification)
- Matrix parameters form: Include information
  - Road category: Exp and NH

Road Category	
Please select an item	~
Please select an item	
Please select an item Exp	

Road class: Class I, Class II, Class III, Class IV, Class V, Class VI
 Road Class

Please select an item	~
Please select an item	
Class I	
Class II	
Class III	
Class IV	



Note:

- As for "Road category" Exp have only 4 types of "Road class": Class I, Class II, Class III, Class IV
- As for "Road category" NH have 6 types "Road class": Class I, Class II, Class III, Class IV, Class V, Class VI.
- o Pavement Type: AC, BST, CC

Pavement Type

AC	~
AC	
BST	
CC	

• Repair methods: Are the repair methods of the system. Each repair method is set up with a default color.

atrix parameters		
Hump Milling 30 and Cracking	Crack Sealing - A (30%)	Crack Sealing - A (40%)
Crack Sealing - A (50%)	Crack Sealing - A (60%)	Micro Surfacing - II
Micro Surfacing - (i)	TL2000 - Dressing	Micro Surfacing (Type II) and Crack Sealing
Micro-Surfacing (Type III) and Crack Sealing	TL2000 - Dressing & Crack Sealing	Hump Milling & Micro Surfacing (Type II)
Hump Milling & Micro Surfacing (Type (!!)	Hump Milling & TL2000-Dressing	Hump Milling & Crack Sealing & Micro Surfacing (Type II)
Hump Milling & Crack Sealing & Micro Surfacing (Type III)	Hump Milling & TL2000-(Crack Sealing & Dressing)	AC Overlaying (3cm)
	AC Overlaying (4cm)	AC Overlaying (5cm)
AC Overlaying (6cm)	AC Overlaying (7cm)	Cut Surface Course and Replacement (Scm)
Cut Surface Course and Replacement (7cm)	Cut Surface Course and Replacement (12cm)	Surface Recycling & Overlaying
Deep Recycling & Overlaying	Cut & Replacement (Fuli Structure)	

- ↓ Operation steps: "Matrix parameters" Form
  - Step 1: Choose Road category
  - Step 2: Choose Road Class
  - Step 3: Choose Pavement type
  - Step 4: Choose the corresponding repair method for each cell in the repair matrix
    - Choose the cell in the matrix that needs to change the repair method
    - Click cell is selected, showing the corresponding repair methods to change
    - Choose the repair method that need to be changed for the selected cell



• Step 5: Click "Next to the Repair Condition setup step" button to complete the setup and go to the "*Repair condition*" screen



=> Also:

- User can click "Remove customization and back to default matrix" in the "Matrix parameters" form to return the default matrix.
- User can press "Back to Dataset Import" button to return to the "Dataset import" (Data table)

# Note: Depending on the "Pavement type" (AC, BST, CC), there are separate repair methods.

### **III) SETTING REPAIR CONDITION**

Purpose: Set parameters to simulate budget for Target Region, Target Route that need repairs and maintenance.



PMS	📟 English (US) 🗸 🕺 🚍
C Home / BudgetSimulation / Start new process	
Budget Simulation > Reparcondition	
Information - /	Repair Condition – .
1 Target Region: RMB	Simulation
A Target Route: NH1	Simulation term 30 w
H Year OL PMIS Galaset: 301	Simulation times 100 ~
	Such to Repair routin. Front to Sequality

Description:

- Information form: Information on the Target Region, Target Route and Year of PMS dataset that the user selected in the Init step.
- Repair condition form: Set repair condition including: Simulation term and simulation times
  - Simulation term: 10, 20, 30, 40 and 50 (30 is value default)

Repair Condition		- /
Simulation		
Simulation term	30	~
	1	Q
Simulation times	10 20	
	30	
	40 50	

- Simulation times: 10, 100, 1000 and 10000 (100 is value default)



Repair Condition		- 2
Simulation		
Simulation term	30	~
Simulation times	100	~
	1	Q
	10	
	100	
	1000	

- ↓ Operation steps: "Repair condition" form
  - Step 1: Choose Simulation term
  - Step 2: Choose Simulation times
  - Step 3: Click the "Next to Scenario" button to complete and switch to the "Scenario" screen or press the "Back to Repair Matrix" button to return to the "*Repair matrix*" screen

Repair Condition			- /
Simulation			
Simulation term	30	1	Ŷ
Simulation times	100	2	*
		Back to Repair r	natrix Next to Scenario

#### **IV) SETTING SCENARIO**

♣ Purpose: Set scenarios for Target Region, Target Route that need repairs and maintances



Process Information		Scenario	- 2
Target Region: MR		Scenario	
Target Route: NH1 How		Scenario 0	1
Wear of PMS dataset: 2017		Non constraint	
	Check Unit Cost 🔶		Evener
			EXECUTE
Ourout			
Cost & Risk / Repair Length			
Condition Transition			

Description:

- Scenario form: Show scenarios of the system including: Scenario 0, Scenario 1, Scenario 2 and Scenario 3.
  - Scenario 0: There are no budget constraint scenario
  - Scenario 1: has budget constraint (user enters the budget constraint) (Unit: Billion VND)
  - Scenario 2: Scenario taking the current risk level
  - Scenario 3: has target risk level constraint (user enters the target risk level) (Unit: %)
- Output Form: Displays the result (in graphical form) after the user performs the selected scenario, divided into two parts:
  - Cost & Risk/ Repair length: Which is devied 2 charts: Cost & Risk chart and Repair length chart
  - Condition transition: Which iss devied 2 charts: Crack condition chart and Rutt condition chart.

**4** Operation steps:

- For Scenario 0
  - Step 1: In the "Scenario" form select Scenario 0
  - Step 2: Click the "Execute" button to view the results of the repair scenario (dislayed in the Output form)


2 Execute

#### $\Rightarrow$ Results:



# **Description:**

• For Cost & Risk chart







risk indicates Risk and Routine Maintenance, ... are indicative of the repair classification

Routine Maintenance Periodic Maintenance - Medium Periodic Maintenance - Big

- The vertical column on the left side of the graph represents the Cost (Billion VND).
- The vertical column on the right side of the graph represents the degree of Risk (%).
- The horizontal line below the graph represents Year





• For Repair length chart





- Routine Maintenance, ... are indicative of the repair classification

Routine Maintenance Periodic Maintenance - Medium Periodic Maintenance - Big

- The vertical column on the left side of the graph represents the Repair lenght (km).
- The horizontal line below the graph represents Year





# • For Crack condition chart



- Colors are indicative Condition rank of cracking ratio, example: C>=50,  $40 \le C \le 50...$ 





- Colors are indicative Condition rank of rutting depth, example: R>=50,  $40 \le R \le 50...$
- User click "Export" to export data (excel file) or click "Back to Condition Setup" to back Repair condition screen
- For Scenario 1
  - Step 1: In the "Scenario" form select Scenario 1
  - Srep 2: Input "Budget constraint (Billion VND)"
  - Step 3: Click the "Execute" button to view the results of the repair scenario (dislayed in the Ouput form)

Scenario	- 7
Scenario	
Scenario 1 1	*
Budget constraint (Billion VND)	
20000 2	
	3 Execute



The Project for Capacity Enhancement in Road Maintenance in Viet Nam Phase II

#### Note: Budget constraint (Billion VND) is an integer type and must be at least 1

#### $\Rightarrow$ Results:



Note: Display data comments for each chart are analyzed as in the "<u>Description</u>" section of Scenario 0.

- User click "Export" to export data (excel file) or click "Back to Condition Setup" to back Repair condition screen
- For Scenario 2
  - Step 1: In the "Scenario" form select Scenario 2
  - Step 2: Click the "Execute" button to view the results of the repair scenario (dislayed in the Output form)



Scenario	
Scenario 2 1	
Use currient risk level 104	

#### $\Rightarrow$ Results:



# Note: Display data comments for each chart are analyzed as in the "<u>Description</u>" section of Scenario 0.



- User click "Export" to export data (excel file) or click "Back to Condition Setup" to back Repair condition screen
- For Scenario 3
  - Step 1: In the "Scenario" form select Scenario 3
  - Step 2: Input "Target Risk Level (%)"
  - Step 3: Click the "Execute" button to view the results of the repair scenario (dislayed in the Output form)

Scenario		
Scenario		
Scenario 3	1	
Farget Risk Level (9	6)	
5.00	2	
		3 Exe

Note: The Target Risk Level (%) is between 0 and 100

 $\Rightarrow$  Results:



The Project for Capacity Enhancement in Road Maintenance in Viet Nam Phase II



Note: Display data comments for each chart are analyzed as in the "<u>Description</u>" section of Scenario 0.

• User click "Export" to export data (excel file) or click "Back to Condition Setup" to back Repair condition screen

# V) SHOW HISTORY

↓ Purpose: View history the created process

User choose menu "Budget Simulation" and choose "Show History" function

PMS					
A Home	Formulate PMS Dataset	Deterioration	Inputting System	Budget Simulation	Work planning
8 Но	me / Budget S	Simulation 7	Start new proce	🕨 Start Ne	w Process
				ວ Show Hi	story



Screen after choose "Show History" function:

iteria i	Extraction MS Datase	Hannan Bern Anton Bernarden mer Bacteri						
S 0ome	/ Budget	Simulation / Show history						
Bud	lget Sir	nLiJațiOn > show history						
History of	Budget P	rocess						- 2
9,								
Deep	Factor	Farger Nume	Teitt					
Created +	Target Region	Target Route	Year of PMS dataset	Progress scenario 0	Progress scenario 1	Progress scenario 2	Progress scenario 1	Action
2017: 09-12 12:24:51	RM61II	NHL JICH	2017	0.8	0 %	a a.	<i>u</i> =	Ven
2017- 09-12 09:15:48	RMB //	NH1, NH10, HCM, NH45, NH45C, NH45K, NH46S, NH46B, NH46B, NH12C, NH9, NH12C, NH9, NH48, Link (Ngh Son Bors - HCM, HCM - West Barran, HCM-East Branch, NH1 (Baan Bridge - Yaguyet Vien Bridge - Byn, NH1 - CH Rouce (Ihanh Hea) NH1 - Ny Anh Bynas, CLI - Smith Bynars, CLI - Smith Bynas, NLI - Stan Alprana, NH1 - Tan Hung Dala Si (Yue), NH1 - HUe Clip Oppeas, NH1 - Approaching branch to Hai Van turnet, NH1 - Fihler Luong Vestige Byness, NH1 Ng Anh Si - Odi rouze	2017	106	£4	e	4.6	View
2017- 09-12 09:03:52	RMBI	NH1, NH10, HCM, NH35, NH35C, NH7, NH36, NH35B, NH8, NH12C, NH9, NH19, Link (NgH Sun Pars-HCM), HCM- Wen Branch, HCM East Branch, NH1 (Brann Bridge: Jopuyer live Bridge: Byn, NH1 - Old Router (Thanh Hoa), NH1 - Ny JAH Sypess, QL9 - North Sypess, QL9 - South Sypess, NH17 - Sale Approach, NH1 - Train Hoag, NH1 (Aght eA), Old router NH1 (Aght eA), Old router	2017	1009 arridem	1004	0.14	5.4	View.
2017- 09-06 15:58-20	RMBII	Nett	2017	1009	1007	1075.	ian open	View

# ♣ Operation steps:

• Filter information to search by properties: Created at, Target Region, Target Route, Year of PMS dataset

itoria B Home	Formanian MS Dauean / Budget	Hannin Bernander Hanne Hannen					_	
Bud	lget Sir	nLilation > Show History						
History of	Budget P	rocess						- 2
Q.								
Dies-	99	far get Route	Yeat					
Created +	Target Region	Larget Bours	Year of PMS dataset	Progress scenario 0	Progressi scenario 1	Progress scenario 2	Progress stenario 1	Action
2017: 09-12 12:24:51	9M61II	KHT, ICM	2017	0.8		a e.	0 m	View
2017- 09-12 09:15:48	AMBH	AH1, NP10, HCM, NM45, NH45C, NH45C, NH45S, NH46S, NH45S, NH12C, NH9, NH40, Link (Ngh Son Porc - HCM, HCM- West Barrat, HCM-bast Branch, NH1 (Baan Bradge - Yaguye Vien Bradge - Byp, NH1 - Old Kuce (Thanh Heat NH1 - Ny Anh Synass, Q10, "One HS garas, Q10," South Byp ass NH7. San Approach, NH1 - Tan Hung Dadi St. (Hue), NH1 - Hue Chy Dypass, NH1 - Approaching branch to Nai Van turnet, NH1 - Hen Luong Vestige Bypass, NH1 (Ngh Han) - Old youe	2017	109. 000.00	¥.4.	0	4.6	Vien
2017- 09-12 09:03:52	RMBII	NH1, NH10, HCM, NH45, NH46C, NH7, NH46, NH46B, NH46B, NH12C, NH9, NH19, Link (NgH Sun Pars-HCM), HCM- West Branch, HCN, Bast Branch, H41 (Brann Bradge, Jopuyer Hen Bradge, Byn, NH1. Old Rutter (Thanh Hoa), NH1 - Ny, Am Spass, QLB - North Dynass, QLB - South Bynass, NH17. Sea Approach, NH1 - Trai Hang Dao Sc. (Hue), NH1 - Hue Cry Bynass, NH1 - Approaching branch to Hai Van turnel, NH1 - Hien Lurong Vedige Bynass, NH1 (Aght en A), Old rouze.	2017	100% Jorkies	10045	0.14	0 W	Vienwe
2017- 09-06 15:58-20	RMBII	THM .	2017	1000	107	1075.	1000	View

Example: Search for Created at is "2017 -09-06" and Year of PMS dataset is "2017"

Formulation Ivenue BAS Dataset		Acet Increment						
S Home / BudgerSimul	econ / Show history							
Budget Simula	ation's > show history							
History of Budget Proces	5							- 2
Q.								
2017.05.06	Target Region	Tayger Res are	2017					
Created at	🐨 Tärger Ragion	Target Route	Year of PMS dataset	Progress scenario 0	Progress szenario 1	Progress scenario 2	Progress scenario 1	Action
2017-89-06 75:58:20	RMEI	NHT	2017	1006	eus 100% oversome	100%	100%	VICW
2017-09-06 11:16:38	RMBIN	NHT	2017	100%	0.66	0 %	σ 44	Viete
2017-09-06 10;39:15	RMB II	RH1	2017	1094	2.6.	ę e	15	View
Showing 1 on 3 of 3 entries	(filtered from 12 social entries)						Carrier	1 me

• View function:

-



- Step 1: In the "History of Budget Process" form, choose one process to view
- Step 2: Choose View button

History of Budget Proce	ess								-
۹									
Created At				Year of PMS dataset					
Greated At	Target Region	Target Route		Year of PMS dataset	Progress scenario 0	Progress scenario 1	Progress scenario 2	Progress scenario 3	Action
2017-05-10 01:48:46	RMB II	NH1		2017	25%	0 %	0 %	0.16	View Delete
2017-05-10 00;20:09	RMB (I	NH10		2017	25%	0_96	0.%	0.96	View Delete
017-05-10 00:13:33	RMB II	NH1		2017	25%	0.96	0 %	0 **	View Delete
017-05-10 00:13:10	RMB II	NH1		2017	25%	Q 96	0.%	0.96	View Delete
017-05-10 00:12:57	RMBII	NH12C, NH9, NH49	1. Choose one process to view	2017	25%	0.96	2. Click View	0.%	View Delete
017-05-10 00:12:36	RMB II	NH12C, NH9, NH49	+	2017	25%	0.96	L	~	View Delete
317-05-09 17:42:13	RMB II	NH1		2017	100% complete	100% complete	100% complete	100% complete	View

# $\Rightarrow$ The screen displays: Scenario screen

Process Information	- 2	ş	cenario	-
Target Region: BMB		5	cenario	
A Target Route: NH1			Scena	ano 0
Year of PMS dataset: 2017			into umbit	prolim
	Check Unit Cost 🛓			
itout.				
est P. Dials / Descriptionship				
ist & Risk / Repair Length				
20 Cost and Risk	100%		50	Repair length
-	90%		45	
-25	80%		40	
20	70%		35	
	60%	TAND	90 0	
15	50% 🙀	pair len	25	
10	40%	Re	15	
	20%		10	*
` <b>\</b>	10%		5	

# Note: Users can view all the settings but can not edit them.

- Delete function
  - Step 1: In the "History of Budget Process" form, choose one process to delete
  - Step 2: Click Delete button
  - Step 3: Choose OK of popup

# Note: Show the Delete button for processes that ran 1 month ago



History of Budget Pro	cess.							
٩								
Created AJ			Year-of PMS dataset					
Created At	* Target Region	Target Route	Year of PMS dataset	Progress scenaria 0	Progress scenario 1	Progress scenario 2	Progress scenario 3	Action
2017-05-10 01:48:46	RME II	NH1 1. Choose one process to delete	2017	25%	0.4	o e 2 Carl	0.% k Delete	Delete
2017-05-10 00:20:09	RME II	NHID	2017	25%	0.46	0 10		Without Delete
2017-05-10 00:13:33	RMB II	NH1	2017	25%	D-%	0.0	0 *	View
2017-05-10 00:13:10	RMB II.	NHT	2017	25%	pms.ssgal	.com:8080 says:		
017-05-10 00:12:57	RMB 0	NH12C, NH9, NH48	2017	25%	Are you sure	k button OK	ок	Cancel
017-05-10 00:12:36	RMB II	NH12C, NH9, NH49	2017	25		10		Delete
017-05-09 17:42:13	RMRII	NH1	2017	100ia mensie	v sóon completi	100% tempe	n 100% nample	- Vere

# **USER'S MANUAL**

# **REPAIR WORK PLANNING MODULE**



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# **CHAPTER 1: INTRODUCTION**

# I) General

Pavement Management System (hereinafter referred to as "PMS") has been developed under Activity-2: Enhancement of Planning Capacity for Road Information Management of the JICA Project on **Capacity Enhancement in Road Maintenance in Vietnam**. This operation manual is prepared to explain the step-by-step procedure to run the Pavement Management System (PMS). Since PMS is still under development, the operation manual will be updated in parallel with system development and the full-version of operation manual will be finalized together with PMS software.

PMS Dataset, which contains road inventory data, pavement condition data, maintenance history data, traffic volume data and some repair work unit cost, has been formulated to fulfill the requirement of PMS. Since only some specific data are required for PMS, a conversion software is developed to extract data from road database and formulate the PMS dataset in the desired format. The conversion software can run independently from the PMS software. A separate user manual is prepared for conversion software. General flow of pms dataset formulation is illustrated in figure below.

#### **II) Process overview**

### **II.1) Main functions:**

- Initial step
- Dataset import
- Select base planning step
- Forecasting index
- Setting repair matrix
- Setting repair condition
- Formulate annual
- Repair planning for 5 years
- Proposal list
- Final list
- Show History

# **II.2**) Login to the system



-	User	can	log	in	to	the	system
from	"http:	://pm	s.dr	vn.	gov	vn"	,

4
A
Login

- User enter Username and Password
- Remember me: User can tick box Remember me to save login information for later time.
- Login: User can press button Login or press Enter

# **III) HOMESCREEN**

The main screen is the display after successful login. On the main screen displays all the data and functions related to the logged in user, depending on the role and permissions of the login user. Also, screen can switch between two languages English and Vietnamese Tieng Viet (VI). Display screen:



Home	_		PMS sys
0 1 10 20 21 0 1 10 10 10 20 0 1 10 10 10 10 10 0 1 10 10 10 10 10 0 10 10 10 10 10 10 0 10 10 10 10 10 10 0 10 10 10 10 10 10 10 0 10 10 10 10 10 10 10 10 10 10 10 10 10	Detenoration Evaluation About Idser Manual Start		Budget Simulation About Unixer Manual Start
	Work Planning About: User Manual		Inputting System About Libur Manual
	Display data on the map Atrout User Manual	and some	Start
	start		



# **CHAPTER 2: WORK PLANNING OPERATION**

#### I) INITIAL STEP

- 4 Purpose: Select Target PMS Dataset, Target Region to be repaired
- User select menu Work planning, click on Start New Process submenu.

		English (UST ~ 🛛 🗙
Formular PMS Demonstration Visuations Bodget	Hitti pustong	
ome. / Work planning / Start new process		
Nork planning - Initial Step		
Information for Process	- /	
it PMS Dataset		
ose year of dataset	×	
erent Reports	*	
	- Impret Migdale Dataset	
4		
User select value:	Target PMS dataset, Taget Region.	
Work planning.	- Level Court	
• work planning>	> Initial Step	
		1.54
nitial Information for Proce	255	-
Year of PMS dataset		
2017		
Target Region		
Target Region		
Target Region RMB III search		7
Target Region RMB III search select all		
Target Region RMB /// search select all RMB (	RMB III	7
Target Region RMB III search select all RMB I	RMB III	
Target Region RMB III search select all RMB I	RMB III	7
Target Region RMB /// search select all RMB (	RMB III	7

Note: User can select one or more Target Region of the selected Year of PMS dataset.

Import Module Dataset

button, display "Dataset import" screen

#### **II) DATASET IMPORT**

 $\downarrow$  Then click on

- ↓ Purpose: Show data list valid sections and invalid sections
- 4 After the data initial set process, the system swithes to the Dataset import screen



551	ntormation												
(e	irget Regio ear of PMS	n: RMB III dataset	2017										
11	ist												
1.5	ections Inva	did Socialions											
												DI	splay Ite
	AB ~	All ~	AII V	Epostnuction Vein	Eram im	exom m	To km	e m aT	0		All ~	All ~	
	Route Name	Branch No	Road Class	Construction Year	From lun	From m	To km	To m	Lengh, m	Number of Lanes	Direction	Pavement Type	Width
į	HCM-East Branch	00	Class III	2004	1325	400	1325	500	100	2	Right	AC	3.50
	HCM East Branch	00	Class III	2004	1351	300	1351	400	100	2	Left	QĈ	3:60
	HCM-East Branch	00	Class III	2004	1352	200	1352	300	100	2	Left	cc	3.50
	HCM-East Branch	00	Class III	2004	1352	100	1352	200	100	2	Lefi	cc	3.50
2	HCM East Branch	00	Class III	2004	1362	Ū.	1352	100	100	2	Loff	CC	3 50
	HCM-East Branch	00	Class III	2004	1353	600	1353	700	100	2	Left	cc	3.50
	HCM-East Branch	00	Class III	2004	1353	500	1353	600	100	2	Left	cc	3.50
	HCM-East Branch	-00	Class Ili	2004	1353	400	1353	500	100	5	1.68	CC.	3.50
	HCM-East Branch	00	Class III	2004	1353	300	1353	400	100	2	Left	cc	3.50
	HCM-East Branch	00	Class III	2004	1353	200	1353	300	100	2	Left	cc	3.50
ŀ	HCM East Branch	00	Class III	2004	1353	100	1353	200	100	2	Loft	CC	3.50
Ē	HCM-East Branch	00	Class III	2004	1353	0	1353	100	115	2	Left	cc	3.50
	HCM-East Branch	00	Class III	2004	1352	500	1352	1000	100	2	Lett	cc	3.50
	HCM-East Branch	00	Classi III	2004	1352	800	1362	900	100	2	Left	CC.	3.60
	HCM-East Branch	00	Class III	2004	1352	700	1352	800	100	2	Left	cc	3.50
	HCM East Branch	00	Class III	2004	1350	200	1350	300	100	2	Loff	CC	3.50
	HCM-East Branch	00	Class III	2004	1350	0	1350	100	115	2	Left	cc	3.50
	HCM-East Branch	00	Class III	2004	1354	900	1354	1000	90	2	Left	cc	3.50
hav	vina 1 to 50 of 1	5. THI antidaz								Denver		5 3	15

Description:

- ↓ Information form: Information on the Target Region and Target PMS Dataset Year that the user selected in the Init step.
- Section List form: Include 2 tab: Valid Sections and Invalid Sections ("Valid Sections" is default tab)
  - Information for Section: Route Name, Branch No, Road Class, Contruction Year, From km, From m, To km, To m, Length (m), Number of Lanes, Direction, Pavament Type, Width (m)
  - "Valid Sections" Tab: Show valid sections to work planning.

