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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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 **Capacity Enhancement in Road Maintenance in Vietnam**.

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

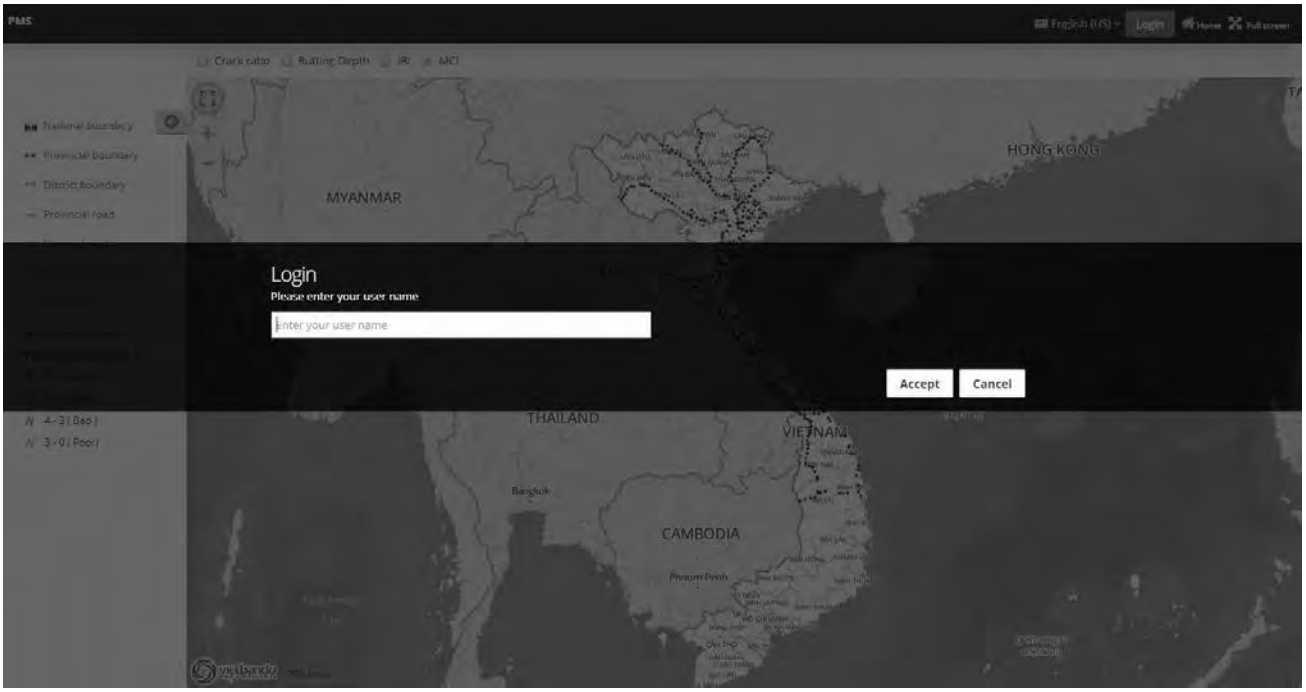
3. Manage and display three types of data on the Zoom area and the Horizontal Interactive area
   - Display data on the Zoom area
   - Display data for the Horizontal Interactive Area based on the gray area selected in the Zoom area
     - Edit the data of Road Inventory, Maintenance History and Traffic 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

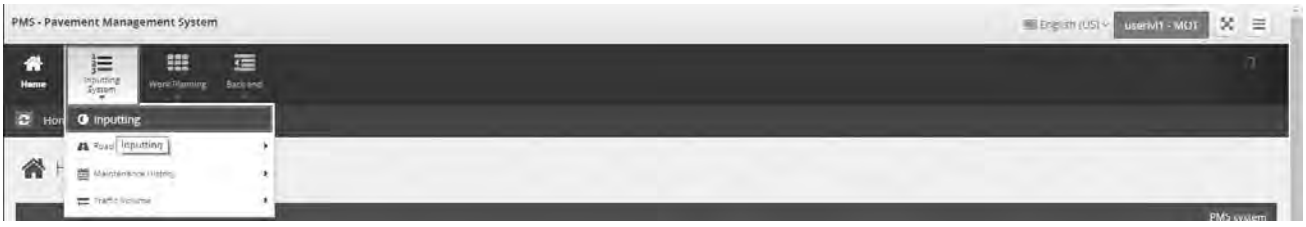


II.3) Language option

- 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.

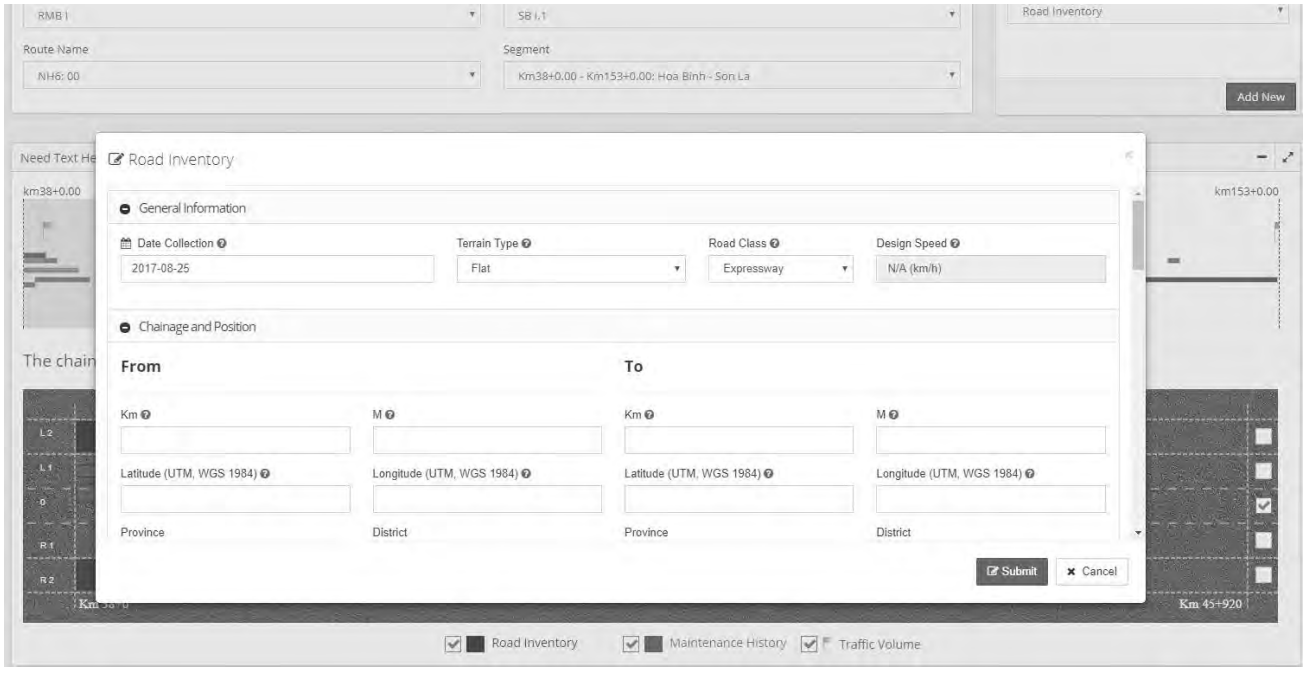
- Sections list is shown based on user jurisdiction:
  - Level 1: Display all of RMBs and SBs
  - Level 2: Display of 1 RMB and all of SBs corresponding RMB
  - Level 3: Display of 1 RMB and 1 SB
- User selects RMB, the SBs, Route Name and Segment will change accordingly.
- If user have selected the 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

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



- 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

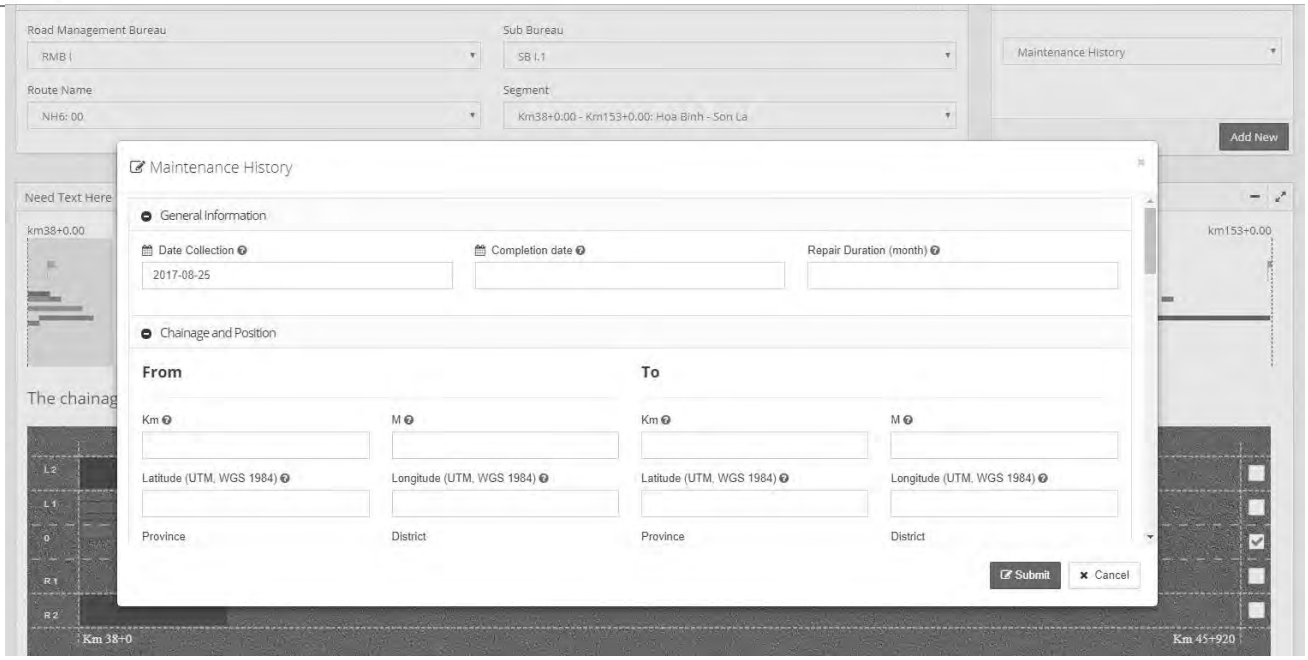
- Enter data to manage material detail layer for the road.
- For each material layer: Select Material Type, Thickness (cm), Description.

- 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.

Note: 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



- 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

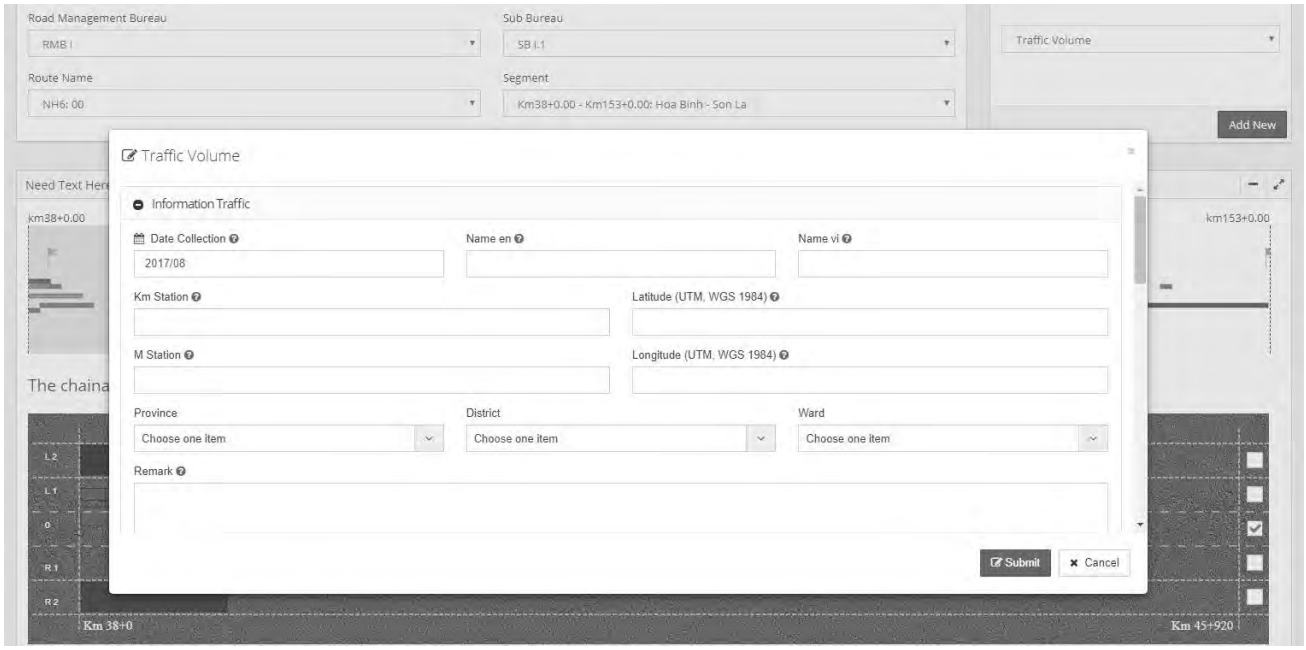
- Import data to manage material layer detail for the road
- For each material class: Choose the type of material, thickness (cm)
- Reapair Category: Select repair category corresponding Surface

- 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.

Note: 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

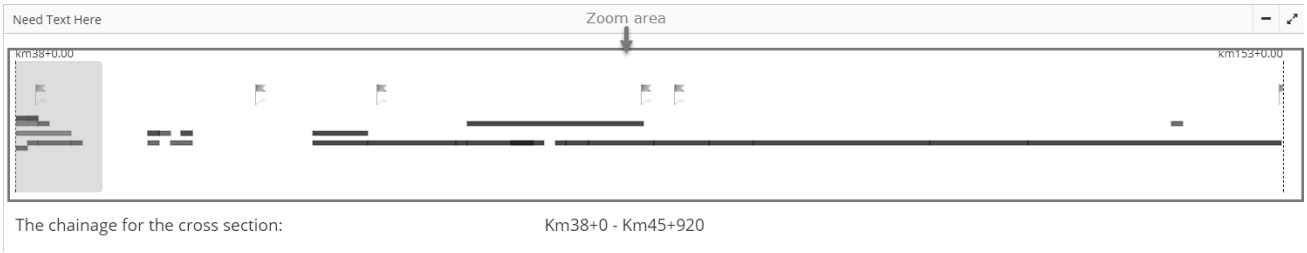


- Input data for Traffic Volume: Enter data traffic volume
    - ➢ Information Traffic
        - Date Collection: Click on the date collection to select date, month, year
        - Name en, Name vi: Enter Name en and Name vi of traffic volume
        - Km, M: Enter km, m of traffic volme
        - Latitude, 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.

Note: 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

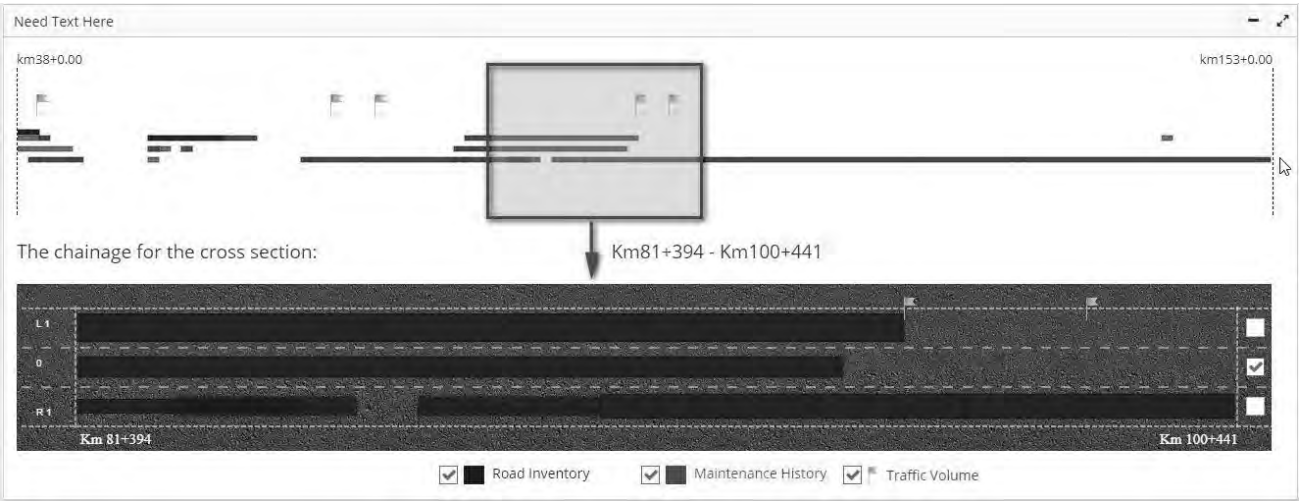
Note: When the user changes the gray area the chainage for the cross section changes accordingly.

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

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

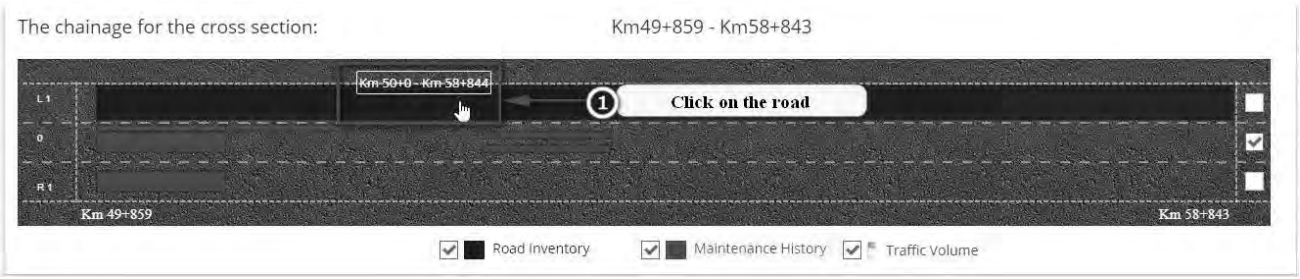
IV.2) Edit the data of Road Inventory, Maintenance History, Traffic Volume

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

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

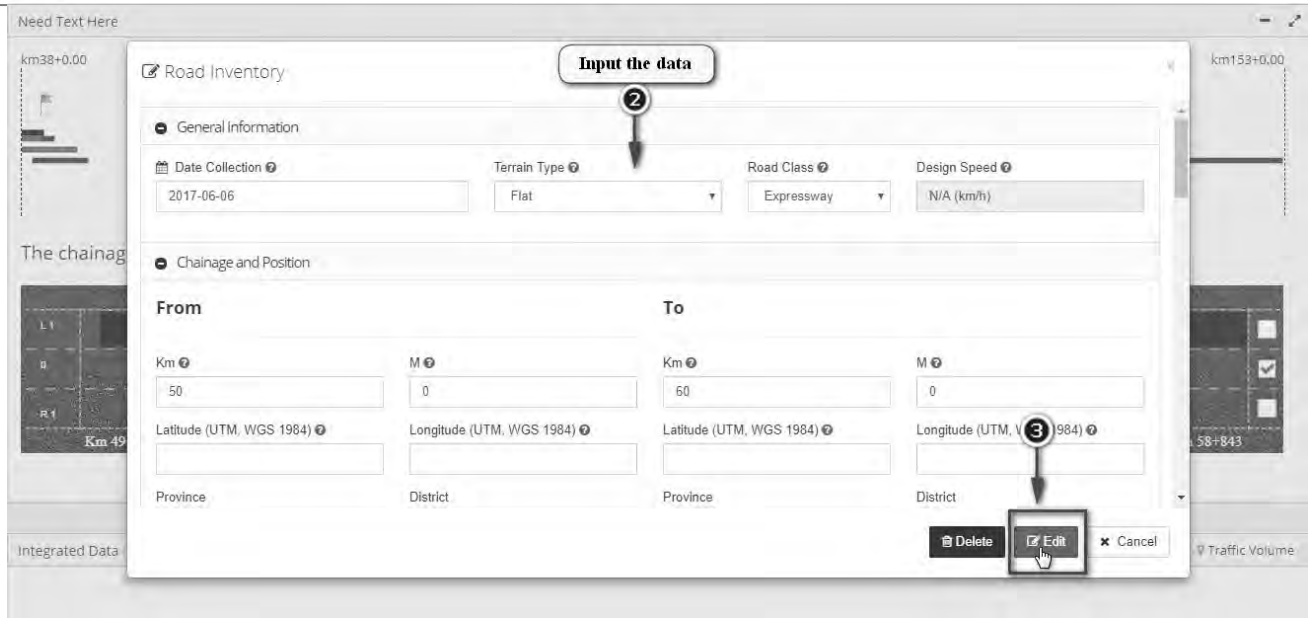
- Steps:

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

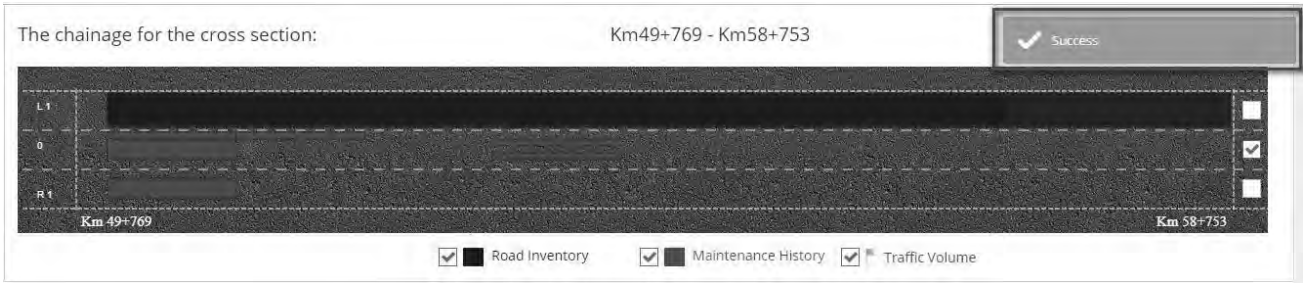


✓ Step 2: “Road Inventory” window appear, input the data you want to change

✓ Step 3: Click on “Edit” button to save change information



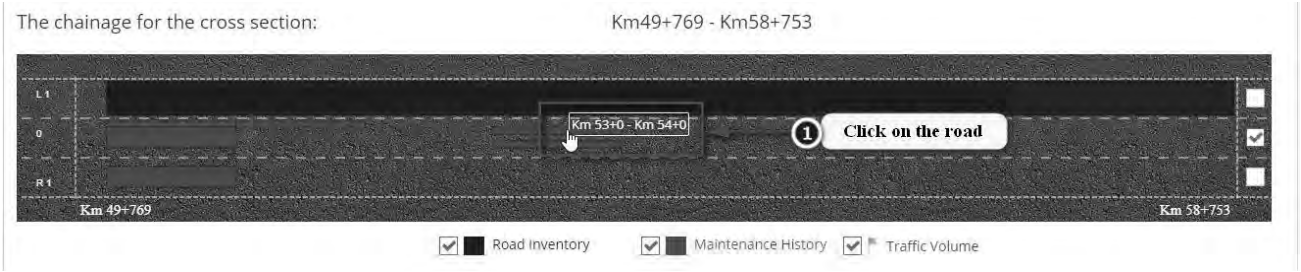
⇨Data that is successfully edit displays the message "Success"



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

- Steps:

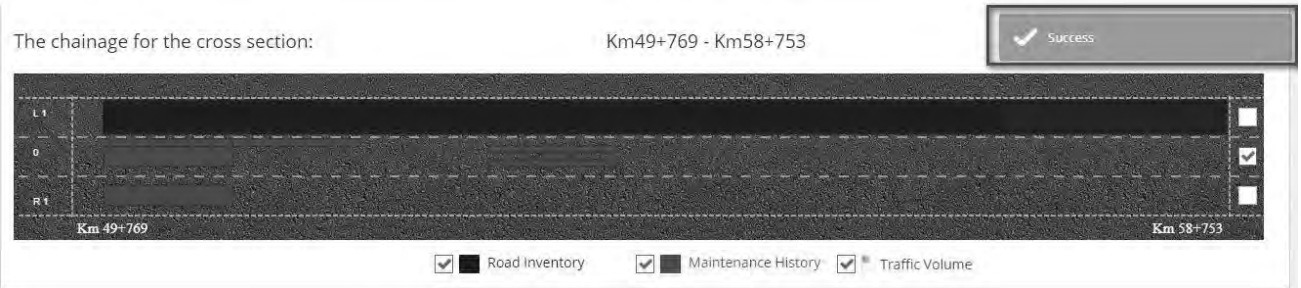
✓ Step 1: Click on the road to change the data



✓ Step 2: "Maintenance History" window appears, input the data you want to change

✓ Step 3: Click on "Edit" button to save change information

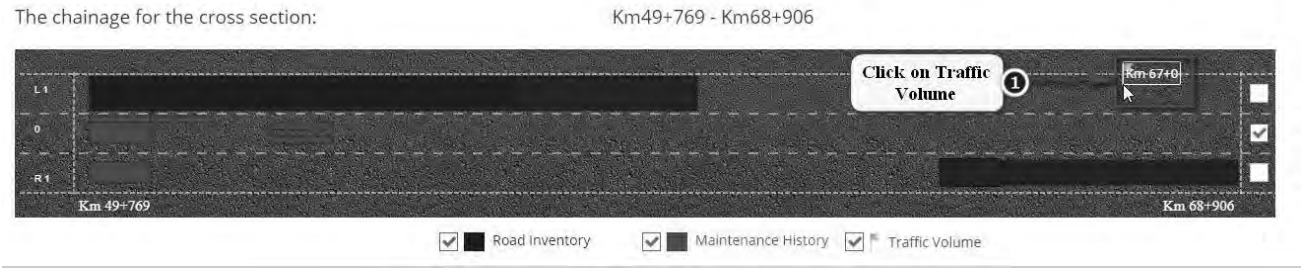
⇨Data that is successfully edit displays the message "Success"



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

- Steps:

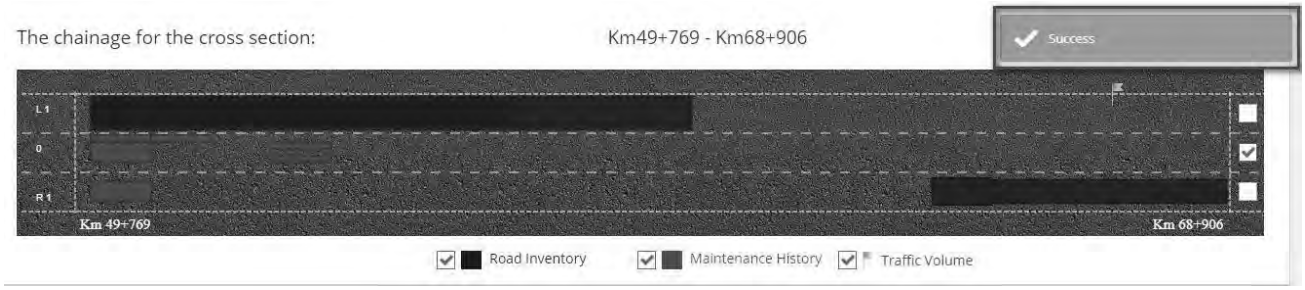
✓ Step 1: Click on the icon of Traffic Volume to change the data



✓ Step 2: “Traffic Volume” window appear, input the data you want to change

✓ Step 3: Click on “Edit” button to save change information

⇨Data that is successfully edit displays message "Success"



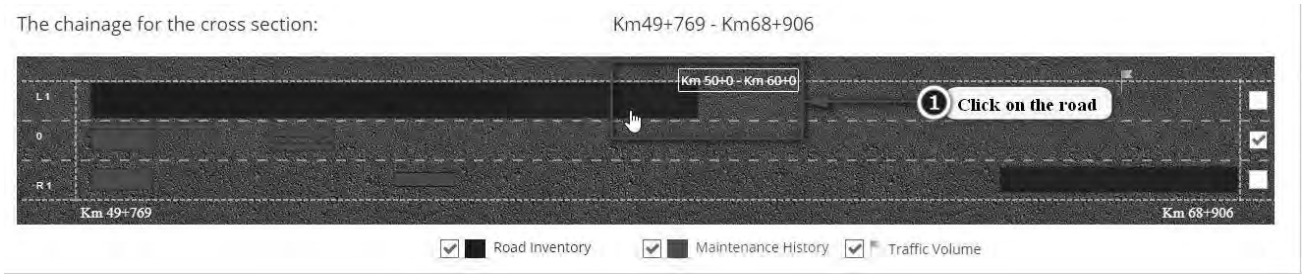
IV.3) Delete Road Inventory, Maintenance History, Traffic Volume

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

IV.3.1) Delete Road Inventory (RI)

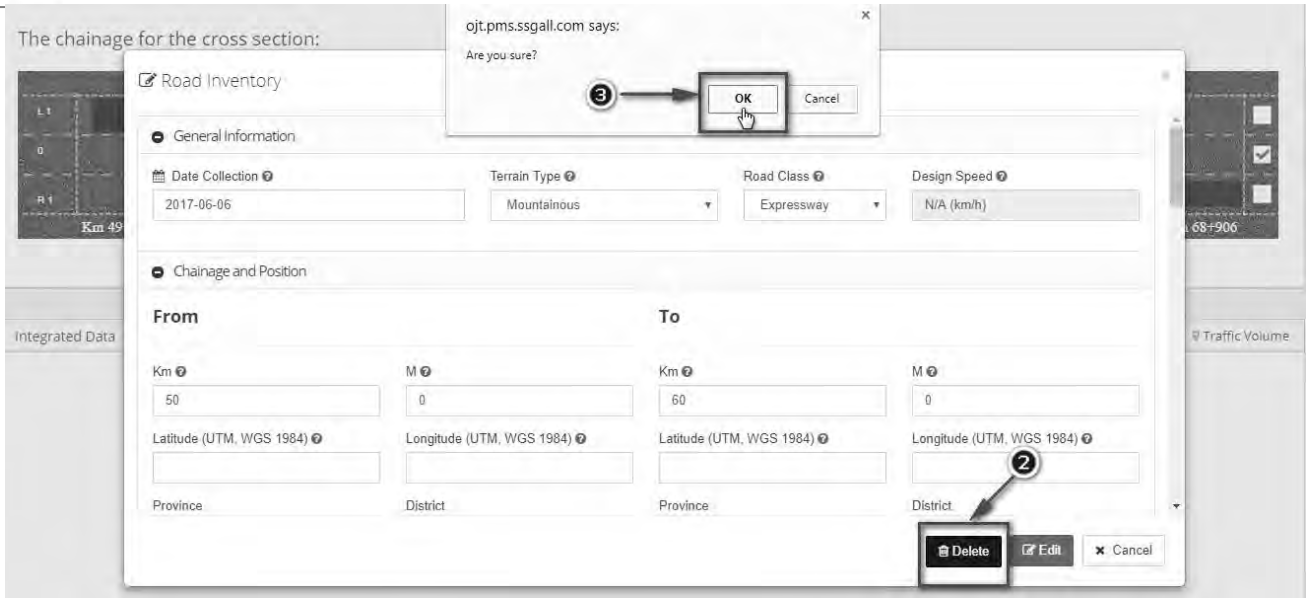
- Steps:

✓ Step 1: Click on the road

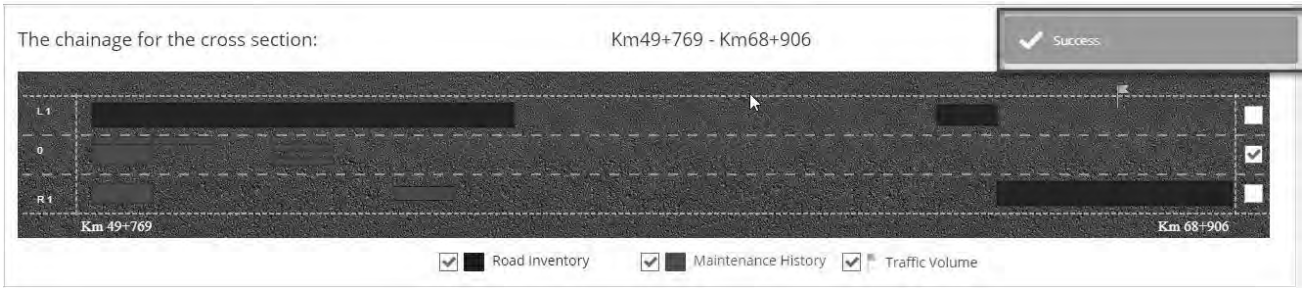


✓ Step 2: "Road Inventory" window appears, click on "Delete" button

✓ Step 3: Click on "OK" button of popup



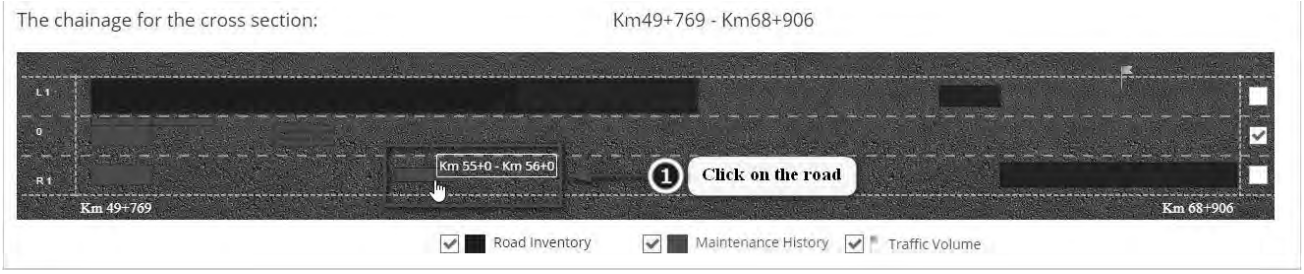
⇨Data that is successfully delete displays the message “Success”



IV.3.2) Delete Maintenance History (MH)

- Steps:

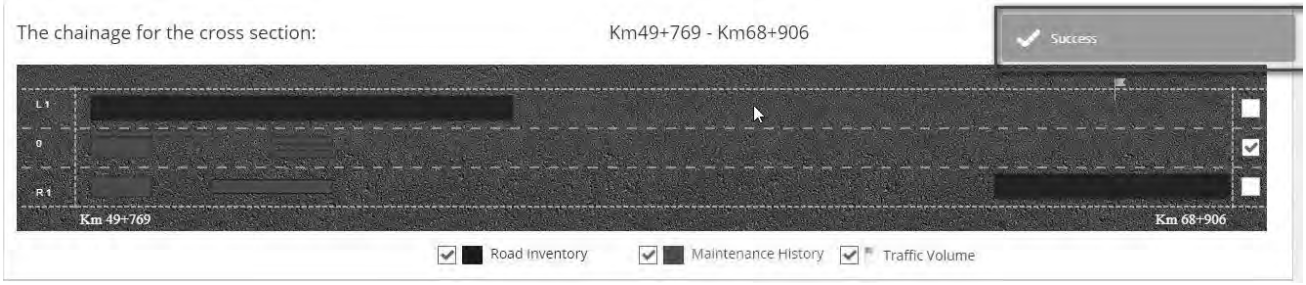
✓ Step 1: Click on the road



✓ Step 2: “Maintenance History” window appears, click on “Delete” button

✓ Step 3: Click on “OK” button of popup

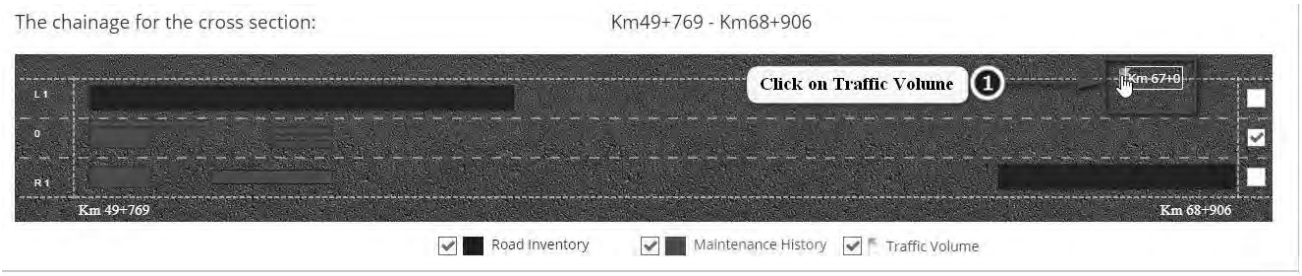
⇨Data that is successfully delete displays the message “Success”



IV.3.3) Delete Traffic Volume (TV)

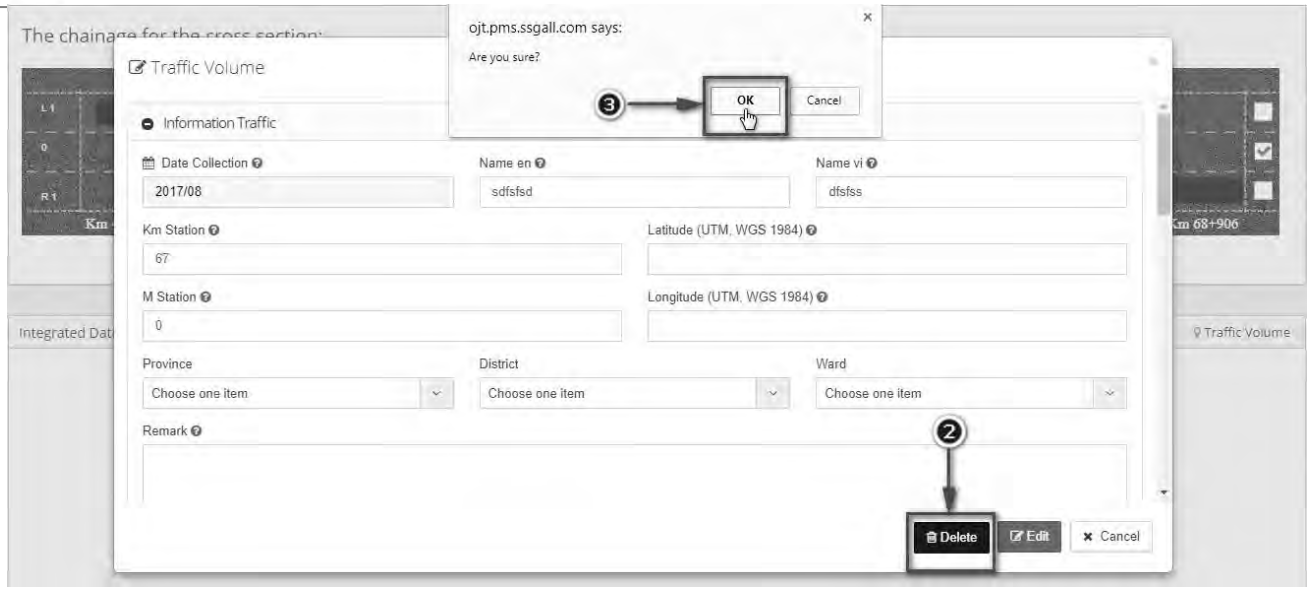
- Steps:

✓ Step 1: Click on the icon of Traffic Volume

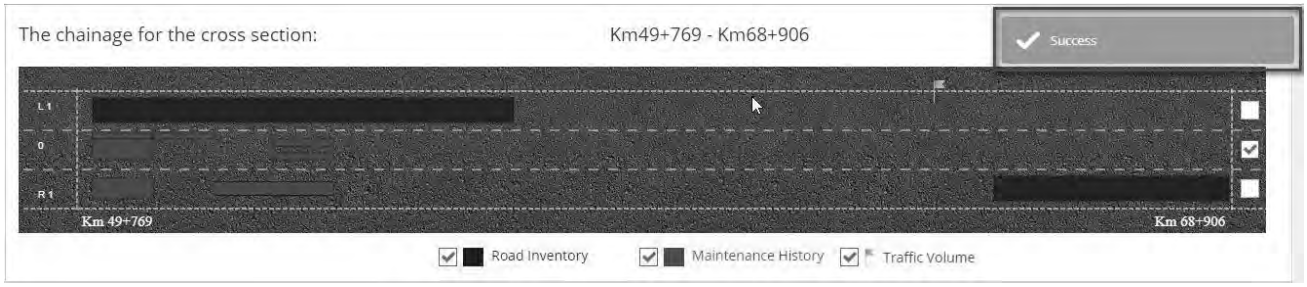


✓ Step 2: “Traffic Volume” window appears, click on “Delete” button

✓ Step 3: Click on “OK” button of popup



⇨Data that is successfully delete displays message "Success"



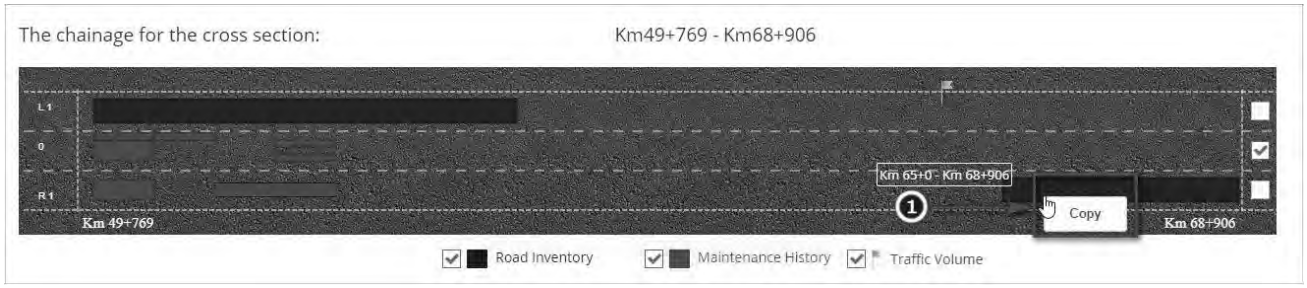
IV.4) Copy the data of Road Inventory, Maintenance History, Traffic Volume

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

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

- Steps:

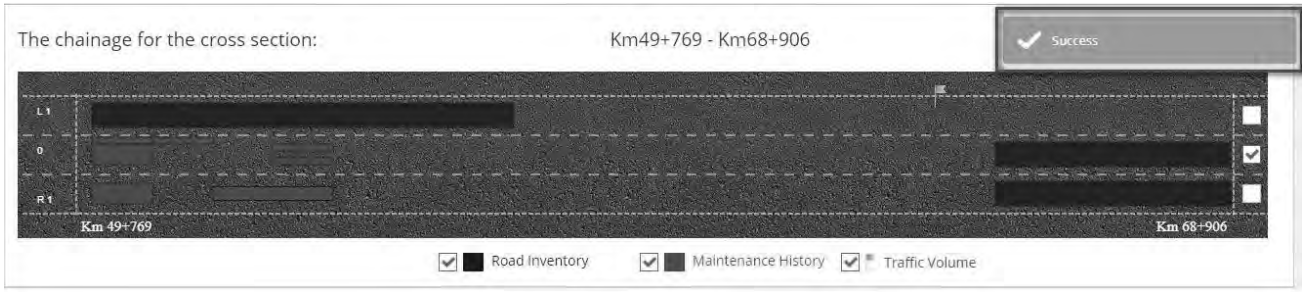
✓ Step 1: Right-click on the section, select "Copy"



✓ Step 2: "Road Inventory" window appears, input the data

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

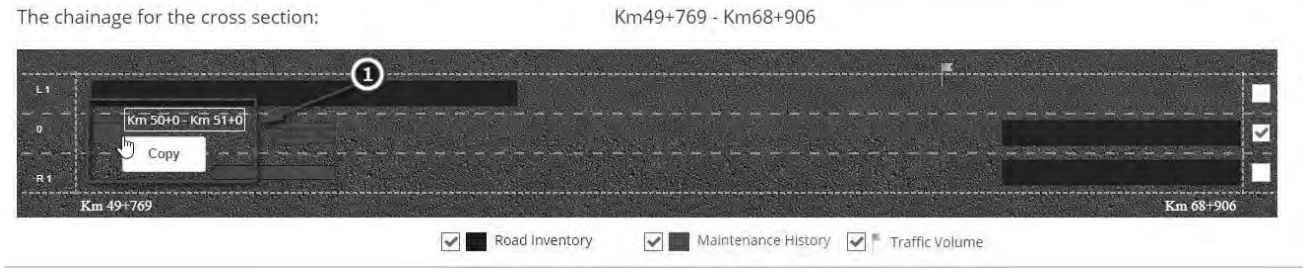
⇨Data that is successfully create display the message "Success"



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

- Steps:

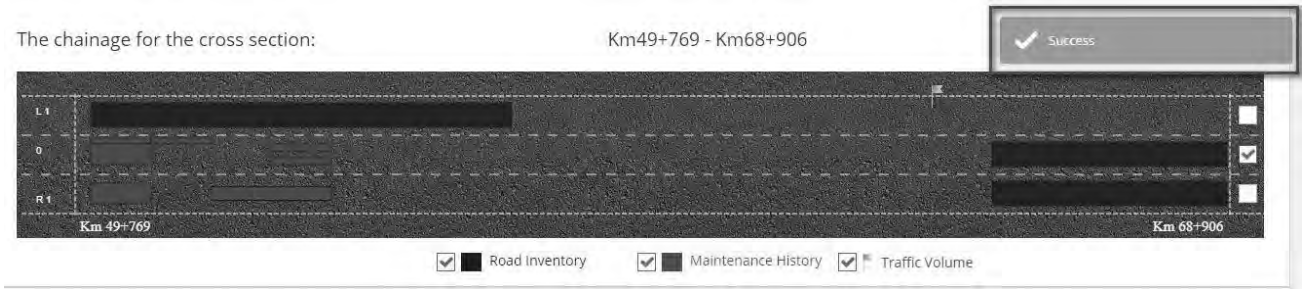
✓ Step 1: Right-click on the section, select "Copy"



✓ Step 2: "Maintenance History" window appears, input the data

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

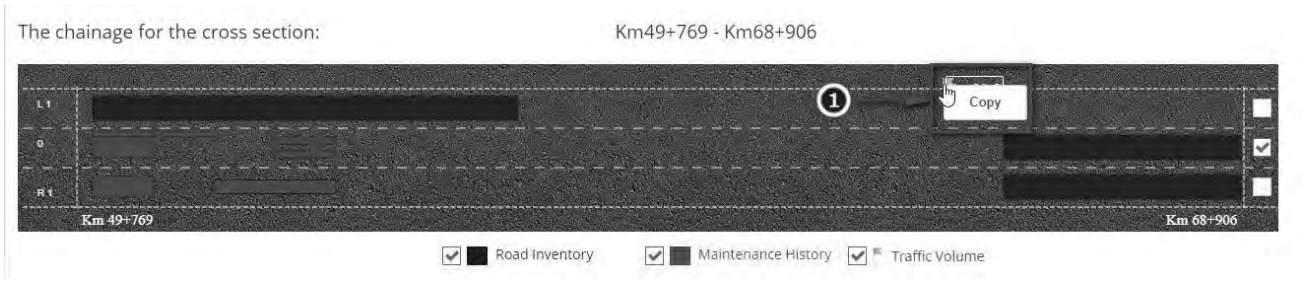
⇨Data that is successfully create displays the message "Success"



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

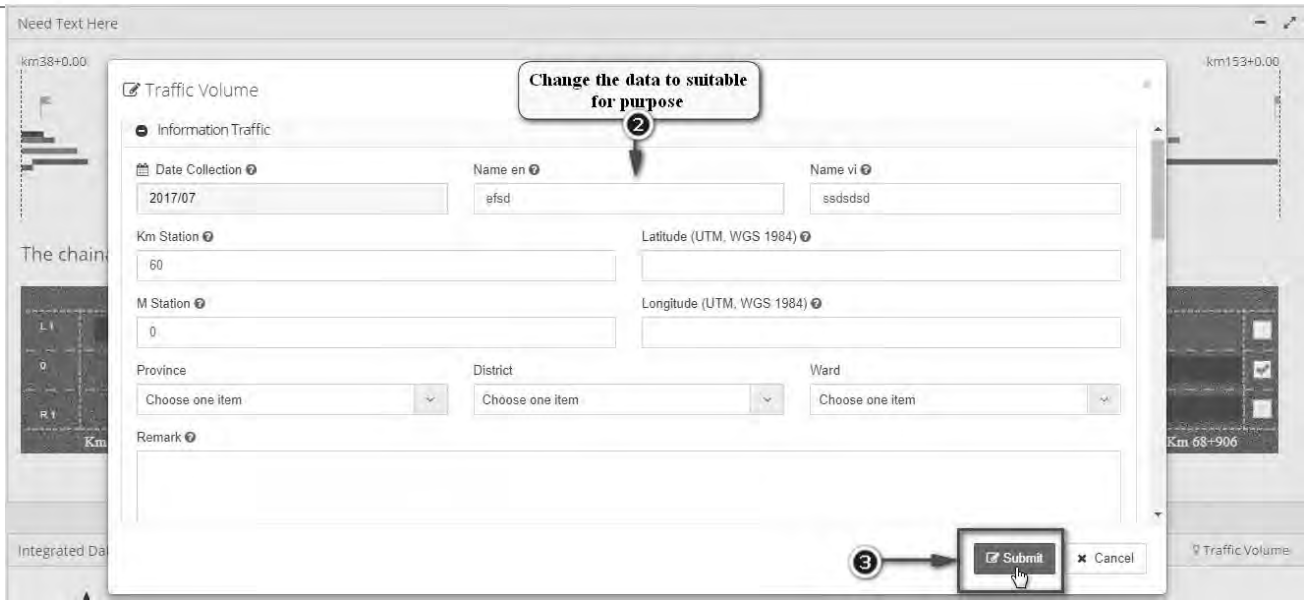
- Steps:

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

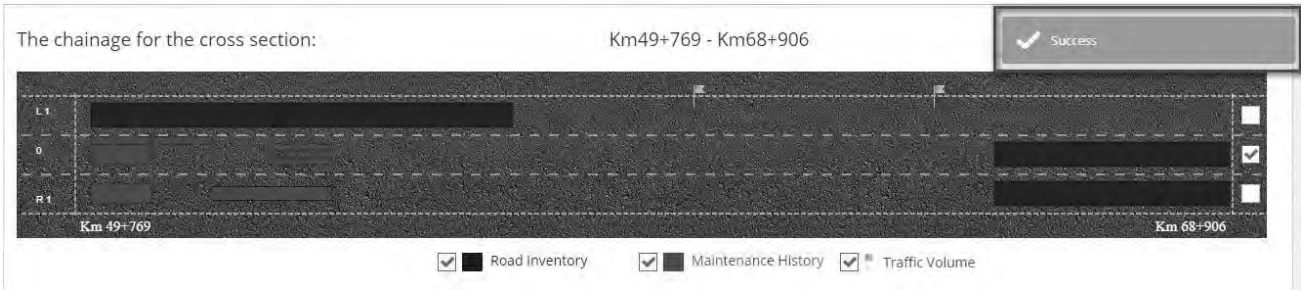


✓ Step 2: "Traffic Volume" window appears, input the data

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

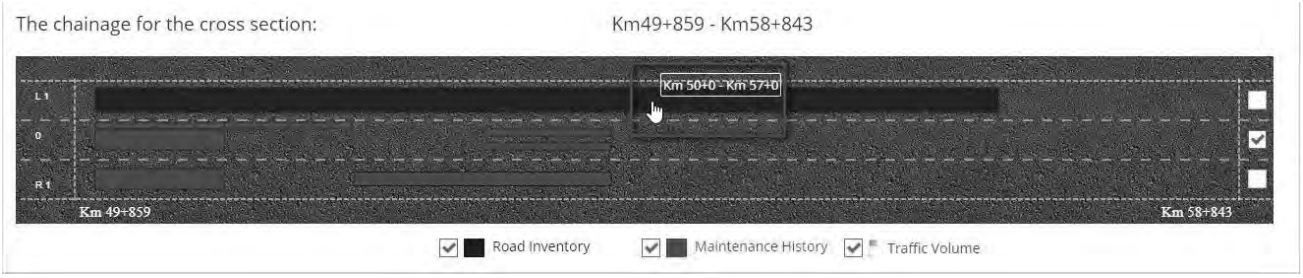


⇨Data that is successfully create displays the message "Success"



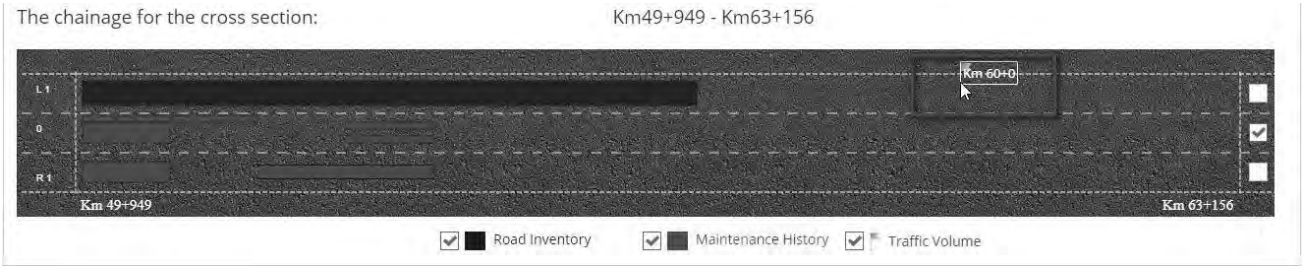
IV.5) Hover to show chainage of Road Inventory, Maintenance History, Traffic Volume

- 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)



  - ➢ Show chainage of Maintenance History (MH)

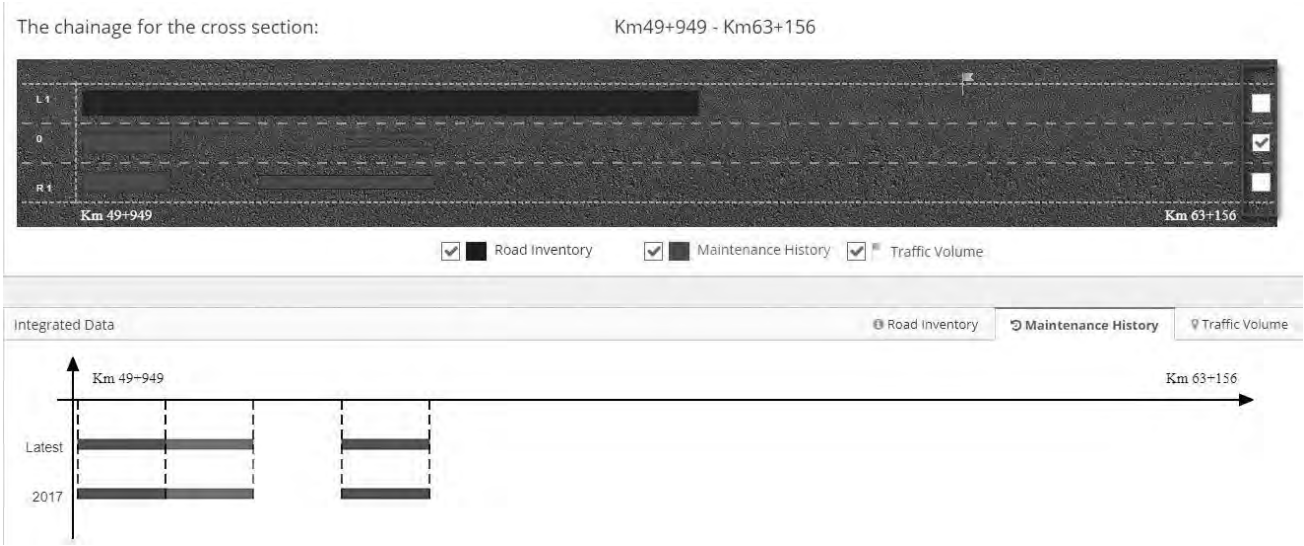
- Show chainage of Traffic Volume (TV)



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.



- Steps: Click on one lane to display information, corresponding data of that lane will be displayed at the Integrated Data block.

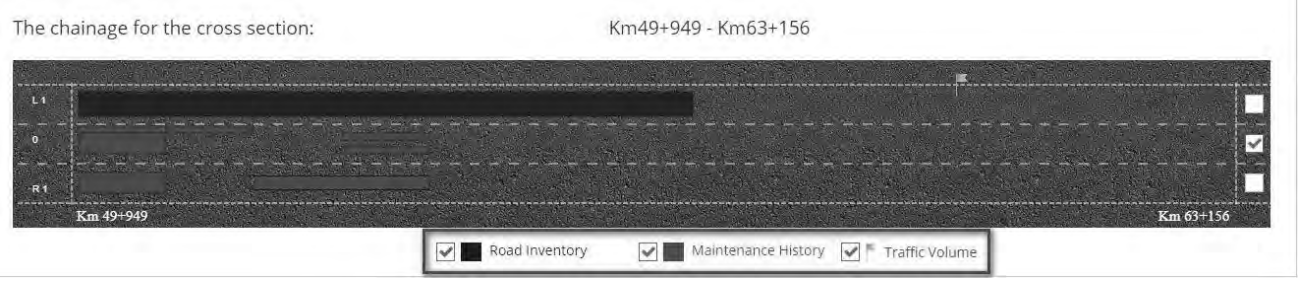
  Integrated Data block:

  - Vertical axis: Show the timeline of the data (History data)
  - Horizontal axis: Display chainage of the chainage for the cross section

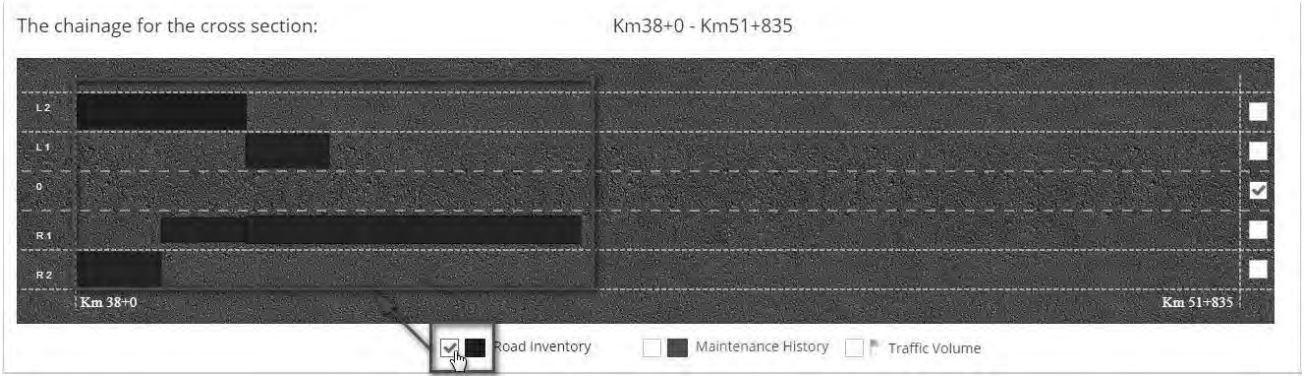
- Road Inventory: Display Integrated Data of Road Inventory of selected lane.
- Maintenance History: Display Integrated Data of Maintenance History of selected lane.
- Traffic Volume: Display Integrated Data of Traffic Volume with all selected lanes (Traffic Volume has no regulations on Direction and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

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

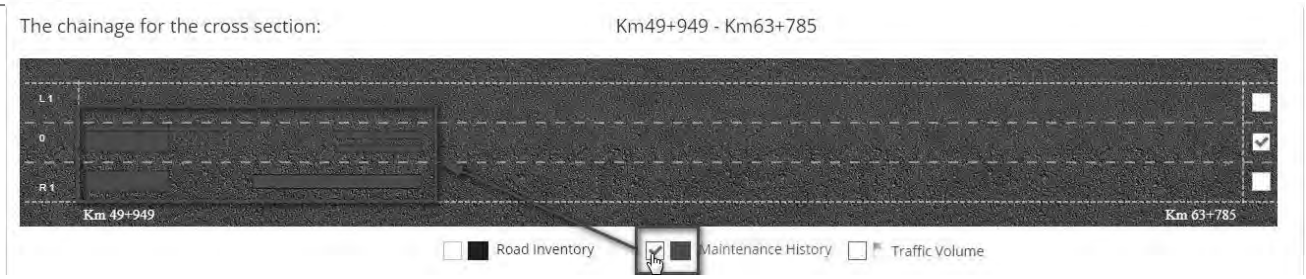
- Purpose: It helps users to easily distinguish the data they are interested in.
- Steps:



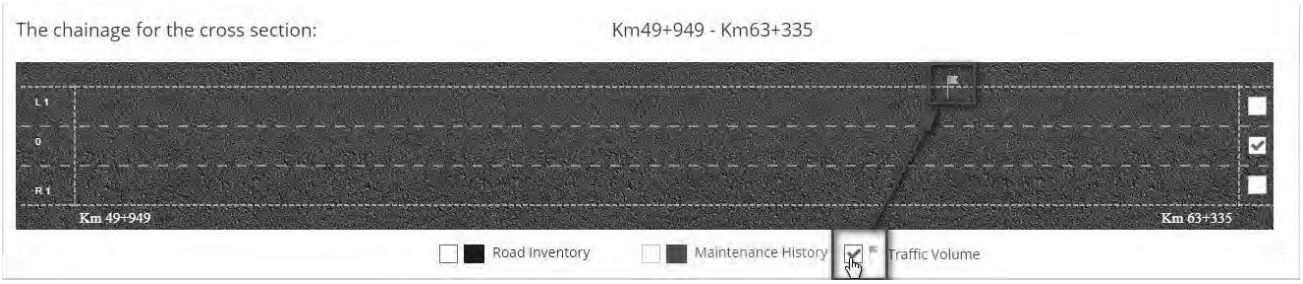
- Road Inventory: Select/Unselect to Show/Hidden Road Inventory on Hirozontal Interactive area and Integrated Data block.



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



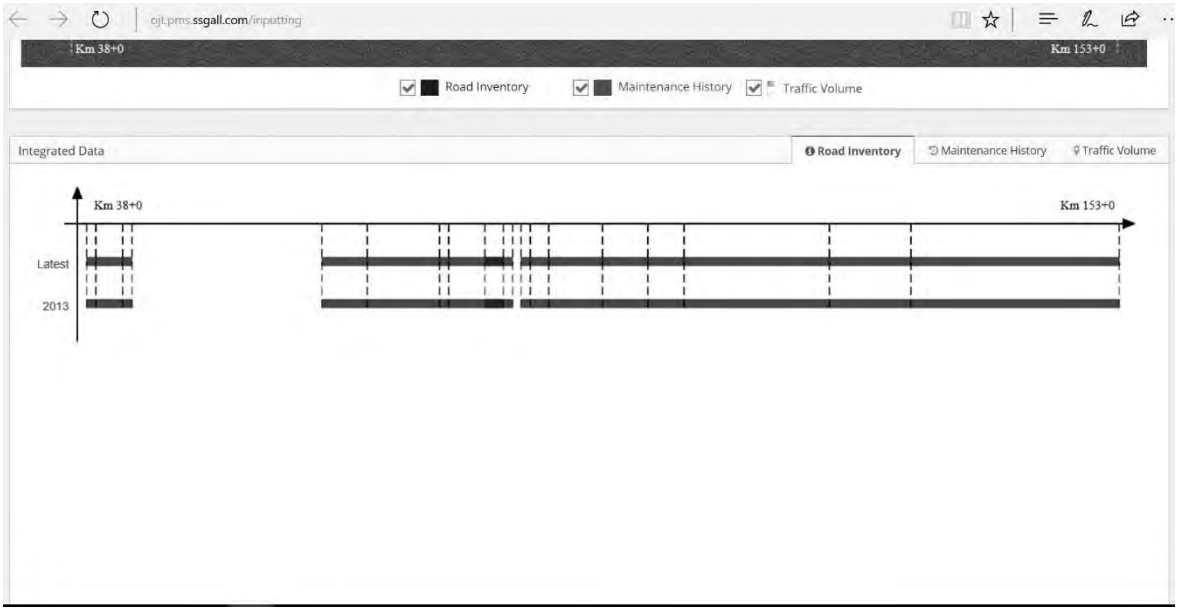
- Traffic Volume: Select/Unselect to Show/Hidden Traffic Volume on Hirozontal Interactive area and Integrated Data block.



V) INTEGRATED DATA

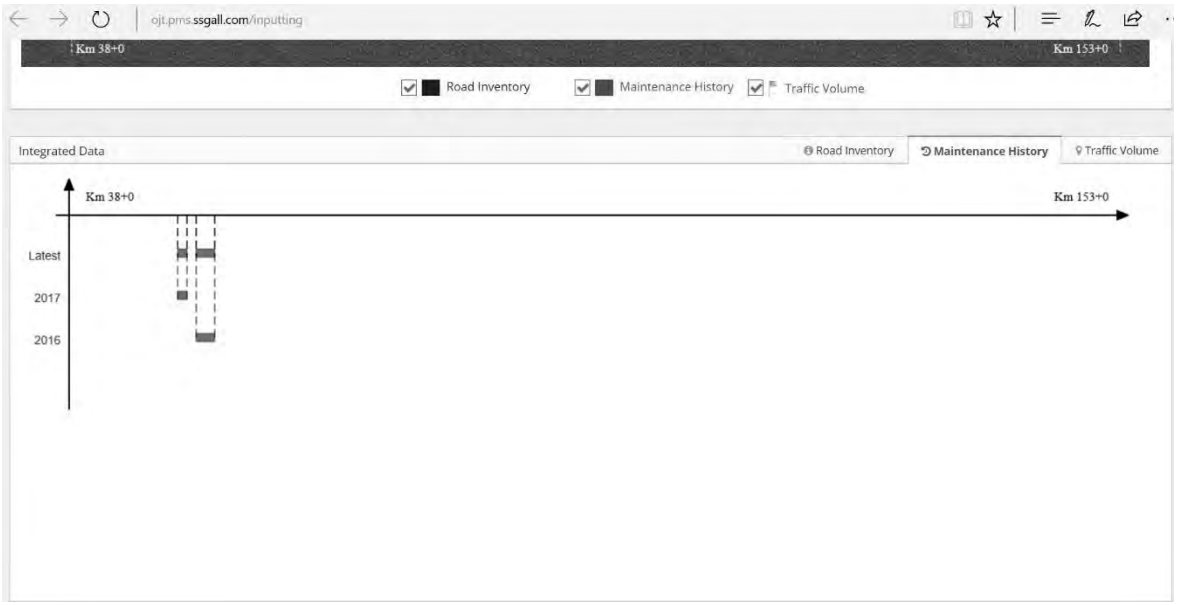
V.1) Interface, display data

- 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



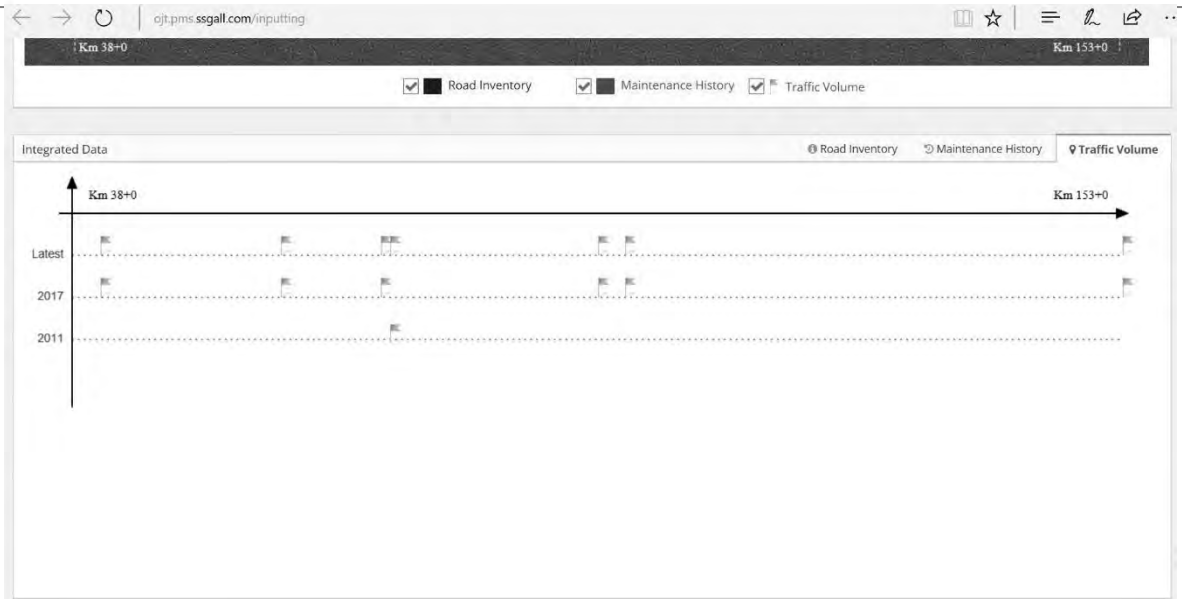
- Chainage: Display the chainage start location and the chainage finish location based on the chainage for the cross section (gray area) of the selected lane.
- Latest: Road Inventory data at the current time based on the lane selected.
- Year (2017, 2016….): Display all of the road segments in the corresponding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

➢ Maintenance History



- 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.

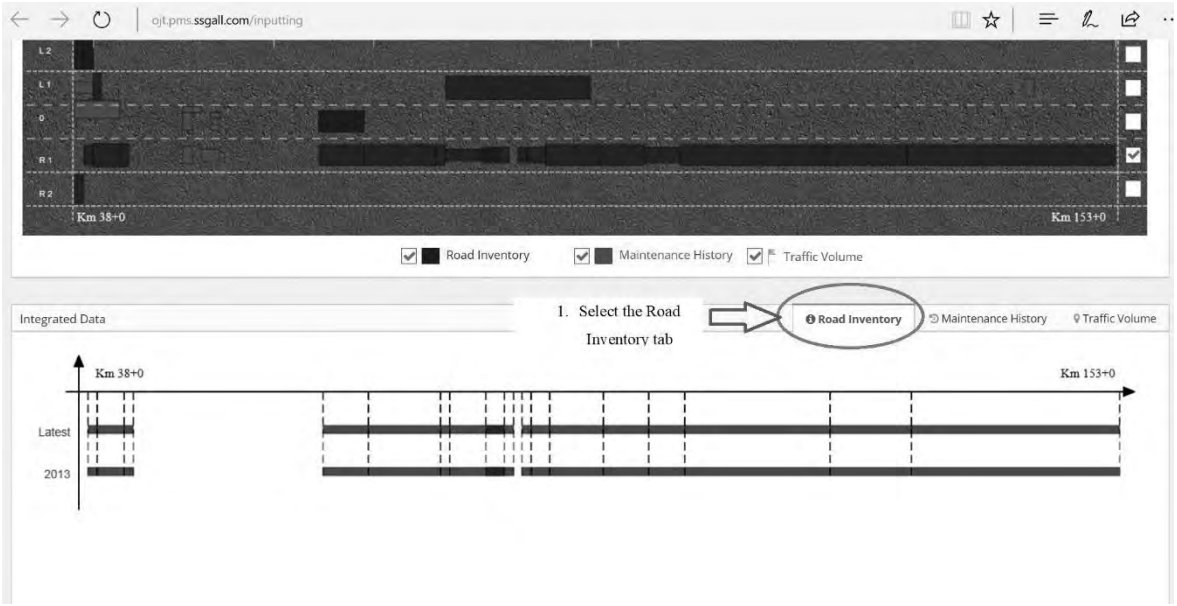
➢ Traffic Volume



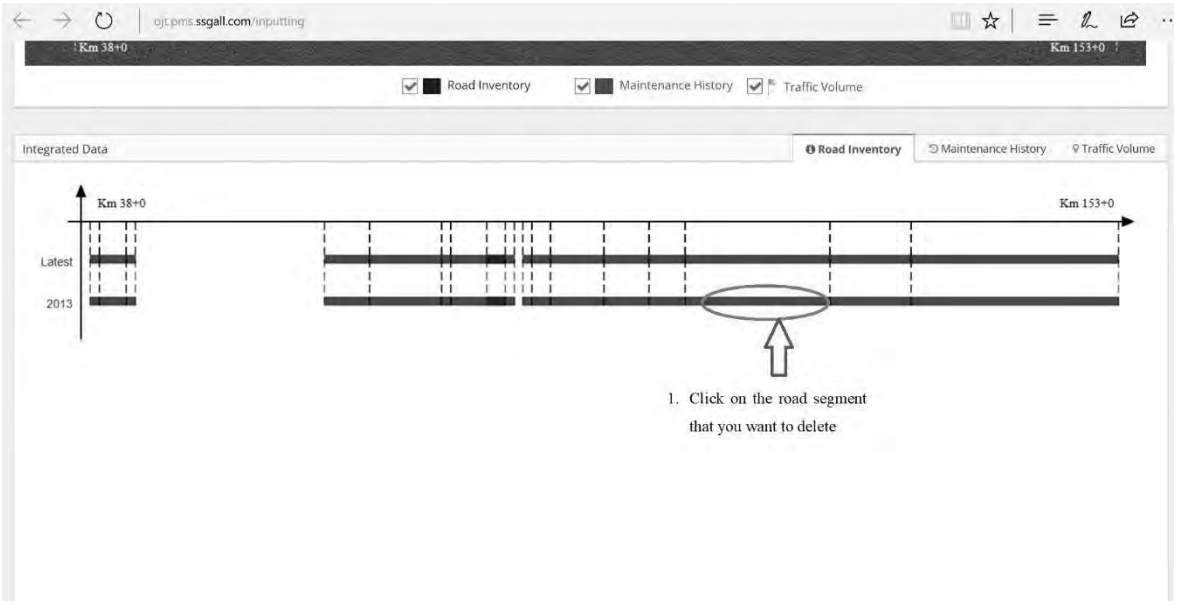
- Chainage: Display the chainage start location and the chainage finish location based on the chainage for the cross section (gray area) of the selected lane.
- Latest: Traffic Volume data at the current time based on the lane selected.
- Year (2017, 2016….): Display all of the road in the corresponding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

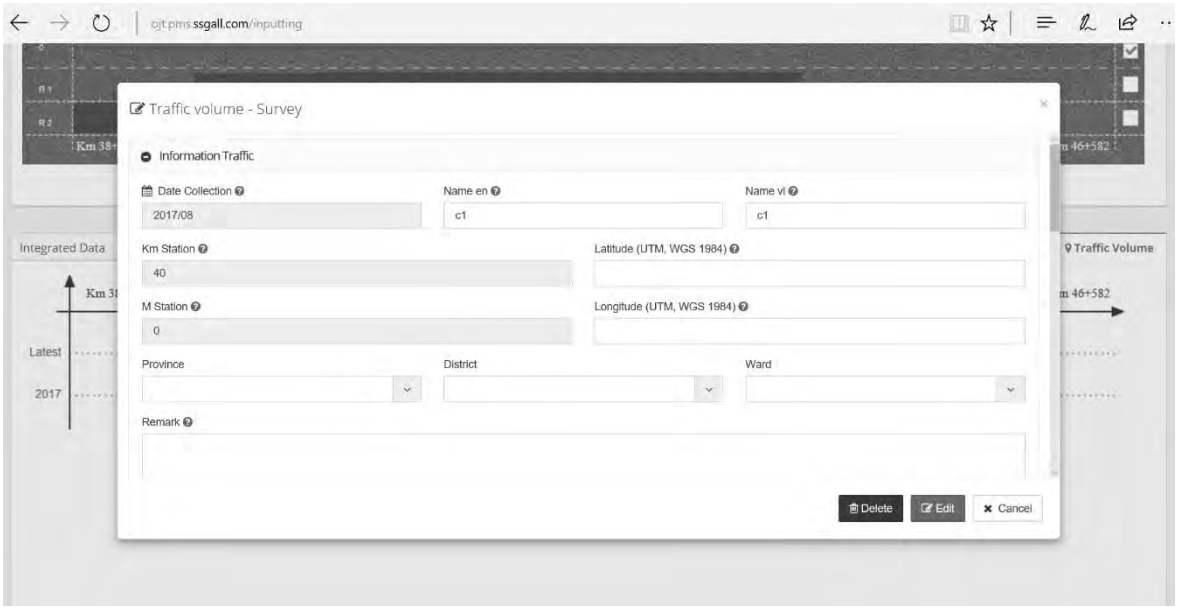


- Step 2: Click on the Road Inventory that you want to edit.

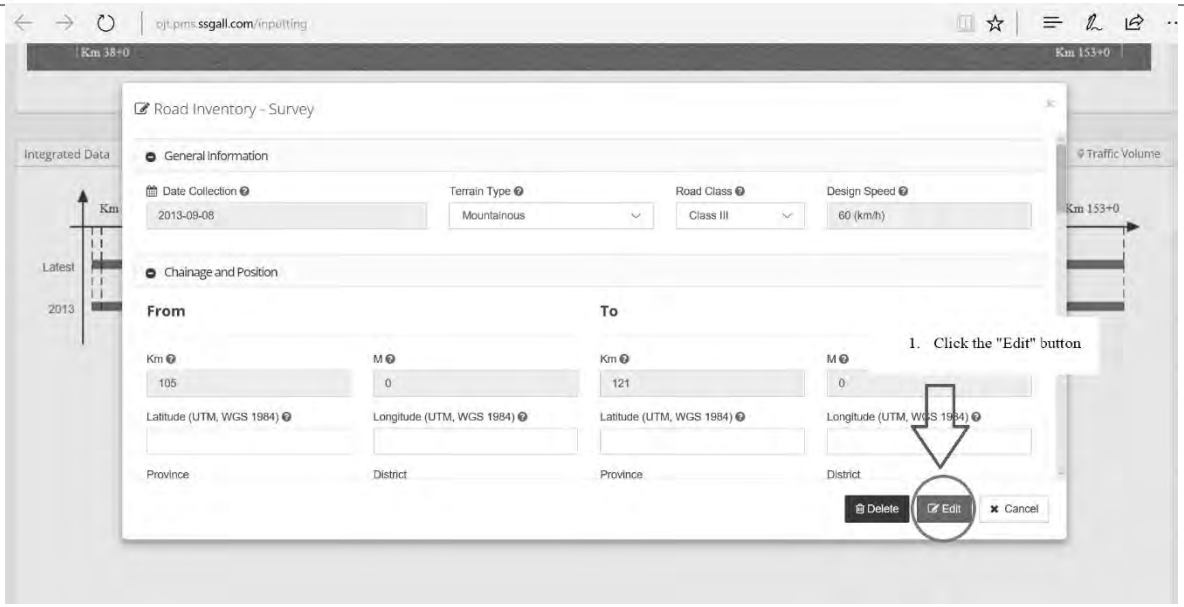


Note: Can not edit the data of "Latest", only edit the road data with time series.

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

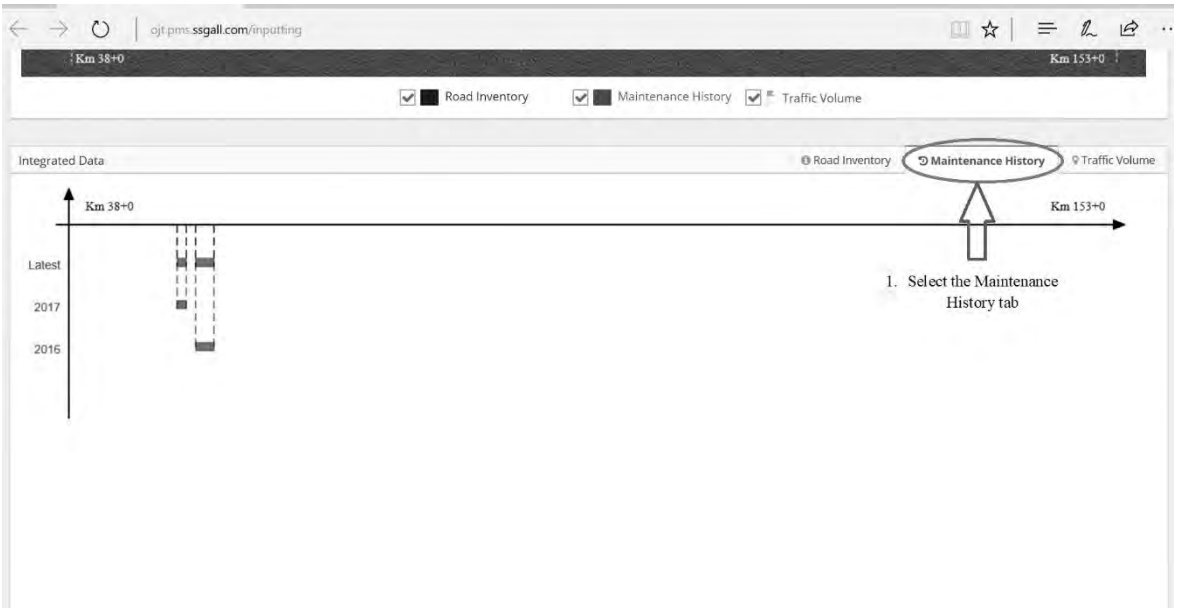


- Step 4: Click the "Edit" button to complete the edit Road Inventory.

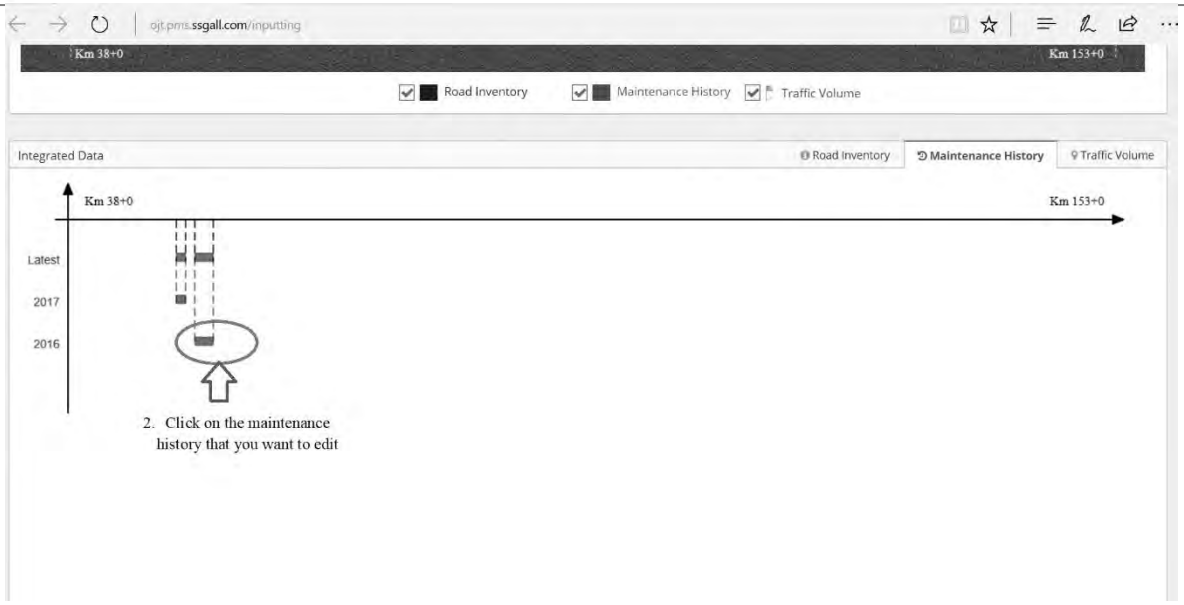


V.3) Edit history data of Maintenance History

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

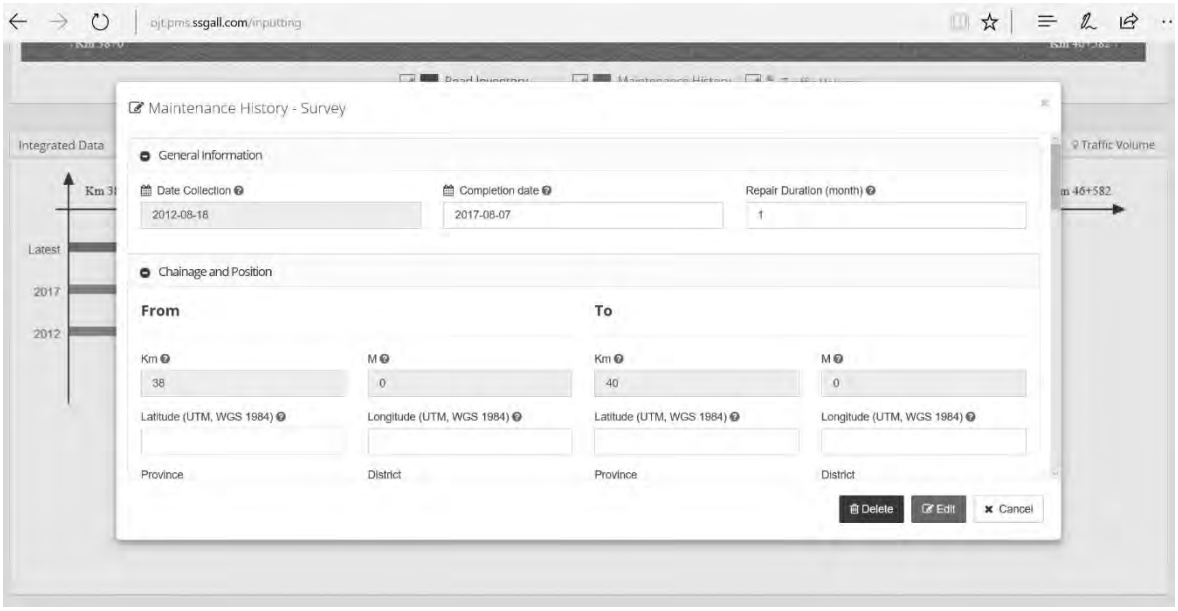


  - Step 2: Click on the Maintenance History that you want to edit.

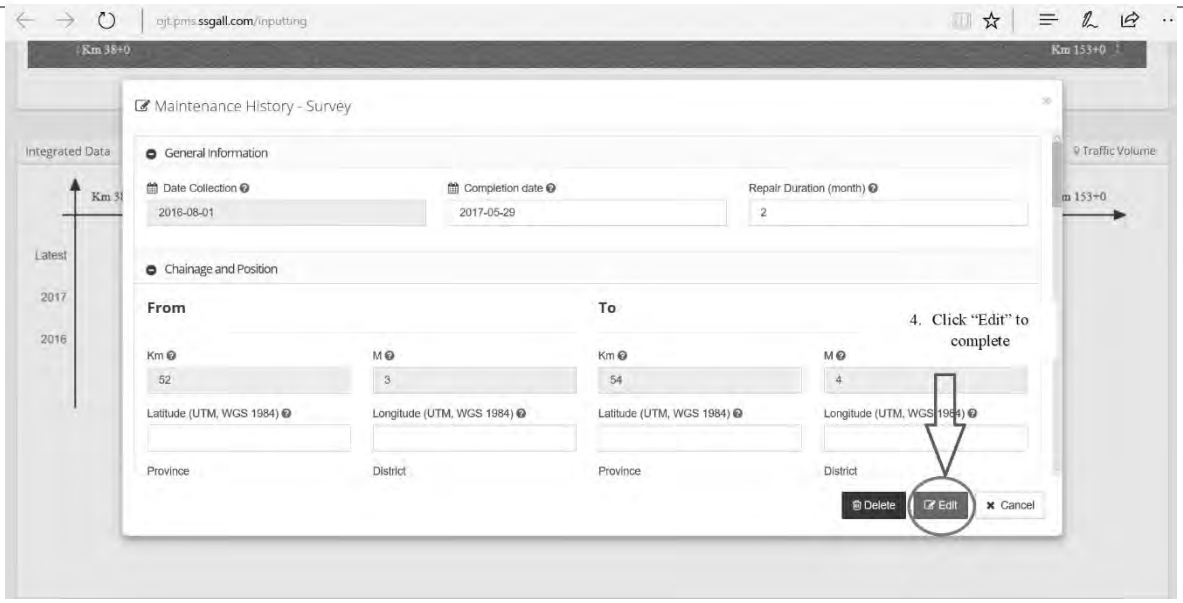


Note: Can not edit the data of "Latest", only edit the road segment data with time series.

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

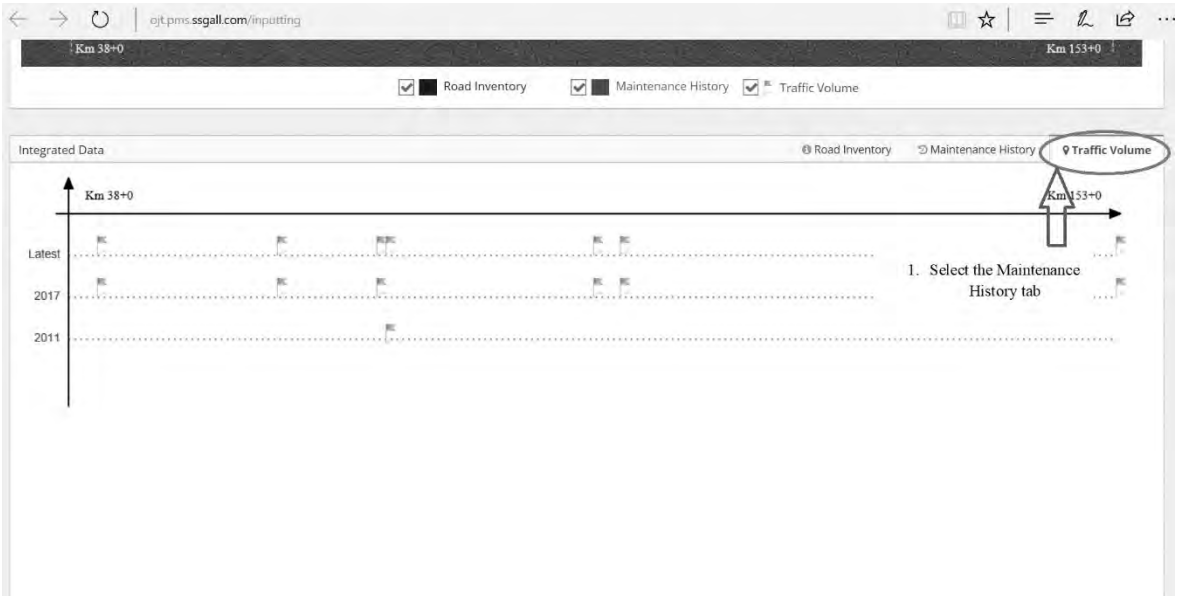


- Step 4: Click on "Edit" to complete the edit Maintenance History.

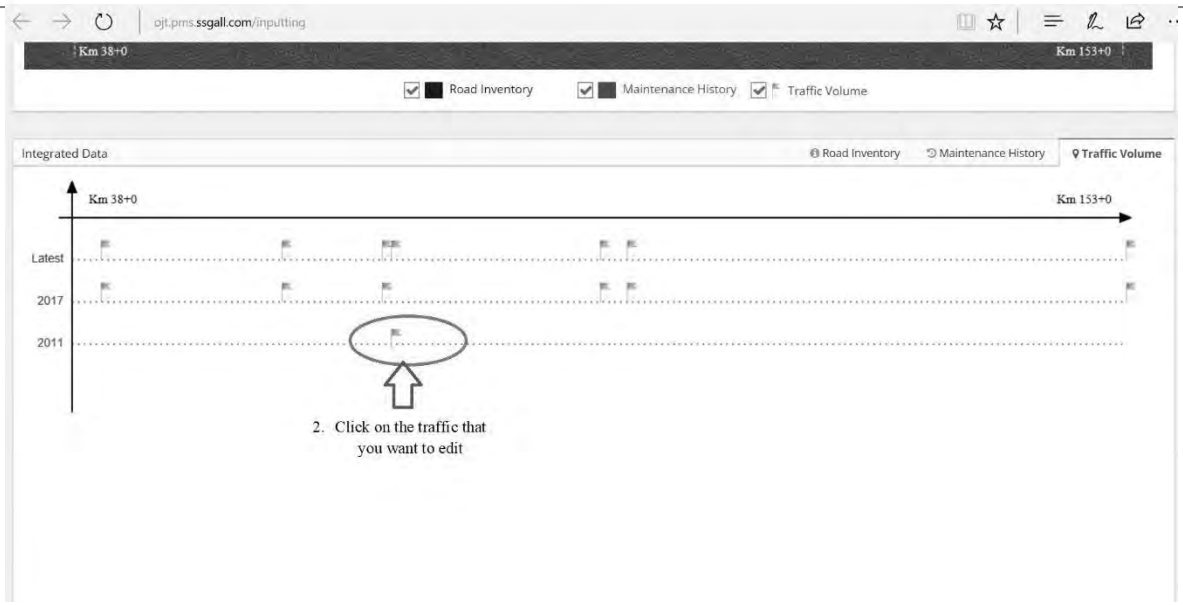


V.4) Edit history data of Traffic Volume

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

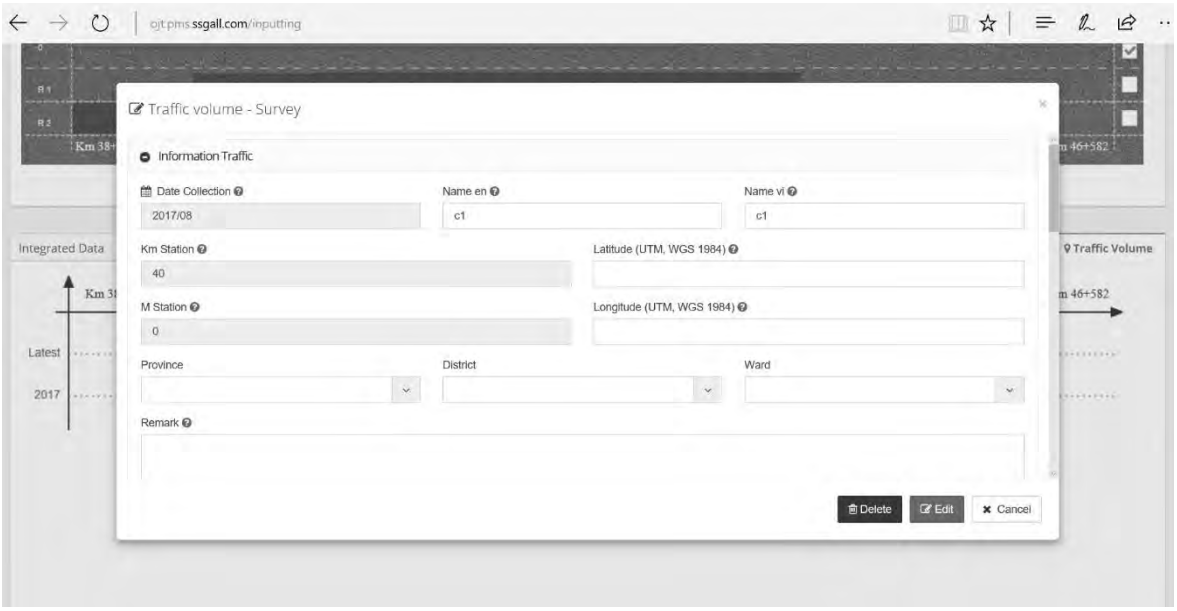


  - Step 2: Click on the Traffic Volume that you want to edit.

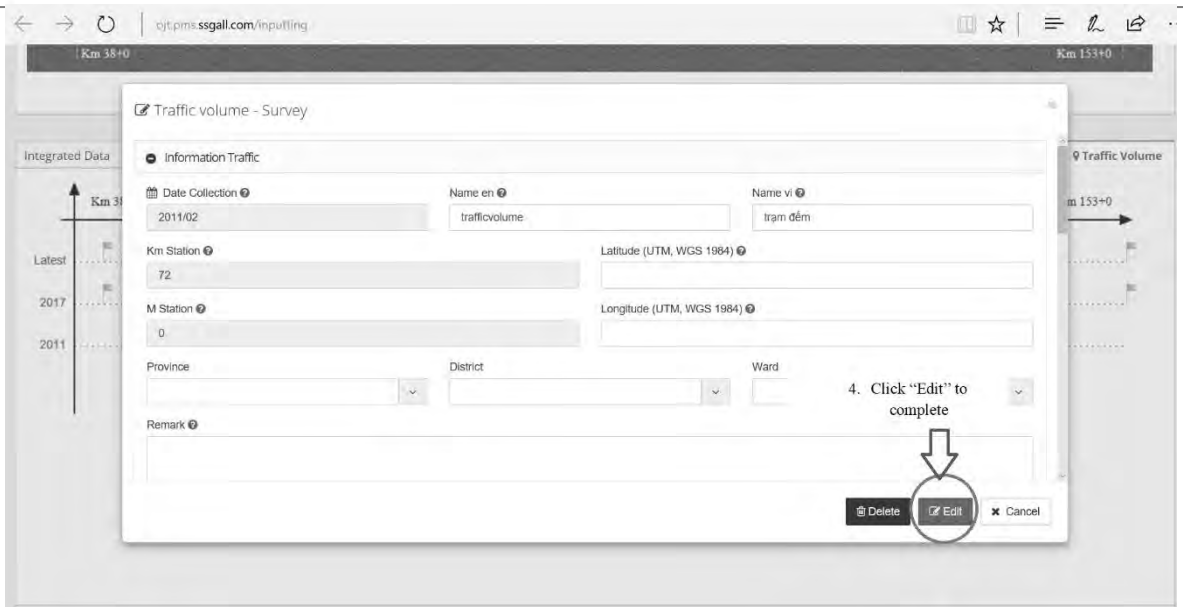


Note: Can not edit the data of "Latest", only edit the Traffic Volume data with time series.

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

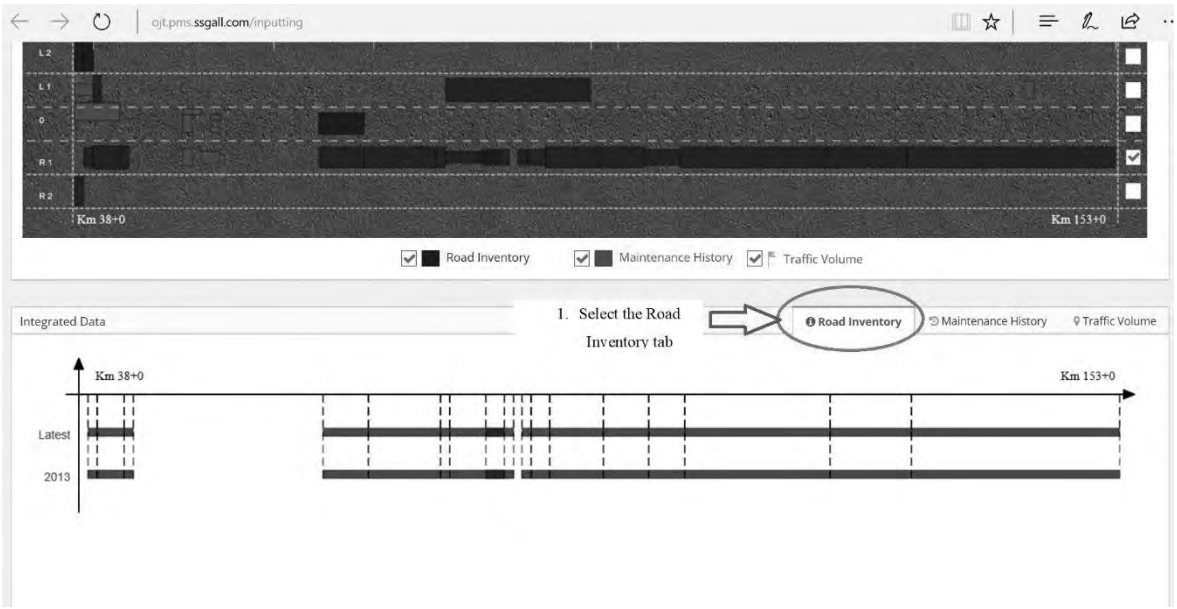


- Step 4: Click on "Edit" button to complete the edit Traffic Volume.

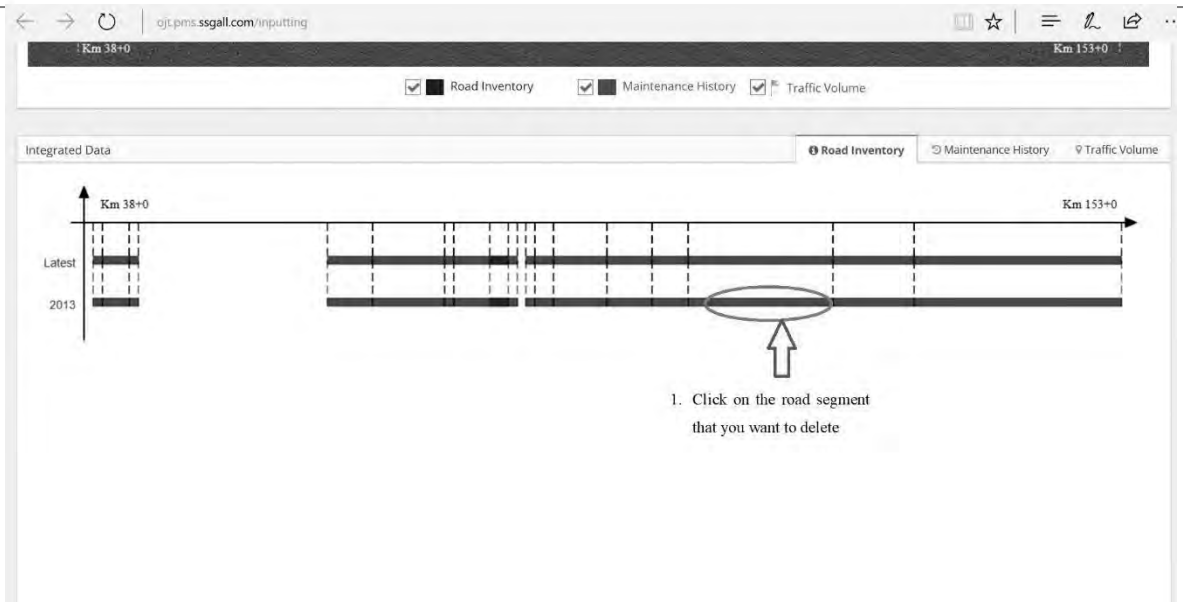


V.5) Delete history data of Road Inventory

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

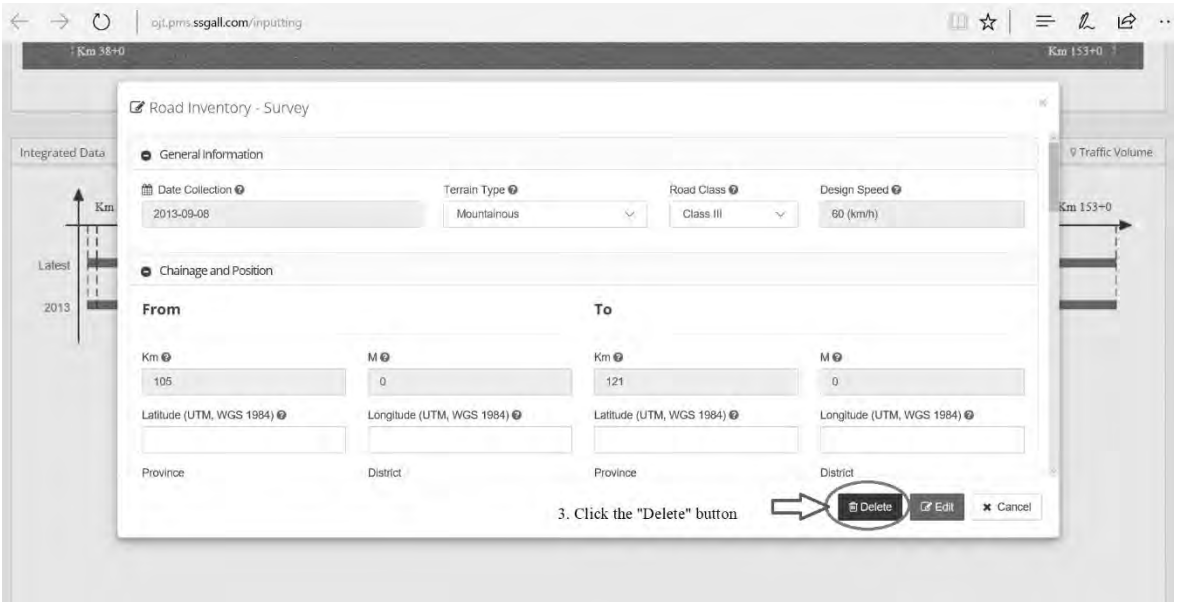


  - Step 2: Click on the Road Segment that you want to delete.



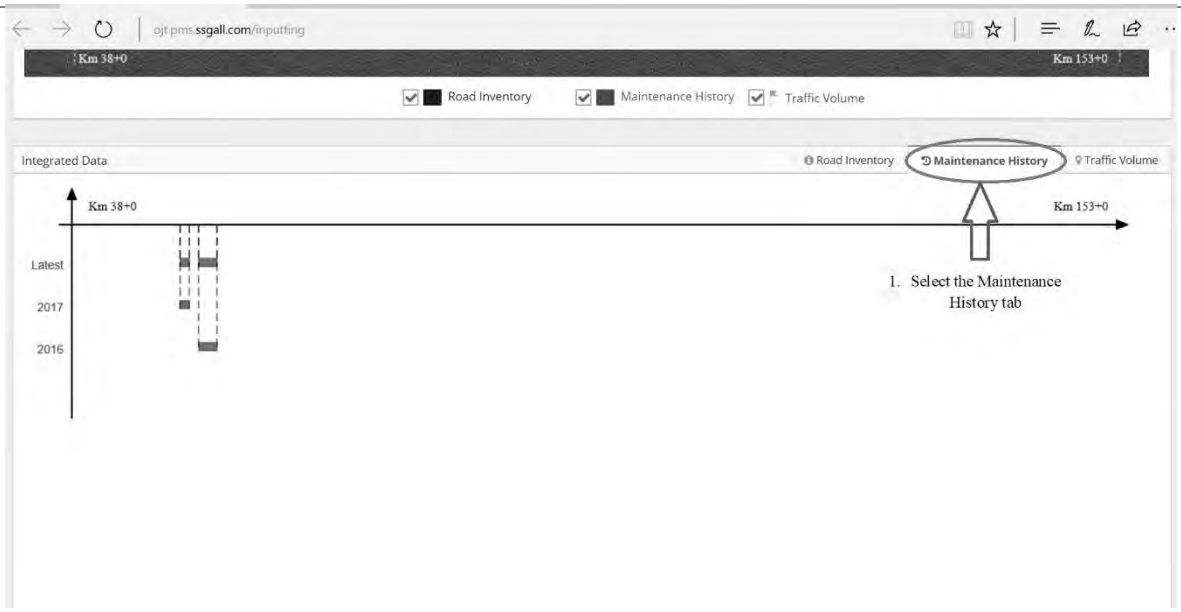
Note: Can not edit the data of "Latest", only edit the Road Inventory data with time series.

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



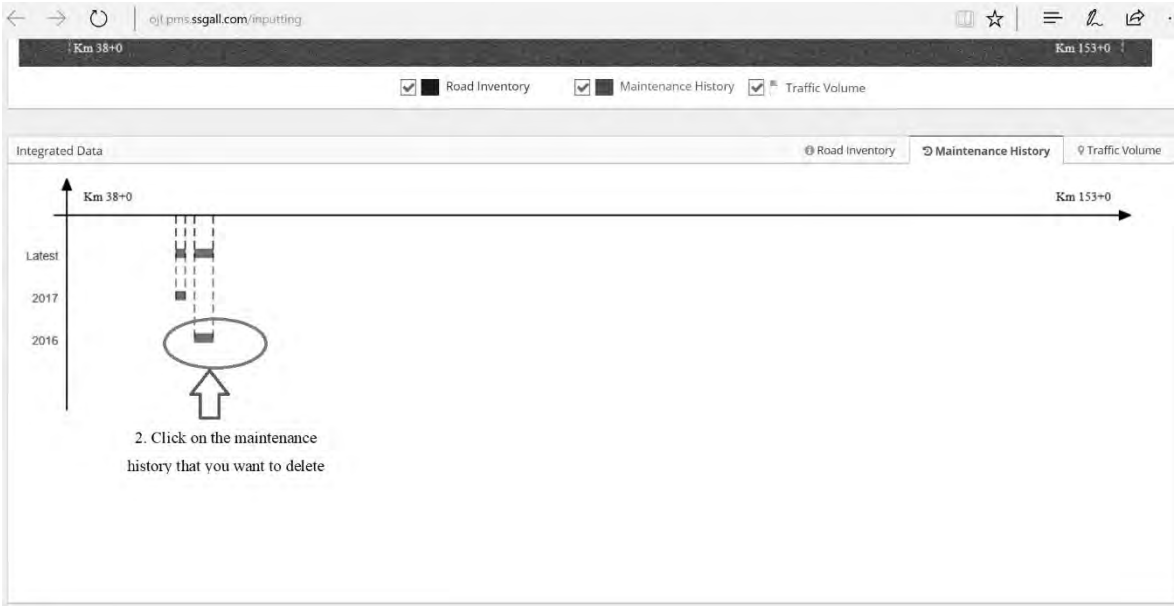
V.6) Delete history data of Maintenance History

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

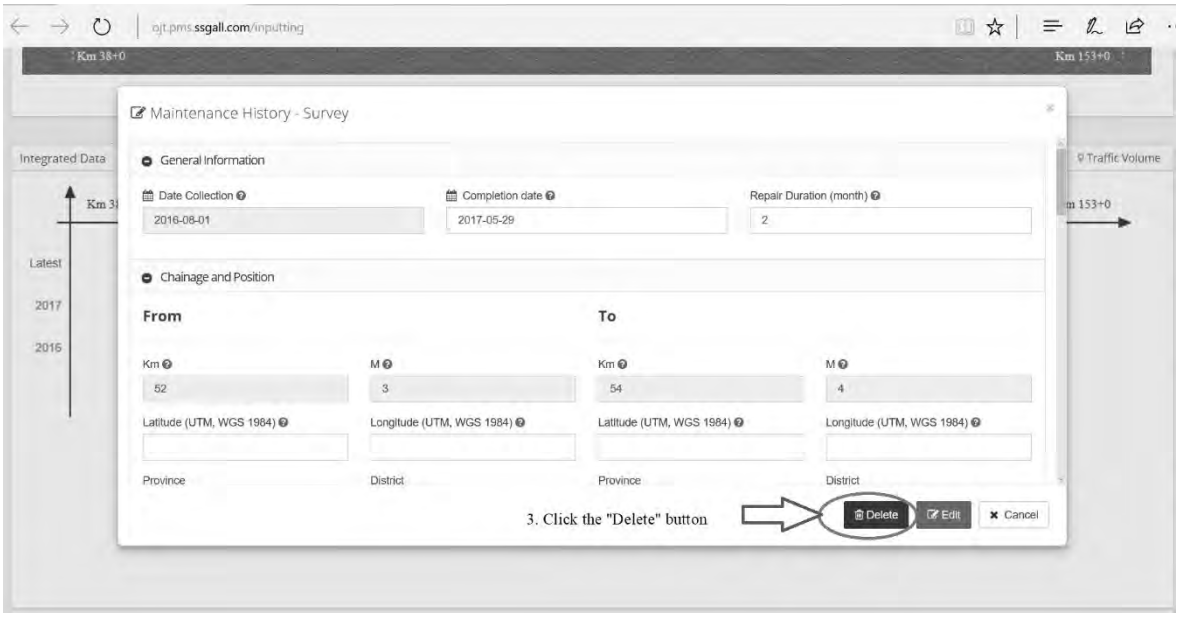


- Step 2: Click on the Maintenance History that you want to delete.

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

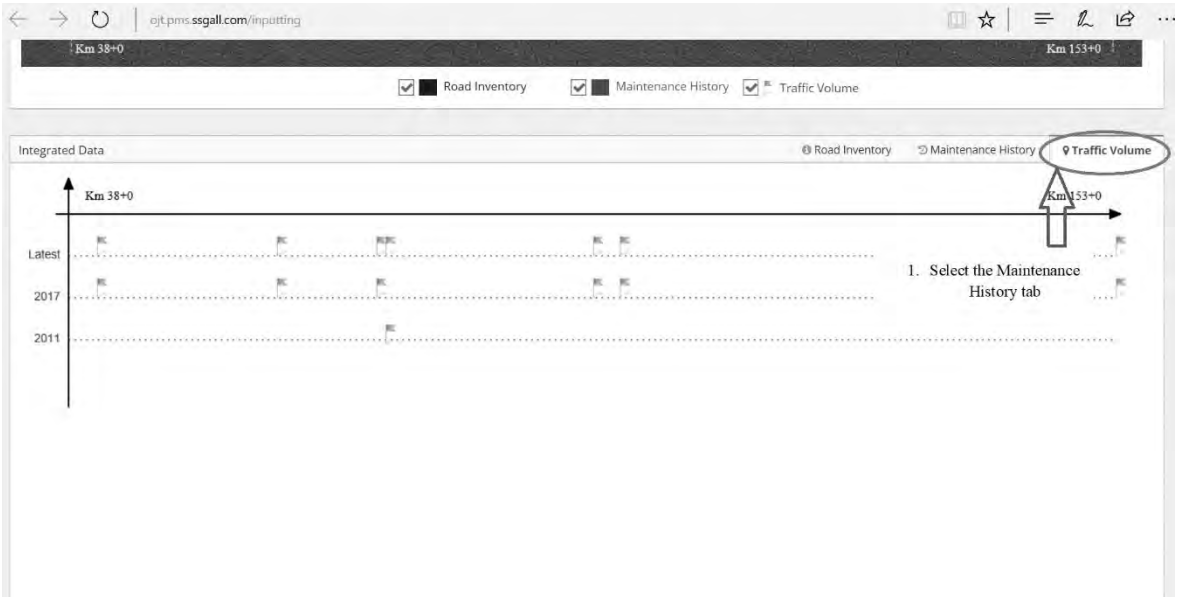


- Step 3: "Maintenance History - Survey" window appear, click on "Delete" button and click on "OK" button of popup.

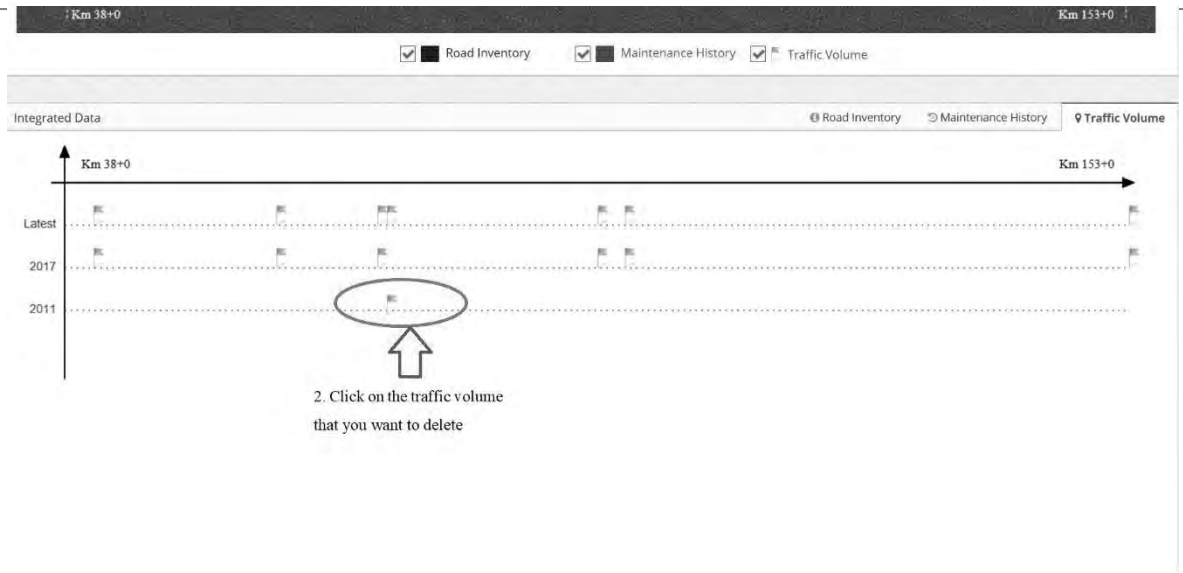


V.7) Delete history data of Traffic Volume

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

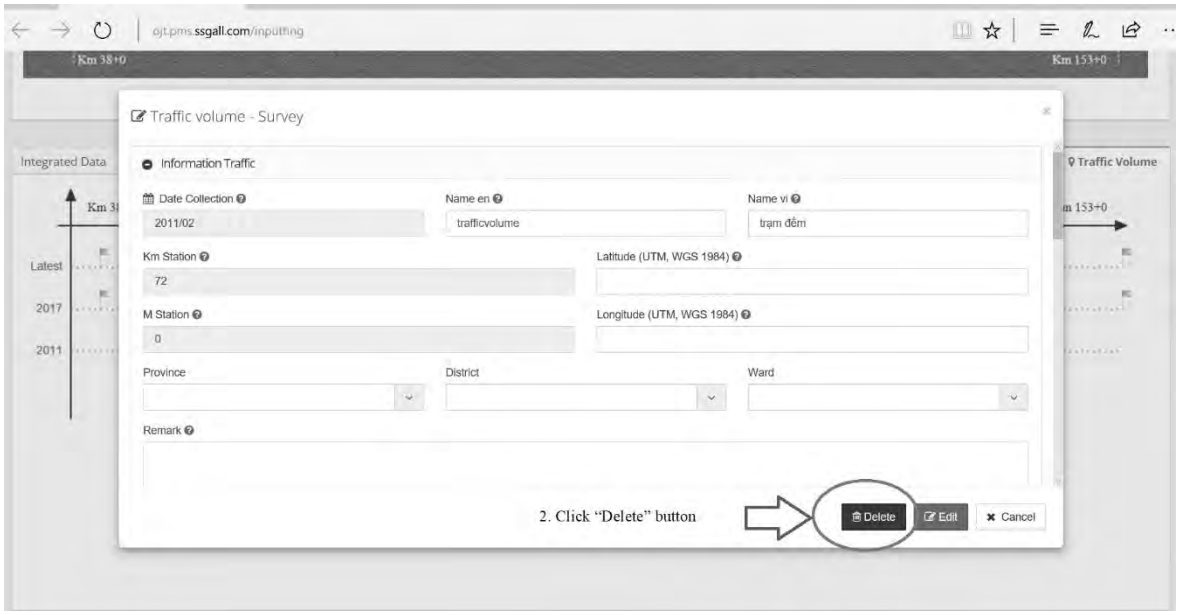


  - Step 2: Click on the Traffic Volume that you want to delete.



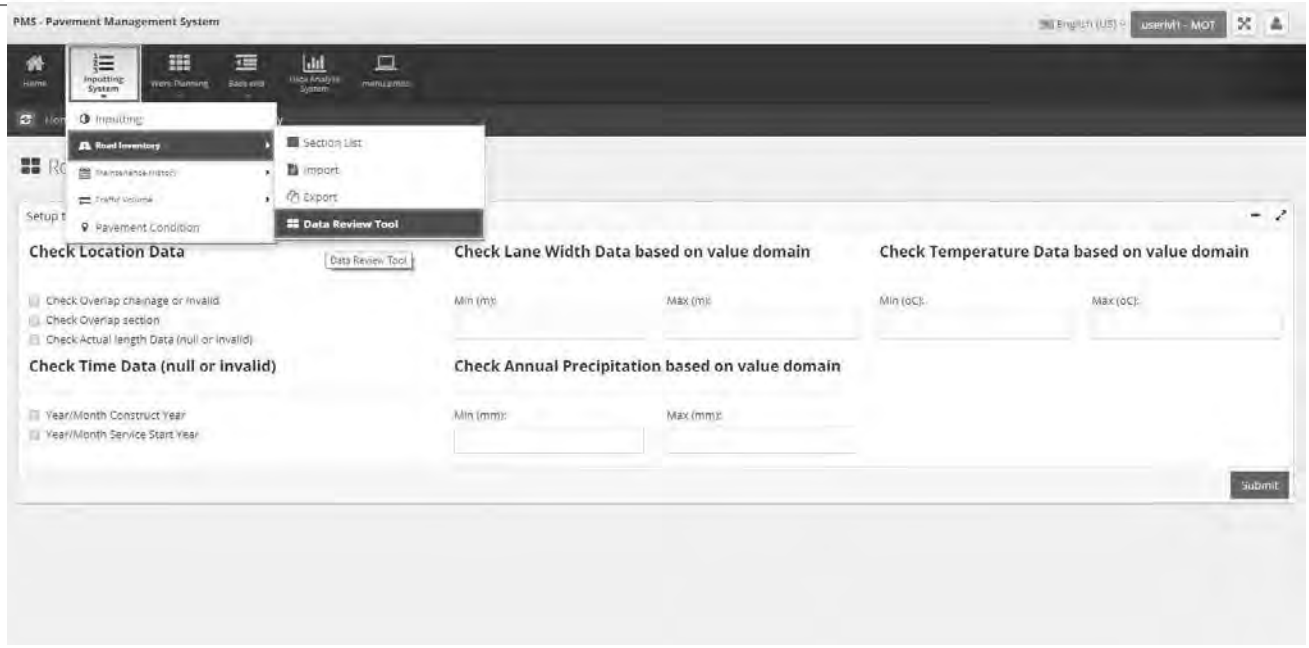
Note: Can not edit the data of "Latest", only edit the Traffic Volume data with time series.

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



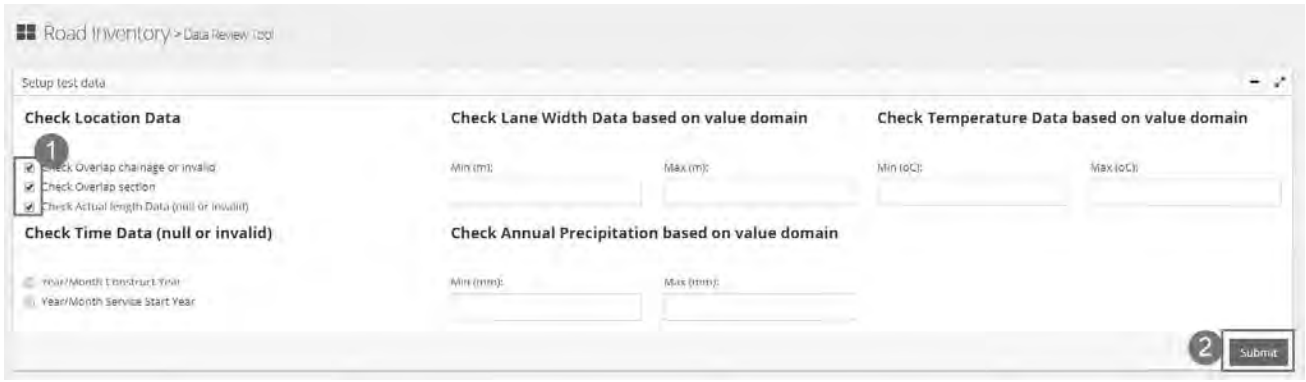
VI) DATA REVIEW TOOL

VI.1) Data review tool for Road Inventory



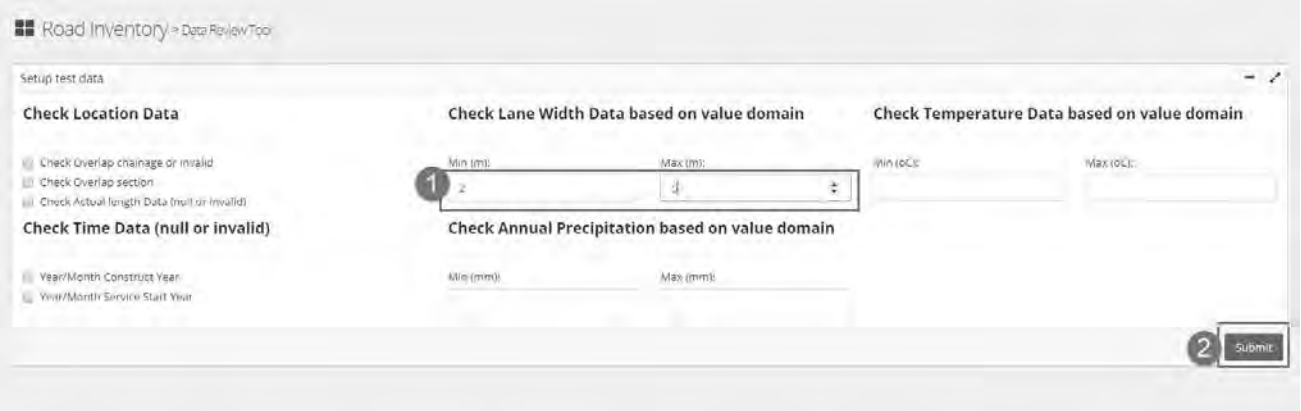
VI.1.1) Setup test data

- 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



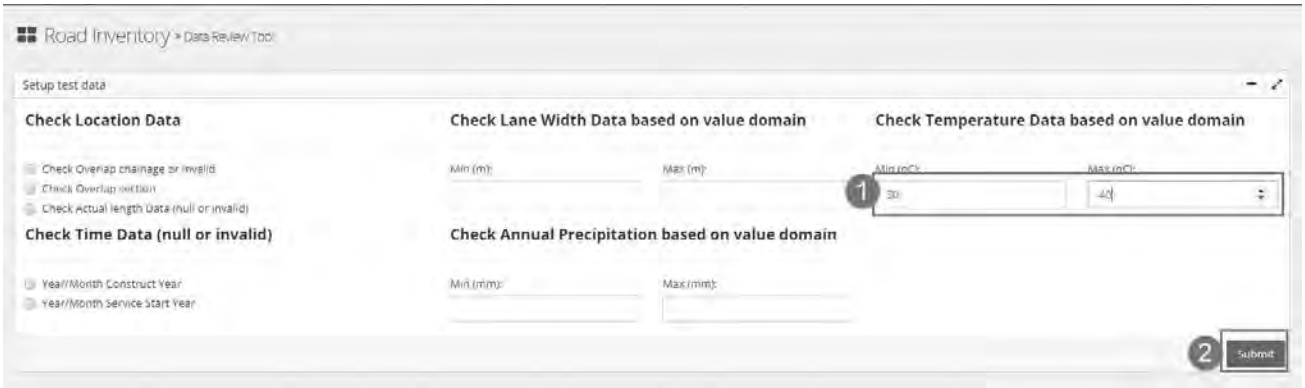
  - ➢ Check Lane Width Data based on value domain
    - Step 1: Input data: Min (m), Max (m) to review Lane Width data
    - Step 2: Click "Submit" button

Note: Values beyond the filter range are invalid values

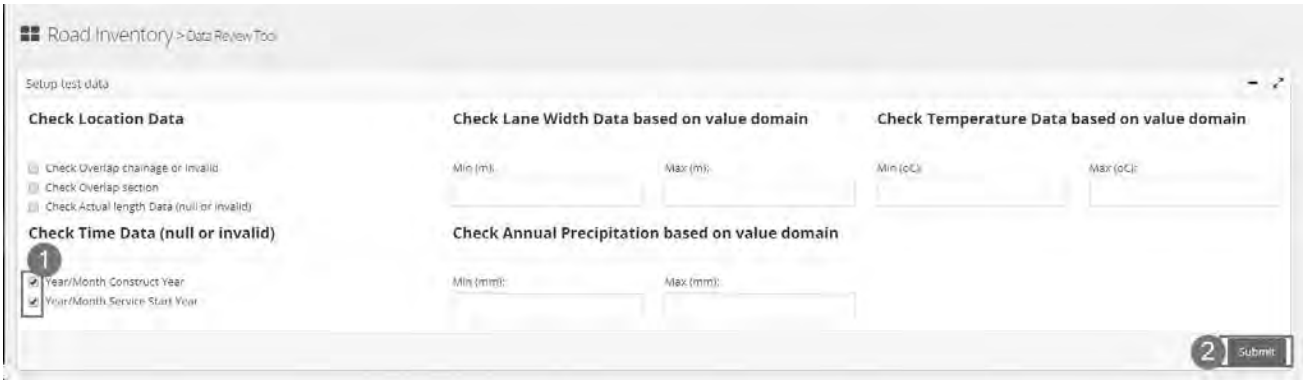


- Check Temperature Data based on value domain
  - Step 1: Input data: Min (oC), Max (oC) to review Temperature data
  - Step 2: Click "Submit" button

Note: Values beyond the filter range are invalid values

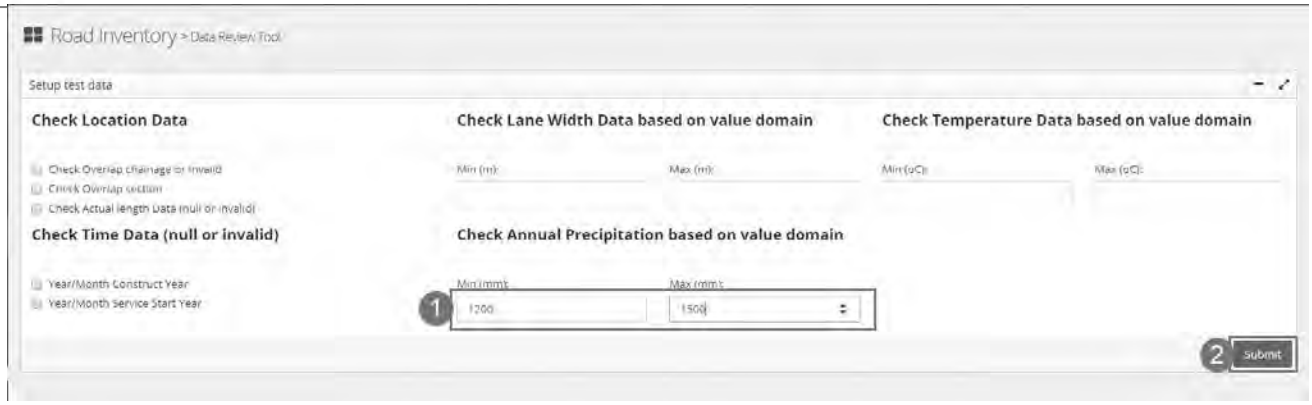


- Check Time Data (null or invalid)
  - Step 1: Choose data to check time data: Year/Month construct Year, Year/Month Service Start Year
  - Step 2: Click "Submit" button



- 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

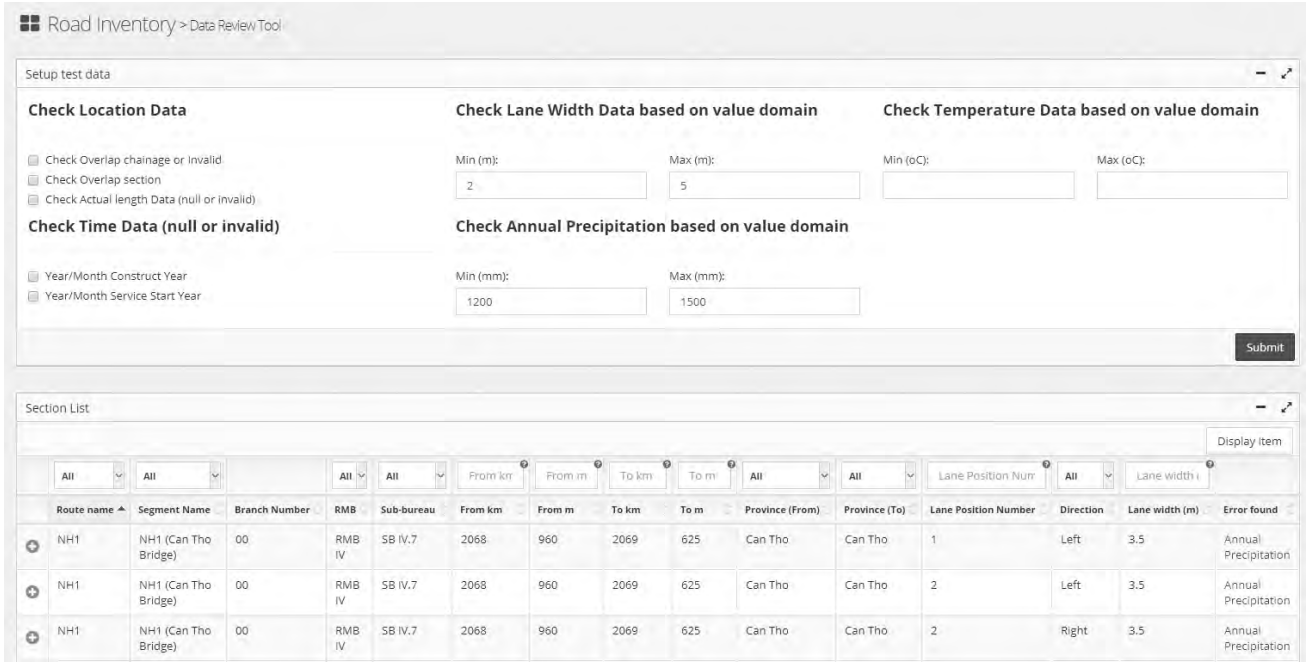
Note: Values beyond the filter range are invalid values



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

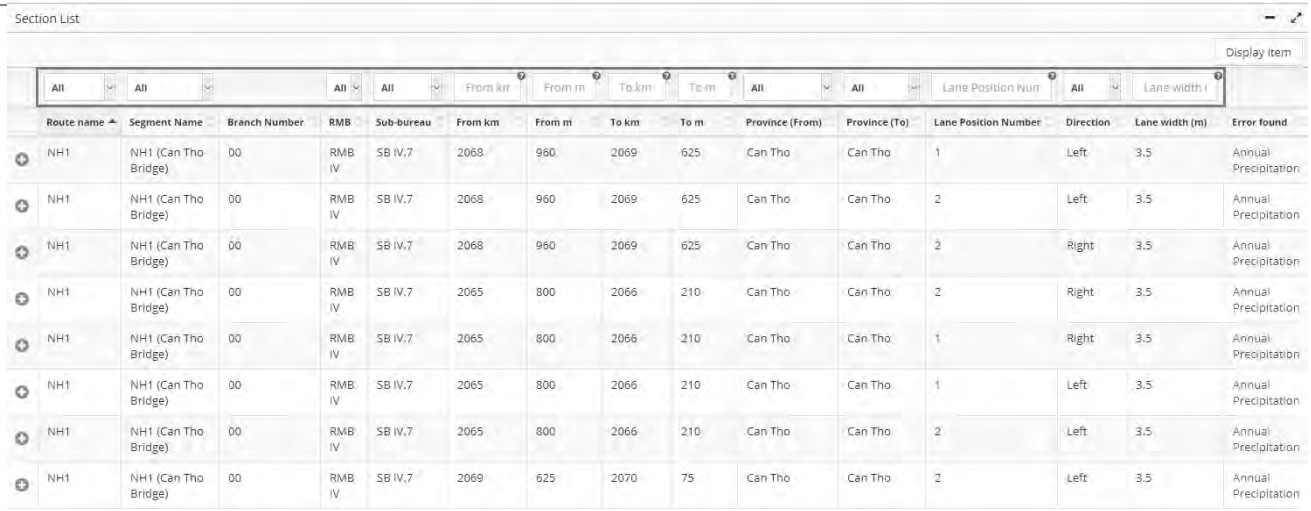
VI.1.2) Sections list after reviewing data

- 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



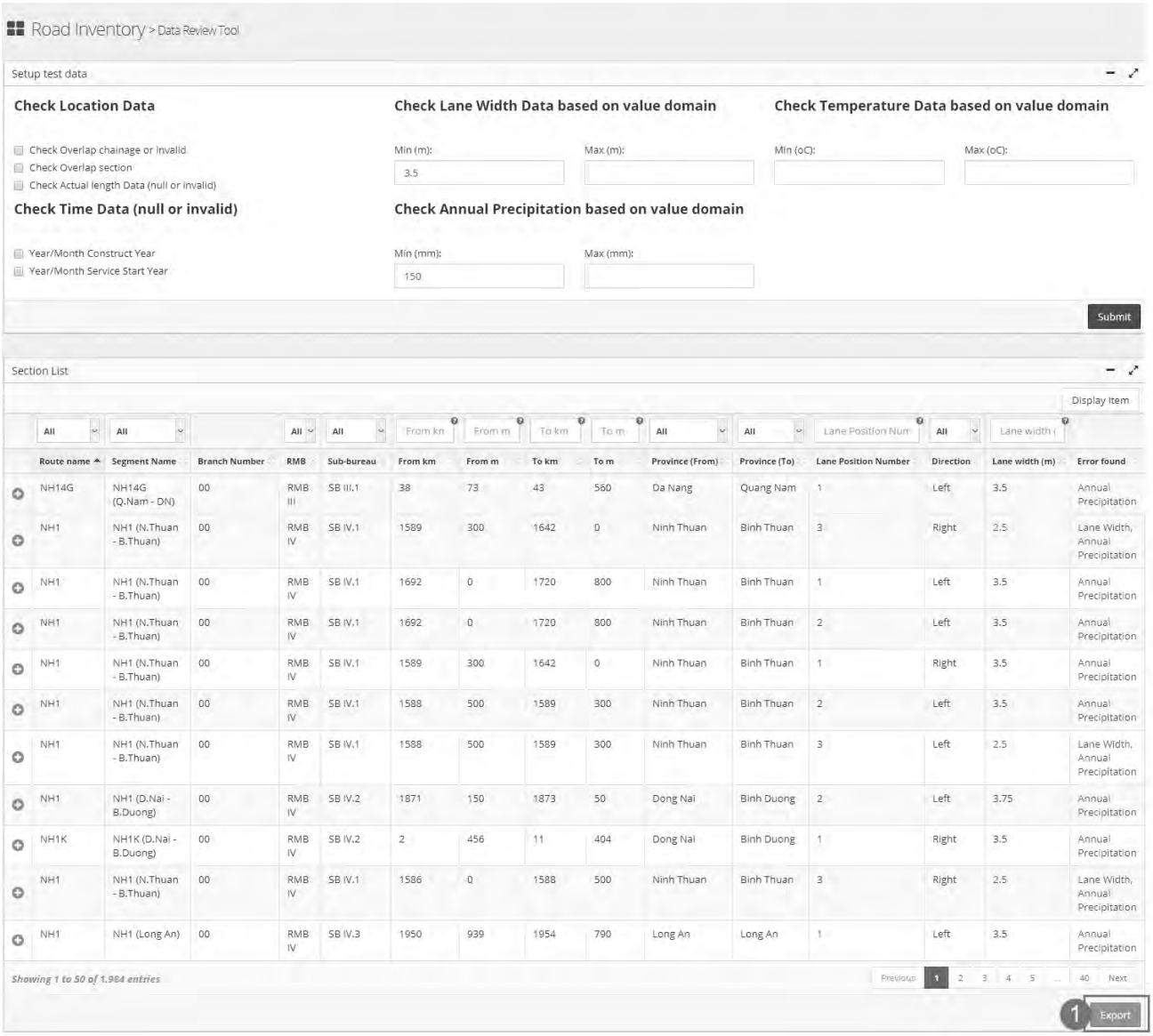
Route name	Segment Name	Branch Number	RMB	Sub-bureau	From km	From m	To km	To m	Province (From)	Province (To)	Lane Position Number	Direction	Lane width (m)	Error found
NH1	NH1 (Can Tho Bridge)	00	RMB IV	SB IV.7	2068	960	2069	625	Can Tho	Can Tho	1	Left	3.5	Annual Precipitation
NH1	NH1 (Can Tho Bridge)	00	RMB IV	SB IV.7	2068	960	2069	625	Can Tho	Can Tho	2	Left	3.5	Annual Precipitation
NH1	NH1 (Can Tho Bridge)	00	RMB IV	SB IV.7	2068	960	2069	625	Can Tho	Can Tho	2	Right	3.5	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))



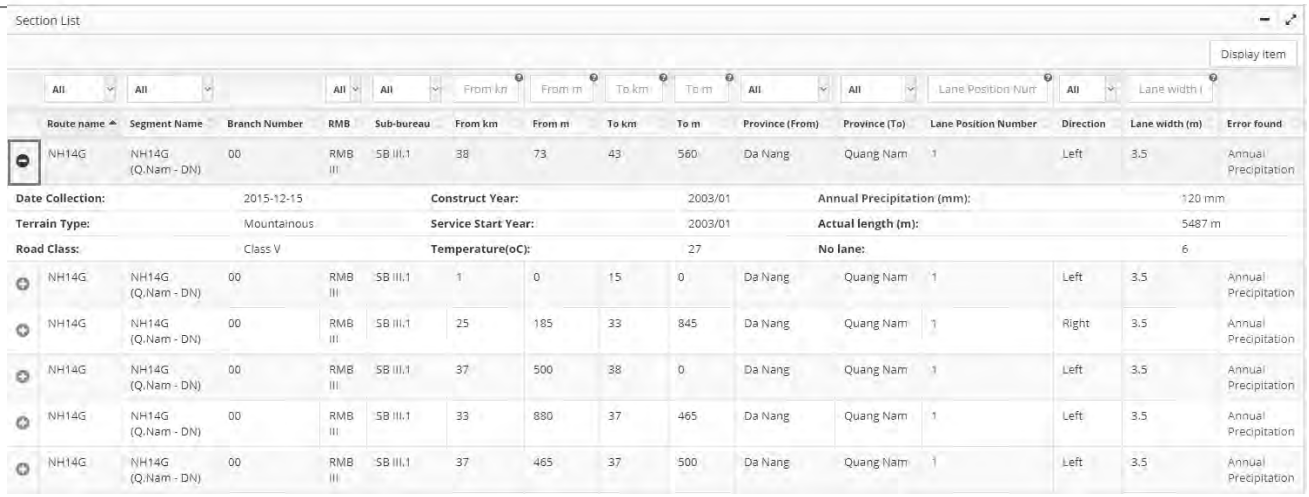
Route name	Segment Name	Branch Number	RMB	Sub-bureau	From km	From m	To km	To m	Province (From)	Province (To)	Lane Position Number	Direction	Lane width (m)	Error found
NH1	NH1 (Can Tho Bridge)	00	RMB IV	SB IV.7	2068	960	2069	625	Can Tho	Can Tho	1	Left	3.5	Annual Precipitation
NH1	NH1 (Can Tho Bridge)	00	RMB IV	SB IV.7	2068	960	2069	625	Can Tho	Can Tho	2	Left	3.5	Annual Precipitation
NH1	NH1 (Can Tho Bridge)	00	RMB IV	SB IV.7	2068	960	2069	625	Can Tho	Can Tho	2	Right	3.5	Annual Precipitation
NH1	NH1 (Can Tho Bridge)	00	RMB IV	SB IV.7	2065	800	2066	210	Can Tho	Can Tho	2	Right	3.5	Annual Precipitation
NH1	NH1 (Can Tho Bridge)	00	RMB IV	SB IV.7	2065	800	2066	210	Can Tho	Can Tho	1	Right	3.5	Annual Precipitation
NH1	NH1 (Can Tho Bridge)	00	RMB IV	SB IV.7	2065	800	2066	210	Can Tho	Can Tho	1	Left	3.5	Annual Precipitation
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
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

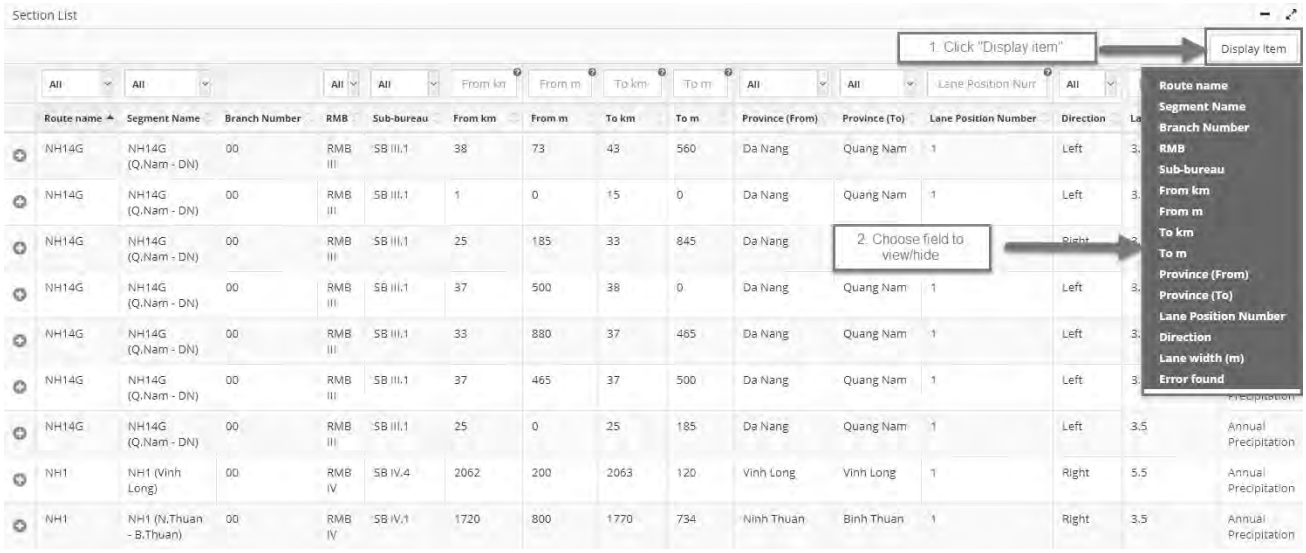


Route name	Segment Name	Branch Number	RMB	Sub-bureau	From km	From m	To km	To m	Province (From)	Province (To)	Lane Position Number	Direction	Lane width (m)	Error found
NH14G	NH14G (Q.Nam - DN)	00	RMB III	SB III.1	38	73	43	560	Da Nang	Quang Nam	1	Left	3.5	Annual Precipitation
NH1	NH1 (N.Thuan - B.Thuan)	00	RMB IV	SB IV.1	1589	300	1642	0	Ninh Thuan	Binh Thuan	3	Right	2.5	Lane Width, Annual Precipitation
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 Precipitation
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 Precipitation
NH1	NH1 (N.Thuan - B.Thuan)	00	RMB IV	SB IV.1	1589	300	1642	0	Ninh Thuan	Binh Thuan	1	Right	3.5	Annual Precipitation
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 Precipitation
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 Width, Annual Precipitation
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 Precipitation
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 Precipitation
NH1	NH1 (N.Thuan - B.Thuan)	00	RMB IV	SB IV.1	1586	0	1588	500	Ninh Thuan	Binh Thuan	3	Right	2.5	Lane Width, Annual Precipitation
NH1	NH1 (Long An)	00	RMB IV	SB IV.3	1950	939	1954	790	Long An	Long An	1	Left	3.5	Annual Precipitation

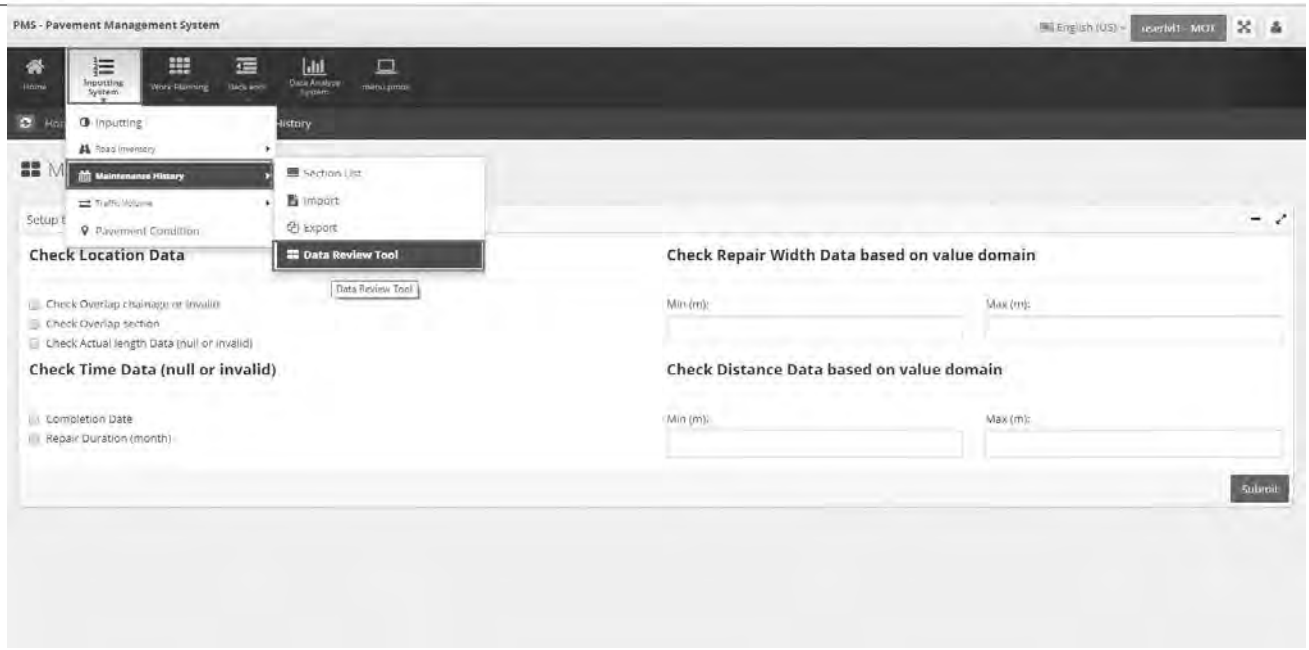
- View detail information of section: Click ⊕ of section to view detail information



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

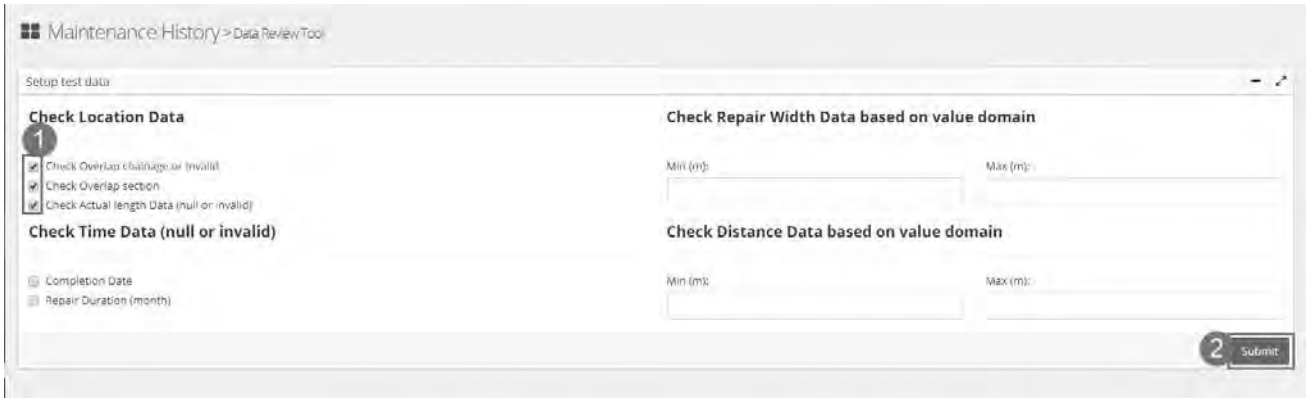


VI.2) Data review tool for Maintenance History



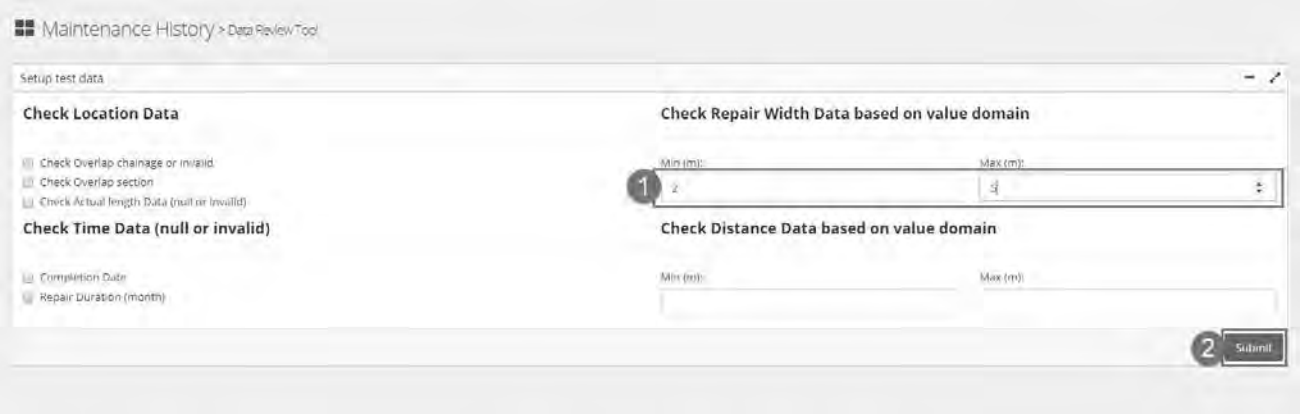
VI.2.1) Setup test data

- 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

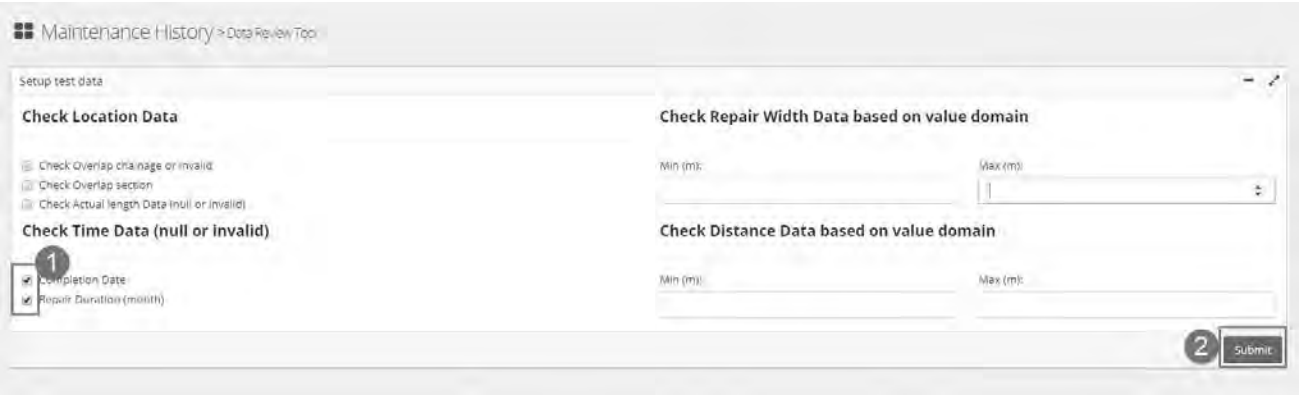


  - ➢ Check Repair Width Data based on value domain
    - Step 1: Input data: Min (m), Max (m) to review Repair Width data
    - Step 2: Click "Submit" button

Note: Values beyond the filter range are invalid values

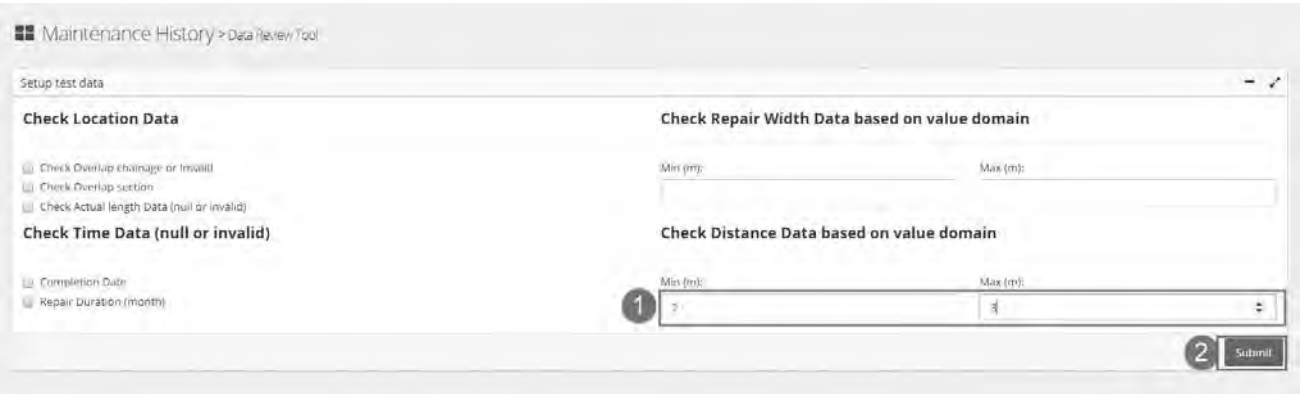


- Check Time Data (null or invalid)
  - Step 1: Choose data to check time data: Completion Date, Repair Duration (month)
  - Step 2: Click "Submit" button



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

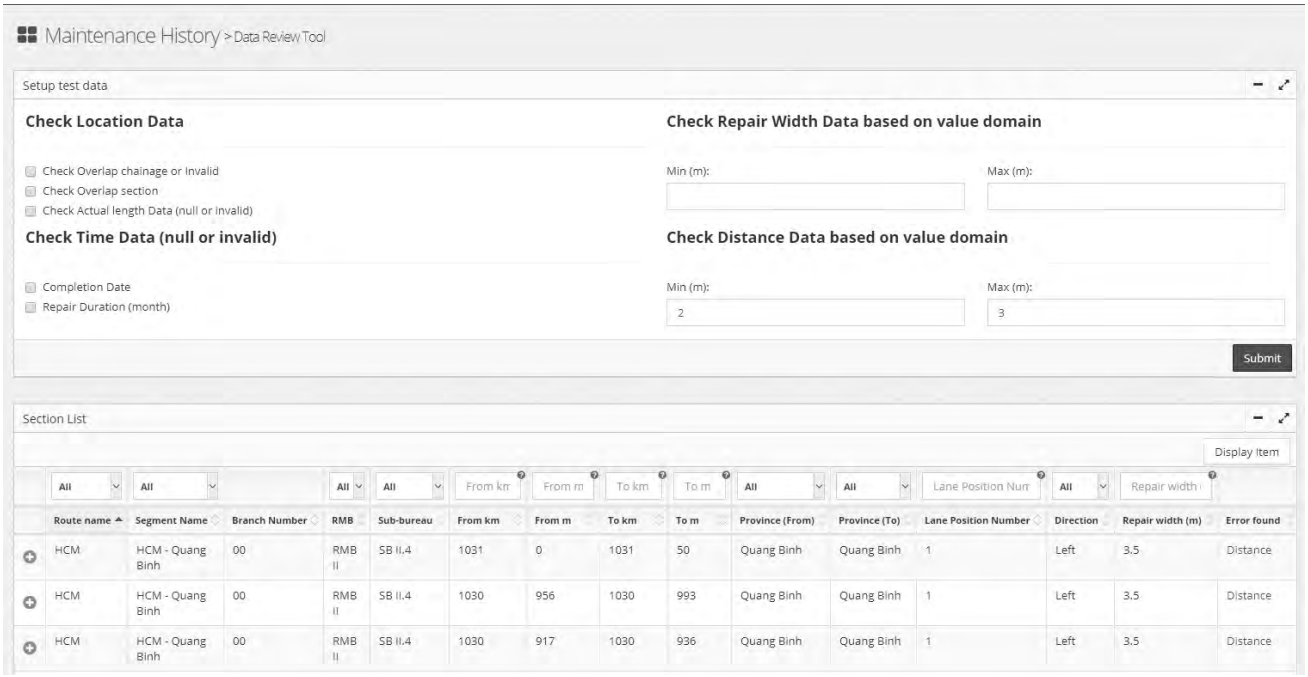
Note: Values beyond the filter range are invalid values



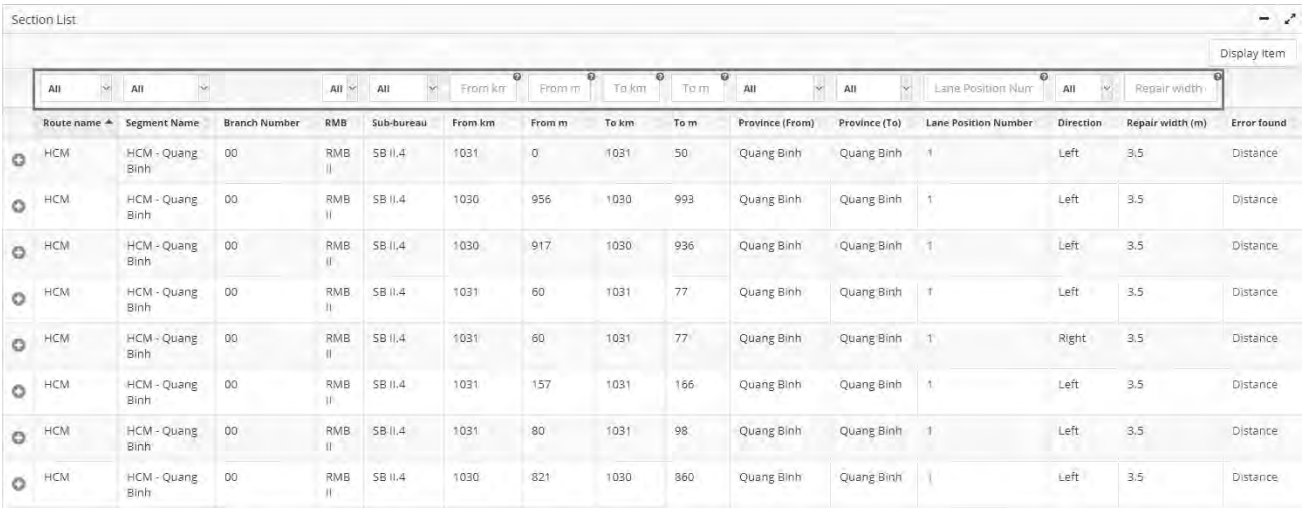
⇨Users can review more than one data at a time for Road Inventory

VI.2.2) Sections list after reviewing data

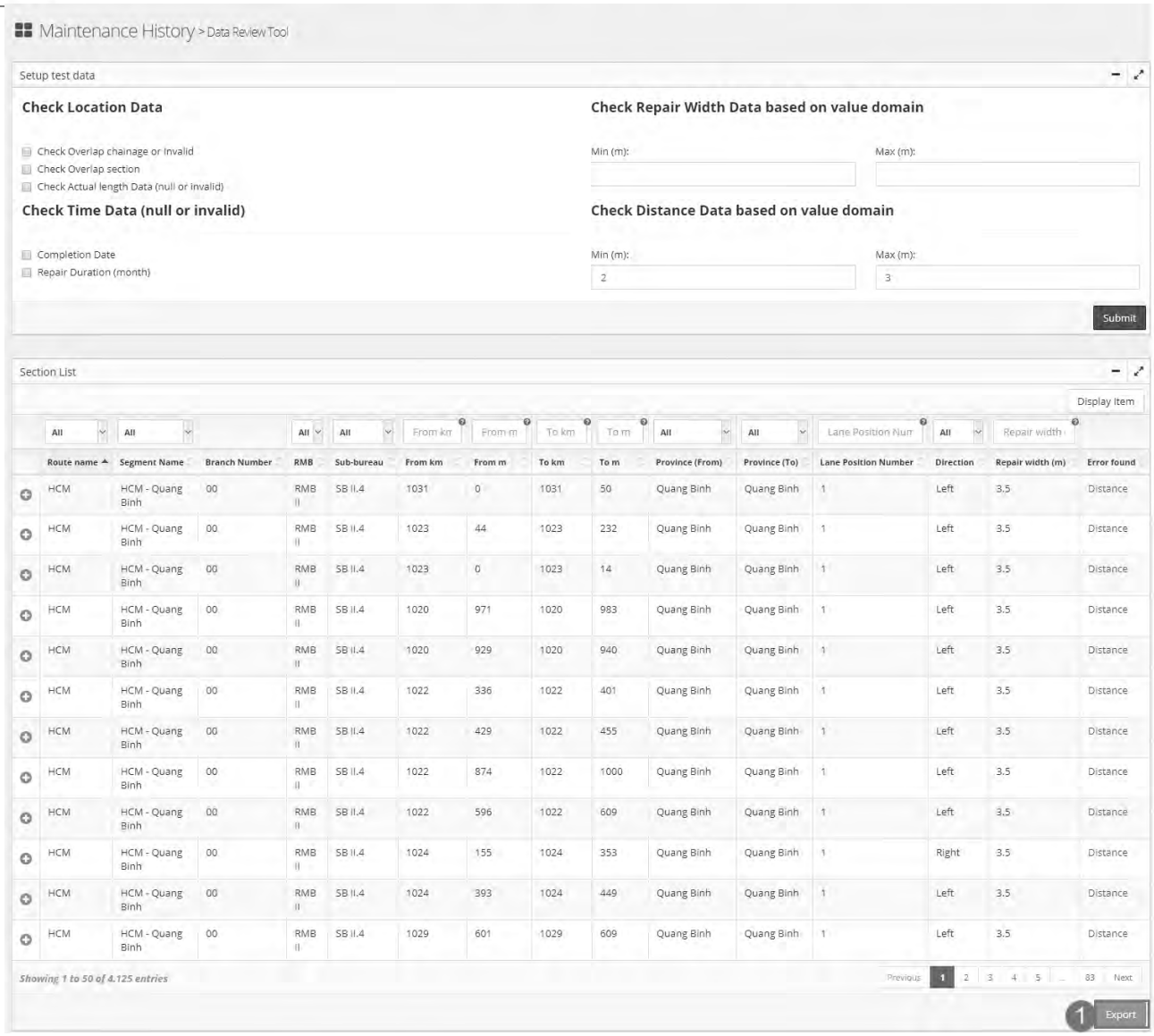
- Purpose: Show the list of the section (maintenance history) of the line of data or error (red) after the user in the step “Steup test data”. Total errors or error information could be displayed in the column "Error found" of sections list



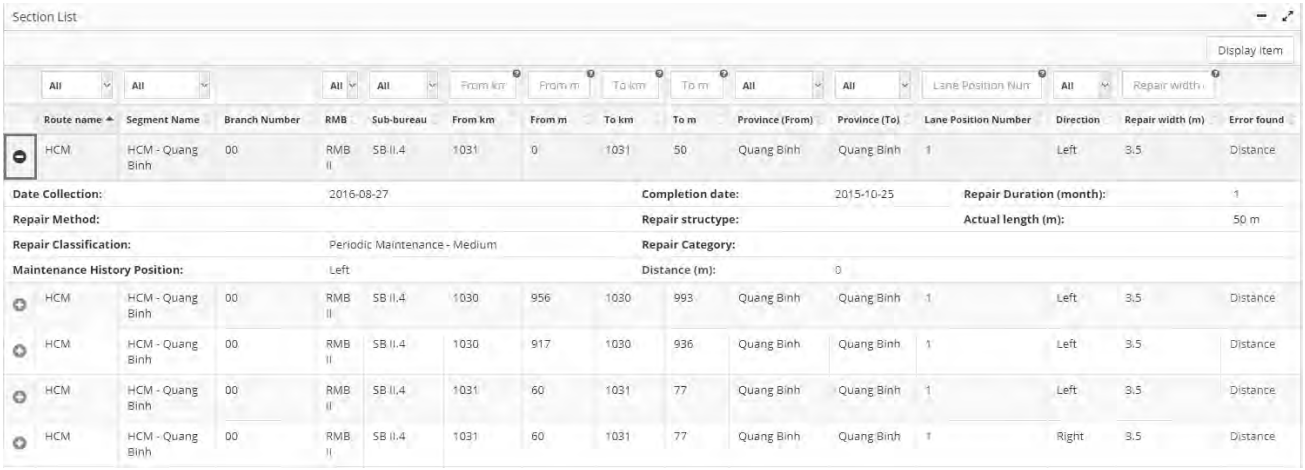
- Operations:
  - Filter data: At the Sections list form, user can filter data (Route Name, Segment name, RMB, SB, Chainage, Province (from), Province (to), Lane position number, Direction, Repair width (m))



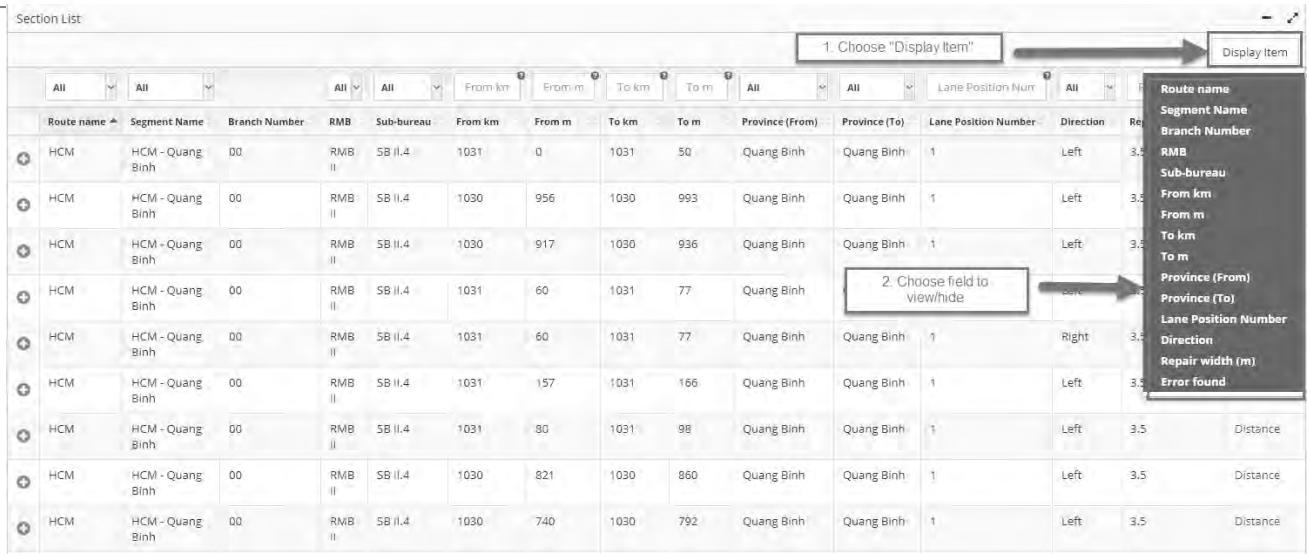
  - Export: At the Sections List form, click “Export” button to export wrong records



- View detail information of section: Click ⊕ of section to view detail information



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



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		
HCM	HCM - Quang Binh	00	RMB II	SB II.4	1031	0	1031	50	Quang Binh	Quang Binh	1	Left		
HCM	HCM - Quang Binh	00	RMB II	SB II.4	1030	956	1030	993	Quang Binh	Quang Binh	1	Left		
HCM	HCM - Quang Binh	00	RMB II	SB II.4	1030	917	1030	936	Quang Binh	Quang Binh	1	Left		
HCM	HCM - Quang Binh	00	RMB II	SB II.4	1031	60	1031	77	Quang Binh					
HCM	HCM - Quang Binh	00	RMB II	SB II.4	1031	60	1031	77	Quang Binh	Quang Binh	1	Right		
HCM	HCM - Quang Binh	00	RMB II	SB II.4	1031	157	1031	166	Quang Binh	Quang Binh	1	Left		
HCM	HCM - Quang Binh	00	RMB II	SB II.4	1031	80	1031	98	Quang Binh	Quang Binh	1	Left	3.5	Distance
HCM	HCM - Quang Binh	00	RMB II	SB II.4	1030	821	1030	860	Quang Binh	Quang Binh	1	Left	3.5	Distance
HCM	HCM - Quang Binh	00	RMB II	SB II.4	1030	740	1030	792	Quang Binh	Quang Binh	1	Left	3.5	Distance

USER'S MANUAL

PMS DATASET FORMULATION MODULE

CONTENTS

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.

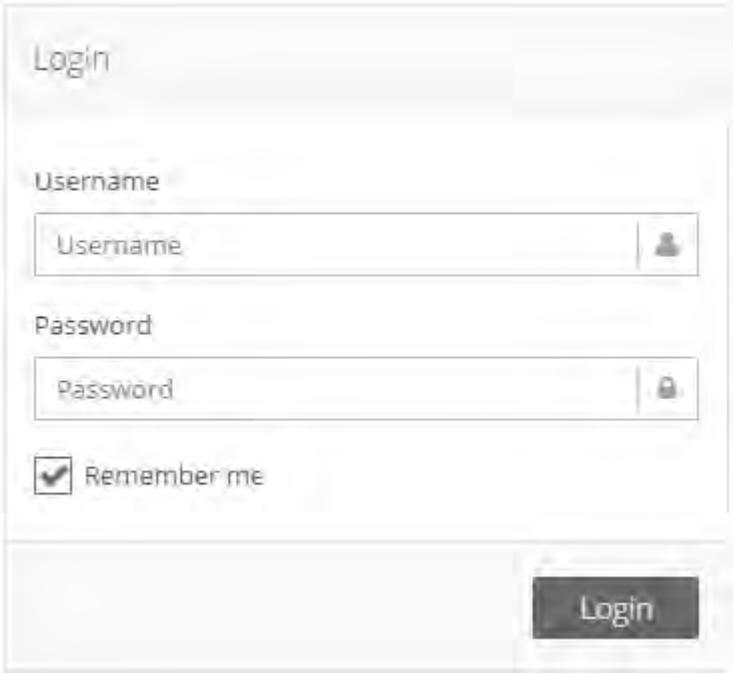
II) Process overview

II.1) Main functions:

- Formulate PMS dataset

II.2) Login to the system

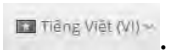
- User can log in to the system from "**http://pms.drvn.gov.vn**"



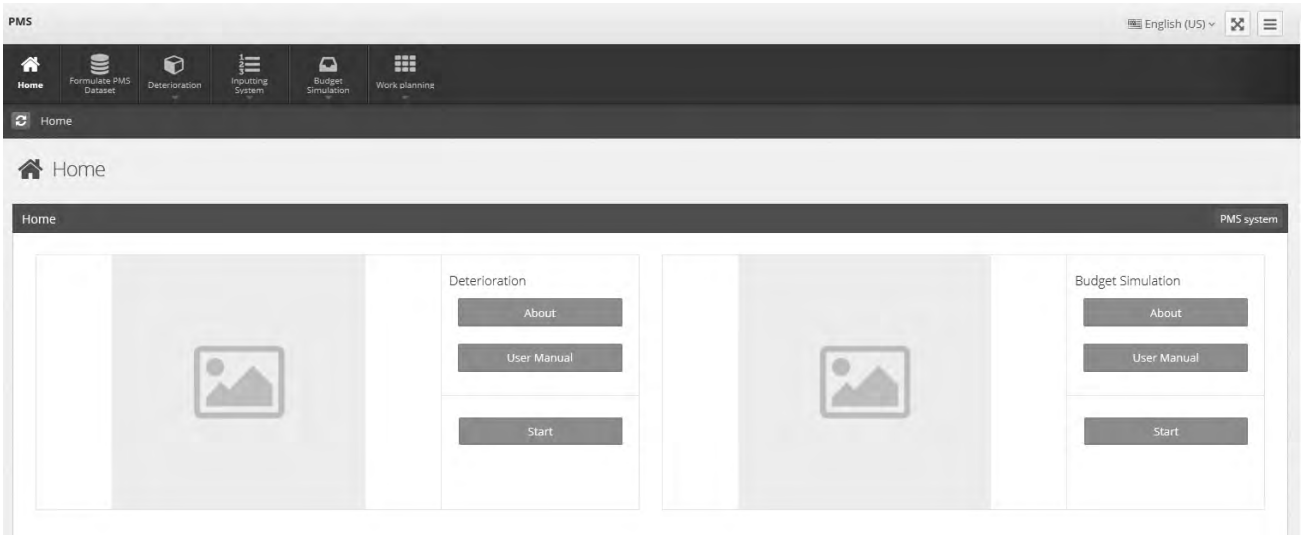
- User enter Username and Password

- 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 

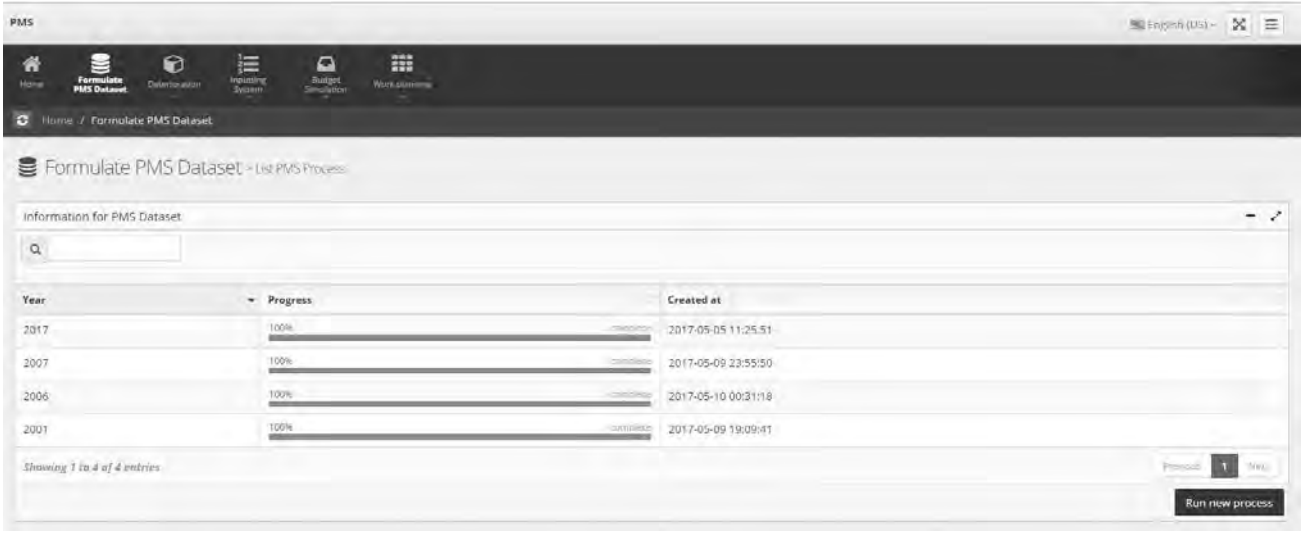
. Display screen:



CHAPTER 2: FORMULATE PMS DATASET OPERATION

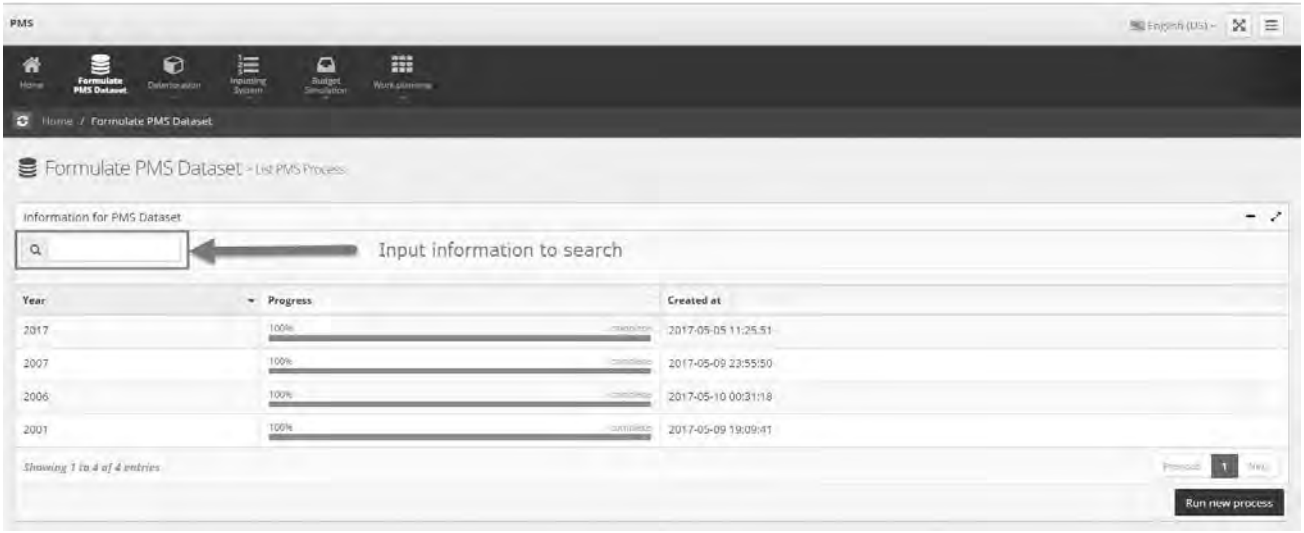
I) FORMULATE PMS DATASET

- 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:

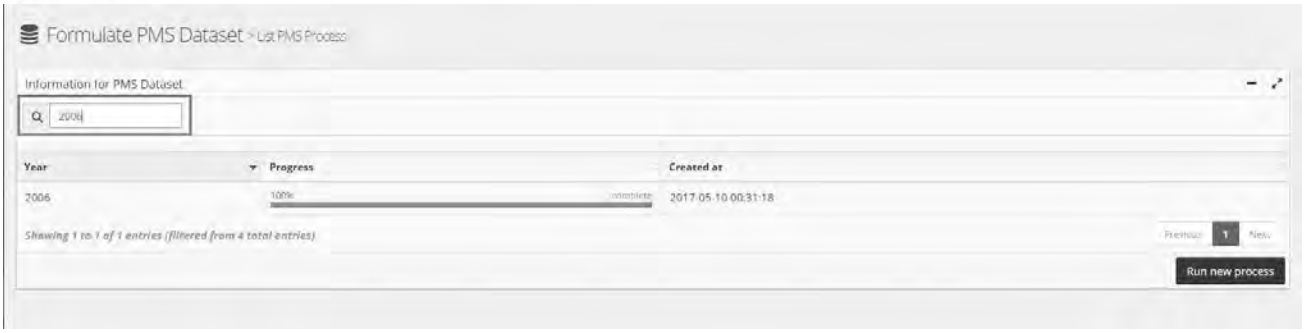


⇨ Display of PMS datasets has been setup year by year with % complete and showing the Created at corresponding to each dataset created.