# **Information for Functions**:

• Filter function



- Step 1: At the "Valid Sections", choose Filter function
- Step 2: Input information to Filter

tion L	lon Use													
	41	44	AII	Communication Server	Control (m)	0 Common	6. The	0	0		All	- A1	Display Item	
	Route Name	Branch No	Road Class	Construction Year	From km	From m	To km	Tom	Lengh, m	Number of Lanes	Up Or Down	Pavement Type	Width,m	
0	NH1	00	Class III	2014	1851	0	1851	100	100	4	Lett	AC	3.75	
0	NH1	00	Class III	2004	.2147	500	2147	800	100	2	Right	AC	3.50	
0	NHI	00	Class III	2004	2148	400	2148	500	100	2	Right	AC	3,50	
0	NH1	00	Class III	2004	.2148	300	2148	400.	100	2	Right	AC	3,50	
0	NH1	00	Class III	2004	2148	200	2148	300	100	2	Right	AC	3.50	
0	NH1	00	Class III	2004	2148	100	2148	200	115	2	Right	AC	3.50	
0	NH1	00	Class III	2004	2148	ů.	2148	100	200	2	Right	AC	3.50	

Example: Search sections have Construction Year data "2015"

# $\Rightarrow$ Results: 2 valid records with search data

													Daplay Item
	All	- Al -	At	- 20.0	Ramke	9 France	ø	<b>9</b> Sm	0		AF -	AR	<u>,</u>
	Route Name	· Uranch No	Road Class	Construction Year	From Am	Fram m.	To km	foe	Lengh, m	Number of Lines	Up Gr Down	Pavement Type	Watth, co
0	NH27	80	12594.00	2018	192	800	196	MUD:	80	*	Late	ě0	3.60
0	10427	100	(11698) (P)	2018	130	000	125	1000	ed	2	alges	AC	3:50

# • Display Item function

- Step 1: At the "Valid Sections", click "Display Item" button
- Step 2: Setup columns to view/hide

									1. Choose	"Display Item"	-	Display Ite
	All	All	All 🗸	Construction Year	Prom kno	Francism	O Ta kan	e Tam	Ð		All 🗸	A Route Name
	Route Name	Branch No	Road Class	Construction Year	From km	From m	To km	Tom	Lengh, m	Number of Lanes	Direction	Branch No Re Road Class
0	HCM-East Branch	00	Class III	2004	1325	400	1325	500	100	2	Right	A Construction Ye From km
0	HCM-East Branch	00	Class III	2004	1351	300	1351	40 2. Ch	ioose field to view/	nide	left	e From m To km
0	HCM-East Branch	00	Class III	2004	1352	200	1352	300	100	2	Left	C To m Lengh, m
0	HCM-East Branch	00	Class III	2004	1352	100	1352	200	100	2	Left	Number of Lane
0	HCM-East Branch	00	Class III	2004	1352	0	1352	100	100	2	Left	<sup>C</sup> Width,m
0	HCM-East Branch	00	Class III	2004	1351	900	1351	1000	95	2	Left	CC 3.50

- o View Information Detail Section function
  - Step 1: At the "Valid Sections", choose section to view information detail
  - Step 2: Click to view information detail: Latest Repair, Traffic Volume, Result of Pavement Condition Survey



	2. Clic	€n+n		1			1. (	Choose Sect	tion to view detail	_									Di	splay Item
Γ	All		All		AII -	Construction Year	<b>9</b> Fr	inal ma	• From m	•	To km	0	Tom	0			All •	All	v	
	Route Name	*	Branch No	R	oad Class	Construction Year	Fro	n km	From m		To km		To m		Lengh, m	Number of Lanes	Direction	Paver	nent Type	Width,m
þ	HCM-East Branch		00	¢	lass III	2004	132	15	400		1325		500		100	2	Right	AC		3.50
0	HCM-East Branch		00	C	lass III	2004	135	1	300		1351		400		100	2	Left	cc		3.50
•	HCM-East Branch	9	00	¢	lass (()	2004	13	51	300		1351	1	400		100	2	Left	CC		3.50
Late	est Repair							Traffic Volume	a					Re	sult Of Pave	ment Condition Surv	ey			
N	ame					Value		Name				Value		N	ame				Value	
L	atest Repair					Ţ.		Traffic Surve	ey Year					S	urveyed Ye	ar/Month			2016/3	
R	lepair Categor	y						Total Traffic	Volume			0.00		S	urveyed La	ne			1	
R	epair Classifie	ation						Heavy Traff	ic Volume			0.00		F	avement Ty	pe			CC.	
P	avement Thic	kness												Ċ	rack,%				6.90	
														P	atching,%				0.00	
														F	othole,%				0.00	
														Т	otal,%				6.90	
														Ň	lāx,mm				19.00	
														A	verage.mm				5.00	
														H	RI.mm/m				5.00	
														ň	ICI				6.68	

• "Invalid Sections" tab: Show invalid sections (the color parameter is an indication of what the segment data is invalid: Road Class is invalid, IRI value is invalid, Cracking is invalid, Pavement Type value is invalid and Rutting value is invalid)

id Sections Invalid Sections	_			Sector Street	
Road Class is invalid	Crackin	g is invalid		Rutting value is invalid	
IRI value is invalid	Paveme	ent Type value is invalid			
a,					Display Ite
Route Name A Branch Name Road Cl	ass Construction Year From km	From m To km To m	Lengh, m Number Of Lanes	Up Or Down Pavement Type	Width,m Erro
		No data available in table			

# Note: The functions of "Invalid sections" corresponding operation as "Valid Section"

User click "Next to Select Base Planning Step" button to "Select Base Planning Step" screen

#### III) SELECT BASE PLANNING STEP

- ✤ Purpose: Choose Year to work planning
- ♣ After Dataset import process, the system swithes to the "Select Base Planning Step" screen

- 2





- Step 1: Choose Year to work planning
- Step 2: Click "Next to the Forecasting Index step" button

Pavement condition forecasting	
🟛 Target Region : RMB III	
Year of PMS dataset : 2017	
😵 Base Planning Year:	
2017 1	~

Other information: User can click "Back to Dataset Import" button to the "Dataset Import" screen

⇒ After click "Next to the Forecasting Index step" button, the system switches the "Forecasting Index" screen

#### **IV) FORECASTING INDEX**

- Purpose: Show information about the pavement condition forecast for the next five years.
- 4 After "Select base planning step", the system swithes "Forecasting index" screen



Proc	ess information	a											
	Target Re Year of Pl	egion: RM MS data	B∭ set:2017										
	Base Plan	nning Ye	ar: 2017										
												Check	: Unit Cos
Sect	ion List												-
					0	0	0	0	0			Dis	splay Item
	All	All	All	Construction Year	From km	Fromm	To km	Tom			All ~	All	
0	Route Name A HCM-East Branch	Branch No	Class III	2004	From km	400	1325	500	100	Number of Lanes	Right	AC	3.50
0	HCM-East Branch	00	Class III	2004	1351	300	1351	400	100	2	Left	cc	3.50
0	HCM-East Branch	00	Class III	2004	1352	200	1352	300	100	2	Left	сс	3.50
0	HCM-East Branch	00	Class III	2004	1353	500	1353	600	100	2	Left	сс	3,50
0	HCM-East Branch	00	Class III	2004	1353	400	1353	500	100	2	Left	сс	3.50
0	HCM-East Branch	00	Class III	2004	1353	300	1353	400	100	2	Left	CC	3,50
0	HCM-East Branch	00	Class III	2004	1353	200	1353	300	100	2	Left	cc	3.50
0	HCM-East Branch	00	Class III	2004	1353	100	1353	200	100	2	Left	СС	3.50
0	HCM-East Branch	00	Class III	2004	1353	0	1353	100	115	2	Left	cc	3.50
0	HCM-East Branch	00	Class III	2004	1352	900	1352	1000	100	2	Left	cc	3.50
0	HCM-East Branch	00	Class III	2004	1352	800	1352	900	100	2	Left	cc	3.50
0	HCM-East Branch	00	Class III	2004	1352	700	1352	800	100	2	Left	CC	3,50
0	HCM-East Branch	00	Class III	2004	1350	200	1350	300	100	2	Left	cc	3.50
0	HCM-East Branch	00	Class III	2004	1350	0	1350	100	115	2	Left	cc	3.50
0	HCM-East Branch	00	Class III	2004	1354	900	1354	1000	90	2	Left	сс	3.50

# Description:

Information for Process" form: Show information Target Region, Target PMS Dataset Year and Base Planning Year that the user selected in the "Initial" step and "Select Base Planning Step" screen

"Check Unit Cost": User click "Check Unit Cost" link to view information detal for Repair method (Repair method name, Unit Cost...)

- **4** "Section List": Show information about parameter for each section
- ↓ Information for function
  - Filter function
    - Step 1: At the "Section List" form, choose Filter function
    - o Step 2: Input information to filter



Sec	tion List												- 2
												Dis	play item
	All	All	All ~	Construction Year	From Ian	From In	Talun	Tom			Al) ~	All v	
	Route Name	Branch No	Road Class	Construction Year	From km	From m	To km	To m	Lengh, m	Number of Lanes	Direction	Pavement Type	Width,m
0	HCM-East Branch	00	Class III	2004	1,325	400	1325	500	100	2	Right	AC	3.50
0	HCM-East Branch	00	Class III	2004	1351	300	1351	400	100	2	Left	cc	3.50
0	HCM-East Branch	00	Class III	2004	1352	200	1352	300	100	2	Left	cc	3.50
0	HCM-East Branch	00	Class III	2004	1352	100	1352	200	100	2	Left	cc	3.50
0	HCM-East Branch	00	Class (II	2004	1352	D	1352	100	100	2	Left	cc	3.50
0	HCM-East Branch	00	Class III	2004	1351	900	1351	1000	95	2	Left	cc	3.50
0	HCM-East Branch	00	Class III	2004	1351	800	1351	900	100	2	Left	cc	3,50

- Display Item function
  - o Step 1: At the "Section List", click button "Display Item"
  - Step 2: Set up columns view/hide

Sect	tion List												
								1	. Glick "Disp	olay Item"		-	Display Item
	All	All ~	All *	Construction Year	Eizətti kü	Prom m	To km	Tam	0		All Ý	All	Route Name
	Route Name 🔺	Branch No	Road Class	Construction Year	From km	From m	To km	To m	Lengh, m	Number of Lanes	Direction	Pav	Branch No Road Class
0	HCM-East Branch	00	Class III	2004	1325	400	1325	500	100	2	Right	AC	Construction Year From km
0	HCM-East Branch	00	Class III	2004	1351	300	1351	400 2. Choo	ose field to v	ew/hide	Left	cç	From m To km
0	HCM-East Branch	00	Class III	2004	1352	200	1352	300	100	2	Left	cc	To m Lengh. m
0	HCM-East Branch	00	Class III	2004	1352	100	1352	200	100	2	Left	cc	Number of Lanes Direction
0	HCM-East Branch	00	Class III	2004	1352	0	1352	100	100	2	Left	cc	Width,m
0	HCM-East Branch	00	Class III	2004	1351	900	t351	3 D00	95	2	Left	сс	3.50

- View Information Detail Section function
  - Step 1: At the "List Section", choose section to view information detail: Forcecasting Index (for 5 year), Lastest Repair, Traffic Volume, Result Of Pavement Condition Survey
  - Step 2: Click to view information detail



Section List				-							
2. Click	n+n			1. Choose S	Section to view de	tail				D	isplay Item
All	~ All ~	All ~	Construction Year	From km	erom m	• To km	D To m	e.	All	• All •	-
Route Name	+ Branch No	Road Class	Construction Year	From km	Fromm	To km	To m	Lengh, m Number	of Lanes Direction	Pavement Type	Width,m
HCM-East Branch	00	Class 01	2004	1325	400	1325	500	100 2	Right	AC	3.50
HCM-East Branch	00	Class III	2004	1351	300	1351	400	1.00 2	Left	cc	3.50
HCM-East     Branch	00	Class III	2004	1351	300	1351	400	100 2	Left	cc	3.50
Forecasting Index											
		1st Yea	r Prediction	2nd Year Pred	liction	3rd Year Predict	ion	4th Year Prediction	5th Ye	ar Prediction	
Concerning Year		2017		2018		2019		2020	2021		
Crack ratio 96		7,56		8.22		8.88		9.54	11.09		
Rutting depth (m	um)	5.68		6.36		7,05		7.73	8.41		
IRI,mm/m		5.38		5.75		6,19		6.76	7.32		
MCI		6.5		6.4		6.3		6.1	6		
Latest Repair				Traffic Volum	ie.			Result Of Pavement Con	dition Survey.		
Name			Value	Name			Value	Name		Value	
Latest Repair			£.	Traffic Surv	vey Year			Surveyed Year/Month		2016/3	
Repair Category				Total Traffi	e Volume		0.00	Surveyed Lane		1	
Repair Classificat	tion			Heavy Traff	fic Volume		0,00	Pavement Type		cc	
Pavement Thickn	ness							Crack,96		6.90	
								Patching.%		0.00	
								Pothole,%		0.00	
								Total.96		6,90	
								Max,mm		19.00	
								Average.mm		5.00	
								RI.mm/m		5.00	
								MCI		6.68	

User click "Next to the Repair Matrix Setup step" button to the "Repair matrix" screen or click "Back to Select Base Planning Year" button to "Select Base Planning Year" screen

# V) SETTING REPAIR MATRIX

- ↓ Purpose: Choose repair matrix for work planning
- ↓ After "Forecasting index" process, the system switches "Repair matrix" screen

Target Route: NH1						
Year of PMS dataset: 2017						
						Check Unit Co
Matrix parameters	Matrix	parameters				
Road Category	- 100	Hump Cutting (<30mm)	100	Crack Sealing		Hump Cutting + Crack Seal
Please select an item	×		_		-	
Road Class		Very Thin Overlay ( micro-surfacing)	ALC: NO	Very Thin Overlay (TL 2000)		Hump Cutting + Very Thin Overlay (MS)
Please select an item		Hump Cutting + Very Thin Overlay (TL2000)		Cut Surface Course and Replacement		Cut Surface Course and Replacement
AC AC	~			(		(1201111)
		Cut Surface Course and Replacement (70mm)		Cut Surface Course and Replacement (50mm)		Single Bitiminous Surface Treatement (DBS)
Remove customzation and back to default m	itrix					Double Bitiminous Surface Treatement (DBST)
		Triple Bitiminous Surface Treatement (TBST)	100	Repair of Macadam of 10cm thick and TBST		Repair of Macadam of 15cm thick and TBST
	100	Localized Repair (1)	100	Localized Repair (2)	100	Replacement of Concrete Slabs, 22cm thick



Description:

- Information form: Show information Target Region, Target PMS Dataset Year and Base Planning Year that the user selected in the "*Initial*" step and "*Select Base Planning Step*" screen
  - "Check Unit Cost": User click "Check Unit Cost" link to view information detail for repair method (Repair Method Name, Pavement Type, Unit Cost, Repair Classification)
- **4** Matrix parameters form: Include information
  - Road category: Exp and NH

Road Category

Please select an item	~
Please select an item	
Exp	
NH	

• Road class: Class I, Class II, Class III, Class IV, Class V, Class VI

Road Class

Please select an item	~
Please select an item	
Class I	
Class II	
Class III	
Class IV	

Note:

- As for "Road category" Exp have only 4 types of "Road class": Class I, Class II, Class III, Class IV
- As for "Road category" NH have 6 types "Road class": Class I, Class II, Class III, Class IV, Class V, Class VI.
- o Pavement Type: AC, BST, CC

Pavement Type



• Repair methods: Are the repair methods of the system. Each repair method is set up with a default color.



aurix parameters		
Hump Milling 30 and Cracking	Crack Sealing - A (30%)	Crack Sealing - A (40%)
Crack Sealing - A (50%)	Crack Sealing - A (60%)	Mierò Surfacing - II
Micro Surfacing - III	TL2000 - Dressing	Micro Surfacing (Type II) and Crack Sealing
Micro-Surfacing (Type III) and Crack Sealing	TL2000 - Dressing & Crack Sealing	Hump Milling & Micro Surfacing (Type II)
Hump Milling & Micro Surfacing (Type III)	Hump Milling & TL2000-Dressing	Hump Milling & Crack Sealing & Micro Surfacing (Type II)
Hump Milling & Crack Sealing & Micro Surfacing (Type III)	Hump Milling & TL2000-(Crack Sealing & Dressing)	AC Overlaying (3cm)
	AC Overlaying (4cm)	AC Overlaying (5cm)
AC Overlaying (6cm)	AC Overlaying (7cm)	Cut Surface Course and Replacement (Scm)
Cut Surface Course and Replacement (7cm)	Cut Surface Course and Replacement (12cm)	Surface Recycling & Overlaying
Deep Recycling & Overlaying	Cut & Replacement (Full Structure)	

- ✤ Operation steps: "Matrix parameters" Form
  - Step 1: Choose Road category
  - Step 2: Choose Road Class
  - Step 3: Choose Pavement type
  - Step 4: Choose the corresponding repair method for each cell in the repair matrix
    - Choose the cell in the matrix that needs to change the repair method
    - Click cell is selected, showing the corresponding repair methods to change
    - Choose the repair method that need to be changed for the selected cell
  - Step 5: Click "Next to the Repair Condition setup step" button to complete the setup and go to the "*Repair condition*" screen



=> Other information:

- User can click "Remove customization and back to default matrix" in the "Matrix parameters" form to return the default matrix.
- User can press "Back to Forecasting Index" button to return to the "Forecasting Index" screen

# Note: Depending on the "Pavement type" (AC, BST, CC), there are separate repair methods.

# **VI) SETTING REPAIR CONDITION**

↓ Purpose: Setting repair information for each section



ess information	n											-
Target R	Region: RMB III											
Year of F	PMS dataset : 2017											
Base Pla	anning Year : 2018											
											Chec	ck Unit C
ions List												- 1
valid Sections	Planned Sections Tar	get Sections Repa	ir Work Long List	Cracking value is	invalid			Rutting value is	s invalid			
Road Cla	Planned Sections Tar	get Sections Repa	r Work Long List	Cracking value is Pavement Type v	invalid alue is invalid			Rutting value is	s invalid		Displ	ay Item
Road Cla IRI value	Planned Sections Tan ass is invalid e is invalid All v All v	get Sections Repa	From km	Cracking value is Pavement Type v	invalid alue is invalid To km	© To m	0	Rutting value is	s invalid	All	Displ	ay Item
Road Cla Road Cla	Planned Sections Tarr ass is Invalid e is invalid All V All V Branch No © Road Class ©	get Sections Repa	From km	Cracking value is Pavement Type v From m From m	invalid alue is invalid To km	To m	C Lengh, m	Rutting value is	a invalid	All ~ Pavement Type	Displa Width,m	ay Item Error
Ail Value	Planned Sections Tarr ass is invalid e is invalid All All Branch No Road Class	Construction Year Construction Year	r Work Long List	Cracking value is Pavement Type v Prom m From m	invalid alue is invalid To km to data available in	Tom Tom table	C Lengh, m	Rutting value is	All V Direction	All ~ Pavement Type ©	Displ Width,m	ay Item Error
Road Cla Road Cla IRI value All Route Name A Showing 0 to 0 o	Planned Sections Tan ass is invalid a is invalid All V All V Branch No C Road Class C of 0 entries	Construction Year	r Work Long List	Cracking value is Pavement Type v From m From m	invalid alue is invalid To km To km to data available in	Tom Tom table	e Lengh, m	Rutting value is	a invalid	All v Pavement Type v	Displ Width,m	ay Item Error

# **Description:**

- Information for process" form: Show information Target Region, Target PMS Dataset Year and Base Planning Year that the user selected in the "*Initial*" step and "Select Base Planning Step" screen
- Check Unit Cost" link: User click "Check Unit Cost" link to view information detail for repair method (Repair Method Name, Pavement Type, Unit Cost, Repair Classification)
- "Section List" form: Including 4 tab: Invalid sections, Planned Section, Target Sections and Repair Work Long List
  - Information for Section: Route Name, Branch No, Road Class, Contruction Year, From km, From m, To km, To m, Length (m), Number of Lanes, Direction, Pavament Type, Width (m) and Error (for Invalid sections)
  - "Invalid Sections" tab: Show invalid sections (The color parameter is an indication of what the segment data is invalid
  - "Planned Sections" tab: Show planned sections
  - "Target Sections" tab: Show sections need Target Sections



Sections

											Di	splay Item
All 👻	.All •	All v	Construction Vear	From lan	• From m	To km	Toim	Ø		All v	All 👻	
Route Name 🔺	Branch No	Road Class	Construction Year	From km	From m	To km	To m	Lengh, m	Number of Lanes	Direction	Pavement Type	Width,m
HCM-East Branch	00	Class III	2004	1325	400	1325	500	100	2	Right	AC	3.50
HCM-East Branch	00	Class III	2004	1351	300	1351	400	100	2	Left	cc	3.50
HCM-East Branch	00	Class III	2004	1352	200	1352	300	100	2	Left.	cc	3.50
HCM-East Branch	00	Class III	2004	1352	100	1352	200	100	2	Left	cc	3.50
HCM-East Branch	00	Class III	2004	1352	0	1352	100	100	2	Left	cc	3.50
HCM-East Branch	00	Class III	2004	1351	900	1351	1000	95	2	Left	cc	3.50
HCM-East Branch	00	Class III	2004	1351	800	1351	900	100	2	Left	cc	3.50
HCM-East Branch	00	Class III	2004	1353	400	1353	500	100	2	Left	cc	3.50
HCM-East Branch	00	Class III	2004	1353	300	1353	400	100	2	Left	çç	3.50
HCM-East Branch	00	Class III	2004	1353	200	1353	300	100	2	Left	CC.	3,50
HCM-East Branch	00	Class III	2004	1353	100	1353	200	100	2	Left	CC	3.50
HCM-East Branch	00	Class III	2004	1353	0	1353	100	115	2	Left	cc	3.50
HCM-East Branch	00	Class III	2004	1352	900	1352	1000	100	2	Left	cc	3.50
HCM-East Branch	00	Class III	2004	1352	800	1352	900	100	2	Left	cc	3.50
HCM-East Branch	00	Člass III	2004	1352	700	1352	800	100	2	Left	сс	3.50
HCM-East Branch	00	Class III	2004	1350	200	1350	300	100	2	Left	cc	3.50
HCM-East Branch	00	Class III	2004	1350	0	1350	100	115	2	Left	CC	3.50
HCM-East	00	Class III	2004	1354	900	1354	1000	90	2	Left.	cc	3.50
	AII	AII     Image: Algebra in the sector of the se	All     All     All     All       Route Name     Branch     Road Class II       Route Name     00     Class II       HCM-East     00     Class II <td>AII         AII         Construction Year           Route Name         Parach No         Rode Class         Construction Year           Branch         00         Class III         2004           <t< td=""><td>All         All         Construction Yeac         From kern           Route Name         Branch NC         Road Class         Construction Yeac         From kern           Branch         00         Class III         2004         1325           HCM-East Branch         00         Class III         2004         351           HCM-East Branch         00         Class III         2004         352           HCM-East Branch         00         Class III         2004         351           HCM-East Branch         00         Class III         2004         351           HCM-East Branch         00         Class III         2004         353           HCM-East Branch         00</td><td>Al         Al         Al         Construction Yeac         From Mm         From Mm         From Mm           Route Name         Banch NG         Road Class         Construction Yeac         From Mm         From Mm           Branch         00         Class III         2004         1325         400           HCM-East Branch         00         Class III         2004         1351         200           HCM-East Branch         00         Class III         2004         1352         200           HCM-East Branch         00         Class III         2004         1352         00           HCM-East Branch         00         Class III         2004         1351         00           HCM-East Branch         00         Class III         2004         1353         00           HCM-East Branch         00         Class III         2004         1353         00           HCM-East Branch</td><td>AB         AB         AB         Construction Yeak         Prom km         Prem m         Prem m         Pre mm         Pre mm&lt;</td><td>Ali         Orantaciant/Name         From Name         From Name         From Name         From Name         Total           Reute Name         Branch No         Roda Class         Construction Yeak         From Nam         Total         Total           HCM-East Branch         00         Class HI         2004         1325         400         1325         500           HCM-East Branch         00         Class HI         2004         1351         300         1351         400           HCM-East Branch         01         Class HI         2004         1352         200         1352         300           HCM-East Branch         01         Class HI         2004         1352         00         1352         300           HCM-East Branch         01         Class HI         2004         1352         00         1352         00         352         100         352         100         352         100         351         900         1000</td><td>Al         Al         Contractor Veal         From Mon         From Mon         Totom         Totom         Totom           Route Mon         A         Banch Mo         Route Mon         Route Mon         Totom Mon&lt;</td><td>An         An         Construction W         From M         From M         Totem         Totem</td><td>AT       A       Constant       Front       Front       Fourme       Totam       To</td><td>Ai         Ai         Commutative         France         Total         <t< td=""></t<></td></t<></td>	AII         AII         Construction Year           Route Name         Parach No         Rode Class         Construction Year           Branch         00         Class III         2004           Branch         00         Class III         2004 <t< td=""><td>All         All         Construction Yeac         From kern           Route Name         Branch NC         Road Class         Construction Yeac         From kern           Branch         00         Class III         2004         1325           HCM-East Branch         00         Class III         2004         351           HCM-East Branch         00         Class III         2004         352           HCM-East Branch         00         Class III         2004         351           HCM-East Branch         00         Class III         2004         351           HCM-East Branch         00         Class III         2004         353           HCM-East Branch         00</td><td>Al         Al         Al         Construction Yeac         From Mm         From Mm         From Mm           Route Name         Banch NG         Road Class         Construction Yeac         From Mm         From Mm           Branch         00         Class III         2004         1325         400           HCM-East Branch         00         Class III         2004         1351         200           HCM-East Branch         00         Class III         2004         1352         200           HCM-East Branch         00         Class III         2004         1352         00           HCM-East Branch         00         Class III         2004         1351         00           HCM-East Branch         00         Class III         2004         1353         00           HCM-East Branch         00         Class III         2004         1353         00           HCM-East Branch</td><td>AB         AB         AB         Construction Yeak         Prom km         Prem m         Prem m         Pre mm         Pre mm&lt;</td><td>Ali         Orantaciant/Name         From Name         From Name         From Name         From Name         Total           Reute Name         Branch No         Roda Class         Construction Yeak         From Nam         Total         Total           HCM-East Branch         00         Class HI         2004         1325         400         1325         500           HCM-East Branch         00         Class HI         2004         1351         300         1351         400           HCM-East Branch         01         Class HI         2004         1352         200         1352         300           HCM-East Branch         01         Class HI         2004         1352         00         1352         300           HCM-East Branch         01         Class HI         2004         1352         00         1352         00         352         100         352         100         352         100         351         900         1000</td><td>Al         Al         Contractor Veal         From Mon         From Mon         Totom         Totom         Totom           Route Mon         A         Banch Mo         Route Mon         Route Mon         Totom Mon&lt;</td><td>An         An         Construction W         From M         From M         Totem         Totem</td><td>AT       A       Constant       Front       Front       Fourme       Totam       To</td><td>Ai         Ai         Commutative         France         Total         <t< td=""></t<></td></t<>	All         All         Construction Yeac         From kern           Route Name         Branch NC         Road Class         Construction Yeac         From kern           Branch         00         Class III         2004         1325           HCM-East Branch         00         Class III         2004         351           HCM-East Branch         00         Class III         2004         352           HCM-East Branch         00         Class III         2004         351           HCM-East Branch         00         Class III         2004         351           HCM-East Branch         00         Class III         2004         353           HCM-East Branch         00	Al         Al         Al         Construction Yeac         From Mm         From Mm         From Mm           Route Name         Banch NG         Road Class         Construction Yeac         From Mm         From Mm           Branch         00         Class III         2004         1325         400           HCM-East Branch         00         Class III         2004         1351         200           HCM-East Branch         00         Class III         2004         1352         200           HCM-East Branch         00         Class III         2004         1352         00           HCM-East Branch         00         Class III         2004         1351         00           HCM-East Branch         00         Class III         2004         1353         00           HCM-East Branch         00         Class III         2004         1353         00           HCM-East Branch	AB         AB         AB         Construction Yeak         Prom km         Prem m         Prem m         Pre mm         Pre mm<	Ali         Orantaciant/Name         From Name         From Name         From Name         From Name         Total           Reute Name         Branch No         Roda Class         Construction Yeak         From Nam         Total         Total           HCM-East Branch         00         Class HI         2004         1325         400         1325         500           HCM-East Branch         00         Class HI         2004         1351         300         1351         400           HCM-East Branch         01         Class HI         2004         1352         200         1352         300           HCM-East Branch         01         Class HI         2004         1352         00         1352         300           HCM-East Branch         01         Class HI         2004         1352         00         1352         00         352         100         352         100         352         100         351         900         1000	Al         Al         Contractor Veal         From Mon         From Mon         Totom         Totom         Totom           Route Mon         A         Banch Mo         Route Mon         Route Mon         Totom Mon<	An         An         Construction W         From M         From M         Totem         Totem	AT       A       Constant       Front       Front       Fourme       Totam       To	Ai         Ai         Commutative         France         Total         Total <t< td=""></t<>