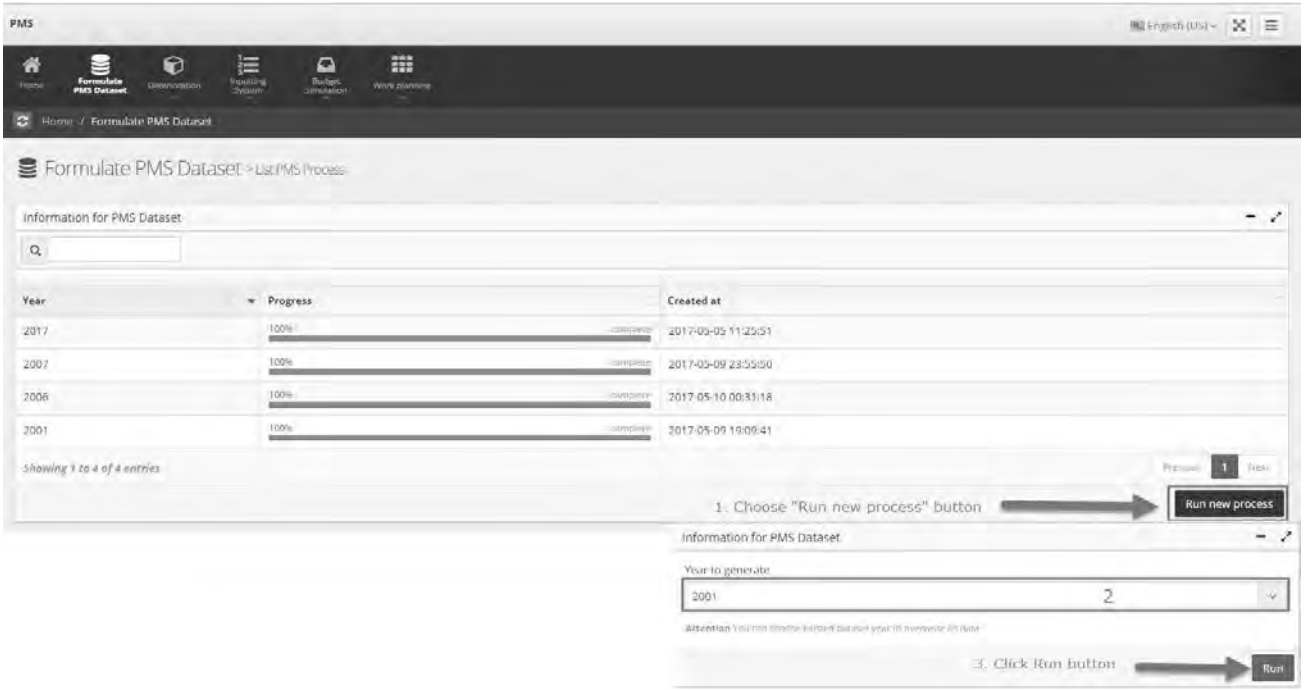
- Information for functions
  - Search function: Input information to search by properties: Year, Progress, Created at
    - Step 1: In the "Information for PMS dataset" form, choose Search function
    - Step 2: Input information to search



- Example: Seach for Year is "2006"

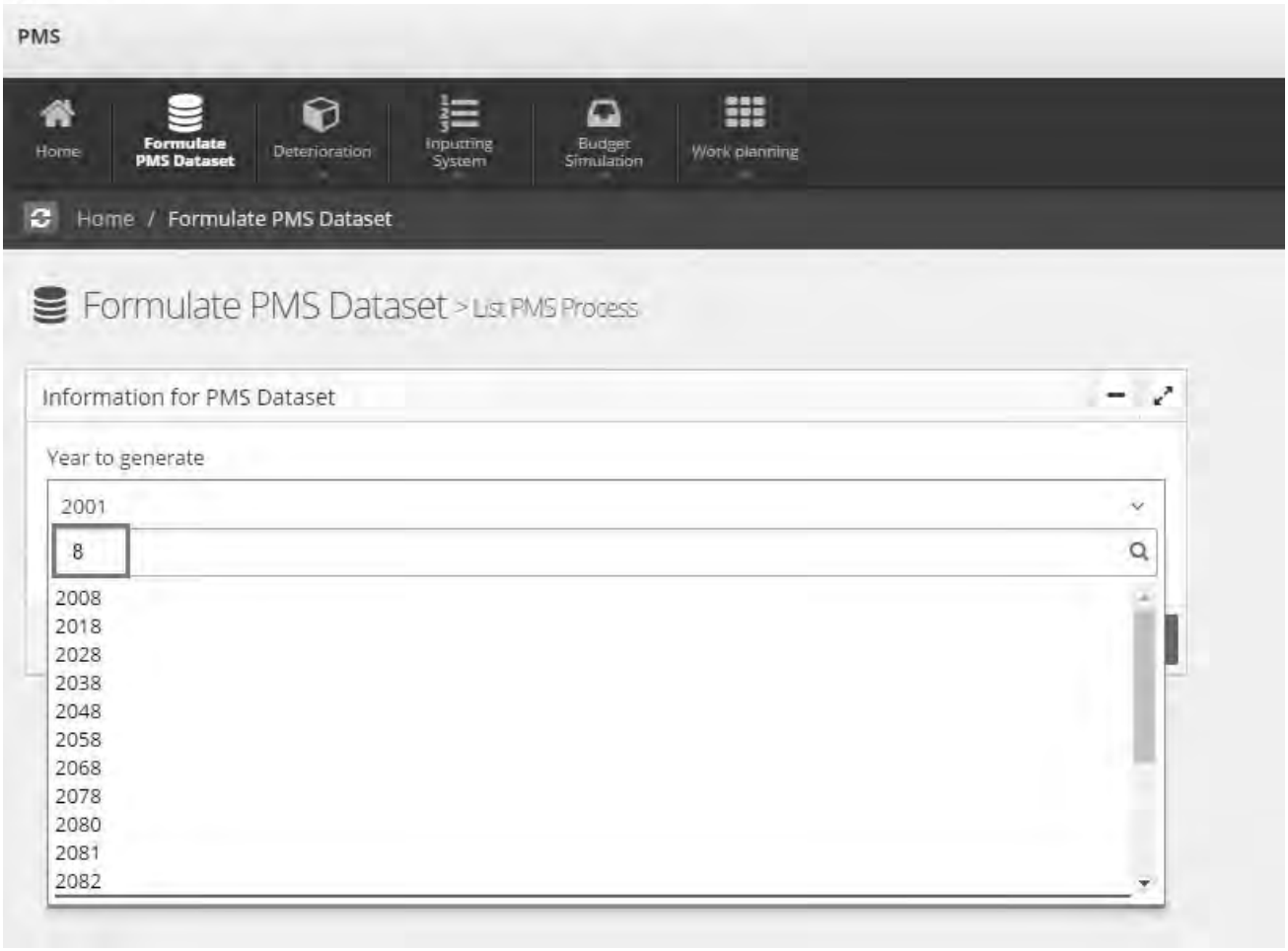


- Run new process function
  - Step 1: In the “Information for PMS dataset”, choose button “Run new process”
  - Step 2: Choose “Year to generate”
  - Step 3: Click button Run



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


PMS
Home
Formulate PMS Dataset
Deterioration
Inputting System
Budget Simulation
Work planning
Home / Formulate PMS Dataset
Formulate PMS Dataset > List PMS Process
Information for PMS Dataset
Year to generate
2001
8
2008
2018
2028
2038
2048
2058
2068
2078
2080
2081
2082

USER'S MANUAL

PAVEMENT DETERIORATION EVALUATION MODULE

CONTENTS

CHAPTER 1: INTRODUCTION

I) General

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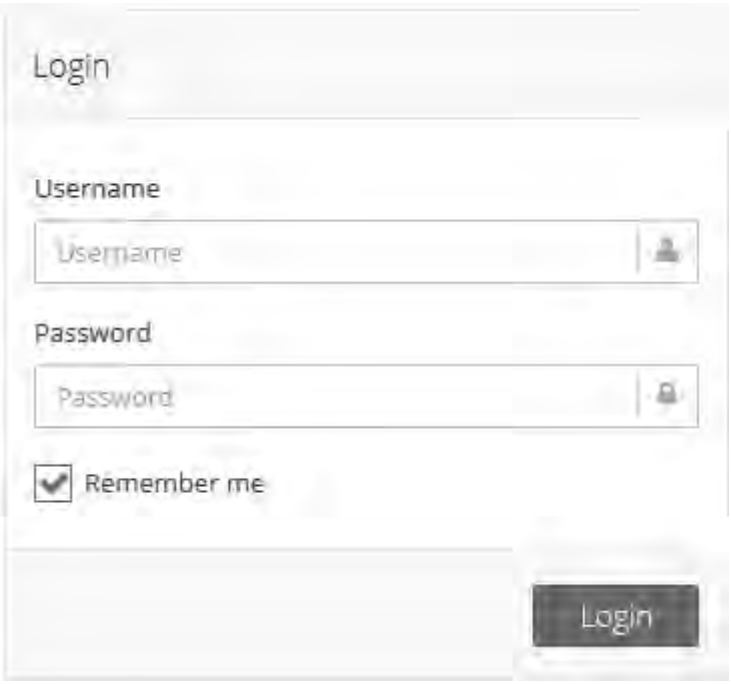
II) Process overview

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



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

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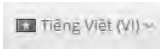
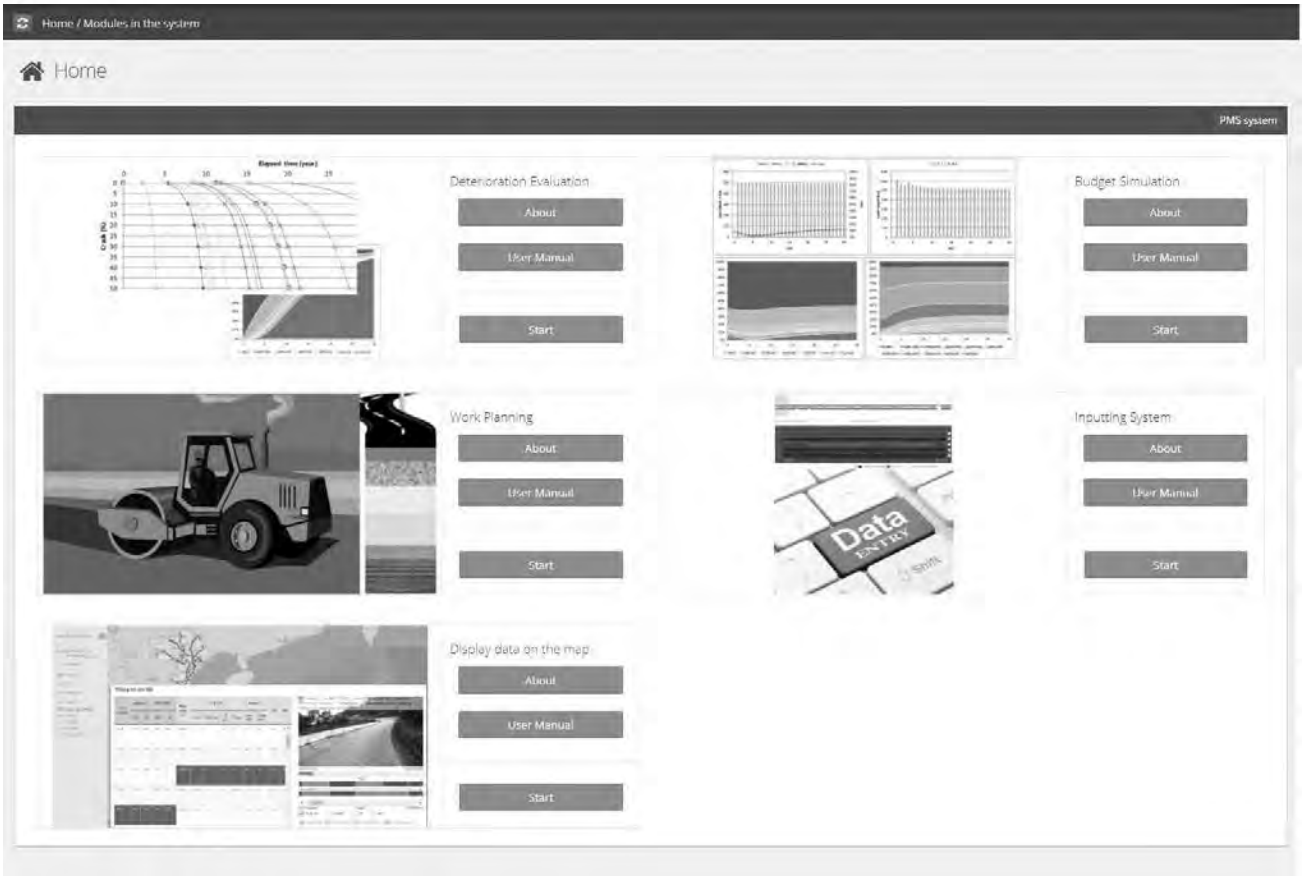
The main screen is the display after successful login. On the main screen displays all the data and functions related to the logged in user, depending on the role and permissions of the login user. Also, user can switch between two languages English and Vietnamese 

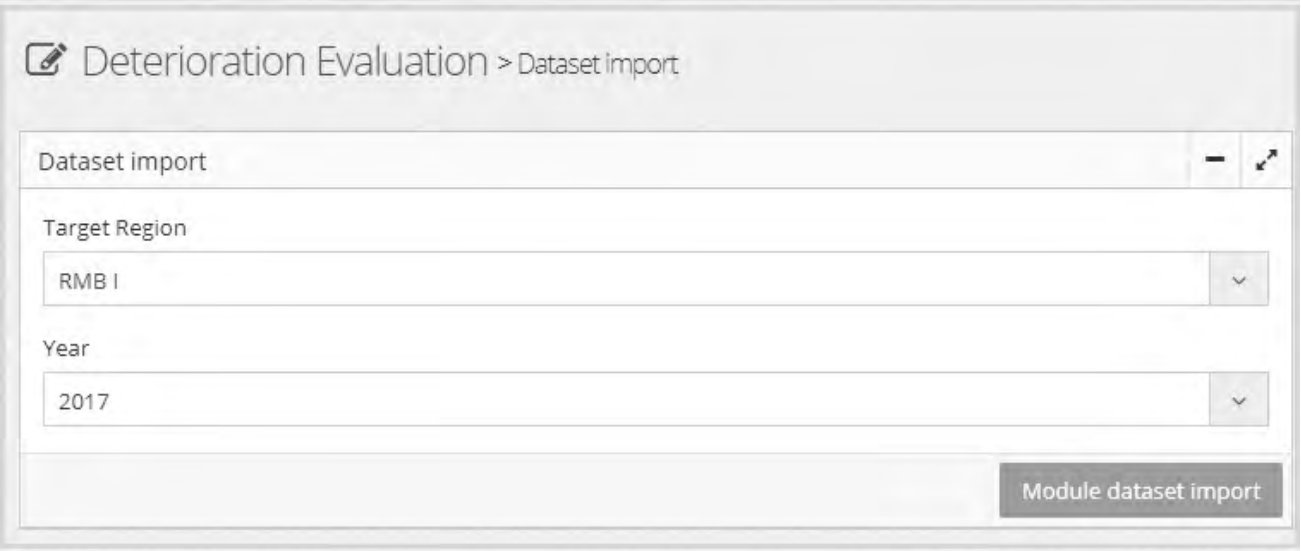
. Display screen:


Home / Modules in the system
Home
PMS system
Deterioration Evaluation
About
User Manual
Start
Budget Simulation
About
User Manual
Start
Work Planning
About
User Manual
Start
Data
ENTRY
Inputting System
About
User Manual
Start
Display data on the map
About
User Manual
Start

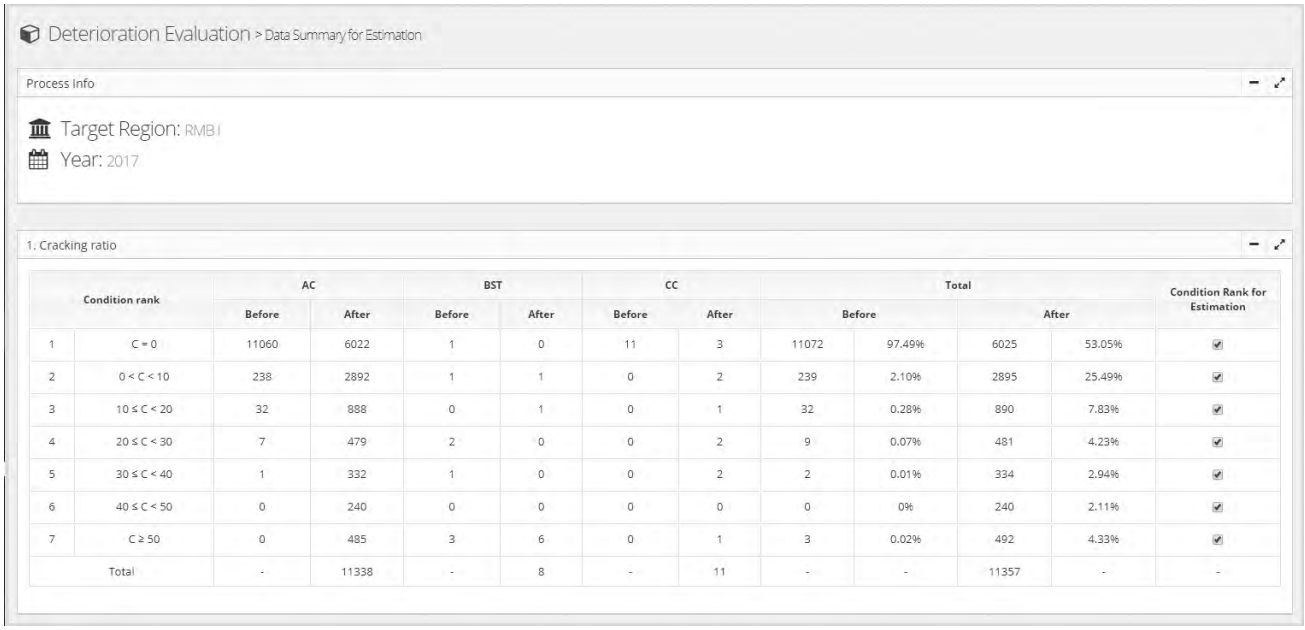
CHAPTER 2: PAVEMENT DETERIORATION EVALUATION OPERATION

I) SETTING PAVEMENT DETERIORATION EVALUATION DATASET

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



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

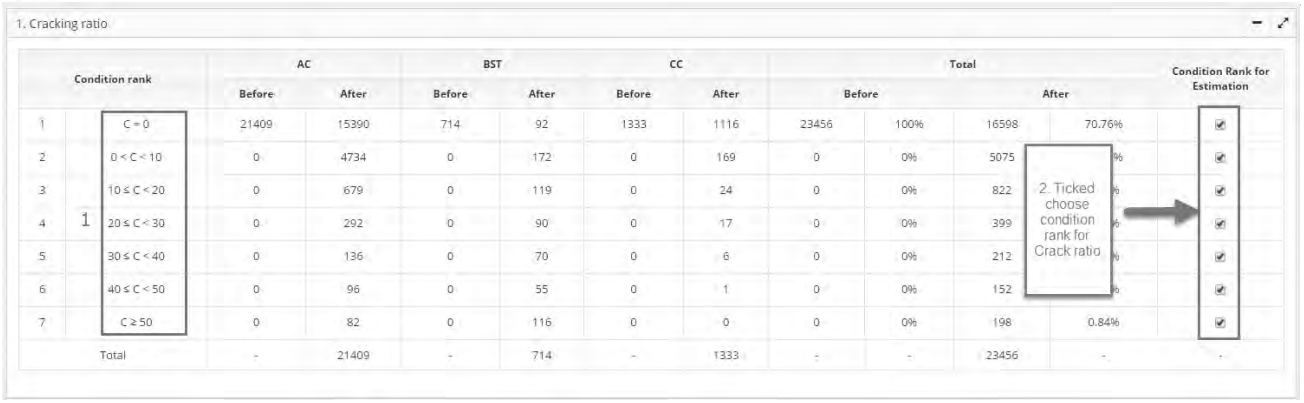


Condition rank		AC		BST		CC		Total				Condition Rank for Estimation
		Before	After	Before	After	Before	After	Before		After		
1	C = 0	11060	6022	1	0	11	3	11072	97.49%	6025	53.05%	☑
2	0 < C < 10	238	2892	1	1	0	2	239	2.10%	2895	25.49%	☑
3	10 ≤ C < 20	32	888	0	1	0	1	32	0.28%	890	7.83%	☑
4	20 ≤ C < 30	7	479	2	0	0	2	9	0.07%	481	4.23%	☑
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	2.11%	☑
7	C ≥ 50	0	485	3	6	0	1	3	0.02%	492	4.33%	☑
Total		-	11338	-	8	-	11	-	-	11357	-	-

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

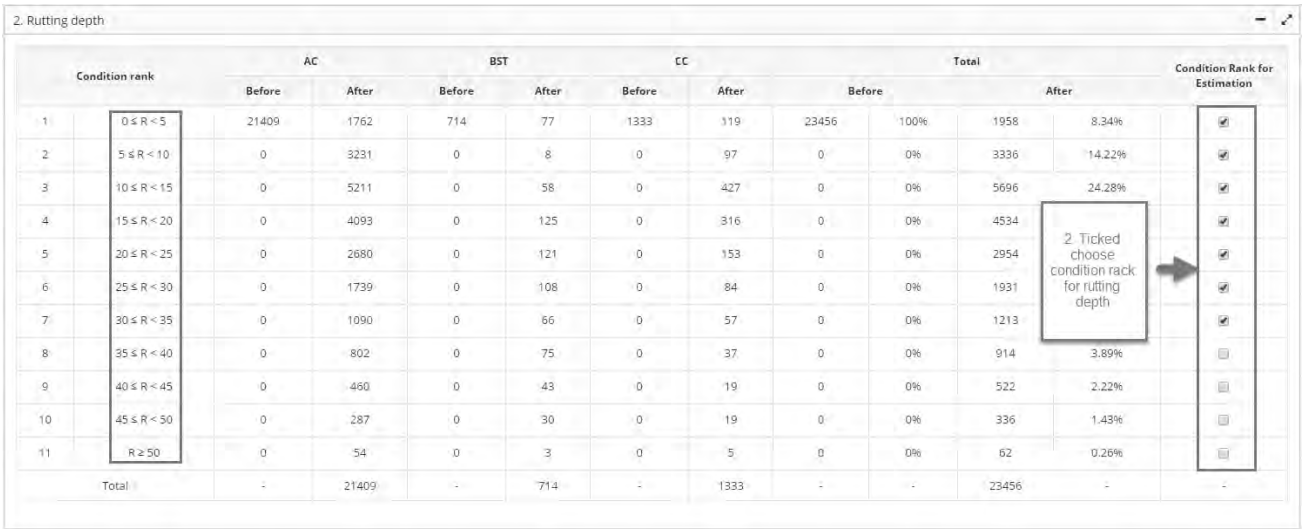
  At the form "**1. Crack ratio** ", user select the condition rank, then ticked the Condition Rank is selected in the column" Condition rank for Estimation"



Note: You must choose at least 5 crack ratio

- Step 2: Set the Rutting depth

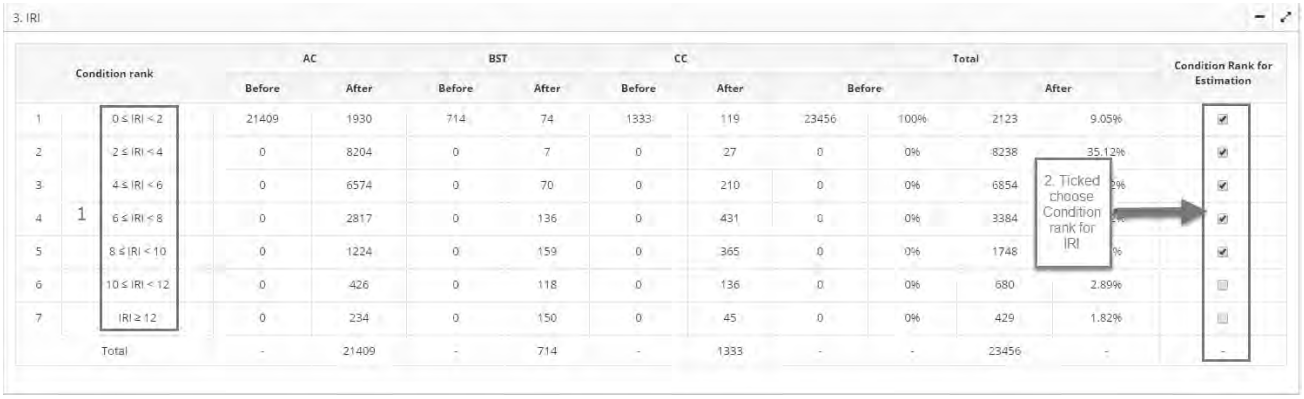
At the form "**2. Rutting depth**", user select the condition rank, then ticked the Condition Rack is selected in the column "Condition rank for Estimation"



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"



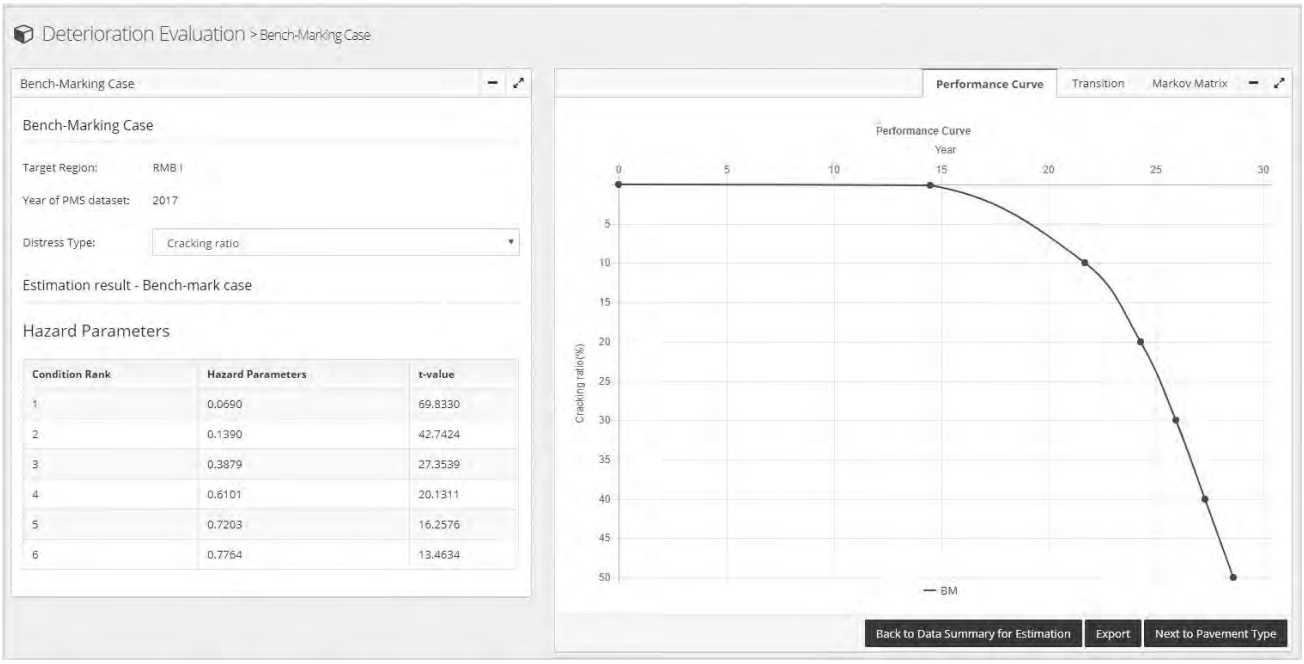
Note: You must choose at least 5 IRI

- 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**.**



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

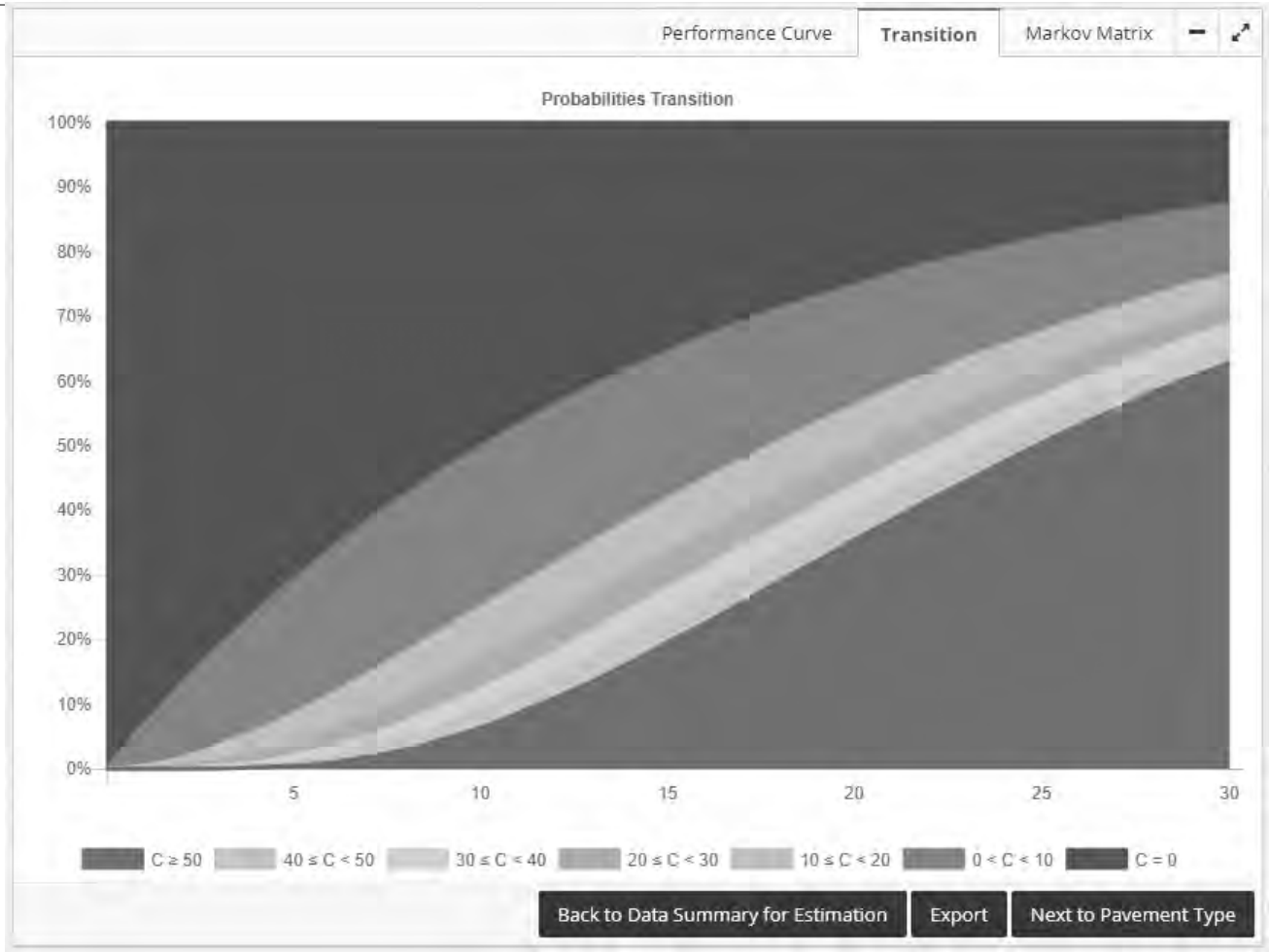
Button	Function
Back to Data Summary for Estimation	Back to previous screen
Export	Save information by excel file
Next to Pavement Type	Go to next screen

III.1) Process export data of the type Crack

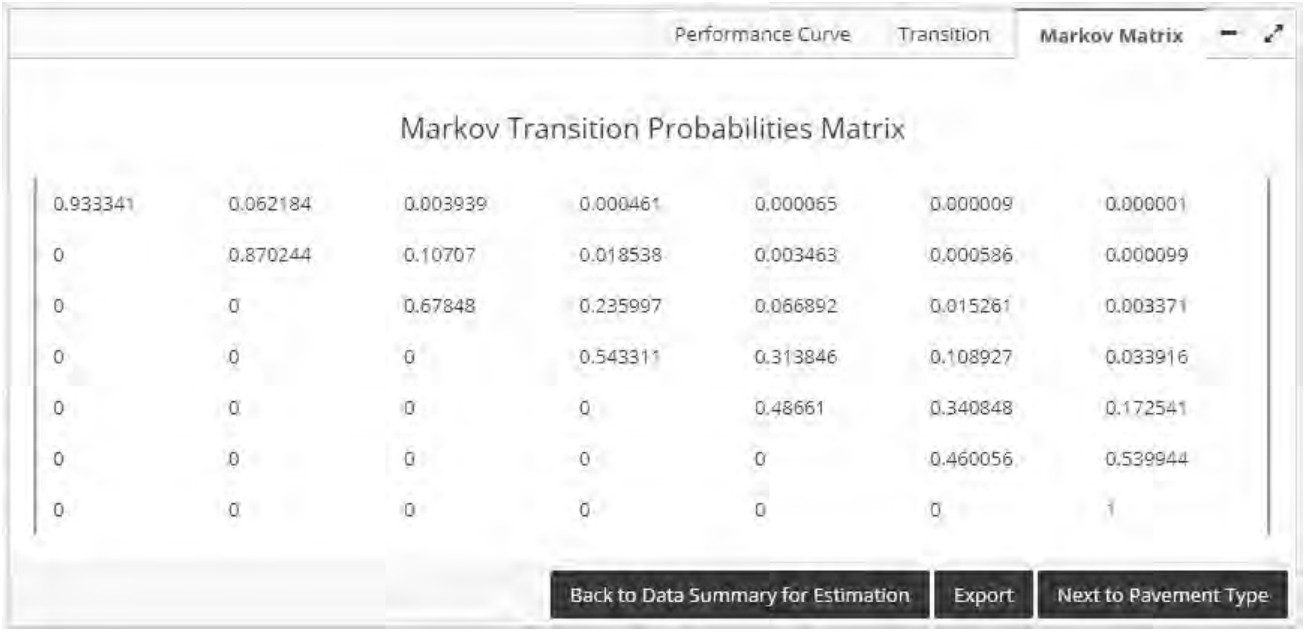
- Step 01: Select distress type "Cracking ratio"

- Performance Curve chart displays

- Probabilities Transition chart displays



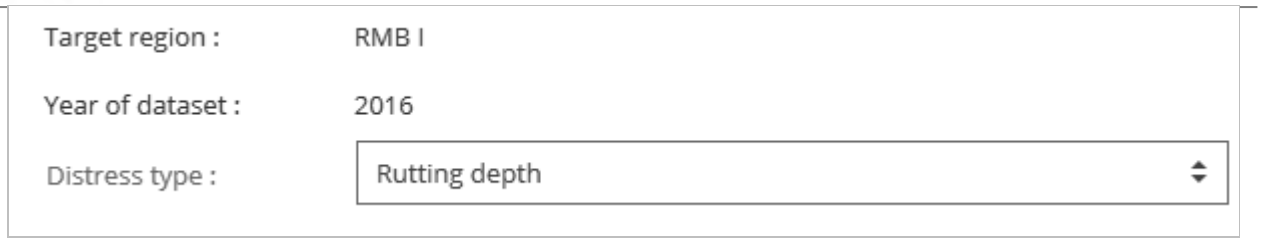
- Markov Transition Probabilities Matrix displays.



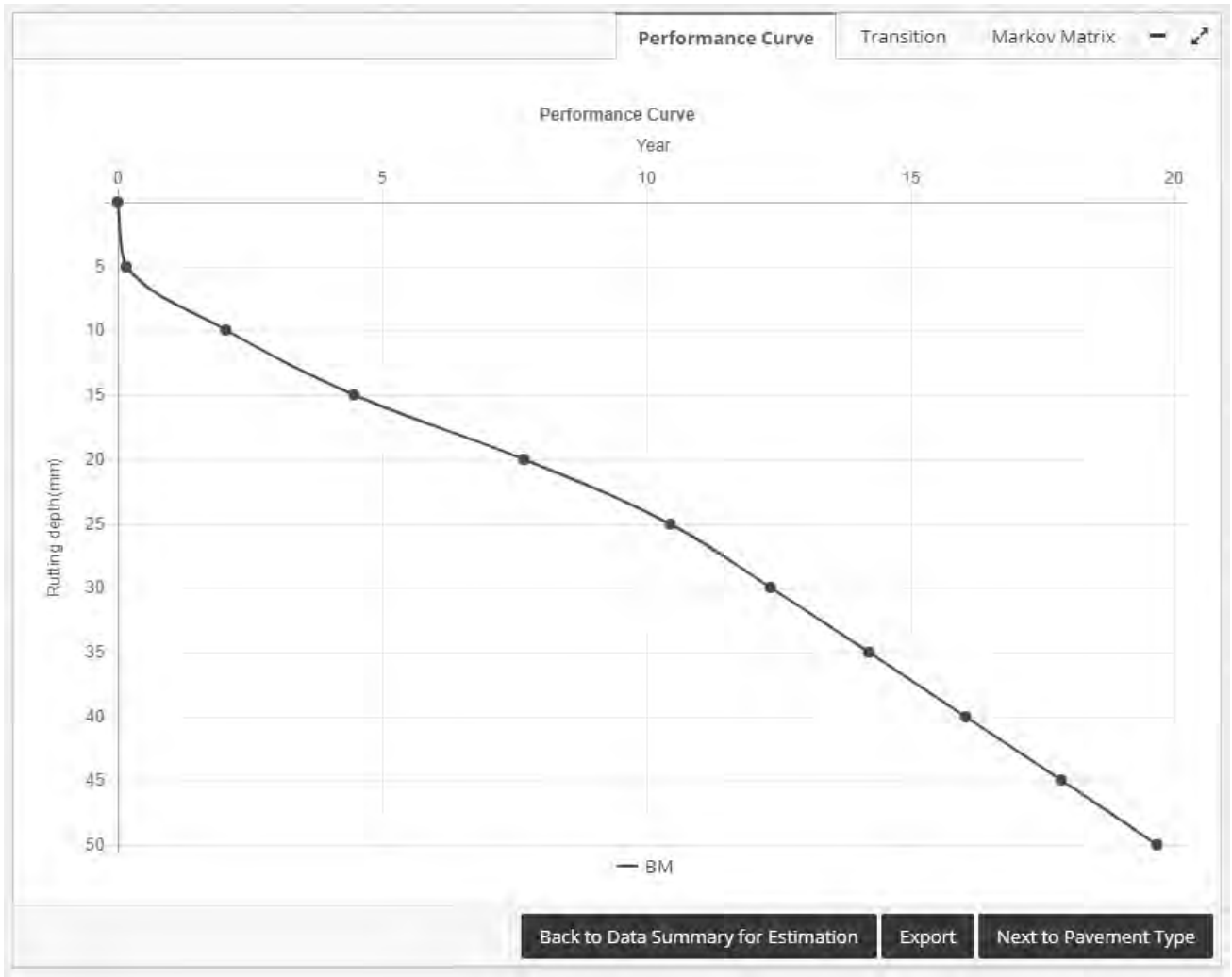
- Step 02: Press “Export” button to save
- Step 03: Check file output data.

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

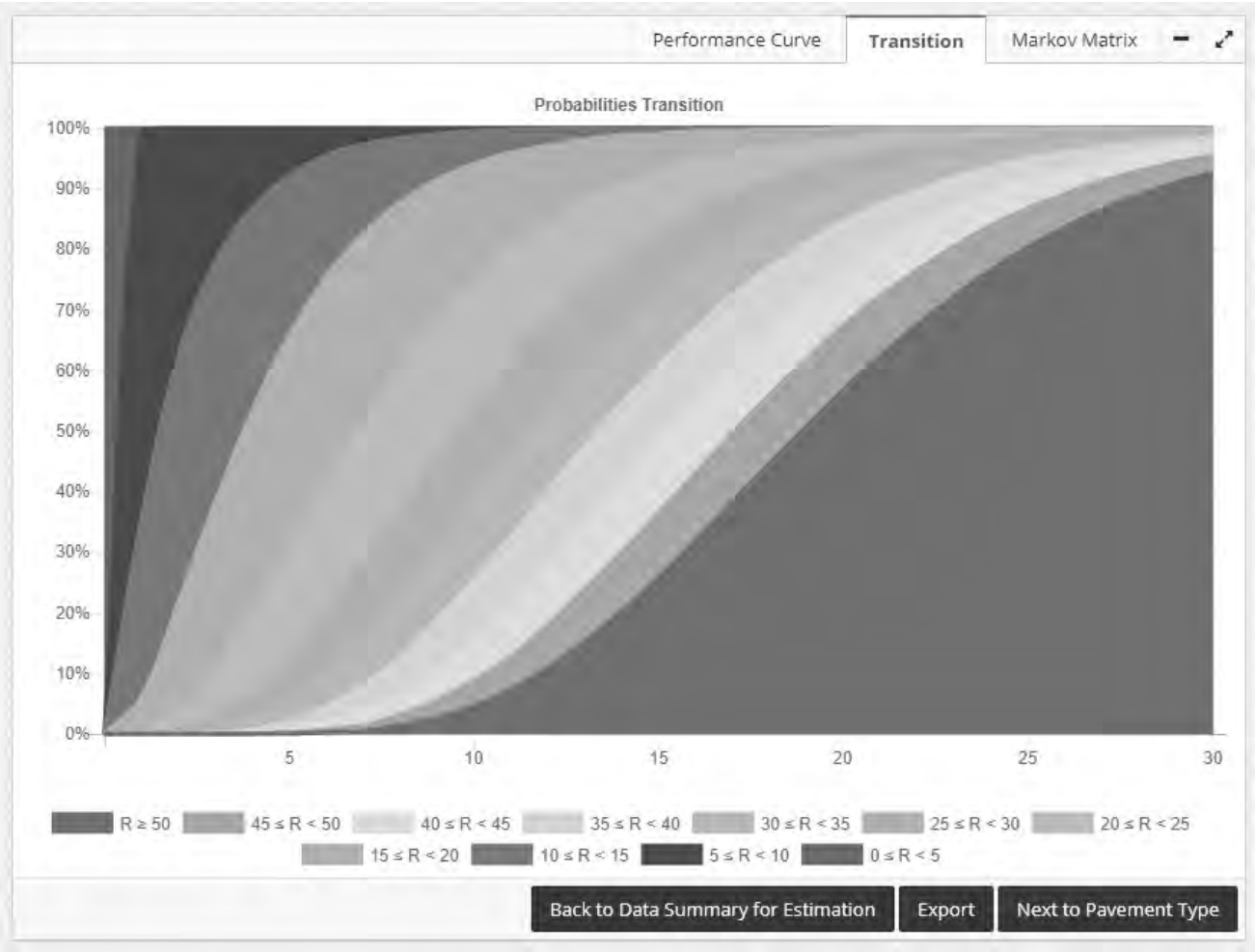
- Step 01: Select distress type “Rutting depth”



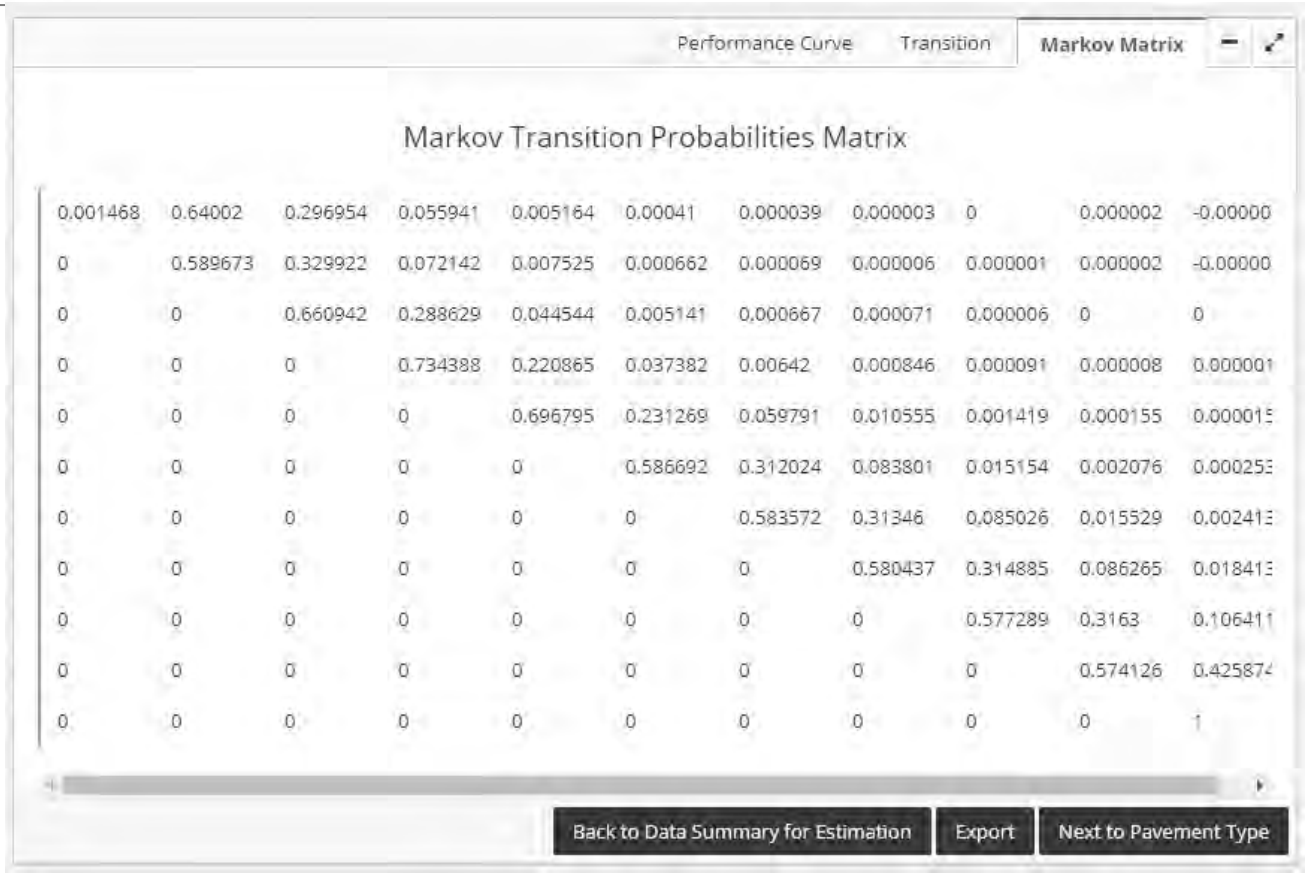
- Performance Curve chart displays



- Probabilities Transition chart displays



- Markov Transition Probabilities Matrix displays.

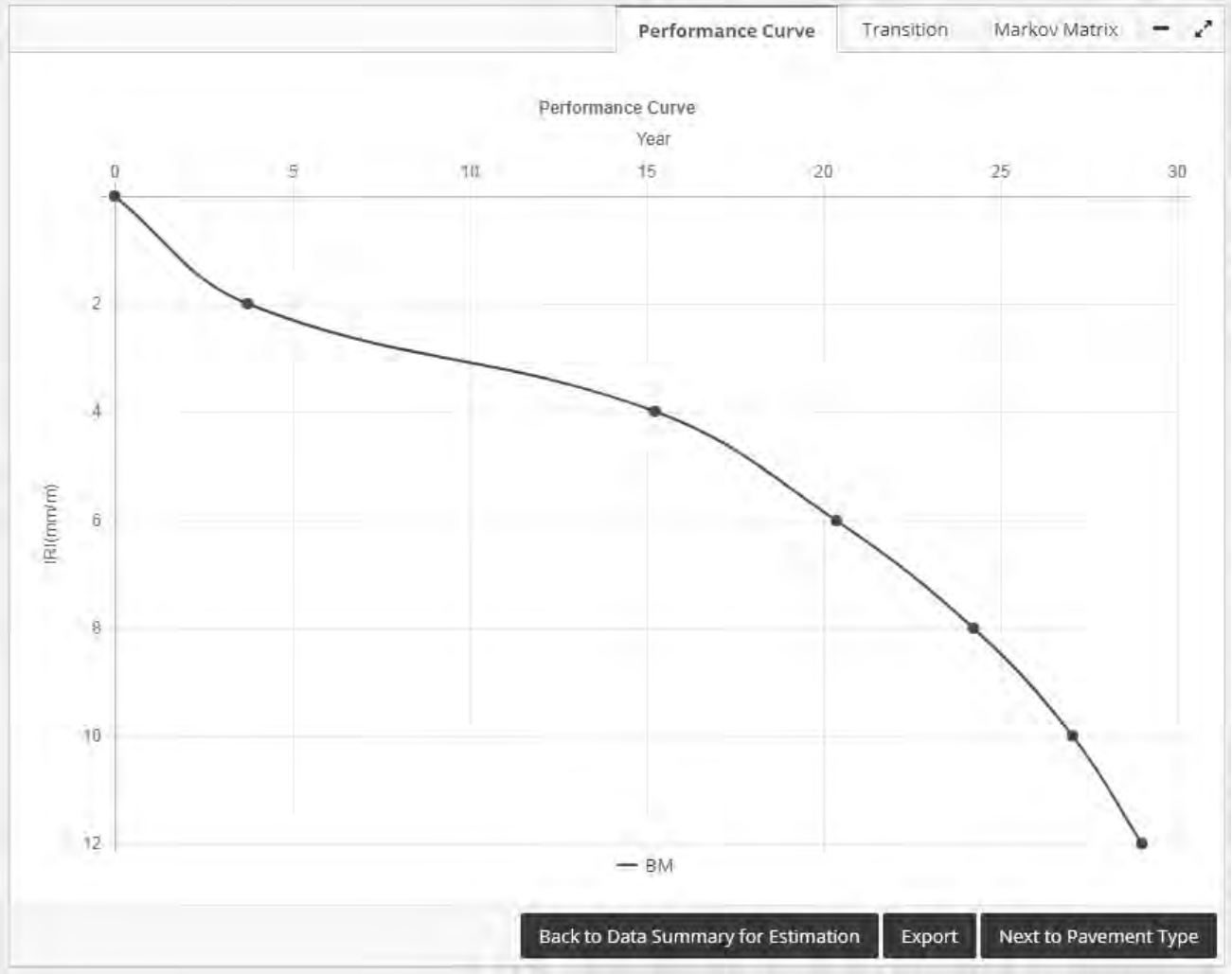


- Step 02: Press “Export” button to save
- Step 03: Check file output data.

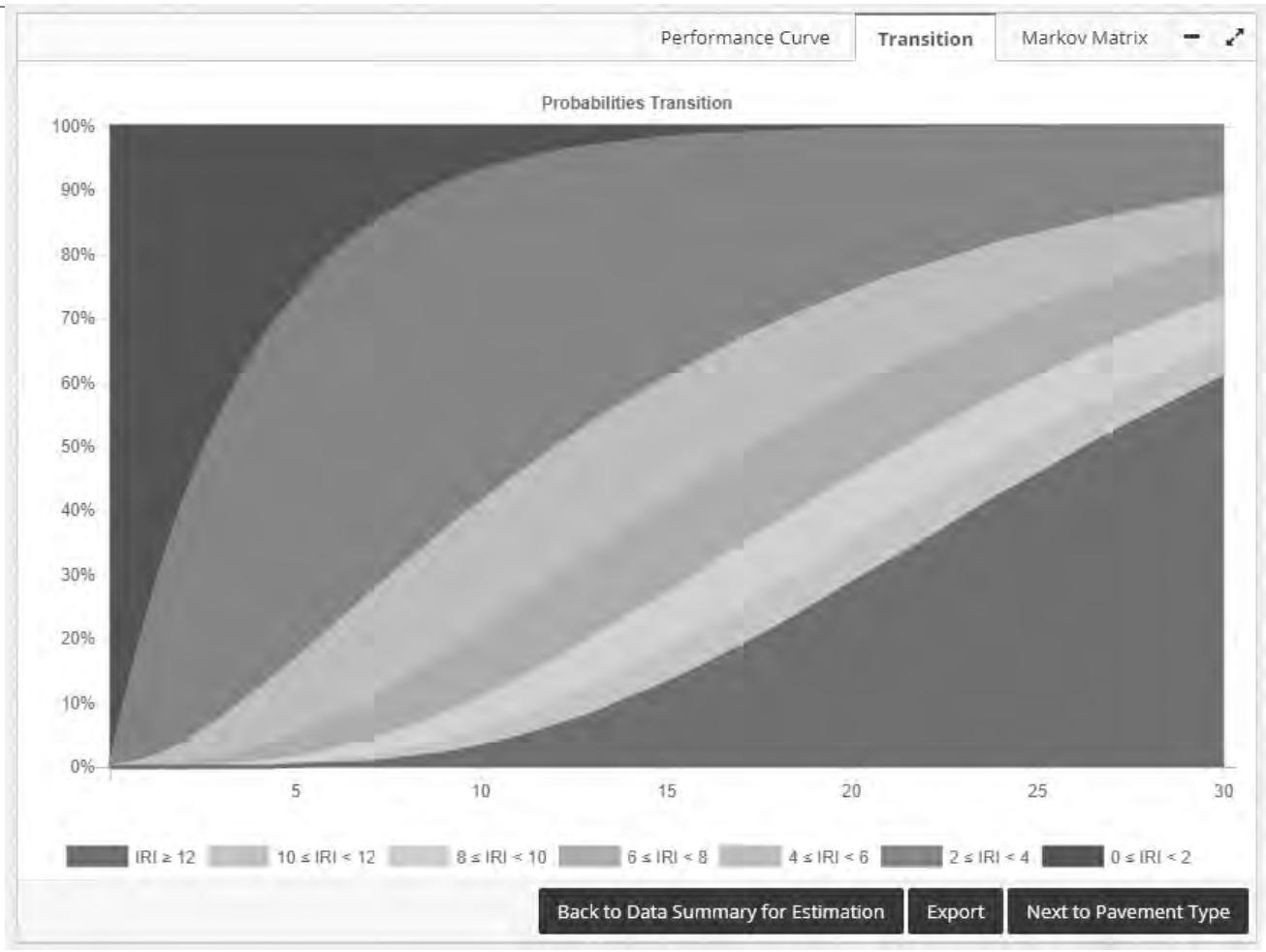
III.3) Process export data of the type IRI

- Step 01: Select distress type “IRI”

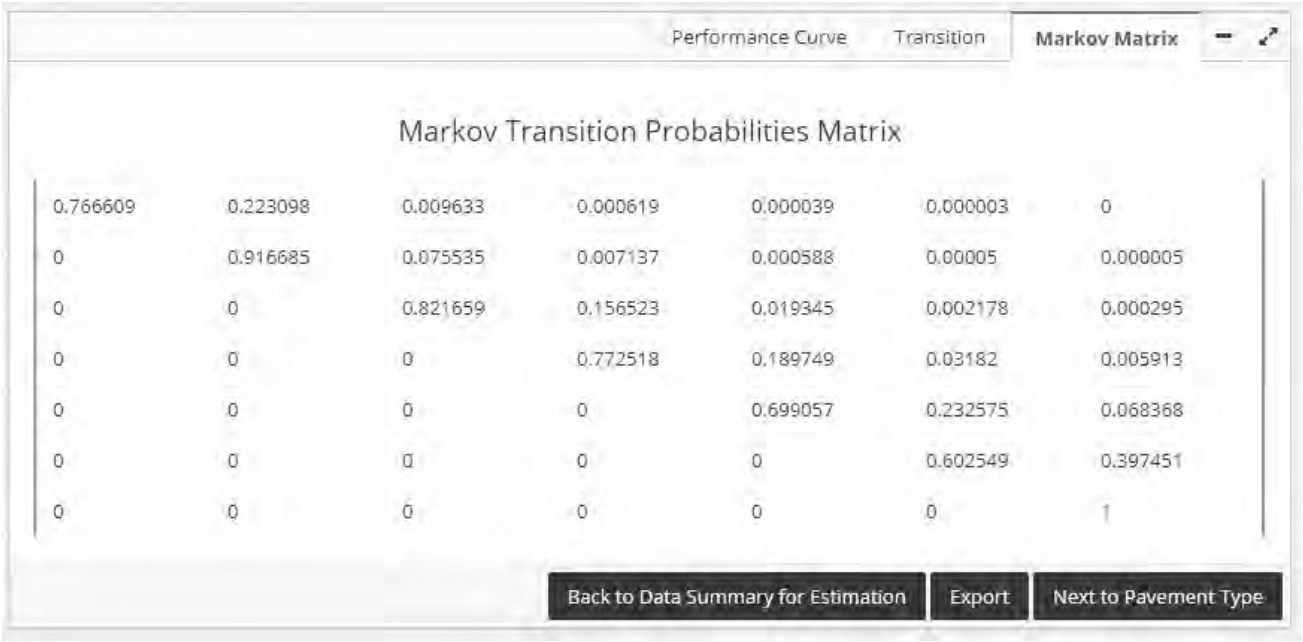
- Performance Curve chart displays



- Probabilities Transition chart displays



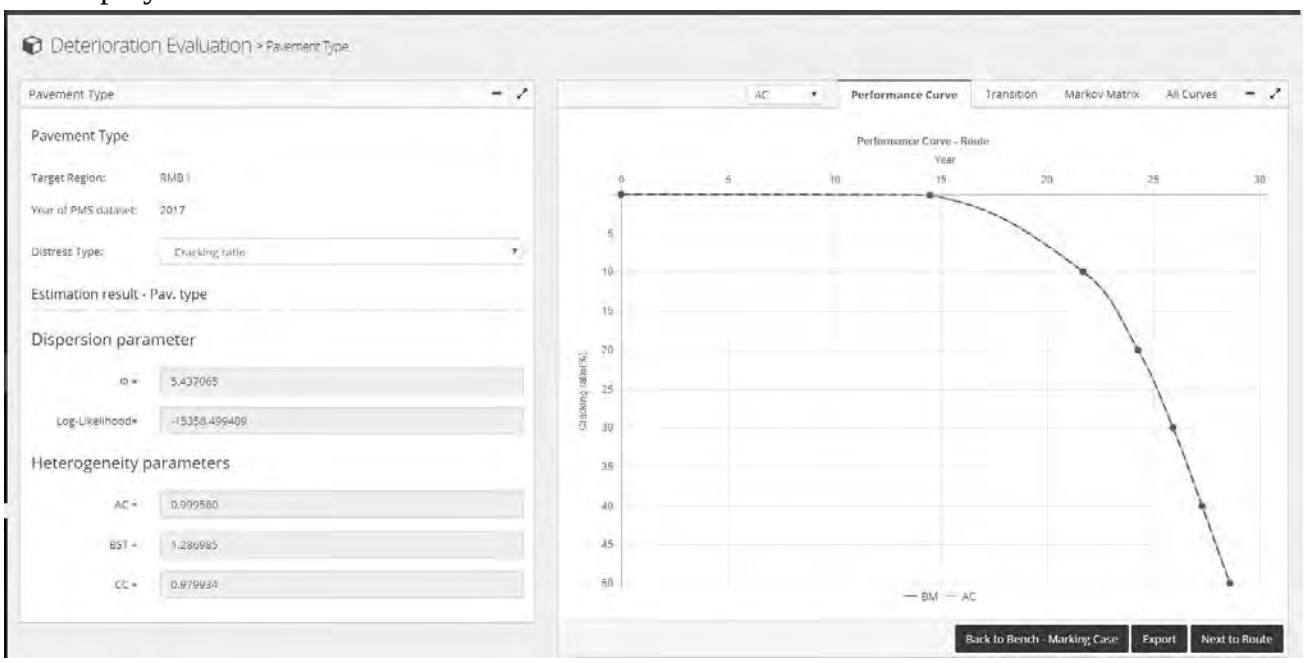
- Markov Transition Probabilities Matrix displays.



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

IV) SETTING DATA CHARTS OF PAVEMENT DETERIORATION

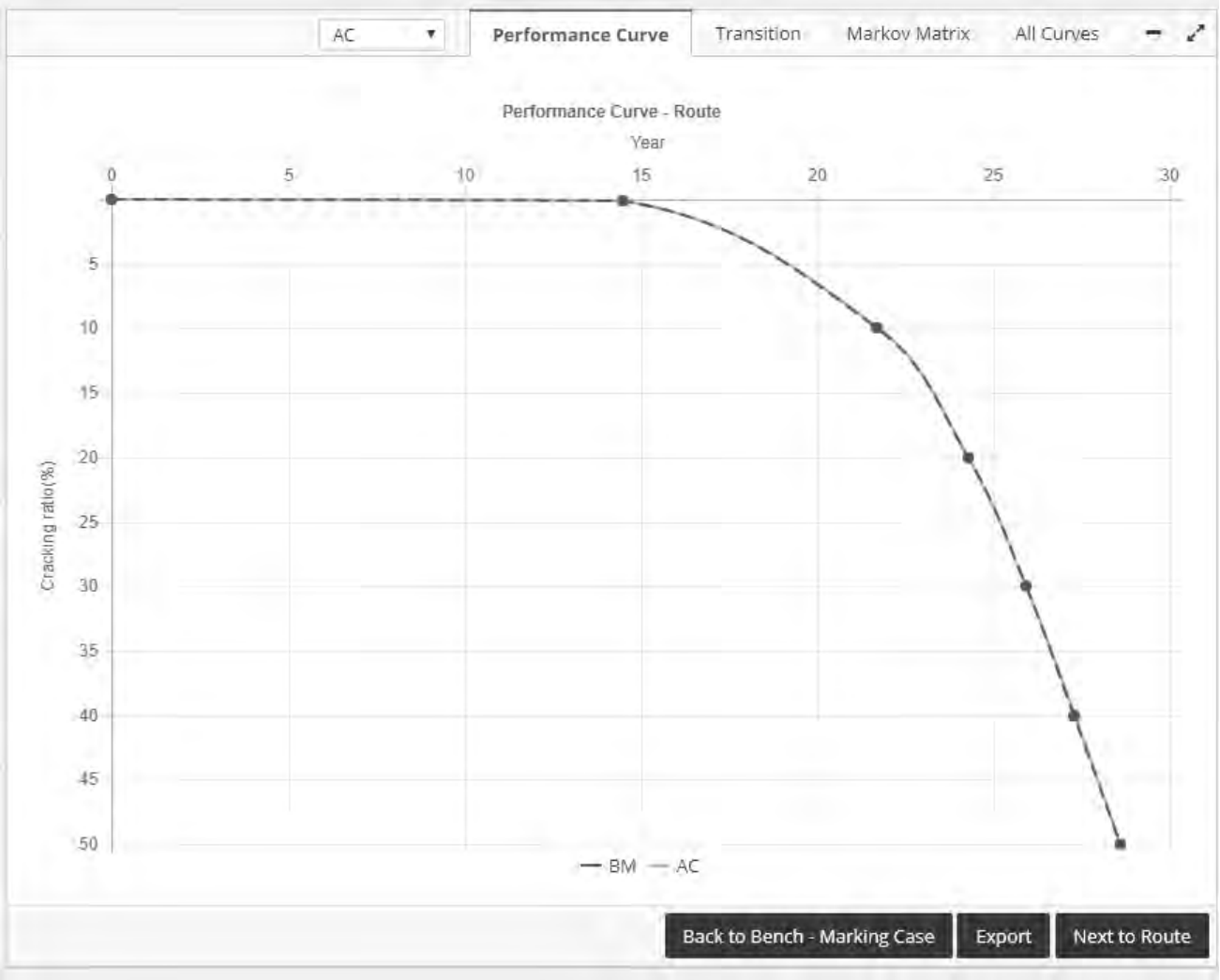
- Purpose: Draw charts
- At the Bench Marking case screen, user press "**Next to Pavement Type"** button**.** Display screen**:**



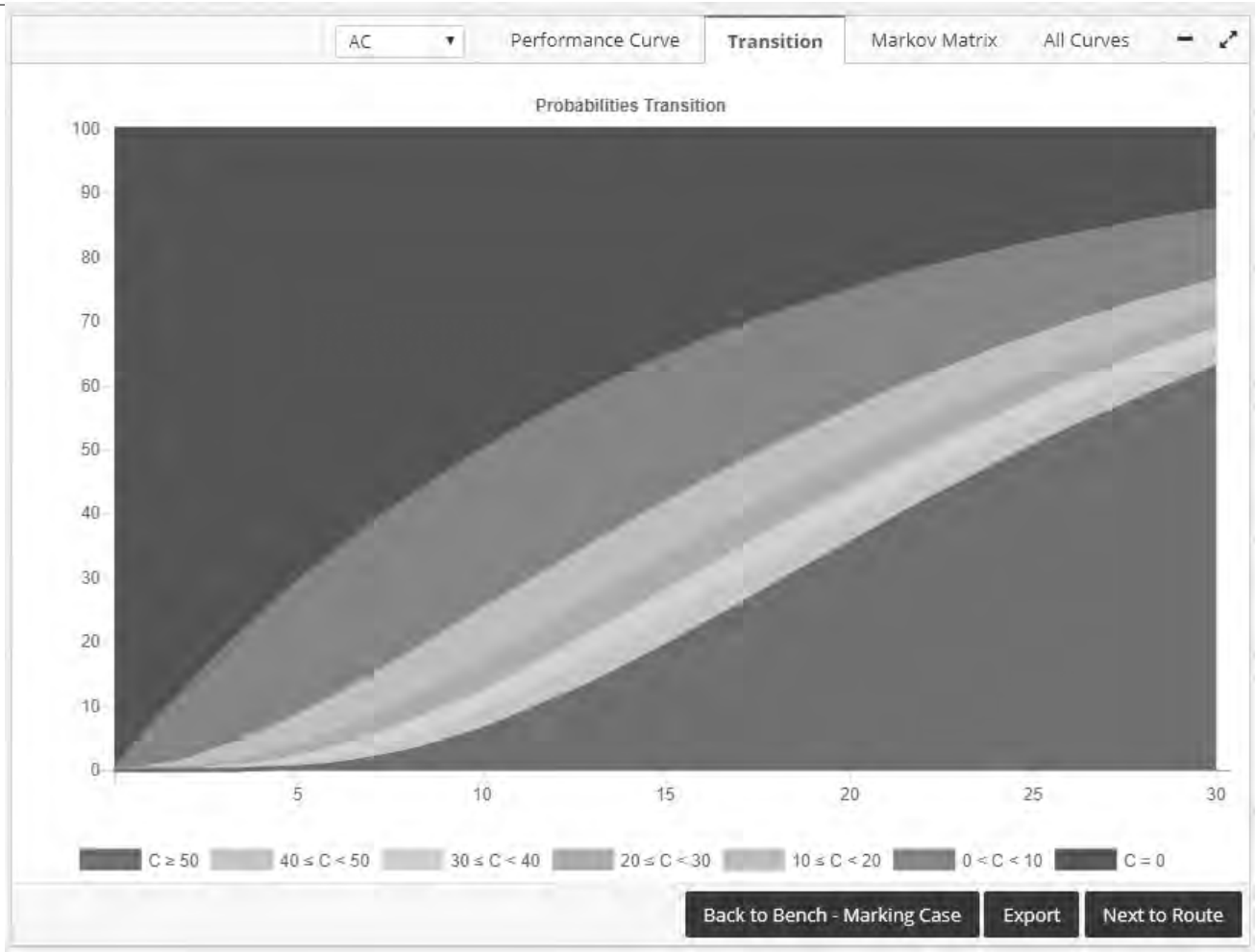
IV.1) Process export data of the type Crack and the type AC stress (BST, CC stress)

- Step 01: Select distress type "Cracking ratio"

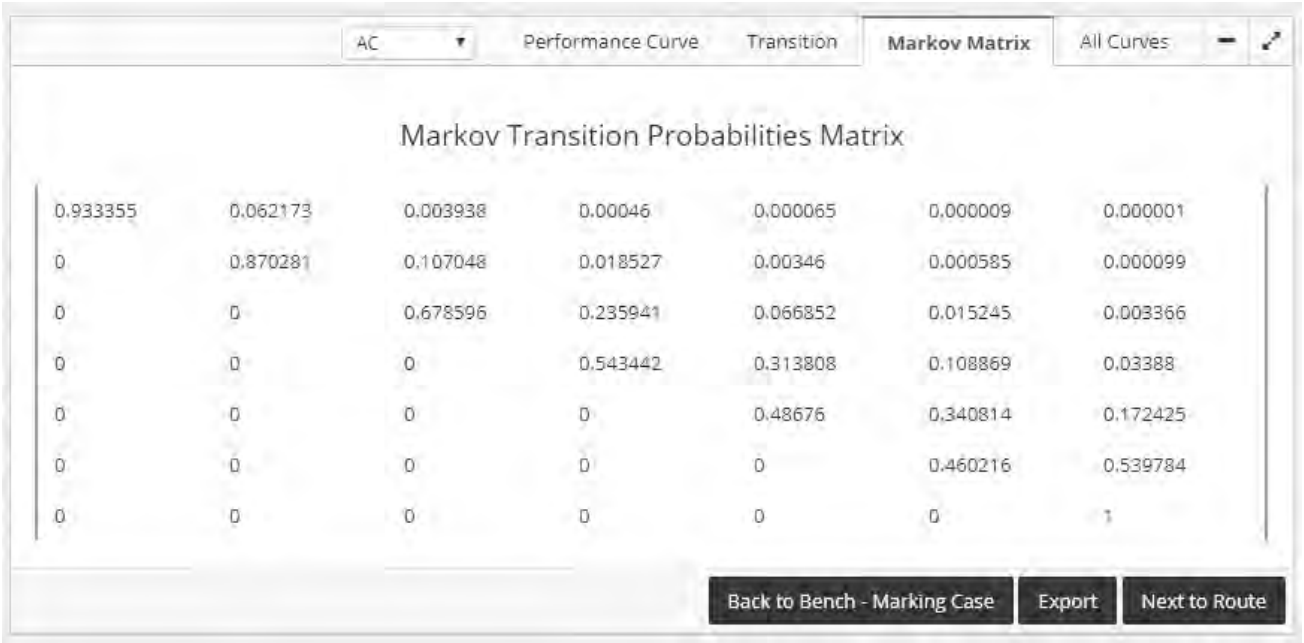
- Performance Curve chart displays



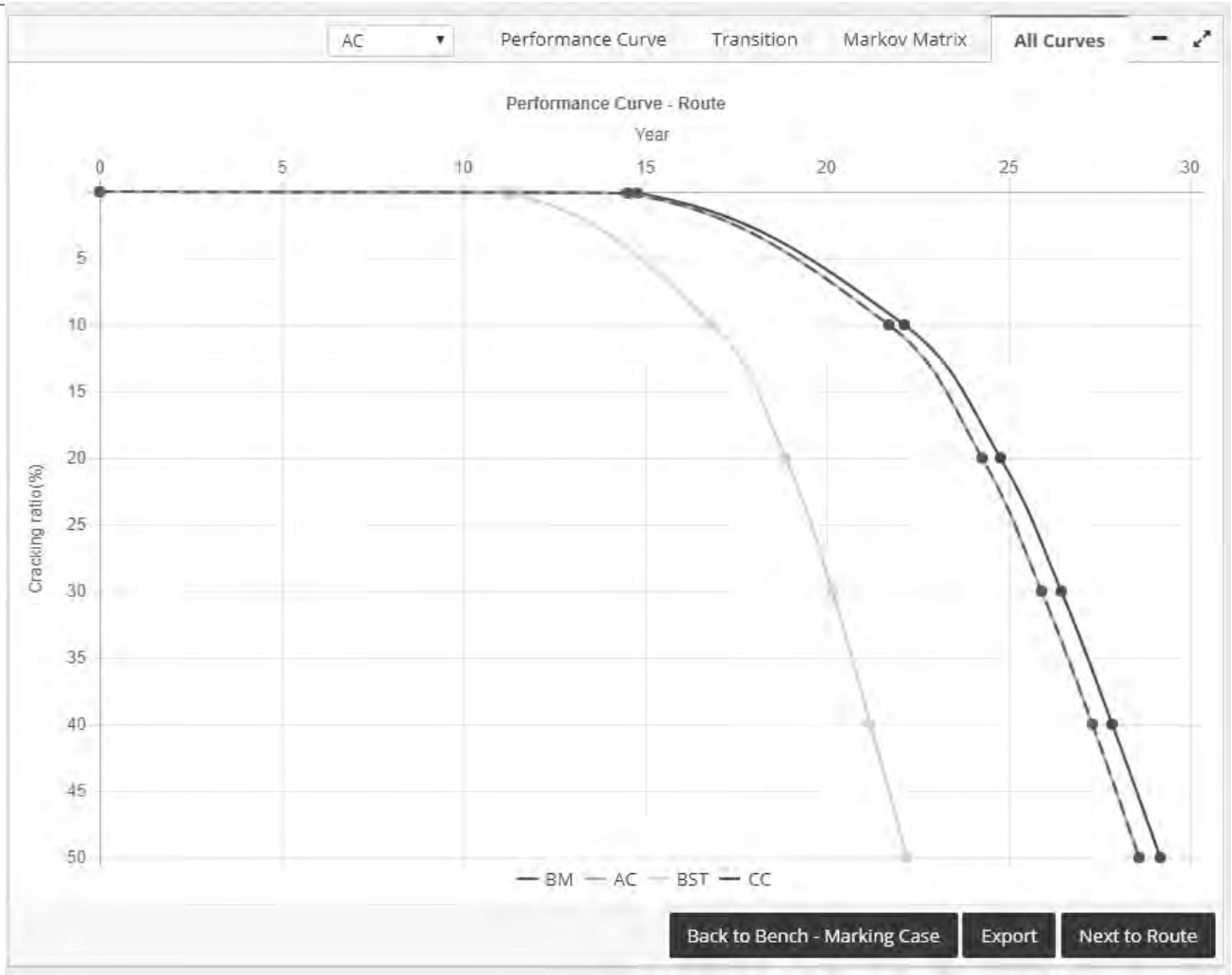
- Probabilities Transition chart displays



- Markov Transition Probabilities Matrix displays



- All Curves displays

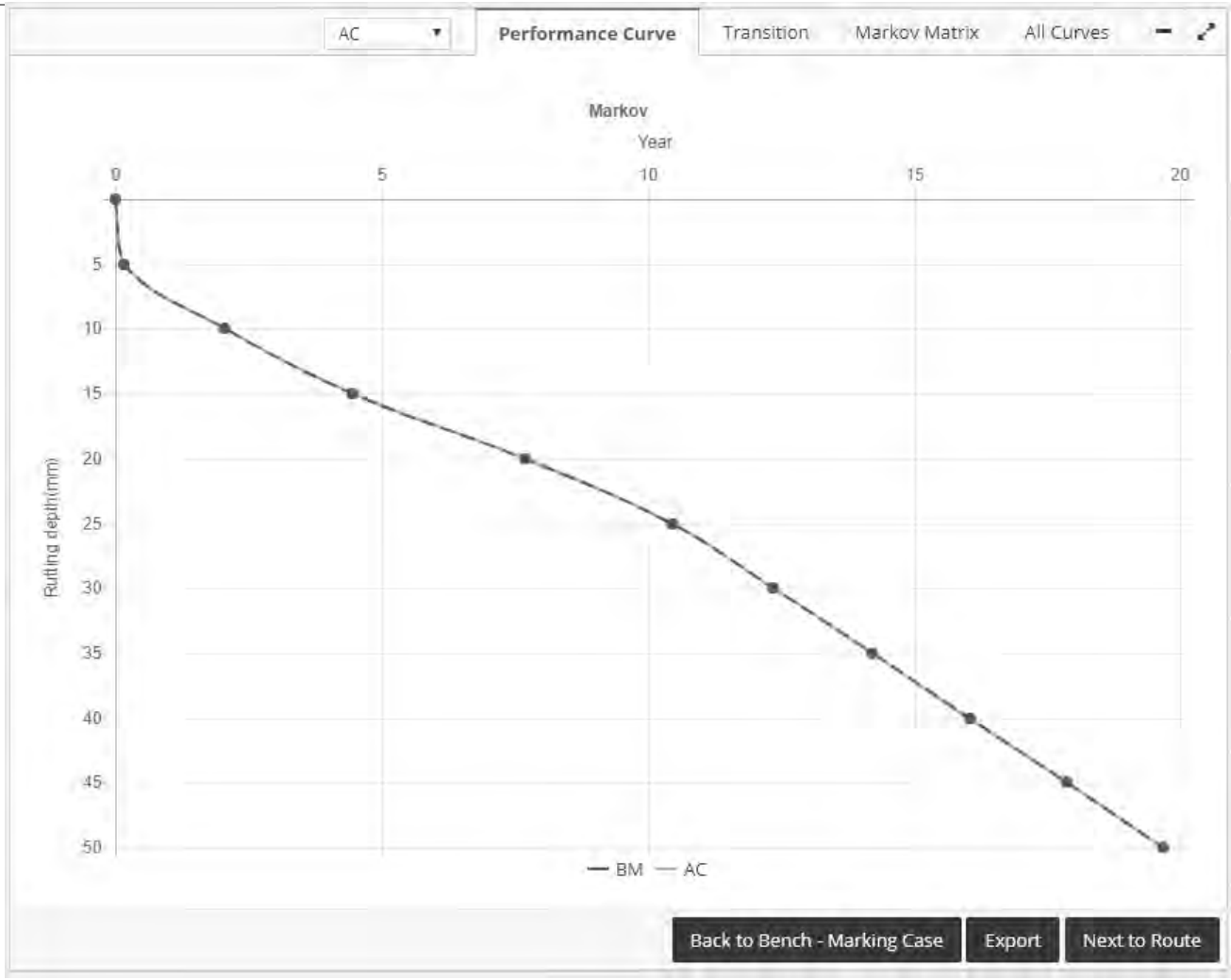


- Step 02: Press “Export” button to save
- Step 03: Check file output data

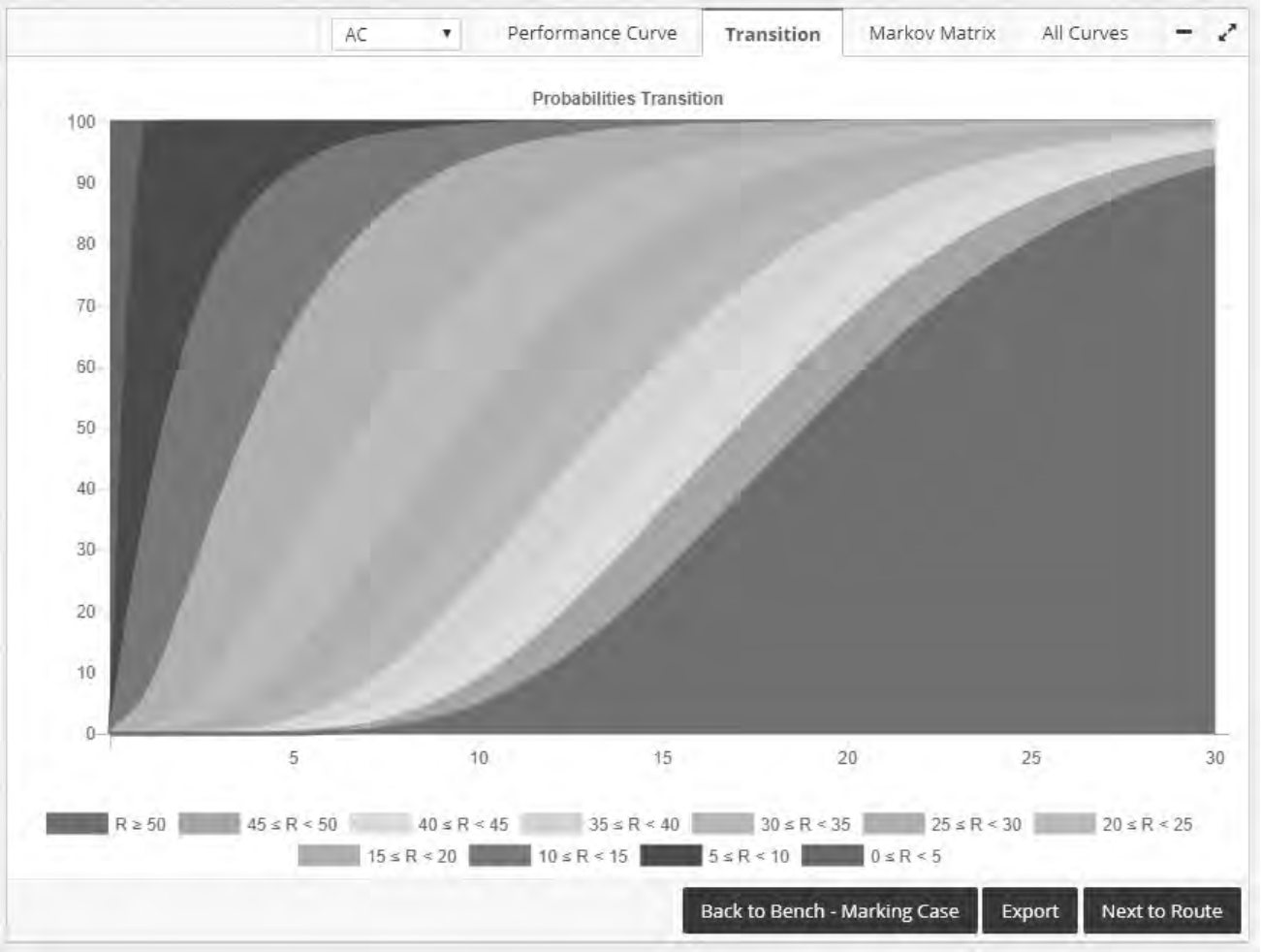
IV.2) Process export data of the type Ruting depth and the type AC stress (BST, CC stress)

- Step 01: Select distress type “Rutting depth”

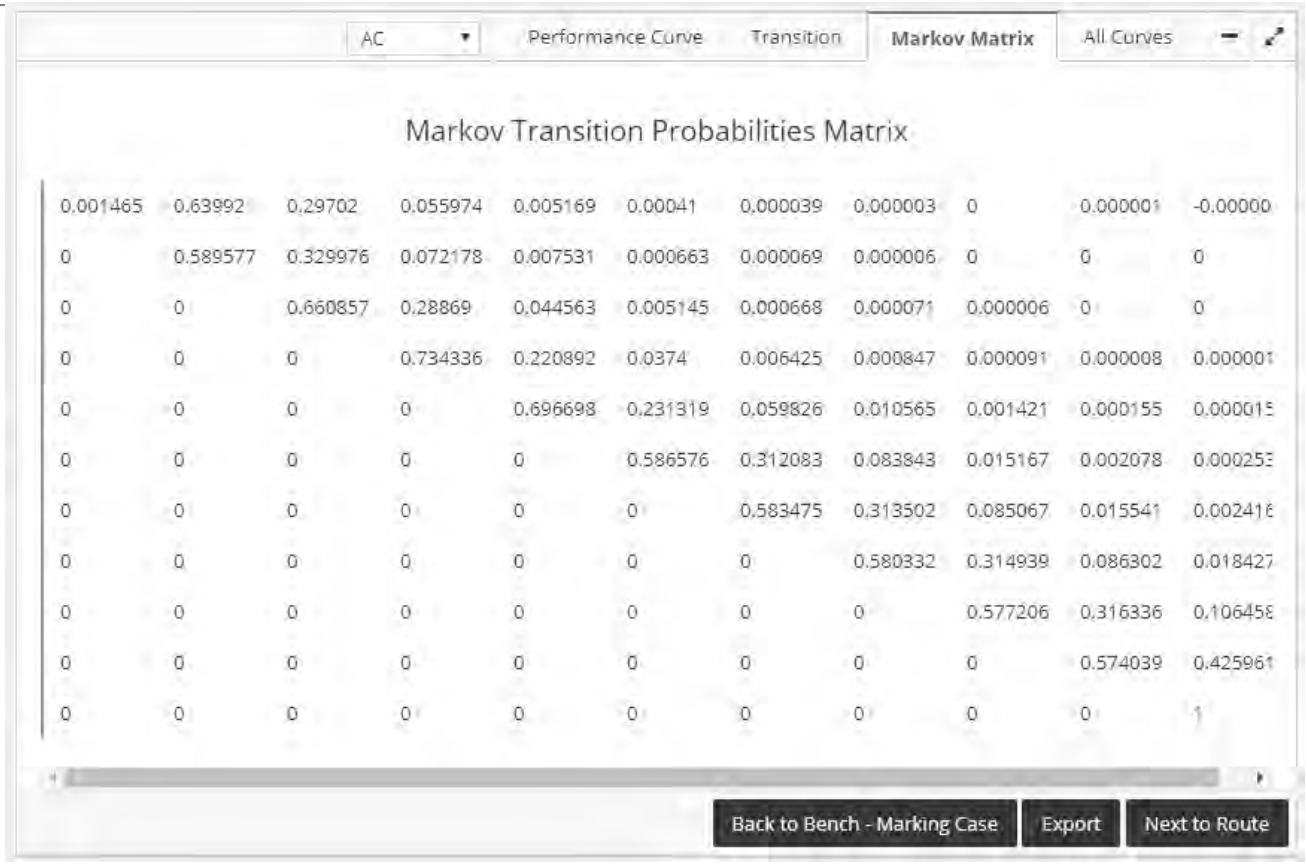
- Performance Curve chart displays



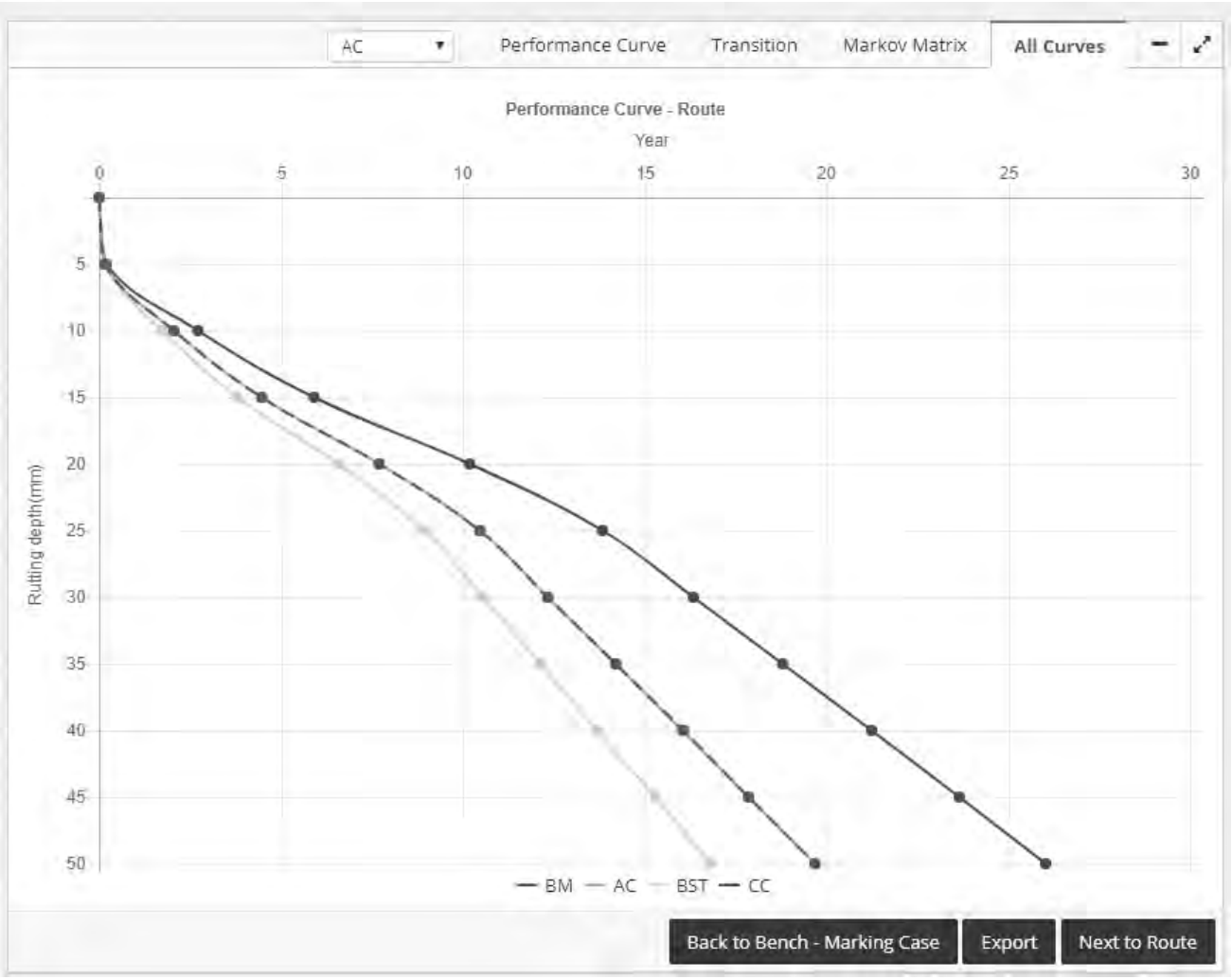
- Probabilities Transition chart displays



- Markov Transition Probabilities Matrix displays



- All Curves displays



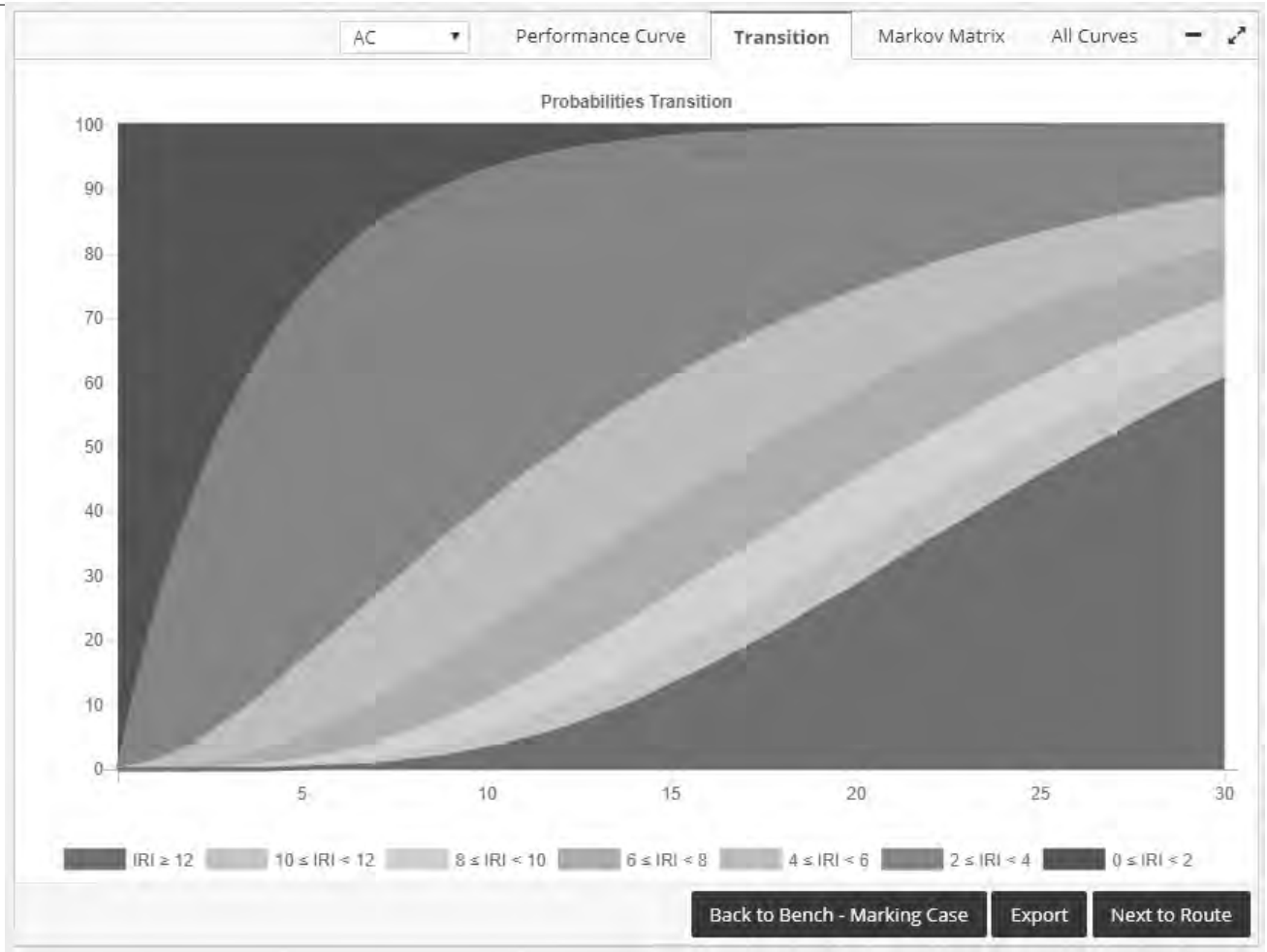
- Step 02: Press “Export” button to save
- Step 03: Check file output data