• "Repair Work Long List" tab: Show sections to repair

# **Information for function:**

- Filter function
  - Step 1: Choose one tab to filter information
  - Step 2: Choose field to filter
  - Step 3: Input information to filter

Example: Choose "Target Sections" tab, filter section has Construction Year "2015" and Route Name = "NH1"

- 1



													Display Iter
1	NH1 ~	Alt v	AB ~	2012	Branni Krin	• From m	• Talm	€ Totm	0		All ~	All	*
	Route Name 🔺	Branch No	Road Class	Construction Year	From km	From m	To km	To m	Lengh, m	Number of Lanes	Direction	Pavement Type	Width,r
0	NHT	00	Class (II	2012	1211	0	1211	100	100	2	Single	AC	7.00
5	NH1	00	Class III	2012	1211	100	1211	200	100	2	Single	AC	7.00
0	NH1	00	Class III	2012	1210	0	1210	100	100	2	Single	AC	7.00
ò	NHT	00	Class III	2012	1210	100	1210	. 200	100	2	Single	AC	7.00
2	NH1	00	Class III	2012	1210	200	1210	300	100	2	Single	AC	7.00
>	NH1	00	Class III	2012	1210	300	1210	400	100	2	Single	ÁC.	7.00
5	NH1	00	Class III	2012	1210	400	1210	500	100	2	Single	cc	7.00
ò	NHT	00	Class III	2012	1210	500	1210	600	100	2	Single	ÁC	7.00
2	NH1	00	Class III	2012	1210	600	1210	700	100	2	Single	AC	7.00
5	NH1	00	Class III	2012	1210	700	1210	800	100	2	Single	AC	7,00
0	NH1	00	Class III	2012	1210	800	1210	900	100	2	Single	AC	7.00
	NH1	00	Class III	2012	1210	900	1210	1000	100	2	Single	AC	7.00

- o Display Item function
  - Step 1: Choose one tab to view/hide information
  - Step 2: Click "Display Item" button
  - Step 2: Set up columns view/hide

tions	List													-
nvalid	Sections P	lanne	d Sections	Target Section	Repair Work Long Li	ist								
									1. Click	Display Item I	outton	_	-	Display Item
	All	×	All ×	All 👻	Construction View	Grom kan	Fram mi	To am	Tom	0		AB ~		Route Name
	Route Name		Branch No	Road Class	Construction Year	From km	From m	To km	To m	Lengh, m	Number of Lanes	Direction	P	Branch No Road Class
0	HCM-East Branch		00	Class III	2004	1325	400	1325	500	100	2	Right	P	Construction Year From km
0	HCM-East Branch		00	Class III	2004	1351	300	1351	400	100	2	Left	¢	From m To km
0	HCM-East Branch		00	Class III	2004	1352	200	1352	300	100 Newhide	2	Left	q	To m Lengh, m
0	HCM-East Branch		00	Class III	2004	1352	100	1352	200	100	2	Left	c	Number of Lanes
0	HCM-East Branch		00	Class III	2004	1352	0	1352	100	100	2	Left	¢	Pavement Type Width,m
9	HCM-East Branch		00	Class III	2004	1351	900	1351	1000	95	2	Left	CC	3.50
2	HCM-East Branch		00	Class III	2004	1351	800	1351	900	100	2	Left	cc	3.50
0	HCM-East Branch		00	Class III	2004	1351	780	1351	800	100	2	Left	CC	3.50

- o View Information Detail for Target Sections
  - Step 1: Choose one section belong tab to view information
  - Step 2: Click 💿 to view information detail



				2. Choose Sectio	n ta view infon	nation						Display Item
All	All V All Y Construction	Viser Sto	m km	6 From m	To km	6	Tam	6		All v	Ali	81
Route Name 🔺	Branch No. Road Class Construction	Year From	km	From m	To km		Tam	Lengh, r	Number of Lanes	Direction	Pavement Typ	e Widthm
HCM-East Branch	00 Class III 2004	1325	5	400	1325		500	100	2	Right	AC	3.50
recasting Index												
	1st Year Prediction	2nd Year Prediction		3rd Year Prediction		4th Year Pre	diction		5th Year Prec	liction		
oncerning Year	2018	2019		2020		2021			2022			
track ratio %	0.01	0.01		0.01		10.01			0.02			
utting depth (mm)	28.04	32.38		36.75		41.15			45.6			
Ri,mm/m	7.72	8.29		9.02		9.75			10.69			
ICI	4.4	3.8		3.3		2.7			2.2			
lepair method						Can Samo	5 9 10		0.6000	Course group	B 4.57	-
tepair Classification	Periodic Maintenance - Medium	Periodic Mainten	ance - Medium	Periodic Maintenan	ce - Médium	Periodic M	aintenance -	Big	Periodic Ma	intenance - Big		
nit Cost	22,000	22,000		22,000		298,000			298,000			
uantity Unit	160	160		160		350			350			
init of Quantity	m2	m2		m2		m2			m2			
mount (VND)	3,520,000	3,520,000		3,520,000		104,300,00	00		104,300,00	0		
est Repair			Traffic Volume					Result Of Pavement (	ondition Survey			
ame	Value		Name			Value		Name			Value	
atest Repair	T		Traffic Survey Ye	ar				Surveyed Year/Mon	'n		2016/2	
lepair Category			Total Traffic Volu	me		0.00		Surveyed Lane			1	
epair Classification			Heavy Traffic Vo	lume		0.00		Pavement Type			AC	
avement Thickness								Crack,%			0.00	
								Patching.%			0.00	
								Pothole.%			0.00	
								Total %			0.00	
								Max.mm			33.00	
								Average mm			20.00	
								IRI.mm/m			6.60	
								MOL				

User click "Next to the Formulate Annual Year step" button to the "*Formulate annual Year*" screen or click "Back to Repair Matrix" button go to back "*Repair matrix*" screen

# **VII) FORMULATE ANNUAL**

♣ Purpose: Setting parameters for

Process information						- /
<ul> <li>Target Region: RME</li> <li>Year of PMS datas</li> <li>Base Planning Yea</li> </ul>	et:2017 11:2018					
Budget constraint.			- 2	Priority criteria		- /
Teral Businer	100	Billers VAD		* © Priority	Parameter	
		ALL STREET		Pirat priority	MC-	
Ron Year 1	10	BolizerWelD		i and a		
For rear 2	10	manes white		3 Second priority		7
For Year 3	10	Elilizan VND		3 Third priority		
For Year 4	10	Billion WAD				
For Year 0	60	01-029/97403				
Price Escalation			19.00			
	3.05					

- ↓ Information for "Formulate annual" function
  - Step 1: Input information for Budget Contraint (unit: Billion VND)



Note: Input information: Total Budget, For Year 1, For Year 2, For Year 3, For Year 4 (For Year 5 = Total Budget – (For Year 1 + For Year 2 + For Year 3 + For Year 4))

- Step 2: Choose Priority criteria by click On/Off with parameter (MCI, Road Class, Traffic Volume) corresponding
- Step 3: Input information for Price Escalation
- Step 4: Click "Make plan" button

Process information							
<ul> <li>Target Region: RME</li> <li>Year of PMS datas</li> <li>Base Planning Yea</li> </ul>	et:2017 r:2018						
Budget constraint				- 2	Priority criteria		
Total Budget	100	1	Billion VND		# OPriority	Parameter	
	10				1 First priority	MCI	•
For Year 1	10		Billion VND		a constant		1
For Year 2	10	1	Bilkon VND		2 Second priority	4	
For Year 3	10		Billion VND.		3 Third prioricy		
For Year 4	20		Billion VND				
For Year 5	50		Billion VND				
2. 2. 6							
Price Escalation							
Price escalation factor	2.00	3	5				

User click button "Make plan" to "Repair Planning For 5 Years" screen or click button "Back to Repair Condition" to back to "*Repair condition*" screen

#### **VIII) REPAIR PLANNING FOR 5 YEARS**

**W** Purpose: Show results work planning for 5 years



cess	information							Cost by Year						-
	arget Regi 'ear of PM! Base Plann	on: PMB) 5 dataset : ing Year : 1	2017					1 st Year Cost: 3 823/25 (1000 V) 2nd Year Cost: 4(07), 139 (1000 V 409 Year Cost: 9(07), 139 (1000 V 409 Year Cost: 13)(55)(443 (1000 V 50) Year Cost: 53(55)(55)(55)(55)(55)(55)(55)(55)(55)(5	VD) VND1 VND1 VND1 VND1 VND1 VND1					
						EN	ck Dist Chitt 🚽							
tions	Ust.													-
nvalid	Sections P	anned Sections	True Led	ilina – Répál Wolk Long L	al List for Year 1	List for Year 2 List for 1	Nur 3 List for	Vian 4 List for Vian 5 Remain	na sector					
	Rood Class is	invalis vatid				Craiseing value is inva Pavement Type value	is invalid			Rutsing value is invalia				
							6						0	Hapiay Idem
	All F	Al of	M	Construction Valle	Evenitar	T Farm	1 2	m Tom	1		Ali	- NI	1	
0	Note Name A	Branch No	Read Class	Construction Year	Erten km 270	1 rom m 700	70 km	iam tam	Langh.m	Runderafianes	Up Or Down	Pavement Type	2/75	Litter
0	NUT	23	Class I	2001	270	500	270	100	100	2	Sitole	AC	2.75	-
0	NH2	00	Člass III	2002	285	000	285	700	100	1	Les	AC	3.50	1
0	NH2	00	Class III	2002	285	500	285	900	100		Left.	AC	3.50	100
0	10130	tti.	Glass IV	2000	ar	0	35	300	100	1	tunge	AC	2.78	1
0	10130	80.	Class IV	2006	42	895	43	800	100	t	Sige	AD.	2.75	1
0	16831	00	Class IV	2008	42	900	42.	1090	100		Single	AC	2.75	1000
0	NH33	00	Class IV	2009	42	800.	42	900	100	1	Single	AC	2.75	1
0	16430	00	Class IV	2009	42	700	42	800	100		Single	AC	2,75	100
0	NH38	00	Class IV	2009	42	000	42	700	100	3	Single	AC	2.75	100
0	16430	00	Dissi IV	2006	42	500	42	900	100		Single	AC	2.75	1000
Ó	NH33	00	Class IV	2000	31	100	31	200	100	э.,	Single	AC	2.78	100
0	NH35	90	Class IV	2000	33	800	30	900	100	9.	Single	AC	2.78	
0	NH33	99	Class (V	2002	90	600	10	700	100	9.	Single	AC	2.78	100
0	NH35	00	Ciass IV	2002	10	600	10	600	100		Single	AC	2.78	1000
ò	NHI	00	Class (V	2002	90	.d	16	100	106	- 4	Single	AC	2.78	100
0	Neclassi	ari.	Class III	2501	20	100	20.	- 250	100	1	llight	AG	3.50	
0	Nichteil	[11]	Class III	2008	20	ŵ.	20	100	100	2	Regnt	λG.	3.50	100
0	\$8×0779	00.	Class IV	2004	7.4	1032	04	uber.	102	1	Single	AG	2.75	1
Sho	ning the 45 of 6	i entries											Peniose	1 tiet

Description:

- "Information for Process" form: Show information Target Region, Target PMS Dataset Year and Base Planning Year that the user selected in the "*Initial*" step and "*Select Base Planning Step*" screen
- "Check Unit Cost" link: User click "Check Unit Cost" link to view information detail for repair method (Repair Method Name, Pavement Type, Unit Cost, Repair Classification)
- "Cost by Year" form: Show Cost for each year (Year 1 to Year 5)
- "Sections List": Include 10 tab: Invaid Sections, Planning Sections, Target Sections, Repair Work Long List, List for Year 1, List for Year 2, List for Year 3, List for Year 4, List for Year 5, Remaining Sections ("Invalid sections" is defacult tab)
  - "Invalid sections": Show sections invalid (The color parameter is an indication of what the segment data is invalid)



tions	List														-
nvalid	Sections	Pa	anned Sections	Target Section	ons Repair Work Long L	st List for Year I	List for Year 2 List for Year	3 List for Year 4 L	ist for Year 5. Remaining section						
	Road Cla	<b>155</b> 15	invalid				Cracking value is invalid				Rutting value is invalid				
	IRI value	is inv	valid				Pavement Type value is in	valid							
															Display Item
	All	M	All v	All ×	Construction/year	(From km	Fromm	To lare	Tom	e.		All	All	-	
	Route Name		Branch No	Road Class	Construction Year	Fram km	Fromm	Ta km	Tom	Lengh, m	Number of Lanes	Up Or Down	Pavement Type	Width,n	Error
0	NH1		00	Classi	2001	270	700	270	800	100-	2	Single	AC	2.75	
o	NH1		<u>ġo</u>	Class I	2001	270	600	270	700	100	2	Single	AC	2.75	
0	NH2		00.	Class III	2002	285	800	285	700	100	T	Left	AC	3.50	
0	NH2		00	Class ()(	2002	285	500	285	doo	100	t.	Left	AC	3.50	
0	NH8		00	Class III	2005	138	700	138	800	100	1	Right.	AC.	3.50	1000

# "Planned Sections" Tab: Show planned sections

							-
All ~ All ~ All ~ Construction Year	6 Fearing Actor	Prote m	P To lim	€ Tom	0	All - All	~
Route Name * Branch No Road Class. Construction Year	From km	From m	To km	To m	Lengh, m Number of Lanes	Up Or Down Paver	nent Type Width,m
			No data available in table				
							Acres 104

# "Target Sections" Tab: Show sections need Target Sections

Sections (Elan	ned Sections	Target Sections	s. Repair Work Long Li	st List for Year 1) Lis	tifor (ear.3 List for Vear.3)	List for Year 4. List for	sear5 Remaining section					
												Disolay Iten
All ×	All 🔍	All	Canstituction Year	From kon	from m	Sec. Kore	Tom	0		All	- AB	
Route Name 🔺	Branch No	Road Class	Construction Year	From km	From m	To km	To m	Lengh, m	Number of Lanes	Up Or Down	Pavement Type	Width.m
нсм	00	Class III	2003	502	a	502	100	115	2	Single	AC	2.75
HCM	00	Class III	2003	459	100	459	200	100	2	Single	AC	2.75
нсм	00	Class III	2003	459	800	459	900	100	2	Single	AC	2.75
нсм	00.	Class III	2003	459	700	450	800	100	2	Single	AC	2.75
нсм	00	Class III	2003	459	800	459	700	100	2	Single	AC	2.75
нсм	00	Class III	2003	459	500	459	600	100	2	Single	AC	2.75
нсм	00	Class (II	2003	459	400	459	500	100	2	Single	AG	2.75
HCM	00	Class III	2003	459	300	459	400	100	2	Single	AC.	2.75
нсм	00	Class III	2003	459	200	459	300	100	2	Single	AC	2.75
нсм	00	Class III	2003	459	0	459	100	100	2	Single	AC	2.75
HGM	90	Class III	2003	480	'0	480	100	110	2	Single	AC	2.76
нсм	00.	Class III	2003	458	900	458	1000	100	z.	Single	AC.	2.75
	All Carlor Name - Plan Route Name - HCM HCM HCM HCM HCM HCM HCM HCM HCM HCM	AR         Image: Compare Support         Array Compare Support           Rode Name         a         Array Compare Support         Array Compare Support           Rode Name         a         Branch No         Array Compare Support           HCM         00         HCM         Array Compare Support	AR         Image: Sections         Target Sections           AR         Image: Sections         Target Sections           Rode Name         Branch No         Road Class           HCM         00         Class III           HCM         00         Class III	Ali         Constructions         Target Sections         Hittpair/Work_Lang Ling           Ali         Ali         Construction Variant         Encoder Variant           Rode Name         Branch No         Road Class         Construction Variant           Rode Name         Branch No         Road Class         Construction Variant           HCM         00         Class III         2003           HCM         00         Class III         2003	All         All <td>AB         AB         Target Sections         Bagaar Week, Long Lini         Link for Yunt 1         <thlink 1<="" for="" th="" yunt=""> <thlink 1<="" for="" th="" yunt=""> <t< td=""><td>Aff         Images Sections         Hamme/Veen Lang Let for Year 1         Lat for Year 2         Lat for Year 3         Lat for Year 4         L</td><td>AR         AR         Target Sections         Happer Video, Long Long         Lat for Yuent 1         Lat for Yuent 2         Lat for Yuent 3         Lat for Yuent 4         Lat for Yuent 4</td><td>AB         Target Section         Target Section<td>Art         Target Stepse         Target Stepse         Repart Work Long Long Long Long Long Long Work Lon</td><td>Art         Target Seetine         Target Seetine<td>Art         Target Section         Target Section</td></td></td></t<></thlink></thlink></td>	AB         AB         Target Sections         Bagaar Week, Long Lini         Link for Yunt 1         Link for Yunt 1 <thlink 1<="" for="" th="" yunt=""> <thlink 1<="" for="" th="" yunt=""> <t< td=""><td>Aff         Images Sections         Hamme/Veen Lang Let for Year 1         Lat for Year 2         Lat for Year 3         Lat for Year 4         L</td><td>AR         AR         Target Sections         Happer Video, Long Long         Lat for Yuent 1         Lat for Yuent 2         Lat for Yuent 3         Lat for Yuent 4         Lat for Yuent 4</td><td>AB         Target Section         Target Section<td>Art         Target Stepse         Target Stepse         Repart Work Long Long Long Long Long Long Work Lon</td><td>Art         Target Seetine         Target Seetine<td>Art         Target Section         Target Section</td></td></td></t<></thlink></thlink>	Aff         Images Sections         Hamme/Veen Lang Let for Year 1         Lat for Year 2         Lat for Year 3         Lat for Year 4         L	AR         AR         Target Sections         Happer Video, Long Long         Lat for Yuent 1         Lat for Yuent 2         Lat for Yuent 3         Lat for Yuent 4         Lat for Yuent 4	AB         Target Section         Target Section <td>Art         Target Stepse         Target Stepse         Repart Work Long Long Long Long Long Long Work Lon</td> <td>Art         Target Seetine         Target Seetine<td>Art         Target Section         Target Section</td></td>	Art         Target Stepse         Target Stepse         Repart Work Long Long Long Long Long Long Work Lon	Art         Target Seetine         Target Seetine <td>Art         Target Section         Target Section</td>	Art         Target Section         Target Section

# "Repair Work Long List": Show all sections need repair

tions	List												-
nvalid.s	Sections Flam	ned Sections	Target Sections	Repáir Work Long List	List for '(ear-) List for '(ear	2 List for Year 3 List,	or Year # List for Year 5	Remaining section					
													Display Item
	All	All	All	Construction Year	From km	Fromm	Tolon	<b>9</b> То т	6		Al	All	~
	Route Name *	Branch No	Road Class	Construction Year	From km	From m	To km	Tom	Lengh, m	Number of Lanes	Up Or Down	Pavement Type	Width,m
0	нсм	00	ClassIII	2003	502	0	502	100	115	2	Single	AC	2.75
0	нсм	Ċ0	Class III	2003	459	100	459	200	100	2	Single	AC	2.75
0	HCM	00	Class ())	2003	459	800	459	800	100	2	Single	AG	2.75
0	нсм	DQ	Class-III	2003	459	700	459	800	100	2	Single	AC	2.75
0	нсм	00	Class III	2003	459	600	459	700	100	2	Single	AC	2.75
0	нсм	άα	Class III	2003	459	500	459	600	100	2	Single	AC	2.75
0	нсм	00.	Class III	2003	450	400	459	500	100	2	Single	AC	2.75
0	нсм	00	Class III	2003	459	300	459	400	100	2	Single	AC	2.75
0	нсм	00	Class III	2003	459	200	450	300	100	2	Single	AC	2.75

- "List for Year 1": Show sections need repair for Year 1


												E					
																	Display It
	All	- AD	All s	Construction rear	Fromikan	Fremm	S and	9 B.P		All	All						
	Route Name	* Branch No	Road Class	Construction Year	From km	From m	To km	To m	Lengh. m	Up Or Down	Pavement Type	Width,m	Repair method	Quantity Unit	Unit of Quantity	Repair Classification	Repair co (1000VND
8	NH1	00	Class III	2001	35	6.	35	100	110	Single	AC	2.76	Cut Surface Course and Replacement (5cm)	302.5	m2	Periodic Maintenance - Big	75,625
D.	NH1	00	Class (II	2011	129	700	129	800	100	Single	AC	3.00	Cut Surface Course and Replacement (5cm)	300	m2	Periodio Maintenance - Big	75.000
10	NH4	00	Class III	2011	130	500	130	800	100	Single	AG	3.00	Cut Surface Course and Replacement (5cm)	300	m2	Periodic Maintenance - Big	75,000
Ō	NH1	00	Class (I)	2011	113	500	113	800	100	Single	AC	3.00	Cut Surface Course and Replacement (5om)	300	m2	Periodic Maintenance - Big	75,000
	инт	00	Class III	2011	130	300	130	400	100	Single	AG	3.00	Gut Surface Course and Replacement (5cm)	300	m2	Periodic Maintenance - Big	75,000
0	NH1	00	Class (II	,2011	130	200	130	300	108	Single	AC	3.00	Cut Surface Course, and Replacement (from)	300	m2	Periodic Maintenance - Big	75,000

Note:

- The remaining tabs "List for Year 2, List for Year 3, List for Year 4, and List for Year 5" is a list of repairs that need repair. The corresponding years
- Functions: Search, Show / Hide Columns, View information detail of section to those shown above.
  - "Remaining Sections" Tab: Show sections not included in the repair plan

													Display Ite
	All	~ All	Ý	All	Senstruction Vean	Pions km	Finantini	To km	τα τα	ø	All	~ All ~	1
	Route Name	- Branch N	0	Road Class	Construction Year	From km	From m	To km	To m	Lengh, m	Up Or Down	Pavement Type	Width,m
	HCM	00		Class III	2003	497	800	497	909	100	Single	AC	2.75
	HCM	.00		Class III	2003	466	700	466	800	100	Single	AC	2.75
	НСМ	00		Class III	2003	501	300	501	400	100	Single	AC.	2.75
	HCM	00		Class III	2003	460	100	466	200	100	Single	AC	2.75
	HCM	00		Class III	2003	466	200	466	300	100	Single	AC	2.75
	HCM	.00		Class III	2003	466	300	466	400.	100	Single	AC	2.75
	Нсм	00		Class III	2003	466	400	466	500	100	Single	AC	2.75
	HCM	00		Class III	2003	468	300	468	400	100	Single	AC:	2.75
	нсм	00		Class III	2003	460	500	466	600	100	Single	AC	2.75
	HCM	.00		Class III	2003	468	000	460	700.	100	Single	AC	2.75
0.0	ving 1/to 10 ol	15,099 entries									Paviaus 1	2 3 4 5	1515 f
												and the second second second	

### **4** Other operations:

- Select the "Back to Formulate Annual Year" button to return to the Formulate Annual Year screen
- Select the "Generate Report File" button to proceed with the report generation process
- Select the "Export Report File" button to export the data to the excel file (This function is only displayed when the user has successfully generated the report data)
- Select the "Next to Proposal List" button to go to "Proposal List" screen

### IX) PROPOSAL LIST

↓ Purpose: Show sections list need proposal



35	ntormation						- 2	Cost by Year						
1 - m	arget Re ear of P lase Plar	egion: RMB I MS dataset nning Year :	1 263 II 2005					1st Vew Cost: RACE //5 (1000 VHD) 2nd Year Cost: RACE //5 (1000 VHD) 3nd Year Cost: RACE //1000 VHD) 4th Year Cost: RACE //1000 VHD) 5eh Year Cost: RACE //1000 VHD)						
		-				Check U	nit l'dat 🔿							
15	Line													
	Road Clas	ss is inveid a inveid			-	Crassing value is invalid Pavement Type value is in	ente		-	Rutting value is invalid			1 0	Display No
	Ai.	- M -	eu -	Gentral (10)	• Franker	Pipetin	P 70.07	• Que	0		Ali	- AU	-	
	Route Name	# Dranch No	Road Class	Construction Year	Ficom kerr	From m	To km	lo m	Leigh, m	Number of Lanks	Up Or Down	Pavement Type	Width,m	Unio
5	1941	.00	Cleas I	5003	5)00	700	270	200	100	2	rongen	AC	2'75	10
	1941	00	Class I	2001	270	800	270	750	100	z	Single	AC.	2.75	H
	NH2	90	Class III	2002	205-	800	285	700	100	t	Lea	40	2.55	1
1	NH2	00	Class III	2002	285	- 500	285	600	100	1.	Let	AC.	3.50	1
5	NH-630	100	Diass IV	5008	42	HOD.	42	900	100	1	stegie .	40	275	1
r	NHOD	- 25	Disks IV	2009	42	200	42	800	100	÷	Single	AC	2.78	10
ŀ	24438	100	Class IV	2009	42.	800	42	700	100	1	Single	AC.	2.75	
,	NH30	00	Dians IV	2009	42	500	1.42	600	100	÷	Single	AC	2.78	
5	NH38	00	Class IV	2000	31	100	31	200	100	1	Single	AC	2.75	1
5	NHSS	90	Class IV	2000	30	800	30	900.	100	8-	Segle	AC	2.75	10
,	NH38	99	Class IV	2002	10	800	10	705	100	1	Simple	40	1.76	1
k	10H38	-00	Class /V	2002	10	600	10	800	100-		Segle	AG	2.78	1
2	NH38	40	Class /V	2002	18	ġ.	łó	100	Hòt	r	Single	AC	2.78	1
	NH38E	40	Casa III	2006	20	100	20	200	100	6	Right	AC.	3.80	1
5	101385	60	Dessill	200/	25	6	20	100	100	£	Riger	ac.	5.86	1
2		1.64	Dassiv	2004	84	1000	04	80	100	1	Single	ett.	.2.75	1.00
	101276	100												1.000

- Description:
  - "Information for Process" form: Show information Target Region, Target PMS Dataset Year and Base Planning Year that the user selected in the "*Initial*" step and "*Select Base Planning Step*" screen
  - "Cost by Year": Show Cost for each year (Year 1 to Year 5)
  - "Sections List": Include 10 tab: Invaid Sections, Planning Sections, Target Sections, Repair Work Long List, List for Year 1, List for Year 2, List for Year 3, List for Year 4, List for Year 5, Remaining Sections ("Invalid sections" is defacult tab)

## Note: Functions "Search, Show / Hide Columns, View information detail of section" corresponding those shown above.

- Other operations:
  - Select the "Back to Candidate List" button to return to the Candidate List screen
  - Select the "Generate Report File" button to proceed with the report generation process



- Select the "Export Report File" button to export the data to the excel file (This function is only displayed when the user has successfully generated the report data)
- Select the "Next to Final List" button to go to "Final List" screen

### X) FINAL LIST

↓ Purpose: Show sections list need signed & confirmed by DRVN

10.55	information					-	× 1	Cott by Year						
YE	arget Regi lear of PM Base Plann	on: aver S dataset : ing Year : :	.2017 2018					ter hear Cost: A VID 225 (1000 VIND) 2nd Year Cost: 70073 135 (1000 VIND) 2nd Year Cost: 3,965,835 (1000 VIND) 4h Tear Cost: 3,905,854 (1000 VIND) 5n Year Cost: 50,855,854 (1000 VIND)						
						Check Unit Co	4.4							
ians	List													
valld	Sections P	unned Steplenti	Tatyot See	idra Résali Were Lor	a List List for Yaar 1	List for Year 2 List for Year 3	List for Veer	A List for Year & Remaining set						
	Road Caes -	n maka naka			1	Cracking value is invalid Proceedent Type value is invalid			-	lutting value of control)				
	1. D		1.00		0			0	0				P	lisbuy ite
	AU C	A1 (7)	A0 1	Constructive taxe	Finance			1418	104.5		All	A	-	
	NH1	00	Clase	2001	270	790	270	800	100.	2	Single	AC	2.75	
	NH	00	Class	2001	270	800	270	705	100.	2	Sirgle	AC	2.75	12
	NH2	00	Class (/)	2002	288	800	286	700	100	1	Lett	AC	3.80	12
5	NH2	00	Class ///	2002	285	600	288	600	100	÷.	int	AC	3.50	1
1	NHB	00	Clase (II	2006	138	700	138	600	100	31	Right	AG	3.50	1
	NH25	20	Class IV	2000	83	800	43	900	100	1.0	Single	AG	2.76	12
,	20138	.00	CIRSE IV	2009	42	900	42	1000	NUEL .	1	strage.	40	2.75	1
5	NP-COM	1301	Class IV	2000	42	#30	42	900	THE	Ť.	Single	AC	2.75	1
,	Nekšel	100	Class IV	2009	42	100	42	RDQ	100	τ	Sige	AC.	2.75	18
,	(49)38	1MI	Classe (V	2009	42	807	42	700	100	1	Single	AG	278	18
,	20130	.00	Diese IV	2009	42	503	42	900	. 9180		Stingle.	40	2.15	1
	NH38	00	Cines IV	2900	31	100	31	200	100	1	Single	AC	2.75	18
5	NH38	00	Class IV	2000	30	800	30	900	100	1	Stryle	AC	2.75	10
	NH38	00	Class IV	2002	10	000	10	700	100	1	Single	AC	2.75	1
>	5430	130	Class IV	2002	τU	300	10	.800	tom	1	Single	AC	2.75	
>	NHOE	nn	Class 1V	5002	18	α	16	100	105	1	15 ng la	AC	2.78	E
,	NH335	00	Class (III	2006	20	100	20	200	100	3.	Right	AC	3,50	1
5	NH398	00	Class III	2008	20-	9	25	00f	100	-i	Right	AC.	3.50	8
>	NH278	00	Class IV	2004	34	800	84	909	100	1	Single	AC.	2,75	1
		6 antinai											Transa P	5.

### **Description**:

- "Information for Process" form: Show information Target Region, Target PMS Dataset Year and Base Planning Year that the user selected in the "*Initial*" step and "*Select Base Planning Step*" screen
- "Cost by Year": Show Cost for each year (Year 1 to Year 5)
- "Sections List": Include 10 tab: Invaid Sections, Planning Sections, Target Sections, Repair Work Long List, List for Year 1, List for Year 2, List for Year 3, List for Year 4, List for Year 5, Remaining Sections ("Invalid sections" is defacult tab)



Note: Functions "Search, Show / Hide Columns, View information detail of section" corresponding those shown above.

- **4** Other operations:
  - Select the "Back to Candidate List" button to return to the Candidate List screen
  - Select the "Generate Report File" button to proceed with the report generation process
  - Select the "Export Report File" button to export the data to the excel file (This function is only displayed when the user has successfully generated the report data)
  - o Select the "Save" button to signed and confirmed by DRVN

	a k plai ii iii	ng > Final Lis	đ.											
This I	ilan has been sij	gned & confir	med by DRVN											
ocess	information					- 2	Cost by Year	r.						-
	'arget Reg 'ear of PM Base Planr	gion: RMB 15 datase hing Year	et : 2017 : 2017				1st Year Cos 2nd Year Cos 3rd Year Cos 4th Year Cos 5th Year Cos	t: 19,987,500 (1000 VND) st: 19,938,788 (1000 VND) st: 20,070,668 (1000 VND) st: 19,996,163 (1000 VND) st: 19,982,376 (1000 VND)						
		0				Check Unit Cost								
ctions	List													-
nvali	1 Sections F	Planned Sectio	ns Target	Sections Repair Wor	k Long List List for	Year 1 List for Year 2 List i	r Year 3 List for 3	Year 4 List for Year 5	Remaining sec	lion				
nvali	Road Class	Planned Sections invalid	ns Target	Sections Repair Wol	ik Long List i List for	Year 1 List for Year 2 List in Cracking value is invalid Pavement Type value is invalid	r Year 3 List for <sup>4</sup>	Year 4 List for Year 5	Remaining sec	lion thng value is invalid			Dia	100 1000
nvali	All	Planned Sections is invalid invalid	ns. Target	Sections Repair Wor	k Long List List for	Year 1 List for Year 2 List in Cracking value is invalid Pavement Type value is invalid	r Year 3 List for <sup>3</sup>	Year 4 List for Year 5	Remaining sec	libh thng value is invalld	All	All	Disp	lay Item
nvali.	I Sections I Road Class IRI value is i All v Route Name +	Planned Sections is invalid invalid All Y Branch No	All Y Road Class	Sections Repair Wol Construction Year Construction Year	k Long List List for	Year 1 List for Year 2 List invalid Cracking value is invalid Pavement Type value is invalid Proor m From m	r Year 3 List for <sup>1</sup> To km To km	Year 4 List for Year 5	Remaining sec	iron ting value is invalid Number of Lanes	All v Direction	All ~	Disp	ilay item Error
o vali	I Sections I Road Class IRI value is i All v Route Name + NH1	Planned Sections invalid All Sections Planned Sections invalid	All Class I	Sections Repair Wor Construction '(ear Construction Year 2001	k Long List Elist for From km 270	Year 1 List for Year 2 List in Cracking value is invalid Pavement Type value is invalid From m 700	r Yean 3 Liet for 1 To low To km 270	Year 4 List for Year 5	Remaining sec	ting value is invalid Number of Lanes 2	All V Direction Single	All ~ Pavement Type AC	Disp Width,m 2.75	lay Item Error
	All Value is i Route Name + NH1 NH1	Planned Sector is invalid invalid All V Branch No D0 00	All Class I Class I	Sections Repair Wor Construction Year 2001 2001	<ul> <li>From km</li> <li>From km</li> <li>270</li> <li>270</li> </ul>	Year 1 List for Year 2 List in Cracking value is invalid Pavement Type value is invalid Preem m 700 600	To Jern 270 270 270	Year 4 List for Year 5	Remaining sec Rul Lengh, m 100 100	ion ting value is invalid Number of Lanes 2 2	All V Direction Single Single	All ~ Pavement Type AC AC	Disp Width,m 2.75 2.75	lay Item Error
	I Sections	Planned Sector is invalid All Y Branch No 00 00	All Class I Class I Class I	Sections Repair Wor Construction Year 2001 2001 2002	<ul> <li>Econo Last</li> <li>Econo loss</li> <li>From loss</li> <li>270</li> <li>270</li> <li>285</li> </ul>	Year 1 List for Year 2 List in Cracking value is invalid Pavement Type value is invalid Prom m From m 700 600 500	To km 270 270 285	Year 4 List for Year 5	Remaining sec Rul Lengh, m 100 100	iting value is invalid Number of Lanes 2 2 1	All V Direction Single Left	All Pavement Type AC AC AC AC	Disp Width,m 2.75 2.75 3.50	Error

### **XI) SHOW HISTORY**

✤ Purpose: View history the created process

User choose menu "Work planning" and choose "Show History" function

MS						🎟 English (US) 🗸 🗮
A Home	Formulate PMS Dataset	Detenioration	1 2 Inputting System	Budget Simulation	III Iorr planning	
С н	ome				Start New Process	
					3 Show History	

 $\Rightarrow$  The screen displays:



ow mistory						
antici el	tinger lingen	Year of USU Same				
alled at.	· Target Region	Year of PMS detained	Capdidate	Proposal	Final	Action
7-09-12 13:47:42	RMEW	2017	*	*	*	Stine
7-69-12 12.39.19	R54570	2017	÷			THEM
7 05 12 12 21 45	Shie II	2017	¥.			a starter
1.09411192212	*08=	2017				1. Same
09/11 18:28:45	RM 8 =	2017	*			NAME
and the and	SMIL	2013	·			Since
08/16 16:31:08	RME	2017	*	*	*	1000

### Information for functions:

- Filter function
  - Step 1: At the "Show history" form, user choose Filter function
  - Step 2: Input information to search to properties: Creatd at, Target Region, Year

now history						
an l	Larger Inegian	Year of Vide paramet				
inated at	- Target Region	Year of PMS dataset	Capitate	Proposal	Final	Action
017-09-12 13:47:42	RMEW	2017	*	*	*	(Aline)
017-09-12 12.39.19	RMBIN	2017	~			west
217 05 12 12:21:46	sMe ii	2017	¥.			Many
10-00-11-10-20-12	KMB	2017				(Alama)
017-09-11 18:28:48	RMB -	2017	4			Vint
17-04-11 17-54-57	stant	2012	*			Sime
17.08.16.16:31:08	RMB	2017	*	*	*	1000

### Note: User can choose in once information of 3 properties

Example: Filter of "Target region" filed is "RMB II", "Year" field is "2017" and "Created at" is "2017-09-12 12:39:19"

Work Planning > Show Heatry							
Show History							- 2
Q							
2017-09-12-12:39:19	Rigin	2017					
Created at	• Larget Region	Year of PNS dataan	Candidate	Proposal	field	Artion	
1017-05-12 12:35:19	RME =	2037	-			March	
(hoogin) I in 1 of 2 unities (filosend (rom 2 tital vertees)						Annual 1	m <sub>i</sub> ge.

- View function
  - Step 1: At the "Show history" form, choose one process to view
  - Step 2: Choose "View" button



Show History							
a							
Owned as	ThepaPerson	Fine O BMS damages					
emod ac	- Target Region	Year of PMS datases	Cam	didate	Proposal	Final	Action
17-09-12 1 Ra7-42	SOMMERS:	2067	1	*	*	~	Sur 2
17-09-12 12,29,15	8M6 II	2017		*			View
17-09-12-12-21-46	RME	2017		*			State .
17-09-11 19:22:12	RMEW	2017					. 100000
7.09.11.18:25:43	RMB II	2017		~			Mana
17-09-11 17:54:07	Role w	2017		*			-Manuel
12-08-16 16:31:08	RMB	2017		4	*	*	Maxe
mong too 7 of Exercise							Acres 1

- ⇒ The screen after the user chooses to view the details of a process will move to the corresponding stage of the process state
  - Go to "Repair planning for 5 years" screen: When the process is only in the "Candidate"
  - Go to "Proposal list" screen: When the process has the status "Candidate" and "Proposal"
  - Go to "Final list" screen: When the process of completing the three "Candidate", "Proposal" and "Final"

Note: Users can view all the setup but can not edit.

### **USER'S MANUAL**

### PAVEMENT CONDITION DATA DISPLAY SYSTEM



### Content

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3,	User level 3	7
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1,	User level 1	. 14
2,	User level 2	.16
3,	User level 3	.18
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#### I. Home

- Website: <u>http://pms.drvn.gov.vn</u>
- Participants in the process include: Everyone who visits the website will see the main interface of the website





Users can also select data to view pavement condition details:



### II. Language options

- User can choose language: English or Vietnamese
- Operations: Click on the language icon on the Website





### III. Login

- Subjects: User already has an account and password
- Operators:
  - + Click "Login" on the Website
  - + Input Username and Password
  - + Press the Login button





### IV. Main Screen

### 1, User level 1

- User level 1 after successful login: The main screen will display Vietnam map with data of all RMB





### 2, User level 2

- User level 2 after successful login: The main screen will display Vietnam map with data of RMB and all SB of that RMB





### 3, User level 3

- User level 3 after successful login: The screen only shows data of a SB of the RMB that the user belongs to





### V. Data detail of Road Inventory

- Subjects: User login and into main screen.
- Operations: Click on section to view data detail of section





Table of pavement condition data of that section:



PMS e 🔀 Full screen 🛈 Logout Front view Window oute Name: NH18, KM: 6+0 - 6+100, Length: 100m, Analysis Area: userlvl3 - SB I.5 Milestone Milestone 378.0000m2. Direction: L. Survey Lane: 1. Branch Number: 80. Pavement Cracking ratio **Rutting Depth** Route (from) (To) Survey Type: AC, Survey Date: 10/20 IRI Name Date KM M KM M Cracking Patching Pothole Total Max Average WH National boundary 10/2012 **NH18** 7.5 7.5 14 8 100 \*\*\* Provincial boundary 0 17 10 **NH18** 200 10/2012 5.9 0 5.9 III District boundary 0 10 **NH18** 200 5 300 10/2012 0 0 0 14 nm Provincial road 0 0 **NH18** 5 300 5 400 10/2012 0.5 0.5 18 10 N National road NH18 500 10/2012 25.4 0 0 25.4 22 11 // Commune boundar **NH18** 500 600 10/2012 2.7 0 0 2.7 15 9 5 KM6+0 KM6+100 1 N Rail Road **NH18** 600 700 10/2012 1.9 0 0 1.9 13 9 5 LEFT Rivers and lakes NH18 800 10/2012 1.3 0 0 1.3 18 10 5 700 5 **Pavement Condition NH18** 900 10/2012 0.6 0.6 13 9 N 5-(Good) 14 **NH18** 900 5 1000 10/2012 0 0 0 0 9 // 5-4(Fair) KM5+0 KM8+0 RIGHT N 4-3(Bad) NH18 1000 10/2012 0 0 0 0 16 11 Cracking ratio Rutting Depth IRI MCI 3-0 (Poor) 10/2012 **NH18** 100 0 n 0 0 N 0 - 10(%) (Good) N 10 - 20 (%) (Fair) N 20 - 40 (%) (Bad) N 40 - (%) (Poor) 0 12 **NH18** 100 200 10/2012 0 0 0 20 Close 10/2012 10 NH18 200 300 n 10 DX.THAI HOA NGHEAN Trune Oude ( vietbando 50 km

- Information and operations on the pavement condition data table:
  - Data information

-

• Display the detailed data: Route name, Chainage Survey date, Cracking ratio (Cracking, Patching, Pothole, Total), Rutting depth (Max, Average), IRI, MCI, Lane direction, Lane position number, Length, Pavement type, Structure ....



- o Show photos: Each section usually has 20 photos
- A road map showing the current section of the road being viewed (blinking green and red) and alternate road sections with a color indicating the road condition of the fault type selected
- List of distress types: Cracking ratio, Rutting Depth, IRI and MCI and annotations corresponding to each type
- Operations:
  - Choose a distress type to view the pavement condition data in the selected distress state of that section



Ro	ute me -	Miles (fro	itone m)	Mile: (1	stone [0]	Survey		Cracking r	atio		Ruttin	ng Depth	IR	321 8000m2, Direction: L. Survey Lane: 1. Branch Number: 50, Pave Type: AC, Survey Date: 5/2016	ment
		КМ	М	KM	M		Cracking	Patching	Pothole	Total	Max	Average			3
NH	45	99	0	99	100	5/2016	0	0	0	0	20	8	À		1.
NH	45	99	100	99	200	5/2016	0	0	0	0	32	15			1
NH	45	99	200	99	300	5/2016	0	0	0	0	25	11			
NH	45	99	300	99	400	5/2016	0	0	0	Ö	22	11			100
NH	45	99	400	99	500	5/2016	0	0	0	Ò	16	9			÷ .
NH	45	99	500	99	600	5/2016	0	0	0	0	12	7			1
NH	45	99	600	99	700	5/2016	0	0	0	Ò	23	10			
NH	45	99	700	99	800	5/2016	0	0	0	0	27	12			
NH	45	99	800	99	900	5/2016	0	0	0	0	20	8		KM100+0 L KM	A100+100
NH	45	99	900	100	0	5/2016	0.8	0	0	0.8	47	17	_	LEFT	
NH	45	100	0	100	100	5/2016	0	0	0	0	29	16			
NH	45	100	100	100	200	5/2016	0	0	0	0	45	19			
NH	45	100	200	100	225	5/2016	0	0	0	0	23	13	- 21	KM100+0 RIGHT	KM100+0
4	A5.	100	225	100	745	5/2016	n	n	n	0	10	11		Cracking ratio Rutting Depth IRI MCI	
1.														N 0 - 10(%) (Good) N 10 - 20 (%) (Fair N 20 - 40 (%) (Bad) N 40 - (%) (Pod	2 <b>7</b> )
														Choose Distress Type	Close
-			-				1.0		-	-		CAME	IOD!	IA (	
			1					T			3-			AND A REAL MARKEN AND	

• Press the left arrow - right arrow on the keyboard to see the list of captured images of the section to view

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....