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

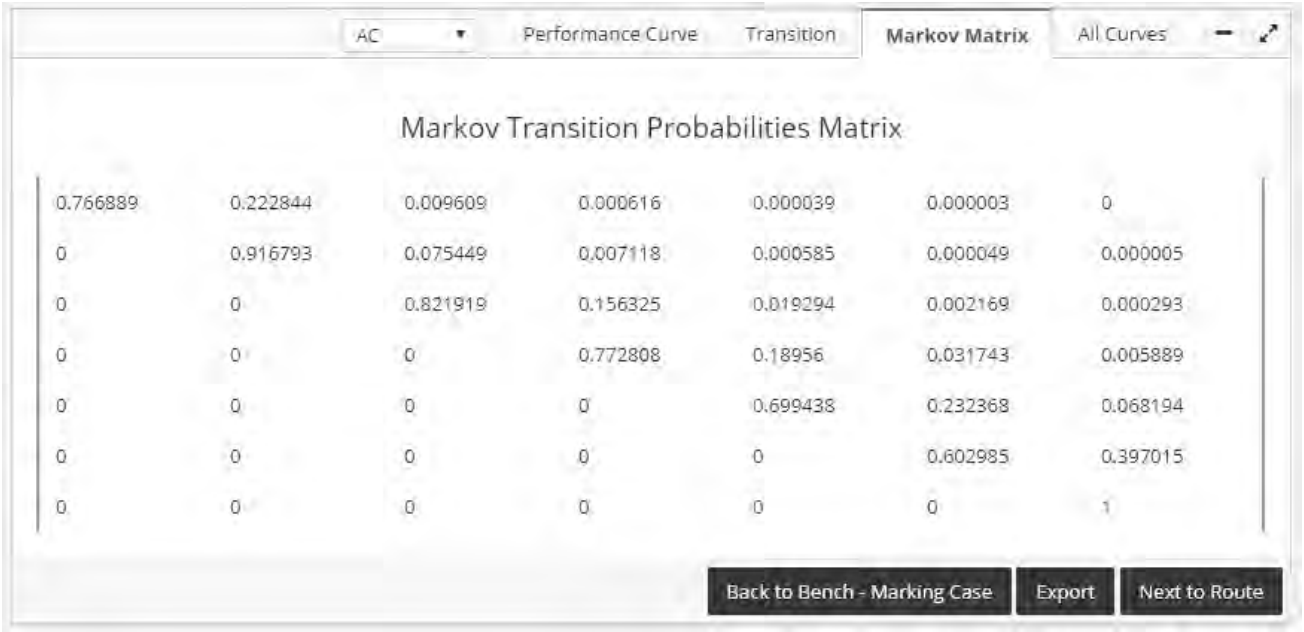
- Step 01: Select distress type “Cracking ratio”

- Performance Curve chart displays

- Probabilities Transition chart displays



- Markov Transition Probabilities Matrix displays



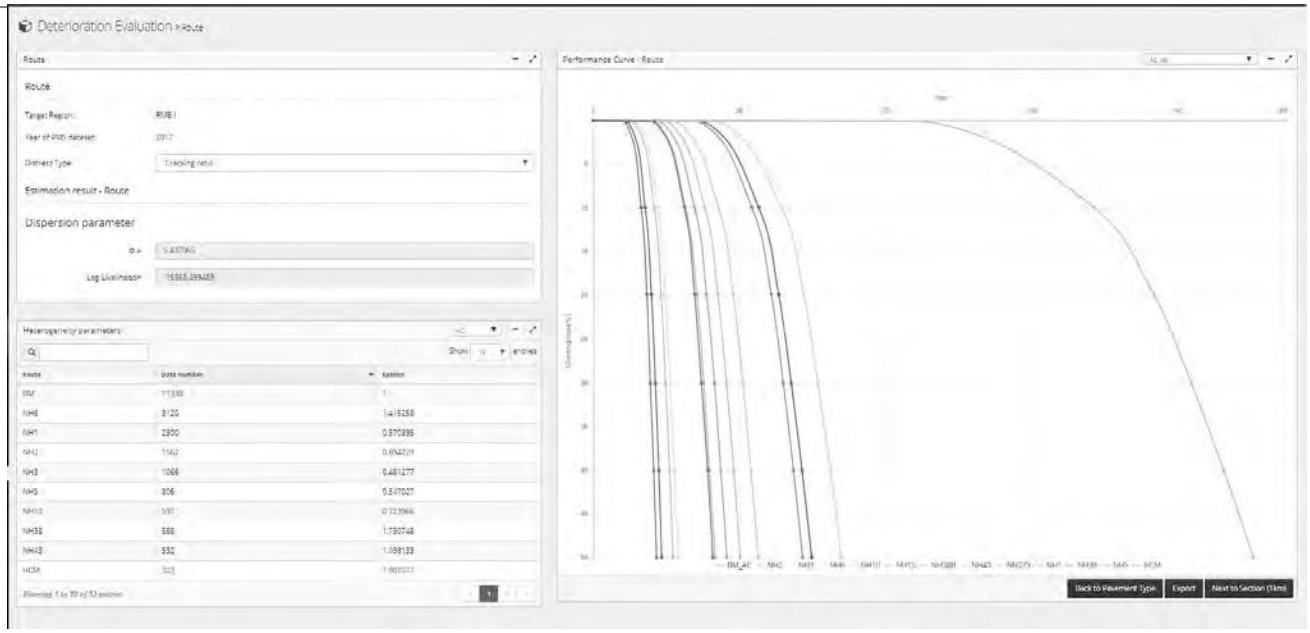
- All Curves displays

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

Note: BST or CC route is the same AC route

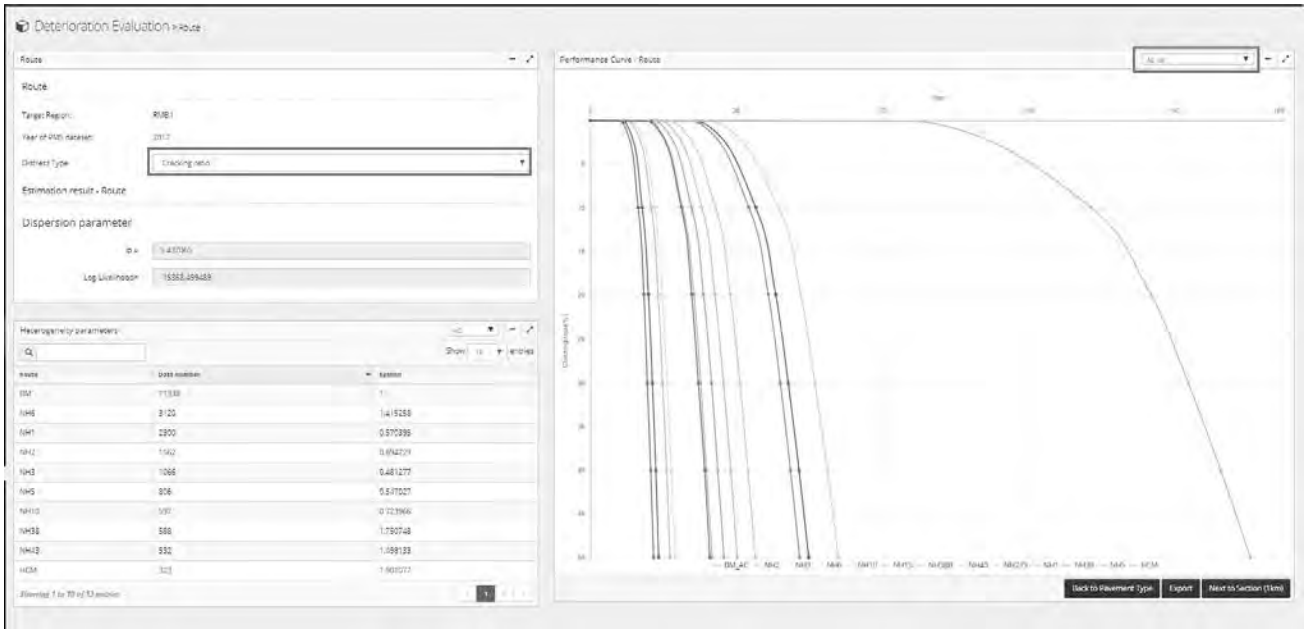
V) SETTING THE CHARTS OF DETERIORATION ROUTES

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

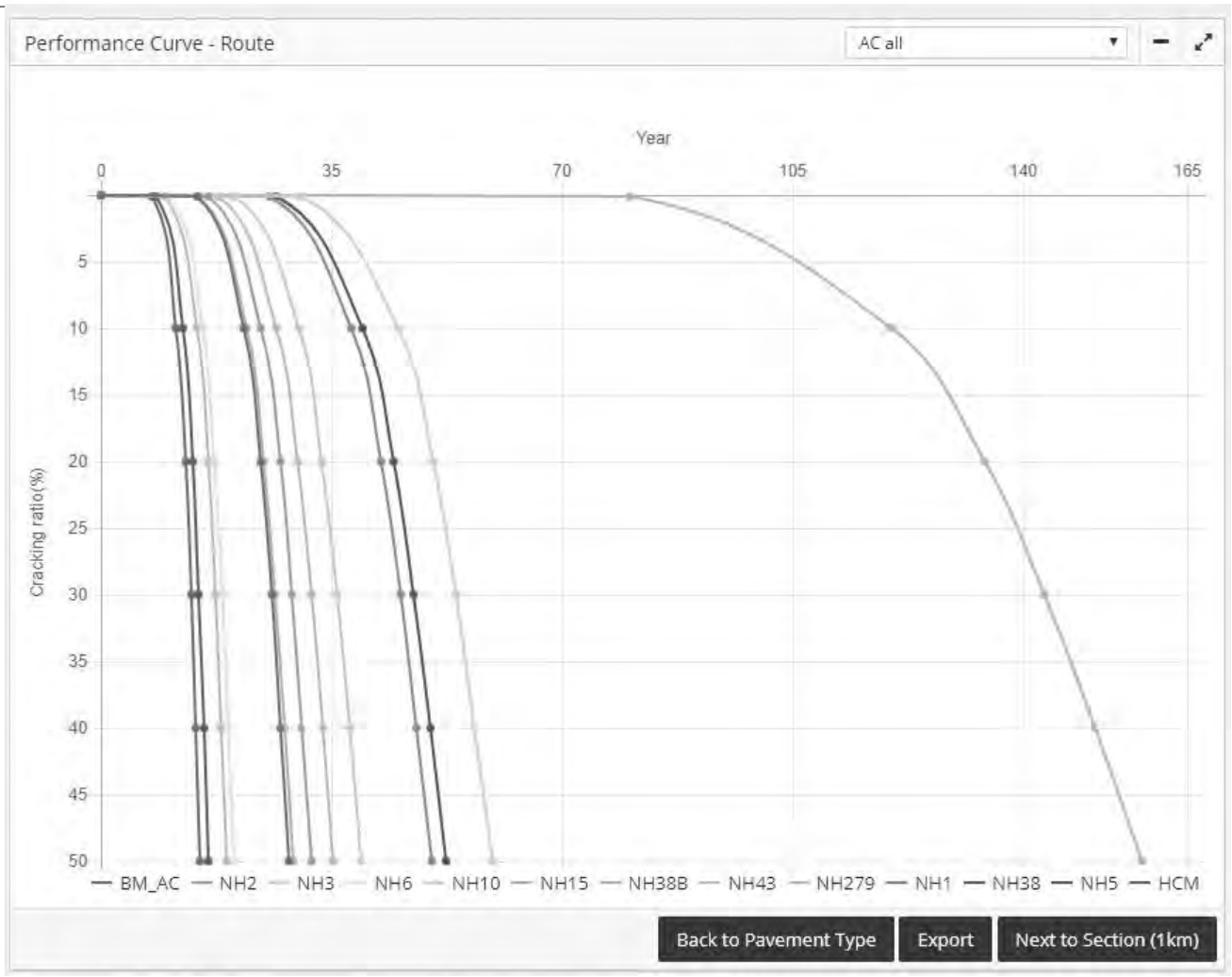


V.1) Process export data of the type Crack and the type AC ALL

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



- Performance Curve chart displays

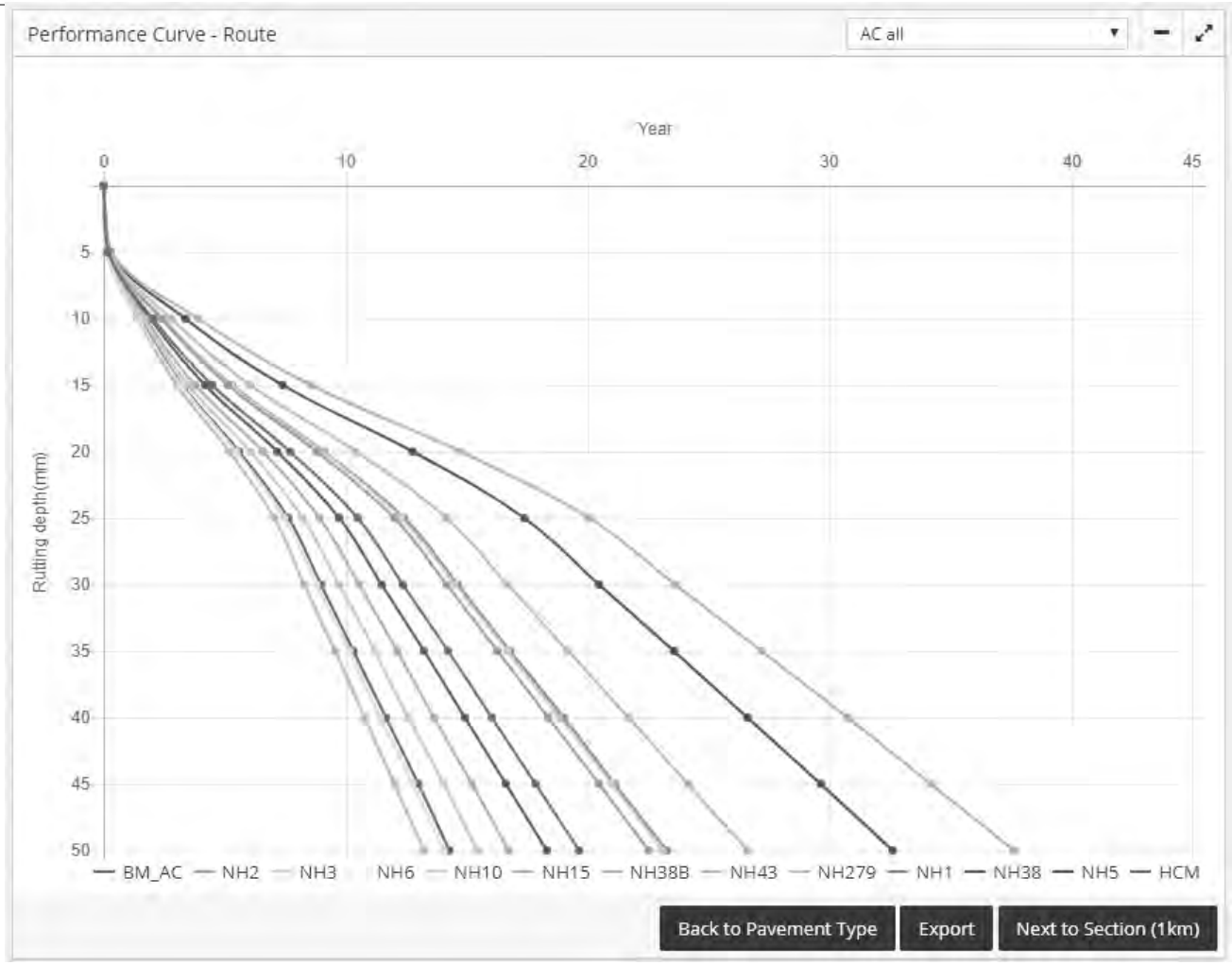


- Step 02: Press “Export” button to Save
- Step 03: Check file output data

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

- Step 01: Select distress type “Rutting depth”

- Performance Curve chart displays

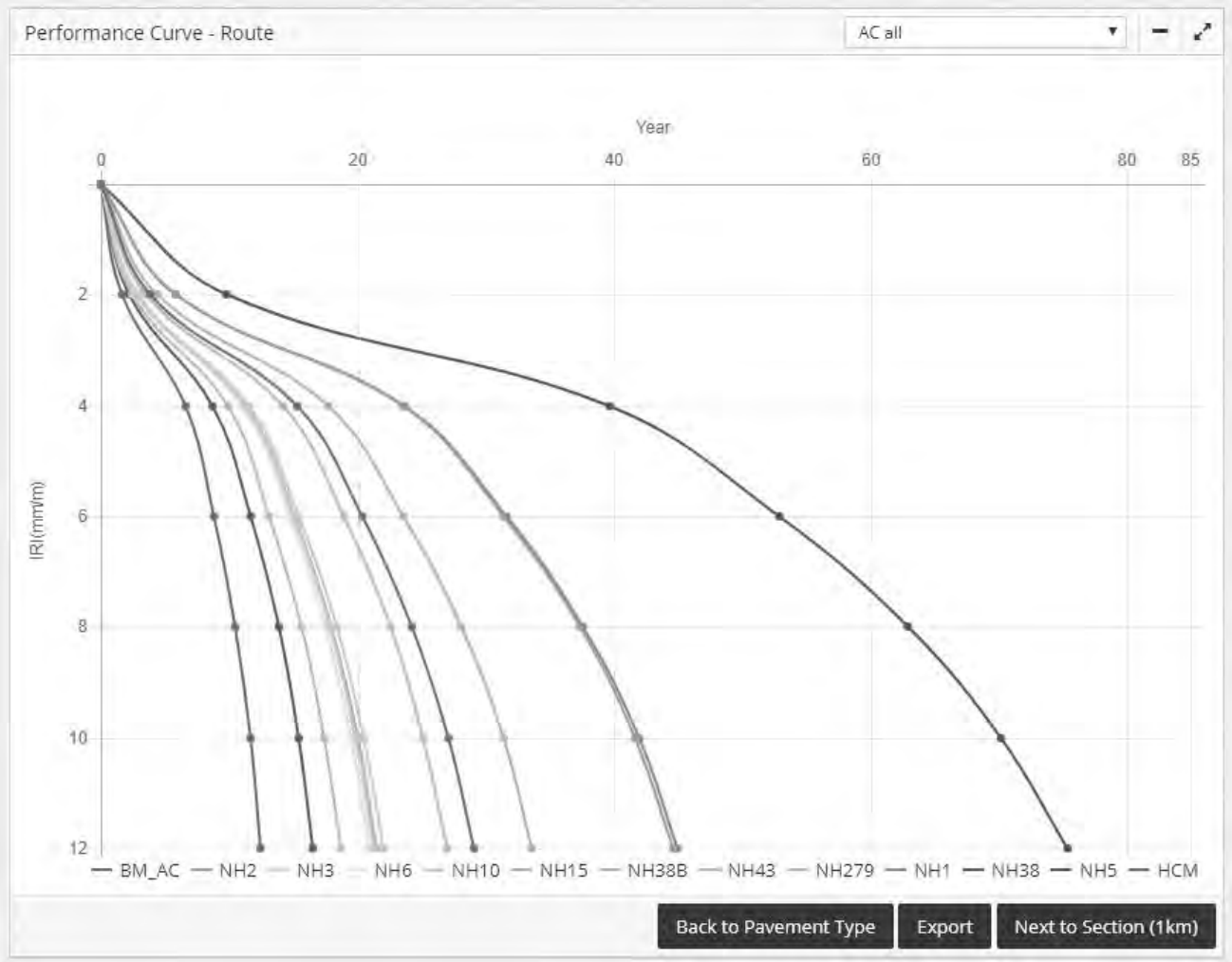


- Step 02: Press "Export" button to save
- Step 03: Check file output data

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

- Step 01: Select distress type "Cracking ratio"

- Performance Curve chart displays

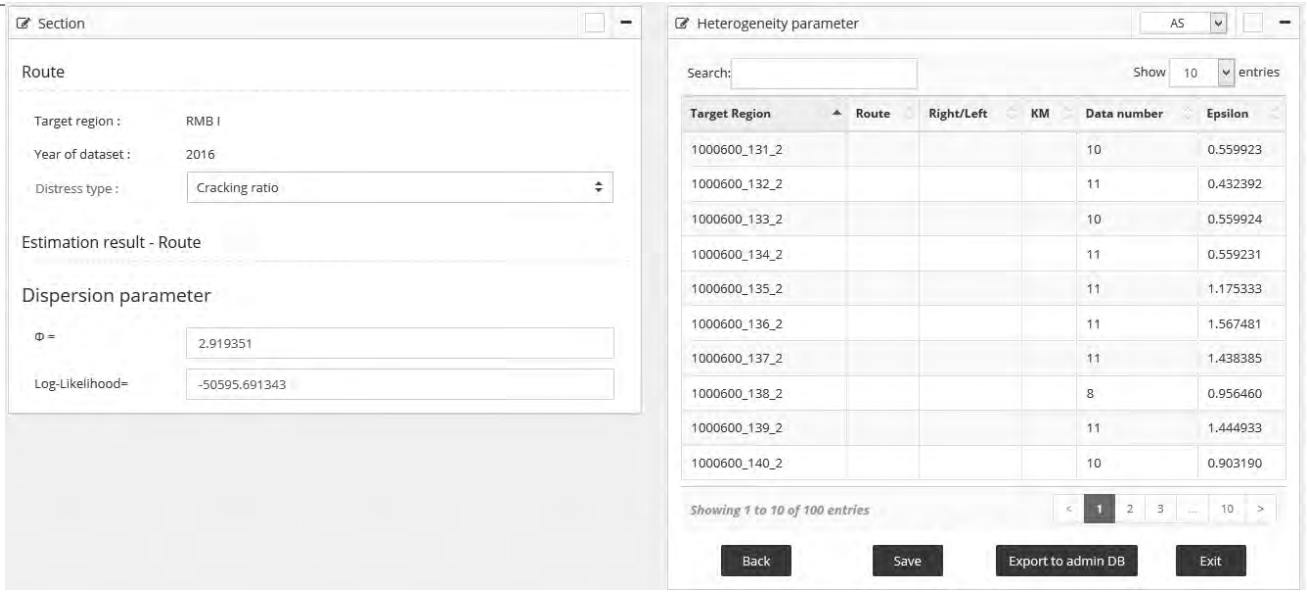


- Step 02: Press "Export" button to save
- Step 03: Check file output data

Note: Others are the same AC ALL route.

VI) SETTING THE CHARTS OF DETERIORATION SECTIONS

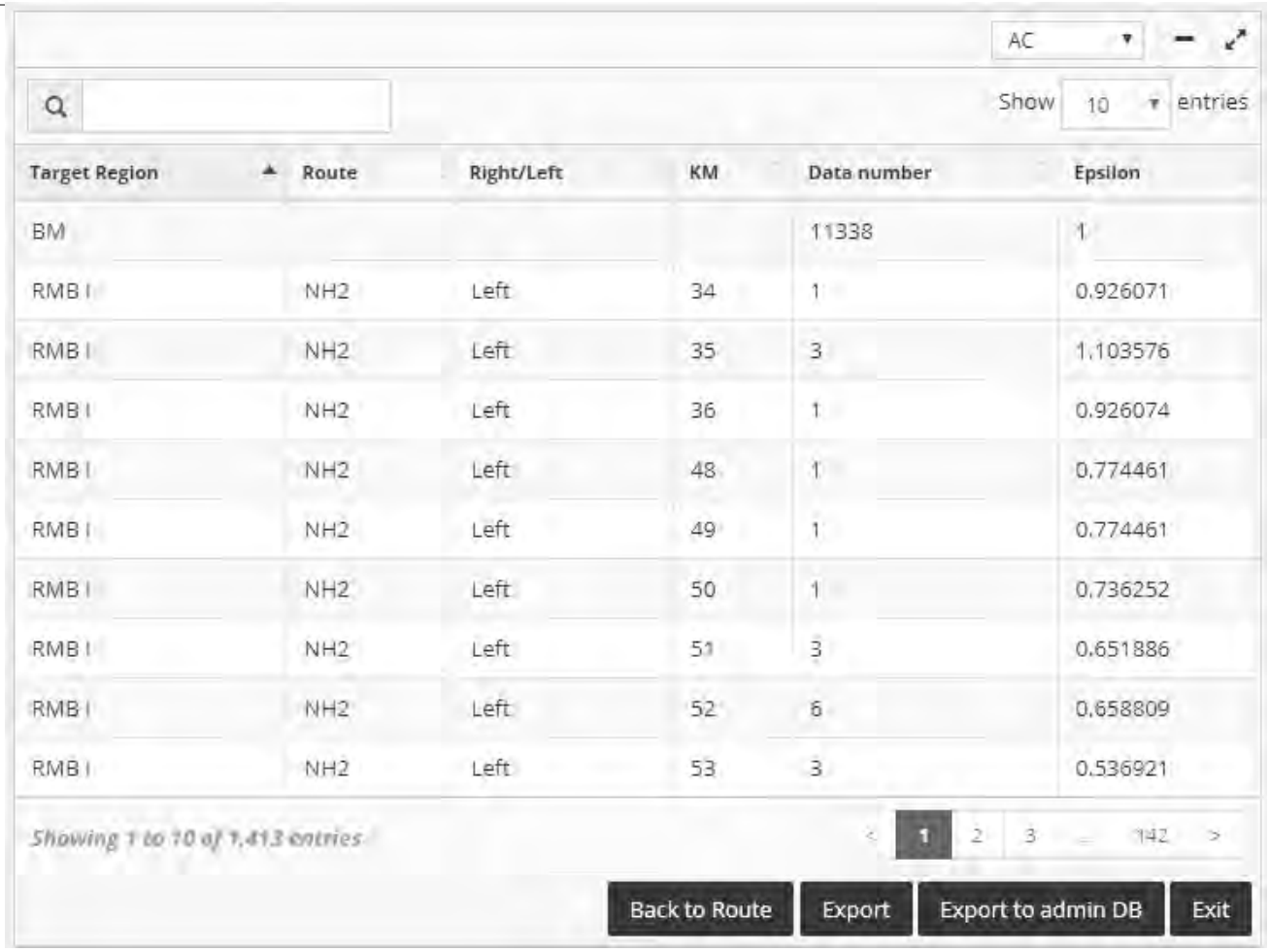
- Purpose: Export data
- At the route screen, user press **Next to Section (1km)** button



Back to Route	Back to before screen
Export	Export data
Export to admin DB	Update data in database
Exit	Back to init screen

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

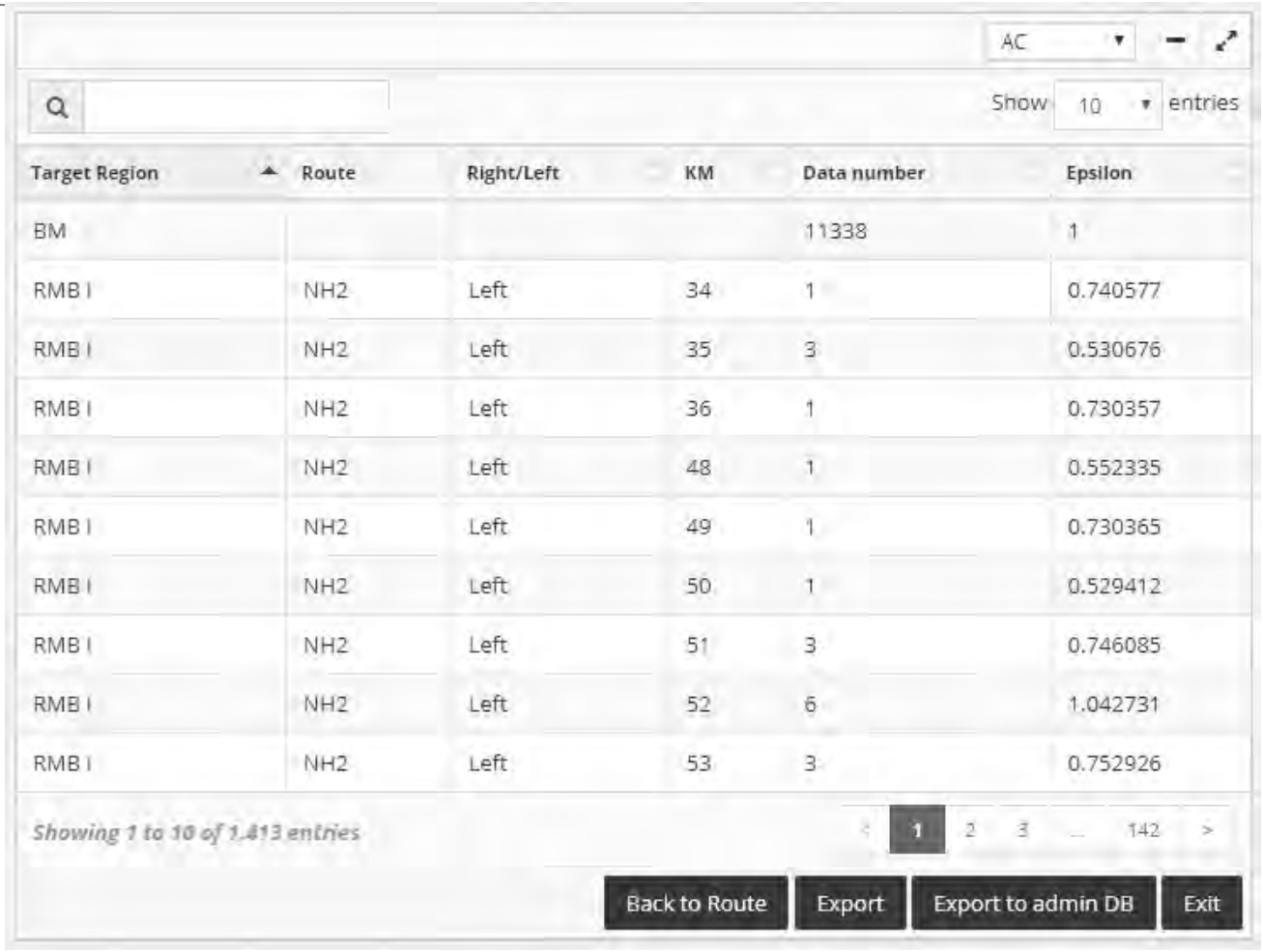
- Step 01: Select distress type “Cracking ratio”



- 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 sucessful”
  - 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

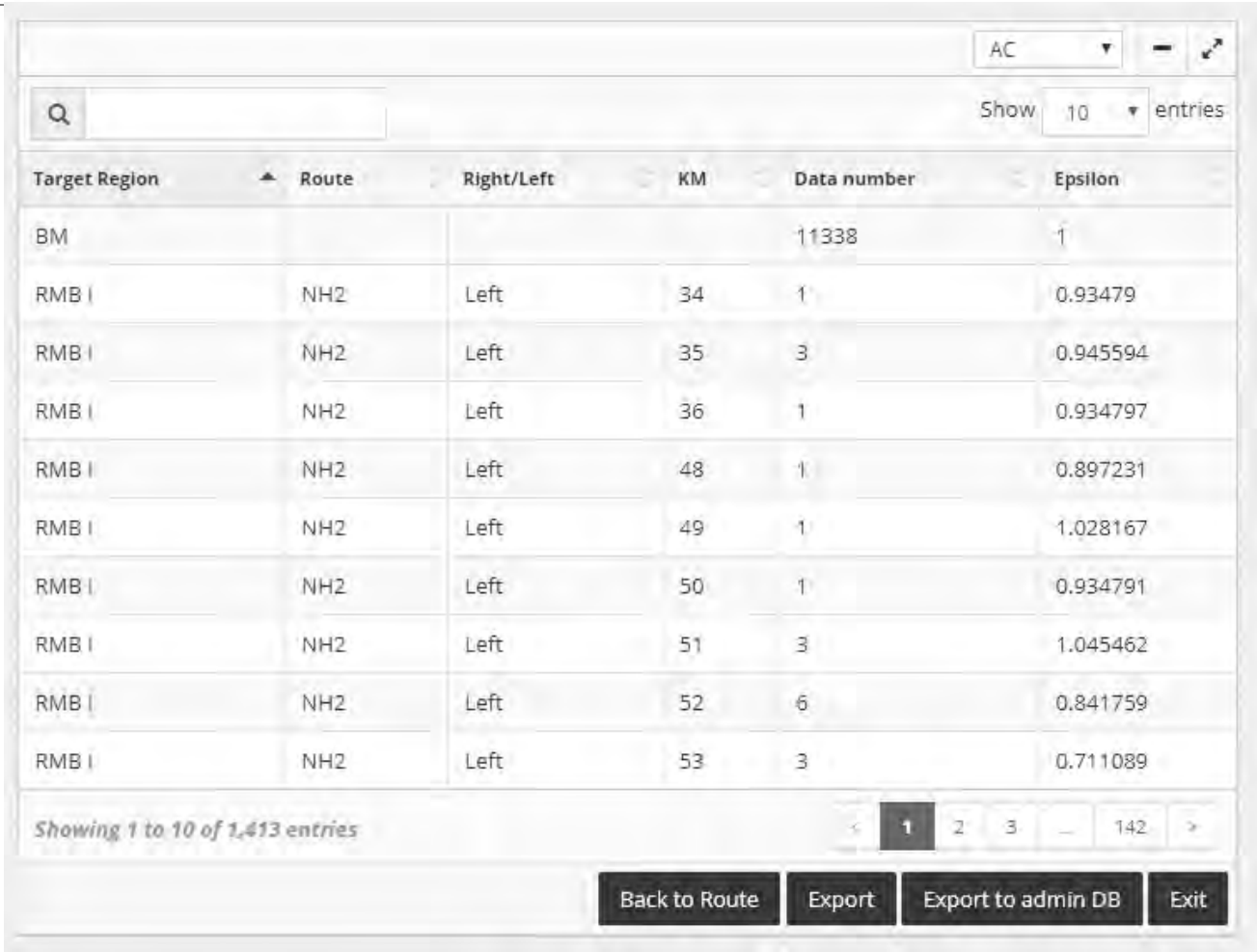
- Step 01: Select distress type “Rutting depth”



- 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 sucessful”
  - 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”



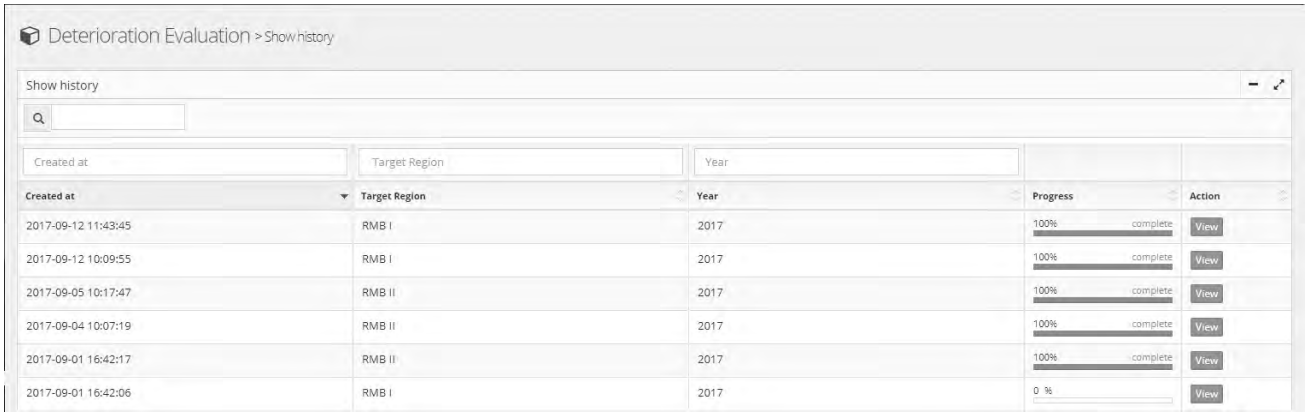
- Step 02: User can press Export, Back to Route, Export to admin DB or Exit button.
  - Press “Back to Route” Button: System will back to before Screen.
  - Press “Export” button: Export file excel.
  - Press “Export to admin DB” button: There is a message “Update is sucessful”
  - Press “Exit” button: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

VII) SHOW HISTORY

- Purpose: View the created process

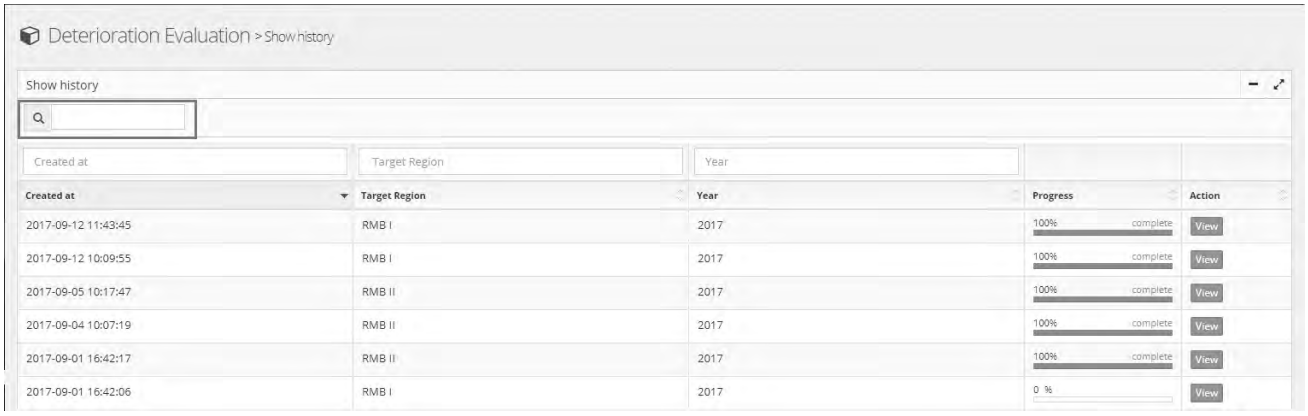
User can select the function:	

- The screen displays:

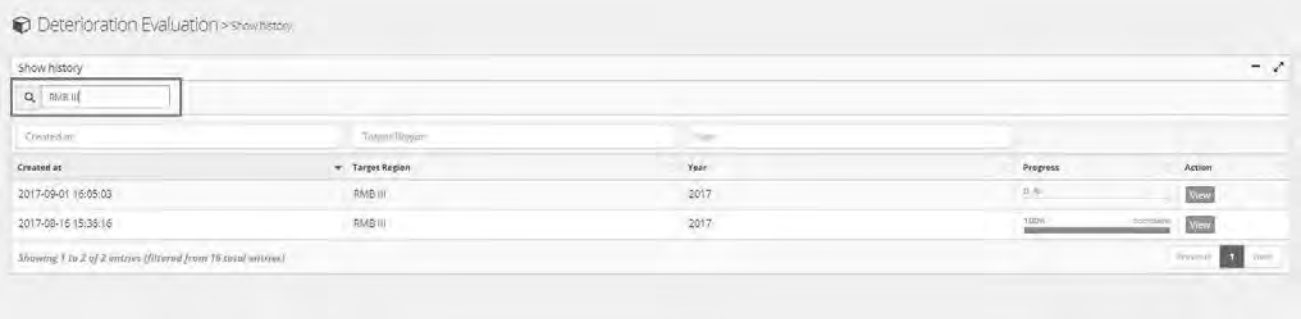


- Information for functions:

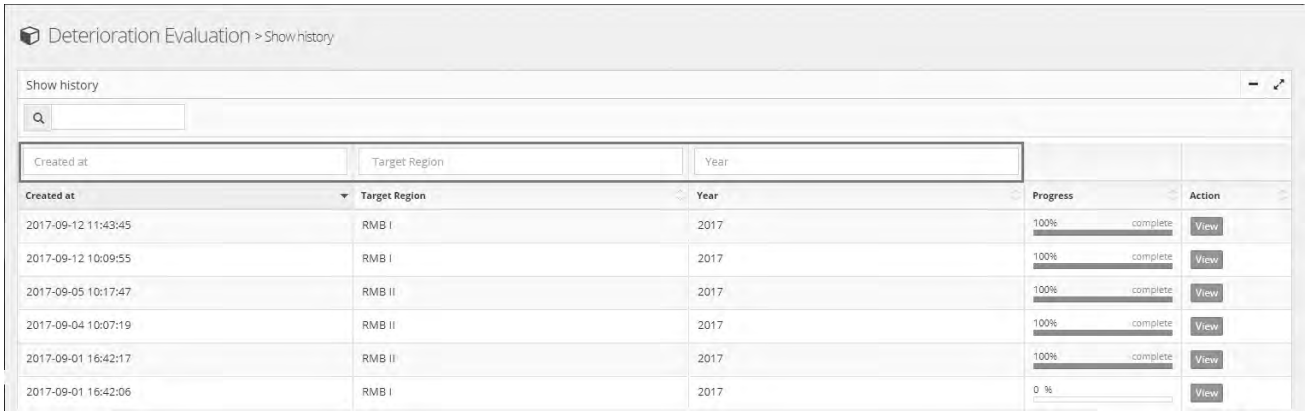
- Search function
  - Step 1: At the “Show history” form, user choose Search function
  - Step 2: Input information to search to properties: Creatd at, Target Region, Year



Example: Search information of Target Region is “RMB III”



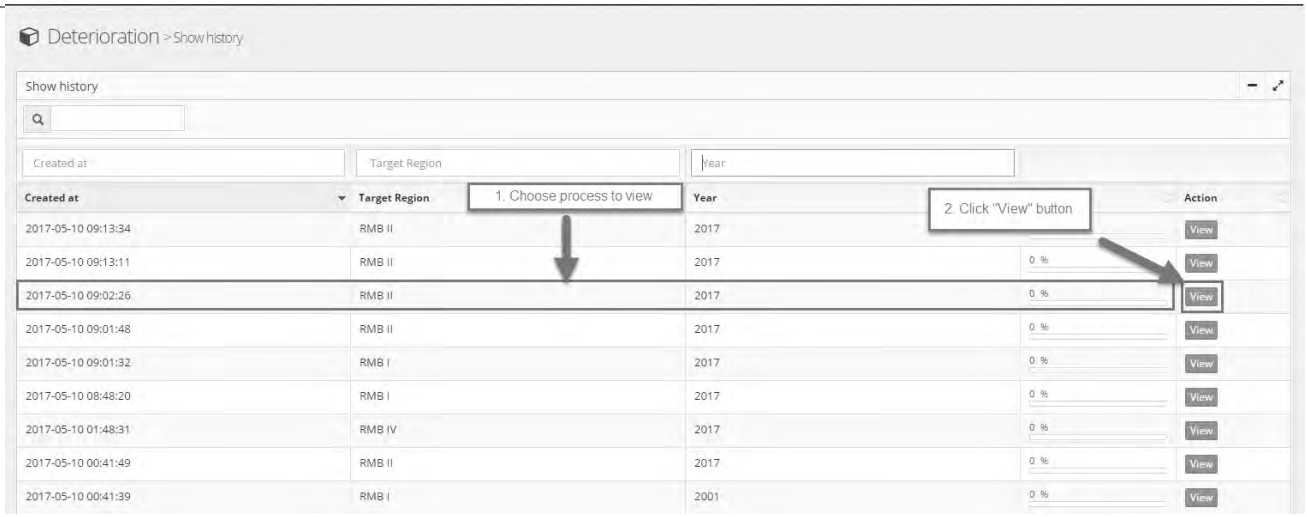
- Filter function
  - Step 1: At the "Show history" form, user choose Filter function for properties: Created at, Target Region and Year
  - Step 2: Input information to filter



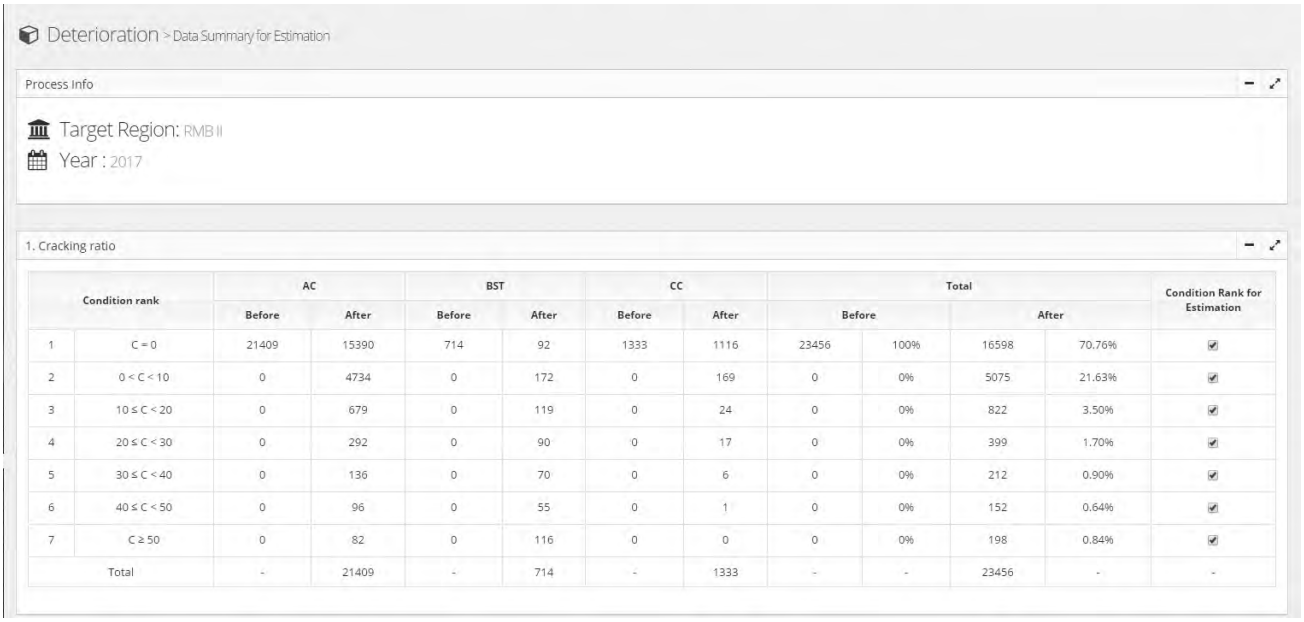
Note: User can choose in once information of 3 properties

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

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



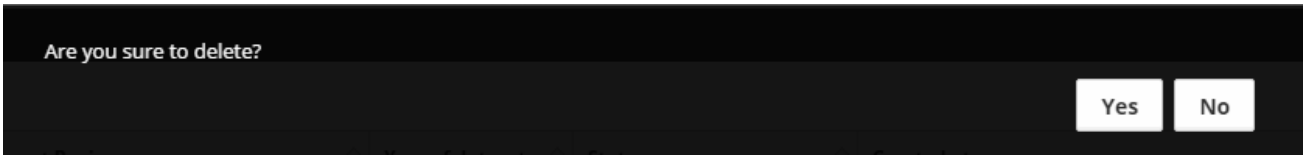
The screen dislay, then user click View button:



Condition rank		AC		BST		CC		Total				Condition Rank for Estimation
		Before	After	Before	After	Before	After	Before		After		
1	C = 0	21409	15390	714	92	1333	1116	23456	100%	16598	70.76%	☑
2	0 < C < 10	0	4734	0	172	0	169	0	0%	5075	21.63%	☑
3	10 ≤ C < 20	0	679	0	119	0	24	0	0%	822	3.50%	☑
4	20 ≤ C < 30	0	292	0	90	0	17	0	0%	399	1.70%	☑
5	30 ≤ C < 40	0	136	0	70	0	6	0	0%	212	0.90%	☑
6	40 ≤ C < 50	0	96	0	55	0	1	0	0%	152	0.64%	☑
7	C ≥ 50	0	82	0	116	0	0	0	0%	198	0.84%	☑
Total		-	21409	-	714	-	1333	-	-	23456	-	-

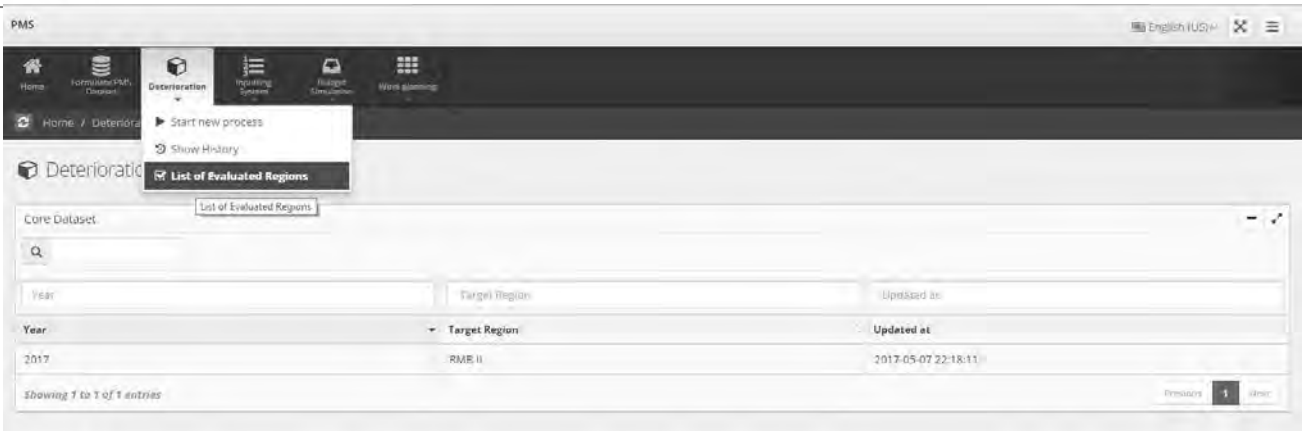
Note: Users can view all the setup but can not edit.

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



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:



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

USER'S MANUAL

STRATEGIC BUDGET SIMULATION MODULE

CONTENTS

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.

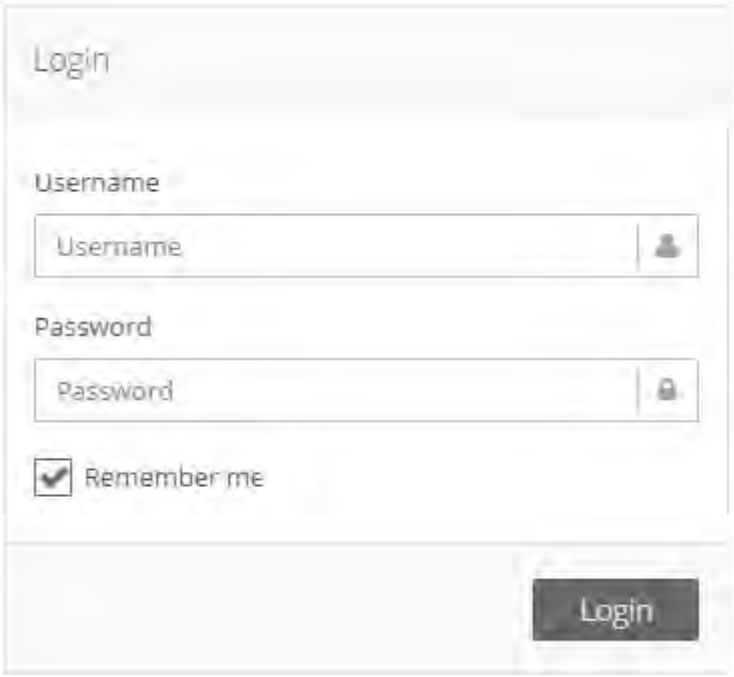
II) Process overview

II.1) Main functions:

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

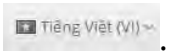
II.2) Login to the system

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

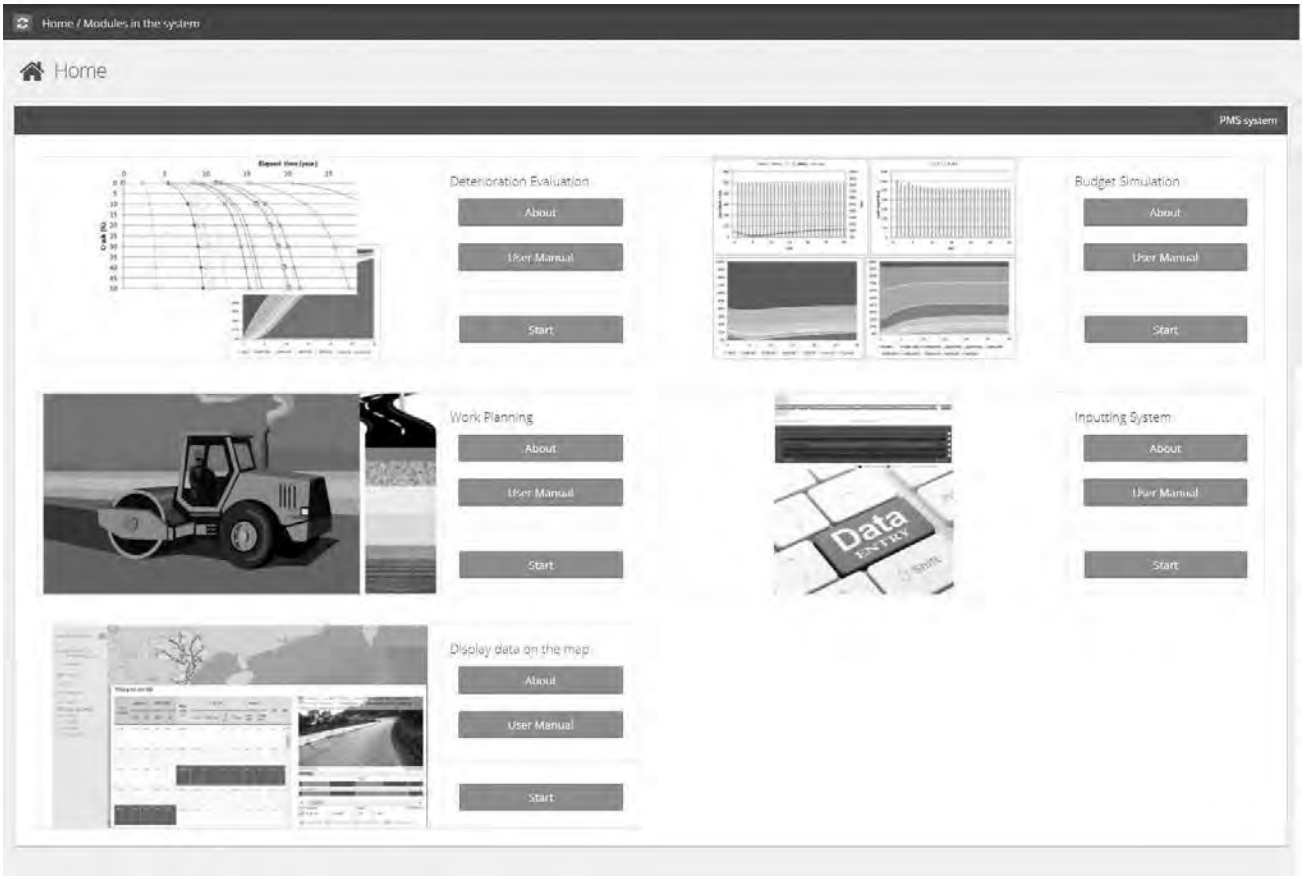


- User enter Username and Password
- Remember me: User can tick box Remember me to save login information for later time.
- Login: User can press button Login or press Enter

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 

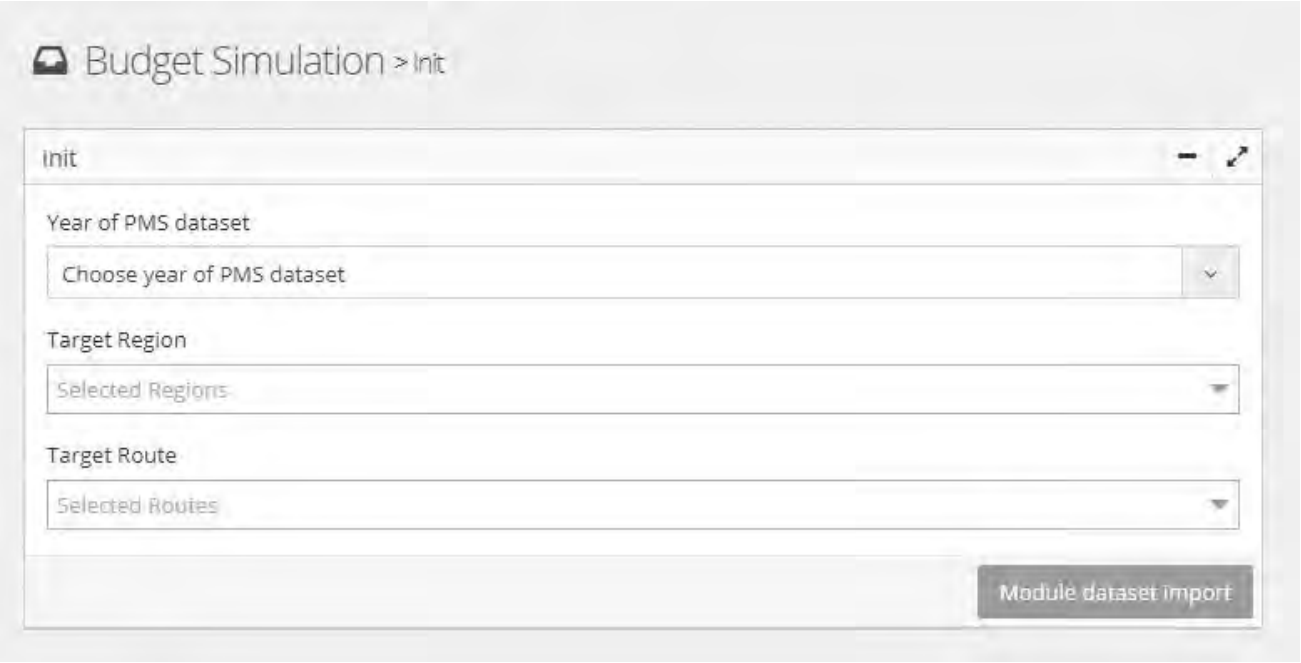
. Display screen:


Home / Modules in the system
Home
PMS system
Deterioration Evaluation
About
User Manual
Start
Budget Simulation
About
User Manual
Start
Work Planning
About
User Manual
Start
Data
ENTRY
Inputting System
About
User Manual
Start
Display data on the map
About
User Manual
Start

CHAPTER 2: BUDGET SIMULATION OPERATION

I) SETTING BUDGET SIMULATION DATASET

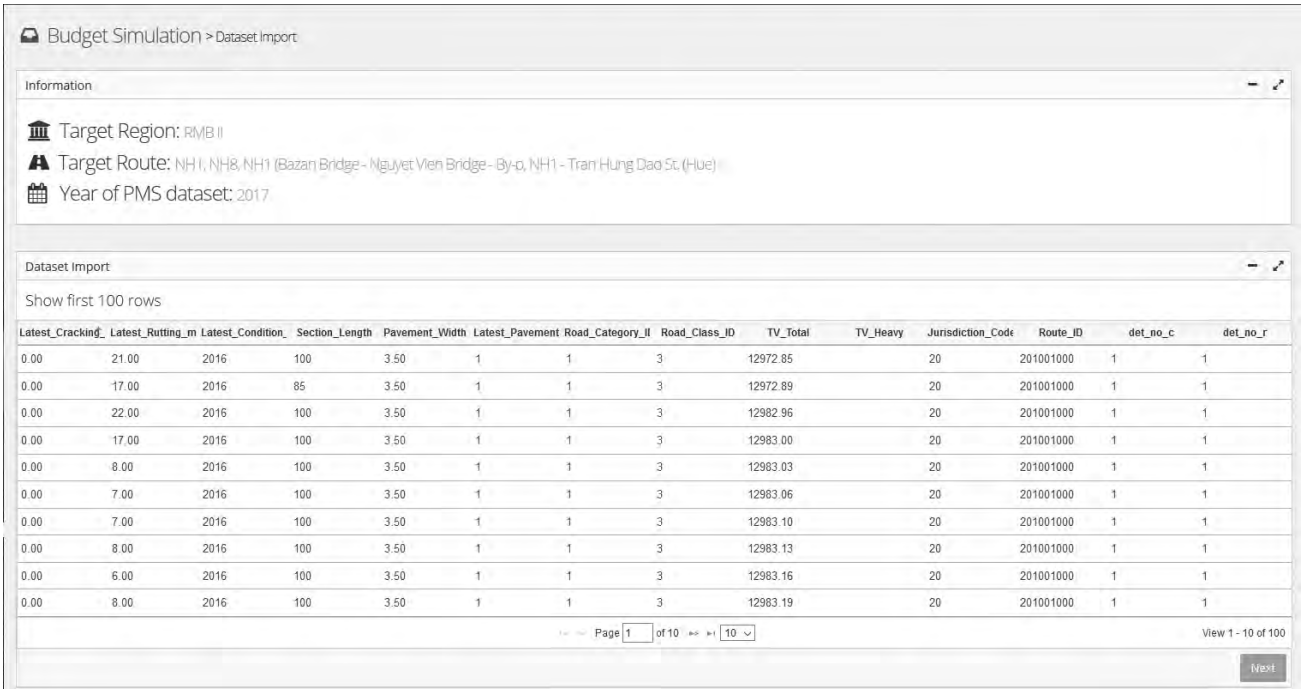
- Purpose: Set Year of PMS dataset, Taget Region and Target Route to budget simulation
- User select menu **Budget Simulation**, click on **Start New Process** submenu.



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

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.

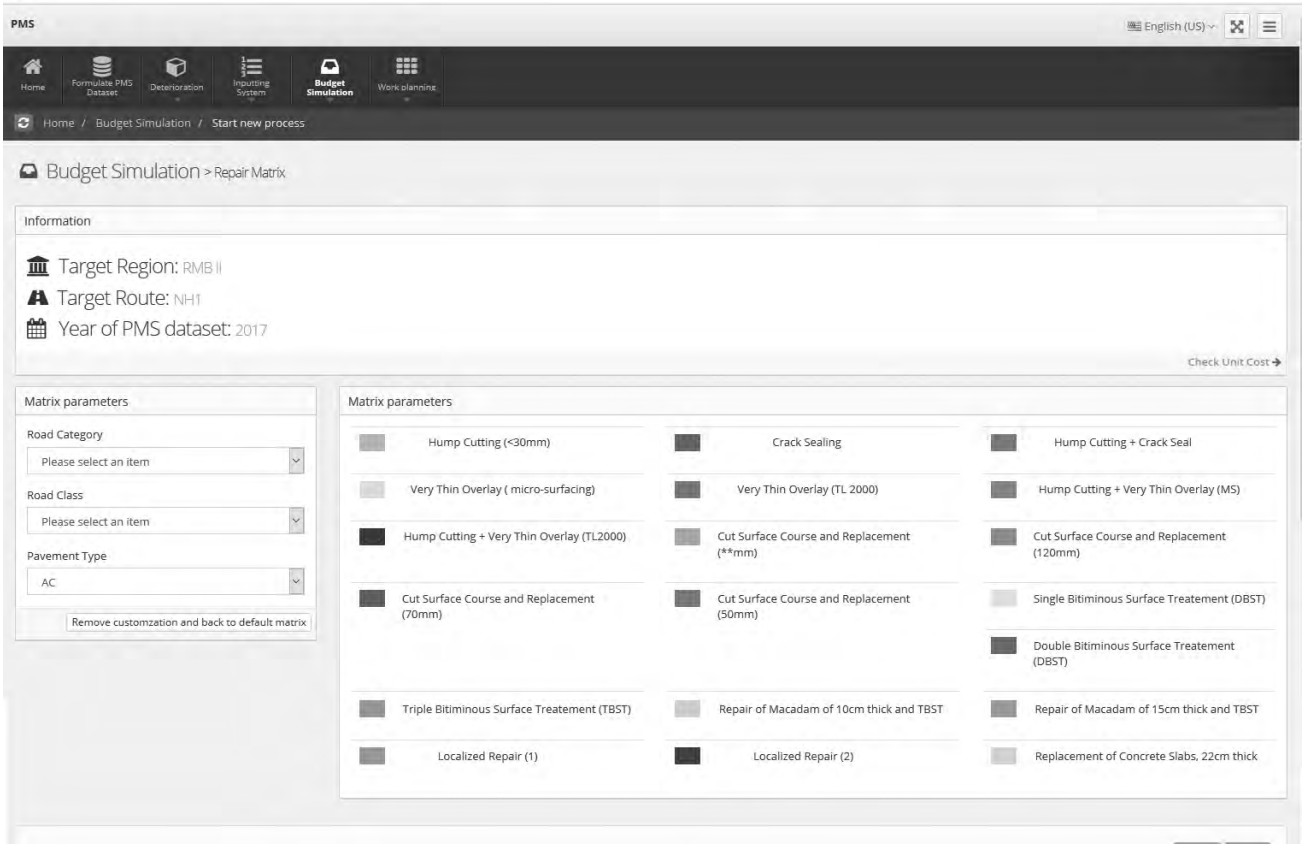
- Then click on Module dataset import button.



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

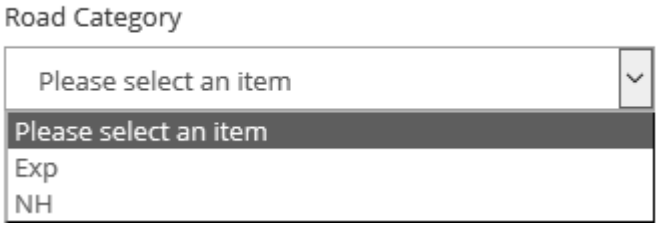
II) SETTING REPAIR MATRIX

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

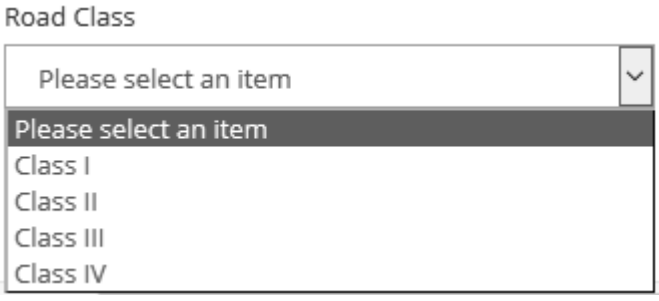


Description:

- 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



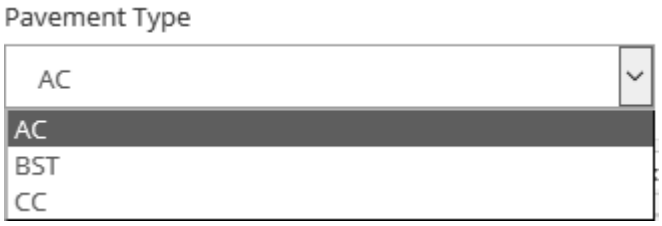
  - Road class: Class I, Class II, Class III, Class IV, Class V, Class VI



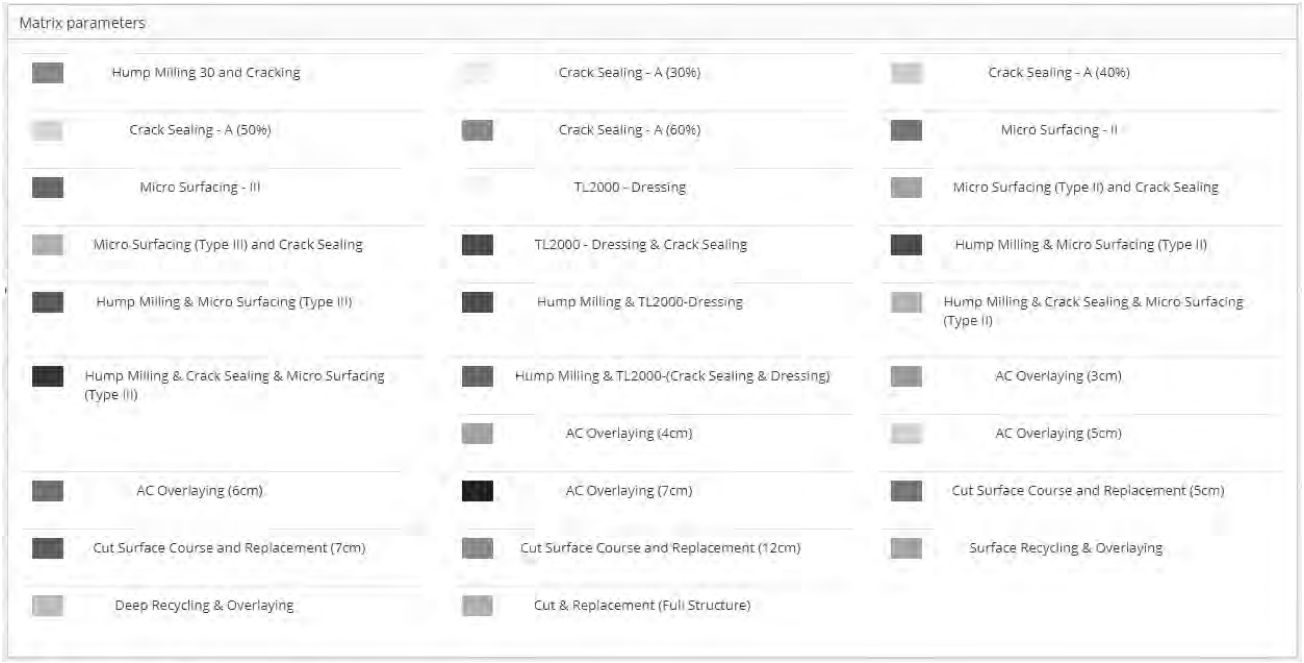
Note:

- ***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

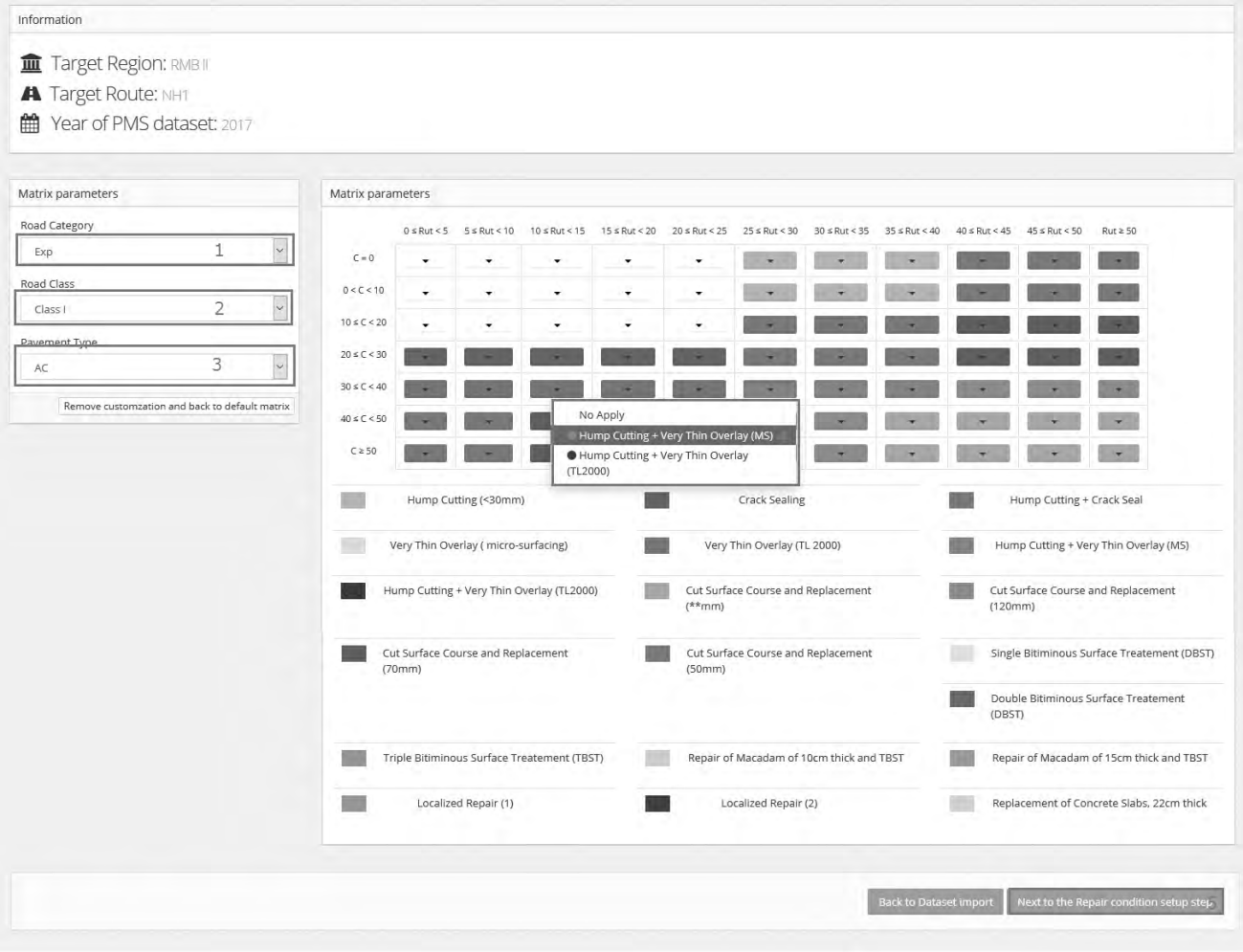


o Repair methods: Are the repair methods of the system. Each repair method is set up with a default color.



- 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



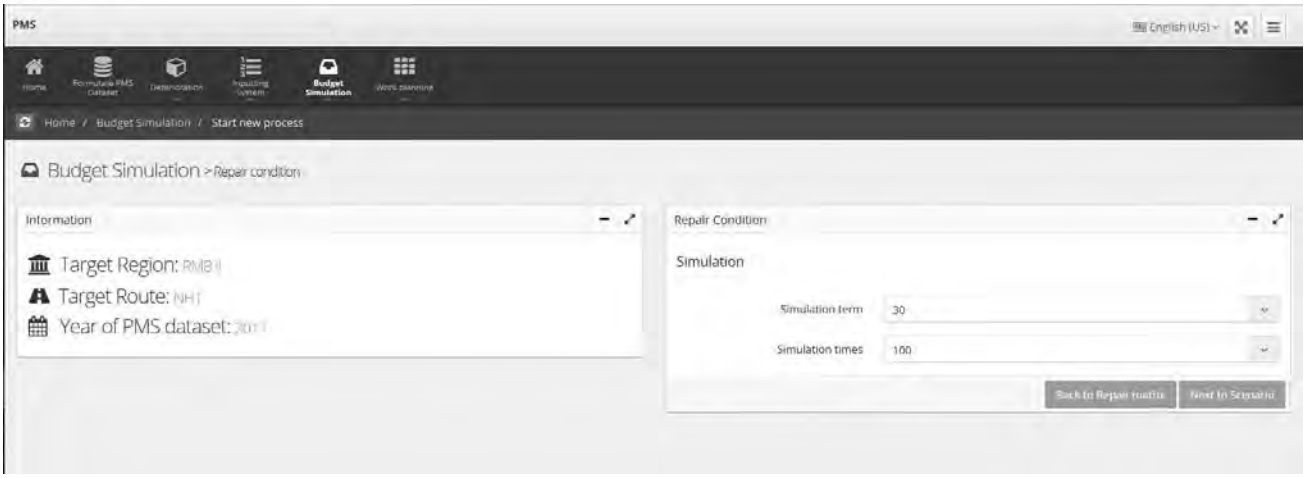
=> Also:

- 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.

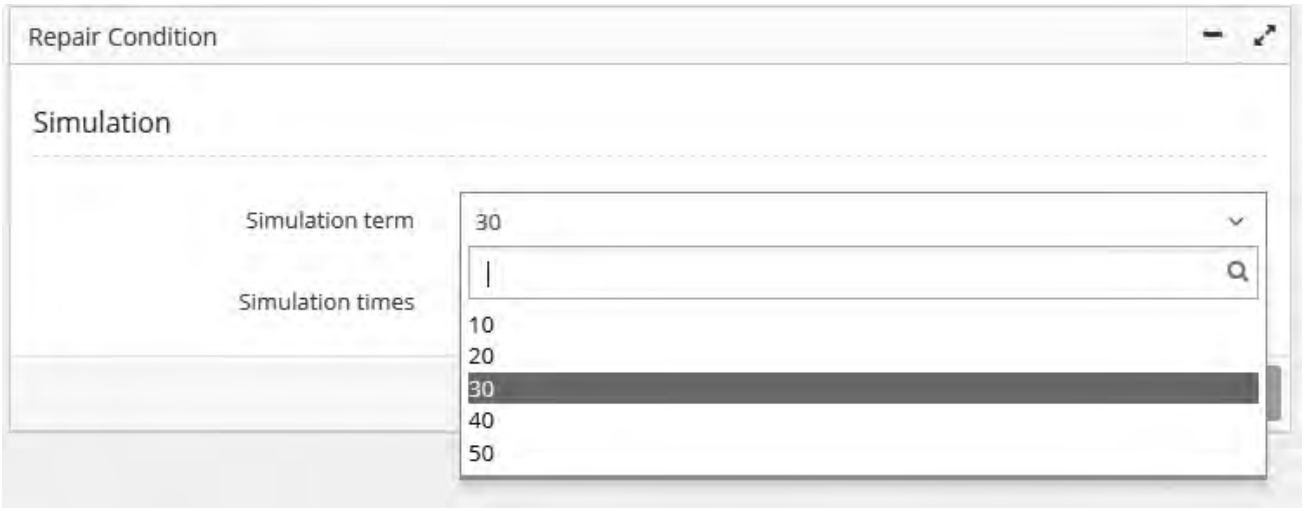
III) SETTING REPAIR CONDITION

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

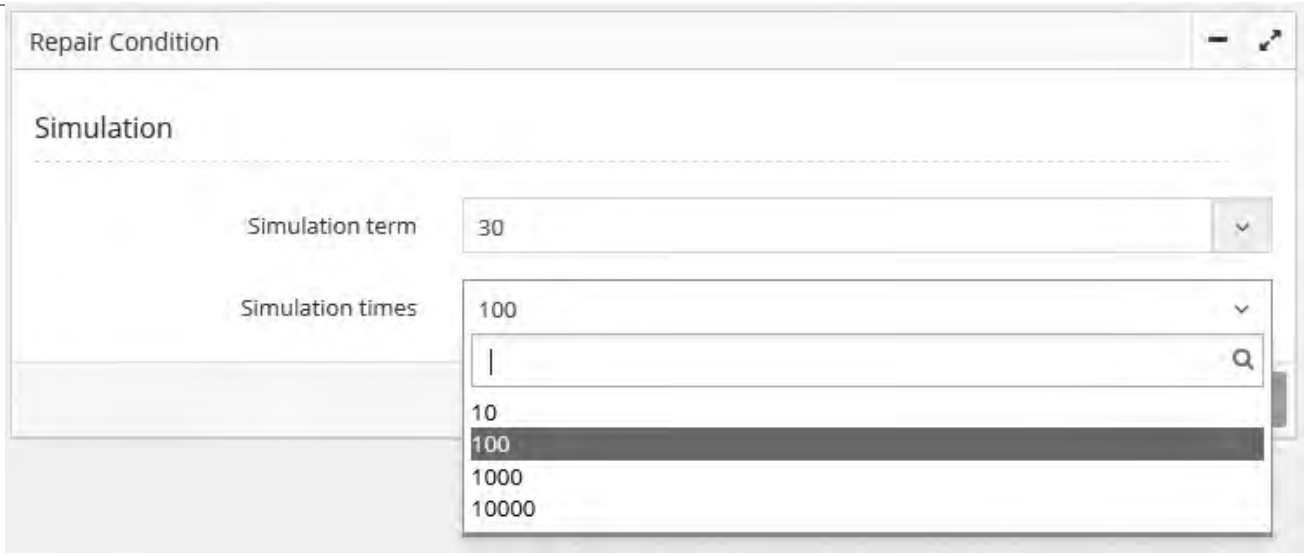


Description:

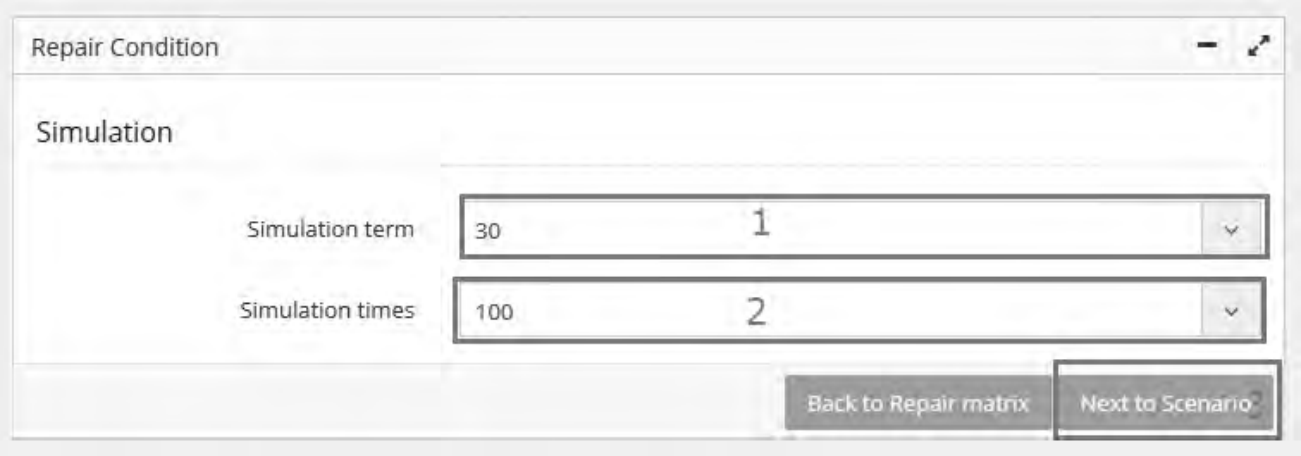
- Information form: Information on the Target Region, Target Route and Year of PMS dataset that the user selected in the Init step.
- Repair condition form: Set repair condition including: Simulation term and simulation times
    - Simulation term: 10, 20, 30, 40 and 50 (30 is value default)



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

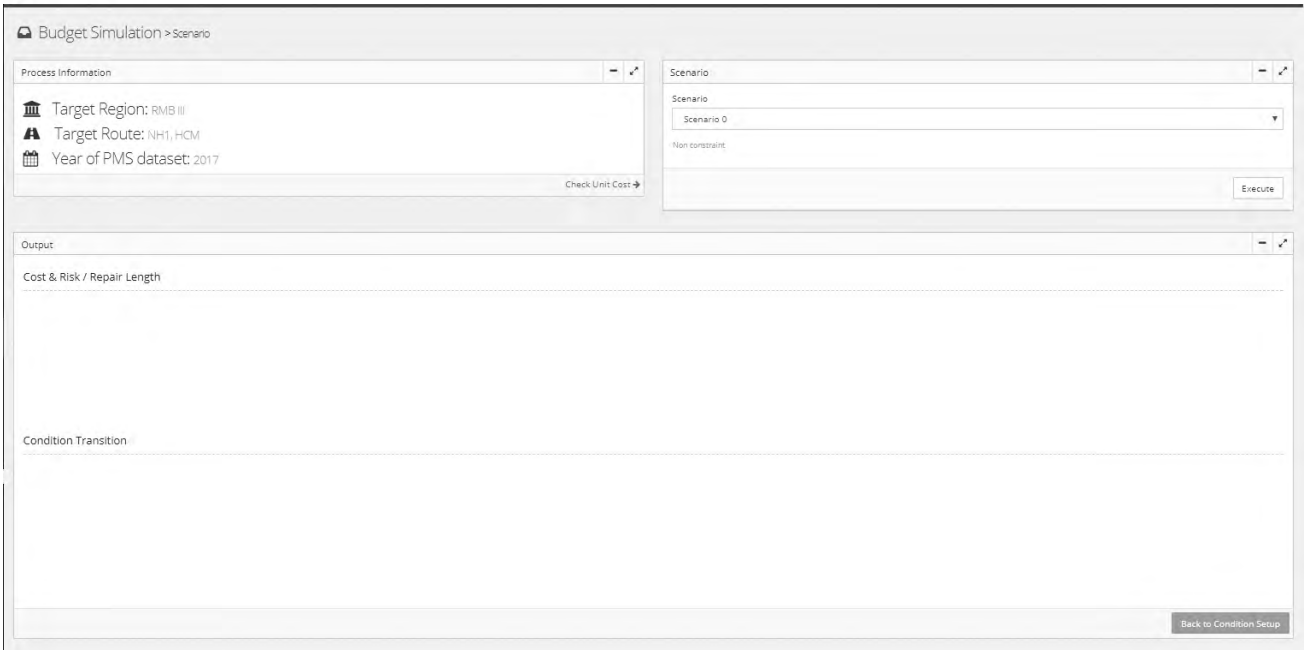


- Operation steps: "Repair condition" form
  - Step 1: Choose Simulation term
  - Step 2: Choose Simulation times
  - Step 3: Click the "Next to Scenario" button to complete and switch to the "Scenario" screen or press the "Back to Repair Matrix" button to return to the "*Repair matrix*" screen



IV) SETTING SCENARIO

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



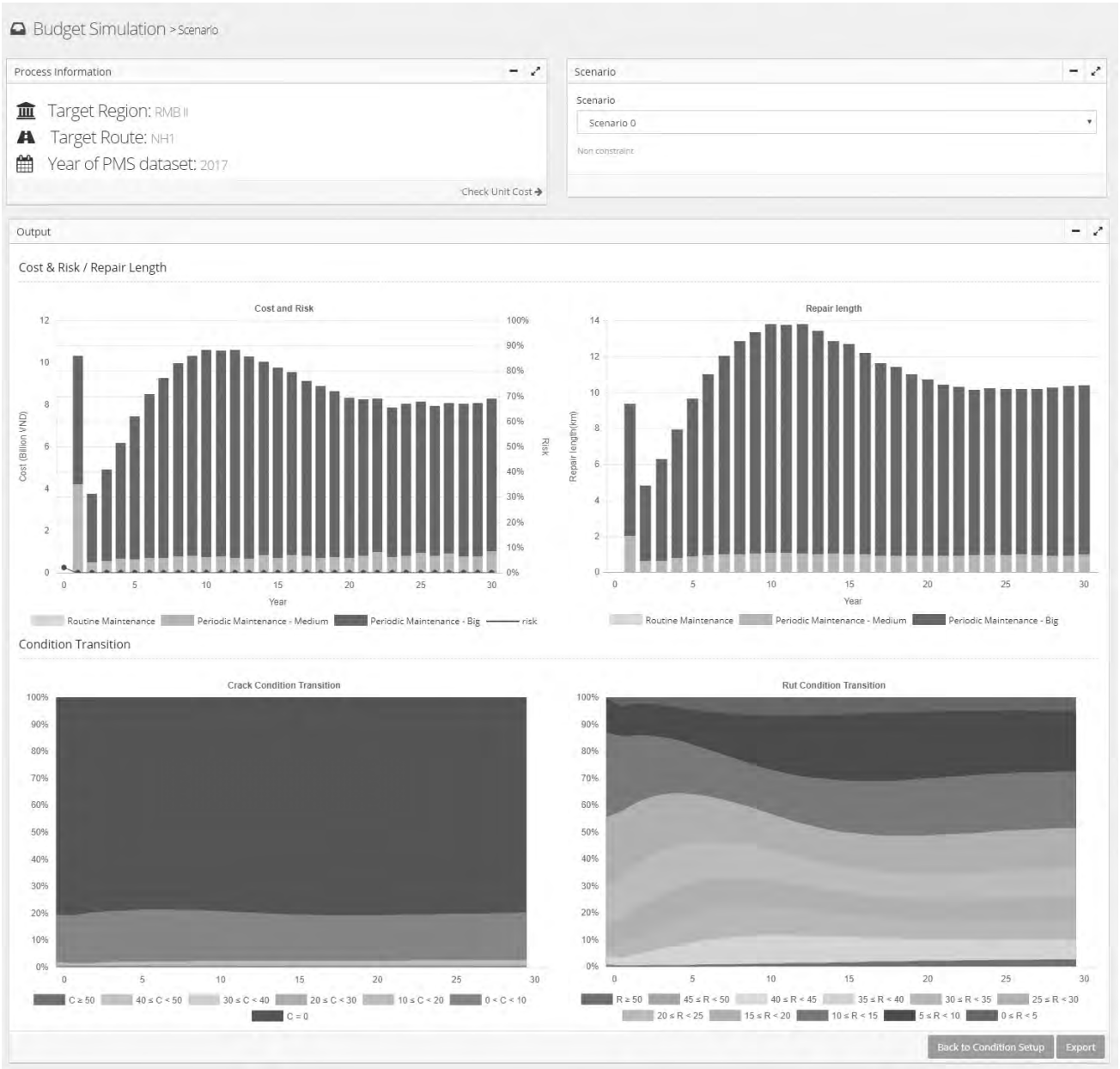
Description:

- 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.