H	Route Name	(fro	om)	Nule (1	To)	Survey – Date		Cracking	atio		Ruttin	ng Depth	IR	321 3010m2 Direction: L. Survey Lane: 1, Branch Number: 50, Pever Type: AC, Survey Date: 5/2016	nent
		КМ	м	KM	М		Cracking	Patching	Pothole	Total	Max	Average			1
/	NH45	99	0	99	100	5/2016	0	0	0	0	20	8	*		
	NH45	99	100	99	200	5/2016	0	0	0	0	32	15			* *
	NH45	99	200	99	300	5/2016	0	0	0	0	25	11			
	NH45	99	300	99	400	5/2016	0	0	0	0	22	11		AND THE SECOND	20 A
	NH45	99	400	99	500	5/2016	0	0	0	0	16	9			it in
У	NH45	99	500	99	600	5/2016	0	0	0	0	12	7			
	NH45	99	600	99	700	5/2016	0	0	0	0	23	10		The second se	- 22
	NH45	99	700	99	800	5/2016	0	0	0	0	27	12		Photo List	
	NH45	99	800	99	900	5/2016	0	0	0	0	20	8		KM100+0 I KM	100+100
	NH45	99	900	100	0	5/2016	0.8	0	0	0.8	47	17		LEFT	
IJ	NH45	100	0	100	100	5/2016	0	0	0	0	29	16			
	NH45	100	100	100	200	5/2016	0	0	0	0	45	19			
	NH45	100	200	100	225	5/2016	0	0	0	0	23	13		* RIGHT	M100+0
	MH 45	100	775	100	715	5/0016	n	n	n	'n	10	11		Cracking ratio Rutting Depth IRI MCI	
														N 0 - 10(%) (Good) N 10 - 20 (%) (Fair) N 20 - 40 (%) (Bad) N 40 - (%) (Pool	x
															Close
-	-	-	-		-	_	5115	-		-	-	CAME	ODIA	A	
			1					1	100	the C	5	-			

• Click on any section on the data table or schematic to view the information



PMS

Front view Window

Route	Mi (	eston from)	ne	Miles (T	stone o)	Survey		Cracking r	atio		Ruttir	ng Depth	18	321.8000m2, Direction: L. Survey Lane: 1, Branch Numi	er: 50. Pavement
Name	KA	1 0	M	KM	м	– Date	Cracking	Patching	Pothole	Total	Max	Average			
NH45	99	0		99	100	5/2016	0	0	Ū	0	20	8			
NH45	99	1	00	99	200	5/2016	0	0	0	a	32	15			
NH45	99	2	00	99	300	5/2016	0	0	0	0	25	11			
NH45	99	3	00	99	400	5/2016	0	0	0	0	22	11			
NH45	99	4	00	99	500	5/2016	0	0	0	0	16	9		and the second s	
NH45	99	5	00	99	600	5/2016	0	0	0	0	12	7			4 × ×
NH45	99	6	00	99	700	5/2016	0	0	0	0	23	10			
NH45	99	7	00	99	800	5/2016	0	0	0	0	27	12		and the second s	
NH45	99	8	00	99	900	5/2016	0	0	0	0	20	8		KM100+0 L	KM100+100
NH45	99	9	00	100	0	5/2016	0.8	0	0	0.6	47	17		IFFT	
NH45	10	0		100	100	5/2016	0	0	0	0	29	16			
NH45	10	1	00	100	200	5/2016	0	0	0	O	45	19			
NH45	10	2	00	100	225	5/2016	0	0	0	0	23	13		4	•
NHAS	10	2	25	100	245	5/2016	n	n	n	'n	10	11	-	KM100+0 RIGHT	MCI KM100+0
1							14	Y	-		1	CAME	ODI	M 0 - 10(%) (Good) M 10 - 20 (%) (Fair) M 20 - 40 (%) (Bad) Choose section to view detail on schematic or data table A Tak HONG, VENDUHCE	/ 40 - (%) ( Poor) Close

### VI. Search

- 1, User level 1
  - Choose RMB

me 🐰 Full screen 🕩 Log



- Choose SB
- Choose Road
- Choose Year
- Input Kilopost
- Click "Search" button



PMS				🕮 English (US) 🗸 🛛 userivi1	Q Search	🖁 Home 🔀 Full screen	le Logout
userlvl1 - MOT	📄 Crack ratio 📄 Rutting Depth 📄 IRI 🖉	MCI					
HH National boundary	# ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~					and the state	S. T.
👐 District boundary	S ( P ) SS	Search	×	1			
mm Provincial road	had the	RMB		HON	G KONG		
N National road	ANYANIMAD			and the second second			
M Commune boundary	IVIYAINMAR	SB	All	and a second			
💉 Rail Road	Here I have	Road	All route				
Rivers and lakes	S - Y	Time	1.000				
Pavement Condition	N 15		Latest				
N 5-(Good)	1 13	Kilopost	From To	3			
№ 4-3(Bad)	Pannon	1					1
N 3 - 0 ( Poor)	Kangoon						6
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	2		TOURNOING RHAM HON				34
	Anduman	195 /	Prinom Penh Shai Huros Ana Thurs				
	Vietbando 200 km	37/	BINH THAN				d'

### 2, User level 2

- Choose SB
- Choose Road
- Choose Year



- Input Kilopost
- Click "Search" button





### 3, User level 3

- Choose Road
- Choose Year
- Input Kilopost
- Click "Search" button



PMS		📰 English (US) 🗸 userivi3 Q Search 👫 Home 🔀 Full screen 🕩 Logout
userlvl3 - SB 1.5	Crack ratio Rutting Depth III MCI	
HH National boundary	C YÊN BẢI THẢI NGUYÊN	QUILINOU Q
<ul> <li>District boundary</li> <li>Provincial road</li> </ul>	SON LA THE RMB I	Behai
National road M Commune boundary	SB SB 1.5	- Ha
Rail Road Rivers and lakes Pavement Condition	Road     All route       Xam Nua     Time       Latest	
N 5-(Good) N 5-4(Fair) N 4-3(Bad)	Kilopost From To	
∛ 3-0(Poor)	Cancel V Sea	arch
	Xiangkhoang NGHĚ AN TX.THÁI HOA	Dảo Hải NamII (Trung Quee)
	Wietbando 50 km	and the second second

### VII. Logout

- Subjects: User logged in
- Operations: The user clicks the "Log Out" button in the upper right corner of the screen







### **USER'S MANUAL**

# PAVEMENT CONDITION DATA ANALYSE SYSTEM (DAS)



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### **CHAPTER 1: GENERAL**

### **I) INTRODUCTION OF SYSTEM**

Pavement Management System (hereinafter referred to as "PMS") has been developed under Activity-2: Enhancement of Planning Capacity for Road Information Management of the JICA Project on <u>Capacity Enhancement in Road Maintenance in Vietnam</u>.

PMS is a set of defined procedures for collecting, analyzing, maintaining and reporting pavement data, to assist the decision makers in finding optimum strategies for maintaining pavements in serviceable condition over a given period of time for the least cost. JICA Project Team in collaboration with DRVN has developed PMS by customizing into Vietnamese context.

Data Analysis System (DAS) is a web-based application to analyze pavement condition and create a summary graph and table based on the PMS database. It helps reporting works for annual maintenance progress report.

### **II) SUMMARY OF THE MAIN FUNCTIONS OF THE SYSTEM**

### **II.1)** The system functions:

- 1. Summary of the Road Network Statistics and PC Survey Length
- 2. Summary of Pavement Condition (PC)
- 3. Transition of Pavement Condition (PC)
- 4. Time series comparison of Pavement Condition (PC)
- 5. Summary of maintenance record
- 6. Summary of passed time from latest repair

### **II.2**) Login to the system

- Purpose: Login to the system
- Operations:
  - Step 1: Access to the system at http://pms.drvn.gov.vn
  - Step 2: User selects "Login" at the top right hand corner, filling Username and Password
  - Step 3: Click "Login" button to login





### **II.3**) Language option

- User can select language: *English* or *Vietnamese*
- Operations: Click on the icon flag England or Vietnam to change language



### II.4) Direction to Data Analyse System (DAS)

- The steps to enter the Data Analyse System:
  - Step 1: Login success
  - Step 2: At the top right hand corner, user selects "Home"
  - Step 3: User selects "Data Analyse System" module







### **CHAPTER 2: GUIDE FUNCTIONS**

After clicking on the "Data Analyse System" module, the screen display default data of "Summary of Road Network Statistics and PC survey length" tab.

### I) SUMMARY OF ROAD NETWORK STATISTICS AND PC SERVEY LENGTH

- Purpose: Summarize road network length and Actual PC Survey Length (Latest Survey) by Year (The latest PC survey year may contain multiple years as random survey interval and survey route may occur. Therefore, latest year may cover 1-5 years period such as 2012-2017 based on actual survey year data in 100m section data)

### **I.1)** Display the data for scope management form

- Purpose: Data include: Road Management Bureau (RMB), Sub Bureau (SB). Display data, is interactive part of the Show analytic and Export
- Data list is shown based on user jurisdiction:
  - ▶ Level 1 and Level 1p: Display all of RMBs and SBs
  - ▶ Level 2: Display of 1 RMB and all of SBs corresponding RMB
- User selects RMB, the SBs will change accordingly.

MS - Pavement Management System								WE Engl	sh (US) - usedula	мот 🗙 🛔	
A I III III	Deta Analysia System	Partice Description	-								
C Home / Data Analysis System				2 <del></del>							
LIII Data Analysis System >A	khalytics										
Summary of Road Network Statistic and PC Survey Length										- 7	
	Roast Managem	ent Bureau				Sub bureau					
Summary of Pavement Condition (PC)	RMB I					ALL			•		
Transition of Pavenner/ Cundition (PC)									Show a	nalytic Export	
Time serves comparison of Pavement Condition. (PC)		Survey Year		AC		BST		cc.	ħ	otai	
			RI	PC	RI	PC	RI	PC	RI	PC	
Summary of maintenancer moard											
Summary of pagesed time from latest repair											

### I.2) Summary Table

- Purpose: Summarize road network length and Actual PC Survey Length (Latest Survey) by Year for the 3 distress type: Asphalt Concrete (AC), Bituminous Surface Treatment (BST) and Cement Concrete (CC).
- Operation:
  - Step 1: Select 1 RMB (In case, user is level 2. Don't select)



- Step 2: Select SB is specific or all (Default is All)
- Step 3: Click on "Show analytic" button

### Example: In Case, SB is all

/ / fome / Data Analysis System												
III Data Analysis System >#	naly0≤											
ummary of Road Network Statistic and PC urvey Length									-			
	Road Management Burea	u				Sub bureau						
immary of Payement Condition (FIC)	RMB (					A) L						
ansition of Pavetment Condition (PC)									Show analytic Ex			
nie-series combatison of Pavement Condition	Survey Year		AC		BST		cc		Total			
0		RI	PC	Ri	PC	RI	PC	RU	PC			
minisy of maintainance includ	2016	590 500	1,984 805	a	58,800	1,100	8,345	591,600	2,051,950			
	2012	0	2,683,720	a	0	ù	17,145	1.Q.	2,700,865			
immary of passed time from latest repair												

- Display data for RMB and SB are selected:
  - > Diplay survey year of 1 RMB and all of SBs corresponding RMB are selected
  - Display the road network length and Actual PC Survey Length (Latest Survey) by servey Years for the 3 distress type: Asphalt Concrete (AC), Bituminous Surface Treatment (BST) and Cement Concrete (CC) of 1 RMB and all of SBs corresponding RMB are selected
  - Display the total road network length and total Actual PC Survey Length (Latest Survey) by servey Years for the 3 distress type: Asphalt Concrete (AC), Bituminous Surface Treatment (BST) and Cement Concrete (CC) of 1 RMB and all of SBs corresponding RMB are selected

### Note: Similar with: Select SB is the specific SB

### I.3) Export

- Purpose: Export into excel file about: Summarize road network length and Actual PC Survey Length (Latest Survey) by Year for the 3 distress type: Asphalt Concrete (AC), Bituminous Surface Treatment (BST) and Cement Concrete (CC)
- Operation:
  - Step 1: Select 1 RMB (In case, user is level 2. Don't select)
  - Step 2: Select SB is specific or all (Default is All)
  - Step 3: Click on "Export" button



a) In Case: Select SB is all

8	-	-		a dana	Ď	AS SummaryO/Road	NetworkStaticAndPCLe	ngth EV (39) size	Ered				m -	ri x
Peste HB	Home In Cat Copy - Formul Pointer about	ent Page Leyou Times New Kome R I U - i far	t formulas $0 = \frac{1}{\sqrt{2}} + \frac{1}{\sqrt{2}} + \sqrt{2} + \frac{1}{\sqrt{2}} + \frac{1}{$	la Renem = ∲: = +3 ≤ Ang	With Control of Contro	General General F = (\$ - 9p. ) The Prove	54 72 Gondille Formalitie	nal Format as Go	ormal Bad pod Tenur styler	nel	Invett Delete Form	E AutraSum Folf- Clevi -	Soft Bill Find & Finer * Solect	1 <u>A</u> Mure
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12	2018	0	2.683.720	0	000	0	17.145	0	2,700.865					
13 14 15 16 17 18 19 20 21 22 23 74 25 26 27				F	'a	ge								
181	Paven	nentType (4							111		-			0.10

b) In Case: Similar with: Select SB is one SB

### **II) SUMMARY OF PAVEMENT CONDITION**

- Purpose: Create a graph of pavement condition summary on targeted survey year and regions.

#### **II.1**) Display the data for scope management form

- Purpose: Data include: Road Management Bureau (RMB), Route Branch, Year, Distress Type. Display data, is interactive part of the Show analytic and Export
- Data list is shown based on user jurisdiction:
  - Level 1 and Level 1p: Display all of RMBs and SBs, Route Name, Survey Year corresponding RMB
  - ▶ Level 2: Display of 1 RMB and all Route Name, Survey Year corresponding RMB
- User selects RMB, Route Name, Survey Year will change accordingly.
- Distress Type include:
  - Crack Ratio
  - Rutting Depth (Max),
  - Rutting Depth (Average),
  - IRI
  - MCI


Home P Data Printyan ayacen				
I Data Analysis System >4	via),tics			
Immany of Road Network Statistic and PC over Length				-
	Road Management Burnau		Survey Year	
anmary of Pavement Condition (PC)	RMB1	)	Latest	
the strength of the strength of	Route Name-		Distress type	
acceleration (i.e.)	ALL		Crack rafia	
se-settes comparison of Pavement Dorpation 2)				Show analytic Expe
miniary of maintenance record				
mintery of cases of time from Jabert Lector				

#### **II.2)** The Graphs and Summary Table

- ✤ 100% stacked bar chart of PC
- 100% stacked bar chart of PC for each RMB, for each pavement index about of pavement condition summary on targeted survey year and regions.
- Operation:
  - Step 1: Select 1 RMB (In case, user is level 2. Don't select)
  - Step 2: Select Route is specific or all (Default is All)
  - Step 3: Select Year is lastest or specific servey year (Default is Lastest)
  - Step 4: Select Distress Type is specific pavement index ( Default is Crack Ratio)
  - Step 5: Click on "Show analytic" button

Note: The 100% stacked bar chart of PC is always showed. Don't change when user selects a specific Route.

- Example: In Case, Distress Type is Crack Ratio



Summary of Road Network Statistic and PC Survey Length					
	Road Management Burnau			Survey Year	
Summary of Pavement Condition (PC)	RMB I		,	Latest	
namilion of Pavement Condition (PC)	Route Name			Distress type	
	ALL		۲	Crack rafin	
inte-settes comparison of Pavement Doridition PC)					Show analytic Exp
ummary of maintenance record					
numintary of passed time from labert topain					
	NH1: 504.995 (km) NH2: 598.165 (km)	Crack ratio (	(Lates	st)	 0%
	NH1: 504.995 (km) NH2: 598.165 (km) NH4E: 85.105 (km) NH4E: 85.105 (km) NH6: 690.86 (km) NH6: 590.865 (km)	Crack ratio (	(Lates	st)	0% 0% - 10% 10% - 20% 20% - 30% 30% - 40% 40% - 50%
	NH1: 504.995 (km)           NH2: 598.165 (km)           NH3: 690.7 (km)           NH4: 85.105 (km)           NH5: 163.36 (km)           NH6: 690.865 (km)           NH6: 55.68 (km)           NH4: 40.09 (km)           NH4: 91.96 (km)	Crack ratio (	(Lates	st)	0% 0% - 10% 10% - 20% 20% - 30% 30% - 40% 40% - 50% 50% -
	NH1: 504.995 (km) NH2: 598.165 (km) NH3: 690.7 (km) NH4: 85.105 (km) NH5: 163.36 (km) NH6: 690.865 (km) NH10: 355.68 (km) NH10: 355.68 (km) NH18: 91.96 (km) NH18: 91.96 (km) NH28: 128.715 (km)	Crack ratio (	(Lates	st)	0% 0% - 10% 10% - 20% 20% - 30% 30% - 40% 40% - 50% 50% -
	NH1: 504.995 (km)           NH2: 598.165 (km)           NH3: 690.7 (km)           NH4: 85.105 (km)           NH5: 163.36 (km)           NH6: 690.865 (km)           NH7: 525.68 (km)           NH7: 40.09 (km)           NH8: 91.96 (km)           NH3: 91.96 (km)           NH3: 76 73 (km)           NH3: 128.715 (km)           NH38: 172.915 (km)	Crack ratio (	(Lates	st)	0% - 10% 0% - 10% 10% - 20% 20% - 30% 30% - 40% 40% - 50%
	NH1: 504.995 (km)           NH2: 598.165 (km)           NH3: 690.7 (km)           NH4: 85.105 (km)           NH4: 85.105 (km)           NH5: 80.38 (km)           NH5: 690.865 (km)           NH10: 355.68 (km)           NH15: 40.09 (km)           NH3: 91.96 (km)           NH3: 128.715 (km)           NH38: 128.715 (km)           NH38: 126.685 (km)           NH438: 126.685 (km)	Crack ratio (	(Lates	st)	0% 0% - 10% 10% - 20% 20% - 30% 30% - 40% 40% - 50% 50% -
	NH1: 504.995 (km)           NH2: 598.165 (km)           NH3: 690.7 (km)           NH4: 850.7 (km)           NH5: 163.36 (km)           NH6: 690.865 (km)           NH6: 690.985 (km)           NH10: 355.68 (km)           NH15: 40.09 (km)           NH3: 819.96 (km)           NH3: 128.715 (km)           NH38: 128.715 (km)           NH38: 128.715 (km)           NH38: 126.685 (km)           NH429: 266.41 (km)	Crack ratio (	(Lates	st)	0% 0% - 10% 10% - 20% 20% - 30% 30% - 40% 40% - 50% 50% -
unecting togd between NH1 with Ninh	NH1: 504.995 (km)           NH2: 598.165 (km)           NH3: 690.7 (km)           NH4: 85.105 (km)           NH5: 163.36 (km)           NH6: 690.865 (km)           NH6: 540.09 (km)           NH1: 40.09 (km)           NH3: 81.91 56 (km)           NH3: 81.91 56 (km)           NH3: 81.02 57.68 (km)           NH3: 81.02 57.58 (km)           NH3: 128.715 (km)           NH38: 172.915 (km)           NH32: 106.885 (km)           NH47: 040.802 (km)           NH47: 106.885 (km)           NH47: 106.885 (km)           NH47: 124.3025 (km)           NH27: 266.41 (km)           HDuc Part 12.83 (km)	Crack ratio (	(Lates	;t)	0% 0% - 10% 10% - 20% 20% - 30% 30% - 40% 40% - 50% 50% -
necting road between NH1 with Ninh National Highway 3	NH1: 504.995 (km)           NH2: 598.165 (km)           NH3: 690.7 (km)           NH4: 85.105 (km)           NH5: 163.36 (km)           NH5: 163.36 (km)           NH6: 690.865 (km)           NH1: 40.09 (km)           NH3: 81.96 (km)           NH3: 81.96 (km)           NH3: 81.96 (km)           NH3: 81.06 (km)           NH3: 128.715 (km)           NH3: 127.15 (km)           NH3: 127.29 (km)           NH70: 423.025 (km)           HCM: 122.54 (km)           HCM: 122.54 (km)           Phué Port 12.83 (km)           Suppass1: 6.885 (km)	Crack ratio (	(Lates	st)	0% 0% - 10% 10% - 20% 20% - 30% 30% - 40% 40% - 50% 50% -
necting road between NH1 with Ninh National Highway 3 National Highway 3 National Highway 4	NH1: 504.995 (km)           NH2: 598.165 (km)           NH3: 690.7 (km)           NH4: 85.105 (km)           NH5: 163.36 (km)           NH5: 163.36 (km)           NH5: 163.36 (km)           NH6: 690.865 (km)           NH1: 540.09 (km)           NH3: 81.92.715 (km)           NH3: 81.28.715 (km)           NH3: 128.715 (km)           NH3: 128.715 (km)           NH3: 128.715 (km)           NH3: 128.715 (km)           NH4: 20.685 (km)           NH70: 423.025 (km)           NH70: 423.025 (km)           HCM: 122.54 (km)           Phué Port 12.83 (km)           3_Bypass1: 6.885 (km)           Jelf spubas 2.71 (km)	Crack ratio	(Lates	st)	0% 0% - 10% 10% - 20% 20% - 30% 30% - 40% 40% - 50% 50% -
nnecting toad between NH1 with Ninh National Highway 3 National Highway 6 National Highway 6 National Highway 6	NH1: 504.995 (km)           NH2: 598.165 (km)           NH3: 690.7 (km)           NH4: 85.105 (km)           NH4: 85.05 (km)           NH5: 63.36 (km)           NH6: 690.865 (km)           NH10: 355.68 (km)           NH10: 355.68 (km)           NH13: 410.96 (km)           NH3: 128.715 (km)           NH38: 128.715 (km)           NH38: 128.715 (km)           NH38: 122.715 (km)           NH38: 122.715 (km)           NH29: 266.41 (km)           NH27: 266.41 (km)           HCM: 192.54 (km)           Phuc Port 12.33 (km)           3. Sypass1: 6.885 (km)           old Bypass1: 27.21 (km)           old foute 15.88 (km)           Bypass1: 27.20 (km)	Crack ratio (	(Lates	st)	0% 0% - 10% 10% - 20% 20% - 30% 30% - 40% 40% - 50% 50% -
nnecting toad between NH1 with Ninh National Highway J National Highway J National Highway 6 National Highway 6 National Highway 6	NH1: 504.995 (km)           NH2: 598.165 (km)           NH3: 690.7 (km)           NH4: 85.105 (km)           NH4: 85.05 (km)           NH5: 80.38 (km)           NH5: 40.90 (km)           NH10: 355.68 (km)           NH10: 355.68 (km)           NH10: 355.68 (km)           NH115: 40.09 (km)           NH3: 91.96 (km)           NH3: 128.715 (km)           NH38: 128.715 (km)           NH38: 128.715 (km)           NH38: 128.715 (km)           NH38: 128.715 (km)           NH39: 120.505 (km)           NH429: 266.41 (km)           H279: 266.41 (km)           H279: 266.41 (km)           Phuc Port 12.83 (km)           3_Bypass: 1.6885 (km)           old forule 15.88 (km)           Bypass: 1.27.52 (km)           Sypass2: 8.22 (km)	Crack ratio	(Lates	st)	0% 0% - 10% 0% - 20% 20% - 30% 30% - 40% 40% - 50% 50% -
nnecting toad between NH1 with Ninh National Highway 3 National Highway 4 National Highway 6 National Highway 6 National Highway 10_roadside of Thanh National Highway 10_roadside of Thanh	NH1: 504.995 (km)           NH2: 598.165 (km)           NH3: 690.7 (km)           NH4: 85.105 (km)           NH4: 85.05 (km)           NH5: 463.36 (km)           NH5: 163.36 (km)           NH5: 163.36 (km)           NH5: 163.36 (km)           NH10: 355.68 (km)           NH10: 355.68 (km)           NH10: 456.37 (km)           NH3: 91.96 (km)           NH3: 128.715 (km)           NH38: 128.715 (km)           NH38: 122.715 (km)           NH38: 122.715 (km)           NH42: 106.685 (km)           NH27: 266.41 (km)           HV27: 266.41 (km)           Phuc Port 12.83 (km)           3_Bypass: 1.27.11 (km)           old route 15.88 (km)           Bypass: 2.71 (km)           Old route 15.88 (km)           Bypass: 2.75 (km)           S_Eypass2 4.22 (km)           Bih bridge: 1.15 (km)	Crack ratio	(Lates	st)	0% 0% - 10% 0% - 20% 20% - 30% 30% - 40% 40% - 50% 50% -

Display of graph:

- > Title of chart: Diplay servey year is selected
- Axis Y- left: Display PC Survey length information of each route, for each RMB, for each pavement index by Distress Type
- Hover on stacked bar chart: Display % of each rank for each route, for each RMB, for each pavement index by Distress Type
- ➢ Icon color: List the ranking of specific distress type

# Note: Operation and display with orther Distress types are simmilar

- Pie chart
- Pie chart for each route and total, for each RMB, for each pavement index about of pavement condition summary on targeted survey year and regions.
- Operation:



- Step 1: Select 1 RMB (In case, user is level 2. Don't select)
- Step 2: Select Route is specific or all (Default is All)
- Step 3: Select Year is lastest or specific servey year (Default is Lastest)
- Step 4: Select Distress Type is specific pavement index ( Default is Crack Ratio)
- Step 5: Click on "Show analytic"

# Note: The Pie chart of PC is always showed. It will change when user selects a specific or all Route.

- Example: In Case, Distress Type is Crack Ratio
- a) In case: Select Route Branch is All, Year is Lastest, Distress Type is Crack Ratio

Home / Data Analysis System				
III Data Analysis System >	Analytics			
ummary of Road Network Statistic and PC- urvey Length				- 2
	Road Management Burnau		Survey Year	
ammary of Pavement Condition (PC)	RMB1	)	Latest	•
and the second sec	Route Name-		Distress type	
anaman ar Fakiminin ("pingmoni (Fit")	ALL	٣	Crack ratio	*
nie-setias comparison of Pavement Sonotion (C)				Show unalytic Export
uminitary of maintenance record				





Display of graph:

- > Title of chart: Diplay servey year is selected
- Pie chart under: Display PC Survey length information for each RMB, for each pavement index by Distress Type
- Hover on Pie chart: Display % of each rank for each route, for each RMB, for each pavement index by Distress Type
- Icon color: List the ranking of specific Distress type

# Note: Operation and display with orther distress types are simmilar

b) In Case: Select Route Branch is the specific, Year is Lastest, Distress Type is Crack Ratio

		7
Road Management Bureau	Survey Year	
RMB I v	Latest	
Route Name	Distress type	
NH1 •	Crack ratio 🔻	
	Show analytic Export	





Display of graph:

- > Title of chart: Diplay servey year is selected
- Pie chart under: Display PC Survey length information for each route of each RMB, for each pavement index by Distress Type
- Hover on Pie chart: Display % of each rank for each route, for each RMB, for each pavement index by Distress Type
- Icon color: List the ranking of specific Distress type

# Note: Operation and display with orther distress types are simmilar

- ✤ Line Graph
- Line graph for each RMB, for each pavement index about of pavement condition summary on targeted survey year and regions.
- Operation:
  - Step 1: Select 1 RMB (In case, user is level 2. Don't select)
  - Step 2: Select Route is specific or all ( Default is All)
  - Step 3: Select Year is lastest or specific servey year (Default is Lastest)
  - Step 4: Select Distress Type is specific pavement index ( Default is Crack Ratio)
  - Step 5: Click on "Show analytic" button

# Note: The Line Graph of PC is always showed. Don't change when user selects a specific or all Route.



#### Example: In Case, Distress Type is Crack Ratio

Home. / Data Analysis System				
Data Analysis System >	Analytics			
2 18 19 19 19 19 19 19 19 19 19 19 19 19 19				
many of Road Network Statistic and PC- vey Length				
	Road Management Burnau		Survey Year	
imary of Pavement Condition (PC)	RMB I	,	Latest	
million of Paymenter (Coordina /PC)	Route Name		Distress type	
Francis and addressed from the set	ALL		Crack ratio	
e-sense companison of Pavement Continue. )				Show analytic Expon
natary of mamienance record				



Display of graph:

- Title of chart: Diplay servey year is selected
- Columns: Display PC Survey average length information for each route of each RMB, for each pavement index by Distress Type
- Red line: shows the average value (Average value is calculated as weighted average by section length and condition value

#### Note: Operation and display with orther distress types are simmilar



- 100% stacked bar chart of each selected route by comparison between directions and lanes
- 100% stacked bar chart for each selected route by comparison between directions and lanes and total of selected route, for each RMB, for each pavement index about of pavement condition summary on targeted survey year and regions.
- Operation:
  - Step 1: Select 1 RMB (In case, user is level 2. Don't select)
  - Step 2: Select Route is specific or all (Default is All)
  - Step 3: Select Year is lastest or specific servey year (Default is Lastest)
  - Step 4: Select Distress Type is specific pavement index ( Default is Crack Ratio)
  - Step 5: Click on "Show analytic"

# Note: The 100% stacked bar chart for each selected route by comparison between directions and lanes of PC is only showed when user selects a specific Route.