➢ Operation steps:

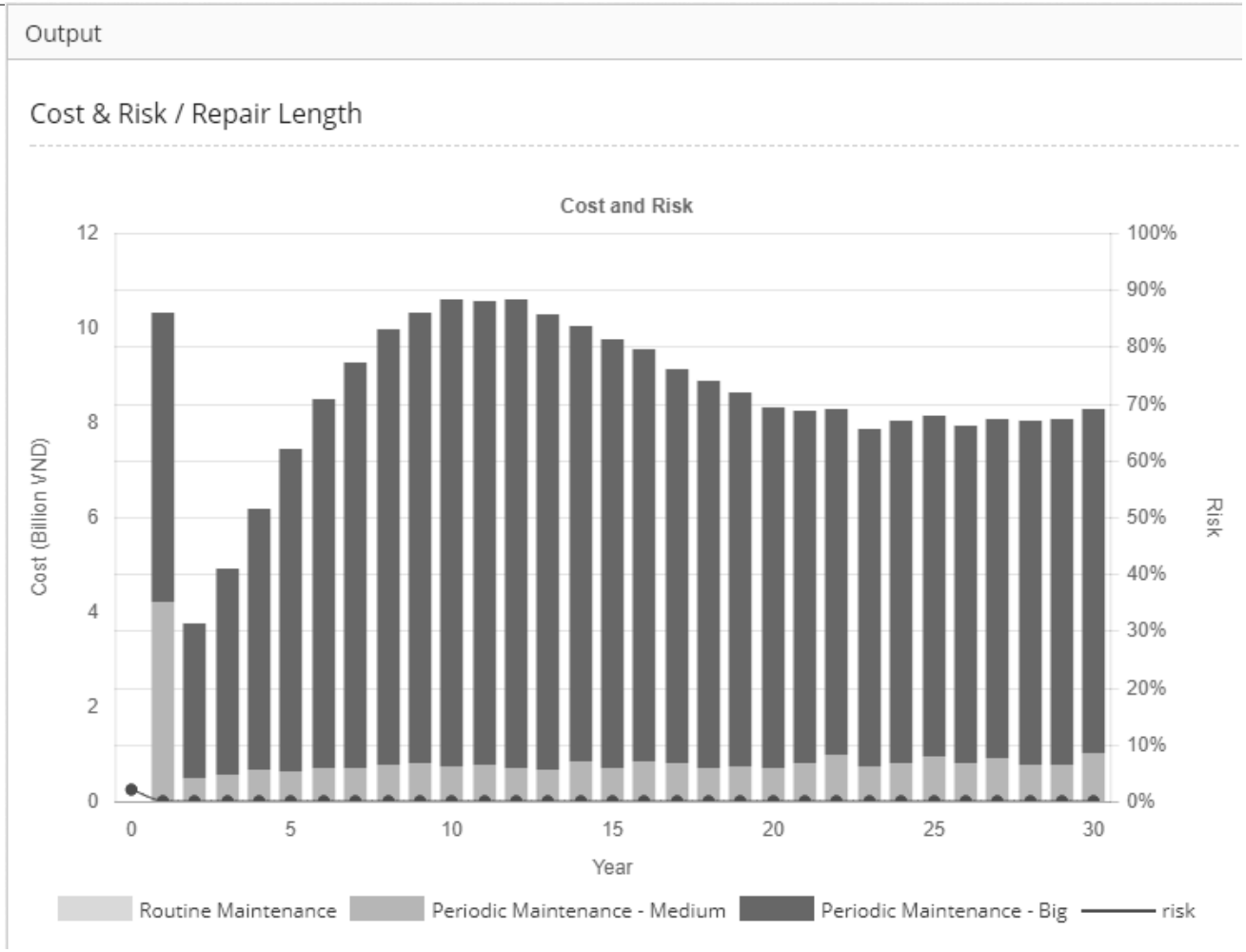
- For Scenario 0
    - Step 1: In the “Scenario” form select Scenario 0
    - Step 2: Click the “Execute” button to view the results of the repair scenario (dislayed in the Output form)

⇨ Results:



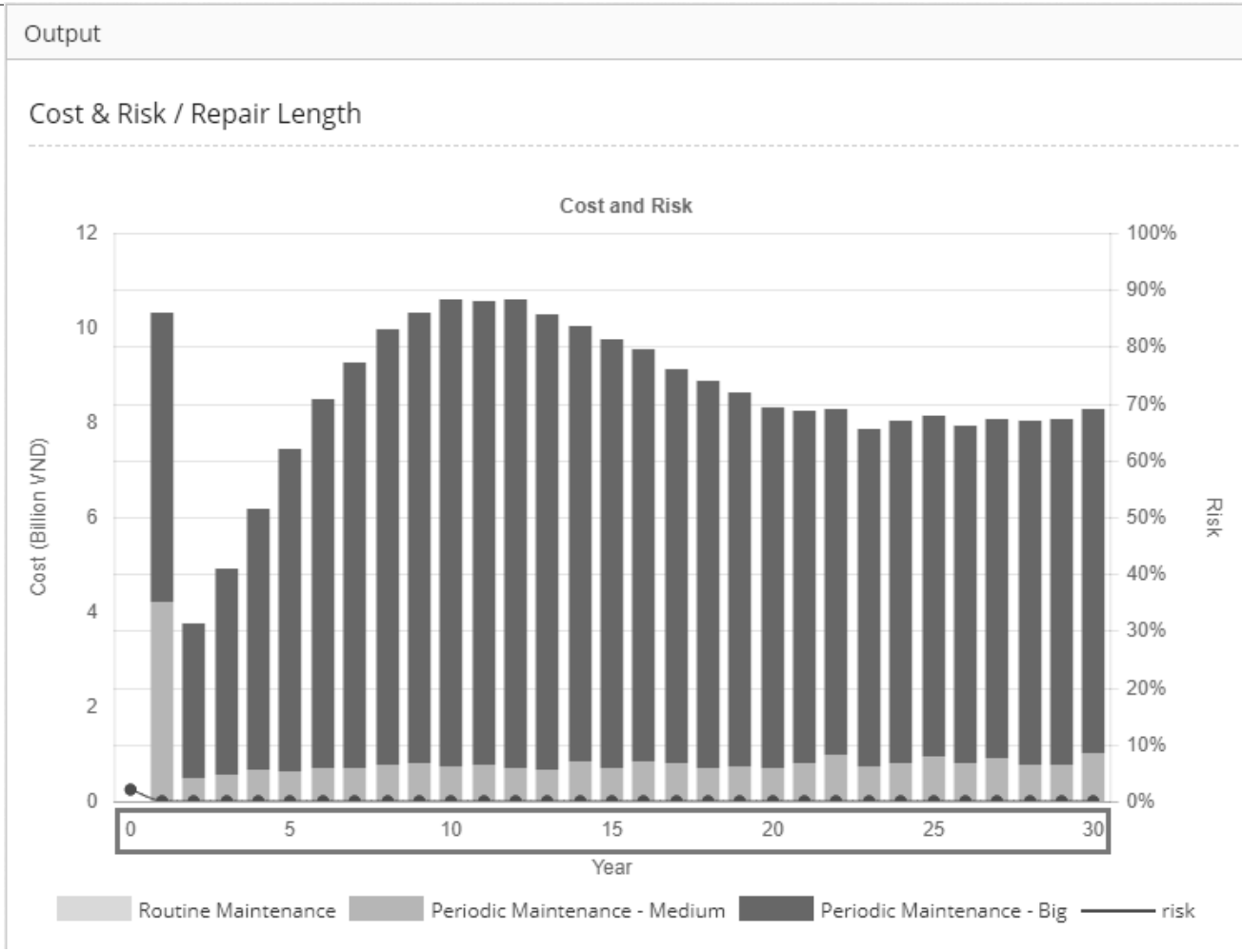
Description:

- **For Cost & Risk chart**

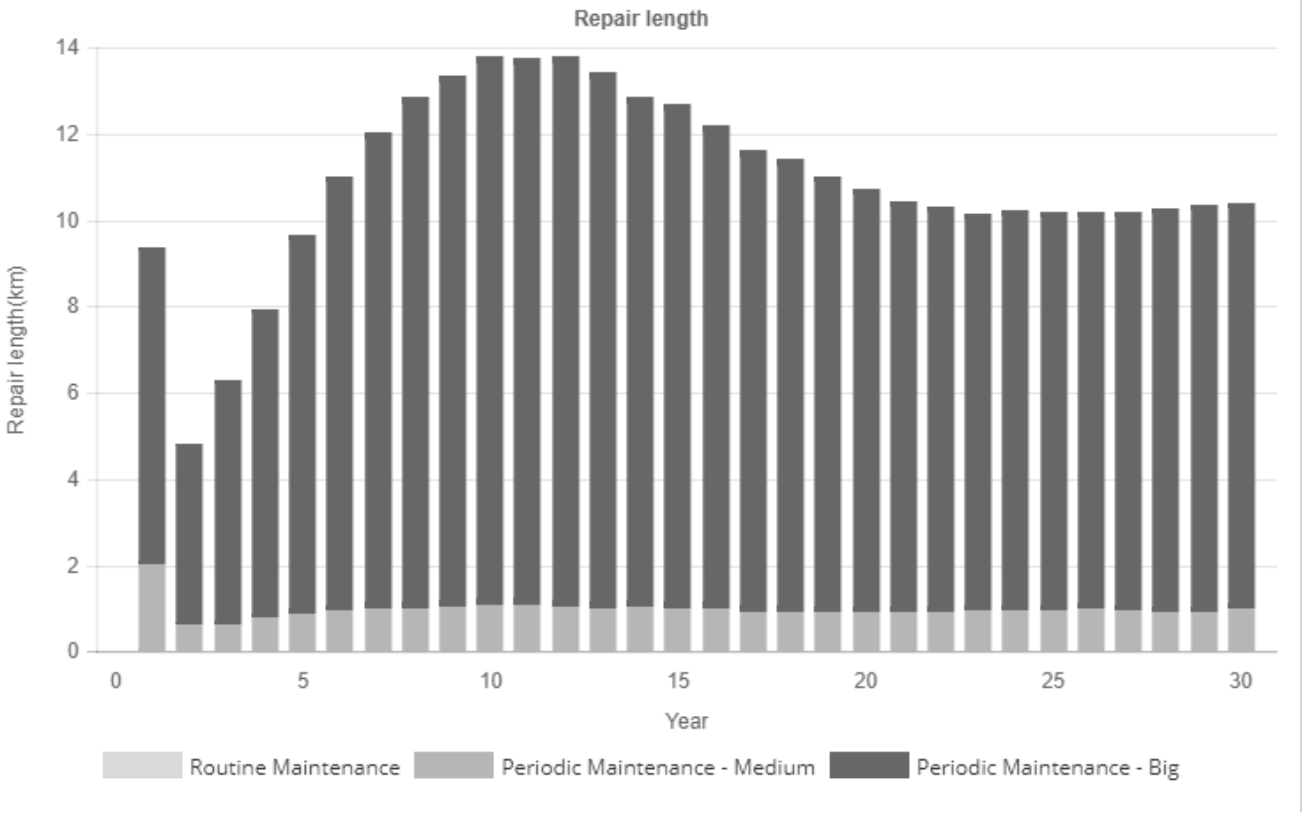


- risk indicates Risk and Routine Maintenance, ... are indicative of the repair classification

- 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

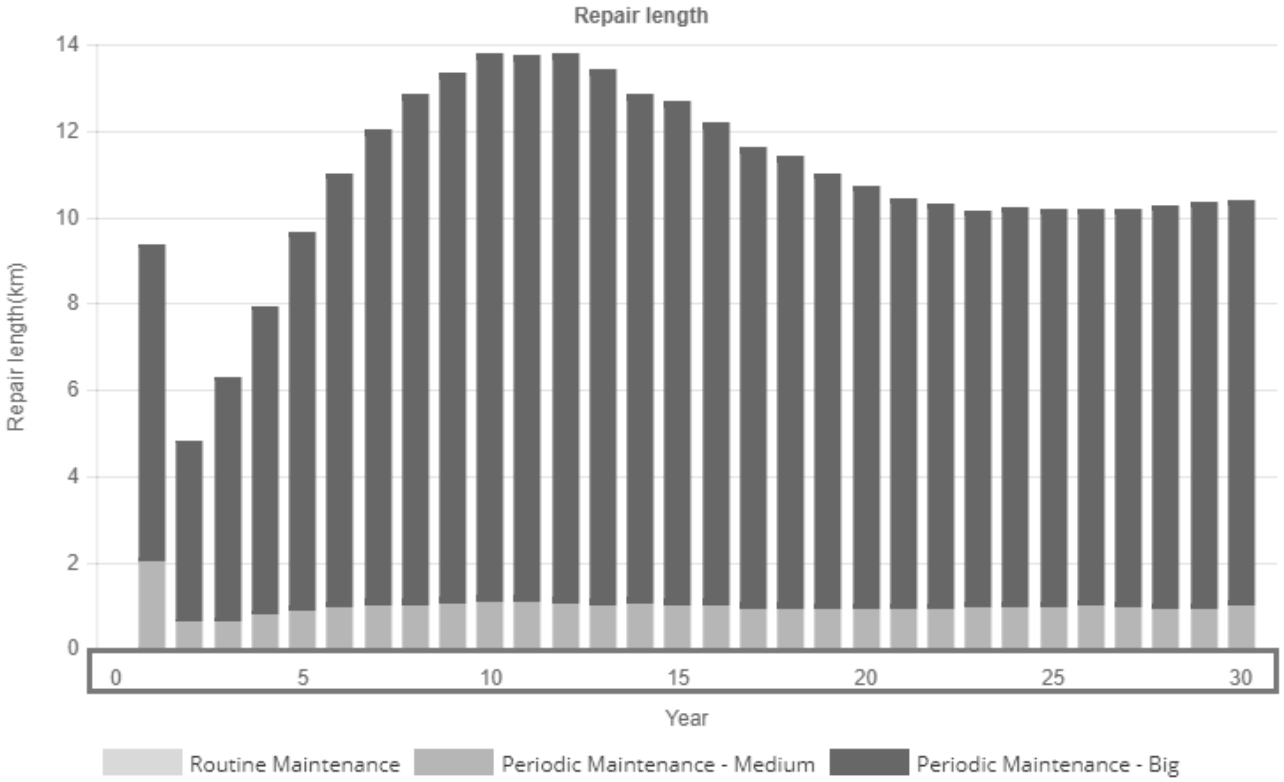


- **For Repair length chart**

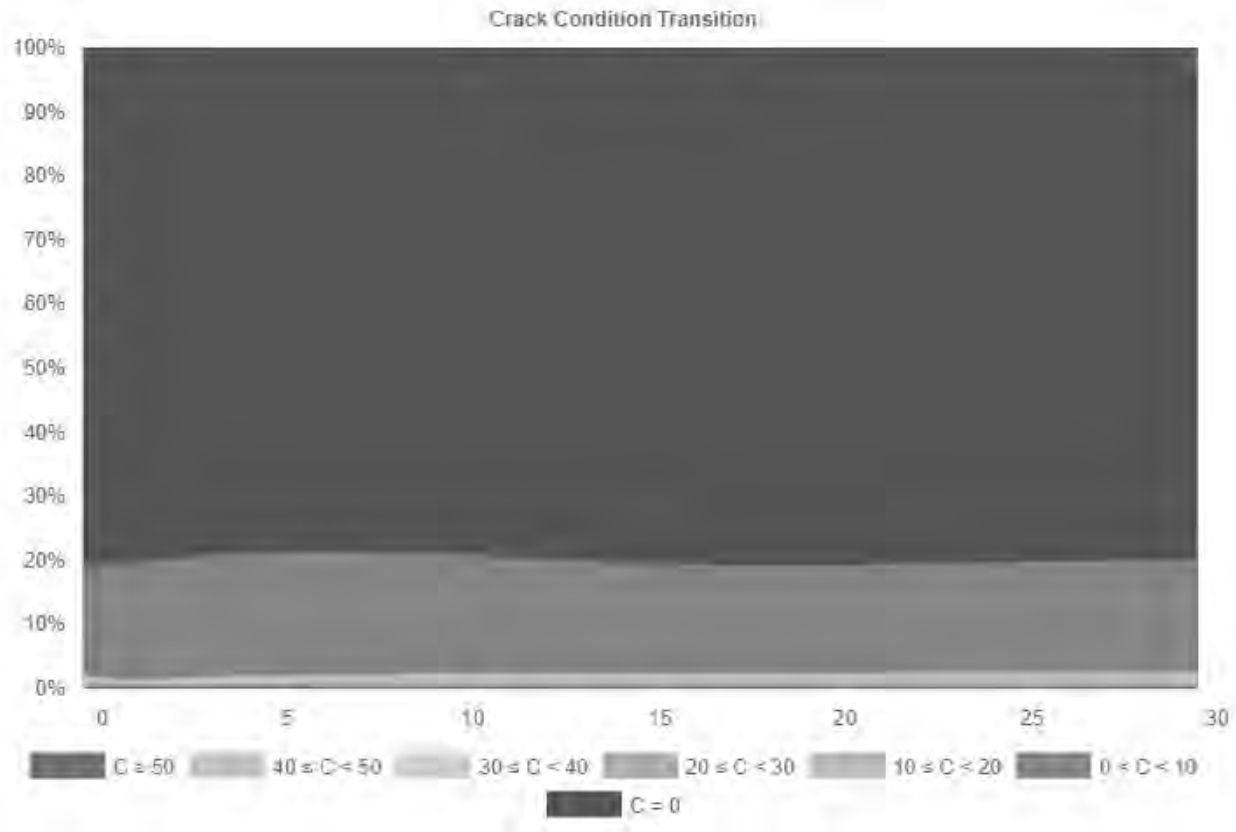


- Routine Maintenance, ... are indicative of the repair classification

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

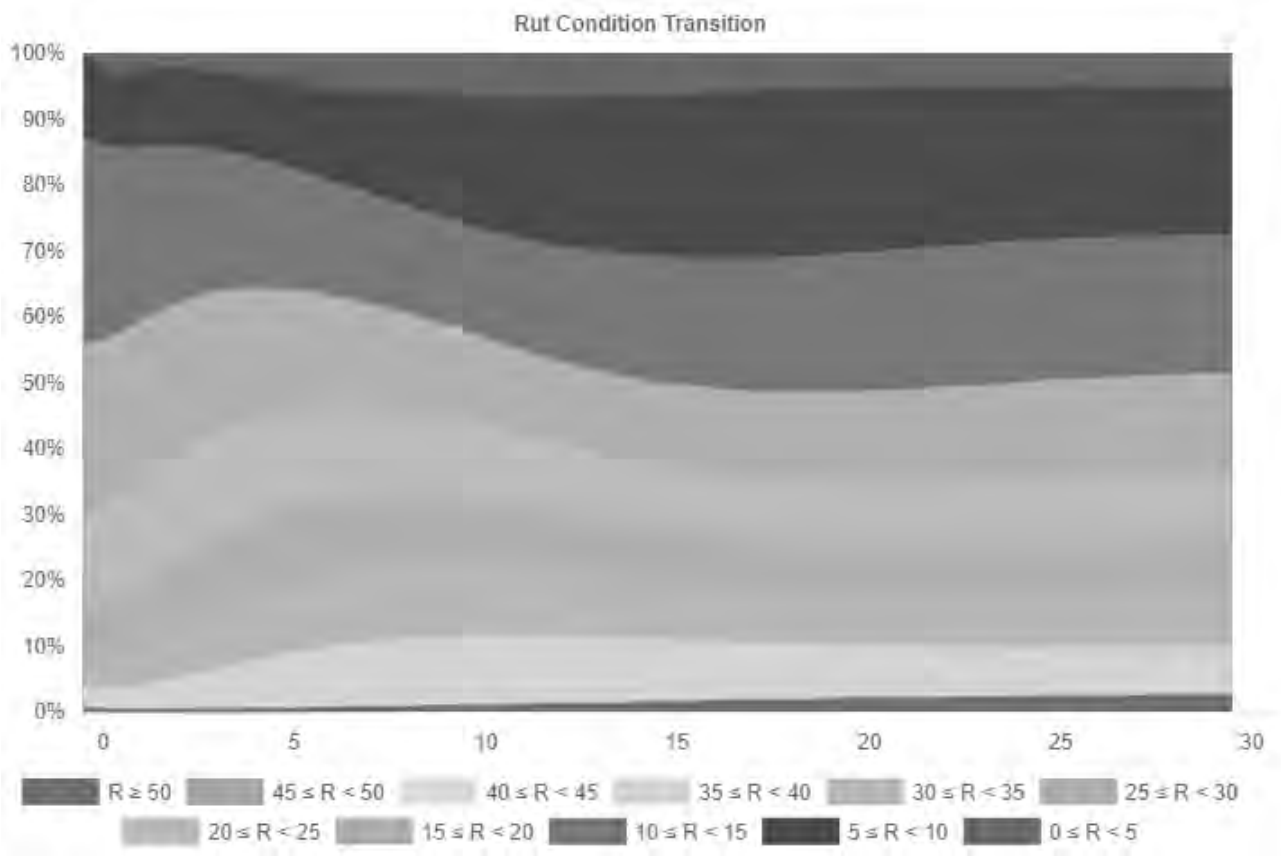


- **For Crack condition chart**



- Colors are indicative Condition rank of cracking ratio, example: C>=50, 40<=C<50…

- **For Rutting depth chart**



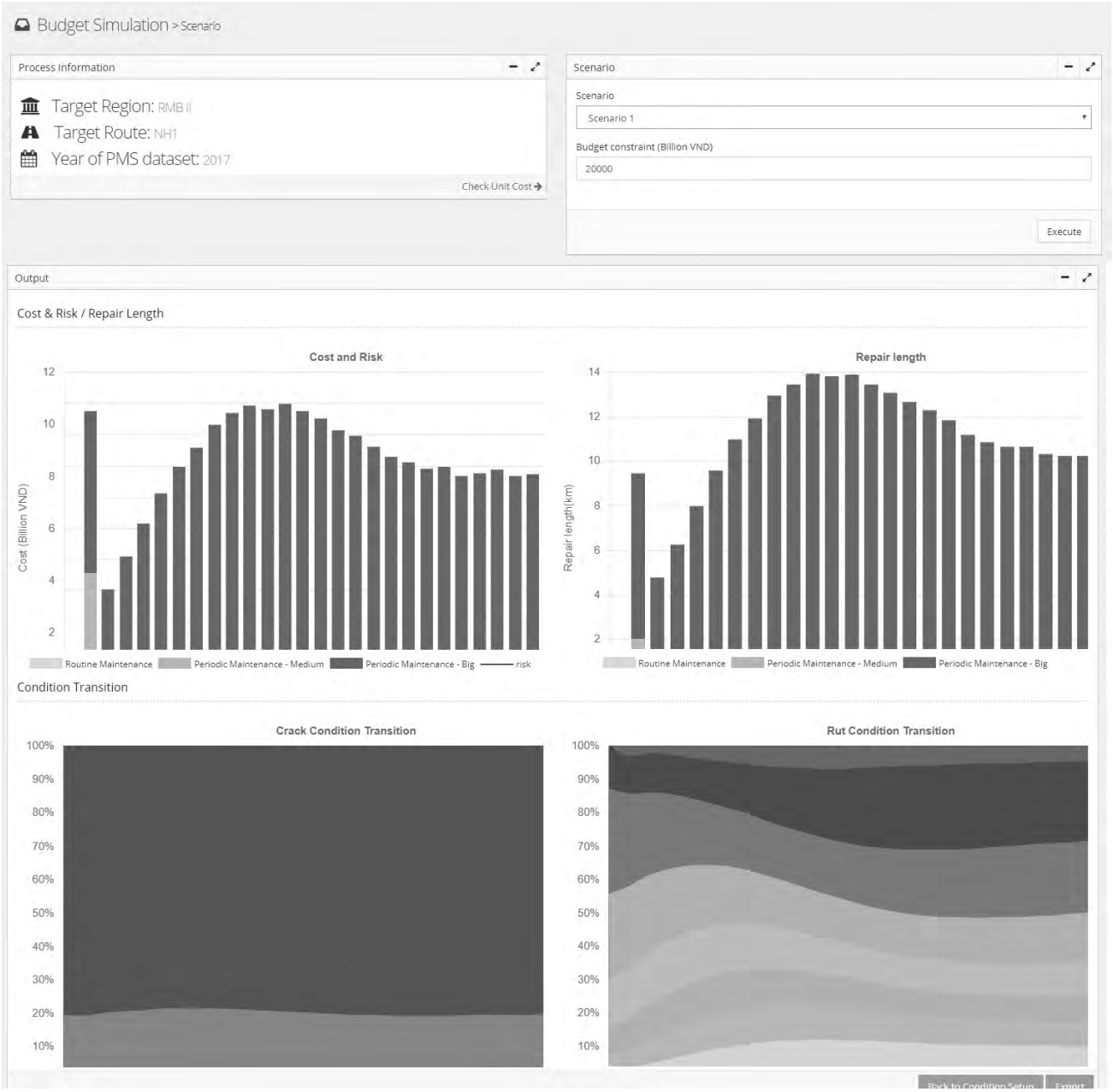
  - Colors are indicative Condition rank of rutting depth, example: R>=50, 40<=R<50…

- 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)

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

⇨ 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)

⇨ Results:

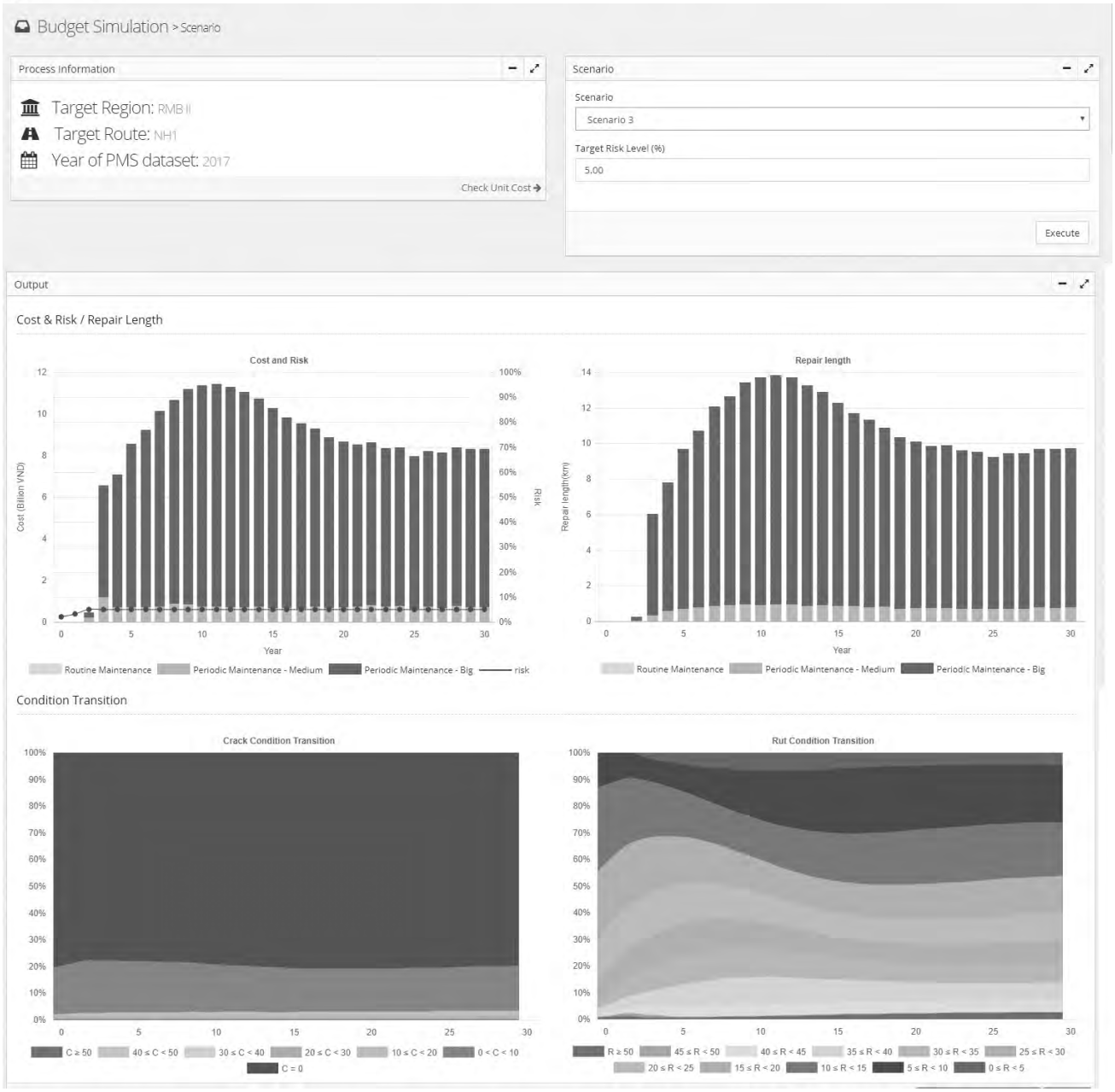
Note: Display data comments for each chart are analyzed as in the "<u>Description</u>" section of Scenario 0.

- 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)

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

⇨ Results:



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

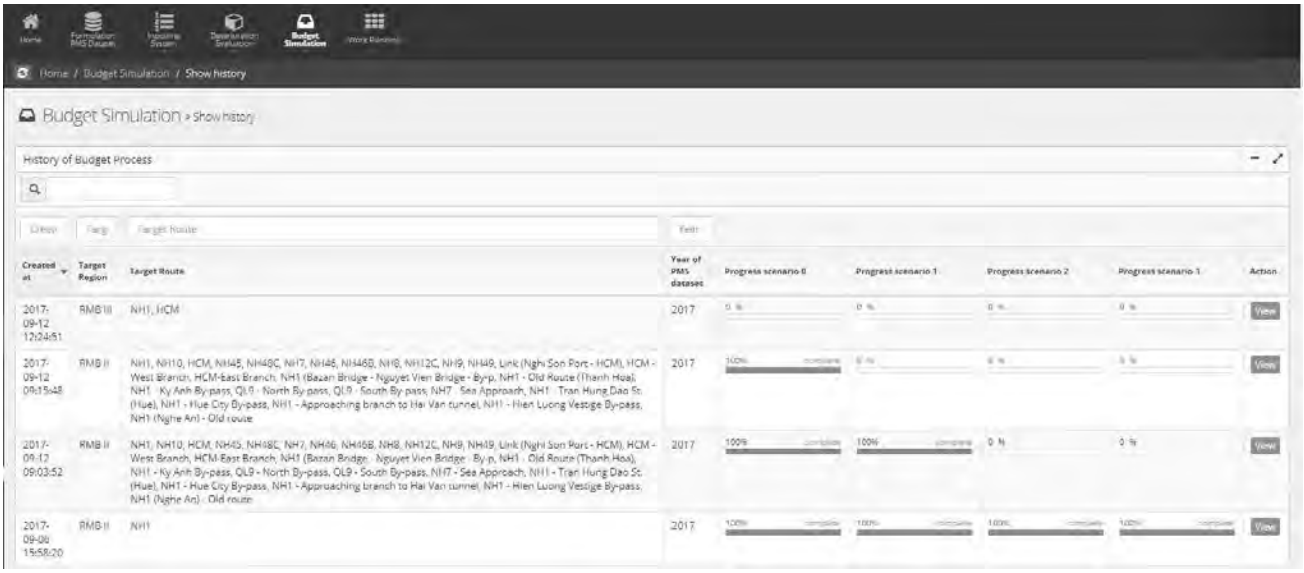
- User click “Export” to export data (excel file) or click “Back to Condition Setup” to back Repair condition screen

V) SHOW HISTORY

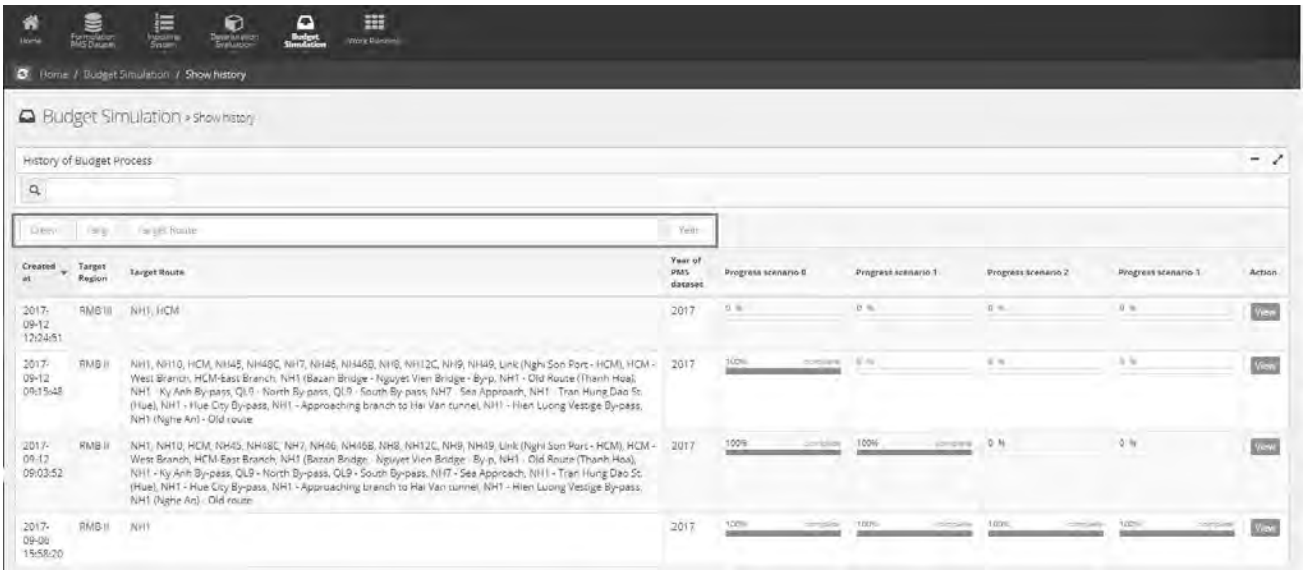
- Purpose: View history the created process

  User choose menu “Budget Simulation” and choose “Show History” function

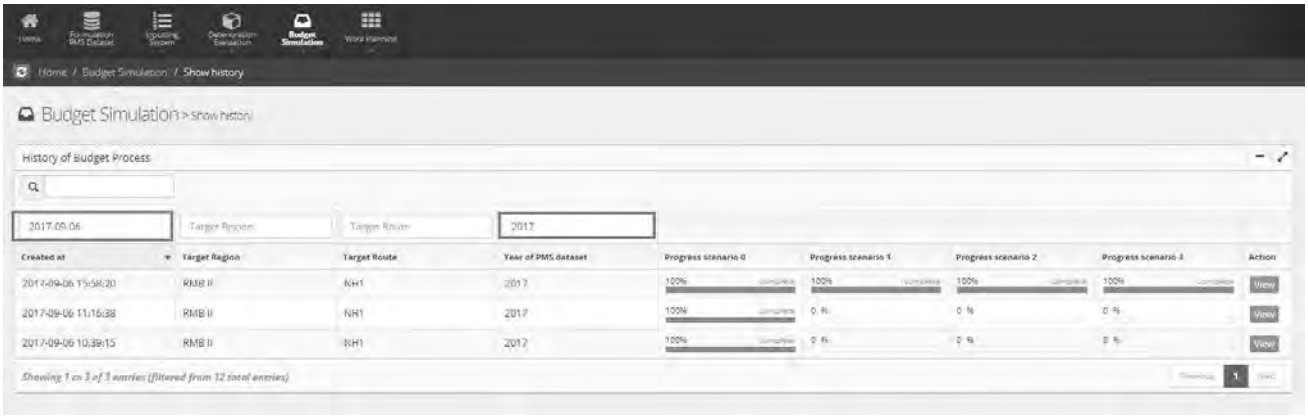
Screen after choose “Show History” function:



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

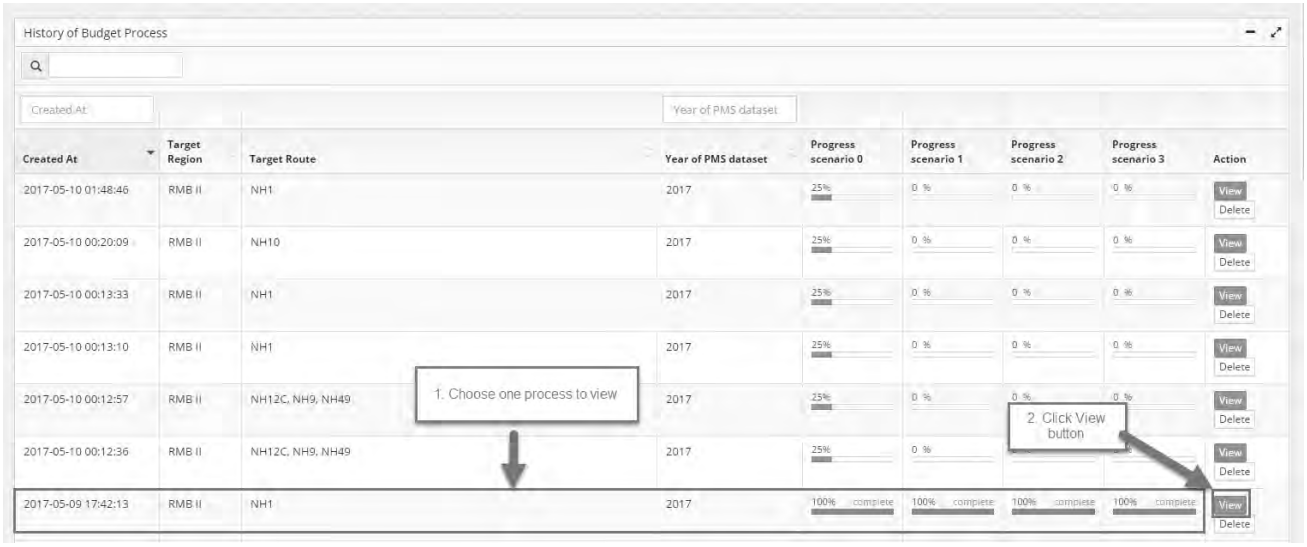


- Example: Search for Created at is “2017 -09-06” and Year of PMS dataset is “2017”



- View function:

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



⇨ The screen displays: Scenario screen

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 Process
Created At
Target Region
Target Route
Year of PMS dataset
Progress scenario 0
Progress scenario 1
Progress scenario 2
Progress scenario 3
Action
1. Choose one process to delete
2. Click Delete button
3. Click button OK
pms.ssgall.com:8080 says:
Are you sure?
OK
Cancel

USER'S MANUAL

REPAIR WORK PLANNING MODULE

CONTENTS

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.

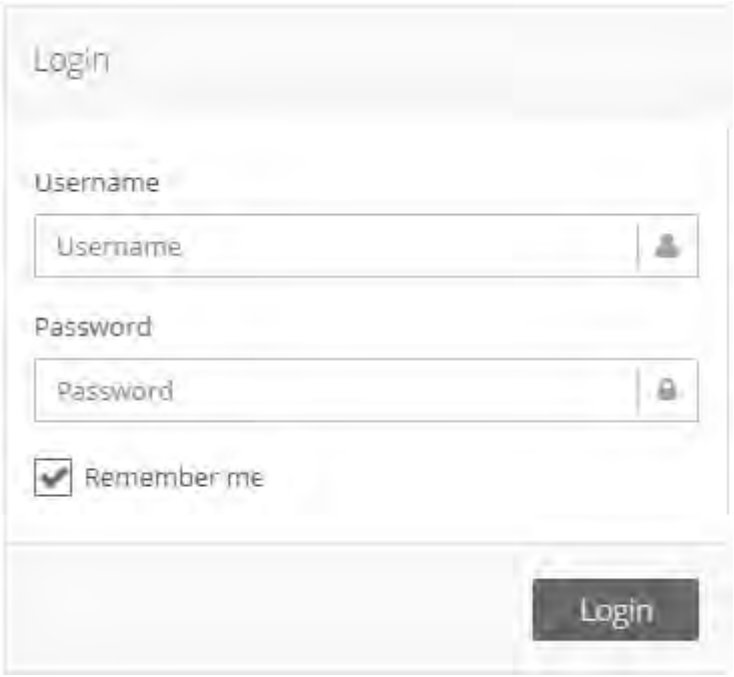
II) Process overview

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

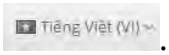
II.2) Login to the system

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

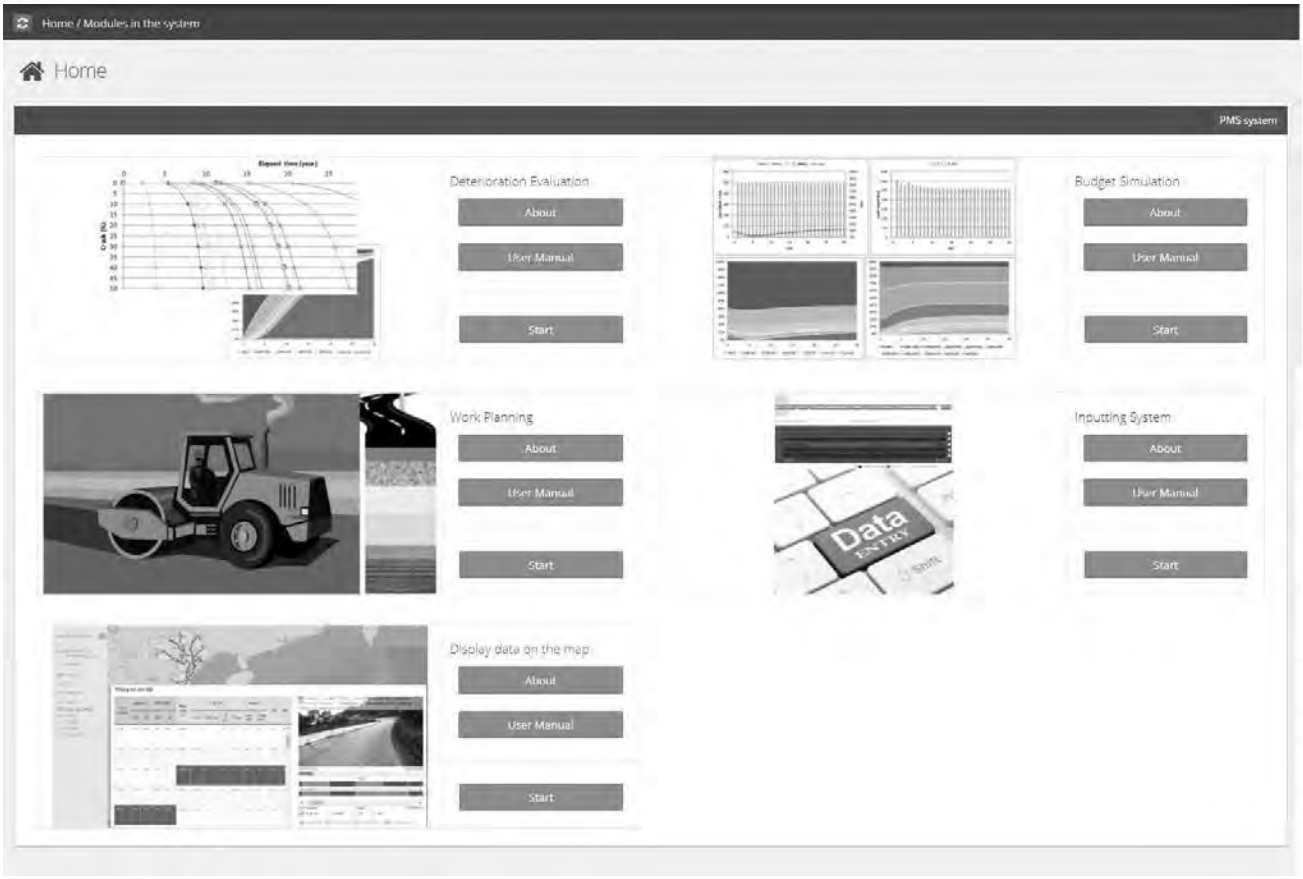


- User enter Username and Password
- Remember me: User can tick box Remember me to save login information for later time.
- Login: User can press button Login or press Enter

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 

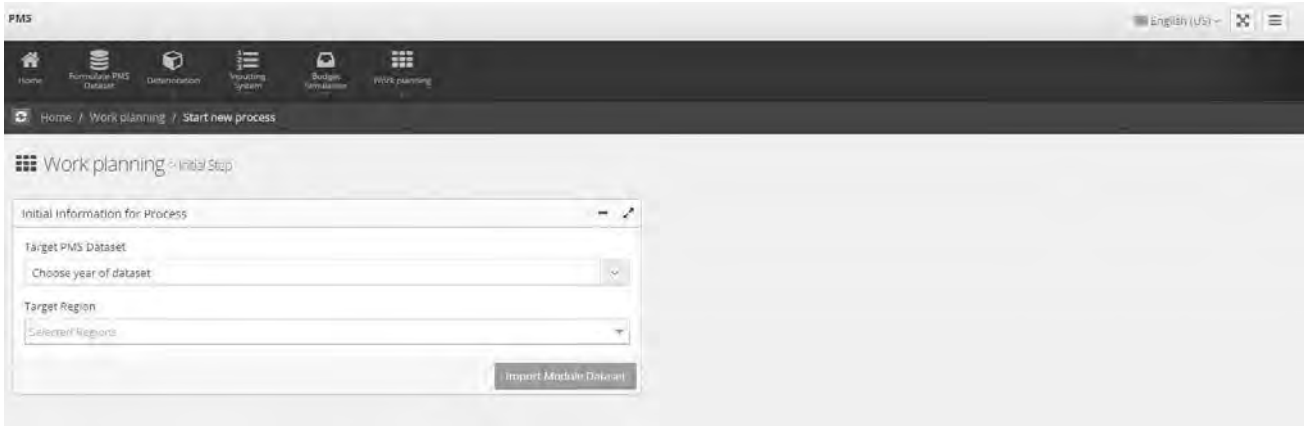
. Display screen:


Home / Modules in the system
Home
PMS system
Deterioration Evaluation
About
User Manual
Start
Budget Simulation
About
User Manual
Start
Work Planning
About
User Manual
Start
Data
ENTRY
Inputting System
About
User Manual
Start
Display data on the map
About
User Manual
Start

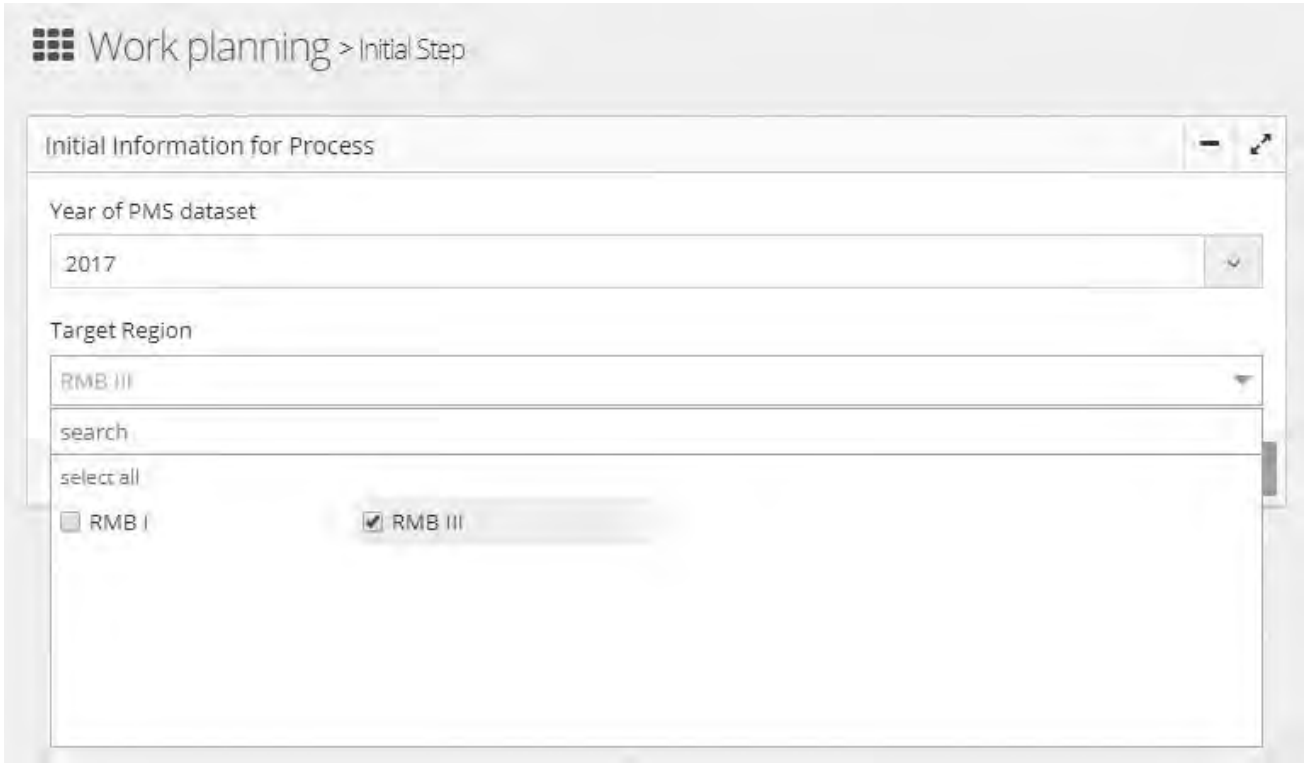
CHAPTER 2: WORK PLANNING OPERATION

I) INITIAL STEP

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



- User select value: **Target PMS dataset**, **Taget Region**.



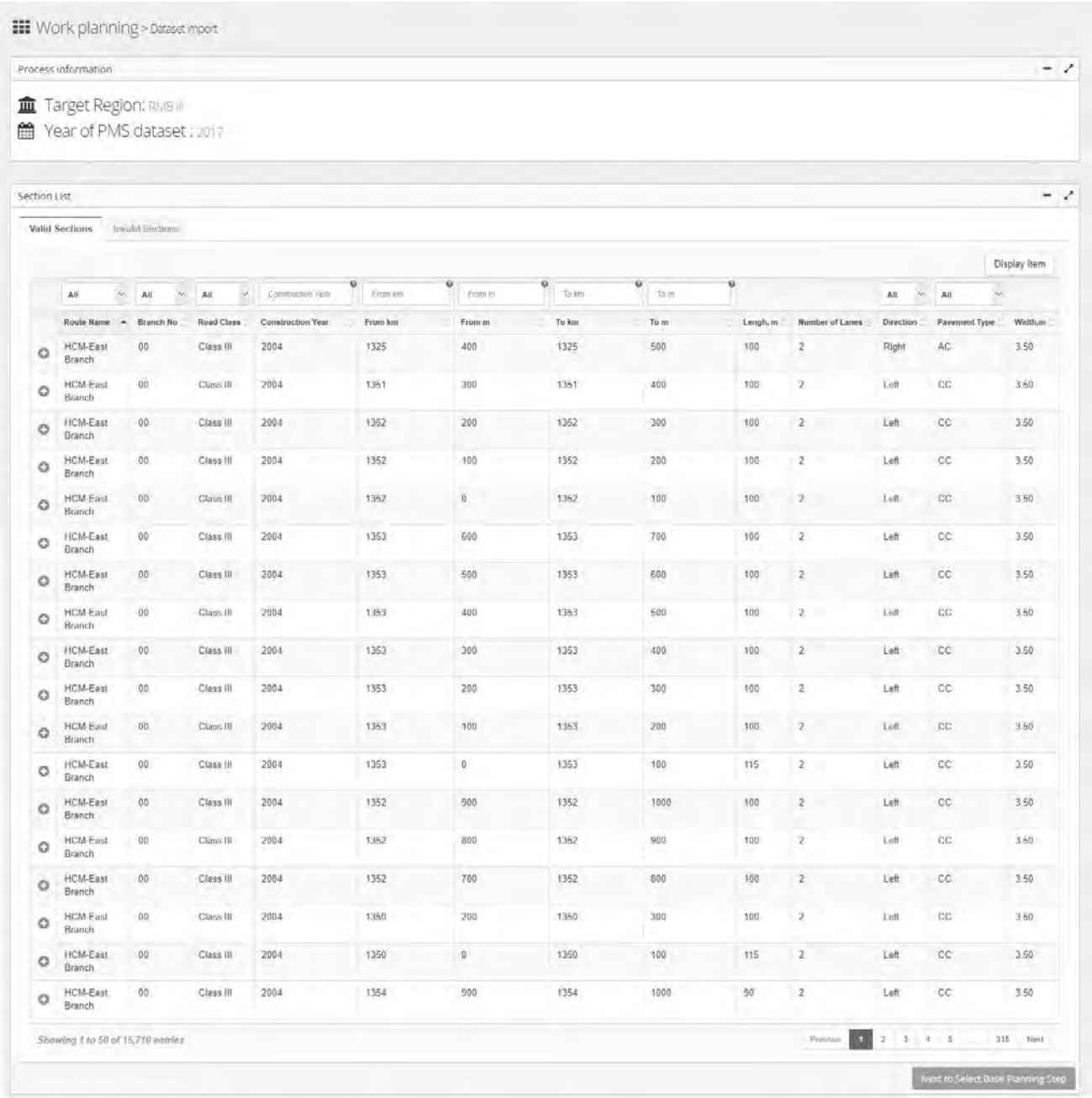
Note: User can select one or more Target Region of the selected Year of PMS dataset.

- Then click on 

button, display "Dataset import" screen

II) DATASET IMPORT

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

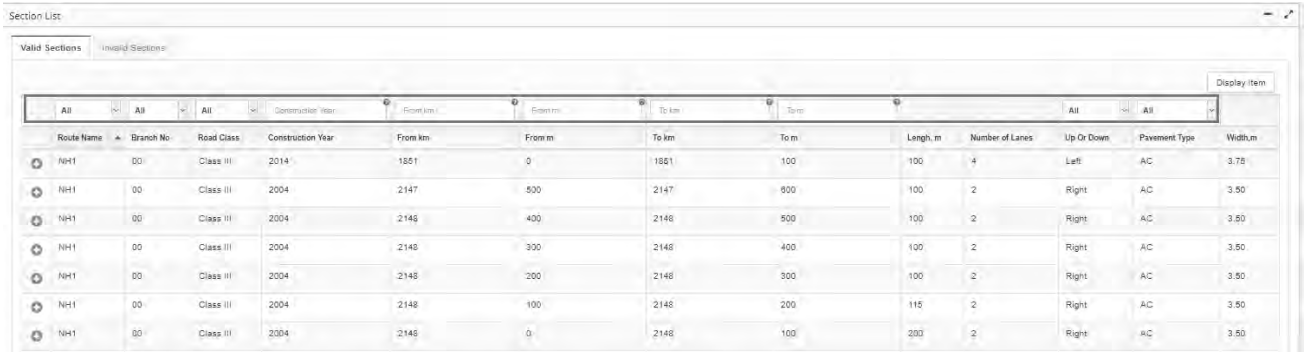


Description:

- 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

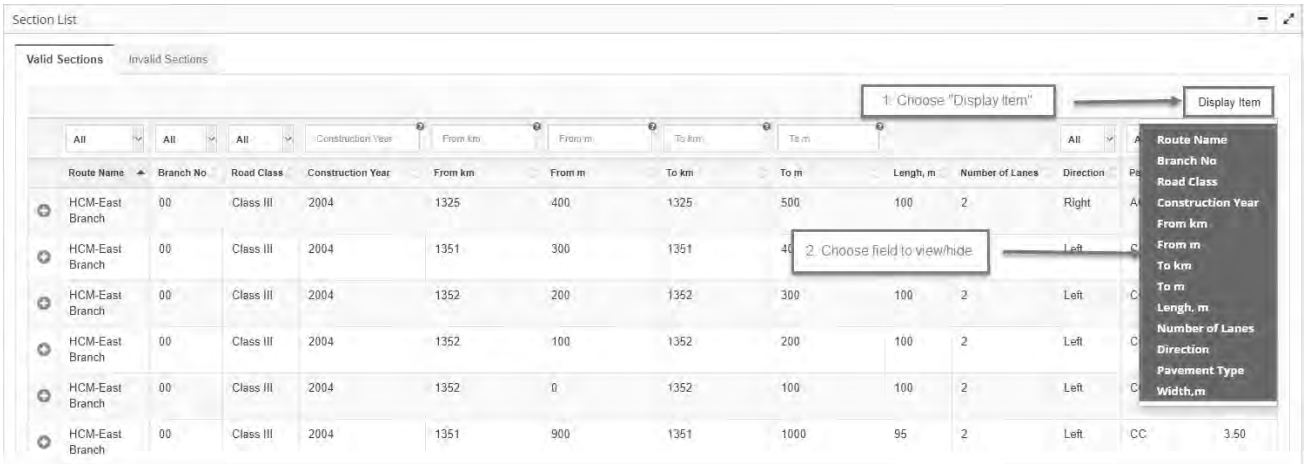
- Step 1: At the “Valid Sections”, choose Filter function
- Step 2: Input information to Filter



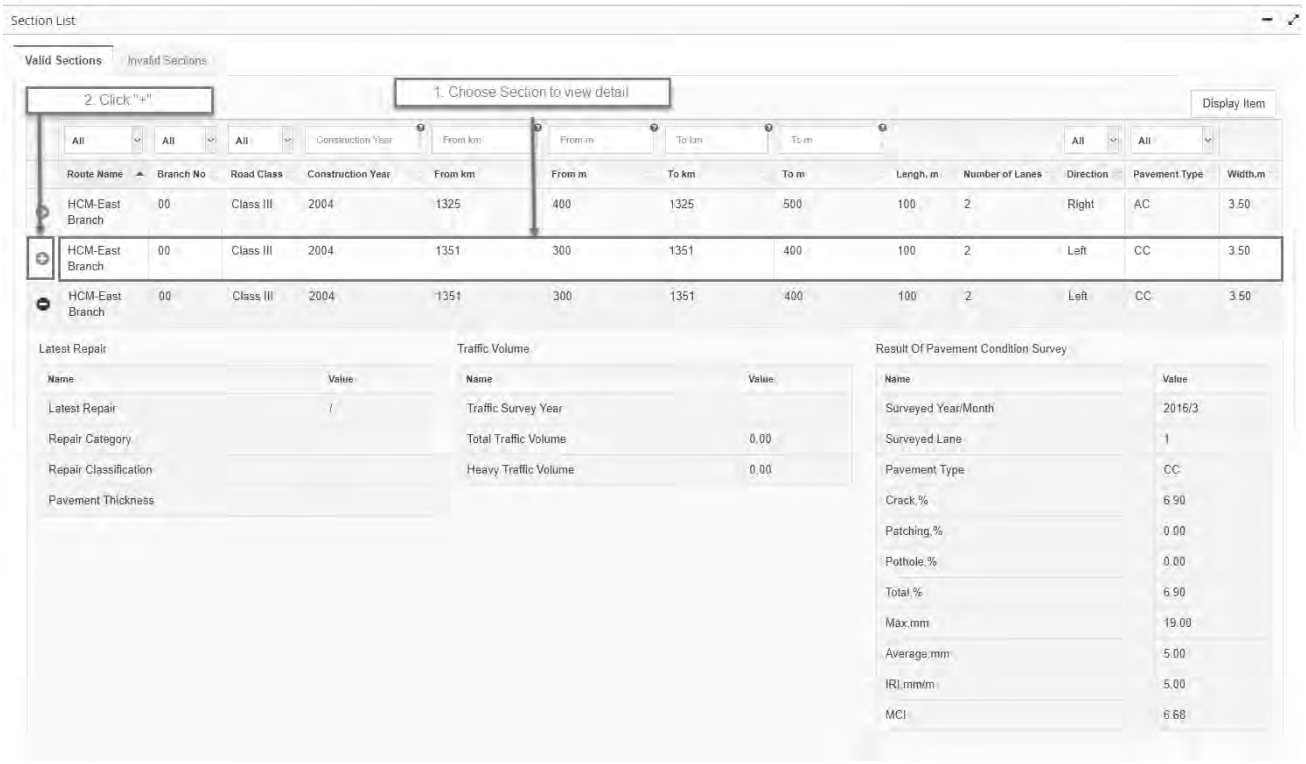
Example: Search sections have Construction Year data “2015”

⇨ Results: 2 valid records with search data

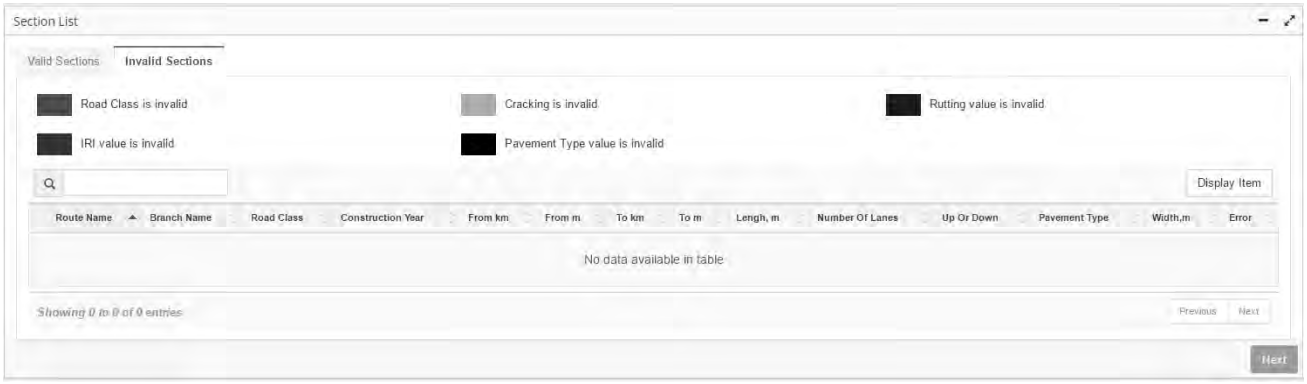
- Display Item function
  - Step 1: At the “Valid Sections”, click “Display Item” button
  - Step 2: Setup columns to view/hide



- 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



- o "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)

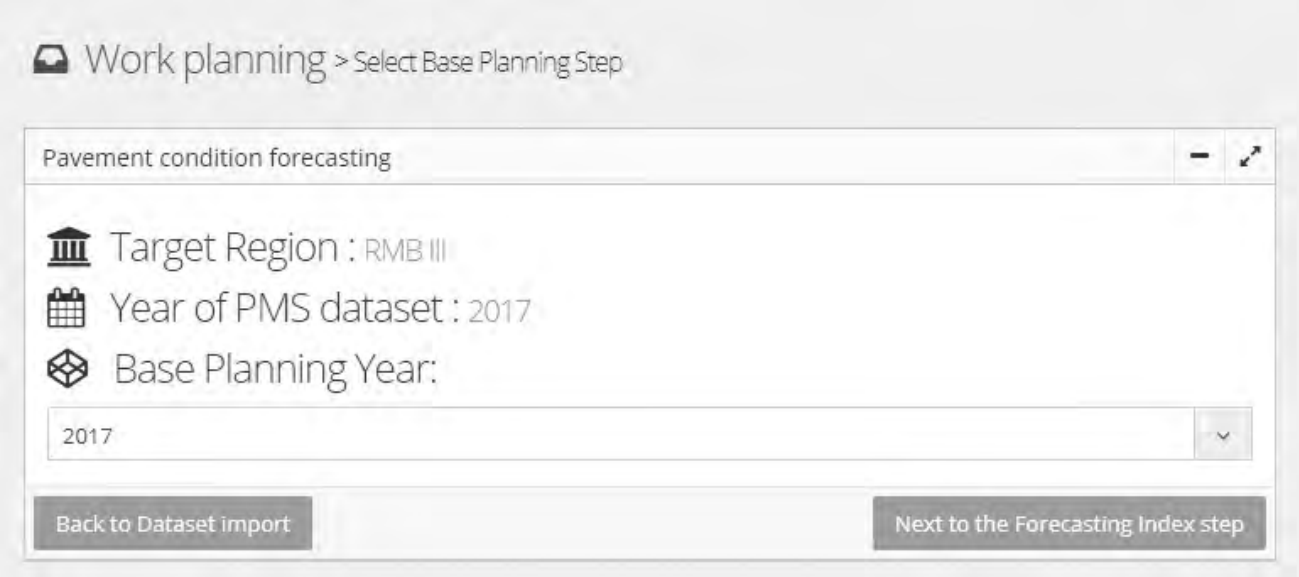


Note: The functions of "Invalid sections" corresponding operation as "Valid Section"

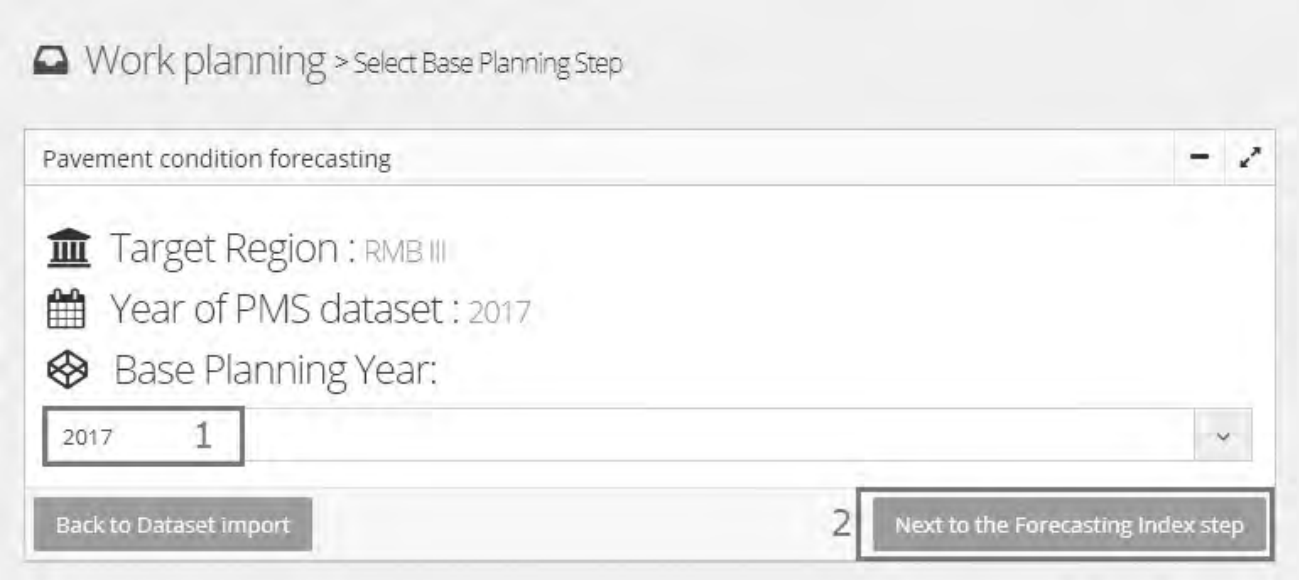
- User click "Next to Select Base Planning Step" button to "Select Base Planning Step" screen

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



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

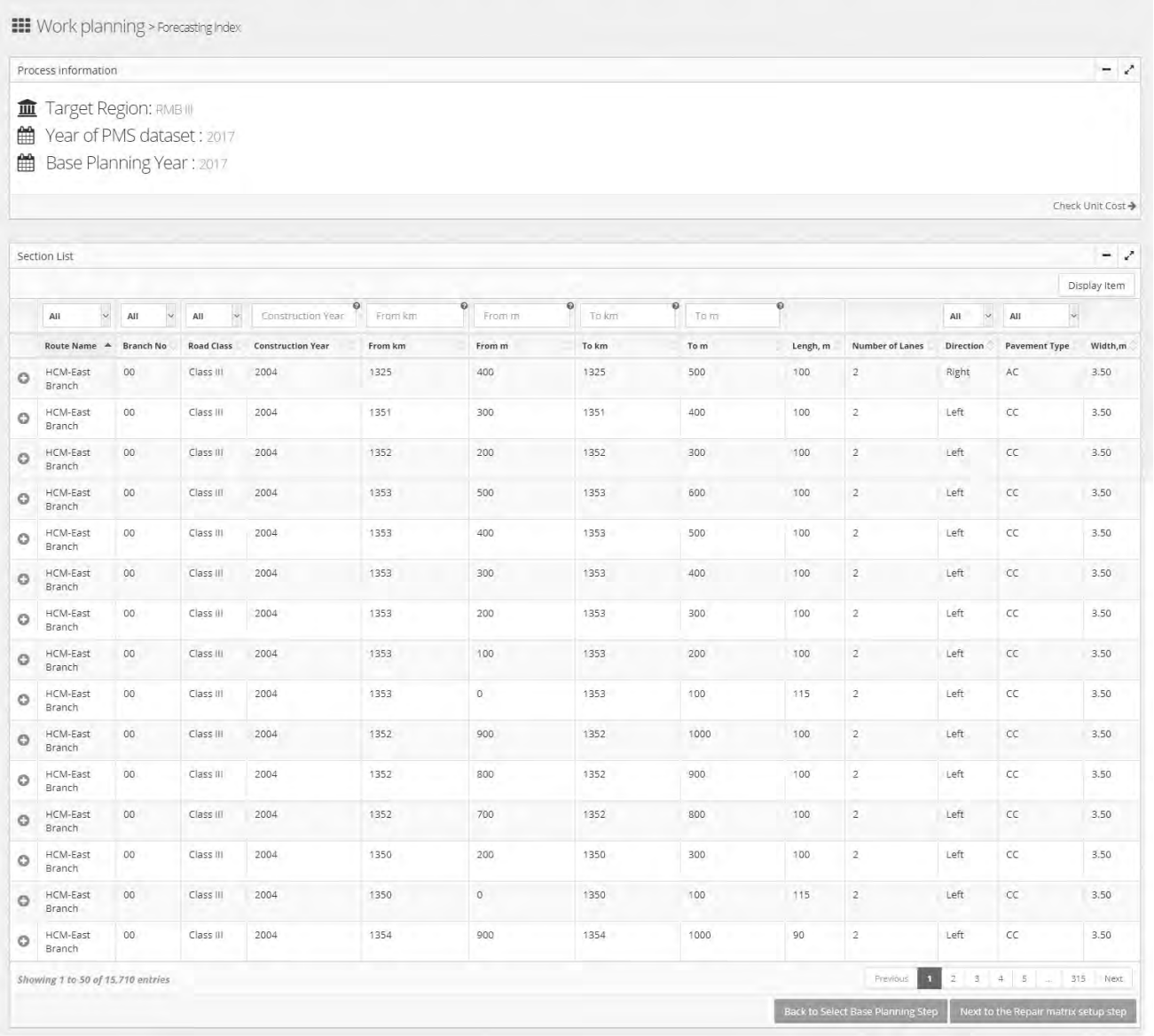


Other information: User can click "Back to Dataset Import" button to the "Dataset Import" screen

⇨ 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.
- After "Select base planning step", the system swithes "Forecasting index" screen

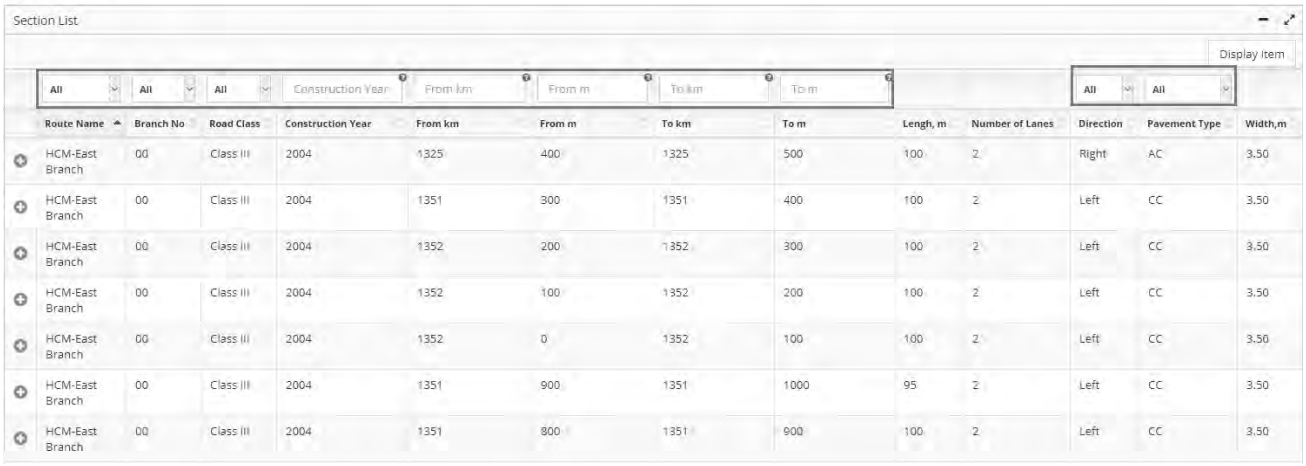


Route Name	Branch No	Road Class	Construction Year	From km	From m	To km	To m	Lengh, m	Number of Lanes	Direction	Pavement Type	Width,m
HCM-East Branch	00	Class III	2004	1325	400	1325	500	100	2	Right	AC	3.50
HCM-East Branch	00	Class III	2004	1351	300	1351	400	100	2	Left	CC	3.50
HCM-East Branch	00	Class III	2004	1352	200	1352	300	100	2	Left	CC	3.50
HCM-East Branch	00	Class III	2004	1353	500	1353	600	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	CC	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	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	Left	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

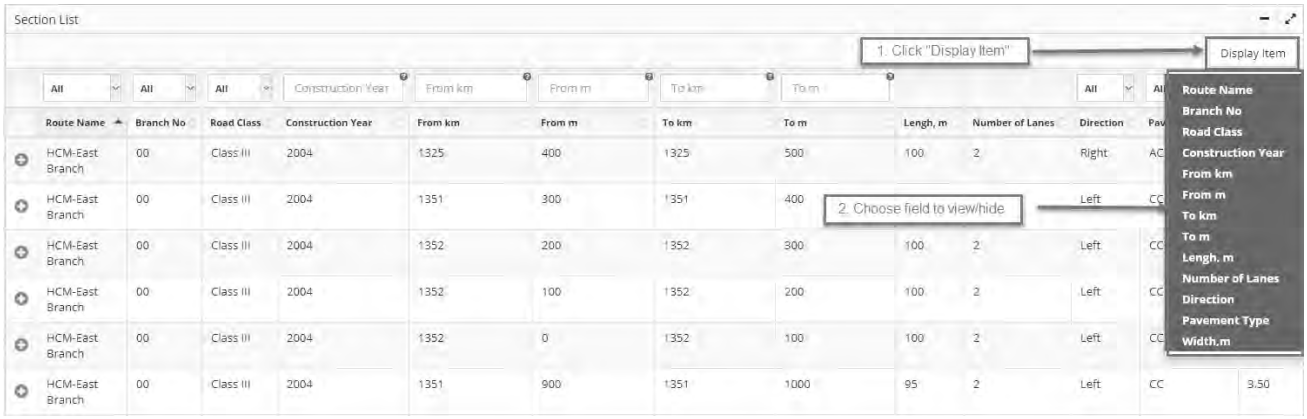
Description:

- "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

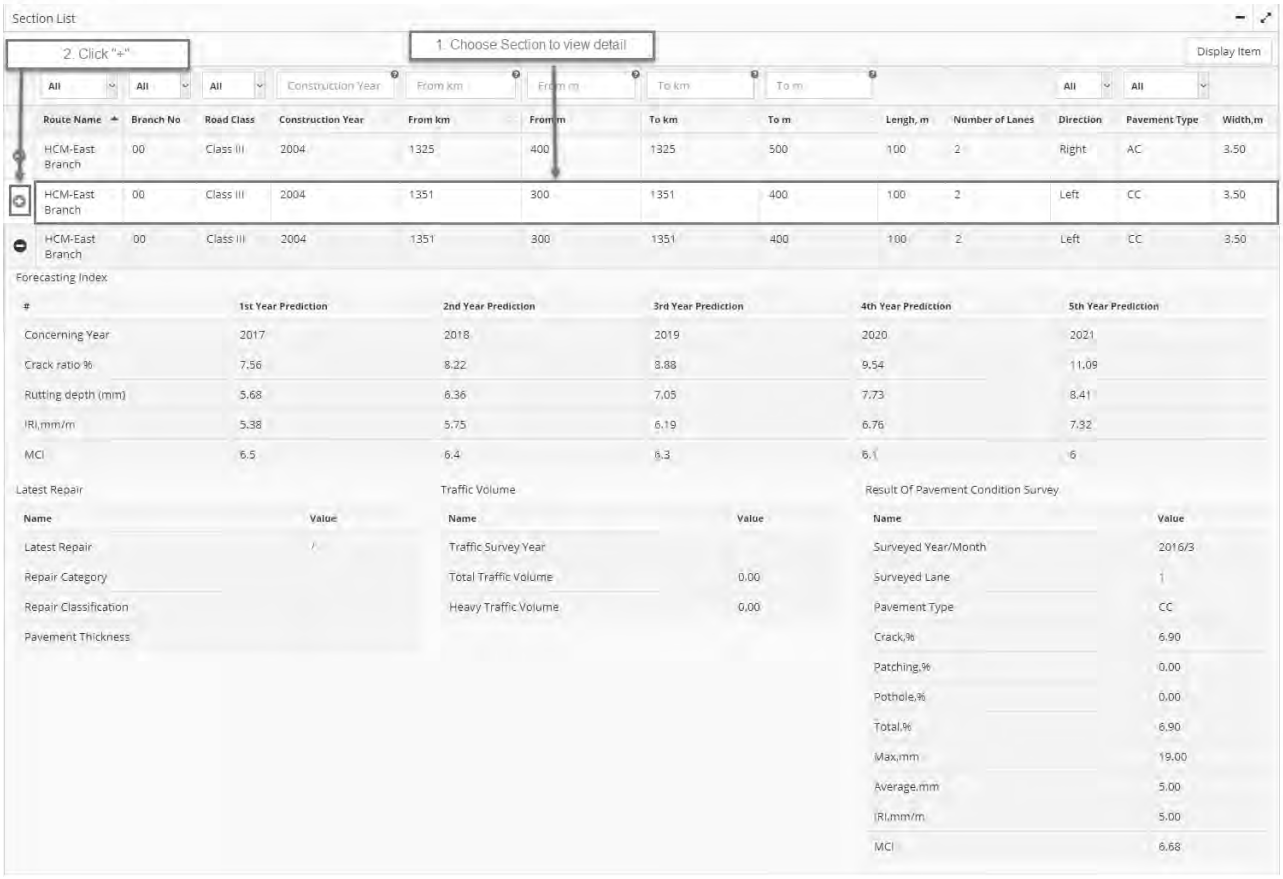
  "Check Unit Cost": User click "Check Unit Cost" link to view information detal for Repair method (Repair method name, Unit Cost…)
- "Section List": Show information about parameter for each section
- Information for function
  - Filter function
    - Step 1: At the "Section List" form, choose Filter function
    - Step 2: Input information to filter



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



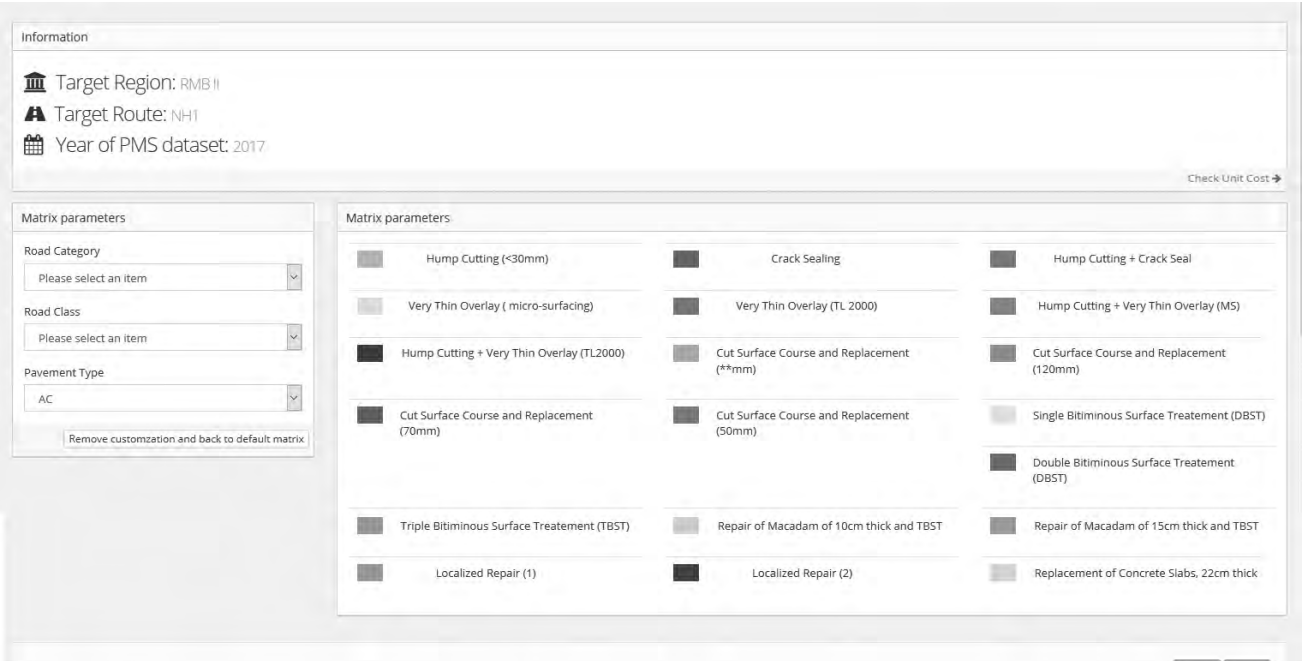
- View Information Detail Section function
  - Step 1: At the "List Section", choose section to view information detail: Forcecasting Index (for 5 year), Lastest Repair, Traffic Volume, Result Of Pavement Condition Survey
  - Step 2: Click  to view information detail



- 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

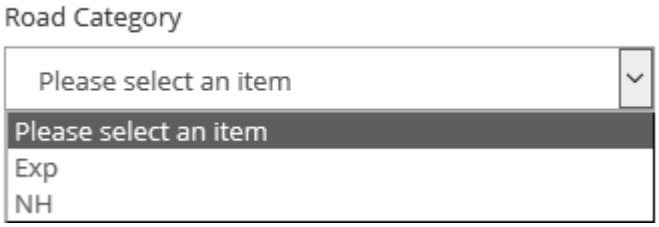
V) SETTING REPAIR MATRIX

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



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)
- Matrix parameters form: Include information
  - Road category: Exp and NH

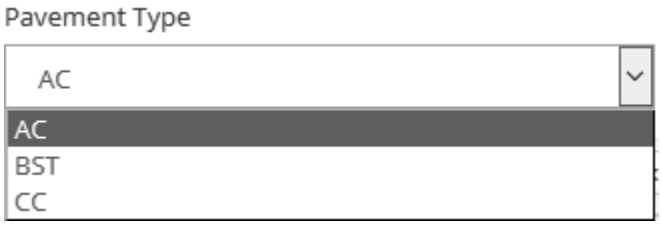


  - Road class: Class I, Class II, Class III, Class IV, Class V, Class VI

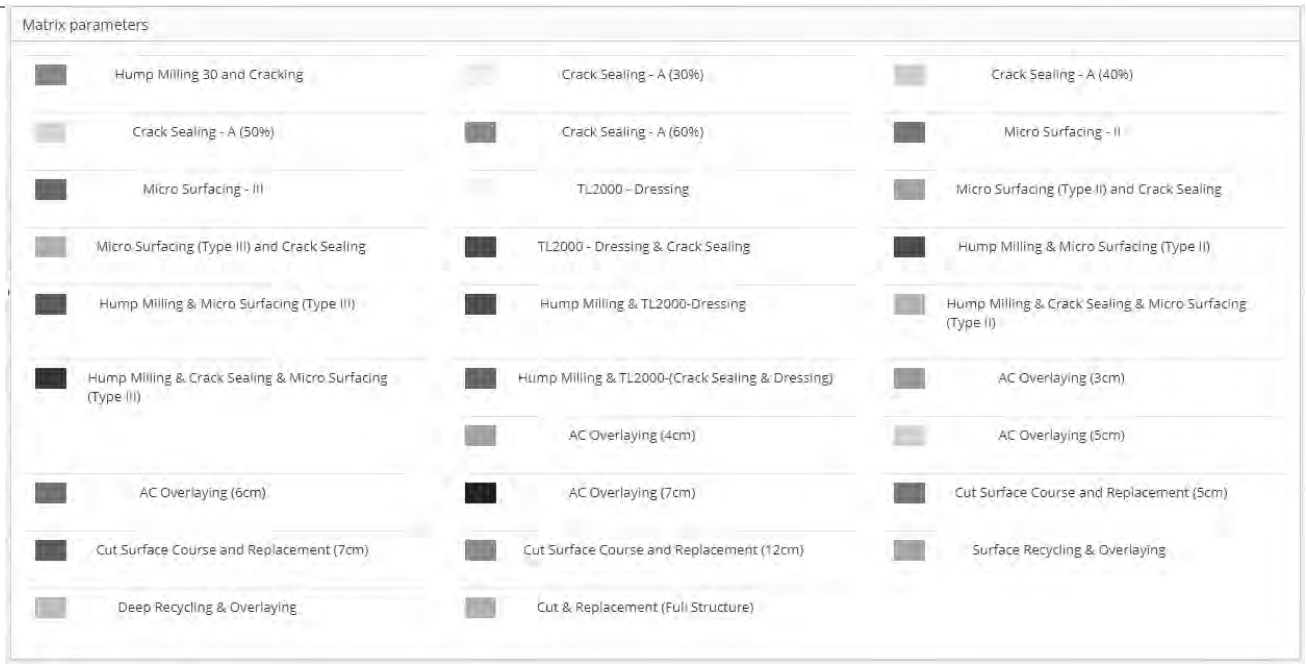
Note:

- ***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.***

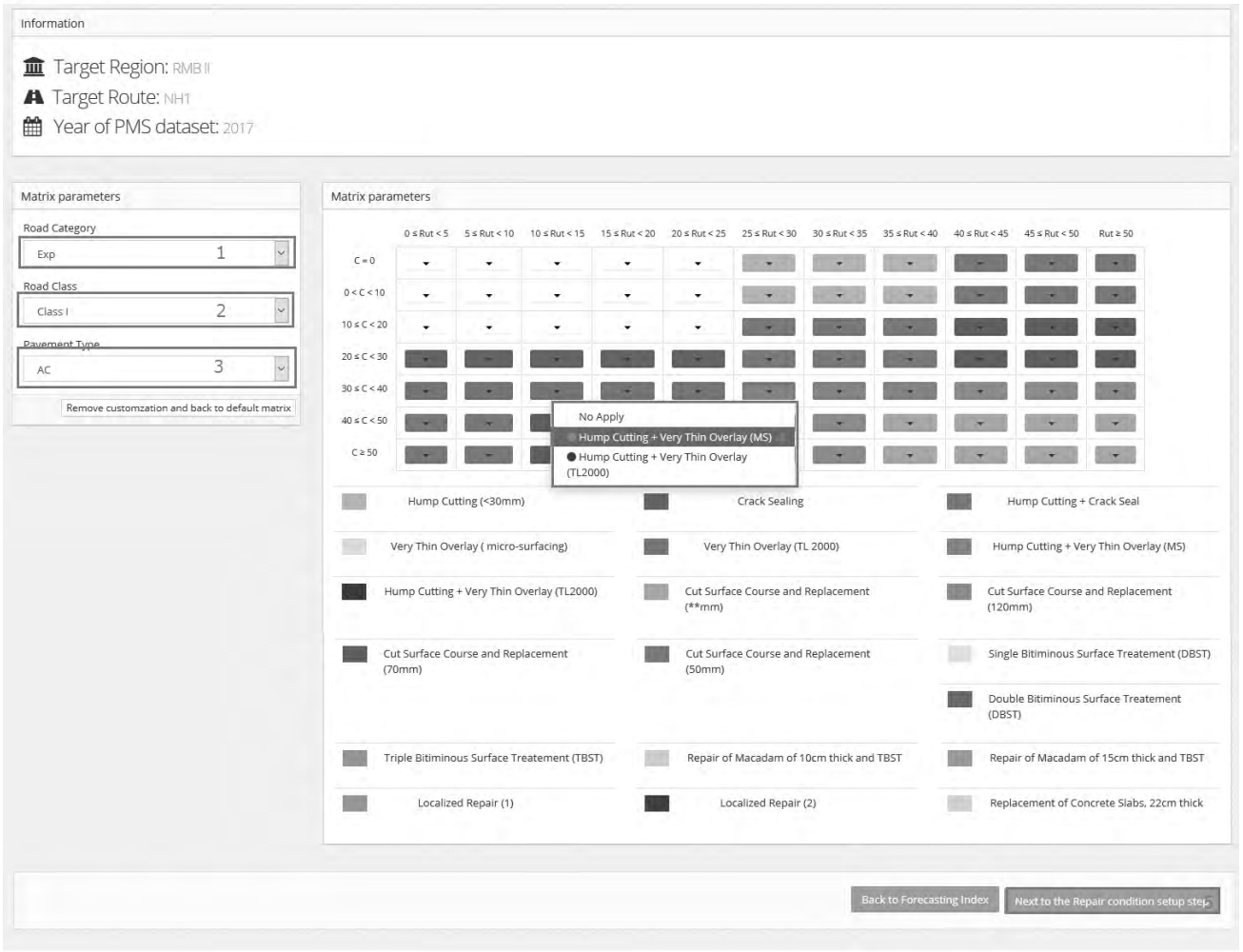
  - Pavement Type: AC, BST, CC



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



- 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



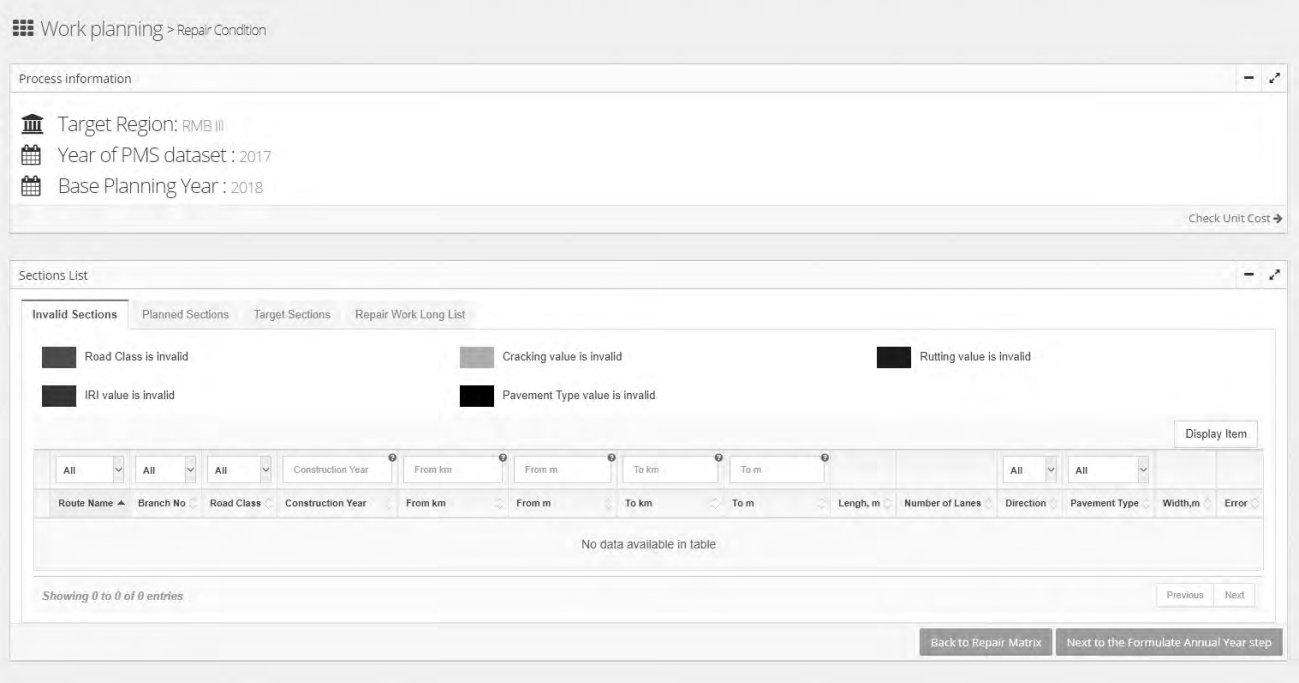
=> Other information:

- 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.

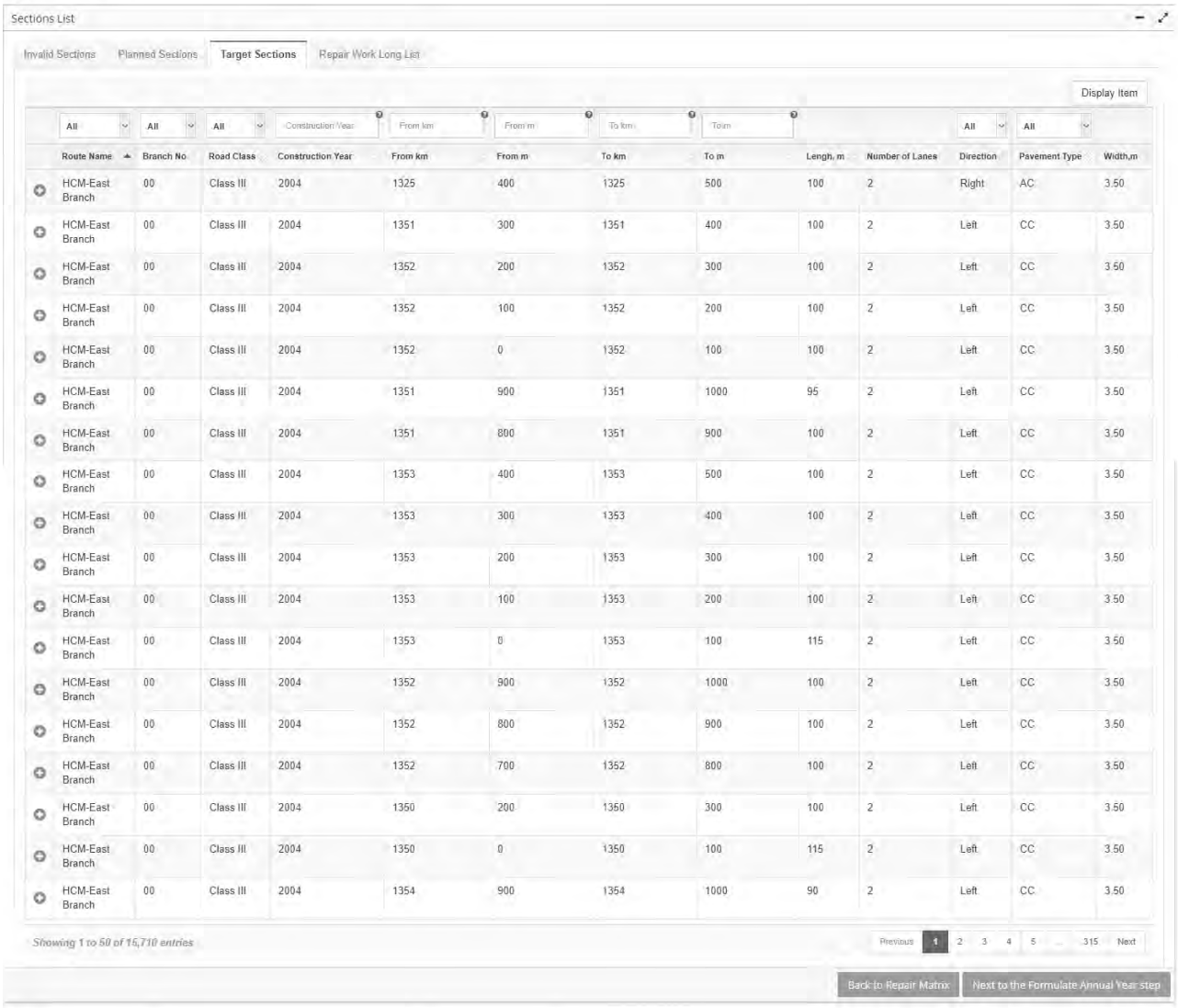
VI) SETTING REPAIR CONDITION

- Purpose: Setting repair information for each section



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



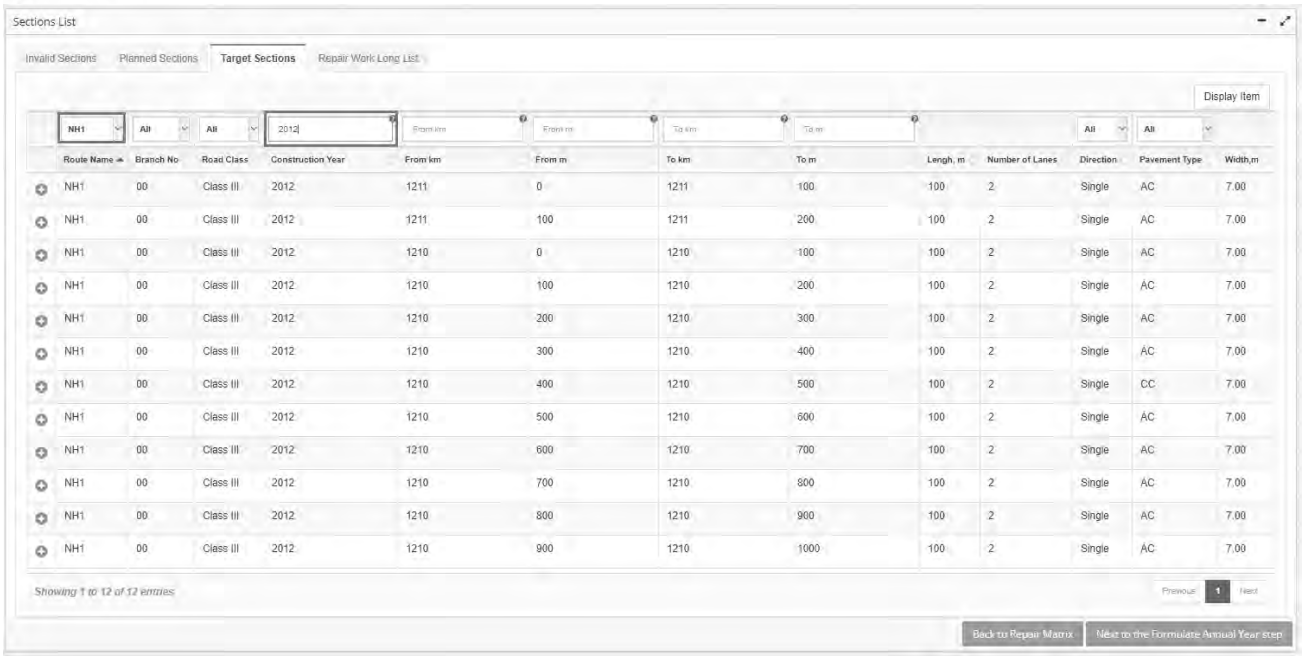
Route Name	Branch No	Road Class	Construction Year	From km	From m	To km	To m	Lengh, m	Number of Lanes	Direction	Pavement Type	Width,m
HCM-East Branch	00	Class III	2004	1325	400	1325	500	100	2	Right	AC	3.50
HCM-East Branch	00	Class III	2004	1351	300	1351	400	100	2	Left	CC	3.50
HCM-East Branch	00	Class 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	CC	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	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	Left	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

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

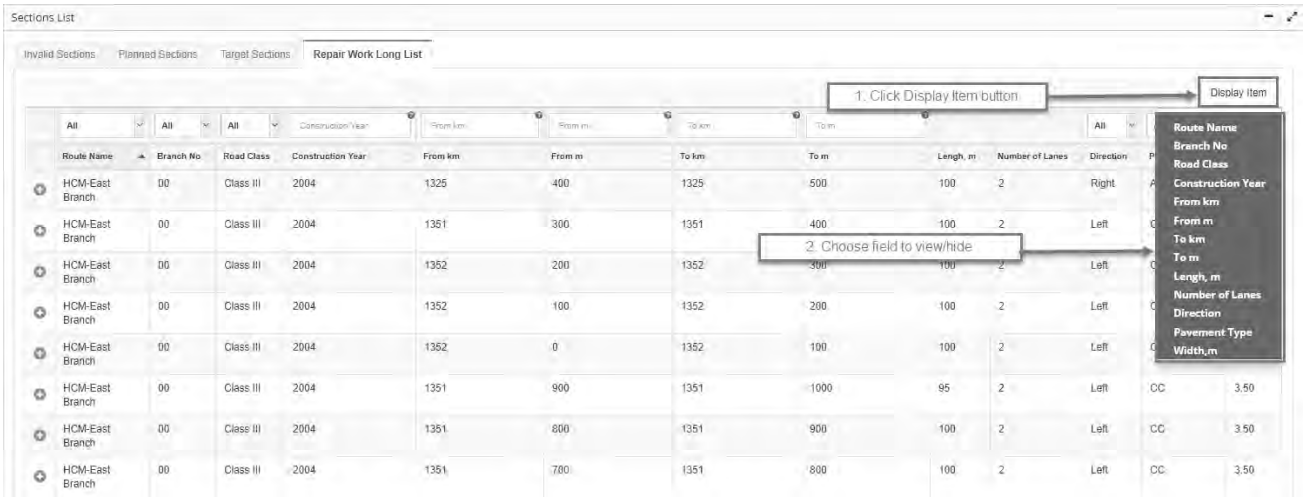
Information for function:

- 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"



- 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

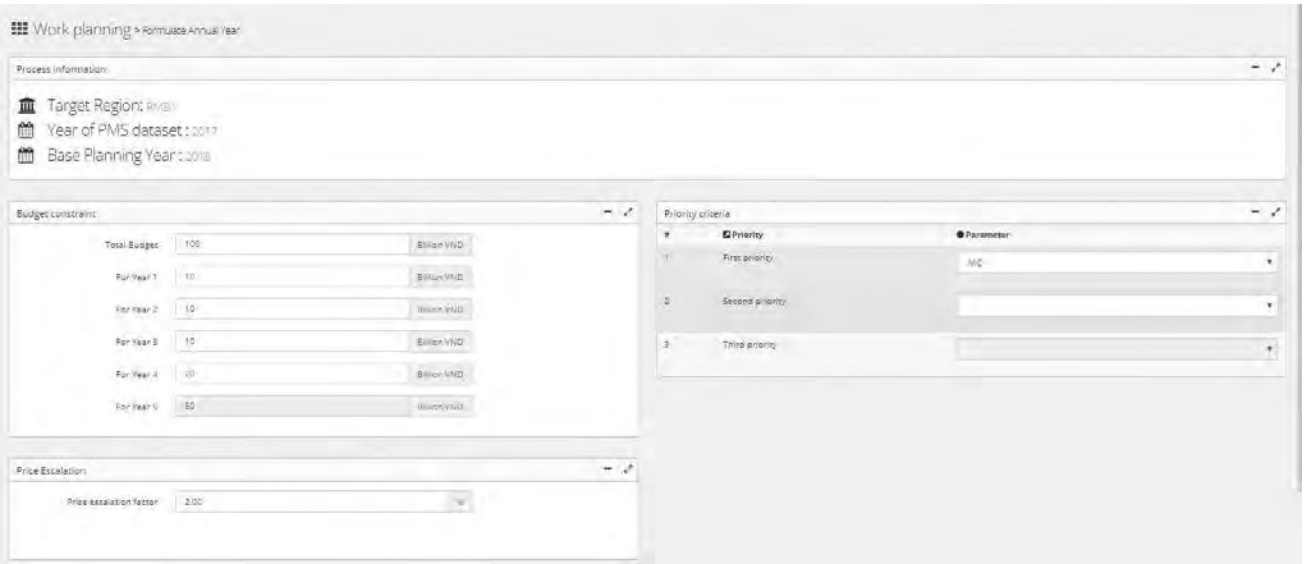


- View Information Detail for Target Sections
  - Step 1: Choose one section belong tab to view information
  - Step 2: Click  to view information detail

- 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

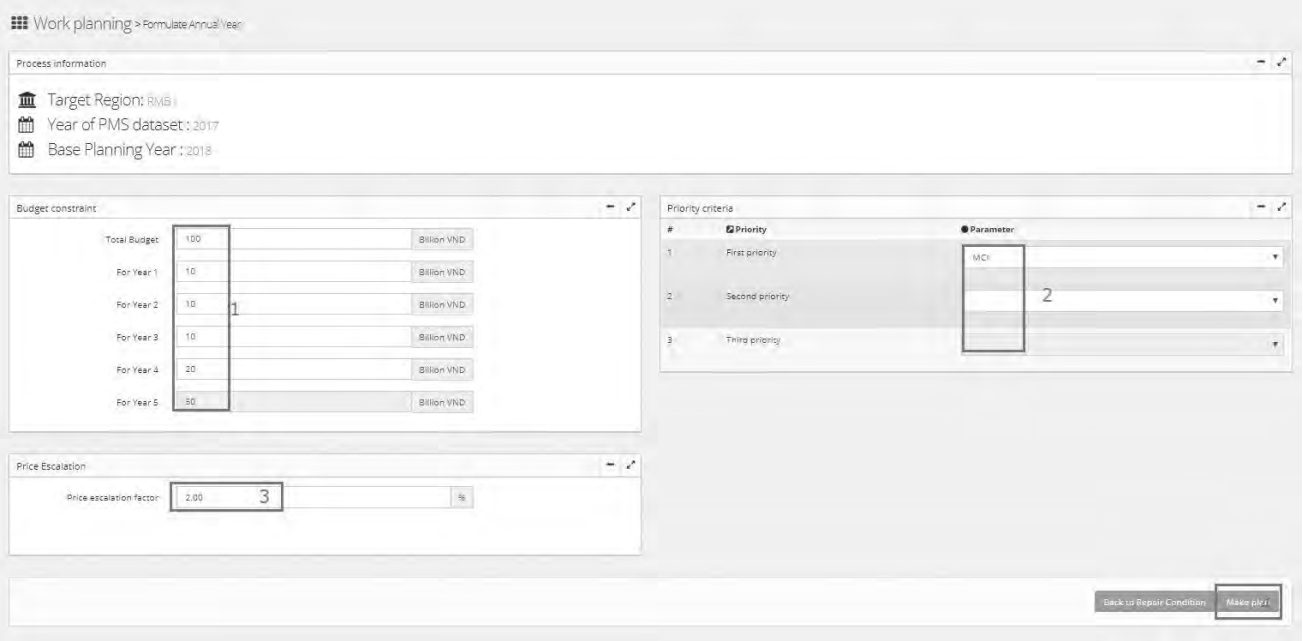
- Purpose: Setting parameters for



- Information for "Formualate 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))

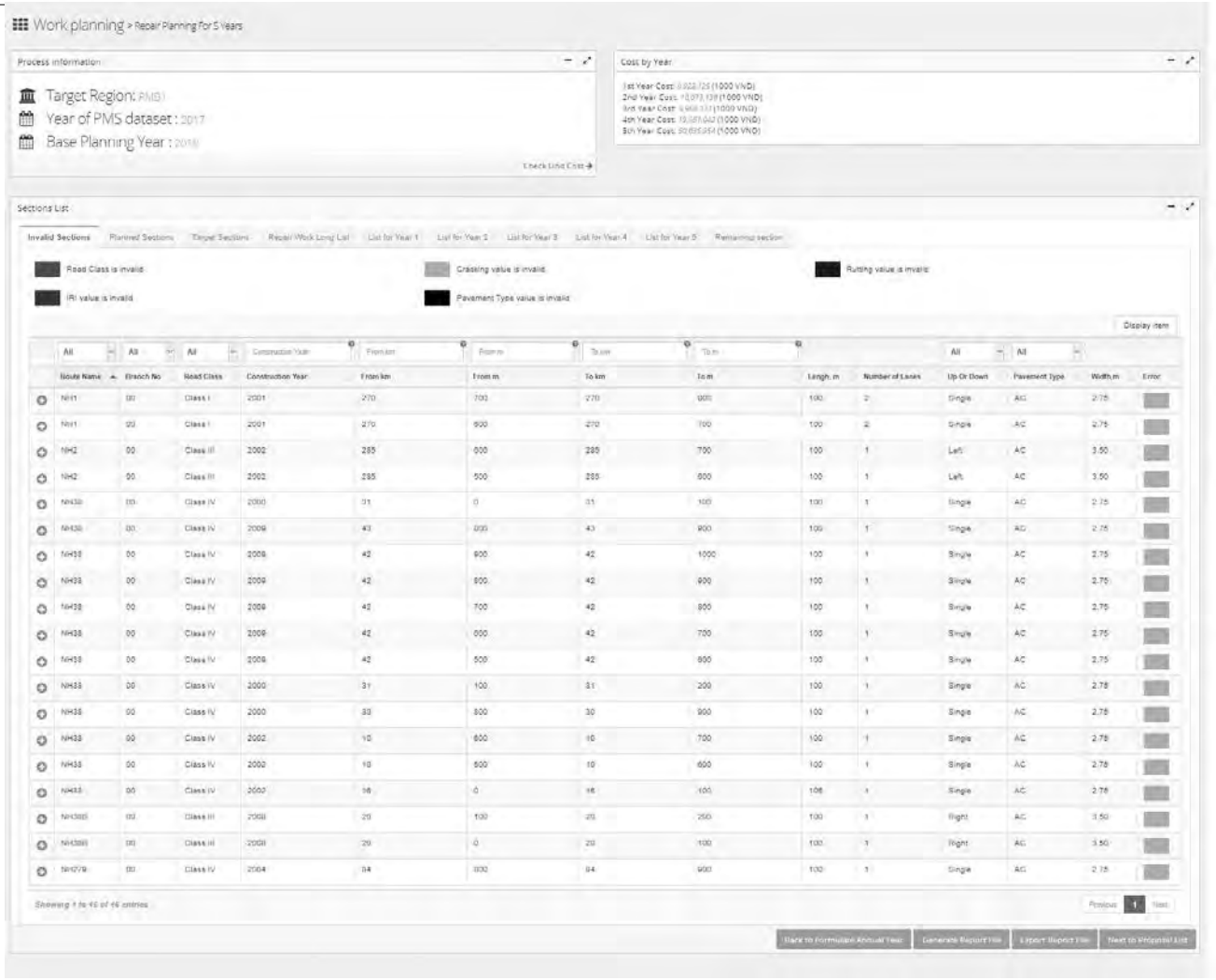
- Step 2: Choose Priority criteria by click On/Off with parameter (MCI, Road Class, Traffic Volume) corresponding
- Step 3: Input information for Price Escalation
- Step 4: Click "Make plan" button



- 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

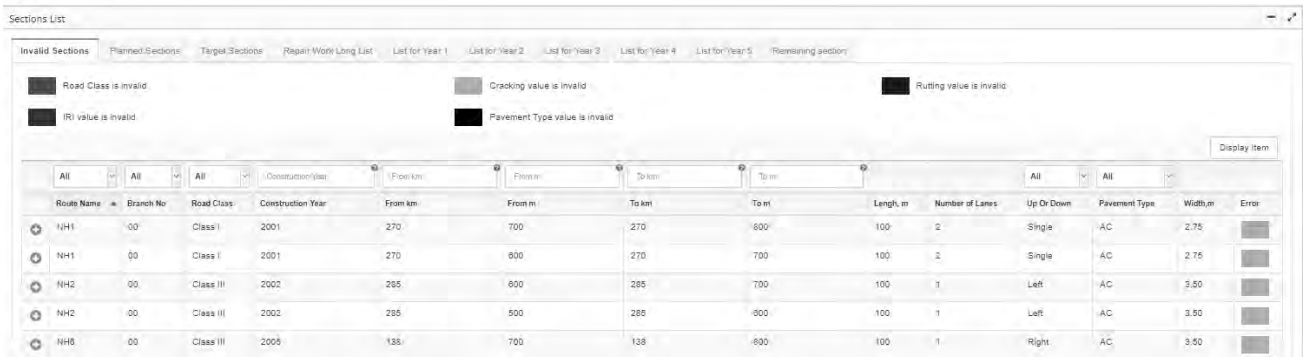
VIII) REPAIR PLANNING FOR 5 YEARS

- Purpose: Show results work planning for 5 years

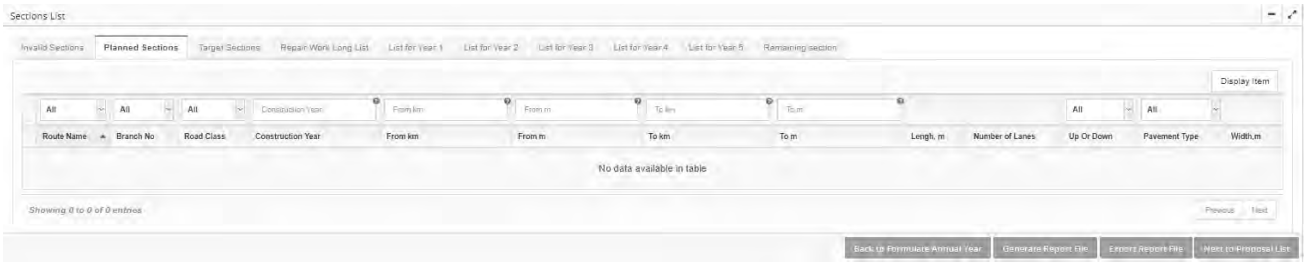


Description:

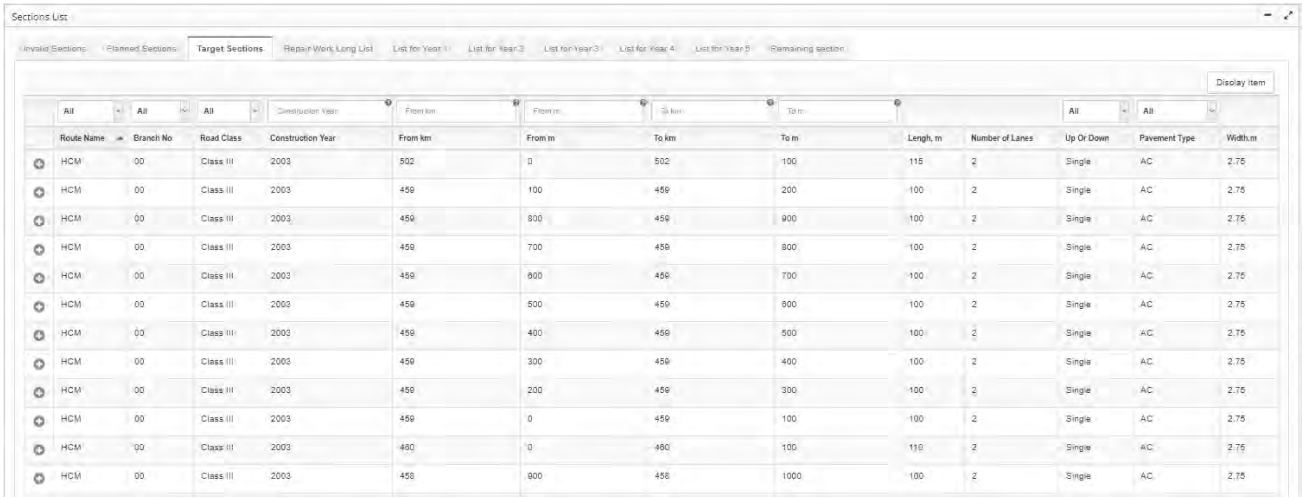
- "Information for Process" form: Show information Target Region, Target PMS Dataset Year and Base Planning Year that the user selected in the "*Initial*" step and "*Select Base Planning Step*" screen
- "Check Unit Cost" link: User click "Check Unit Cost" link to view information detail for repair method (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)



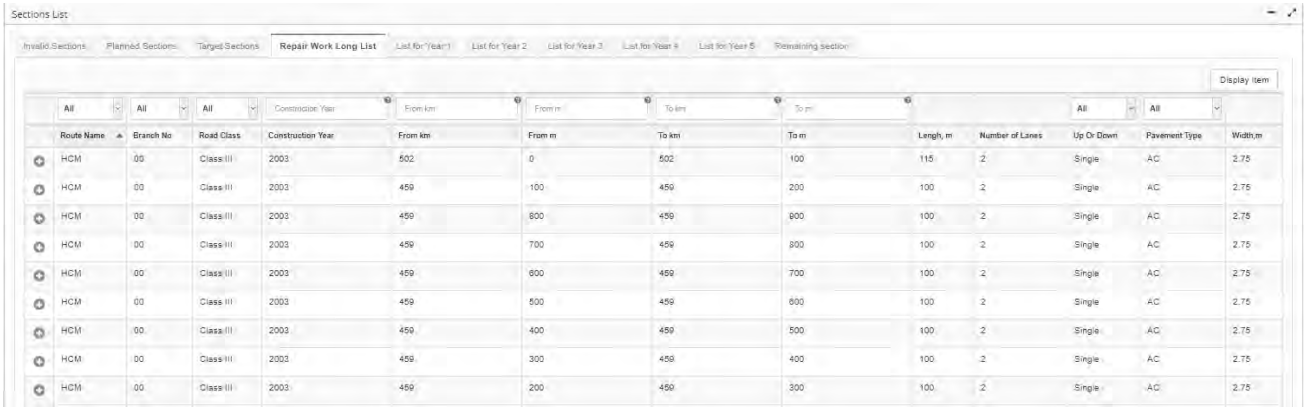
- "Planned Sections" Tab: Show planned sections



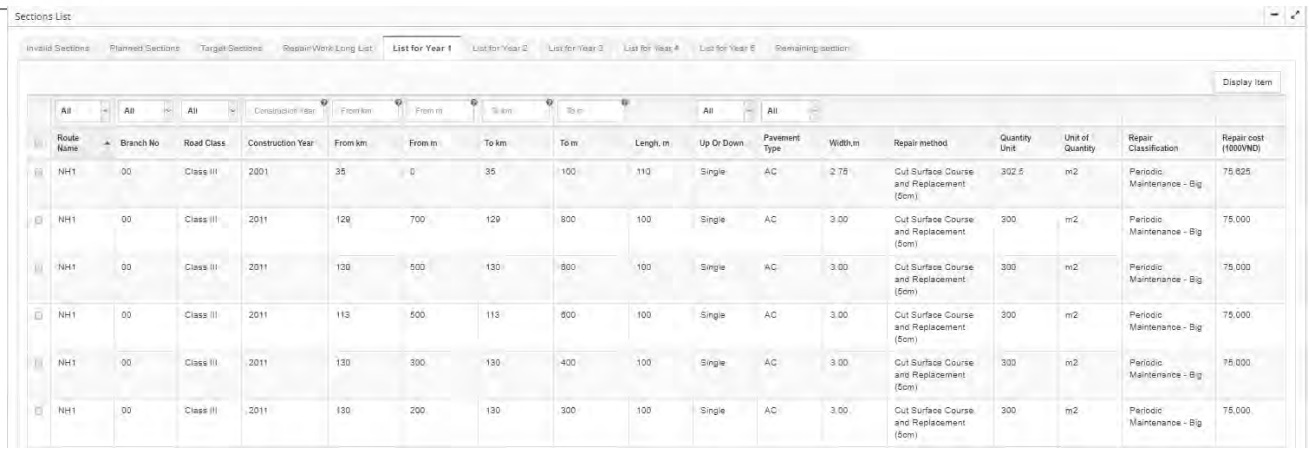
- "Target Sections" Tab: Show sections need Target Sections



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

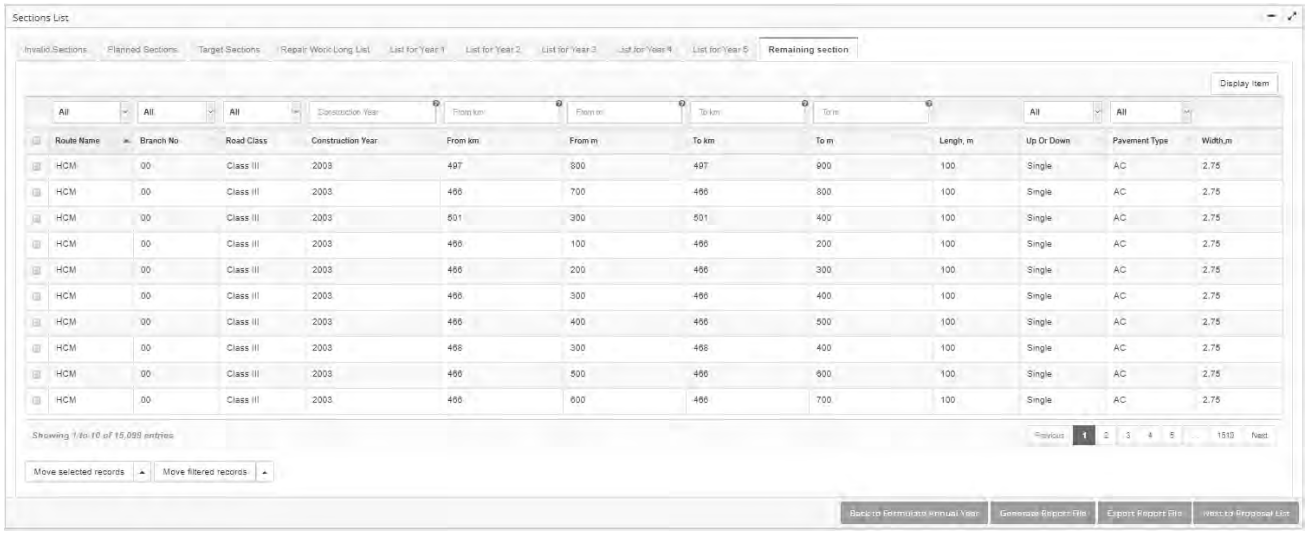


- "List for Year 1": Show sections need repair for Year 1



Note:

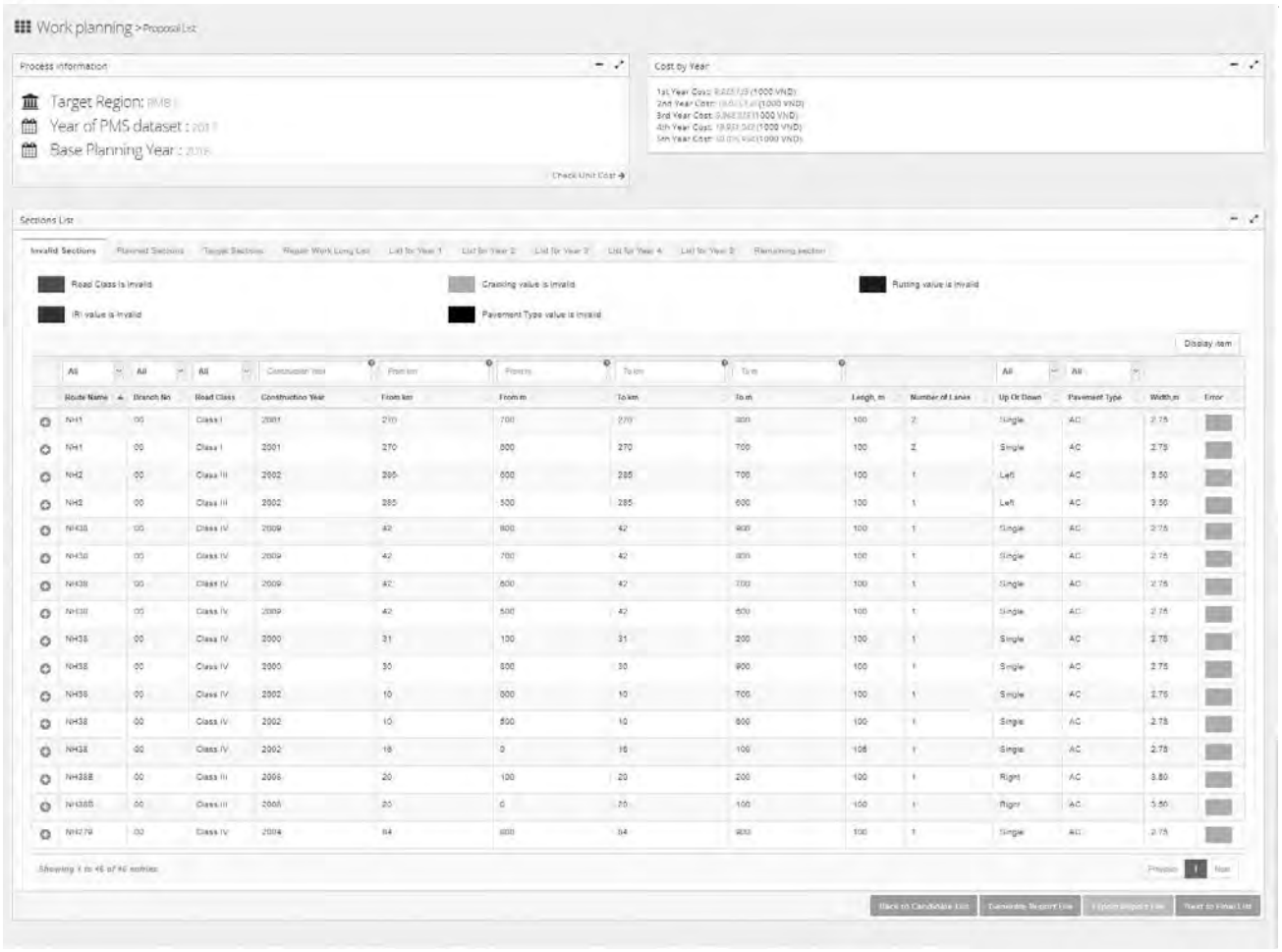
- ***The remaining tabs "List for Year 2, List for Year 3, List for Year 4, and List for Year 5" is a list of repairs that need repair. The corresponding years***
- ***Functions: Search, Show / Hide Columns, View information detail of section to those shown above.***
  - "Remaining Sections" Tab: Show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



- 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



- 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)

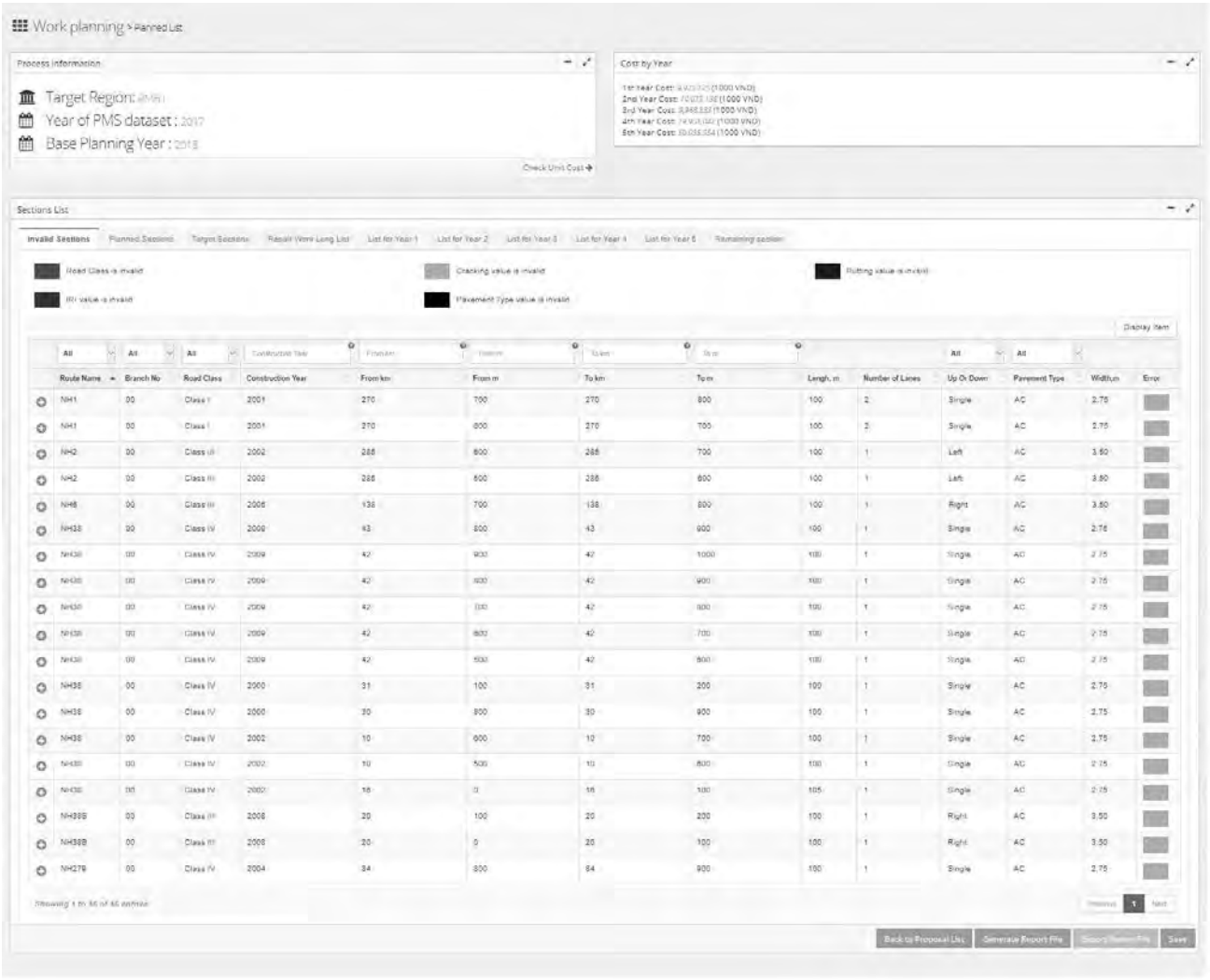
Note: Functions "Search, Show / Hide Columns, View information detail of section" corresponding those shown above.

- 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

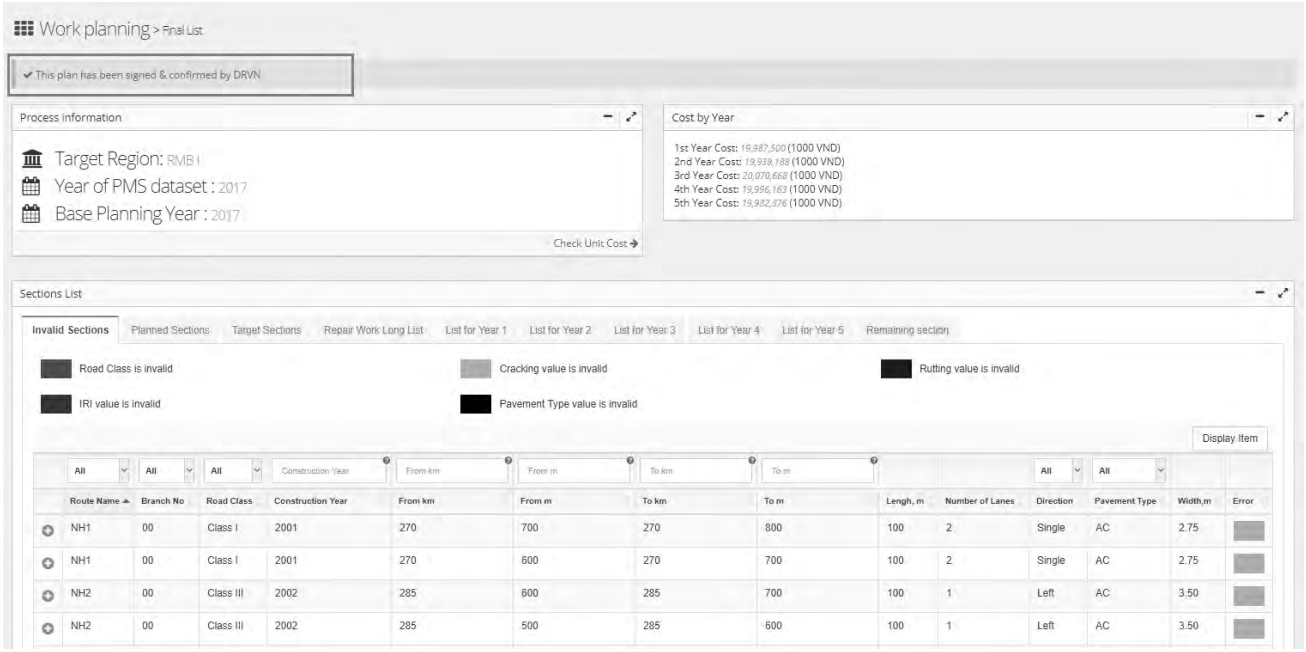
- Purpose: Show sections list need signed & confirmed by DRVN



- 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.

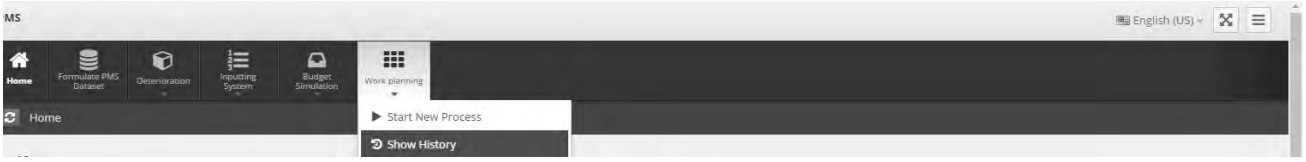
- Other operations:
  - Select the "Back to Candidate List" button to return to the Candidate List screen
  - Select the "Generate Report File" button to proceed with the report generation process
  - Select the "Export Report File" button to export the data to the excel file (This function is only displayed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



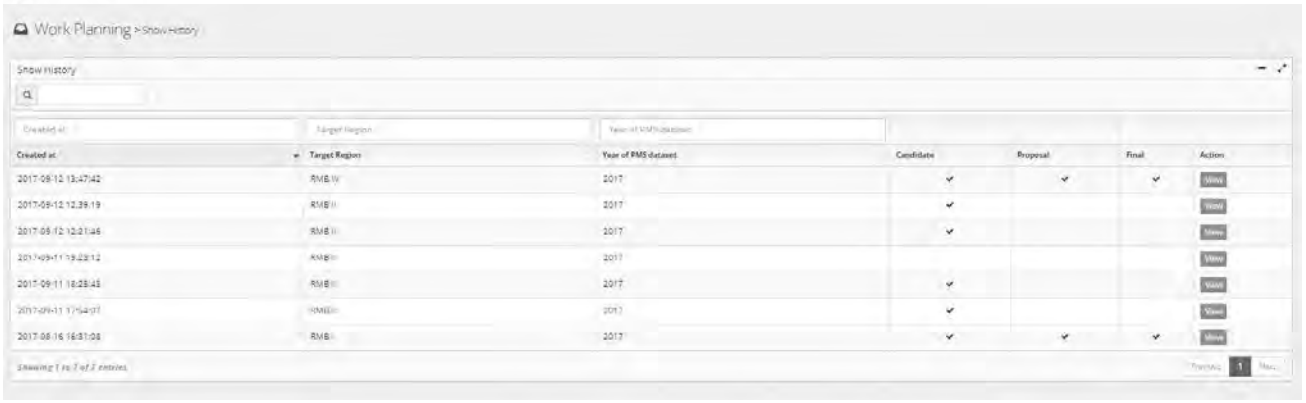
XI) SHOW HISTORY

- Purpose: View history the created process

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



⇨ The screen displays:



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

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”

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

⇨ 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.

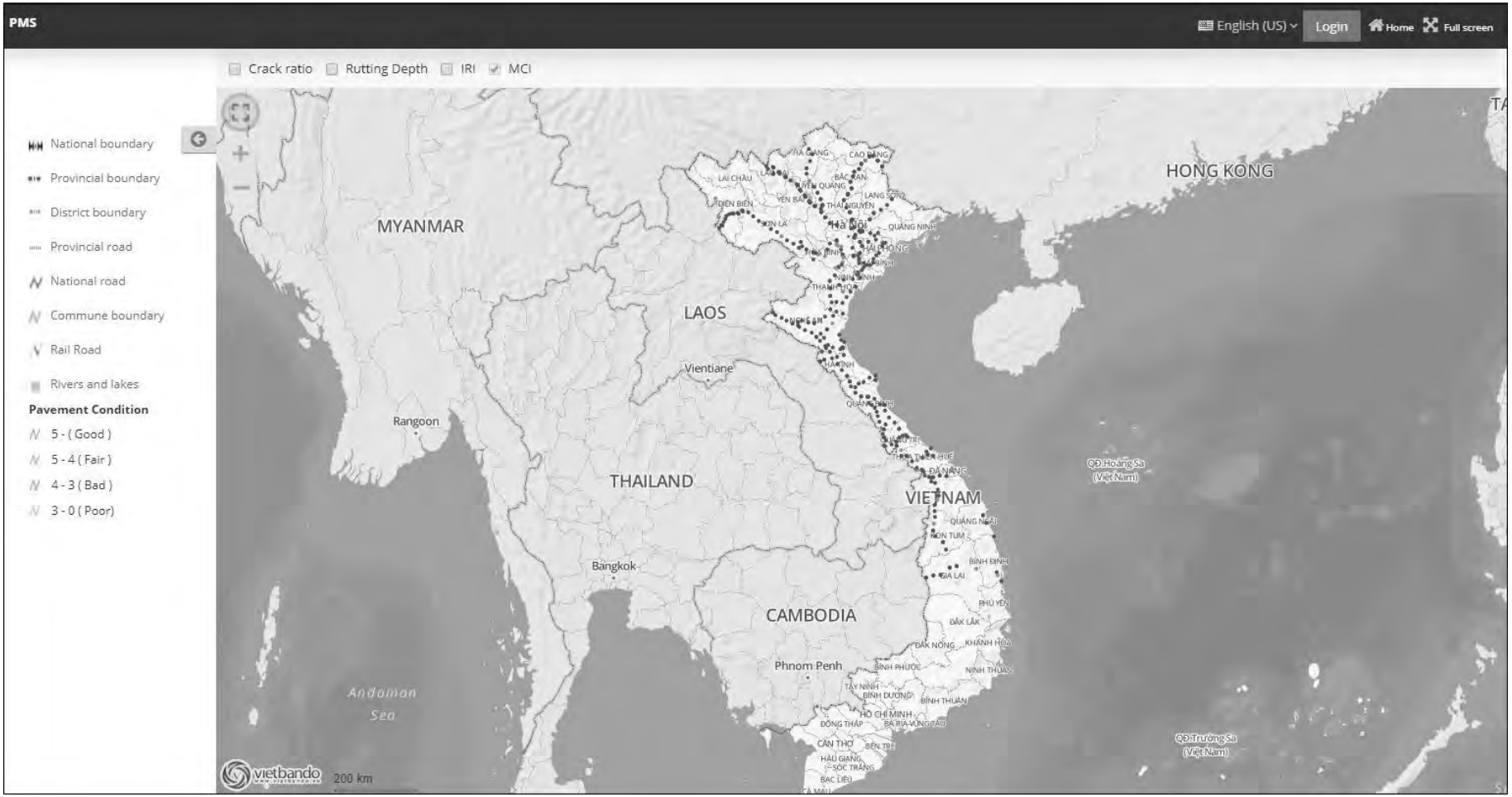
USER'S MANUAL

PAVEMENT CONDITION DATA DISPLAY SYSTEM

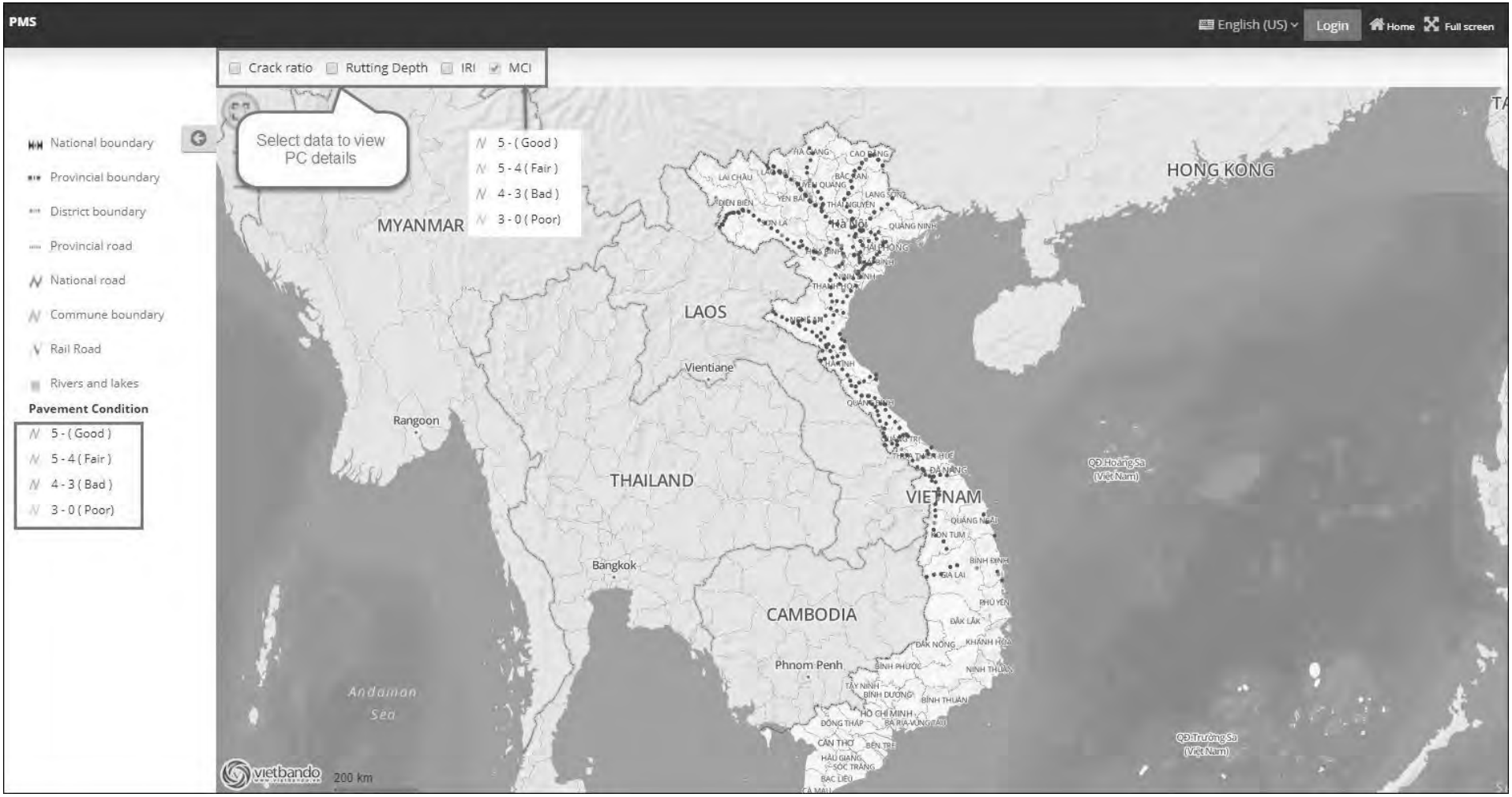
Content

I. Home

- Website: http://pms.drvn.gov.vn
- 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:

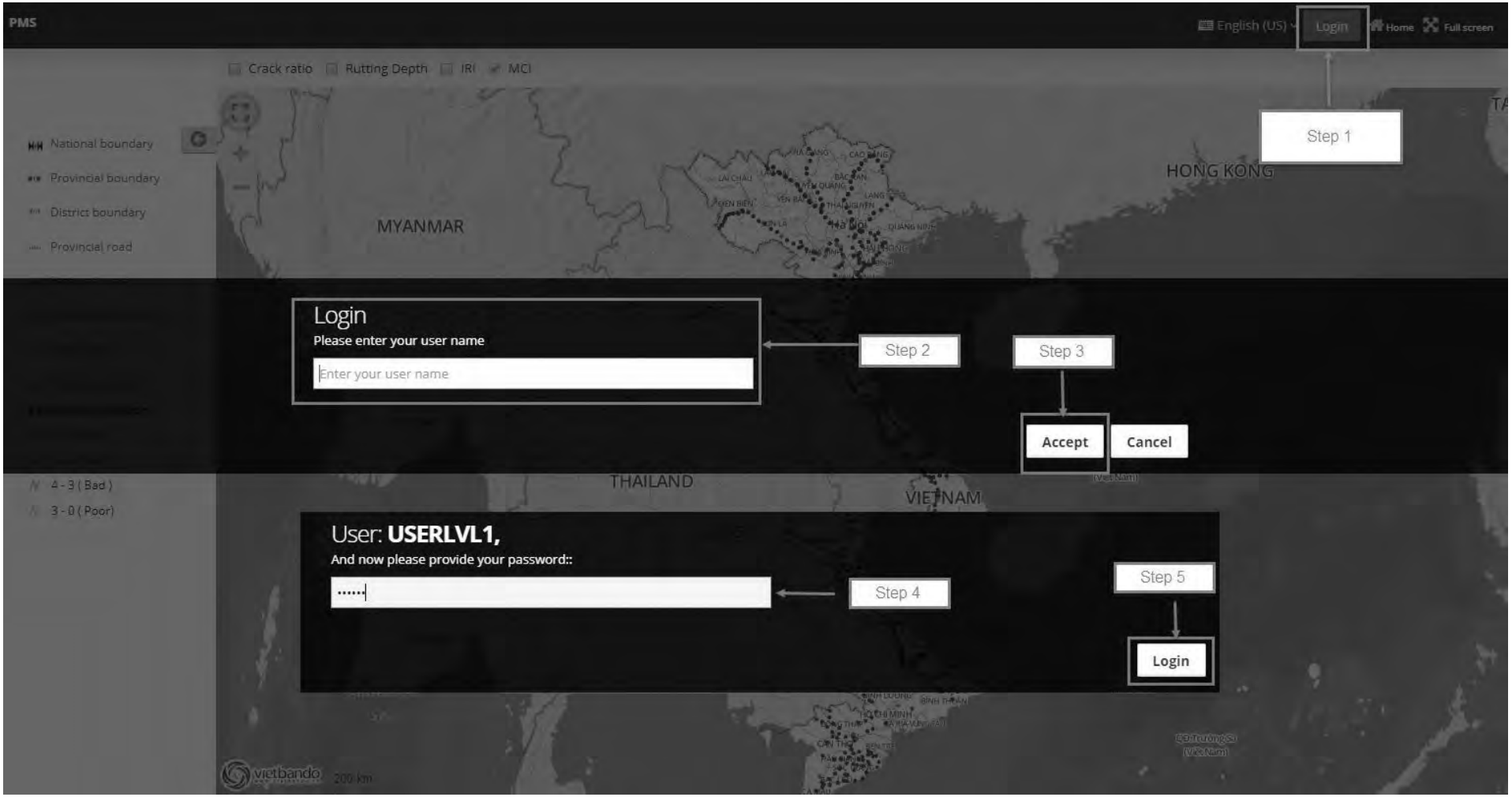


II. Language options

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

III. Login

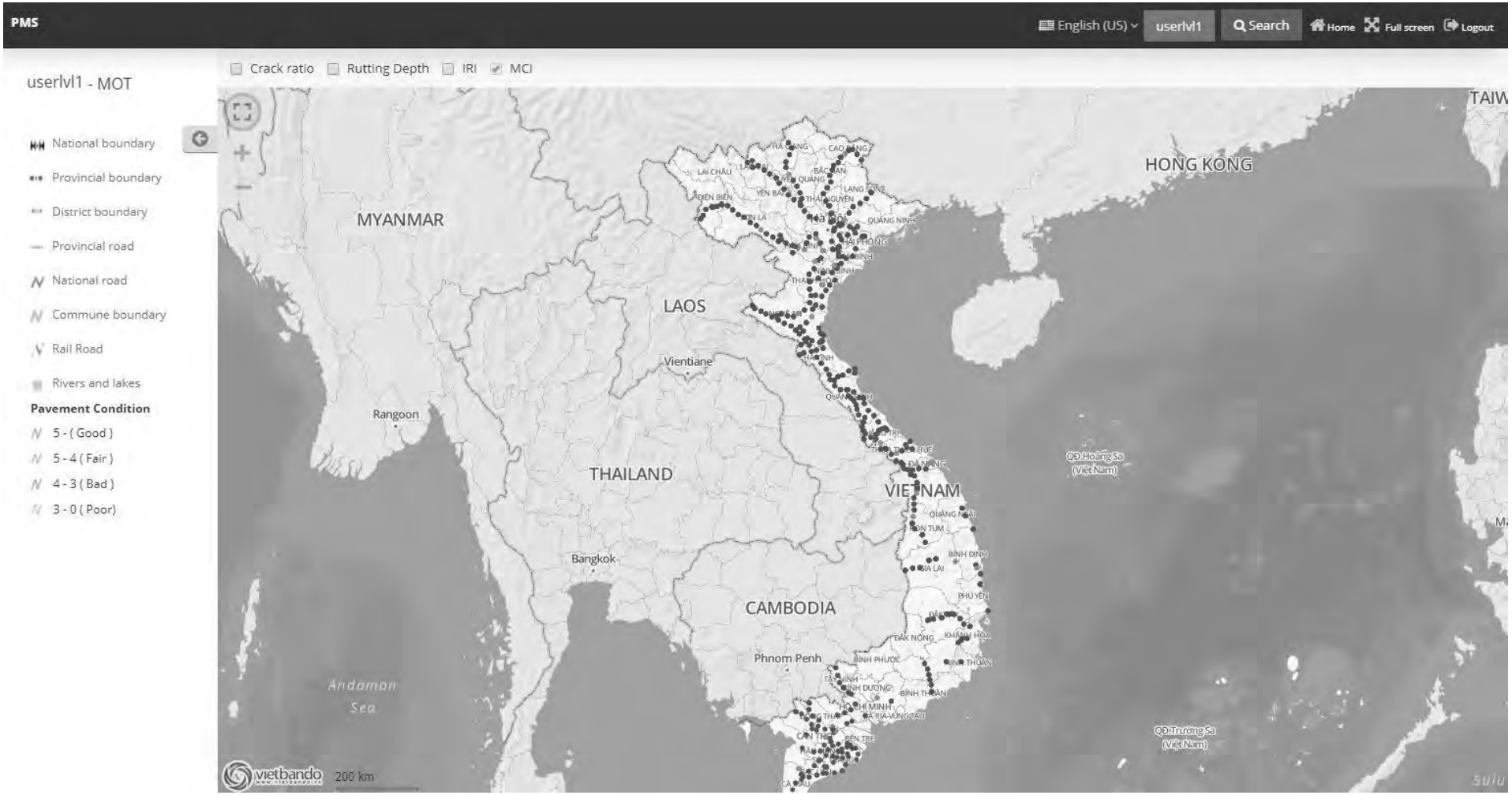
- Subjects: User already has an account and password
- Operators:
  + Click "Login" on the Website
  + Input Username and Password
  + Press the Login button



IV. Main Screen

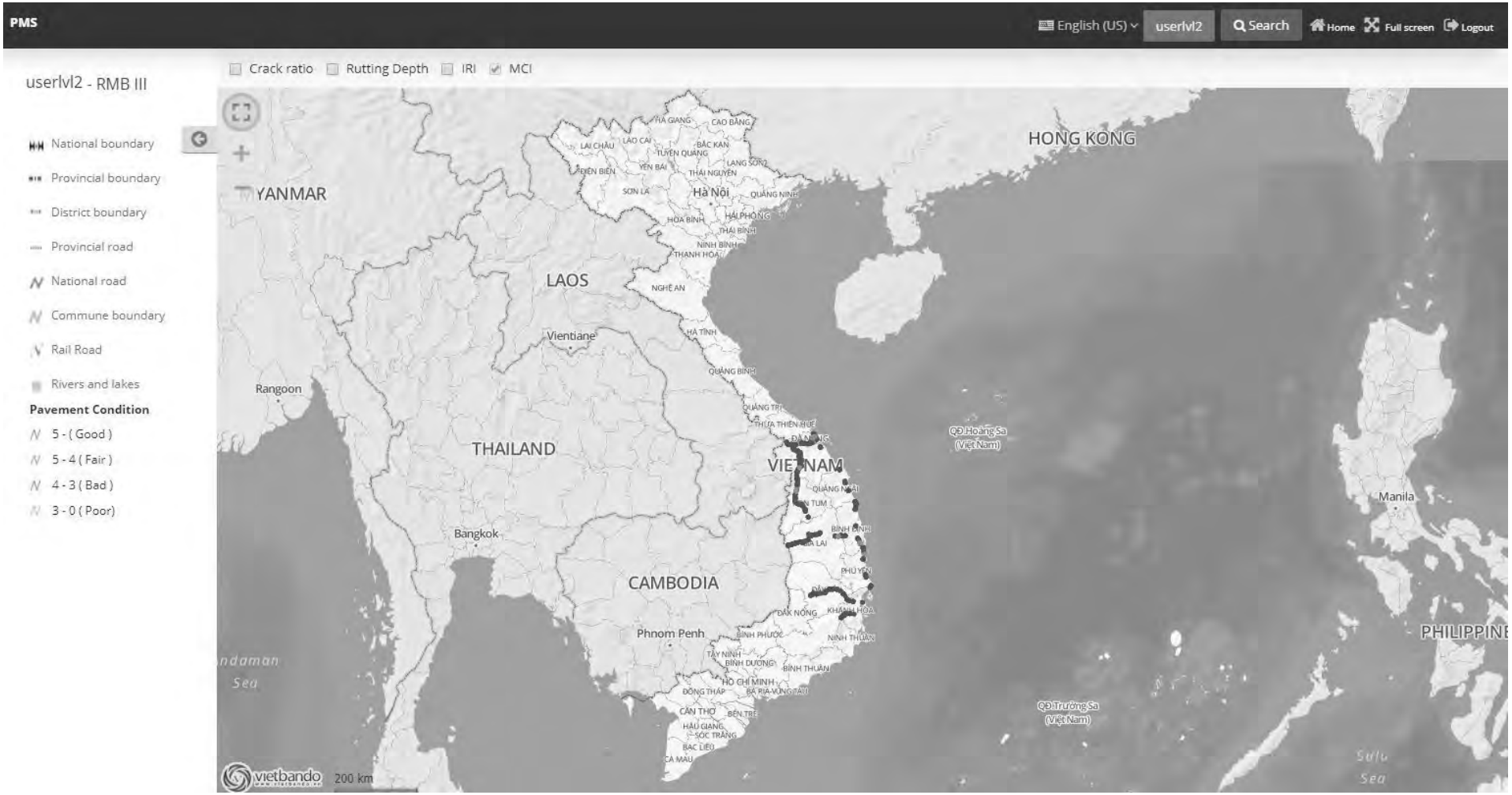
1, User level 1

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



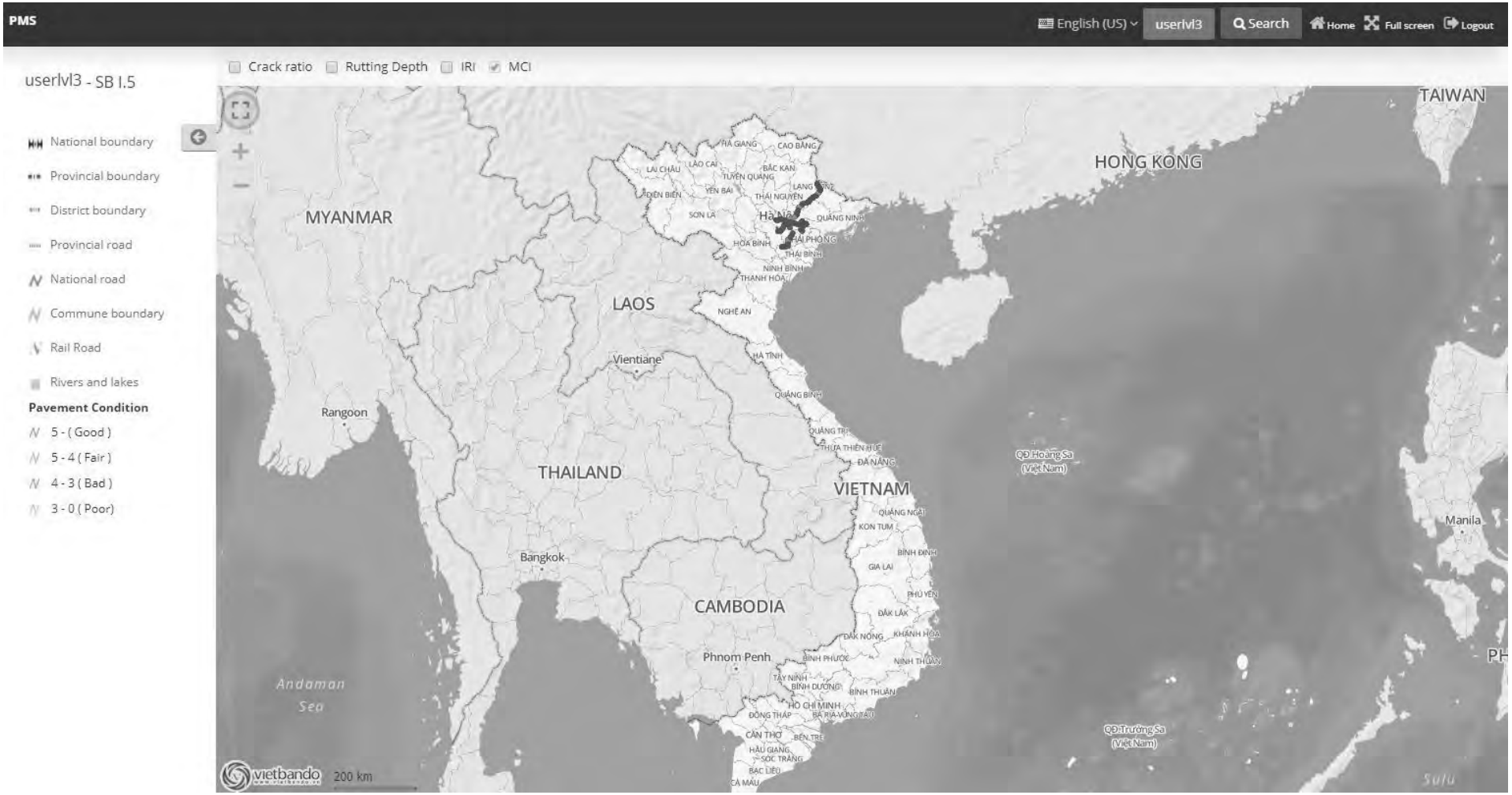
2, User level 2

- 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

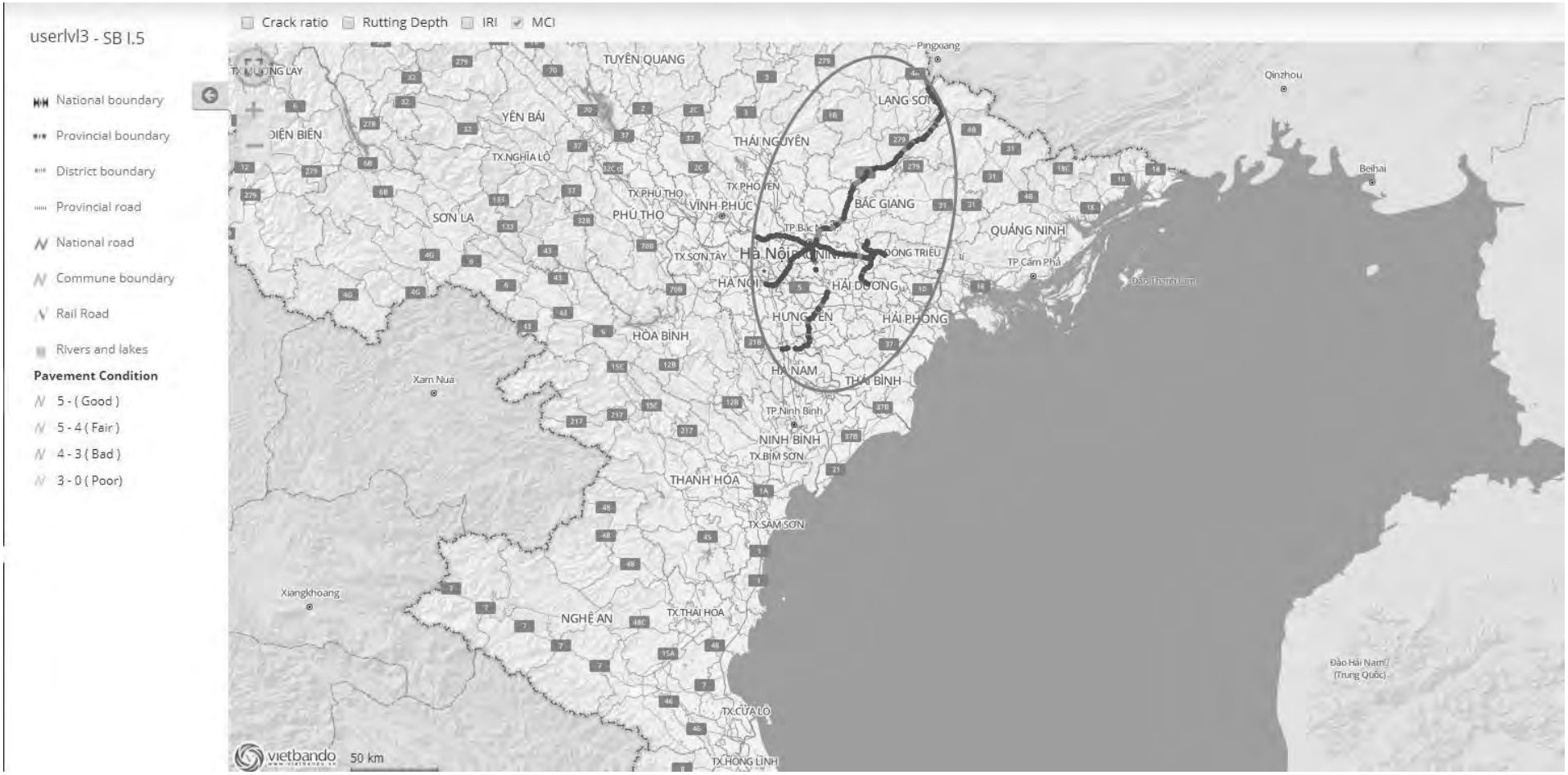
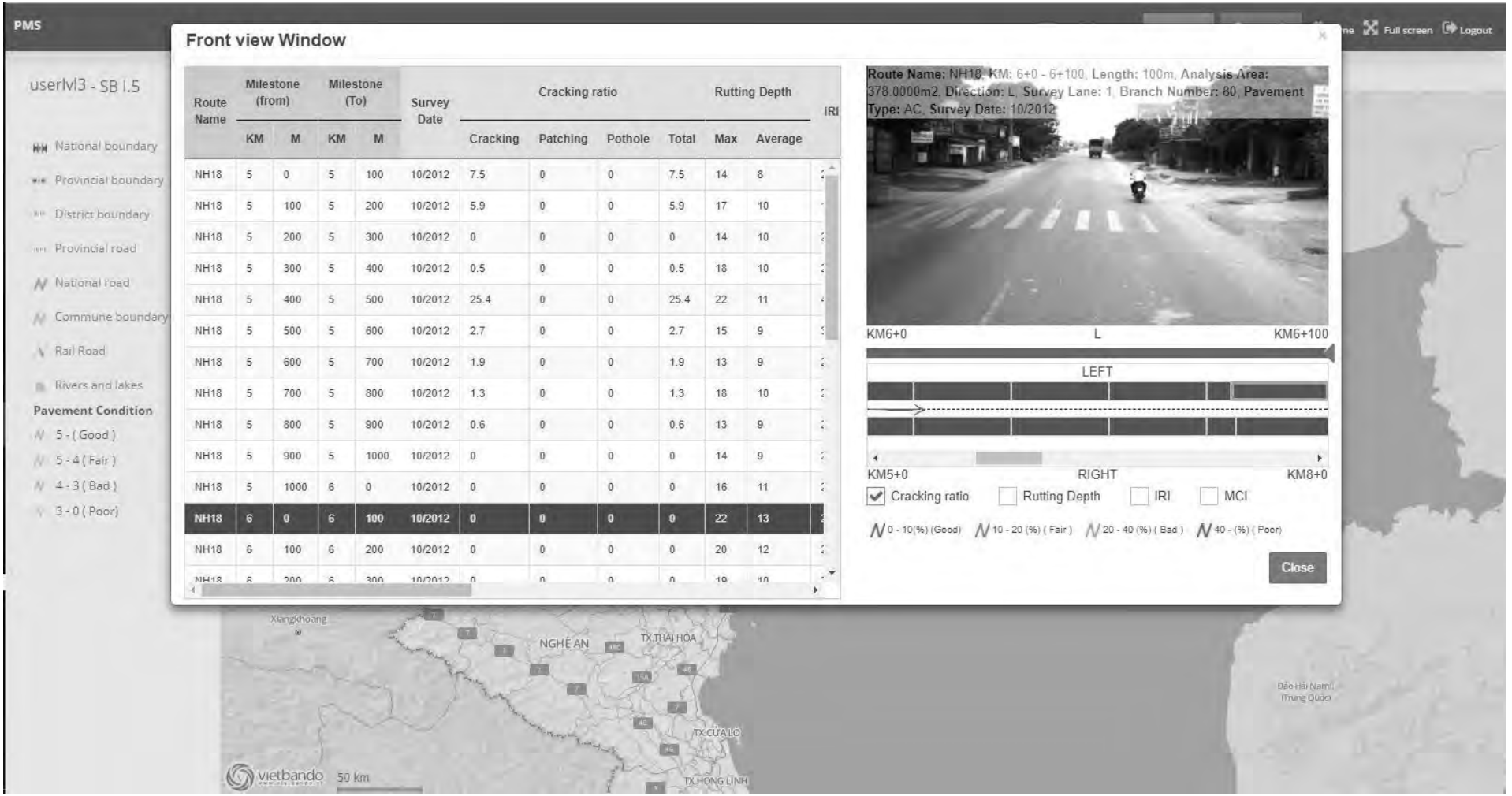


Table of pavement condition data of that section:

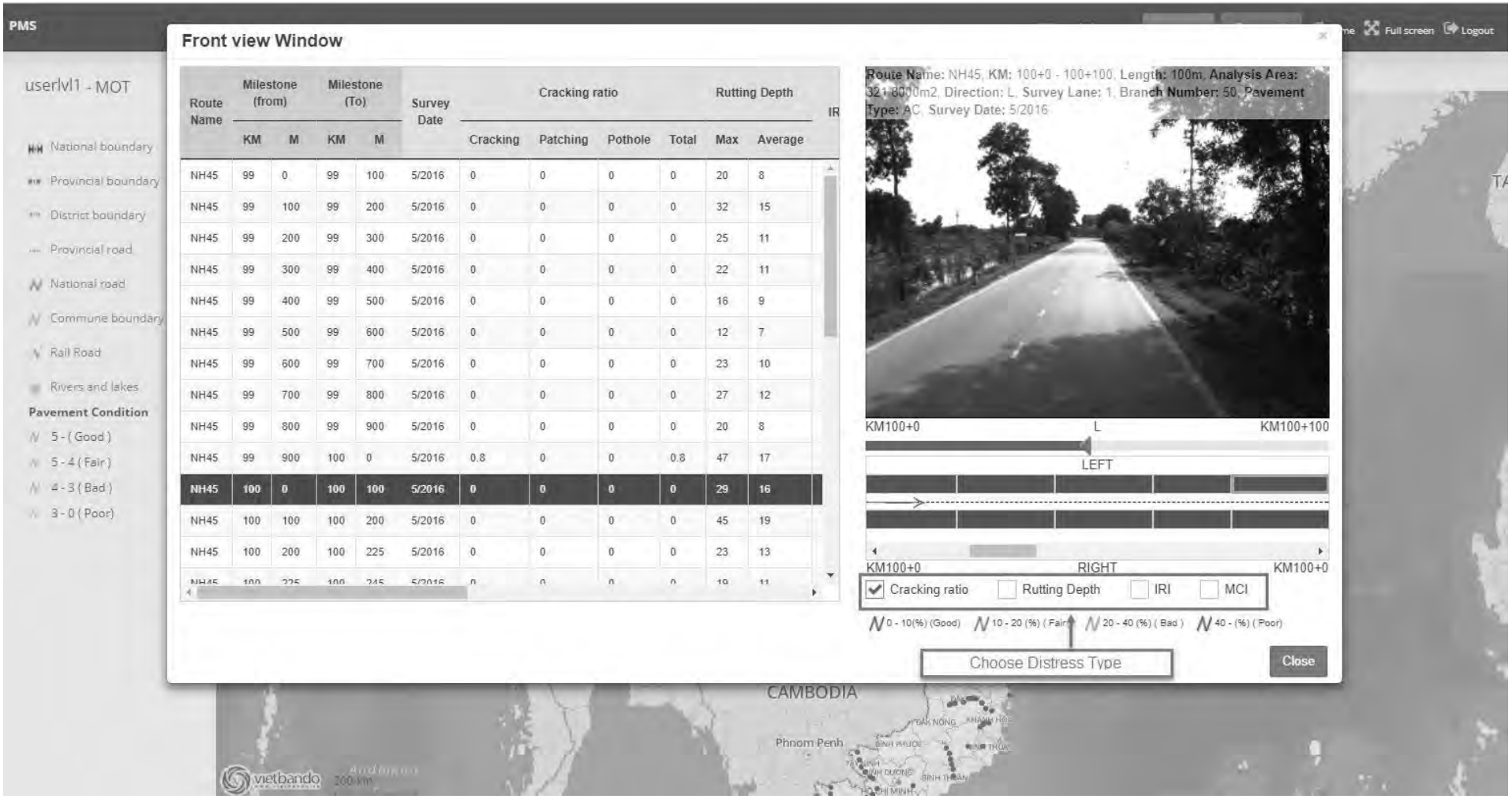


Route Name	Milestone (from)		Milestone (To)		Survey Date	Cracking ratio				Rutting Depth		IRI
	KM	M	KM	M		Cracking	Patching	Pothole	Total	Max	Average	
NH18	5	0	5	100	10/2012	7.5	0	0	7.5	14	8	
NH18	5	100	5	200	10/2012	5.9	0	0	5.9	17	10	
NH18	5	200	5	300	10/2012	0	0	0	0	14	10	
NH18	5	300	5	400	10/2012	0.5	0	0	0.5	18	10	
NH18	5	400	5	500	10/2012	25.4	0	0	25.4	22	11	
NH18	5	500	5	600	10/2012	2.7	0	0	2.7	15	9	
NH18	5	600	5	700	10/2012	1.9	0	0	1.9	13	9	
NH18	5	700	5	800	10/2012	1.3	0	0	1.3	18	10	
NH18	5	800	5	900	10/2012	0.6	0	0	0.6	13	9	
NH18	5	900	5	1000	10/2012	0	0	0	0	14	9	
NH18	5	1000	6	0	10/2012	0	0	0	0	16	11	
NH18	**6**	**0**	**6**	**100**	**10/2012**	**0**	**0**	**0**	**0**	**22**	**13**	
NH18	6	100	6	200	10/2012	0	0	0	0	20	12	

- 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 ....

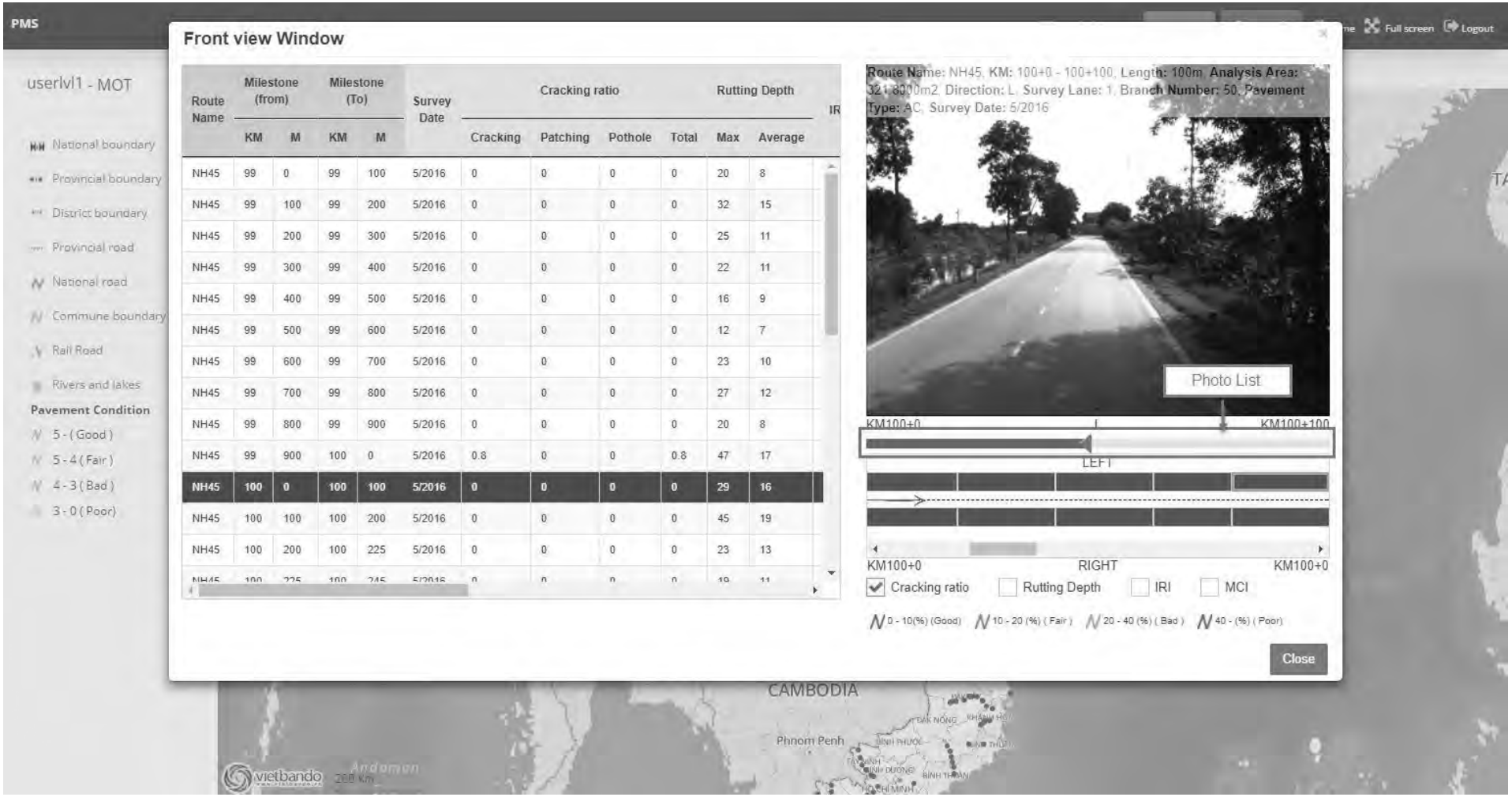
- Show photos: Each section usually has 20 photos
- A road map showing the current section of the road being viewed (blinking green and red) and alternate road sections with a color indicating the road condition of the fault type selected
- List of distress types: Cracking ratio, Rutting Depth, IRI and 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

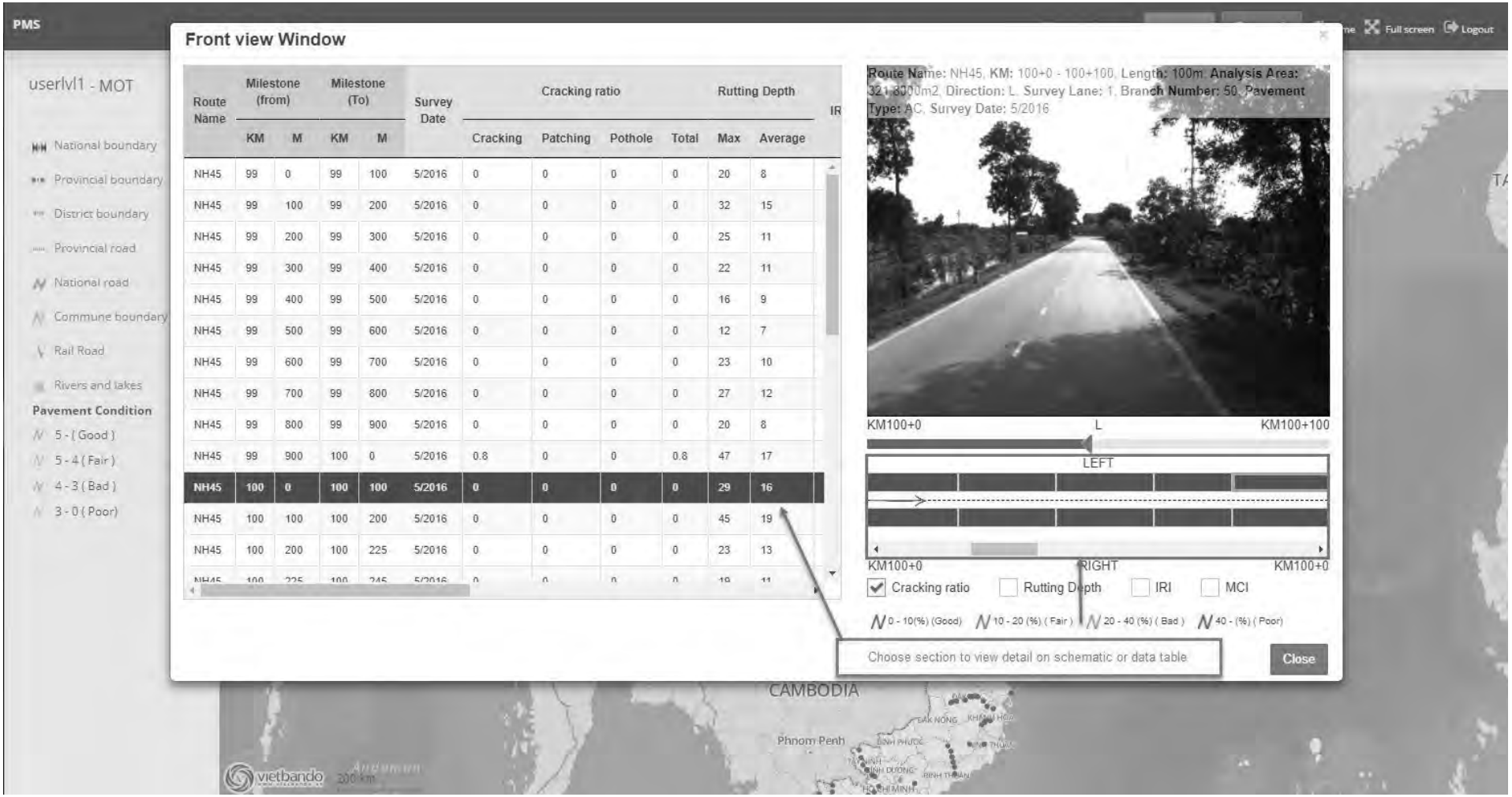


Route Name	Milestone (from)		Milestone (To)		Survey Date	Cracking ratio				Rutting Depth		IR
	KM	M	KM	M		Cracking	Patching	Pothole	Total	Max	Average	
NH45	99	0	99	100	5/2016	0	0	0	0	20	8	
NH45	99	100	99	200	5/2016	0	0	0	0	32	15	
NH45	99	200	99	300	5/2016	0	0	0	0	25	11	
NH45	99	300	99	400	5/2016	0	0	0	0	22	11	
NH45	99	400	99	500	5/2016	0	0	0	0	16	9	
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	
NH45	99	700	99	800	5/2016	0	0	0	0	27	12	
NH45	99	800	99	900	5/2016	0	0	0	0	20	8	
NH45	99	900	100	0	5/2016	0.8	0	0	0.8	47	17	
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	

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



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



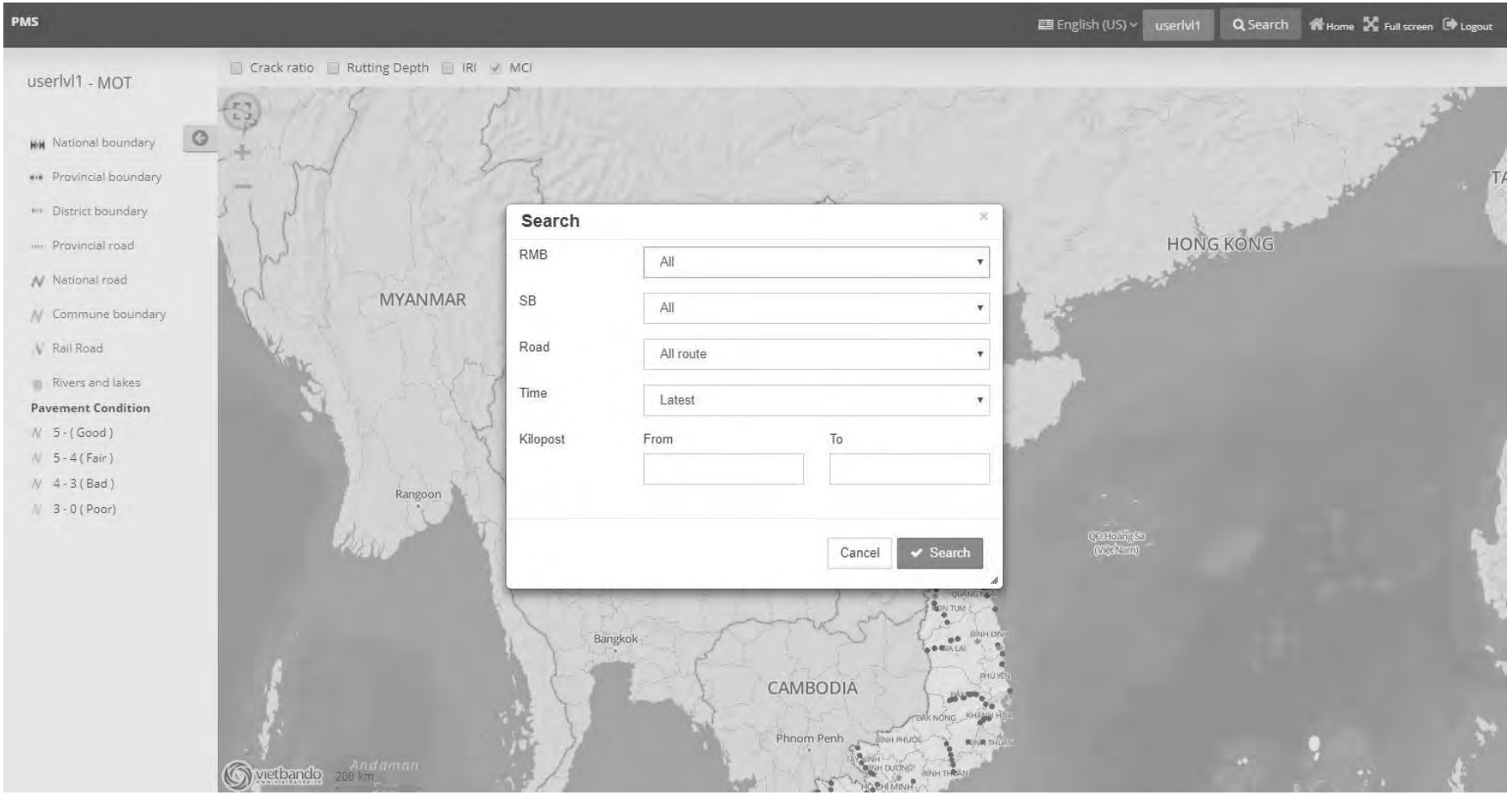
Route Name	Milestone (from)		Milestone (To)		Survey Date	Cracking ratio				Rutting Depth		IR
	KM	M	KM	M		Cracking	Patching	Pothole	Total	Max	Average	
NH45	99	0	99	100	5/2016	0	0	0	0	20	8	
NH45	99	100	99	200	5/2016	0	0	0	0	32	15	
NH45	99	200	99	300	5/2016	0	0	0	0	25	11	
NH45	99	300	99	400	5/2016	0	0	0	0	22	11	
NH45	99	400	99	500	5/2016	0	0	0	0	16	9	
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	
NH45	99	700	99	800	5/2016	0	0	0	0	27	12	
NH45	99	800	99	900	5/2016	0	0	0	0	20	8	
NH45	99	900	100	0	5/2016	0.8	0	0	0.8	47	17	
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	

VI. Search

1, User level 1

- Choose RMB

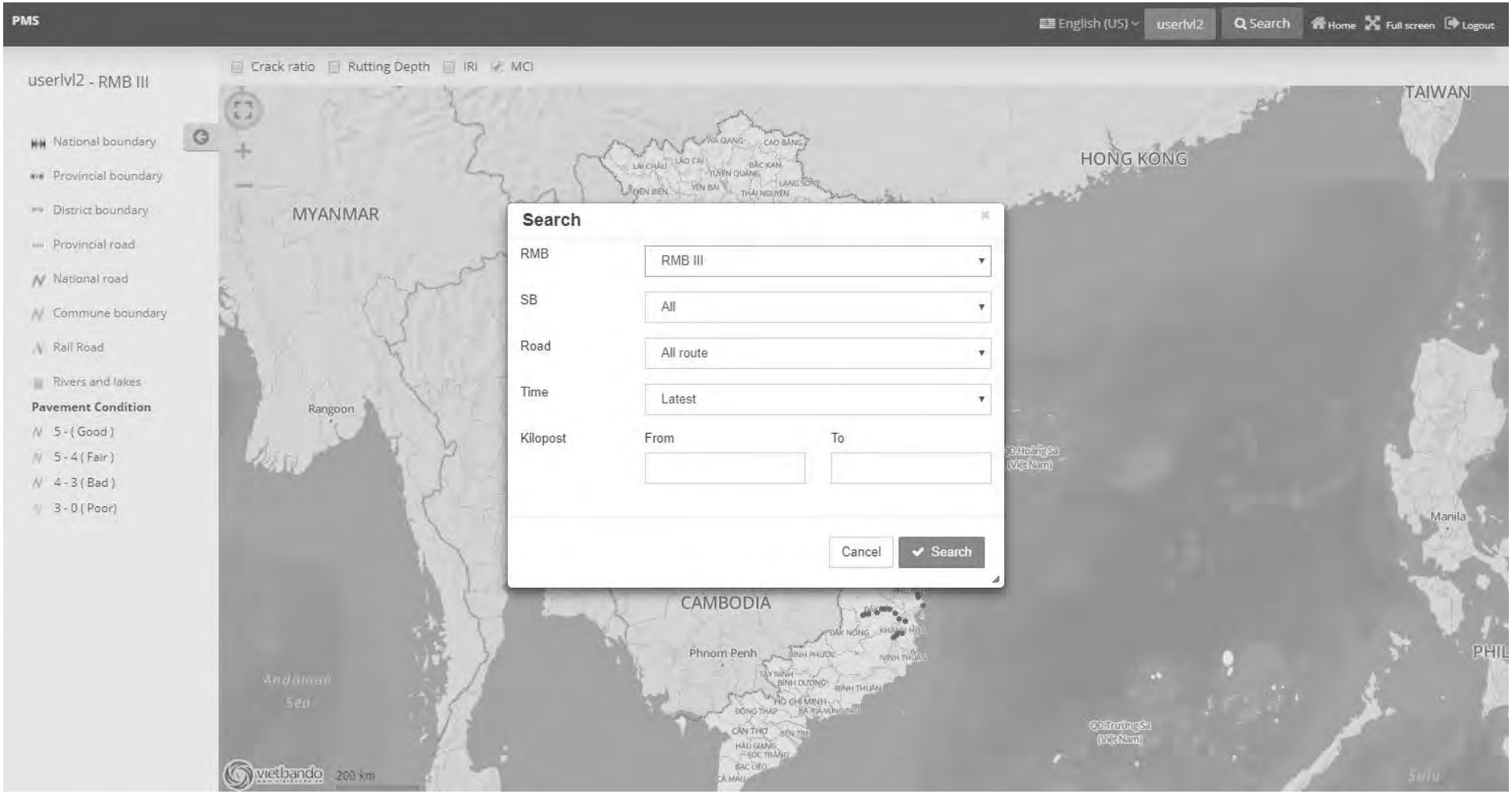
- Choose SB
- Choose Road
- Choose Year
- Input Kilopost
- Click “Search” button



2, User level 2

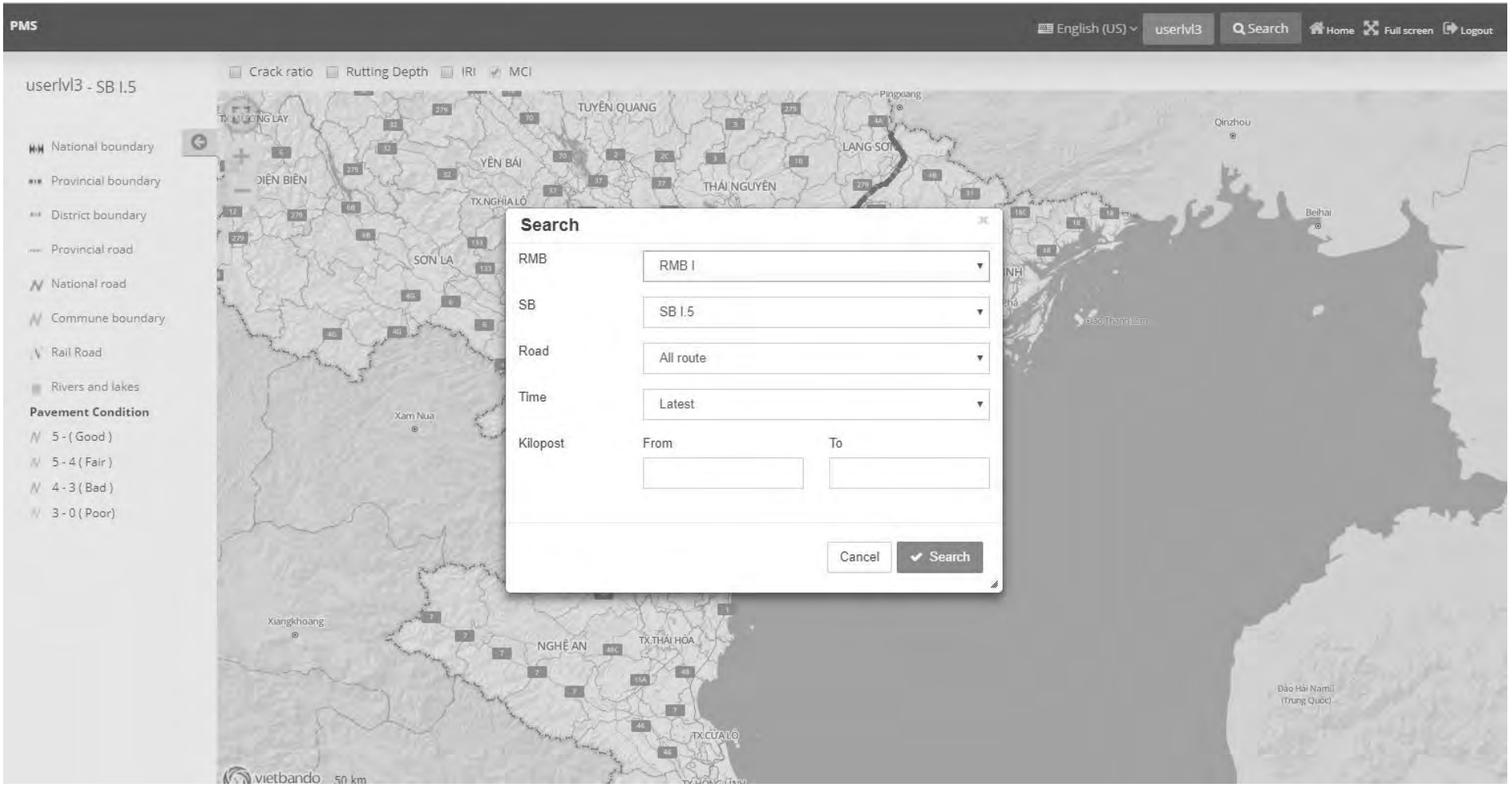
- Choose SB
- Choose Road
- Choose Year

- Input Kilopost
- Click “Search” button



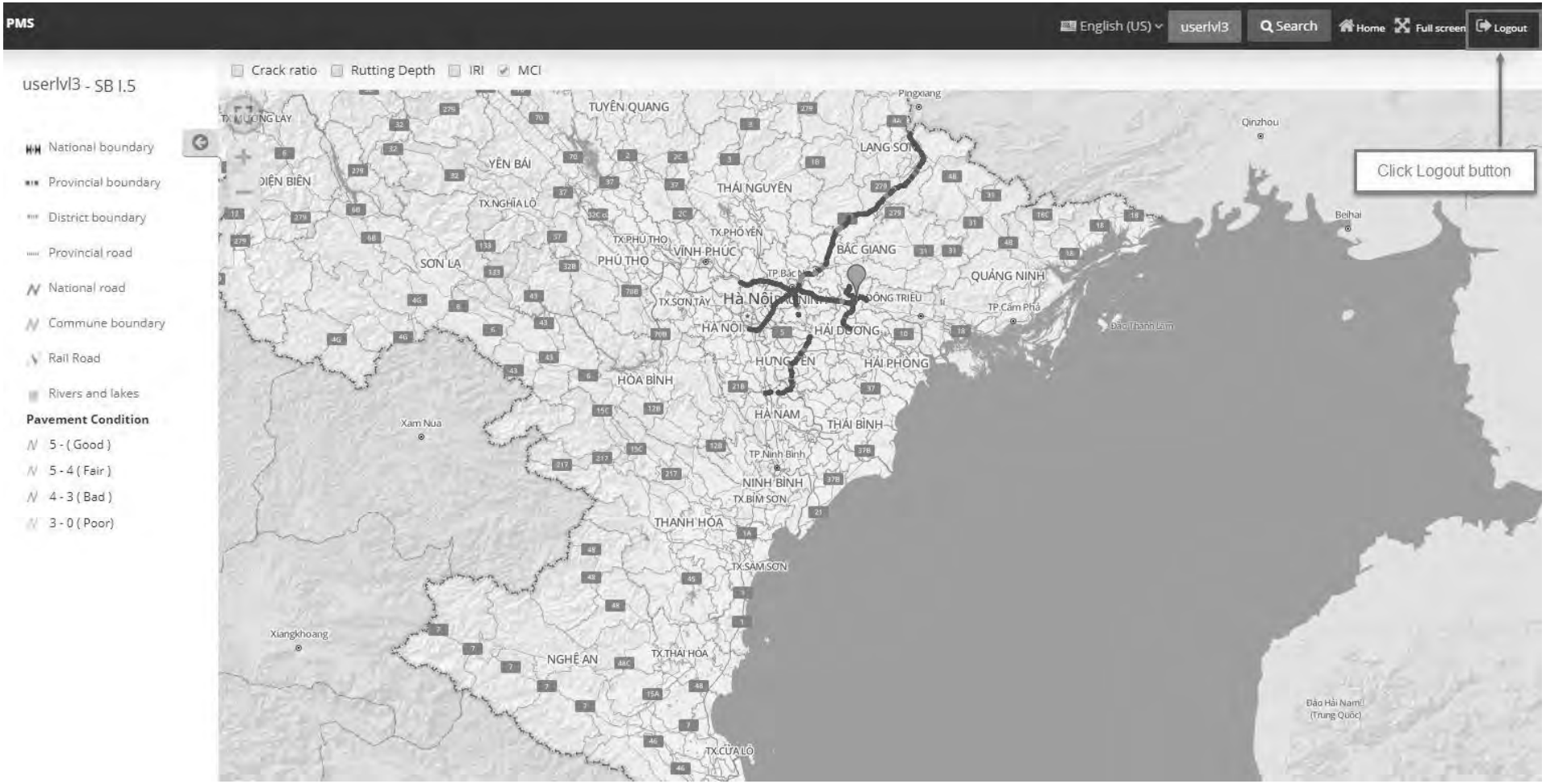
3, User level 3

- Choose Road
- Choose Year
- Input Kilopost
- Click “Search” button



VII. Logout

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


PMS
English (US)
userlvl3
Search
Home
Full screen
Logout
Click Logout button
userlvl3 - SB I.5
Crack ratio
Rutting Depth
IRI
MCI
National boundary
Provincial boundary
District boundary
Provincial road
National road
Commune boundary
Rail Road
Rivers and lakes
Pavement Condition
5 - (Good)
5 - 4 (Fair)
4 - 3 (Bad)
3 - 0 (Poor)
TUYÊN QUANG
LẠNG SƠN
YÊN BÁI
THÁI NGUYÊN
BẮC GIANG
QUẢNG NINH
VĨNH PHÚC
PHÚ THỌ
SƠN LA
HÒA BÌNH
HÀ NỘI
HẢI DƯƠNG
HẢI PHÒNG
HƯNG YÊN
HÀ NAM
THÁI BÌNH
NINH BÌNH
THANH HÓA
NGHỆ AN
Hà Nội
Pingxiang
Qinzhou
Beihai
Xam Nua
Xiangkhoang

USER'S MANUAL

PAVEMENT CONDITION DATA ANALYSE SYSTEM (DAS)

CONTENTS

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 **Capacity Enhancement in Road Maintenance in Vietnam**.