- Example: In Case, Distress Type is Crack Ratio

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			- /
ad Management Buréau		Survey Year	
RMB I	۲	Latest	•
ute Núese		Distruses type	
NH1	•	Crack ratio	•
			Shew analytic Exped
	Ad Management Buréau BMd I Urin Namo	S Budget	S Survey Year Ad Management Bureau BMB 1 I I I I I I I I I I I I I I I I I I





Display of graph:

- > Title of chart: Diplay servey year is selected
- Axis Y- left: Display PC Survey length information of directions and lanes for each selected route, for each RMB, for each pavement index by Distress Type
- Hover on stacked bar chart: Display % of each rank for directions and lanes of each selected route, for each RMB, for each pavement index by Distress Type
- Icon color: List the ranking of specific distress type

# Note: Operation and display with orther distress types are simmilar

- ✤ Summary Table
- Summary Table for each route and total, for each RMB, for each pavement index about of pavement condition summary on targeted survey year and regions.
- Operation:
  - Step 1: Select 1 RMB (In case, user is level 2. Don't select)
  - Step 2: Select Route is specific or all ( Default is All)
  - Step 3: Select Year is lastest or specific servey year (Default is Lastest)
  - Step 4: Select Distress Type is specific pavement index ( Default is Crack Ratio)
  - Step 5: Click on "Show analytic"

#### Note: Summary Table is always showed

- Example: In Case, Distress Type is Crack Ratio



#### The Project for Capacity Enhancement in Road Maintenance in Viet Nam Phase II

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	0%	0% - 10%	10% - 20%	20% - 30%	30% - 40%	40% - 30%	50% -	Total	Average	
NH1	361015	97525	25330	9725	5290	2555	2995	504435	2.82	
NH2	384360	119110	33605	16585	13585	8215	21670	597130	5.97	
NH3	567580	106280	10965	2810	1315	220	505	689675	0.81	
NH4E	16520	4770	1820	2455	2380	2735	46775	77455	55.11	
NH5	128375	11675	4360	2955	3915	2890	9190	163360	6.48	
NH6	326015	184230	66345	36585	26125	20075	30500	689875	9.15	
NH10	298790	52850	3025	615	320	80	0	355680	0.53	
NH15	10250	15420	6015	3755	1155	845	520	37960	9.42	
NH18	60270	21750	5155	2010	1245	535	.995	91960	3.59	
NH37	43210	7745	3760	3025	1600	2470	6920	68730	12.14	
NH38	34460	28385	14165	8705	7055	6035	26225	125030	24.39	
NH38B	99220	22755	6740	3875	3365	2670	31375	170000	18.95	
NH43	12950	36945	15170	9130	8975	6635	16880	106685	22.81	
NH70	282410	111395	15015	6815	2620	1535	2690	422480	2.41	
NH279	156815	54125	10280	9130	5200	4070	21245	260865	9.43	
нсм	110060	45485	15000	9750	6425	2885	2900	192505	5.96	
Connecting road between NH1 with Ninh Phuc Port	12330	500	0	0	0	۵	0	12830	0.04	
National Highway 3_Bypass1	6685	200	Ó	0	0	D	Ó	6885	0.08	
National Highway 3_old Bypass	440	2140	0	0	0	0	0	2580	1.28	
National Highway 6_old route	13050	2830	0	9	0	0	0	15880	0.19	
National Highway 6_Bypass1	1035	1235	1735	2975	2670	3325	13920	26895	50.65	
National Highway 6_Bypass2	200	3645	2680	955	390	100	250	8220	14.02	
National Highway 10_roadside of Thanh Blnh bridge	850	300	0	0	Q	0	0	1150	0.58	
National Highway 21B	91665	2695	300	0	200	0	Ó	94860	0.17	
National Highway 279_Bypass	2320	500	Ö	0	Ō	0	0	2820	0.21	
RMB I Total	3020875	934490	241465	131855	93830	67875	235555	4725945	7.14	

# II.3) Export

- Purpose: Export into excel file about: Summarize pavement condition on targeted survey year and regions.



The Project for Capacity Enhancement in Road Maintenance in Viet Nam Phase II

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44 44		Cracle (As of Latest PC Survey)		Average - Loca		
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# **III) TRANSITION OF PAVEMENT CONDITION (PC)**

- Purpose: Display data of transition of average value of pavement condition (PC) on based RMB, Survey year, Distress type and display data by summary graph, table.

#### **III.1)** Display the data for scope management form

- Purpose: Display data included: RMB and Distress type
- Data list is shown based on user jurisdiction:
  - ▶ Level 1 and Level 1p: Display all RMBs and All
  - Level 2: Display 1 RMB
- Distress type: Display 5 distress type:
  - Crack ratio
  - Rutting depth (max)
  - Rutting depth (average)
  - IRI
  - MCI

	- 2
Road Management Bureau	Distress type
RMB I v	Crack ratio 🔻
	Show analytic Export

# III.2) Summary graph and table



- ✤ Line graph chart
- Purpose: Display data of transition of average value of pavement condition (PC) based on RMB, Survey year, Distress type
- Operations:
  - Step 1: Choose data: RMB and Distress type
  - Step 2: Click "Show analytic" button
- Distress type is Crack ratio in case view detail of 1 RMB

ad Management Bureau		Distress type	
RMBI		Crack ratio	
			Show analytic Exp
12	Cracking - Average		
10			IB (
8			
8 6			
8 6 4 2			
8 6 4 2 0 2012		2016	

Description:

- X axis: Indicates the Average value for each distress type
- Y axis: Indicates the Survey year
- \_\_\_\_: Indicates the RMB
- Distress type is Crack ratio in case view detail of all RMBs (userlvl1 and userlvl1p)





Description:

- X axis: Indicates the Average value for each distress type
- Y axis: Indicates the Survey year
- \_\_\_\_: Indicates for each RMB ( 1 RMB has color corresponding)

# Note: Above are sample of crack. The others, Rutting depth (max), rutting depth (average), IRI, MCI are also same Crack ratio

- ✤ Summary table
- Display data of transition of average value of pavement condition (PC) based on RMB
- Distress type is Crack ratio in case view detail of 1 RMB

	2012	2016
RMB I	10.87	2.28

- Distress type is Crack ratio in case view detail of all RMBs (userlvl1 and userlvl1p)

	2012	2015	2016
RMBI	10.87		2.28
RMB II			3.09
RMB III			6.3
RMB IV		2.11	1.23

#### **III.3**) Export function

- Operations: User clicks the "Export" button to export data including summary chart and data table into excel file





### **IV) TIME – SERIES COMPARISON OF PAVEMENT CONDITION (PC)**

- Purpose: Creat a comparison graph of pavement condition on targeted two – times series survey year (latest and second latest) and regions, route name, distress type. Display data by summary graph and table

#### IV.1) Display the data for scope management form

- Purpose: Display data included: RMB, First Year, Second Year, Route Name, Distress type.
- Data list is shown based on user jurisdiction:
  - ▶ Level 1 and Level 1p: Display all RMBs
  - Level 2: Display 1 RMB
- Corresponding RMB is selected, First year, Second Year, Route Name to change
- Distress type: Display 5 distress type:
  - Crack ratio
  - Rutting depth (average)
  - Rutting depth (max)
  - IRI
  - MCI

			- 2
Road Management Bureau	First year	Second year	Route name
RMB I 🔹	2016 •	2016 •	ALL
			Distress type
			Crack ratio 🔻
			Chaw applytic Expert
			Snow analytic Export

#### IV.2) Summary graph and table

- ✤ 100% stacked bar chart
- Display data comparison by PC survey length based on two time series corresponding RMB and Distress type is selected at the scope management form
- Operations:
  - Step 1: Choose data: RMB, First Year, Second Year and Distress type
  - Step 2: Click "Show analytic" button

#### Note: 100% stacked bar chart always for all Route Name of RMB is selected

- Distress type: Crack ratio



								-	1
Road Management Bureau		First year		Second year		Route name			
RMB I	٣	2016	Ŧ	2016	*	ALL			۳
						Distress type			
						Crack ratio			*
							Show analytic	Expo	ort



Descriptions:

- 2012, 2016: Two time –series is selected
- Color is rank list corresponding of Crack ratio

# Note: Above are sample of crack. The others, Rutting depth (max), rutting depth (average), MCI, IRI are also same Crack ratio

Doughnut chart

- Display data comparison by PC survey length based on two time series corresponding RMB, Route Name and Distress type is selected at the scope management form
- Operations:
  - Step 1: Choose data: RMB, First Year, Second Year, Route Name and Distress type
  - Step 2: Click "Show analytic" button

#### Note:



- > Doughnut chart will show data by RMB is selected in case Route Name is All value
- > Doughnut chart will show data by 1 Route Name of RMB is selected
- Distress type: Crack ratio
  - In case Route Name is "All" value

Management Bureau	First vear	Second year	Route name	
MB I	▼ 2016	v 2012	ALL	
			Distress type	
			Crack ratio	
			Show analyt	tic E
				Π.
Coophine rai	tis tatal 2010/int	2046(aut)	0%	
cracking ra	tio total - 2012(in)	- 2010(001)	0% - 10%	
4	T	and the second sec	ane/	
			10% - 20%	
1			20% - 30%	
K			30% - 40%	
1 1		1	40% - 50%	
/ / \	Le V		50% -	
NY				
17				
				1
		1		
	1 /			
		1		

• In case Route Name is 1 Route Name belong RMB

							- 2
Road Management Bureau		Firstyear	Second year		Route name		
RMB I	3	2015	2012	e.	NH2		÷.
					Distress type		
					Crack ratio		•
						Show analytic	Export



Description:

- 2016 (out) and 2012 (in)
- Color is rank list corresponding Crack ratio

# Note: Above are sample crack. The others, Rutting depth (max), Rutting depth (average), IRI, MCI are same Crack ratio

- ✤ Summary table
- Display data comparison by PC survey length based on two time series corresponding RMB, Route Name and Distress type is selected

Cracking ratio total	0%	0% - 10%	10% - 20%	20% - 30%	30% - 40%	40% - 50%	50% -	Total	Average
2012	1478725	551810	186175	103150	78100	59770	216265	2673995	10.87
2016	1542150	382680	55290	28705	15730	8105	19290	2051950	2.28

# **IV.3**) Export function

- Operations: User clicks the "Export" button to export data including summary chart and data table into excel file



	DAS_TimesSeriesComparisonOfPavem	ntCondition.xlsx - Excel		B - 8 3
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8 24/5 15/24 25 362880 25000 26/05 15/20 61/05 15/20 10 11 12 13 14 Crack	Doughnut chart Crack		RMB	te Name 😤 🏹
15 16 17 18 19 20 20 20 20 20 20 20 20 20 20 20 20 20	90% 80-00% 80-00% 820-00%	+ 6 % + 0 - 10% + 10 - 20% - 20 - 50% + 30 - 40%	SB         Image: SB (1)           SB (2)         Image: SB (2)           SB (3)         Image: SB (3)	nntecting road A 2M astonial Highway ational Highway
22 24 25 26 27	a 40-50%	+ 40-10% = 50%-	SB 1.4         Ni           SB 1.5         Ni           SB 1.6         Ni	ational Highway stional Highway v
28 0% 10% 20% 30% 40% 50% 80% 70% 80% 90% 30%			SB 1.7	
30 51 52 53 54 55 56 57 001 target data 1 chart 001 target data 1 summary tr	ble 001 Jarget, data_2,thart   001 Jarget, data_2,sun	imary table 🕴 001 target data 3 cha	rt   001järget,data,3,s 🛞	

#### V) SUMMARY OF MAINTENAME RECORD

- Purpose: Summary data of repair length based on RMB, SB, Route Name, Accumulated term, Repair method and Repair category. Display data by summary graph and table

# V.1) Display the data for scope management form

- Purpose: Display data included: RMB, SB, Route Name, Accumulated term, Repair method and Repair category.
- Data list is shown based on user jurisdiction:
  - ▶ Level 1 and Level 1p: Display all RMBs and all SBs
  - Level 2: Display 1 RMBs and all SBs belong RMB
- User selects RMB, SB and Route Name to change
- User selects 1 SB belong RMB, Route Name to change
- Accumulated term: 5 and 10 years can be selected
- Repair method, Repair Category: Display all repair method and repair category in the system.



Line and Line and an and a second s		Sub bureau					Ro	oute Nar	ne								
RMB II	7	ALL				Ċ,		ALL									٠
Repair Method		Repair Category					Ac	cumulat	ed Tei	n							
All	τ.	All						5 years									,
Repair length				201	F	Repai	r W	ork(f	ror 2010	n 2(	013 · 2017	- To • Rep	Show 201	v anal 7) e	ytic	Exp	Cr
80000			400		1	1				,							Ì,
600000 500000 400000 100000 200000			(Ly) 300 45 250 45 200 150 45 150 150 150 100 100 100 100 100 100 100	-				i.	1		Ľ.						- N 4 4 4 4 4 4

#### V.2) Summary graph and table

✤ Bar chart of history of repair length

- Purpose: Display data of repair length for RMB, SB, Route Name, Repair method and Repair category
- Operations:
  - Step 1: Choose data: RMB, SB, Route Name, Repair method and Repair category
  - Step 2: Click "Show analytic" button

#### Note: The chart always displays data for all the years of maintenance data

					- 2
Road Management Bureau		Sub bureau		Route Name	
RMB II	•	ALL	*	ALL	Ψ
Repair Method		Repair Category		Accumulated Tern	
All	•	All	•	5 years	
					Show analytic Export





Descriptions:

- X axis: Indicates the reapair year
- Y axis: Indicates the total length of repair (unit: m)
- ✤ Bar chart of accumulated repair length
- Purpose: Display data of Bar chart of accumulated repair length for Route Name of accumulated term (5 or 10 years) of RMB, Repair method and Repair Category
- Operations:
  - Step 1: Choose data: RMB, Accumulated term, Repair method, Repair category
  - Step 2: Click "Show analytic" button
- Bar chart of accumulated term: 5 years

Road Management Bureau	Sub bureau	Route Name
RMB II 🔹	ALL •	ALL
Repair Method	Repair Category	Accumulated Tern
All	All	5 years 🔻
		Show analytic Export





Descriptions:

- X axis: Indicates all Route Name belong RMB, SB is selected
- Y axis (left): Repair length (unit: m)
- Y axis (right): Repair rate (unit %)
- 2013 2014 2015 2016 2017 : Accumulated term (5 years)
- •: Indicates repair rate
- $\Rightarrow$  Accumulated term (10 years) do the same as the accumulated term (5 years)
- Summary table
- Display summary table of repair length of Route Name with accumulated term is selected



	2013	2014	2015	2016	2017	Total
NH1	0	0	121,563	131,663	0	253,226
NH10	0	0	11,678.5	11,002	0	22,680.5
HCM	0	0	336,100	47,180	Q	383,280
NH45	0	0	0	20,597	0	20,597
NH48C	0	0	708	0	0	708
NH7	0	Ó	666.5	Ö	0	666.5
NH46	0	0	16,200	Ó.	0	16,200
NH46B	0	0	634	3,400	Ō	4.034
NH8	0	0	105,300	0	0.	105,300
NH12C	0	0	172,000	6,000	0	178,000
NH9	0	0	718	0	Q	718
NH49	0	0	7,025	16,423	0	23,448
Link (Nghi Son Port - HCM)	0	0	37,169	0	Ŭ.	37,169
HCM - West Branch	0	Ó	85	955.1	- 0.	1,040.1
HCM-East Branch	0	0	669	0	0	669
Total	0	0	810,516	237,220.1	0	1,047,736.1

# V.3) Export function

- Operations: User clicks the "Export" button to export data including summary chart and data table into excel file



# VI) SUMMARY OF PASSED TIME FROM LASTEST REPAIR

- Purpose: Summary of passed time (year) from latest repair year by accumulated section length for each RMB and route

# VI.1) Display the data for scope management form



- Purpose: Data include: Road Management Bureau (RMB), Sub Bureau (SB), . Display data, is interactive part of the Show analytic and Export
- Sections list is shown based on user jurisdiction:
  - ▶ Level 1 and Level 1p: Display all of RMBs and SBs
  - ▶ Level 2: Display of 1 RMB and all of SBs, Route Name corresponding RMB
- User selects RMB, the SBs, Route Name will change accordingly.
- If user have selected the RMB, but the user selects one other SB within the RMB, then the Route Name will change accordingly.

#### VI.2) The Graph and Summary Table

- Bar chart (Histogram) of passed time (year) from latest repair year by accumulated section length for each RMB and route
- Operation:
  - Step 1: Select Road Management Bureau (RMB), Sub Bureau (SB), Route name

oad Management Bureau	Sub bureau	Route Name	
RMB II	▼ ALL	▼ ALL	Ŧ
			Show analytic Export
00000			-
00000		-	
00000			
ODOOD			
60000			
00000			
00000			
00000			
PD000		÷+	
		1	

• Step 2: Click on "Show analytic"

# Display of graph:

- Axis X: Accumulated section length (m)



- Axis Y: Elapsed time from lastest repair (year)
- ✤ Summary Table
- Display data: Road Management Bureau (RMB), Sub Bureau (SB), Route name, Elapsed time, Repair Year, Repair length

RMB	SB	Route Name	Elapsed time	Survey Year	Section Length
RMB II	SB II.1	HCM	2	2015	4,571
RMB II	SB II.1	NH45	1	2016	20,597
RMB II	SB II 1	NH10	2	2015	11,678.5
RMB II	SB II.1	NH10	ł	2016	11,002
RMB II	SB II 1	Link (Nghi Son Port - HCM)	2	2015	37,169
RMB II	SB II.2	нсм	1	2016	143
RMB II	SB II.2	NH1	2	2015	12,800
RMB II	SB II.2	NH7	2	2015	666.5
RMB II	SB II.2	HCM	2	2015	1.254
RMB II	SB II.2	NH46	. 2	2015	16,200
RMB II	SB II.2	NH46B	1	2016	3,400
RMB II	SB II.2	NH46B	2	2015	634
RMB II	SB II.2	NH48C	2	2015	708
RMB II	SB II.3	NH12C	1	2016	6,000
RMB II	SB II.3	NH1	1	2016	85,800
RMB II	SB II.3	NH12C	2	2015	172,000
RMB II	SB II.3	HCM	d	2016	26,000
RMB II	SB II.3	NH1	2	2015	74,600
RMB II	SB II.3	HCM	2	2015	206,000
RMB II	SB II.3	NH8	2	2015	105,300
RMB II	SB II 4	NH1	i i	2016	177
RMB II	SB II.4	NH1	2	2015	3,858
RMB II	SB II.4	HCM	t	2016	21,037
RMB II	SB II.4	HCM	2	2015	124,275
RMB II	SB II.4	HCM - West Branch	1	2016	955.1
RMB II	SB II.5	HCM-East Branch	2	2015	669
RMB II	SB II.5	NH9	2	2015	718
RMB II	SB II.5	HCM - West Branch	2	2015	85
RMB II	SB 11.5	NH1	2	2015	8,443
RMB II	SB II.6	NH49	1	2016	16,423
RMB II	SB II.6	NH1	2	2015	21,862
RMB II	SB II.6	NH1	1	2016	45,686
RMB II	SB II.6	NH49	2	2015	7,025

# VI.3) Export

- Operation:
  - Step 1: Select Road Management Bureau (RMB), Sub Bureau (SB), Route name
  - Step 2: Click on "Export"



The Project for Capacity Enhancement in Road Maintenance in Viet Nam Phase II

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- A 6 C 0 E F 6 8 1	J & L M N	O P Q R S	t U w	w a v j
2         DATE         19-0x1-2017           4         Maintenance data of each section           5         Expect time: * Section 1 rength (m)           7         1         200000           9         Grant total         104/7756.1           10         104/7756.1         200000           11         200000         200000           12         200000         200000           13         4         200000           14         200000         200000           15         200000         2           16         200000         2           17         200000         2           18         200000         2           19         200000         2           10         200000         2           12         200000         2           18         200000         2           19         200000         2           21         200000         2           22         22         24           23         23         24           24         24         24           25         25         25           26	antitargan (gan)	RMB         *           RMB //         *           58         52           59 // 1         *           58/10         *           58/10         *           S8/10         *           Read Name         52           HCM         *           HCM Vest Branch         *           HCM Fast Branch         *           NH1         *		
Bar_chart Summary_Inble			11	
Peady			# IC PI	- + 1879



# **USER'S MANUAL**

# **PAVEMENT MONITORING SYSTEM (PMOS)**



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# **CHAPTER 1: GENERAL**

# **I) INTRODUCTION OF SYSTEM**

Pavement Management System (hereinafter referred to as "PMS") has been developed under Activity-2: Enhancement of Planning Capacity for Road Information Management of the JICA Project on <u>Capacity Enhancement in Road Maintenance in Vietnam</u>.

PMS is a set of defined procedures for collecting, analyzing, maintaining and reporting pavement data, to assist the decision makers in finding optimum strategies for maintaining pavements in serviceable condition over a given period of time for the least cost. JICA Project Team in collaboration with DRVN has developed PMS by customizing into Vietnamese context.

PMoS is a visualization system of road conditions utilizing Road Database. It helps the routine road pavement maintenance and the prioritization of repair works. It shows road pavement conditions, management criteria and a maintenance history in order of chainage of kilo post by each lane.

# **II) SUMMARY OF THE MAIN FUNCTIONS OF THE SYSTEM**

#### **II.1)** The system functions:

- **1.** Display the data of "Scope Management" form
- **2.** Zoom area
- **3.** Horizontal Interactive area

Display data for based on the gray area selected Noteblock of gray area

- 4. Pavement Condition
- **5.** Traffic Volume
- 6. Mantenance History

#### II.2) Login to the system

- Purpose: Login to the system
- Operations:
  - Step 1: Access to the system at http://pms.drvn.gov.vn



- Step 2: User selects "Login" at the top right hand corner, filling Username and Password
- Step 3: Click "Login" button to login



# **II.3**) Language option

- User can select language: *English* or *Vietnamese*.
- Action: Click on the icon flag England or Vietnam to change language



# **II.4) Direction to PMoS**



- The steps to enter the PMoS
  - Step 1: Login success
  - Step 2: User selects "Home" at the top right hand corner
  - Step 3: In the menu bar select to "PMoS"

PMS - Pavement Management System			🖷 English (US) ~ userlvi1p - MOT 🛛 🗙
Home Formulation Instating System Evaluation	ation Budget Ion Simulation Work Planning System	PMoS Display System	
Home / PMoS			
- Home > PMos			
Jurisdiction			- 2
Road Management Bureau	1		h
RMB 1	km0+0.00		Kili94+70.00
Sub Bureau			
All			
Route Name			
NH1:00 *			
Segment			
Km0+0.00 - Km94+70.00: Lang Son Bắc 🔹			
	The chainage for the cross section:	Km0+0	0 - Km9+829



# **CHAPTER 2: GUIDE FUNCTIONS**

After clicking on the "PMoS" link, the screen display default data of Road Management Bureau, Sub Bureau, Route Name and the first segment that the user belongs to.