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.

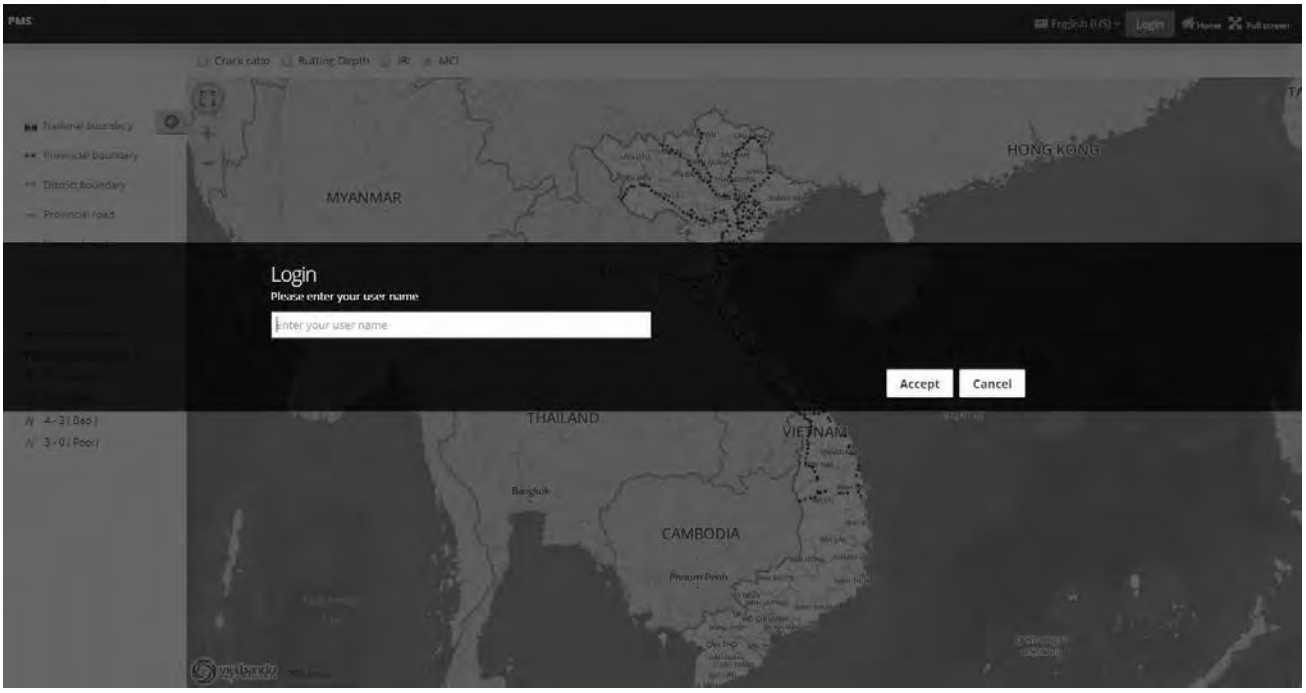
II) SUMMARY OF THE MAIN FUNCTIONS OF THE SYSTEM

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

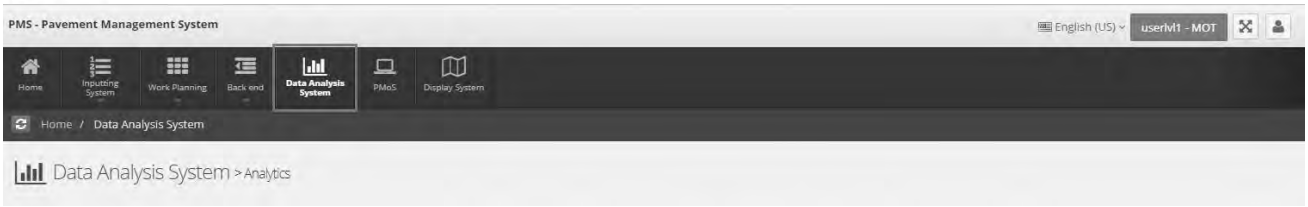


II.3) Language option

- 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


PMS - Pavement Management System
English (US)
userlv1 - MOT
Home
Inputting System
Work Planning
Back end
Data Analysis System
PMoS
Display System
Home / Data Analysis System
Data Analysis System > Analytics

CHAPTER 2: GUIDE FUNCTIONS

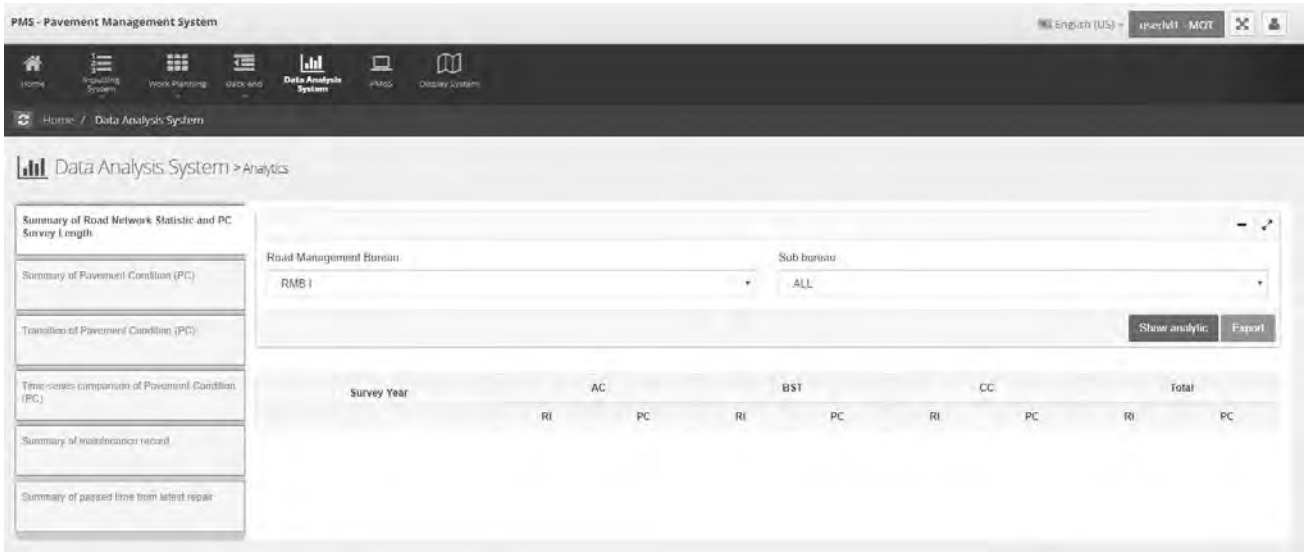
After clicking on the "Data Analyse System" module, the screen display default data of "Summary of Road Network Statistics and PC survey length" tab.

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.

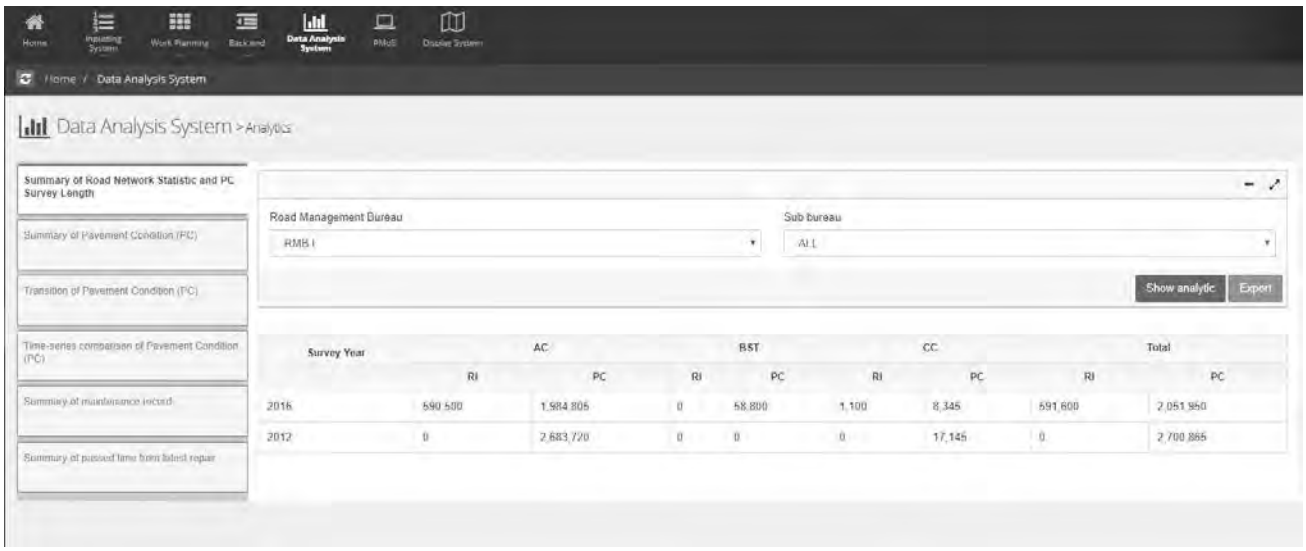


I.2) Summary Table

- 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



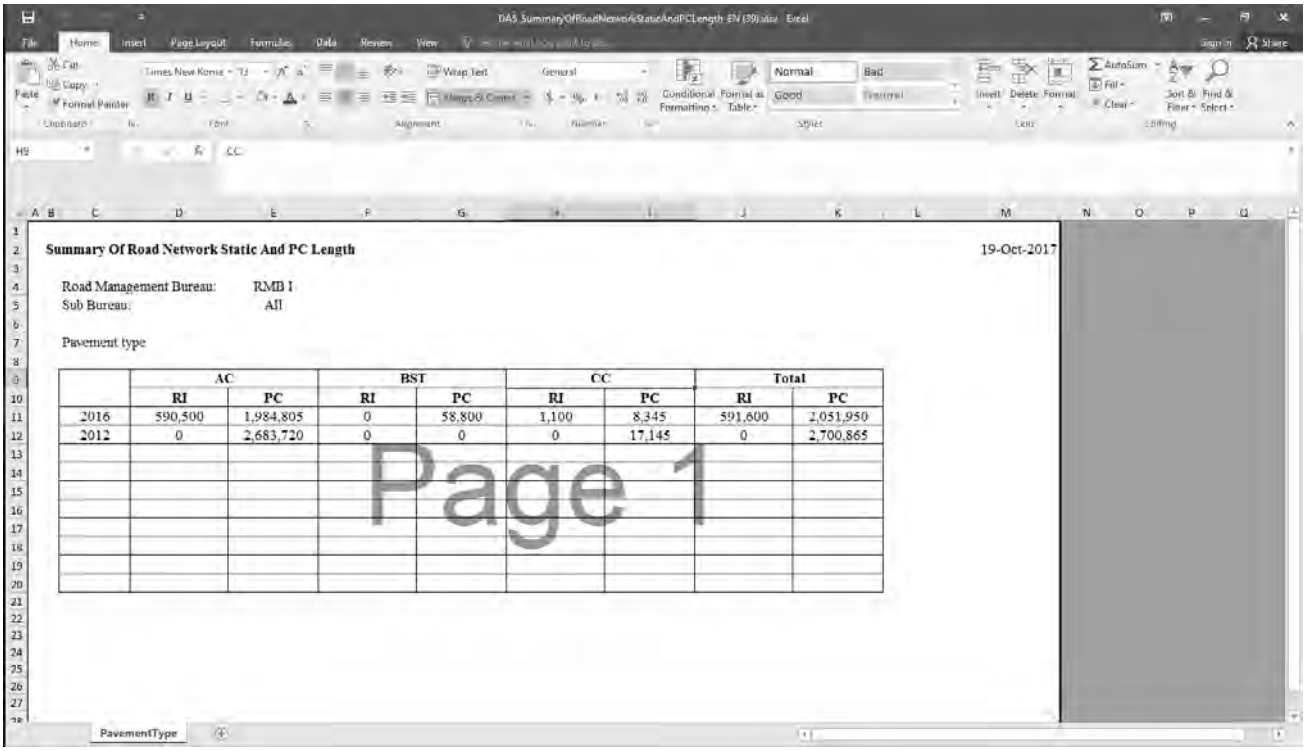
- Display data for RMB and SB are selected:
  - Diplay survey year of 1 RMB and all of SBs corresponding RMB are selected
  - Display the road network length and Actual PC Survey Length (Latest Survey) by servey Years for the 3 distress type: Asphalt Concrete (AC), Bituminous Surface Treatment (BST)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



Summary Of Road Network Static And PC Length

19-Oct-2017

Road Management Bureau: RMB 1
Sub Bureau: All

Pavement type

	AC		BST		CC		Total	
	RI	PC	RI	PC	RI	PC	RI	PC
2016	590,500	1,984,805	0	58,800	1,100	8,345	591,600	2,051,950
2012	0	2,683,720	0	0	0	17,145	0	2,700,865

PavementType

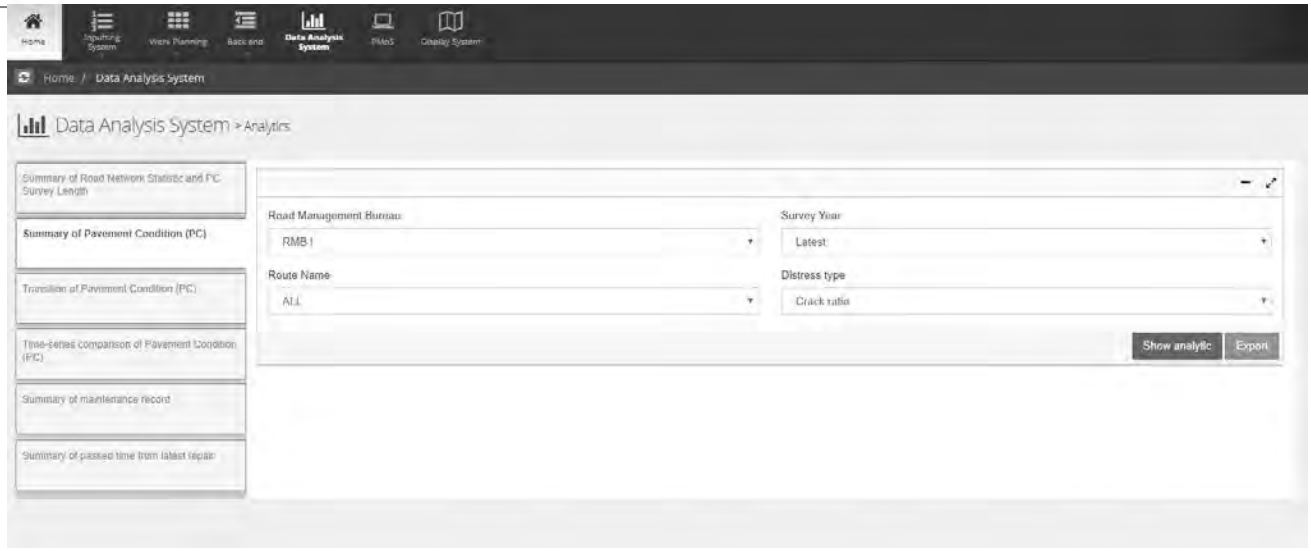
b) In Case: Similar with: Select SB is one SB

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



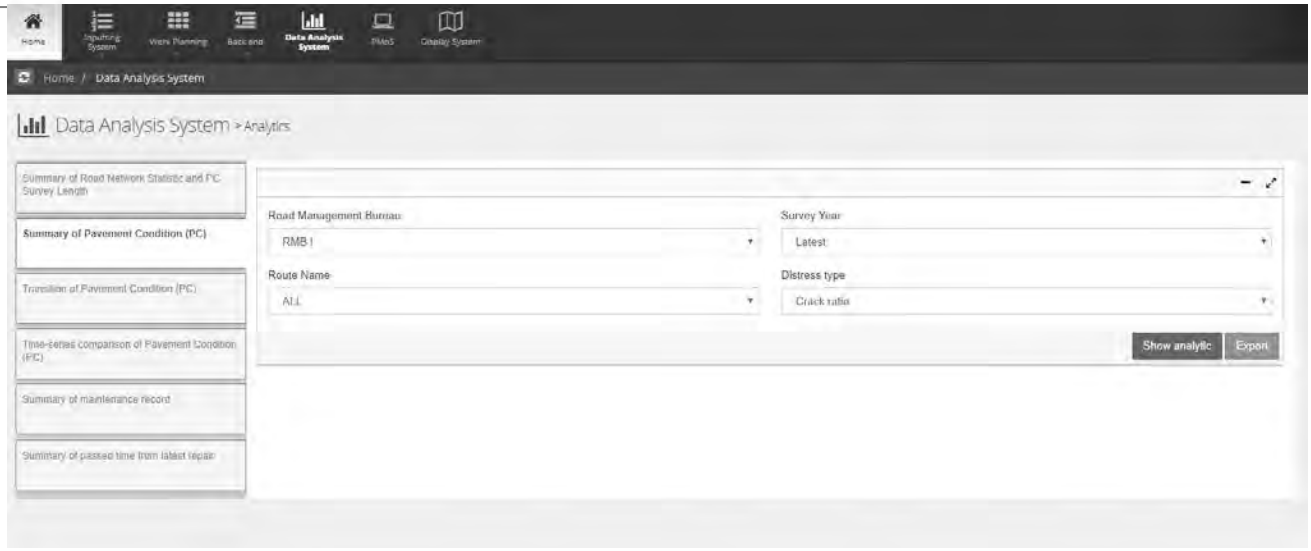
II.2) The Graphs and Summary Table

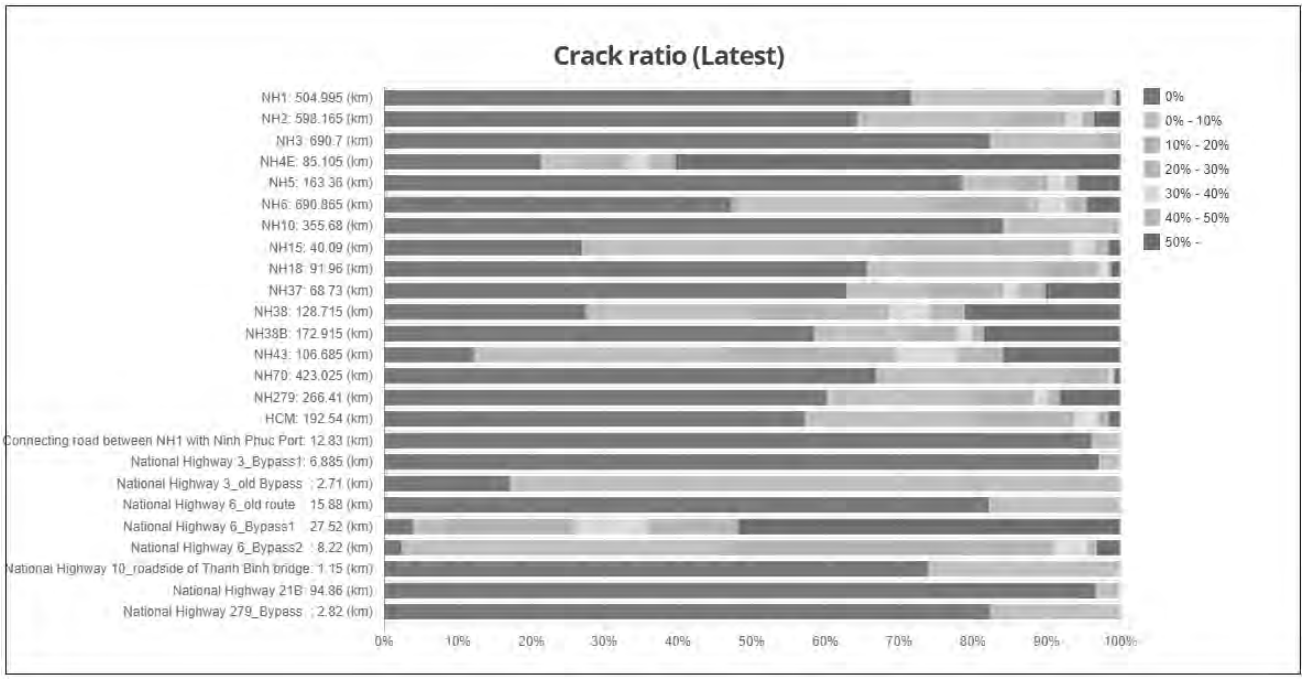
❖ 100% stacked bar chart of PC

- 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





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

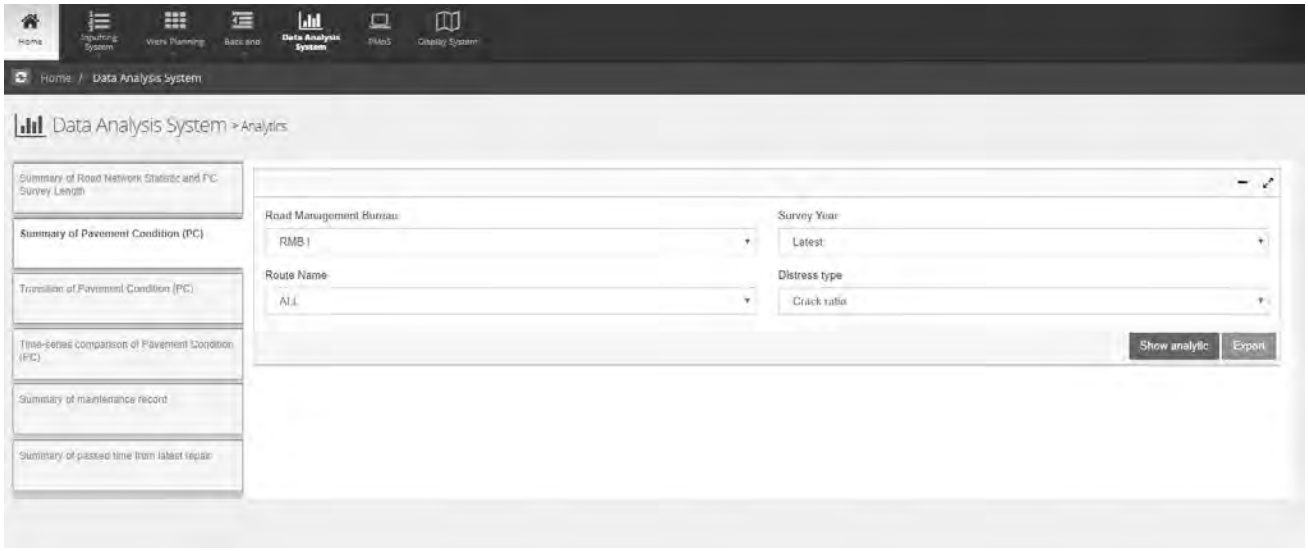
- Pie chart for each route and total, for each RMB, for each pavement index about of pavement condition summary on targeted survey year and regions.
- Operation:

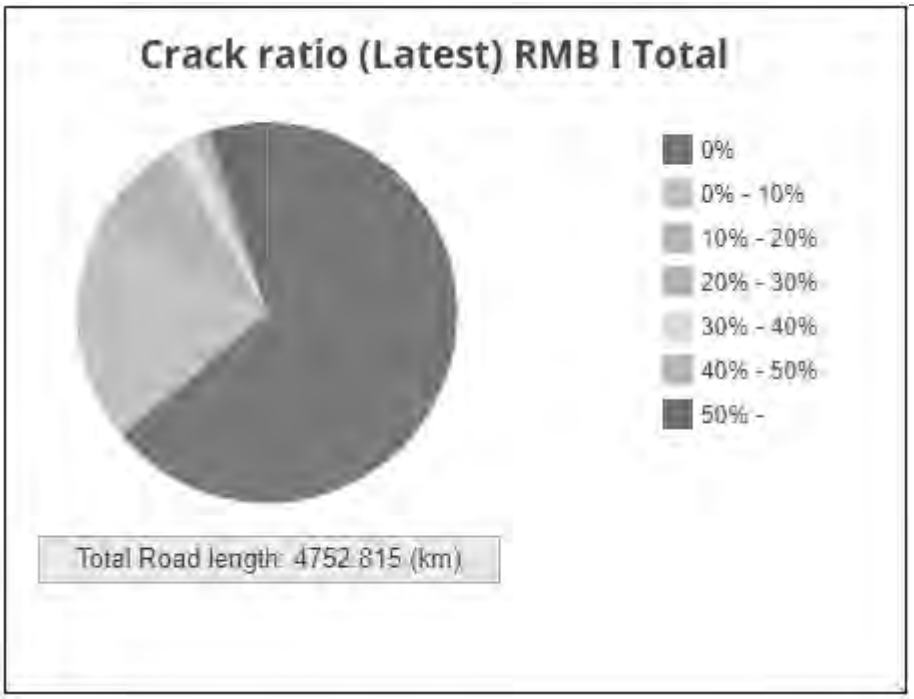
- Step 1: Select 1 RMB (In case, user is level 2. Don't select)
- Step 2: Select Route is specific or all (Default is All)
- Step 3: Select Year is lastest or specific servey year (Default is Lastest)
- Step 4: Select Distress Type is specific pavement index (Default is Crack Ratio)
- Step 5: Click on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



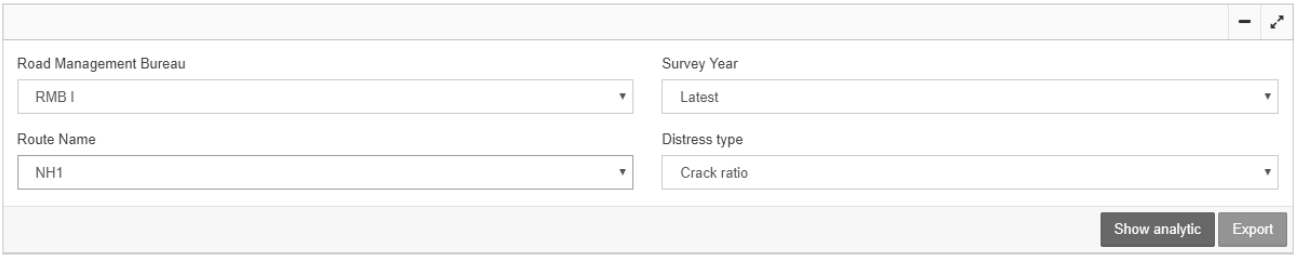


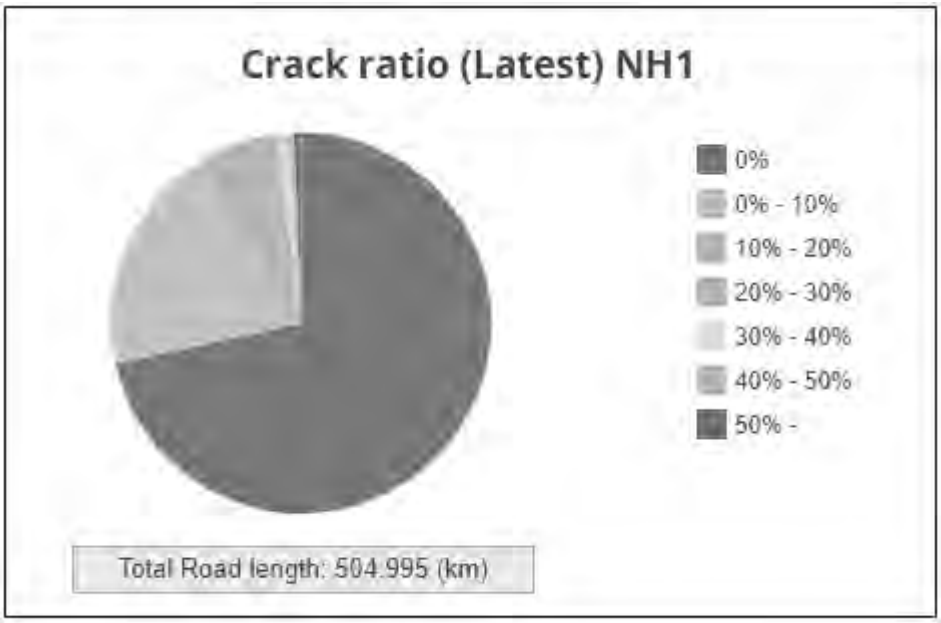
Display of graph:

- 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





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

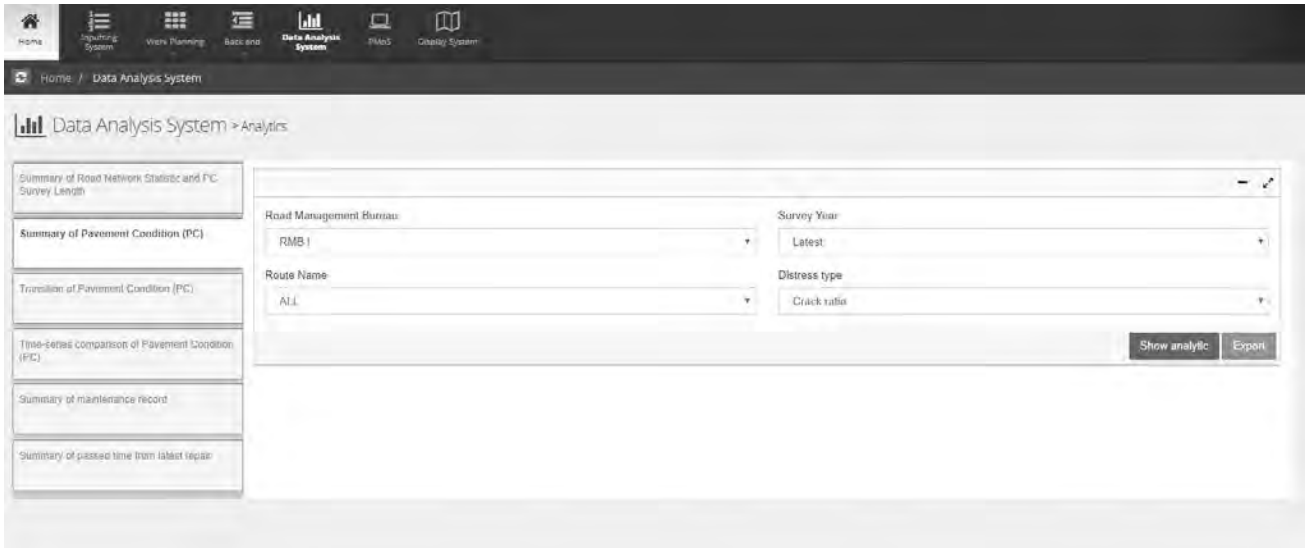
Note: Operation and display with orther distress types are simmilar

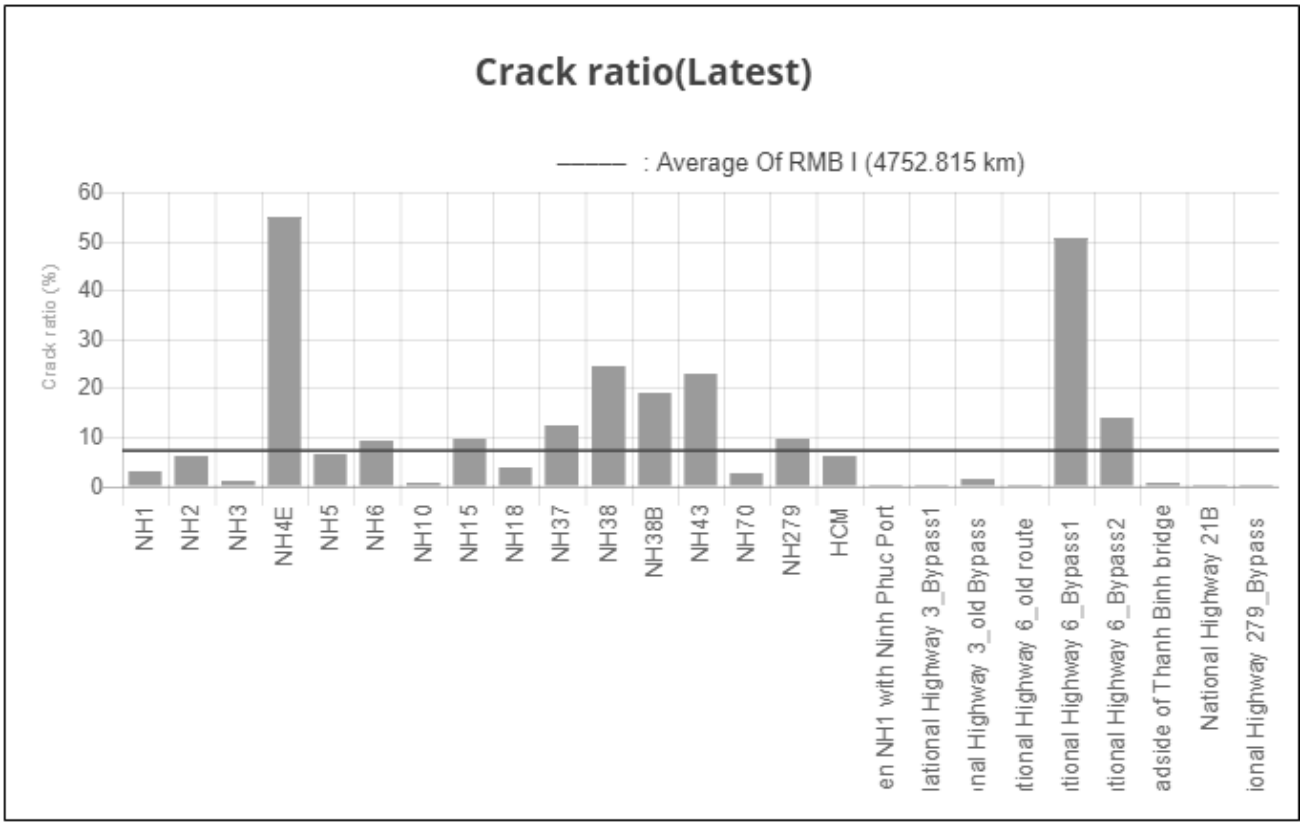
❖ Line Graph

- 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





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

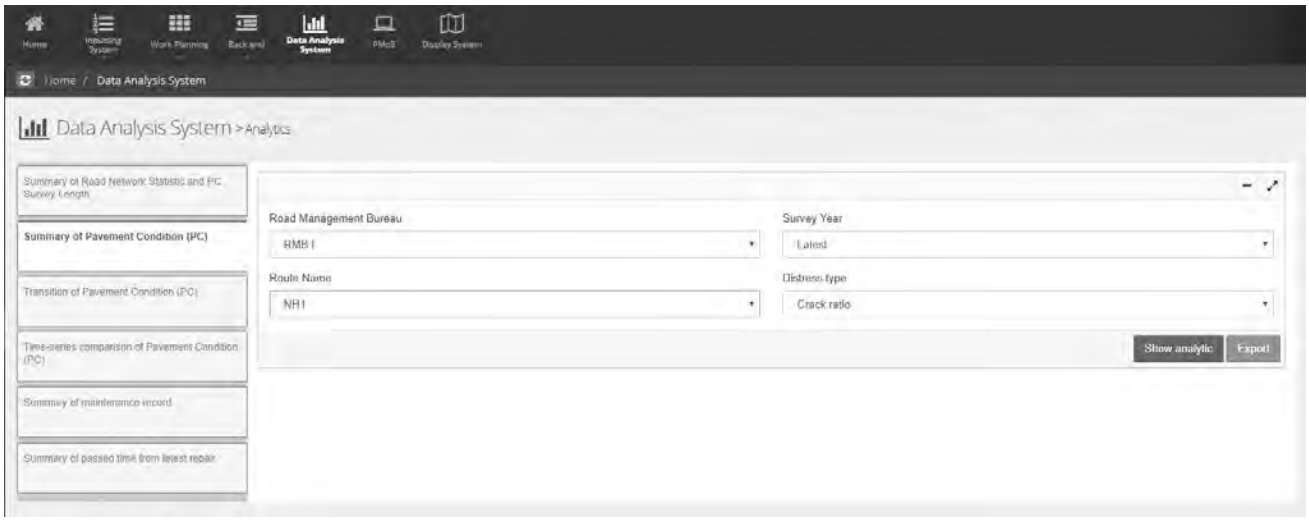
Note: Operation and display with orther distress types are simmilar

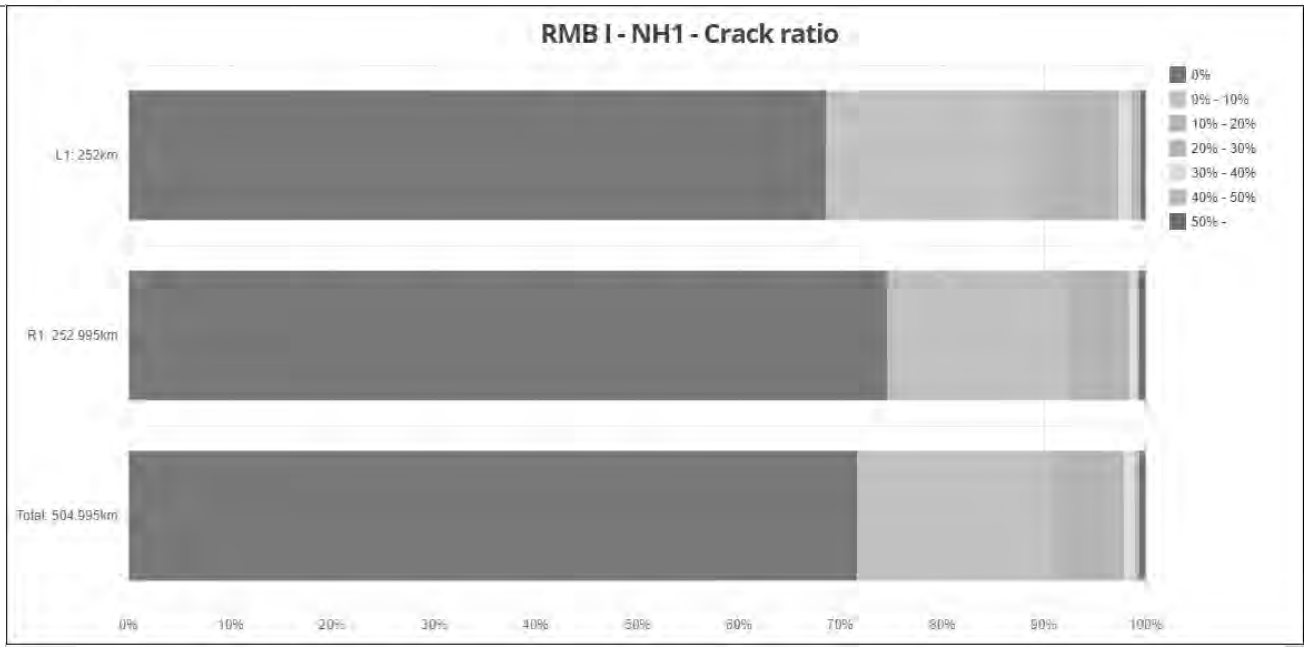
❖ 100% stacked bar chart of each selected route by comparison between directions and lanes

- 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





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"

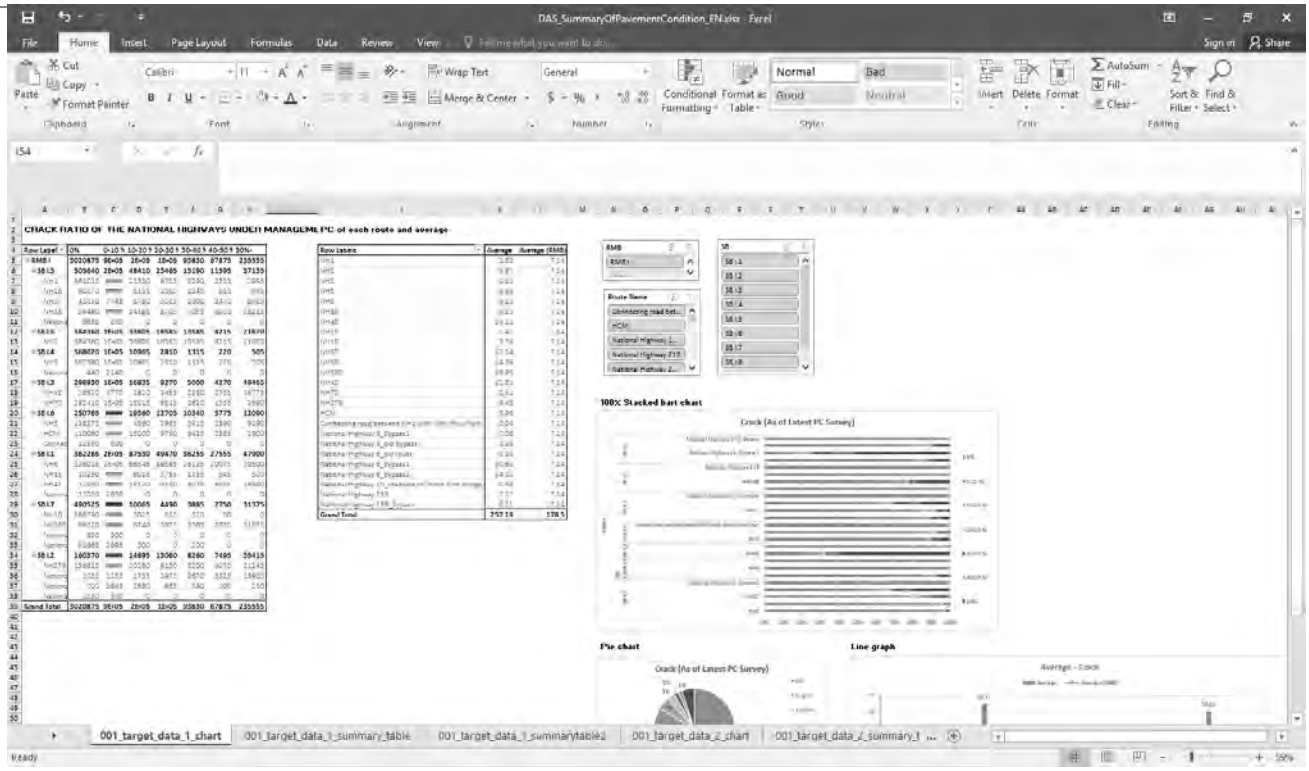
Note: Summary Table is always showed

- Example: In Case, Distress Type is Crack Ratio

	0%	0% - 10%	10% - 20%	20% - 30%	30% - 40%	40% - 50%	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
HCM	110060	45485	15000	9750	6425	2885	2900	192505	5.96
Connecting road between NH1 with Ninh Phuc Port	12330	500	0	0	0	0	0	12830	0.04
National Highway 3_Bypass1	6685	200	0	0	0	0	0	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	0	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 Binh bridge	850	300	0	0	0	0	0	1150	0.58
National Highway 21B	91665	2695	300	0	200	0	0	94860	0.17
National Highway 279_Bypass	2320	500	0	0	0	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.

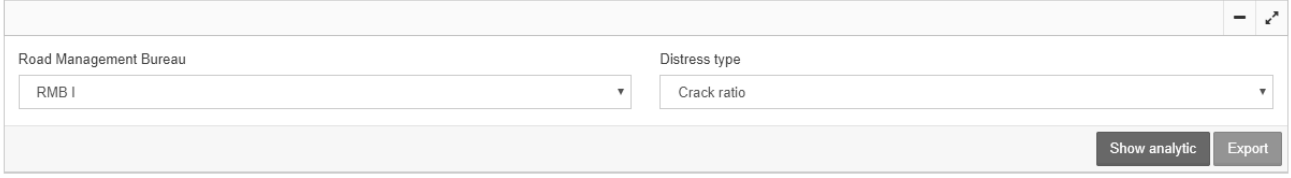


III) TRANSITION OF PAVEMENT CONDITION (PC)

- 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

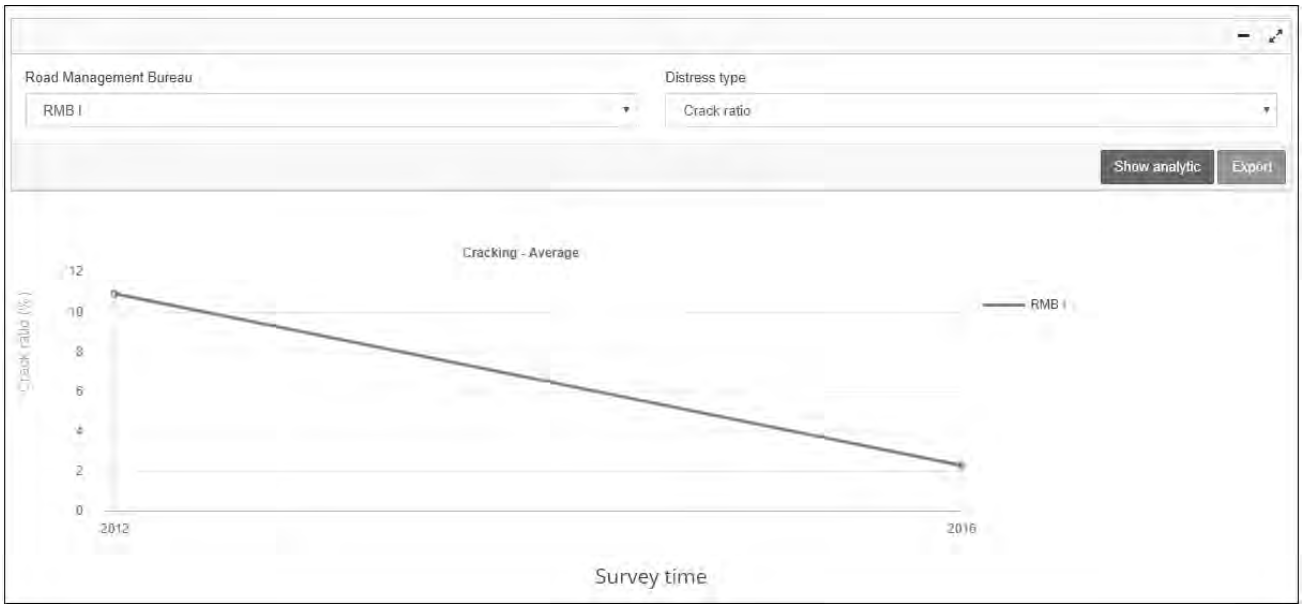
- Purpose: Display data included: RMB and Distress type
- Data list is shown based on user jurisdiction:
  - ➢ Level 1 and Level 1p: Display all RMBs and All
  - ➢ Level 2: Display 1 RMB
- Distress type: Display 5 distress type:
  - Crack ratio
  - Rutting depth (max)
  - Rutting depth (average)
  -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



III.2) Summary graph and table

❖ Line graph chart

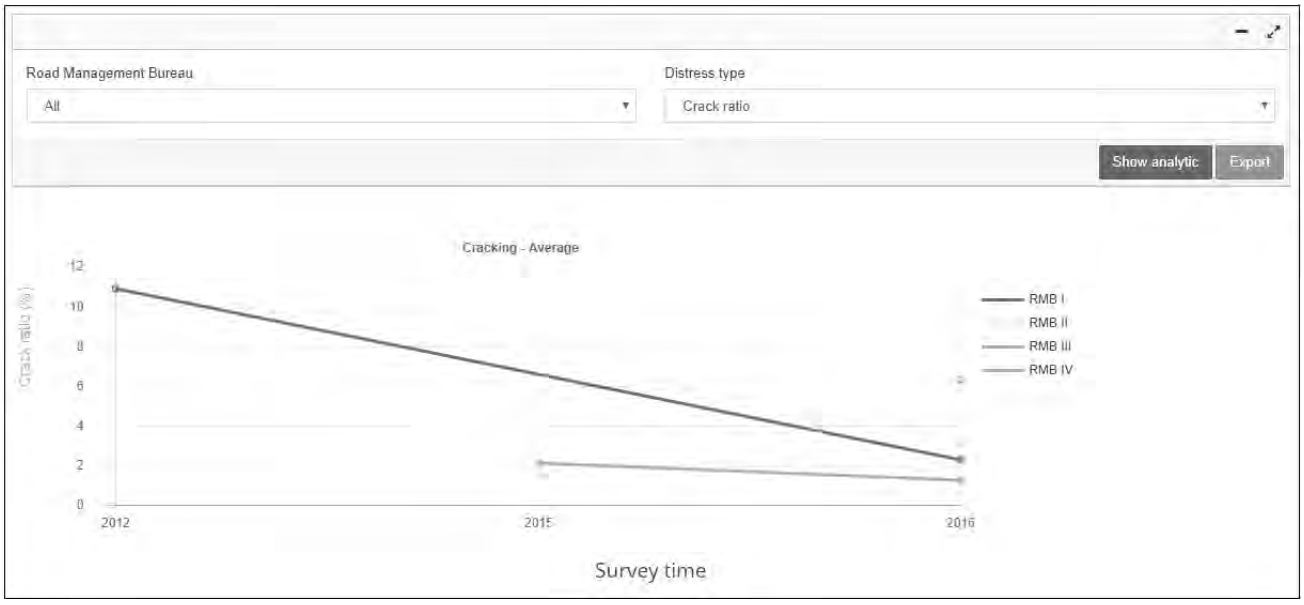
- Purpose: Display data of transition of average value of pavement condition (PC) based on RMB, Survey year, Distress type
- Operations:
  - Step 1: Choose data: RMB and Distress type
  - Step 2: Click “Show analytic” button
- Distress type is Crack ratio in case view detail of 1 RMB



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

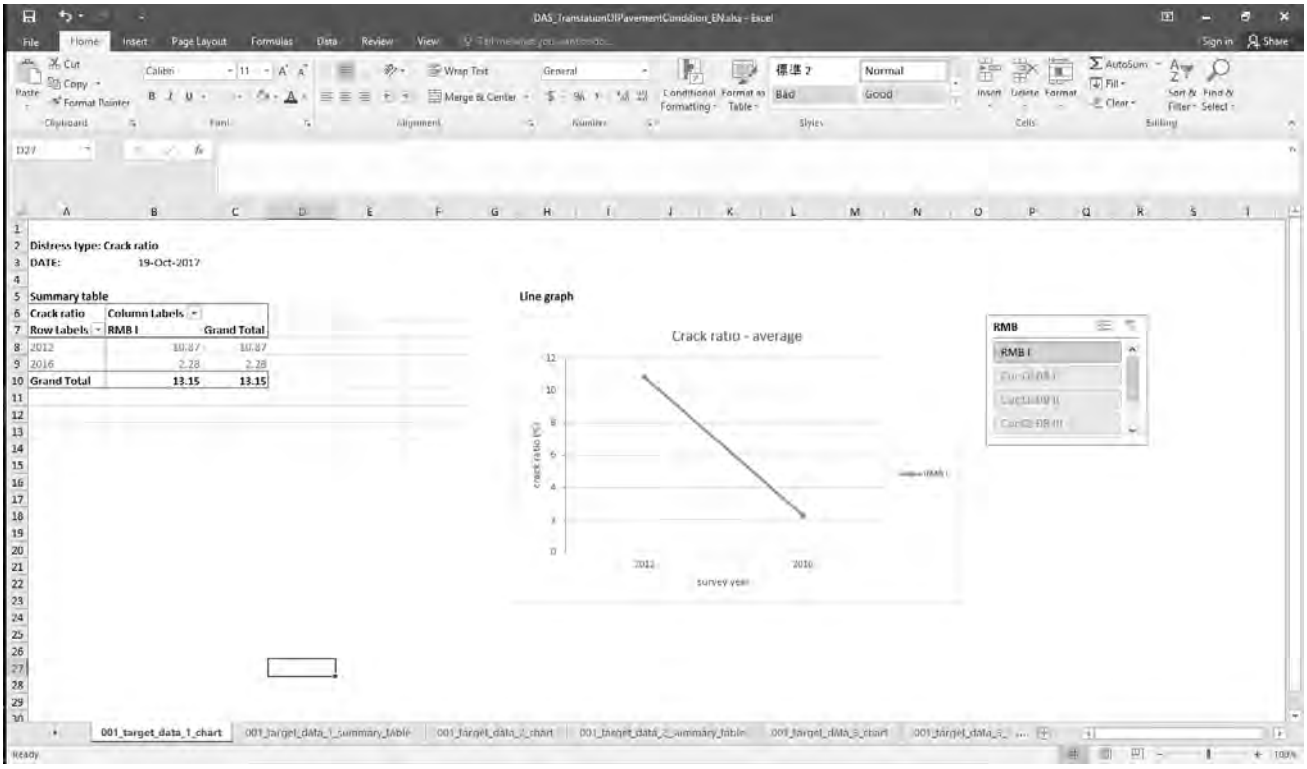
	2012	2016
RMB I	10.87	2.28

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

	2012	2015	2016
RMB I	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

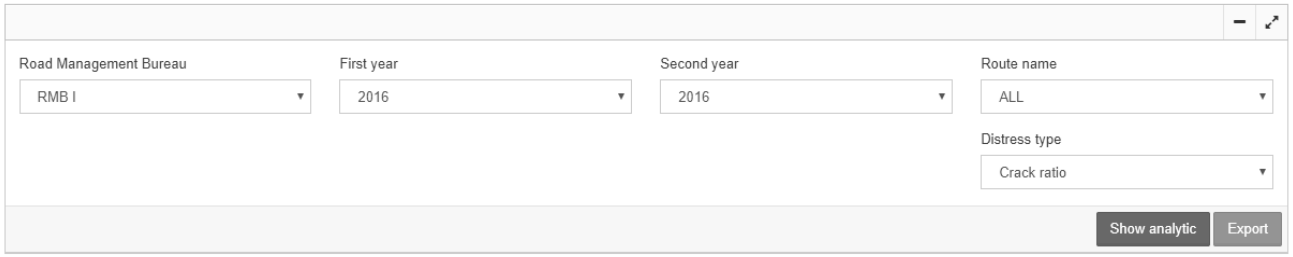


IV) TIME – SERIES COMPARISON OF PAVEMENT CONDITION (PC)

- 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



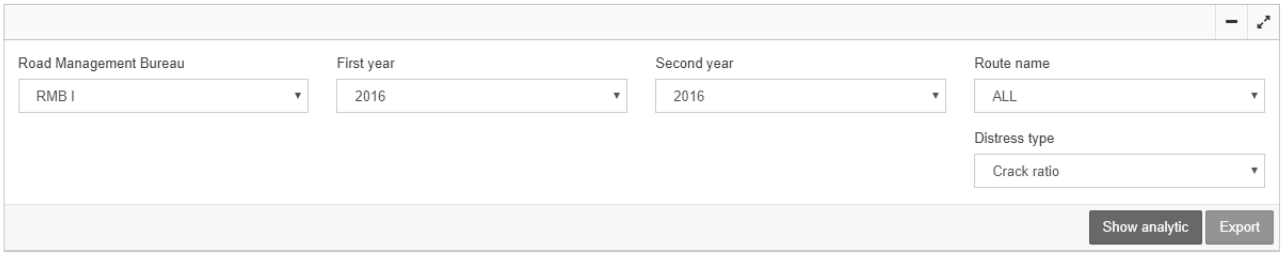
IV.2) Summary graph and table

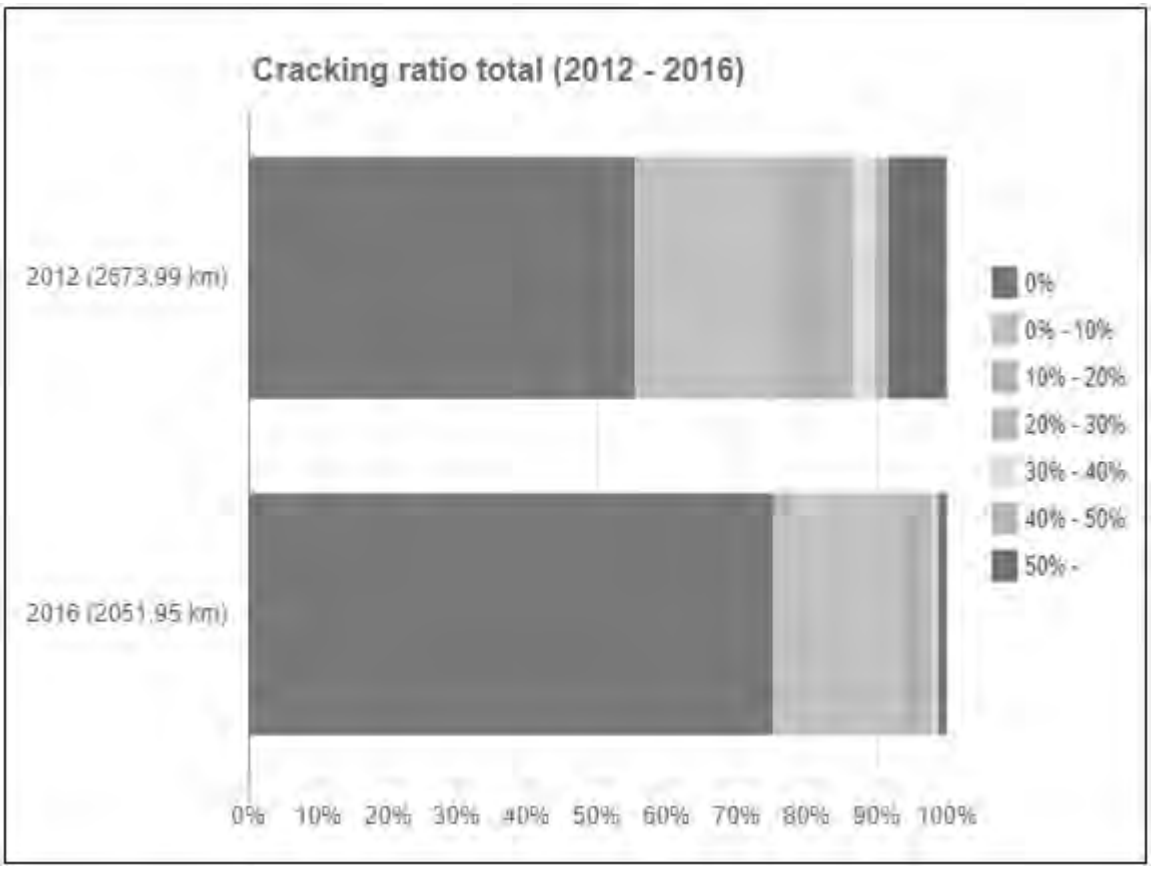
❖ 100% stacked bar chart

- 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





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

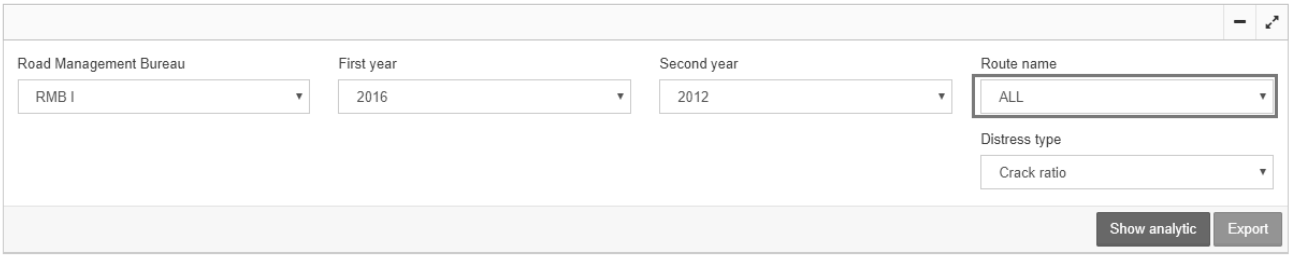
❖ Doughnut chart

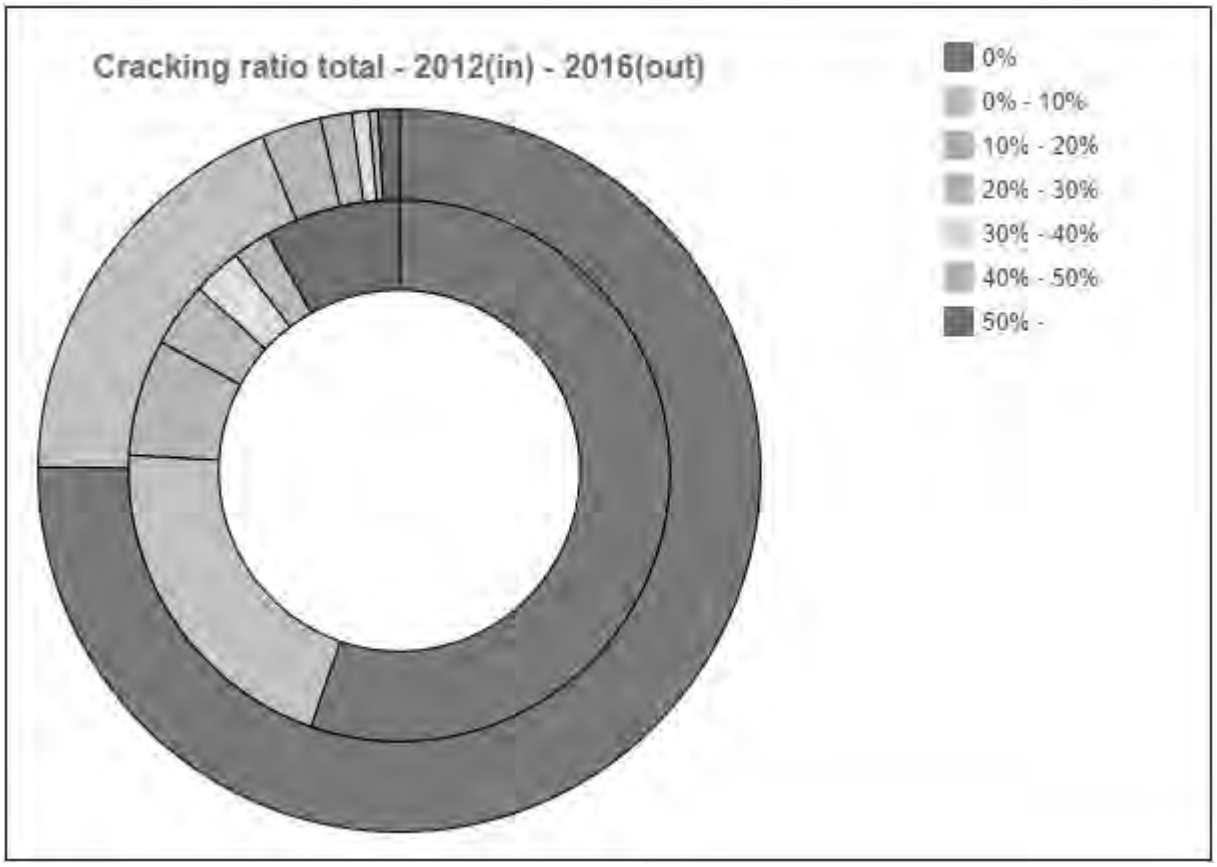
- Display data comparison by PC survey length based on two time – series corresponding RMB, Route Name and Distress type is selected at the scope management form
- Operations:
    - Step 1: Choose data: RMB, First Year, Second Year, Route Name and Distress type
    - Step 2: Click “Show analytic” button

Note:

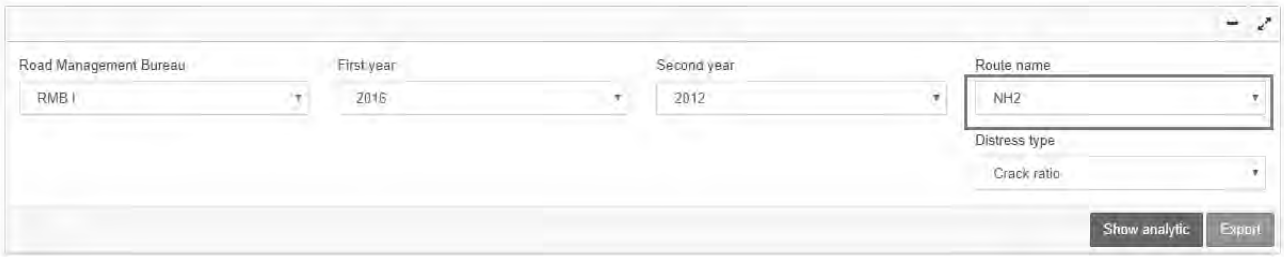
- ***Doughnut chart will show data by RMB is selected in case Route Name is All value***
- ***Doughnut chart will show data by 1 Route Name of RMB is selected***

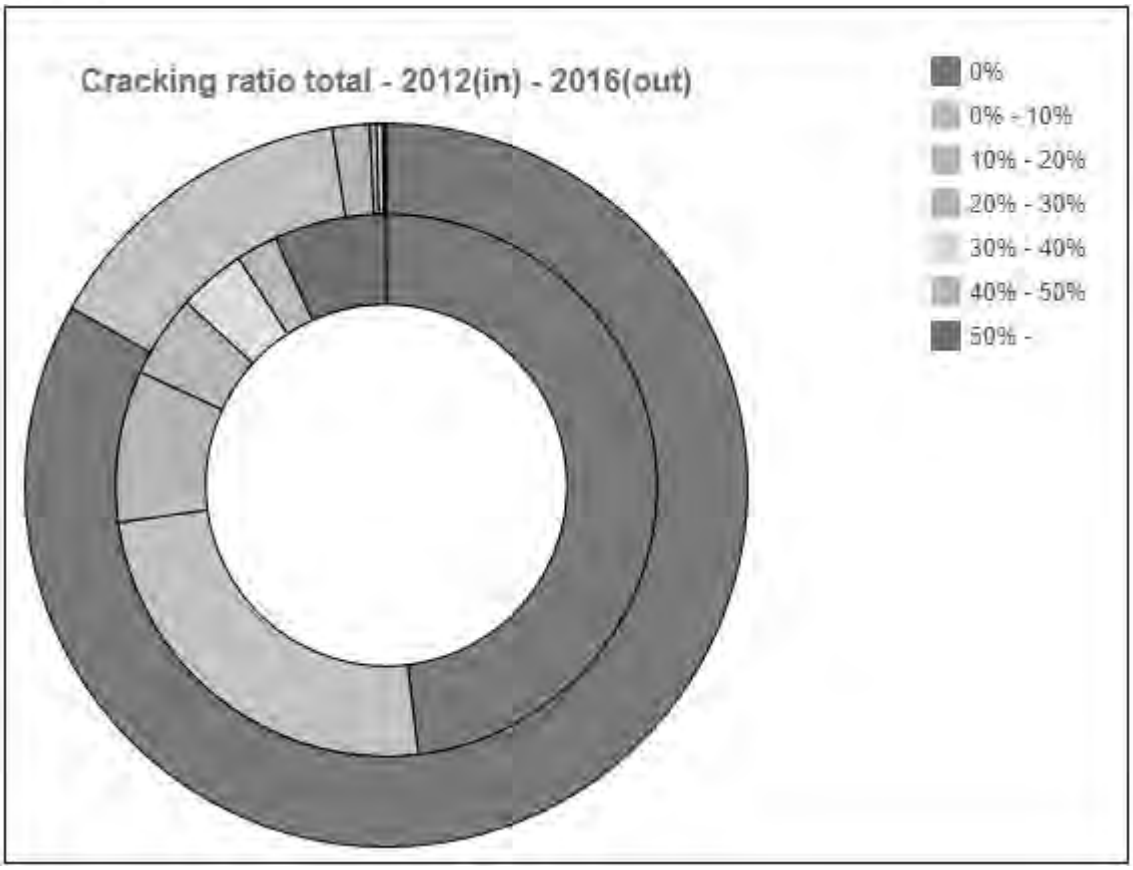
- Distress type: Crack ratio
  - In case Route Name is "All" value





  - In case Route Name is 1 Route Name belong RMB





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

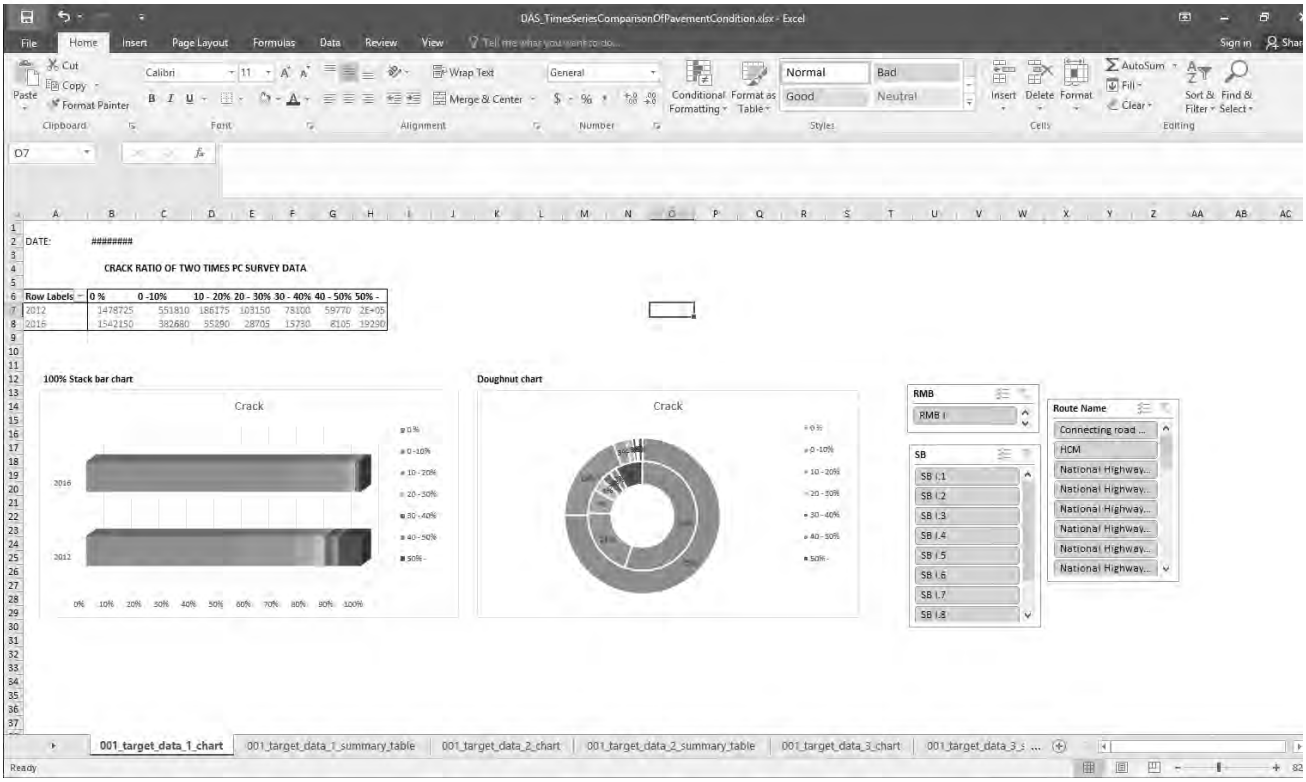
❖ Summary table

- 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

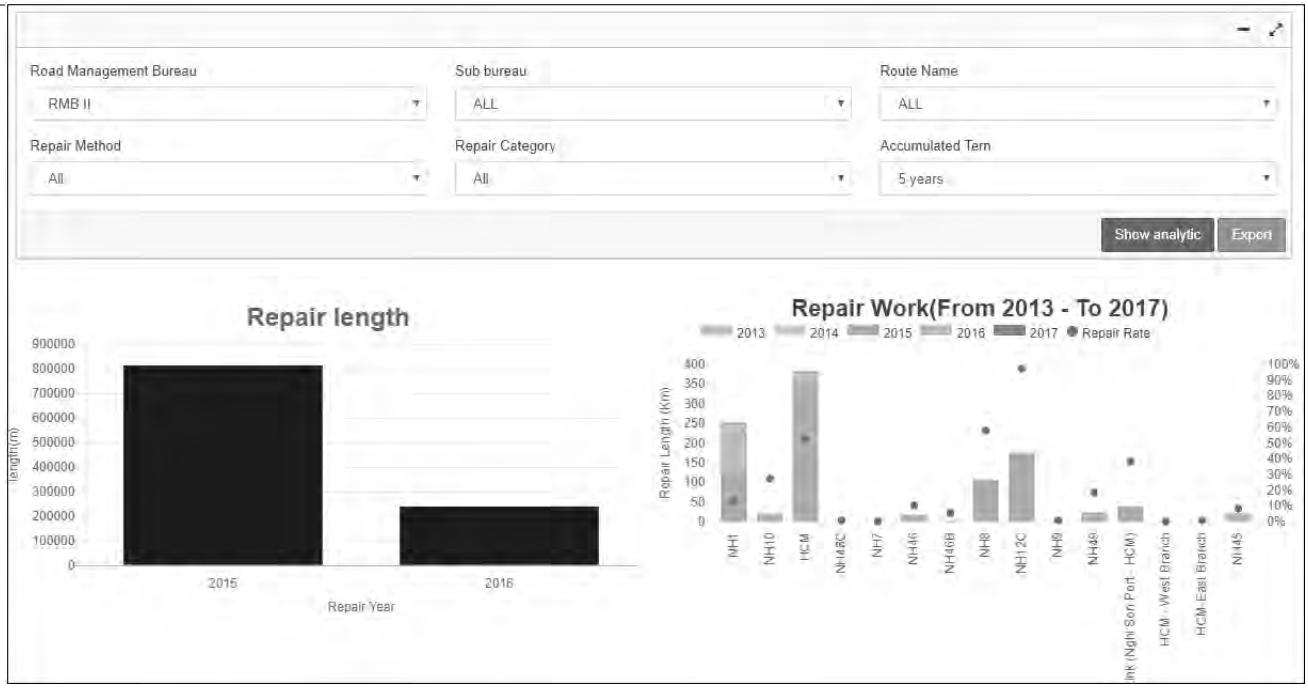


V) SUMMARY OF MAINTENAME RECORD

- 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.