# I) DISPLAY THE DATA OF SCOPE MANAGEMENT FORM

- Purpose: Display data and display the data of Horizontal Interactivice Area, Zoom Area, Pavement Condition data, Traffic Volume data and Maintenance History data.

risdiction				÷ .
Road Management Bureau		h0-0.00		I
RMB I	٣	kno+0.00		km94+70.00
Sub Bureau				
All	Ψ			
Route Name				
NH1:00				
Segment				
Km0+0.00 - Km94+70.00: Li	ạng Sơn Bắc 🔻			
		The chainage for the cross section:	Km0+0 - Km9+829	1

- Sections list is shown based on user jurisdiction:
  - ▶ Level 1, Level 1p: Display all of RMBs and SBs
  - ▶ Level 2: Display of 1 RMB and all of SBs corresponding RMB
  - ▶ Level 3: Display of 1 RMB and 1 SB
- User selects RMB, the SBs, Route Name and Segment will change accordingly.
- If user have selected the RMB, but the user selects one other SB within the RMB, then the Route Name and Segment will change accordingly.
- If the RMB and SB has been selected, the user chooses a different Route Name, only the Segment changes accordingly.

# II) ZOOM AREA

- Purpose: Display the components in a segment, the user can drag, miniature-drag long the gray area and it's the display path in the extended interactive area (Horizontal Interactive Area)
- User interface, display data in the Zoom area and Gray area



irisdiction				- 2
Road Management Bureau		km0+0.00		km04+70.00
RMB I		1010.00		KIII94+70.00
Sub Bureau				
All				
Route Name				
NH1:00				
Segment				
Km0+0.00 - Km94+70.00	): Lạng Sơn Bắc 🔻			
		The chainage for the cross section:	Km0+0 - Km9+829	,

- Display km, m of the chainage start location and the chainage finish location based on the segment selected.
- ✓ Gray area:
  - Always display the default gray area when the user changes the data in the Management Scope block.
  - User can drag, drag long miniature and this is the display path in the Horizontal Interactive Area

**Note:** When the user changes the gray area the chainage for the cross section changes accordingly.

 Display the data of Road Inventory, Maintenance History, Traffic Volume based on the segment selected.

# III) HORIZONTAL INTERACTIVE AREA

#### III.1) Interface, Data was displayed based on gray area is selected

- Purpose: The area display data based on gray area is selected. If the gray area is moved, the horizontal interactive area will also change the data accordingly.



- Data infomation



- The chainage for the cross section: Show the start position and end position of chainage based on gray area is selected. This chainage will also change with the gray area change.
- ▶ L1, L2: Helps users identify Direction (Left) and Lane Position Number (1, 2, 3...)
- R1, R2: Helps users identify Direction (Right) and Lane Position Number (1, 2, 3...)
- > 0: Display the position of Single lane

# III.2) The block note of Gray Area

- Purpose: The block displaying annotations about the display data of the horizontal interactive area, Select/Unselect to Show/Hidden the data.

eed Text Here	
Road Inventory     AC BST CC Dmer     Ad BST CC Dmer     Maintenance History     Repair Classification     Period Vaintenance     Repair Surface     Repair Surface     AC BST     CC     Come     Traffic Volume	L1 0 R1 Km 0+0 Km 9+829

Data information:

- > Road Inventory: Note the color of each type of information.
  - AC (Blue color): Asphalt Concrete
  - BST (Violet color): Bituminous Surface Treatment
  - CC (Pink color): Cement Concrete
  - Other (Gray color): Other materials
  - Select/Unselect to Show/Hidden the data of Road Inventory

eed Text Here		- 2
Road Inventory     Ac BST CC Down     Maintenance History     Mepair Classification     Perddc Mansance - Emergency Papel     Contractionson     Perddc Mansance - Emergency Papel     Repair Surface     Ac     C C Cmm     Traffic Volume	L1 0 R1 Km 0+0	Km 9+829
eed Text Here		- 2
Road Inventory     Ac BST C O Other     Maintenance History     Repair Classification     Periodo Mandanese Enrangency Road     Robust Mandanese     Repair Surface     Acr	L1 -0 	
		***************************************

Maintenance History: Displayed the data of Repair Classification and Repair Surface



• Select/Unselect to Show/Hidden the data of Mantenance History



- Repair Classification: Note the color off Repair Classification on the Horizontal Interactive Area.
  - Periodic Maintenance Big
  - Emergency Repair
  - Routine Maintenance
  - Periodic Maintenance Medium
  - Select/Unselect to Show/Hidden the data of Repair Classification

eed Text Here		
Road Inventory     Ac Strategy C Other     Maintenance History     Repair Classification     Periodic Vienement     Periodic Vienement     Repair Surface     Repair Surface     Ac Str	L1 - 0 	
CC Generation Construction	Km 34+85	Km 44+200
eed Text Here		
Ac est other Maintenance History Repair Classification Period: Maintenance - Emigency Resur Period: Maintenance- Repair Surface Ac Est	L1 	

- Repair Surface: Note the color of Repair Surface on the Horizontal Interactive Area.
  - AC: Asphalt Concrete
  - BST: Bituminous Surface Treatment
  - CC: Cement Concrete
  - Other: Other materials
  - Select/Unselect to Show/Hidden the data of Repair Surface



Veed Text Here		- <
Road Inventory     Ac      Ac      Set      Cc      Donen     Maintenance History     Repair Classification     Parodi Mancandor     Denigit Mancandor     Ac      Cc      Donen     Traffic Volume	Lt 0 Rt Km 34+85	I Filmer I for the second s
Need Text Here		- 2
Road Inventory     Ac Barrier Comments     Maintenance History     Repair Classification     Pando Mémoranos     Pendo Mémoranos     Pendo Mémoranos     Repair Surface	Lt 	
CC Other	Km 34+85	Km 44+200

- ➢ Traffic Volume:
  - Note the icon of Traffic Volume on horizontal interactive area (Green flag)
  - Select/Unselect for Show/Hidden Traffic Volume

eed Text Here	-
Road Inventory     Ac BST C Other     Maintenance History     Repair Classification     Prince (Hentanance Benergency Repair     Repair Surface     Ac S S S C S S C S S C S S C S S C S S C S S C S S C S S S C S	Km 32+6
leed Text Here	
Road Inventory     Ac Bst C Other     Maintenance History     Repair Classification     Period c Identification     Period c Identification     Period c Identification     Period C Maintenance     Repair Surface     Km 21+892     Ac     Traffic Volume	

# **IV) PAVEMENT CONDITION**

- Purpose: Display specific data for every 100 m of road, base on Gray Area are selected.



		Chairage and Position		Collapse
		Crack ratio		
ondition		Legend : % 0-10 10-20 20-40 40 or	L-1	
ent C		more	R-1	
avem	•	Rutting depth (Average)		KM26+100 - KM26+200
۵.		Legend : mm 0-20 20-30 30-50 50 or	L-1	28.0000 [9/2012]
		more	R-1	
		Rutting depth (Max)		
		Legend : mm 0-20 20-30 30-50 50 or	L-1	
		more	R-1	
		IRI		
		Legend : mm/m 0-4 4-6 6-10 10 or	L-1	
		more	R-1	
		MCI		
		Legend : 5 or 4-5 3-4 3 or less	L-1	
		more	R-1	

#### Data infomation:

- Crack ratio: Display percent of Crack ratio for every 100m of road
  - Blue: Display Crack ratio from 0% to less than 10%
  - Green: Display Crack ratio from 10% to less than 20%
  - Orange: Display Crack ratio từ 20% to less than 40%
  - Red: Display Crack ratio from 40% or more
  - You can mouse over each section to display specific data: Chainage, Survey time, Crack ratio
  - Select/Unselect for Show/Hidden Crack ratio

Crack ratio						
Legend : 96 0-10 10-20 20-40 40 or	L-1					
more	R-1					
Crack ratio						

- Rutting depth (Average): Display Rutting depth (mm) for every 100m of road
  - Blue: Display Rutting depth (ave) from 0 mm to less than 20 mm
  - Green: Display Rutting depth (ave)from 20 mm to less than 30 mm
  - Orange: Display Rutting depth (ave) from 30 mm to less than 50 mm
  - Red: Display Rutting depth (ave) from 50 mm or more
  - You can mouse over each section to display specific data: Chainage, Survey time, Rutting depth (ave).
  - Select/Unselect for Show/Hidden Rutting depth (Average)





	Rutting depth (Average)		
	Legend : mm 0-20 20-30 30-50 50 or	L-1	
	more	R-1	
	Rutting depth (Average)		

Rutting depth (Max): Display Rutting depth (mm) for every 100m of road

- Blue: Display Rutting depth (max) from 0 mm to less than 20 mm
- Green: Display Rutting depth (max) from 20 mm to less than 30 mm
- Orange: Display Rutting depth(max) from 30 mm to less than 50 mm
- Red: Display Rutting depth(max) from 50 mm trở lên
- You can mouse over each section to display specific data: Chainage, Survey time, Rutting depth(max).
- Select/Unselect for Show/Hidden Rutting depth (Max)

Rutting depth (Max)		
Legend : mm 0-20 20-30 30-50 50 or	L-1	
more	R-1	
Rutting depth (Max)		

- ▶ IRI: Display rough IRI for every 100m of road
  - Blue: Display rough ratio from 0 mm/m to less than 4 mm/m
  - Green: Display rough ratio from 4 mm/m to less than 6 mm/m
  - Orange: Display rough ratio from 6 mm/m to less than 10 mm/m
  - Red: Display rough ratio from 10 mm/m or more
  - You can mouse over each section to display specific data: Chainage, Survey time, IRI.
  - Select/Unselect for Show/Hidden IRI

IRI		
Legend : mm/m 0-4 4-6 6-10 10 or		
more	R-1	
IRI		

- MCI: Display MCI for every 100m of road
  - Blue: MCI from 5 or more
  - Green: MCI from 4 to less than 5
  - Orange: MCI from 3 to less than 4
  - Red: MCI less than 3


- You can mouse over each section to display specific data: Chainage, Survey time, MCI.
- Select/Unselect for Show/Hidden MCI

MCI	
Legend : 5 or 4-5 3-4 3 or less	
more	R-1
МСІ	

#### V) TRAFFIC VOLUME

- Purpose: Display the data of Traffic Volume base on data are selected of "Scope Management" form

urisdiction			-	
Road Management Bureau	100 167-10 DO		LOSEDELO I	20
RMB (I	Kined 7 10.00		(i) 25 (i)	1
Sub Bureau				1
SB 0.3				
RouteName				-
NHT: QO				-
Segment				
Km487+0.00 - Km595+0.00: NH1 - Ha Ti 🔹				1
	The chainage for the cross section:	Km537+85 - Km58	i1+27	÷
8 8	10000	and the second sec	The Low House	
olun	8000			
Lic V				
Tat	6000			
	4000			
	2000			
	2000			
	0			
	483+800	529+600	564+90	0

- Data infomation:
  - Vertical axis: Display traffic density
  - Horizontal axis: 2 terminals are the location of 2 Traffic Volume
  - Select/Unselect for Show/Hidden Traffic Volume

#### **VI) MANTENANCE HISTORY**

- Purpose: Display the Maintenance History data of the last 5 years from the current year in the gray area selected.

	Repaired Surface	2017		
		2016		
	2015 2014	2015		
		2013		

- Data infomation:
  - AC: Asphalt Concrete
  - BST: Bituminous Surface Treatment
  - CC: Cement Concrete



- Other: Other materials
- L1, L2: Helps users identify Direction (Left) and Lane Position Number (1, 2, 3...)
- R1, R2: Helps users identify Direction (Right) and Lane Position Number (1, 2, 3...)
- 0: Display the position of Single lane
- Select/Unselect to Show/Hidden the data of Mantenance History.
- Example: The Maintenance History data for Direction (Left) and Lane Position Number (1)

	Repaired Surface	2017
	Chú thích :	2016
ảo trì	AC BSI CC Other	2015
l sử b		2014
Lịch		2013

# **USER'S MANUAL**

## DEVELOPMENT OF INFORMATION SYSTEM FOR ROAD MAINTENANCE TECHNOLOGY VIETNAM



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#### **CHAPTER 1: GENERAL**

#### **I) INTRODUCTION OF SYSTEM**

**Information systems for Road Maintenance Technology Vietnam** (hereinafter referred to as **TIS**) is a communication system built into information system of DRVN web-based. This system allows DRVN contact with new maintenance technologies, which developed by private companies. On the other hand, private companies have the opportunity to promote sales to DRVN, presenting technologies for DRVN and demonstration of technologies in the field.



- DRVN invites private companies to develop road maintenance technology through the DRVN website, display the maintenance and repair technologies that DRVN desires and Manuals of this system will be provided on the system.
- Private companies which have a system of maintenance and repair technology that fits these technologies and want to promote sales to DRVN, respond to this invitation by filling in the application form through the system for user/company registration. After registration completed, company user is cable to register their technologies in the system and maintain their technology information.
- Private companies can review and edit their own technologies, but other companies are not able to review your technologies. DRVN users can review all technologies registered in the system.
- When a private company register a technology, it shall clarify their intention by choosing the following actions:
  - Send technical product documentation
  - Present to DRVN staff
  - Conduct a small scale model of this field
  - Make a large-scale experiment of this field
- DRVN collects technical information regularly in the system and evaluates the technology expected to suitable with DRVN's needs. DRVN contacts to the companies who have technologies in line with DRVN's needs, and makes



opportunities to present the company's technology products. Product which attracts DRVN's attention during the presentation will be performed demonstration or will be conducted pilot activities in the field designated by DRVN.

- Private companies are requested to present to DRVN staff at DRVN's request by Email or Phone if it required.
- DRVN and the competent authority evaluate the proposed technology in the system.

#### **II) SUMMARY OF THE MAIN FUNCTIONS OF THE SYSTEM**

#### **II.1**) The system includes functions for DRVN:

- 1. Maintain own account information
  - Edit profile
- 2. Review Information in the TIS`
  - User Management
  - Company Management
  - Technology Management
- 3. Manage Experts of Competent Agency and Send Technology Link to Experts
  - Survey Management
  - Expert Management

#### II.2) Work Flow

Work flow of the TIS is shown as following figure. DRVN staff mainly views and searches Technology information interested in. DRVN can access and reach to the information to be utilized for their works.





#### Figure 1 Work Flow of Administrator

#### II.3) Login to the system

- Purpose: Login to the system
- Operation: Access to the system at http://tis.drvn.gov.vn, and filling e-mail address and password for login.





- If User wants to keep login, tick "Stay signed in" and the system saves the login information for the next time.
- User clicks "Sign in" button to Login or press Enter.
- After successfully login, a list screen will appear as shown below.

#### III) MAIN SCREEN

The main screen is shown after successful login. On the top of the main screen, all functions for a user are shown as icon (see following figure). TIS is compatible to English and Vietnamese and can be switched by clicking triang viet (VI) button.



#### **CHAPTER 2: GUIDE FUNCTIONS**

#### I) EDIT PROFILE

- ↓ Purpose: DRVN Staff edits own profile
- Operation: DRVN Staff 1 selects "Profile" at the top right hand corner, as shown in the following display screen:

TIS				the English (US)	-
		Choose	Profile	A Profile	
User Company Technology Survey Expert Permission				X Full Streen	
				(+ Logout	-
☑ User List - Edituser					
2 User information	- 🖍 🗴 🗭 Change past	sword		+	2 ×
Username	Old password				
DRVN					
Email	New Dessword				
drvn@gmail.com					
	Sabinta Continn passwo	wa			
					abmit

- **4** Information of Profile:
  - Edit Own Profile: In the "User Information" form, DRVN Staff can edit and change own username and Email address. Click the button Submit to save information.

🕼 User information		- 2 ×
Username		
DRVN		
Email	1. Input information to Edit	
drvn@gmail.com		
	2. Click button Submit	Submit

Change Password: In the "Change password" form, DRVN staff can change password by inputting "Old password", "New password" and "Confirm password". Click the button Submit to save information.



Change password	- / ×
.Old password	
New password	1. Input information to Change password
Confirm password	
	2. Click button Submit

#### **II) USER MANAGEMENT**

#### ↓ Purpose: DRVN User views registered User

Ser Company Technology S	A Q Survey Expert								
s oser management	> LIST								
					Сору	CSV	Excel	PDF	Display Iten
Name		Email	Created at	Updated at					
Name	*	Email	Created at	Updated at					Action
abca		abc@abc.com	2017-08-06 07:23:53	2017-08-08 08:35:2	1				
abcd		abcd@cabc.com	2017-08-08 08:35:41	2017-08-08 08:35:4	11				
admin		admin@admin.com	2016-12-04 15:25:39	2017-05-12 21:46:0	9				
Anh		anh.nh@libre.com.vn	2017-03-19 16:45:25	2017-03-27 11:23:0	5				
congtyglaothong		hienld@gmail.com	2017-06-28 09:20:55	2017-06-28 09:22:4	19				
developer		developerlibre@gmail.com	2017-05-11 13:24:09	2017-05-12 11:54:5	6				
DRVN		drvn@gmail.com	2017-03-15 06:09:01	2017-06-07 14:18:4	10				
hlen		hlen@abc.com	2017-03-17 07:26:50	2017-03-21 06:37:5	5				
Hien		nhanvienvp@gmail.com	2017-03-21 07:33:07	2017-03-21 07:33:2	27				
HienLD		nhanxvien@gmail.com	2017-03-21 06:51:16	2017-03-21 06:53:0	06				
kazuya aoki		kiakzo6013@pasco.co.jp	2017-03-22 08:24:24	2017-04-05 07:43:0	8				
Kunimasa		kunimasa@katahira.com	2017-04-04 12:43:33	2017-05-26 11:01:3	5				
Pantha		pantha@katahira.com	2017-07-21 09:31:12	2017-07-21 09:34:2	7				

- **H** Manupilation of User Management:
  - Filter information: Users are filtered for search by Name, Email, Created at, Updated at



I User Management

Name	Errail	Created at	Updated at
ame	+ Email	Created at	Updated at
dmin	admin@admin.com	2016-12-04 15:25:39	2017-03-25 02:24:55
nh	anh.nh@libre.com.vn	2017-03-19 16:45:25	2017-03-19 16:45:25
heck	check@gmail.com	2017/03-20 04:20:16	2017/03-20 04:20:16
hecktest_approve	app Input mfo	smation to Filter	2017-03-21 03:45:54
RVN	dryn@gmail.com	2017-02-15 06:09:01	2017-03-15 10:17:17
lien	nhanvienvp@gmail.com	2017-03-21 07:33:07	2017-03-21 07:33:27
	private166@gmail.com	2017-03-23 07:54/10	2017-03-25 03:27:19
izuya aoki	kiak706013@pasco.co.jp	2017-03-22 08:24:24	2017-03-22 08:24:24
ivate Company	privatecompany@igmail.com	2016-12-08 01:43:22	2017-03-21 02:27:31
nvate Company1	PrivateCompany1@gmail.com	2012-03-20-20:32:56	2017-03-20 20:35:01
est11	aaaaaaa@gmail.com	2017-03-20 04:04:02	2017-03-25 03:28:22
stationable	testdouble@gmail.com	2017-03-21 05:53:55	2017-03/21 03:58:55
u	trinhvul94.gtvt@gmail.com	2017-03-22 09:22:04	2017-03-22 09:45:59

- Example: Search for username is "admin"

admin	Email	Ereated at	Updated at
ame	+ Emeil	Created at	Updated at
ditura	admin@admin.com	2016-12-04 15:25:39	2017-03-25 02:24:55

- Column visibility function: View/ Hide column in "User list" table
  - Step 1: Click button Display Item
  - o Step 2: Choose name field to view/hide data

Z User Management	>Dst			
		1. Choose "Display Item"	Cop	y CSV Excel PDF Display
Name	Email	Crossing at	Llindated at	Name
lame	+ Email	Created at	Updated at	Created at
bca	abc@abc.com	2017-08-05 07:23:53	2017-08-08 08:35:21	Updated at Action
bed	abcd@cabc.com	2017 08-08 08:35:41	2017 08-08 08:35:41	1
dmin	admin@admin.com	2016-12-04 15:25:89	2017-05-12 21:46:09	/
nh	anh.nh@libre.com.i/n	2017-03-19 16:45:25	2017-03-27 11:23:05	/
anglygiaothong	hlenid@gmail.com	2017-06-28-09:20:55	2017-06-28-09:22:49	2. Choose field
eveloper	developeribre@gmail.com	2017-05-11 13:24:09	2017-05-12 11:54:50	to view/Hide
RVN	drvn@gmail.com	2017-03-15 06:09:01	2017-08-07 14:18:40	
teri	Interr@ubic.com	2017-03-17 07:26:50	2017-03-21 06:37:55	
ien.	nhanvienvpi@gmail.com	2017-03-21 07:23:07	2017-08-21 07:83:27	
lenLD	nhanxvien@gmail.com	2017-03-21 06:51:16	2017-03-21 06:53:06	
azuya aoki	klakzo6013@passo.co.jp	2017-03-22-08:24:24	2017 04-05 07:43:08	

#### **III) COMPANY MANAGEMENT**

↓ Purpose: View private companies' information.



#### Company management >Lst

								Copy CSV	Excel PDF	Display Item
Company's nan	Emiail	Phone numb	Fas	Department:	Contect p	Address	Company s n	Created at	Updated at	
* Company's name	Email	Phone number	Fax	Department	Contact person	Address	Company's registration date	Created at	Updated at	
Company 3	email@email.com	phone	fax.	department	name	address	2017-07-02	2017-07-21 09:38:26	2017-08-08 08:34:34	View
Công ty A112	trinhvui94,gtvt@gmail.com	0123456789	0431234567	Phòng kỹ thuật	Trần Cao Thẳng	Hà Nội	2017-05-11	2017-05-11 13:33:03	2017-08-08 08:34:48	View
CÔNG TY CỔ PHẦN XÂY DỰNG ZESCONS	descon@descon.com	66666	2312313	Construction/Building /Engineering	Nguyễn Văn A	146 Nguyen Cong Tru Street, Nguyen Thai Binh Ward, District 1, HCM Cityd	1976-01-31	2017-03-20 10:26:46	2017-06-28 11:42:46	View
Công ty K1	congtyk@gmail.com	22222222222	222222222222	Phòng kỹ thuật	Nguyễn A	Hà Nội	2017-03-23	2017-03-20 10:30:50	2017-04-11 04:02:47	View
Katahira & Engineers International	katahira@kei-mnl.com	84437264060	84437264050	Hanoi Office	Le Ngoc Hieu	5th Floor, Licogi 13 Tower, 164 Khuat Duy Tien Street Thanh Xuan District, Ha Noi, Viet Nam	2012-04-01	2017-04-05 08:01:23	2017-04-05 08:01:23	View
Developed by JICA									č.	

- ↓ Manipulation of Company Management
  - Filter information: Companies ca be filtered by Company Name, Email, Phone, Fax, Department, Contact Person, Address, Registration Date

Company Ter	A Q Christopy Survey Expert		_				_			
s company n	nanagement > tst		1	Input information to fil	ter		Cot	y CSV E	ixcel PDF	Display Ite
Company's name	Email	Phone numb	Fax	Department	Contact	Address	Company'	Created	Updated	
Company's name	Email	Phone number	Fax	Department	Contact person	Address	Company's registration date	Created at	Updated at	
Company 3	email@email.com	phone	fax	department	name	address	2017-07-02	2017-07-21 09:38:26	2017-08-08 08:34:34	View
ông ty A112	trinhvui94.gtvt@gmail.com	0123456789	0431234567	Phòng kỹ thuật	Trần Cao Thắng	Hà Nôi	2017-05-11	2017-05-11 13:33:03	2017-08-08 08:34:48	View
ÔNG TY CỔ PHẦN ÂY DỰNG ZESCONS	descon@descon.com	66666	2312313	Construction/Building/Engineering	Nguyễn Văn A	146 Nguyen Cong Tru Street. Nguyen Thai Binh Ward. District 1. HCM Cityd	1976-01-31	2017-03-20 10:26:46	2017-06-28 11:42:46	View
ông ty K1	congtyk@gmail.com	22222222222	222222222222	Phòng kỹ thuật	Nguyễn A	Hà Nội	2017-03-23	2017-03-20 10:30:50	2017-04-11 04:02:47	View
(atahira & Engineers nternational	katahira@kei-mnl.com	84437264060	84437264050	Hanoi Office	Le Ngoc Hieu	5th Floor, Licogi 13 Tower, 164 Khuat Duy Tien Street Thanh Xuan District, Ha Noi, Viet Nam	2012-04-01	2017-04-05 08:01:23	2017-04-05 08:01:23	View
Tổng công ty Thăng	tig12@tig.com.vn	0123456711111	043567899991	Văn Phòng	Nguyễn Văn A	Đống Đa, Hà Nội	2017-03-25	2017-03-27	2017-05-12	View

- Example: Search for a company with company name is " Tổng công ty xây dựng công trình giao thông 1"

Liker Company Fectioning		<b>)</b>								
Company man	agement >us	t								
								Copy CSV	Excel PDF	Display Item
Tổng công tự xây dựng c	Email	Phone numbe	Fax.	Department	Contact perso	Address.	Company's reg	Desited ac	Updisted at	
Company's name	Email	Phone number	Fax	Department	Contact person	Address	Company's registration date	Created at	Updated at	
Tổng công ty xây dựng công trình giao thông 1	tig@tig.com.vn	(84-4) 38350930	(84-4) 38350930	Văn Phông	Nguyễn Xuân Bình	Tòa nhà CIENCO1 - Số 623 Là Thành - Bà Đình - Hà Nội	2017-03-20	2017-03-20 10:30:08	2017-06-28 11:43:26	View
Shawing 1 to 3 of 8 entries									Photois	d 1 Ned

• Copy function: The system can copy all items in the list of the "Company Management".



- Step 1: Click "Copy" button to Copy data in the list.
- Step 2: Paste items in any application, such as MS Word, MS Excel, Text editor, etc.

Liser Company Tec	🖌 🔬 Q Annology Survey Expert										
🖲 Company m	nanagement > List										
							[	Сору	CSV Exc	el PDF	Display Iter
Company's name	Email	Phone numb	Fax	Department	Contact	Address	Comp	any.	Created	Updated	
ompany's name	Email	Phone number	Fax	Department	Contact person	Address	Compan registra date	iy's tion	Created at	Updated at	
Company 3	email@email.com	phone	fax	department	name	address	2017-07	-02	2017-07-21 09:38:26	2017-08-08 08:34:34	View
ông ty A112	trinhvui94.gtvt@gmail.com	0123456789	0431234567	Phòng kỹ thuật	Trần Cao Thắng	Hà Nôi	2017-05	5-11	2017-05-11 13:33:03	2017-08-08 08:34:48	View
ÔNG TY CỔ PHẦN ÂY DỰNG ZESCONS	descon@descon.com	66666	2312313	Construction/Building/Engineering	Nguyễn Văn A	146 Nguyen Cong Tru Street. Nguyen Thai Binh Ward. District 1. HCM Cityd	1976-01	-31	2017-03-20 10:26:46	2017-06-28 11:42:46	View
ông ty K1	congtyk@gmail.com	22222222222	222222222222	Phòng kỹ thuật	Nguyễn A	Hà Nội	2017-03	3-23	2017-03-20 10:30:50	2017-04-11 04:02:47	View
atahira & Engineers hternational	katahira@kei-mnl.com	84437264060	84437264050	Hanoi Office	Le Ngoc Hieu	5th Floor, Licogi 13 Tower, 164 Khuat Duy Tien Street Thanh Xuan District, Ha Noi, Viet Nam	2012-04	1-01	2017-04-05 08:01:23	2017-04-05 08:01:23	View
ổng công ty Thàng ong CTCP	tig12@tig.com.vn	0123456711111	043567899991	Văn Phòng	Nguyễn Văn A	Đống Đa. Hà Nôi	2017-03	3-25	2017-03-27 03:51:45	2017-05-12 18:49:51	View

- CSV/ Excel/ PDF function: The system can export all items in the list of the "Company Management" as csv/ excel or pdf format.
  - o Step 1: Click button CSV/Excel/ PDF to export company list
  - Step 2: Select a folder in your PC to save the file (export data format is .csv, excel or .pdf corresponding to clicked button)

							Cop	CSV EX	cel PDF	Display It
Company's name	Email	Phone numb	Fax	Department	[contact]	Address	Company'	Created	Updated	
company's name	Email	Phone number	Fax	Department	Contact person	Address	Company's registration date	Created at	Updated at	
ompany 3	email@email.com	phone	fax	department	name	address	2017-07-02	2017-07-21 09:38:26	2017-08-08 08:34:34	View
ông ty A112	trinhvui94.gtvt@gmail.com	0123456789	0431234567	Phòng kỹ thuật	Trần Cao Thắng	Hà Nôi	2017-05-11	2017-05-11 13:33:03	2017-08-08 08:34:48	View
ÔNG TY CỔ PHẦN ÂY DỰNG ZESCONS	descon@descon.com	66666	2312313	Construction/Building/Engineering	Nguyễn Văn A	146 Nguyen Cong Tru Street, Nguyen Thai Binh Ward, District 1, HCM Cityd	1976-01-31	2017-03-20 10:26:46	2017-06-28 11:42:46	View
ông ty K1	congtyk@gmail.com	22222222222	222222222222	Phòng kỹ thuật	Nguyễn A	Hà Nội	2017-03-23	2017-03-20 10:30:50	2017-04-11 04:02:47	View
atahira & Engineers hternational	katahira@kei-mnl.com	84437264060	84437264050	Hanoi Office	Le Ngoc Hieu	5th Floor, Licogi 13 Tower, 164 Khuat Duy Tien Street Thanh Xuan District, Ha Noi, Viet Nam	2012-04-01	2017-04-05 08:01:23	2017-04-05 08:01:23	View
ồng công ty Thăng	tig12@tig.com.vn	0123456711111	043567899991	Văn Phòng	Nguyễn Văn A	Đống Đa, Hà Nội	2017-03-25	2017-03-27	2017-05-12	View

- Display Item function: The system can change display items of "Company list" table
  - Step 1: Click button "Display item"
  - Step 2: Choose name field to view/hide data from Company's Name, Email, Phone number, Fax, Department, Contact person, Address, Company's registration date, Created at and Updated at



				1. C	Choose "D	isplay Item"	Cop	y csv	Excel PDE Display Item
Company's name	Email	Phone numb	Гах	Department	Contact	Address	Company	Company' Crea Email	
▲ Company's name	Email	Phone number	Fax	Department	Contact person	Address	Company's registration date	Create	Phone number Fax Department
Company 3	email@email.com	phone	fax	department	name	address 2. Choose field	2017-07-02	2017-0 09:38:	Contact person Address
Công ty A112	trinhvul94.gtvt@gmail.com	0123456789	0431234567	Phòng kỹ thuật	Trần Cao Thẳng	Ha Nôi to View/Hide	2017-05-11	2017-0 13:33:	Company's registration date Created at
CÔNG TY CỔ PHẦN XÂY DỰNG ZESCONS	descon@descon.com	66666	2312313	Construction/Building/Engineering	Nguyễn Văn A	146 Nguyen Cong Tru Street. Nguyen Thai Binh Ward. District 1. HCM Cityd	1976-01-31	2017-0 10:26:46	Updated at 11:42:46
Công ty K1	congtyk@gmail.com	22222222222	22222222222	Phòng kỹ thuật	Nguyễn A	Hà Nội	2017-03-23	2017-03 10:30:50	-20 2017-04-11 View 04:02:47
Katahira & Engineers International	katahira@kei-mnl.com	84437264060	84437264050	Hanoi Office	Le Ngoc Hieu	5th Floor, Licogi 13 Tower, 164 Khuat Duy Tien Street Thanh Xuan District, Ha Noi, Viet Nam	2012-04-01	2017-04 08:01:23	-05 2017-04-05 View 08;01:23

#### IV) TECHNOLOGY MANAGEMENT

Purpose: View technology information. DRVN can search and view all registered technologies.

Advanced Sea	arch											+ .
									Сору	CSV Exce	I PDF	Display Iten
Technoloj	Company	Technology	Facility	Year of Dev	Target	Status	Stage	Evaluation information	Evaluatic	Creater	Update	
Technology 🔺 Name	Company	Technology Code	Facility	Year of Development	Target	Status	Stage	Evaluation information	Evaluation date	Created at	Updated at	
Công nghệ ABCA	Tổng công ty Thăng Long CTCP	Inspection and Monitoring Technology	Bridge	2016	Improve safety	Under Development	Registered	The technology is not suitable to national roads	2017-05-12 20:00:18	2017-05- 12 20:00:07	2017-05- 12 20:00:18	View
Công nghệ K	Công ty A112	Inspection and Monitoring Technology	Bridge	2016	Enhance working environment, Improve negative effects to earth environment	Under Development	Registered	The technology is not suitable to national roads	2017-05-12 19:15:24	2017-05- 12 19:14:57	2017-05- 12 19:15:24	View
Công nghệ tái chế	CÔNG TY CỔ PHẦN XÂY DỰNG ZESCONS	Traffic Safety Technology	Road Slope	2016		Prepare for standardization in Vietnam	Registered			2017-03- 20 20:51:45	2017-03- 21 09:31:27	View
Công nghệ ái chế	Tổng công ty xây dựng công trình giao thông 2	Maintenance and Repair Technology	Bridge	2014		Under Development	Technology is demonstrated to DRVN by the company	The technology can be applied to national road as an alternative	2017-05-12 16:07:19	2017-03- 21 07:39:29	2017-05- 12 16:07:19	View
Công nghê tái chế mặt đường	CÔNG TY CỔ PHẦN XÂY DỰNG ZESCONS	Inspection and Monitoring Technology	Bridge	aaa		Under Development	Technology is demonstrated to DRVN by the company			2017-03- 21 02:23:53	2017-03- 25 01:58:48	View

- **H** Manipulation of Technology Management
- Search function: DRVN can keyword search by each categories of Company Technology name, Company, Technology code, Facility, Years of development and Target, Status, Stage, Evaluation information, Evaluation date, Created at and Updated at.



-

Advanced Se	arch											+
					Input inform	ation to filte	er		Сору	CSV Exce	el PDF	Display Iten
Technoloj	Company	Technology	Facility	Year of Dev	Target	Status	Stage	Evaluation information	Evaluatic	Createc	Update	]
Technology 🛓 Name	Company	Technology Code	Facility	Year of Development	Target	Status	Stage	Evaluation	Evaluation date	Created at	Updated at	
Công nghệ ABCA	Tổng công ty Thăng Long CTCP	Inspection and Monitoring Technology	Bridge	2016	Improve safety	Under Development	Registered	The technology is not suitable to national roads	2017-05-12 20:00:18	2017-05- 12 20:00:07	2017-05- 12 20:00:18	View
Công nghệ K	Công ty A112	Inspection and Monitoring Technology	Bridge	2016	Enhance working environment, Improve negative effects to earth environment	Under Development	Registered	The technology is not suitable to national roads	2017-05-12 19:15:24	2017-05- 12 19:14:57	2017-05- 12 19:15:24	View
Công nghệ tái chế	CÔNG TY CỔ PHẦN XÂY DỰNG ZESCONS	Traffic Safety Technology	Road Slope	2016		Prepare for standardization in Vietnam	Registered			2017-03- 20 20:51:45	2017-03- 21 09:31:27	View
Công nghệ tải chế	Tổng công ty xây dựng công trình giao thông 2	Maintenance and Repair Technology	Bridge	2014		Under Development	Technology is demonstrated to DRVN by the company	The technology can be applied to national road as an alternative	2017-05-12 16:07:19	2017-03- 21 07:39:29	2017-05- 12 16:07:19	View
Công nghệ tái chế mặt đường	CÔNG TY CỔ PHẦN XÂY DỰNG ZESCONS	Inspection and Monitoring Technology	Bridge	aaa		Under Development	Technology is demonstrated to DRVN by the company			2017-03- 21 02:23:53	2017-03- 25 01:58:48	View

Example: Search technologies developped in 2016.

Advanced Sea	arch											+
									Co	py CSV E	xcel PDF	Display Item
Téchnoloj	Gomplany	Technology (C)	Farilly	2016	Targes	Status	Stage	Evaluation inform	Evaluatio	Créated	L/odated	
Technology _ Name	Company	Technology Code	Facility	Year of Development	Target	Status	Stage	Evaluation information	Evaluation date	Created at	Updated at	
Còng nghẽ ABCA	Tổng công ty Thăng Long CTCP	Inspection and Monitoring Technology	Bridge	2016	improve safety.	Under Development	Registered	The technology is not suitable to national roads	2017-05-12 20:00:18	2017 05 12 20:00:07	2017-05-12 20:00:18	View
Cộng nghẽ K	Công ty A112	Inspection and Monitoring Technology	Bridge	2016	Enhance working environment, Improve negative effects to earth environment	Under Development	Registered	The technology is not suitable to national roads	2017-05-12 19:15:24	2017-05-12 19:14:57	2017-05-12 19:15:24	View
Công nghẽ tài chế	CÔNG TY CỔ PHĂN XÂY DƯNG ZESCONS	Traffic Safety Technology	Road Slope	2016		Prepare for standardization in Vietnam	Registered			2017-03-20 20:51:45	2017-03-21 09:31:27	View
Còng nghệ tái tạo mặt đượng	Tổng công ty Thàng Long	Mapping technology	Pavement	2016		Already standardized in Vietnam	Registered			2017-03-29 01:35:36	2017-04-05 07:15:22	View

- Advanced Search function: In addition to keyword search functions, advanced search by Created at, Updated at, Evaluation date and Year of development.
  - Step 1: Input information to search
  - o Step 2: Click button "Submit"



Advanced Se	arch											-
Created	at	From		To	Dpdat Updat	ed at	From	To To	*			
Evaluatio	in date	From	<b>m</b>	Ta	Year o	f development						
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rectinoloj	Company	Technology	Facility	Year of Dev	Target	Status	Stage	Evaluation informat	ii Evaluatic	Creater	Update	
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ing nghê 3CA	Tổng công ty Thăng Long CTCP	Inspection and Monitoring Technology	Bridge	2016	Improve safety	Under Development	Registered	The technology is not suitable to national roads	2017-05-12 20:00:18	2017-05- 12 20:00:07	2017-05- 12 20:00:18	View
ng nghệ	Công ty A112	Inspection and Monitoring Technology	Bridge	2016	Enhance working environment, Improve negative effects to earth environment	Under Development	Registered	The technology is not suitable to national roads	2017-05-12 19:15:24	2017-05- 12 19:14:57	2017-05- 12 19:15:24	Viev
	CÔNG TV CỔ	Traffic Cafeta	Press.	2015		Deserve for	Registered			2017-03-	2017-03-	Viev
ng nghệ chế	PHÂN XÂY DựNG ZESCONS	Technology	Slope	2016		standardization in Vietnam				20 20:51:45	21 09:31:27	
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ing nghệ i chế đưanceri Se Created Evaluatio	PHÀN XÂY DUNG ZESCONS arch arch at n date	2015/05/09 2017/01/02	Koad Slope	2018 2017/85/09 Te	1. Inp	ut information	to search 2016/00/11 2016	1017/08/0 2	o 📾 . Click butt copy	20 20:51:45	21 09:31:27	Display Is
ing nghệ i chế đưanced Se Created Evaluatio	Corrobanty	Technology           Q           Q           Q           Q           2016/08/09           2017/01/02	Koad Slope M M M Kauty Facity	2018 2017/08/09 To Year of De-	1. Inp	t Status	to search 2016/08/11 2016	2017/05/0 2 Eyplaztoo/interms	o 📾 . Click butt copy Fasturator	20 20:51:45	21 09:31:27	Sea Display le
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vanced Se come kvaluation kvaluat	Company Transcore Company Transcore Tran	Technology Coc Technology Coc Techno	Koad Slope	2017/08/09 To Year of Development 2016	1. Inp	t Status Status Ut information Ut information t t Status Under Development	2016/08/11 2016 2016 2016 2016 2016 2016 2016 20	Evaluation informs Evaluation information The information The information The information	2 mi Click butt Copy Explusion date c 2017.05.12 0 2000:18 2	20 20:51:45	21 09:31:27	- Display II

### • Copy function: Click button Copy to Copy data of technology

Liser Comp	any Technology	Survey Expert										
Advanced Se	arch											+ .
									Сору	CSV Exc	el PDF	Display Item
Technoloį	Company	Technology	Facility	Year of Dev	Target	Status	Stage	Evaluation information	Evaluatic	Creater	Update	
Technology 🔺 Name	Company	Technology Code	Facility	Year of Development	Target	Status	Stage	Evaluation information	Evaluation date	Created at	Updated at	
Công nghệ ABCA	Tổng công ty Thầng Long CTCP	Inspection and Monitoring Technology	Bridge	2016	Improve safety	Under Development	Registered	The technology is not suitable to national roads	2017-05-12 20:00:18	2017-05- 12 20:00:07	2017-05- 12 20:00:18	View
Công nghệ K	Công ty A112	Inspection and Monitoring Technology	Bridge	2016	Enhance working environment, Improve negative effects to earth environment	Under Development	Registered	The technology is not suitable to national roads	2017-05-12 19:15:24	2017-05- 12 19:14:57	2017-05- 12 19:15:24	View

- CSV/ Excel/ PDF function: Export data (technology) in system
  - Step 1: Click button CSV/Excel/ PDF to export data of technology
  - Step 2: Click on file (down on your machine) to view data (export data with file .csv, excel, .pdf corresponding)



Liser Comp	any Technology	Survey Expert										
Advanced Se	arch											+ .
									Сору	CSV Ex	el PDF	Display Item
Technoloį	Company	Technology	Facility	Year of Dev	Target	Status	Stage	Evaluation information	Evaluatic	Created	Update	
Technology 🔺 Name	Company	Technology Code	Facility	Year of Development	Target	Status	Stage	Evaluation information	Evaluation date	Created at	Updated at	
Công nghệ ABCA	Tổng công ty Thầng Long CTCP	Inspection and Monitoring Technology	Bridge	2016	Improve safety	Under Development	Registered	The technology is not suitable to national roads	2017-05-12 20:00:18	2017-05- 12 20:00:07	2017-05- 12 20:00:18	View
Công nghệ K	Công ty A112	Inspection and Monitoring Technology	Bridge	2016	Enhance working environment, Improve negative effects to earth environment	Under Development	Registered	The technology is not suitable to national roads	2017-05-12 19:15:24	2017-05- 12 19:14:57	2017-05- 12 19:15:24	View

- Column visibility function: View/ Hide column in "Technology list" table
   Step 1: Click button Display Item
  - Step 2: Choose name field to view/hide data

Advanced Sea	arch										+
Copy CSV Exc									ccel PDF Display ite		
Technoloj	Company	Technology.	Facility	Véar of Dev	Target	Sfatus	Stage	Evaluation information	Evaluatic	Creater	Technology Name
Fechnology 🔺 Name	Company	Technology Code	Facility	Year of Development	Target	Status	Stage	Evaluation information	Evaluation date	Created at	Technology Code Facility
Công nghệ NBCA	Tổng công ty Thăng Long CTCP	inspection and Monitoring Technology	Bridge	2016	Improve safety	Under Development	Registered	The technology is not suitable to national roads	2017-05-12 20:00:18	2017-05- 12 20:00:07	Year of Development Target Status
Công nghệ C	Công ty A112	Inspection and Monitoring Technology	Bridge	2016	Enhance Working environment, improve negative effects to earth environment	Under Development	Registered	The technology is not suitable to national roads	2017-05-12 19:15:24	2017-05- 12 19:14:57	Stage Evaluation informatio Evaluation date Created at
lông nghệ ái chế	CÔNG TÝ CỔ PHẦN XÂY DỰNG ZESCONS	Traffic Safety Technology	Road Slope	2016		Prepare for standardization in Vietnam	Registered			2017-03- 20 20:51:45	Updated at 09:31:27
Công nghệ :ài chế	Tổng công ty xây dựng công trình giao thông 2	Maintenance and Repair Technology	Bridge	2014		Under Development	Technology is demonstrated to DRVN by the company	The technology can be applied to national road as an alternative	2017-05-12 16:07:19	2017-03- 21 07:39:29	2017-05- 12 16:07:19

### **V) SURVEY MANAGEMENT**

Purpose: Send technology information to the experts of the compete organizations who are not registered in the system by e-mail through the system. The experts can review technology sent and evaluate it, then results are stored in the system.

	Select Technology	0	0	0
itep 1	- Select Technology			
	Technology name		Сотрану	
Θ.	Cũng nghệ tải chẽ mặt đường		company 1	
*	Công tighệ cáo bóc tải sinh nguồi		Tông công ty sáy dụng công trình giao thông 11	
Ň	Cộng nghệ thay thế		company 1	
-	Công ngtiệ làng nhựa đường		applacaf	
	Công nghệ tại chế mặt đường cũ		Tổng công tự xây dựng công trình giao thông 11	
Prevec	n/a			Nex

• Step 1: Select Technology to survey, then click button Next to transfer the technology information.



🖌 Invitati	on wizard			
	Solect Technology	0	0	0
Step 1	- Select Technology			
	Technology name		Сопциалу	
0	Cũng nghệ tải chế mặt đường		company 1	
*	Công nghệ cáo bóc tải sinh nguỗi		Tổng công ty xây dựng công trình giao thông 11	
K	1 Công right thay the		company 1	
18	tang ngisé láng nhua duöng.		asolasaf	
10	Công nghệ tài chế mặt đường cũ		Tổng công tự xây dựng công trình giao thông 11	
Provid	1.29			2 Next

• Step 2: Select experts, who evaluate the technology, then click button to send invitation e-mail which has linkage which access to the technology information. If re-select Technology, click button Previous

	0	•	0	0
	Sulect Technology	Select Expert	The second se	
Step 2 - Selec	t expert			
	Technolegy name		Сетрапу	
0	Nguyễn Ngọc A		expert1@gmail.com	
\$ 1	Lé Van B		test2@gmul.com	
2	Trân Thi C		xuanbinh91@gmail.com	
Previous				2 Next

Step 3: Enter Name and Content for the survey information of the technology, then click button Next to finish the survey process. If re-select expert, click button Previous.

#### NOTE:

- The system sends evaluation requests by system language (English / Vietnamese). When DRVN staff conducts survey management and sends request to experts, the email sent by the system is written in the language corresponding to the display language. If DRVN staff uses English, written language is English and if it is Vietnamese, written language is Vietnamese.
- Experts can evaluate sent technologies once for all.



V Invitation wizard		and the second se	
0	0	0	0
Step 3 - Customize email content	Select Expert	Customize email content	-
Tearrow			
Description	1. Unput:Nar Descript	ne and lon	
Previous		-2: Click(Next)	Next

### **VI) EXPERT MANAGEMENT**

- ♣ Purpose: Manage Experts accounts of Competent Organizations
- 4 Manipulation of Expert Management
- Add new Expert
  - o Step 1: Click button "Add", then the system shows Add new Expert screen
  - o Step 2: Enter Add new information: Full name, Email
  - Step 3: Click button "Submit" to save Expert information.

r Expert						- /
Name	Email	Created by	Updated by	Created at	Updated at	Action
Nguyễn Ngọc A	experti sigmail.com	admin	admin	2017-03-13-05:02:03	2017-03-14 08:03:35	Edu. Delete
Lê Văn B	test2@gmail.com	admin	admin	2016-12-05 15:37:01	2017-02-14 08:04:04	Fair Delete
Trân Thị C	xuanbinn91@gmail.com	admin		2016-12-07 11:56:53	2010-12-07 11:56:58	Edit Delete
s Experit>Add						
Expert Add						
f Add						
¢arne-						
	3. Inp.	itentomation				

- Edit Expert information
  - Step 1: Select Expert to Edit
  - o Step 2: Click button "Edit"
  - Step 3: Enter information to Edit for Expert
  - Step 4: Click button "Submit" to save information



Expert		1 Choose Expe	entto Ealt	-2. Clic	k(button)Edit	-
Name	Email	Created by	Updated by	Created at	Updated at	Action
Nguyễn Ngọc A	expert1@gmail.com	admin	admin	2017-03-13 05:02:03	2017-03-14 08:03:35	Fill Delete
Lê Văn B.	test2idigmail.com	admin	admin	2016-12-05 15:37:01	2017-03-14 08:04:04	Entil Deleue
Trần Th) C	xuanbinn91@gmail.com	Name				leve
Add First		i é vi5n €i		3. input		
and a second		Email		Edit-		
		test2@gmail.com				

- Delete Expert
  - o Step 1: Select Expert to delete
  - o Step 2: Click button "Delete"

2 Expert	1.0	Choose Expert-to	Delete	2. Click t	outton Delete	- 2
Name	Email	Ere. ed by	Updated by	Created at	Updated at	Action
Nguyên Ngoc A	expert1@gmail.com	adh	admin	2017-03-13 05:02:03	2017-03-14 08:03:35	Delece
Lễ Vân B	test2@gmail.com	admin	D admin	2018-12-05 (5:37:0)	2017-03-14 08:04:04	FiSI Unlete
Tràn Thị C	xuanbinn91drgmail.com	admin		2016-12-07 11:56:53	2016-12-07 11:56:53	Edb Delete
Add Back						