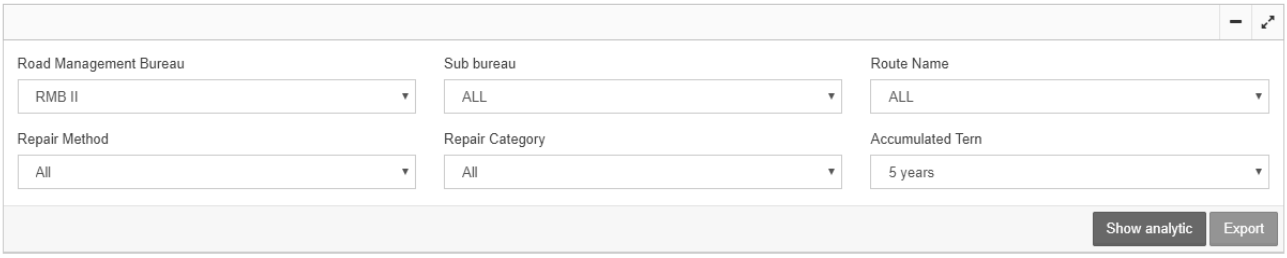


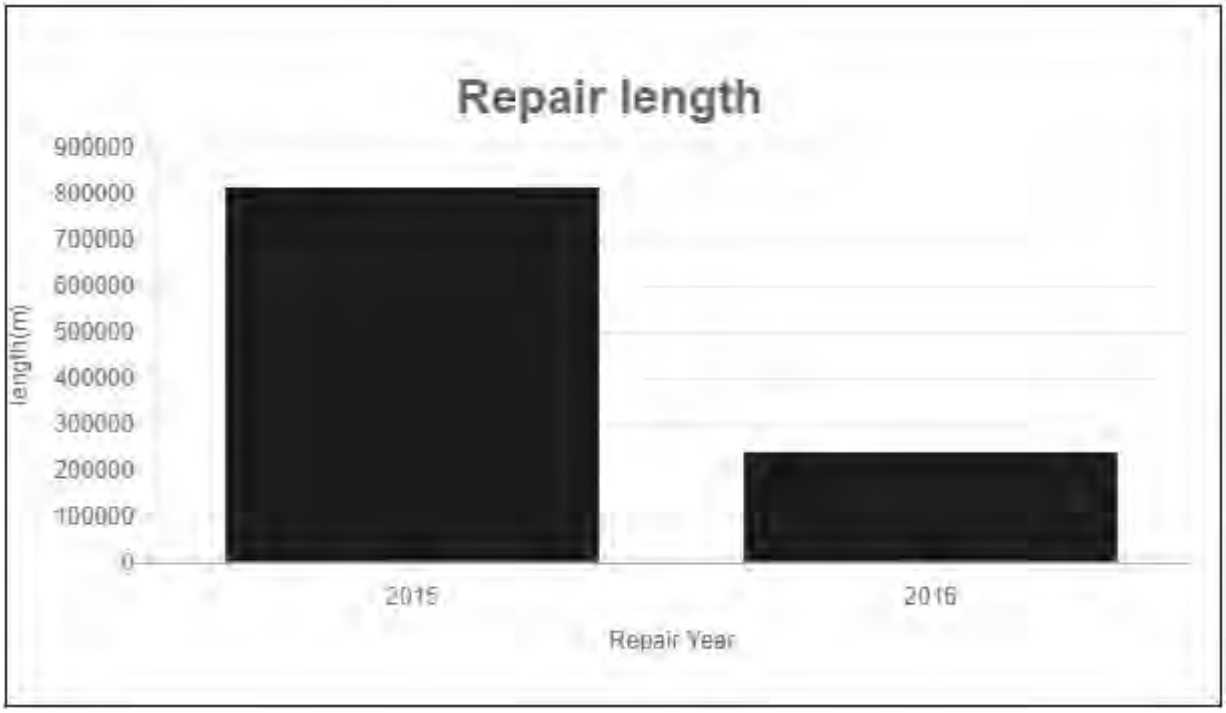
V.2) Summary graph and table

❖ 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*



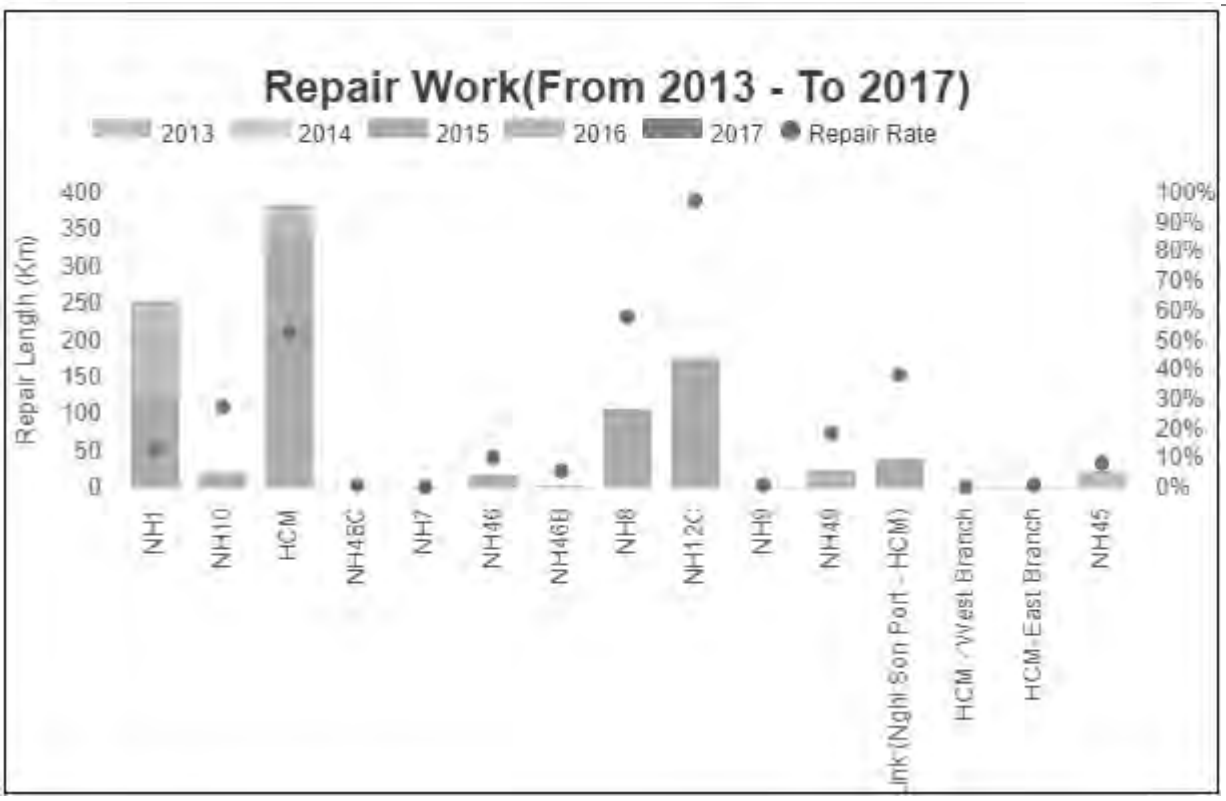


Descriptions:

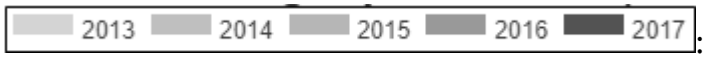
- X axis: Indicates the reapair year
- Y axis: Indicates the total length of repair (unit: m)

❖ 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



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 %)
- 

: Accumulated term (5 years)
- ●: Indicates repair rate

⇨ Accumulated term (10 years) do the same as the accumulated term (5 years)

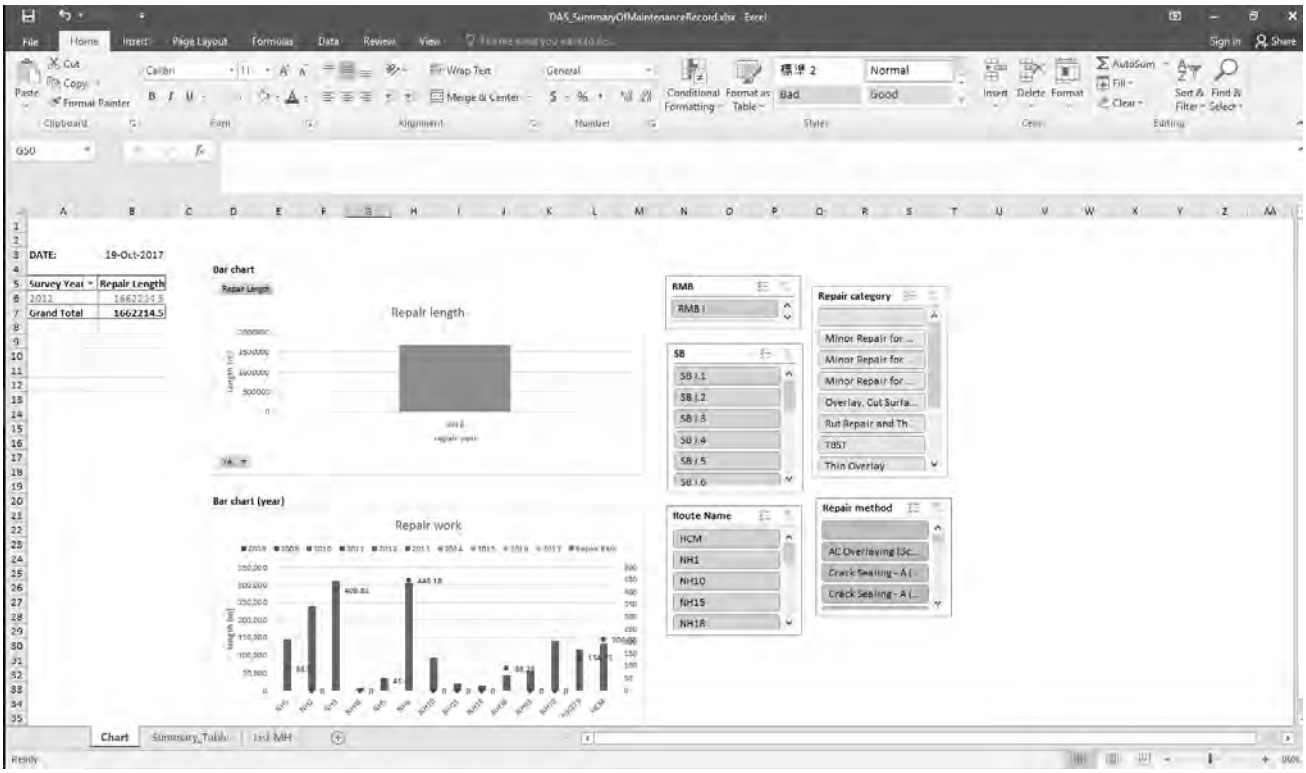
❖ Summary table

- 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	0	383,280
NH45	0	0	0	20,597	0	20,597
NH48C	0	0	708	0	0	708
NH7	0	0	666.5	0	0	666.5
NH46	0	0	16,200	0	0	16,200
NH46B	0	0	634	3,400	0	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	0	718
NH49	0	0	7,025	16,423	0	23,448
Link (Nghi Son Port - HCM)	0	0	37,169	0	0	37,169
HCM - West Branch	0	0	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

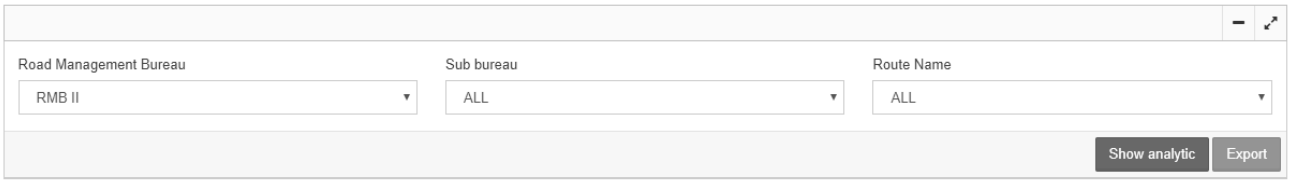
VI.1) Display the data for scope management form

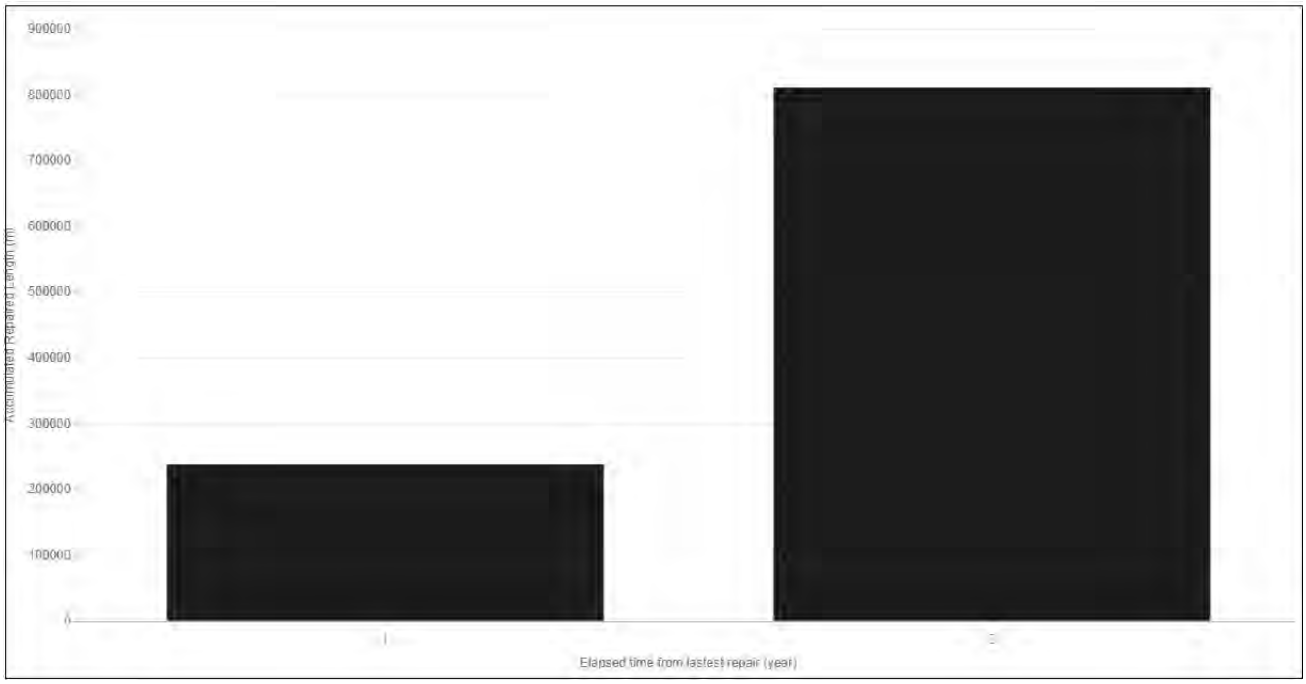
- Purpose: Data include: Road Management Bureau (RMB), Sub Bureau (SB), . Display data, is interactive part of the Show analytic and Export
- Sections list is shown based on user jurisdiction:
  - ➢ Level 1 and Level 1p: Display all of RMBs and SBs
  - ➢ Level 2: Display of 1 RMB and all of SBs, Route 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
  - Step 2: Click on "Show analytic"





Display of graph:

- Axis X: Accumulated section length (m)

- Axis Y: Elapsed time from lastest repair (year)

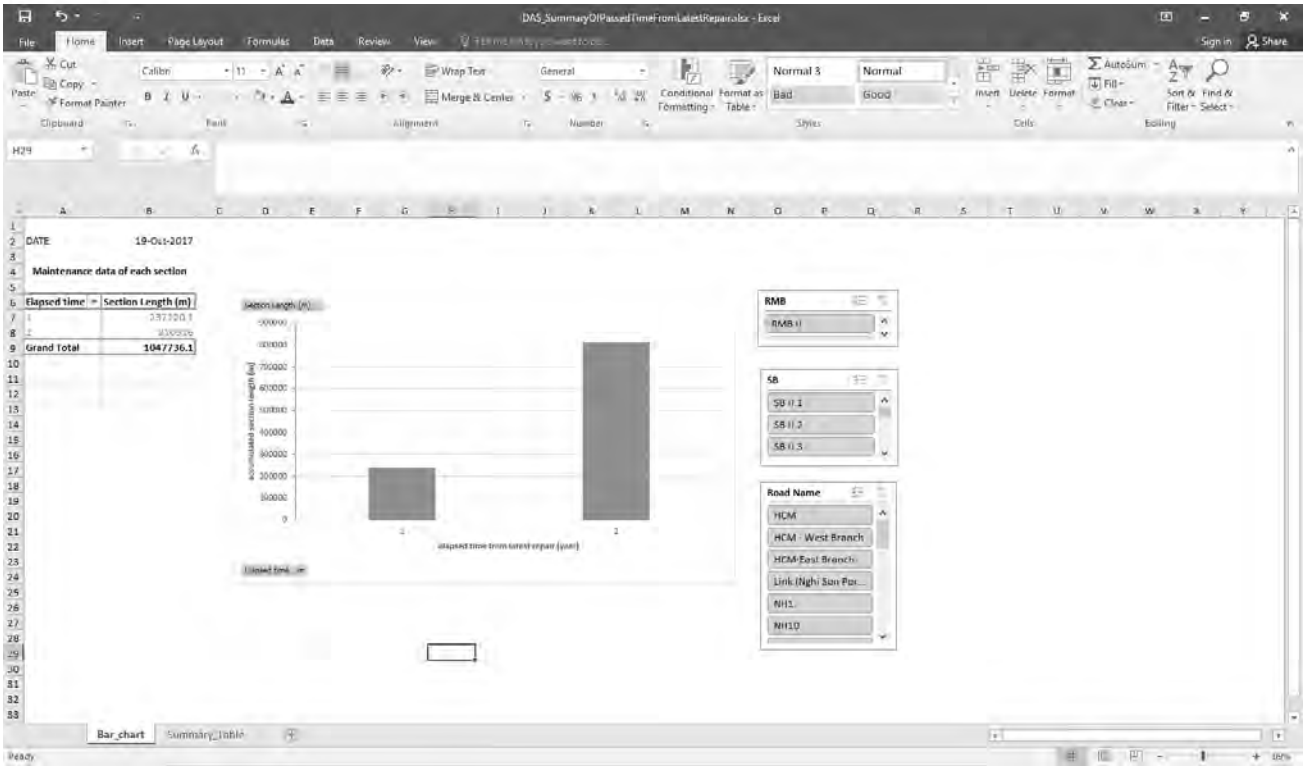
❖ Summary Table

- 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	1	2016	11,002
RMB II	SB II.1	Link (Nghi Son Port - HCM)	2	2015	37,169
RMB II	SB II.2	HCM	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	1	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	1	2016	177
RMB II	SB II.4	NH1	2	2015	3,858
RMB II	SB II.4	HCM	1	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 II.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”


DAS_SummaryOfPassedTimeFromLatestRepair.xlsx - Excel
DATE 19-Oct-2017
Maintenance data of each section
Elapsed time
Section Length (m)
Grand Total 1047736.1
RMB
SB
Road Name
HCM
HCM - West Branch
HCM-East Branch
NH1
NH10
Bar_chart
Summary_Table
Ready

USER'S MANUAL

PAVEMENT MONITORING SYSTEM (PMOS)

TABLE OF CONTENTS

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 **Capacity Enhancement in Road Maintenance in Vietnam**.

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

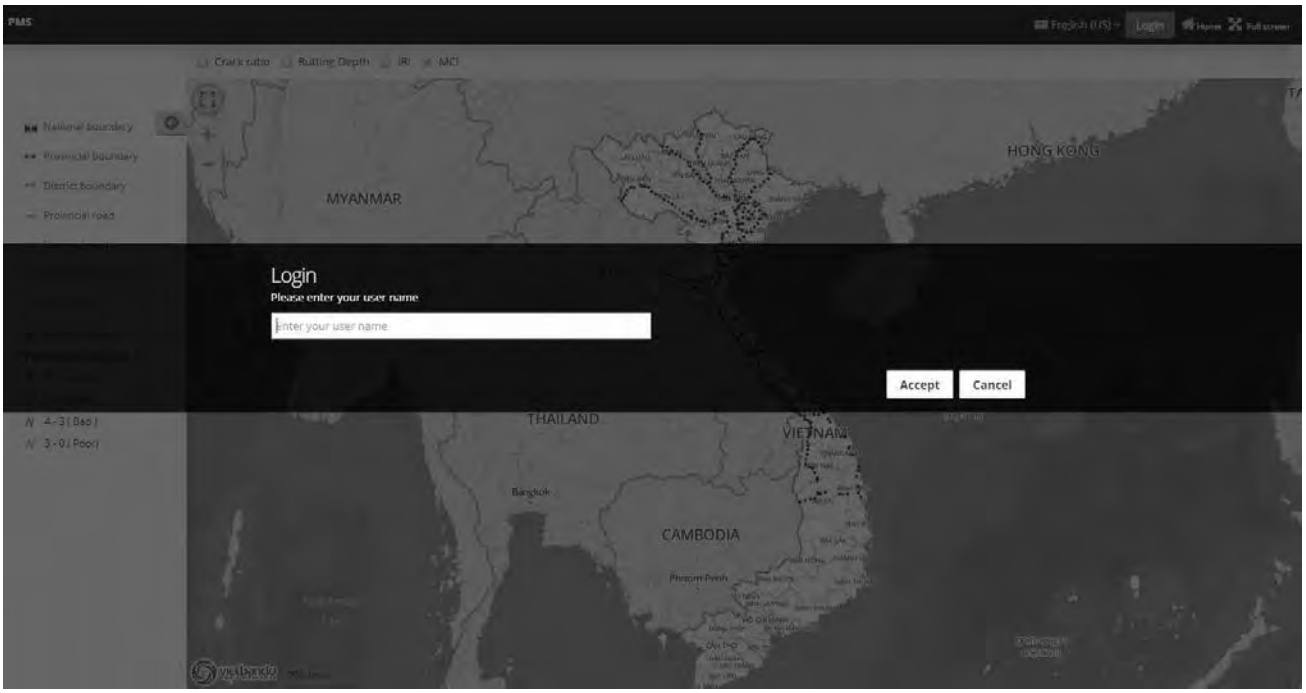
5. Traffic Volume

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



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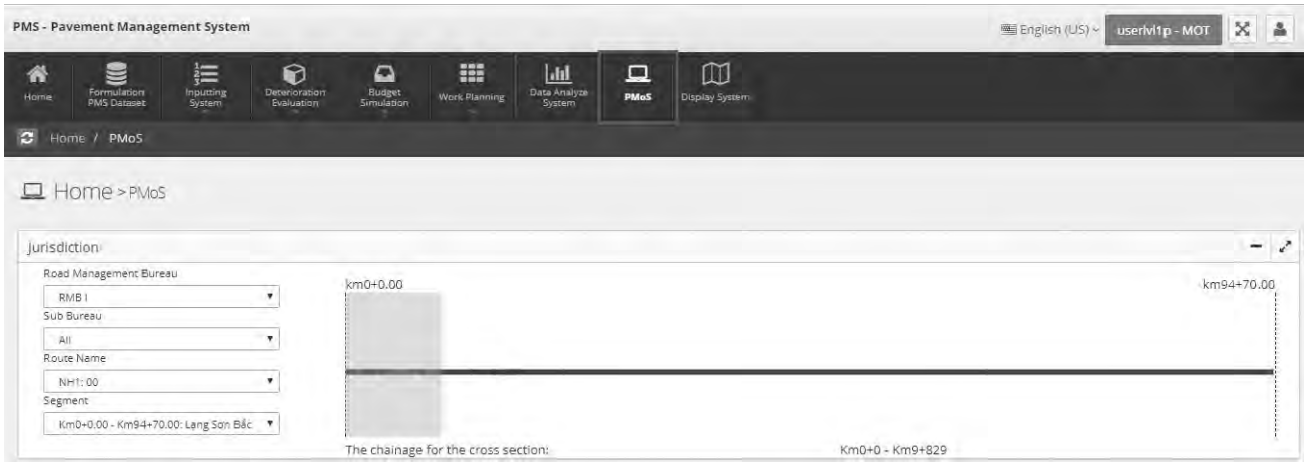
II.3) Language option

- 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”



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.

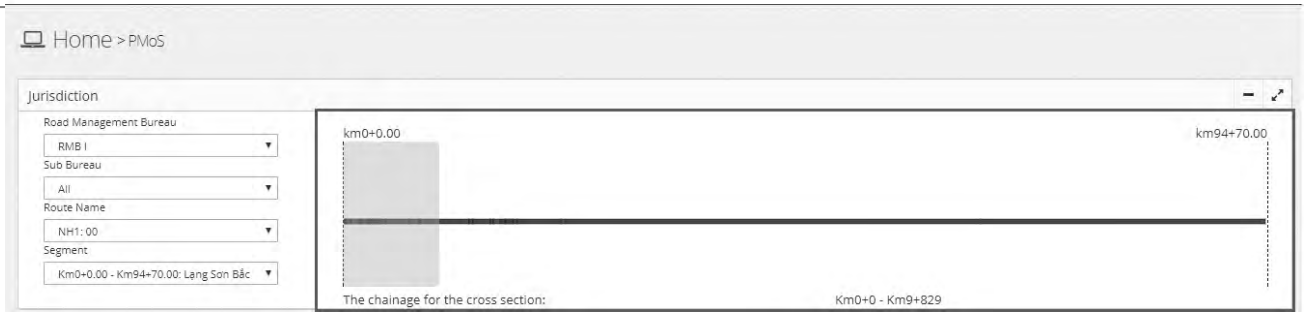
I) DISPLAY THE DATA OF SCOPE MANAGEMENT FORM

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

- 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



- ✓ 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

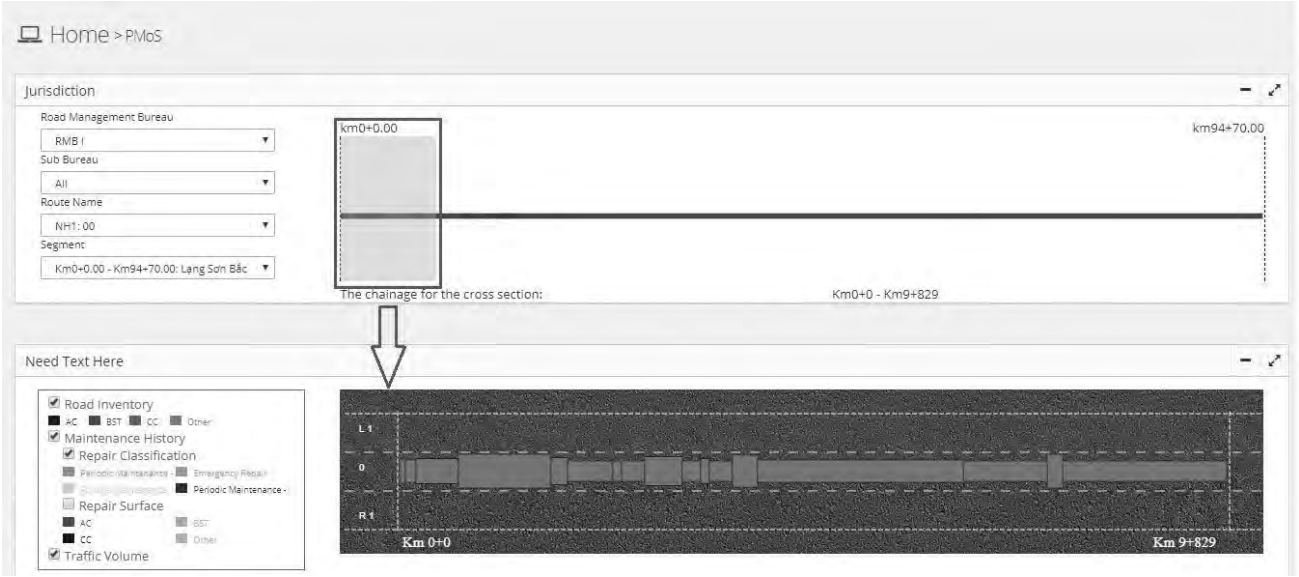
Note: When the user changes the gray area the chainage for the cross section changes accordingly.

- ✓ 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

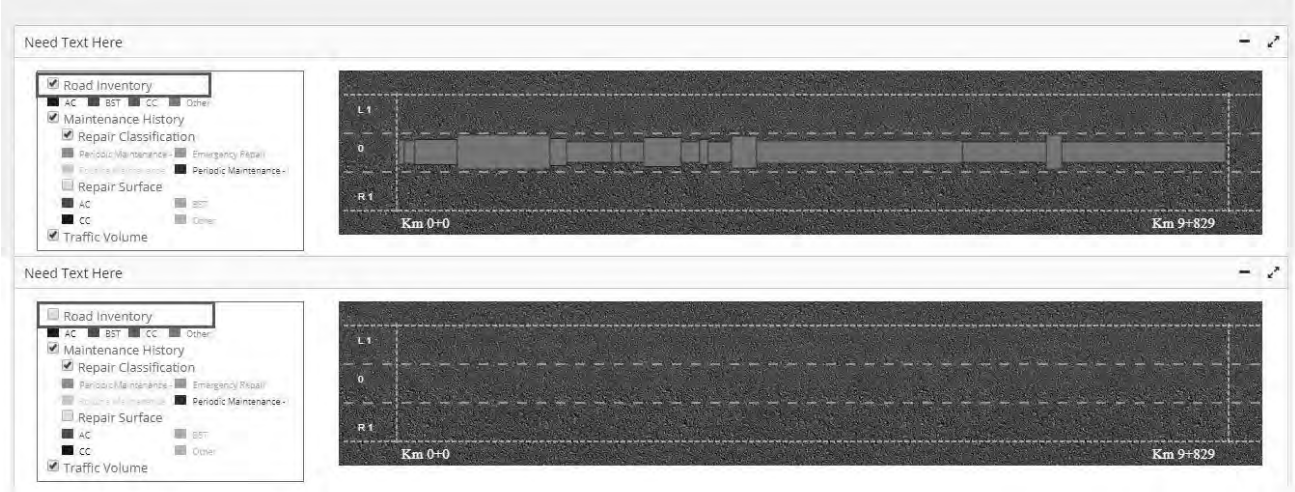
- The chainage for the cross section: Show the start position and end position of chainage based on gray area is selected. This chainage will also change with the gray area change.
- L1, L2: Helps users identify Direction (Left) and Lane Position Number (1, 2, 3…)
- R1, R2: Helps users identify Direction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

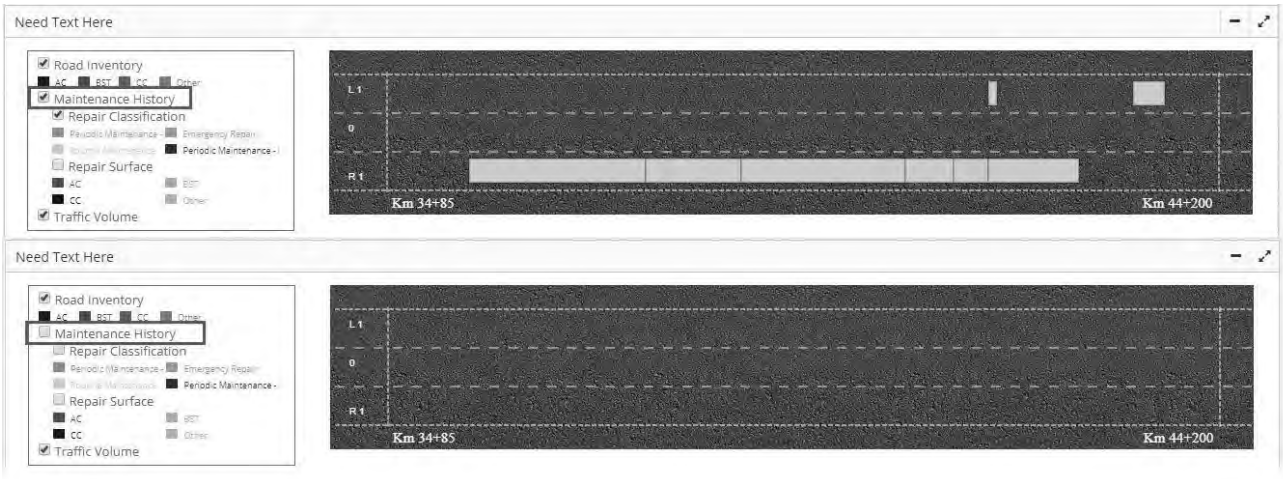
Data information:

- 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

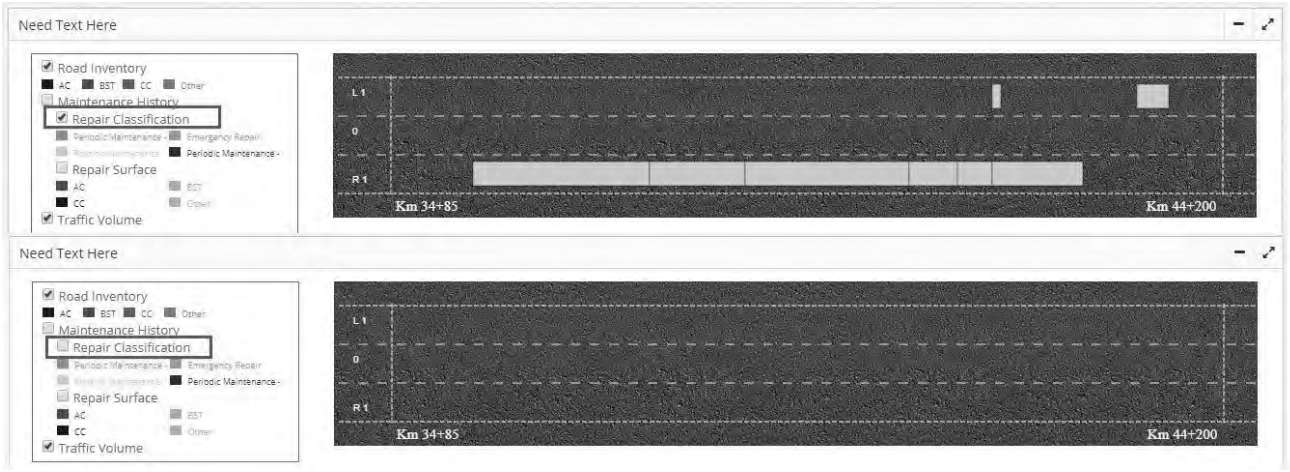


- Maintenance History: Displayed the data of Repair Classification and Repair Surface

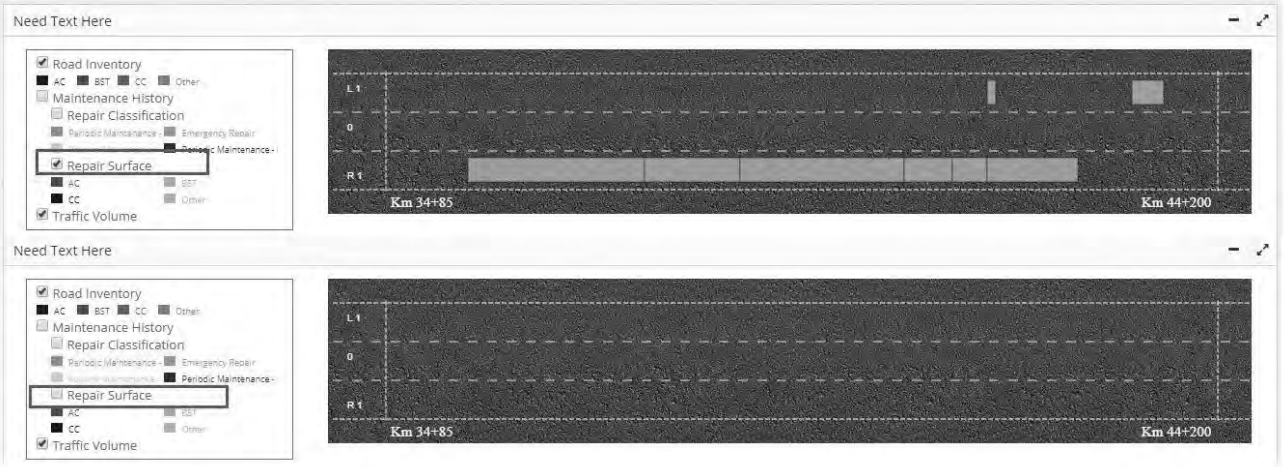
- Select/Unselect to Show/Hidden the data of Mantenance History



- 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



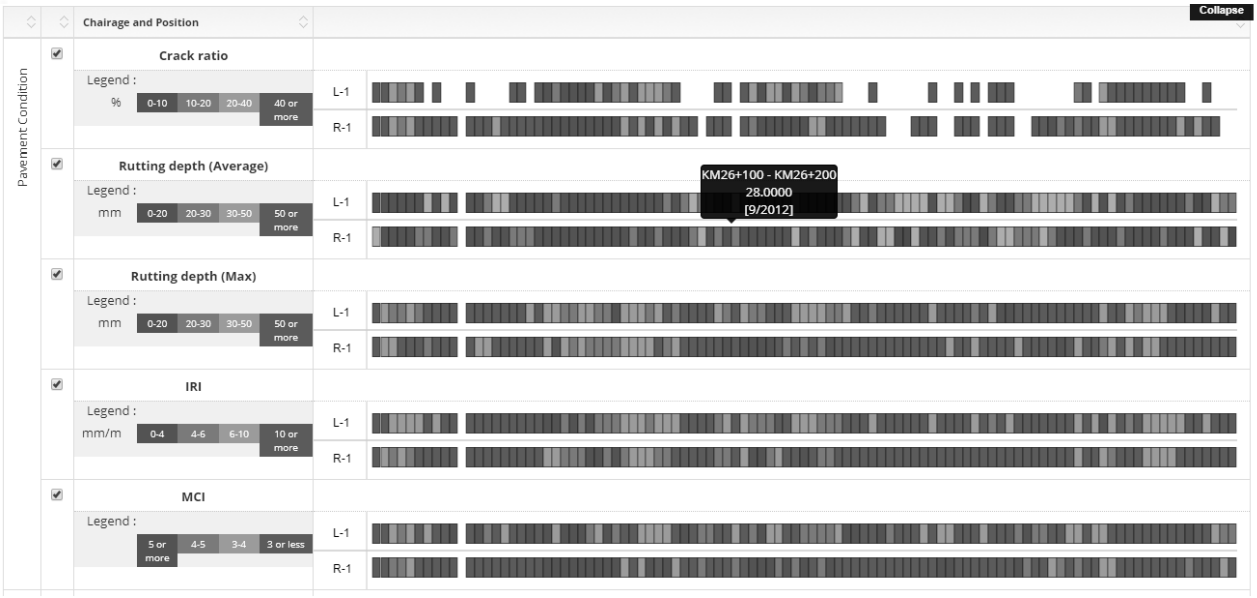
- Repair Surface: Note the color of Repair Surface on the Horizontal Interactive Area.
  - AC: Asphalt Concrete
  - BST: Bituminous Surface Treatment
  - CC: Cement Concrete
  - Other: Other materials
  - Select/Unselect to Show/Hidden the data of Repair Surface



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

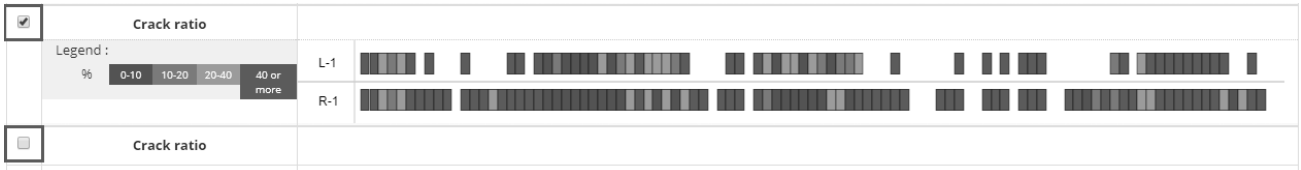
IV) PAVEMENT CONDITION

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

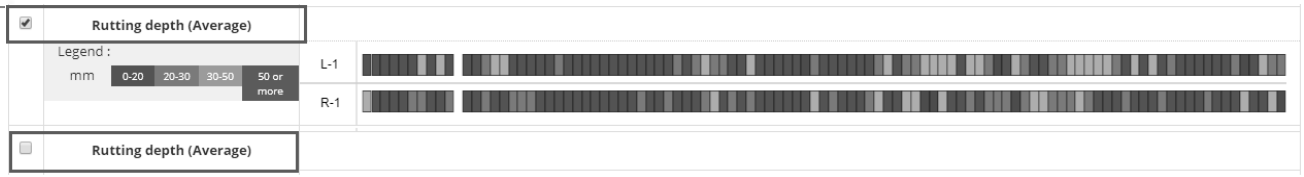


Data infomation:

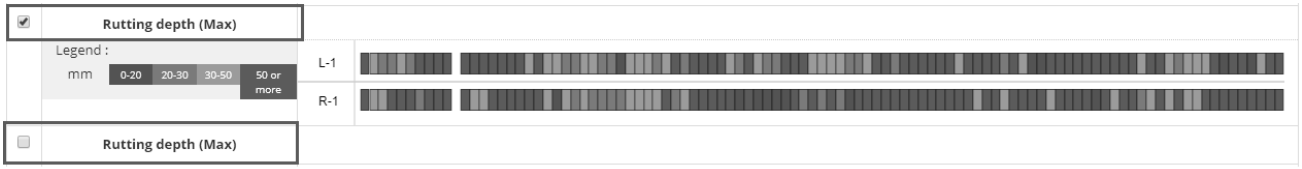
- Crack ratio: Display percent of Crack ratio for every 100m of road
  - Blue: Display Crack ratio from 0% to less than 10%
  - Green: Display Crack ratio from 10% to less than 20%
  - Orange: Display Crack ratio từ 20% to less than 40%
  - Red: Display Crack ratio from 40% or more
  - You can mouse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



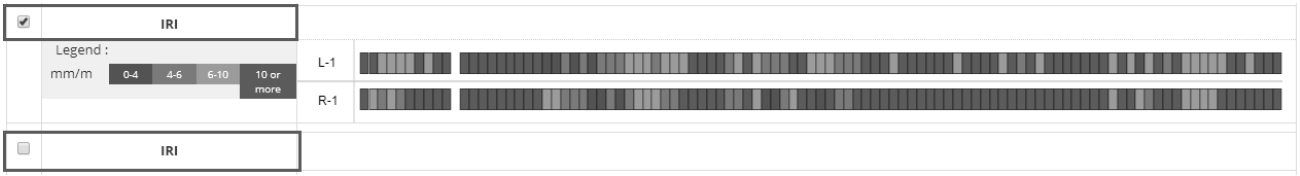
- Rutting depth (Average): Display Rutting depth (mm) for every 100m of road
  - Blue: Display Rutting depth (ave) from 0 mm to less than 20 mm
  - Green: Display Rutting depth (ave)from 20 mm to less than 30 mm
  - Orange: Display Rutting depth (ave) from 30 mm to less than 50 mm
  - Red: Display Rutting 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 (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)

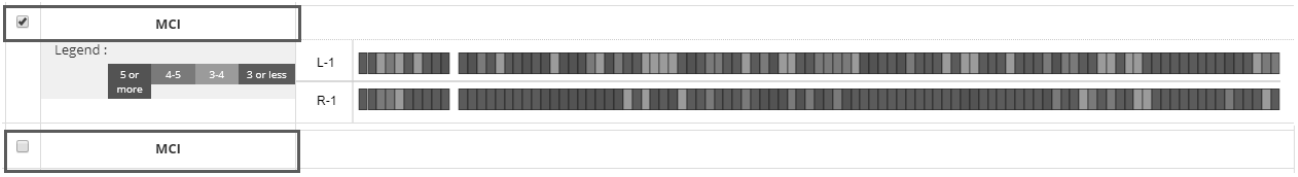


- IRI: Display rough IRI for every 100m of road
  - Blue: Display rough ratio from 0 mm/m to less than 4 mm/m
  - Green: Display rough ratio from 4 mm/m to less than 6 mm/m
  - Orange: Display rough ratio from 6 mm/m to less than 10 mm/m
  - Red: Display rough ratio from 10 mm/m or more
  - You can mouse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



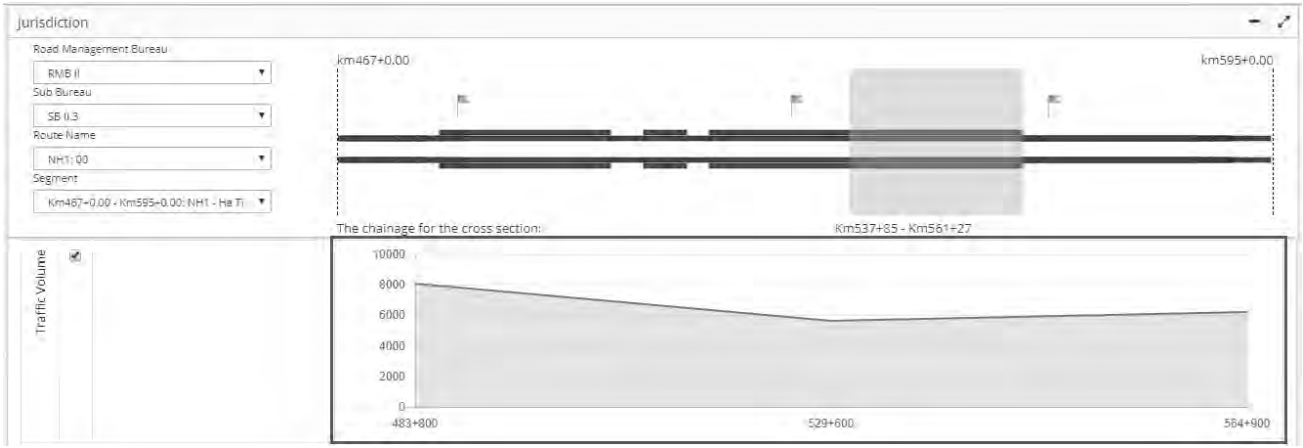
- MCI: Display MCI for every 100m of road
  - Blue: MCI from 5 or more
  - Green: MCI from 4 to less than 5
  - Orange: MCI from 3 to less than 4
  - Red: MCI less than 3

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



V) TRAFFIC VOLUME

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



- 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

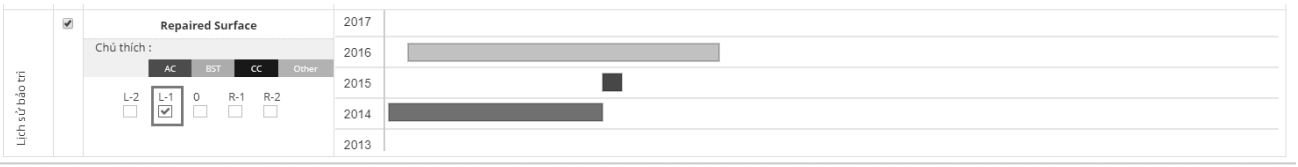
VI) MANTENANCE HISTORY

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

- 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)



USER'S MANUAL

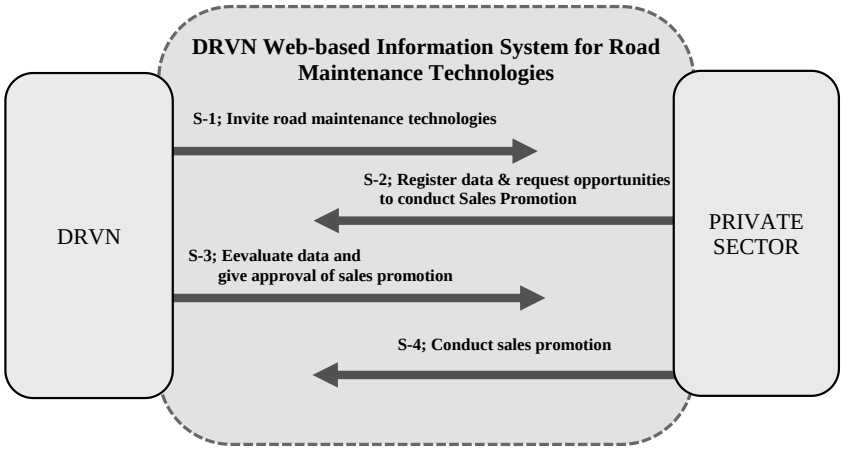
DEVELOPMENT OF INFORMATION SYSTEM FOR ROAD MAINTENANCE TECHNOLOGY VIETNAM

TABLE OF CONTENTS

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.

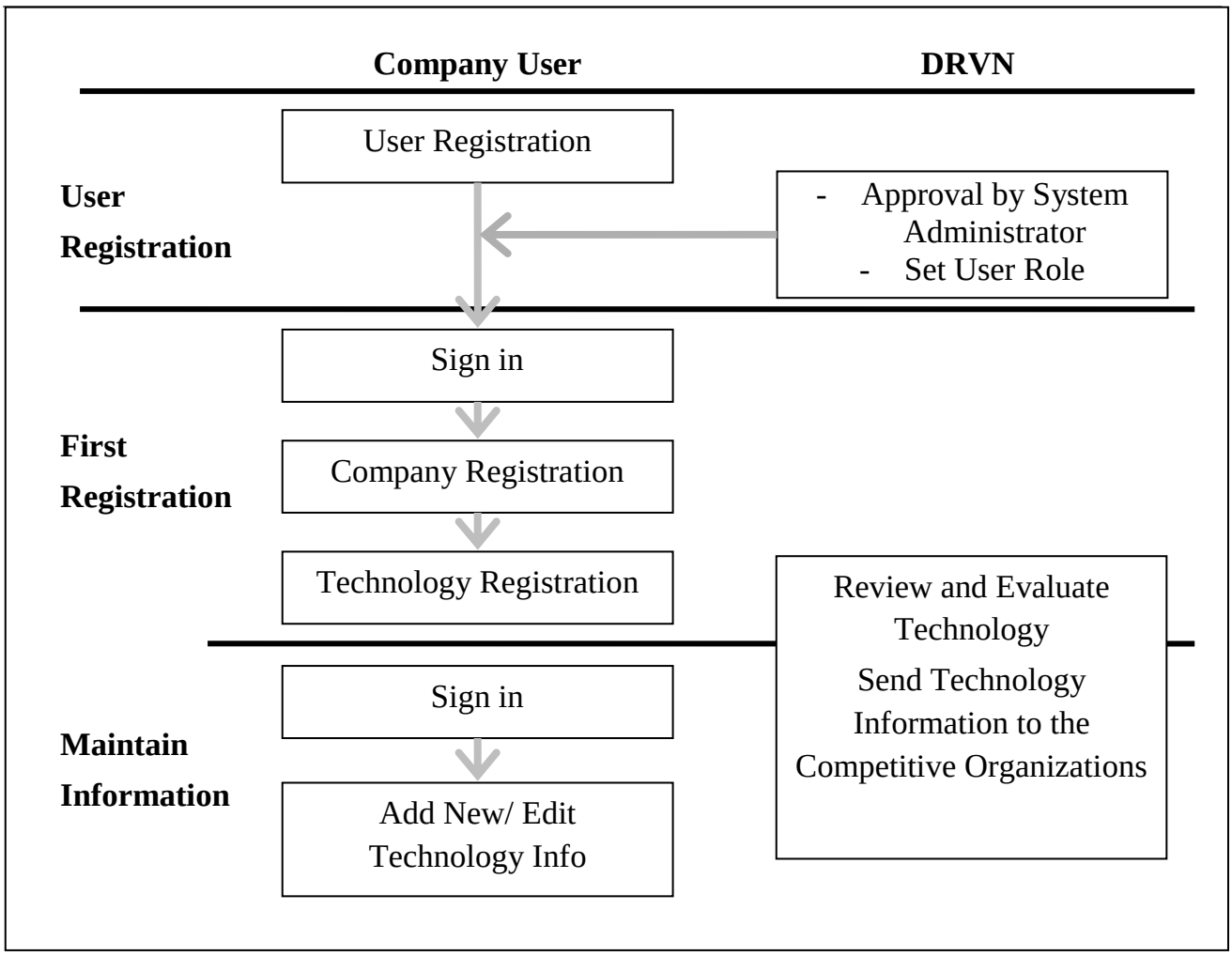
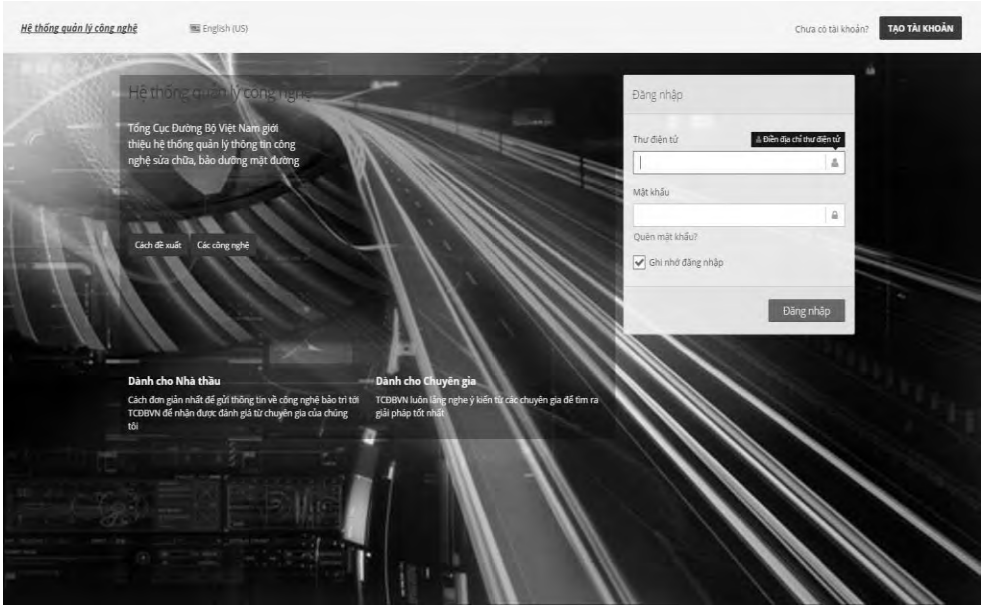


Figure 1 Work Flow of Administrator

II.3) Login to the system

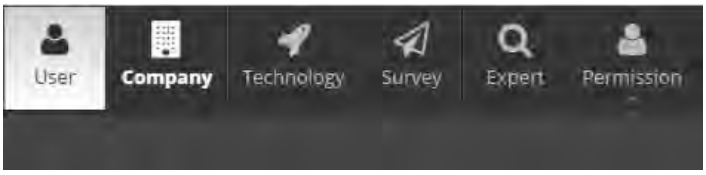
- Purpose: Login to the system
- Operation: Access to the system at http://tis.drvn.gov.vn, and filling e-mail address and password for login.



- 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

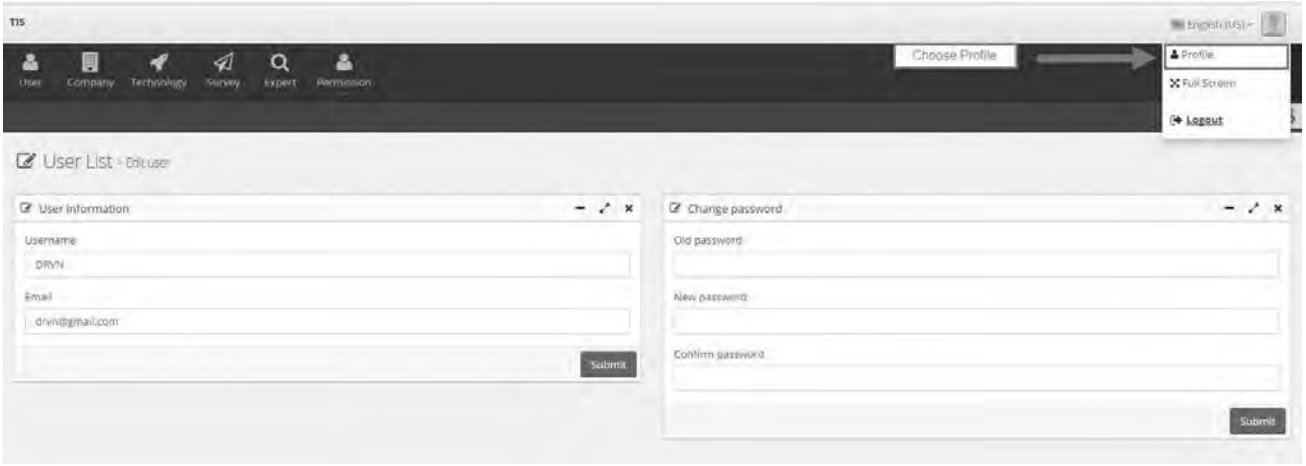
The main screen is shown after successful login. On the top of the main screen, all functions for a user are shown as icon (see following figure). TIS is compatible to English and Vietnamese and can be switched by clicking  button.



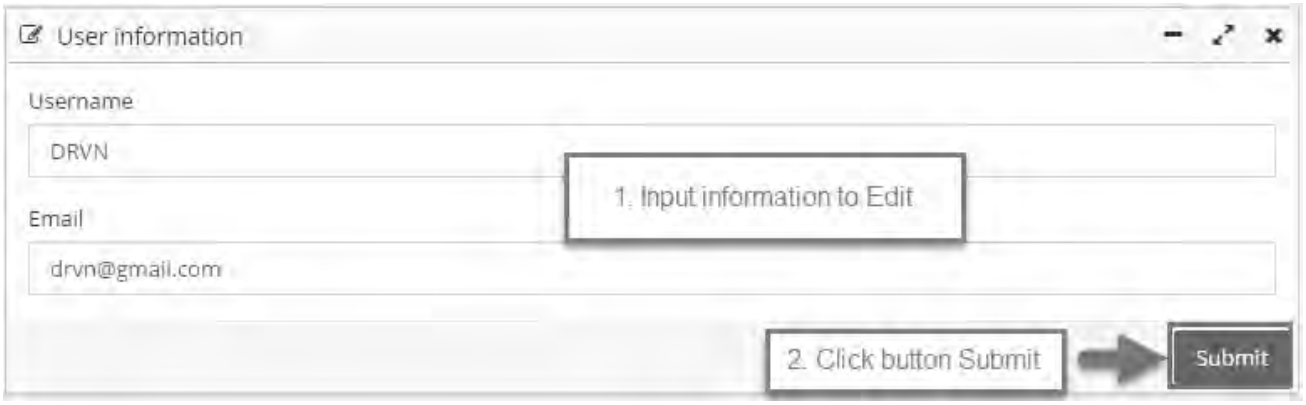
CHAPTER 2: GUIDE FUNCTIONS

I) EDIT PROFILE

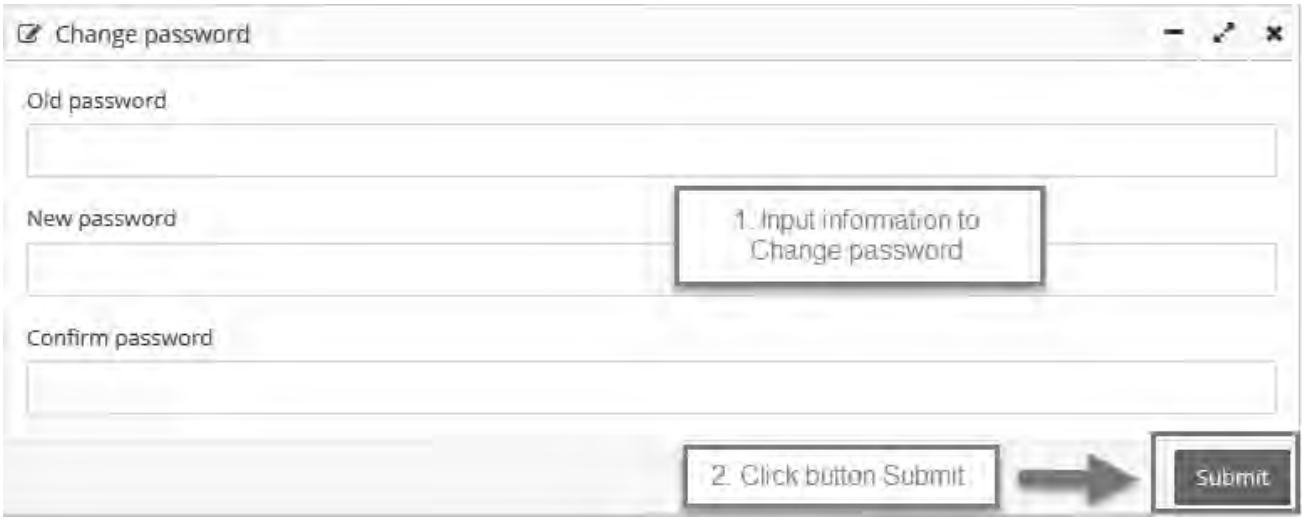
- Purpose: DRVN Staff edits own profile
- Operation: DRVN Staff l selects “Profile” at the top right hand corner, as shown in the following display screen:



- 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.

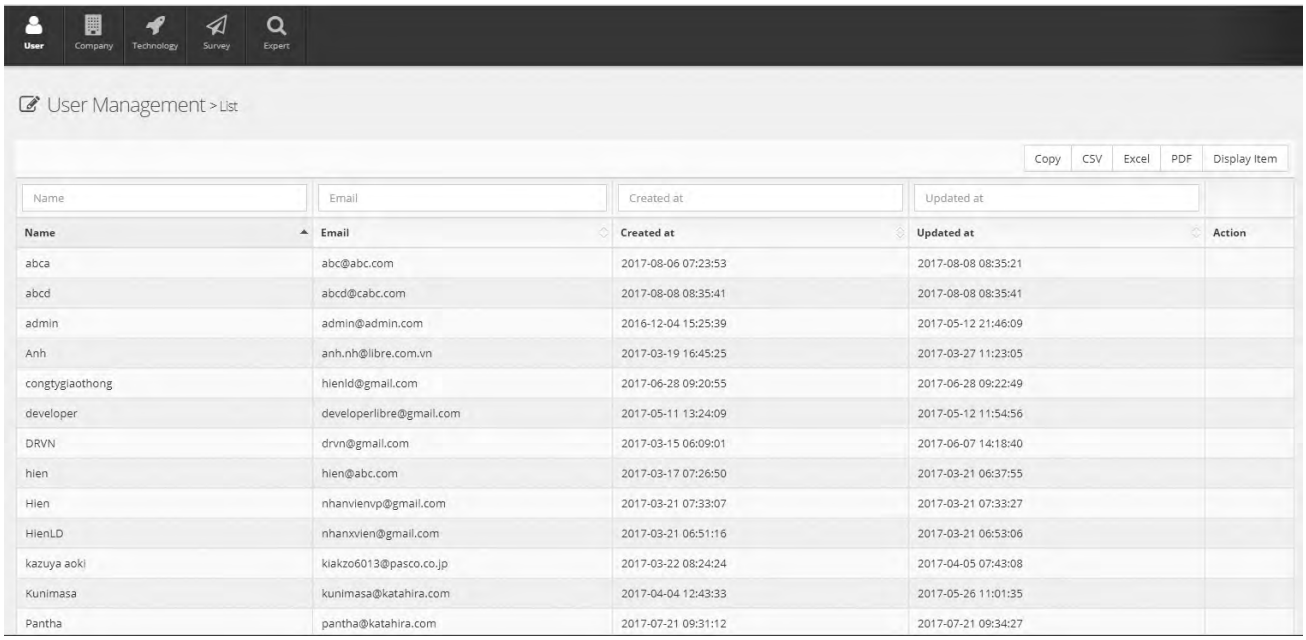


  - Change Password: In the "Change password" form, DRVN staff can change password by inputting “Old password”, “New password” and “Confirm password”. Click the button Submit to save information.

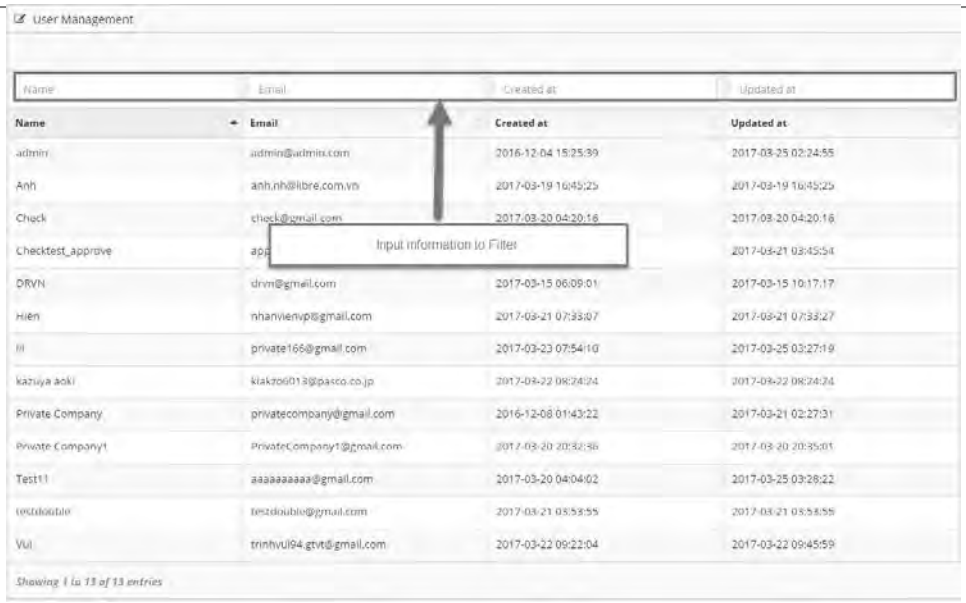


II) USER MANAGEMENT

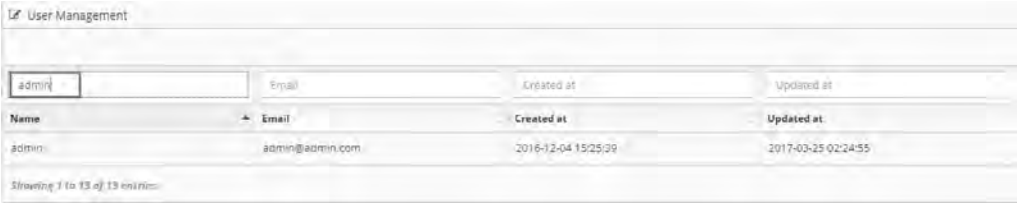
- Purpose: DRVN User views registered User



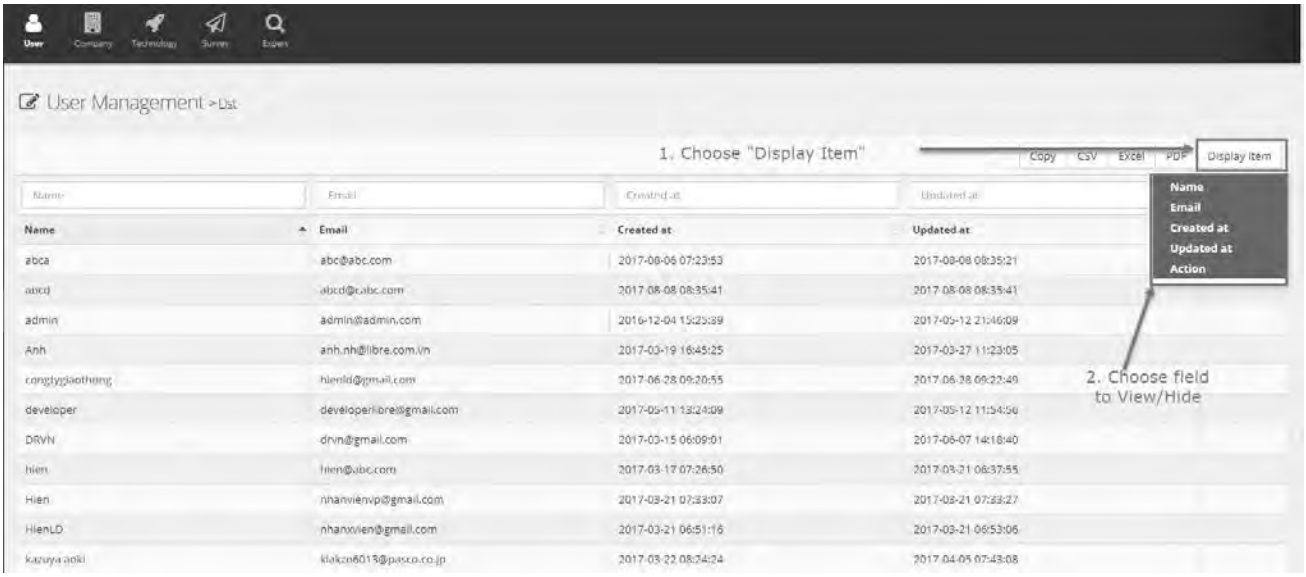
- Manupilation of User Management:
  - Filter information: Users are filtered for search by Name, Email, Created at, Updated at



- Example: Search for username is "admin"

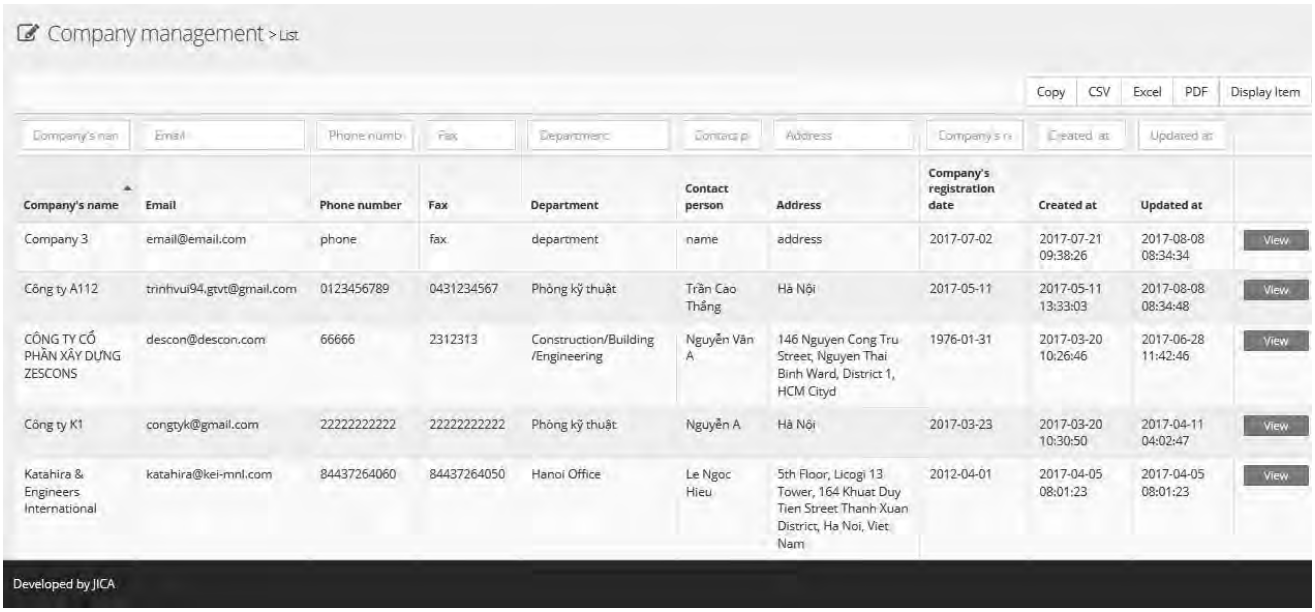


- Column visibility function: View/ Hide column in “User list” table
  - Step 1: Click button Display Item
  - Step 2: Choose name field to view/hide data

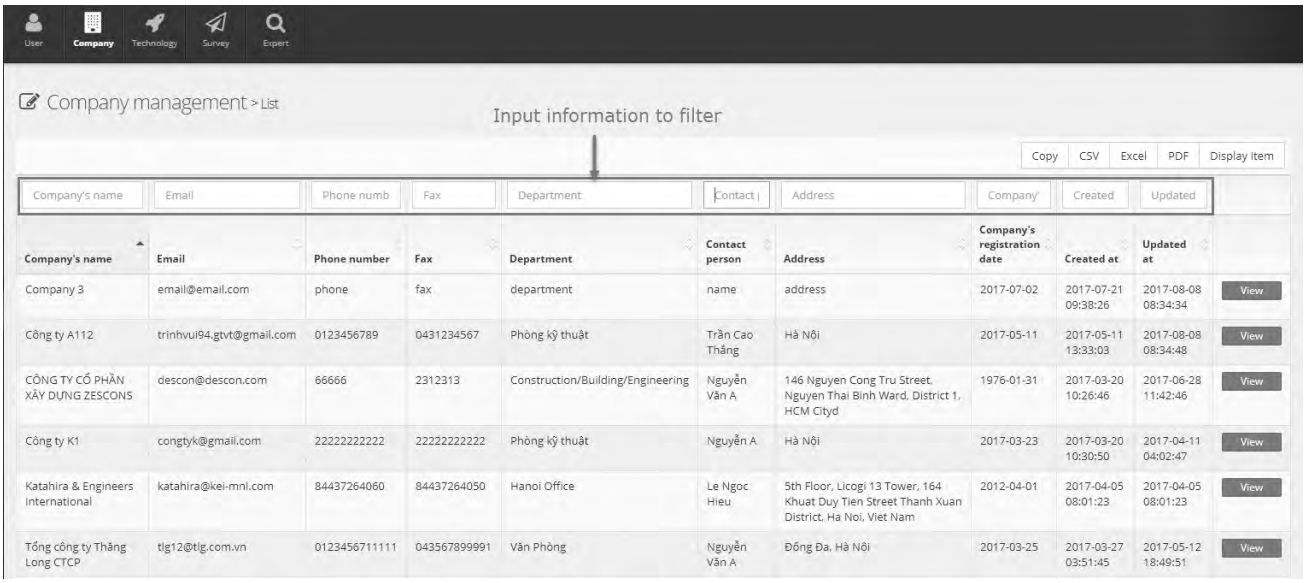


III) COMPANY MANAGEMENT

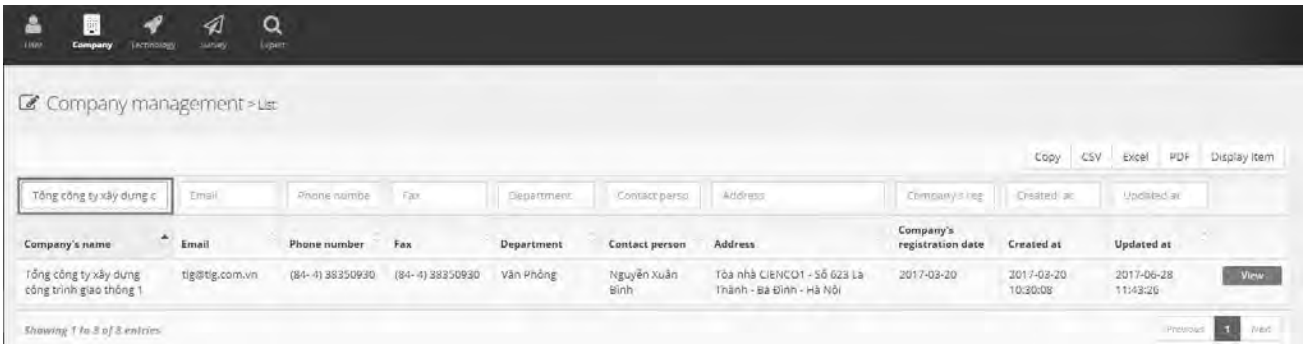
- Purpose: View private companies’ information.



- Manipulation of Company Management
  - Filter information: Companies ca be filtered by Company Name, Email, Phone, Fax, Department, Contact Person, Address, Registration Date

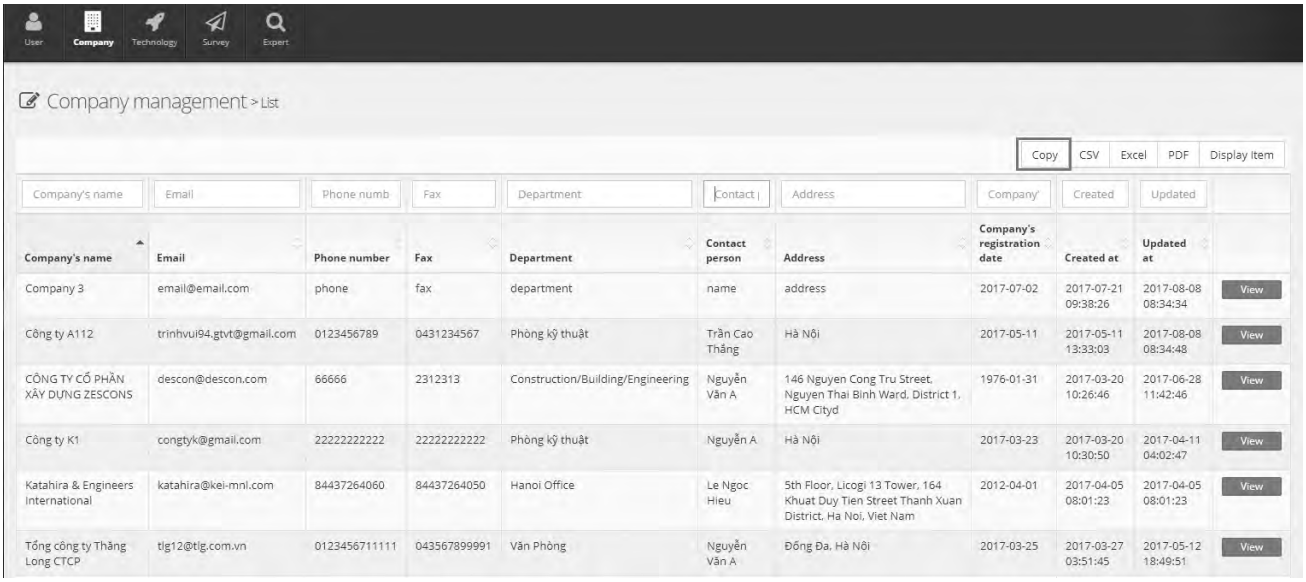


- Example: Search for a company with company name is " Tổng công ty xây dựng công trình giao thông 1"

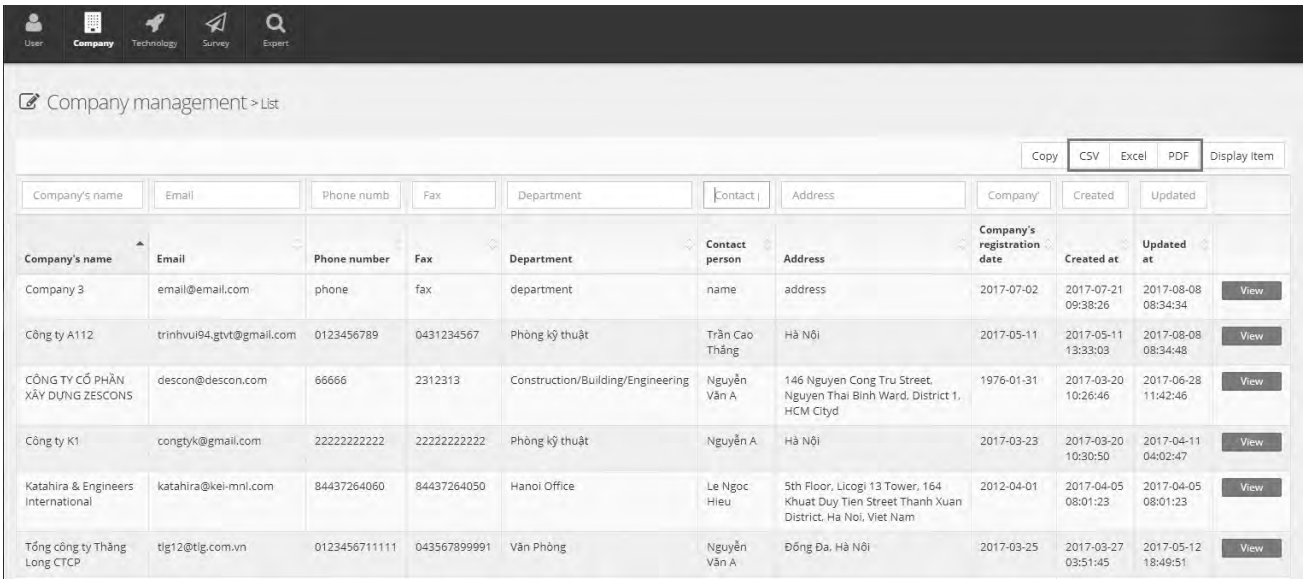


- Copy function: The system can copy all items in the list of the “Company Management”.

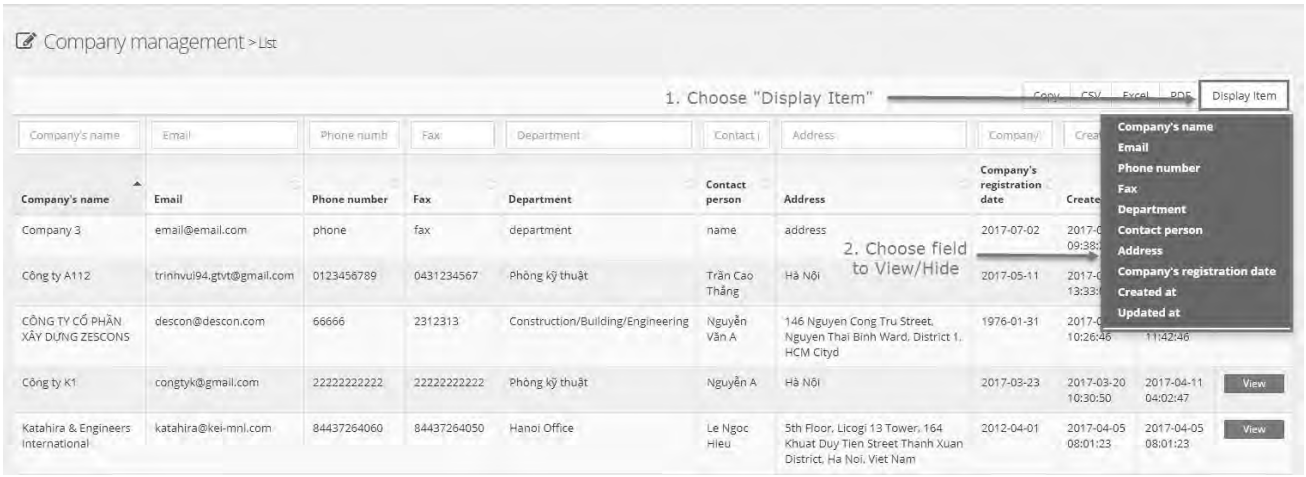
- Step 1: Click “Copy” button to Copy data in the list.
- Step 2: Paste items in any application, such as MS Word, MS Excel, Text editor, etc.



- CSV/ Excel/ PDF function: The system can export all items in the list of the “Company Management” as csv/ excel or pdf format.
  - 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)

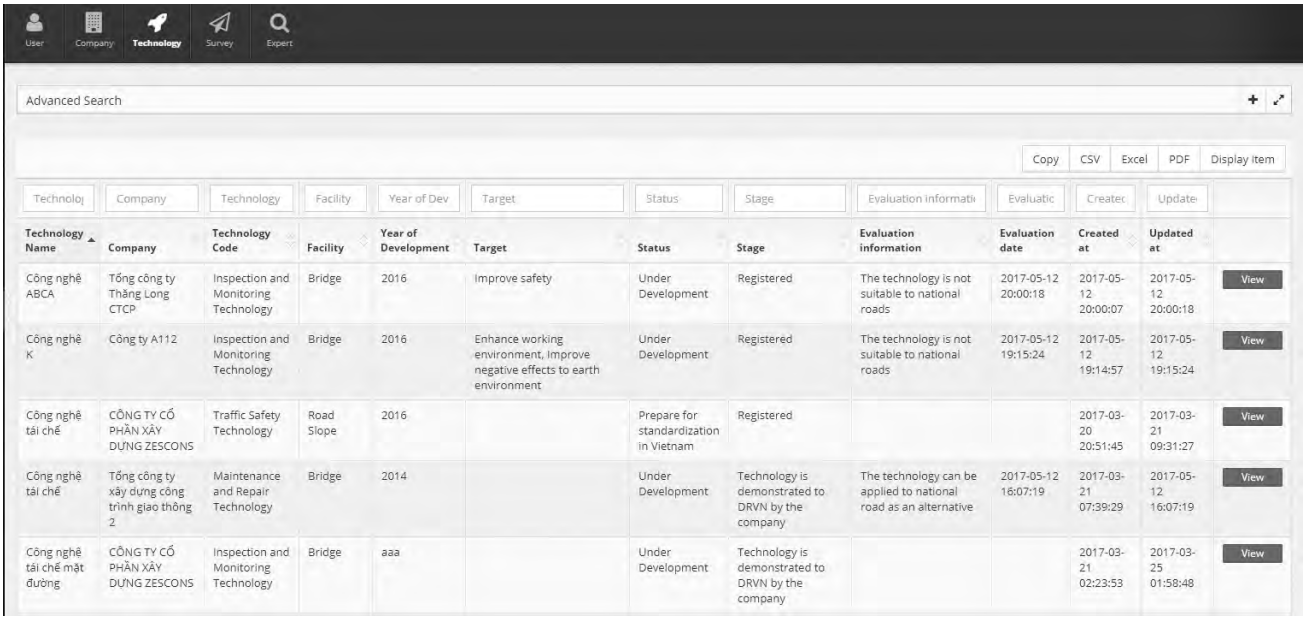


- Display Item function: The system can change display items of “Company list” table
  - Step 1: Click button “Display item”
  - Step 2: Choose name field to view/hide data from Company’s Name, Email, Phone number, Fax, Department, Contact person, Address, Company’s registration date, Created at and Updated at



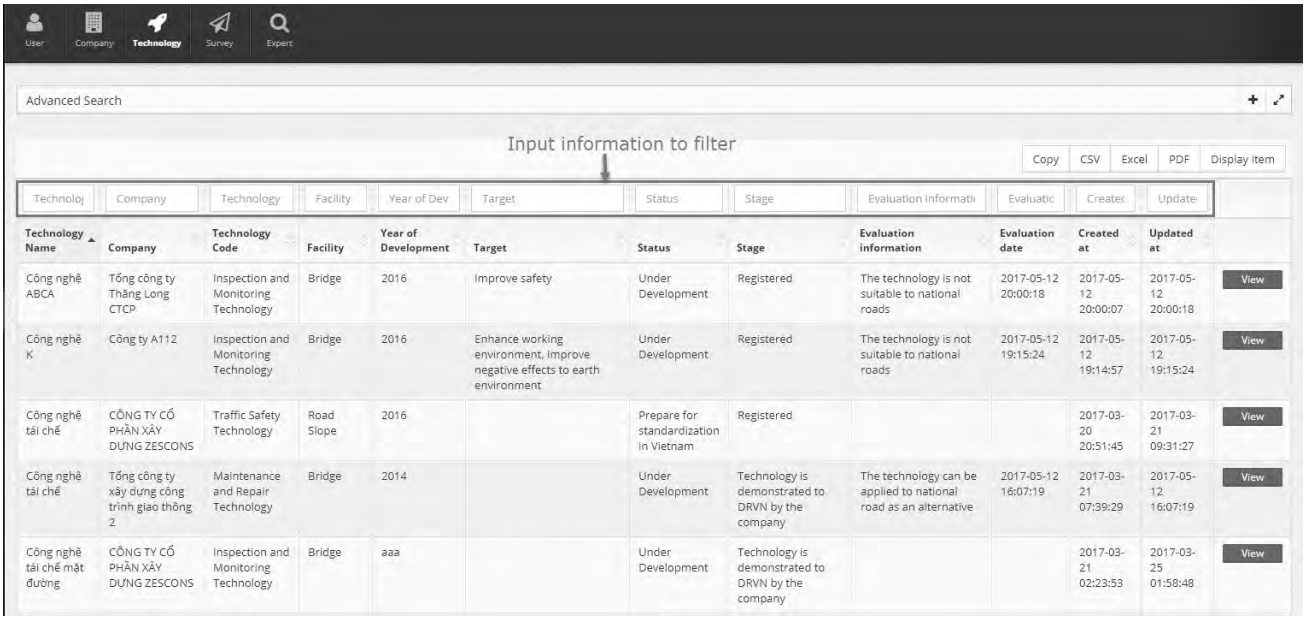
IV) TECHNOLOGY MANAGEMENT

- Purpose: View technology information. DRVN can search and view all registered technologies.

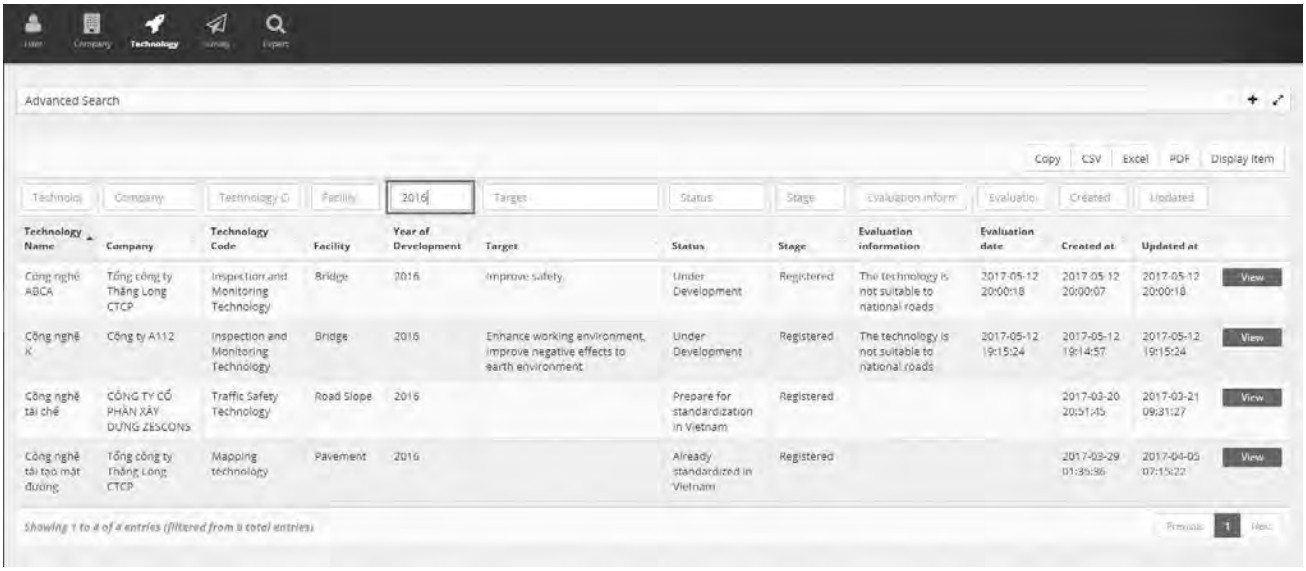


Technology Name	Company	Technology Code	Facility	Year of Development	Target	Status	Stage	Evaluation information	Evaluation date	Created at	Updated at	
Công nghệ ABCA	Tổng công ty Thăng Long CTCP	Inspection and Monitoring Technology	Bridge	2016	Improve safety	Under Development	Registered	The technology 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 tái 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

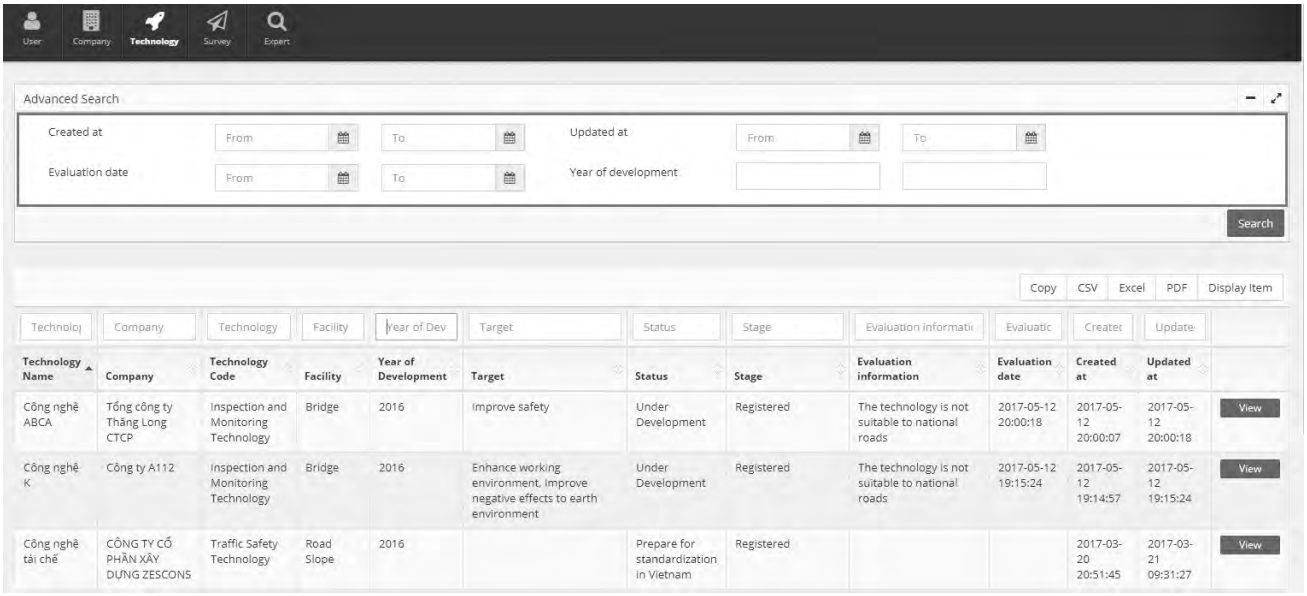
- Manipulation of Technology Management
  - Search function: DRVN can keyword search by each categories of Company Technology name, Company, Technology code, Facility, Years of development and Target, Status, Stage, Evaluation information, Evaluation date, Created at and Updated at.

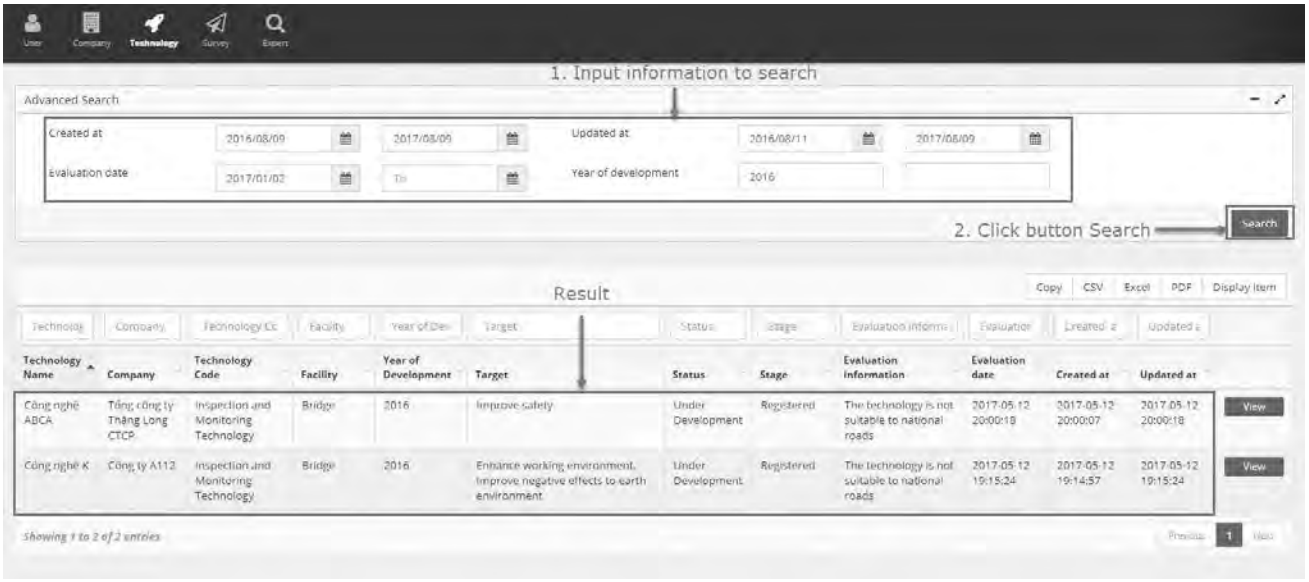


- Example: Search technologies developped in 2016.

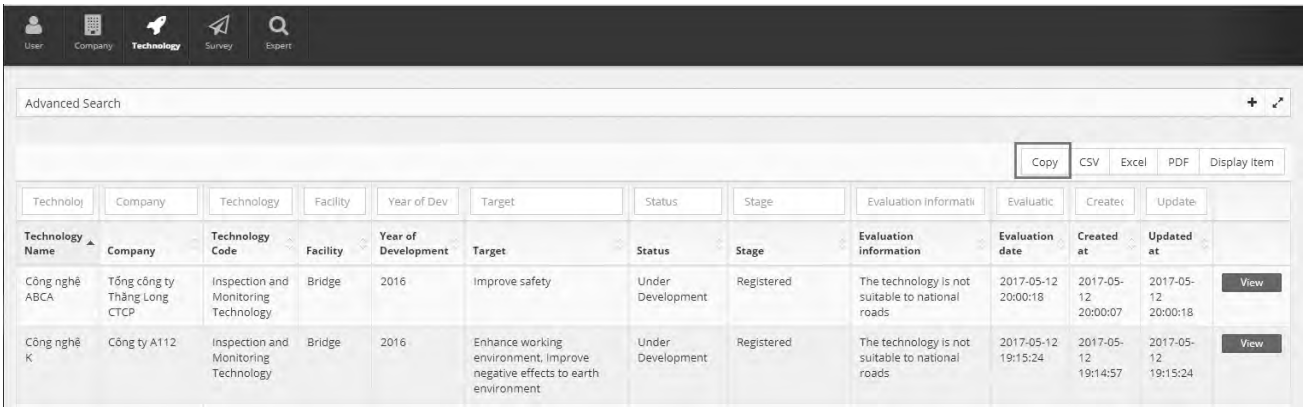


- Advanced Search function: In addition to keyword search functions, advanced search by Created at, Updated at, Evaluation date and Year of development.
  - Step 1: Input information to search
  - Step 2: Click button “Submit”

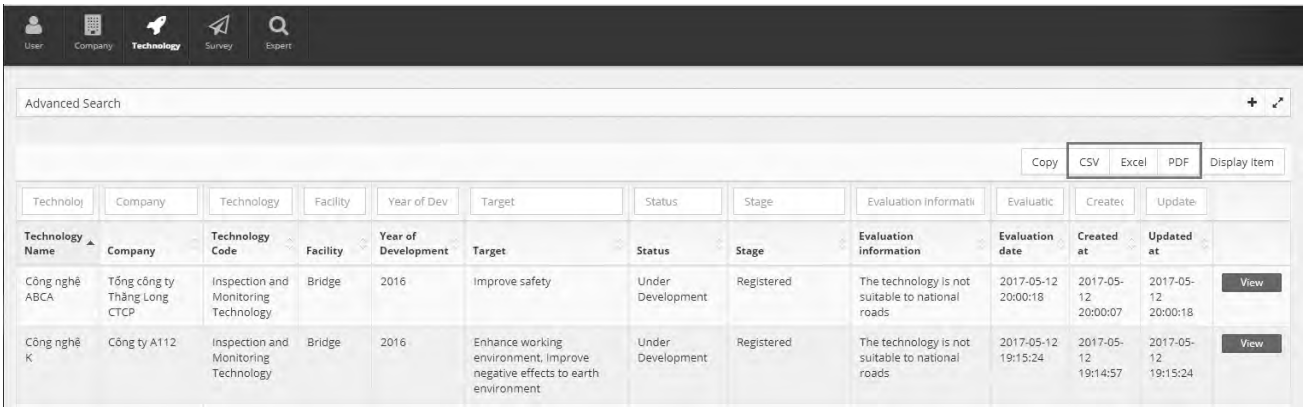




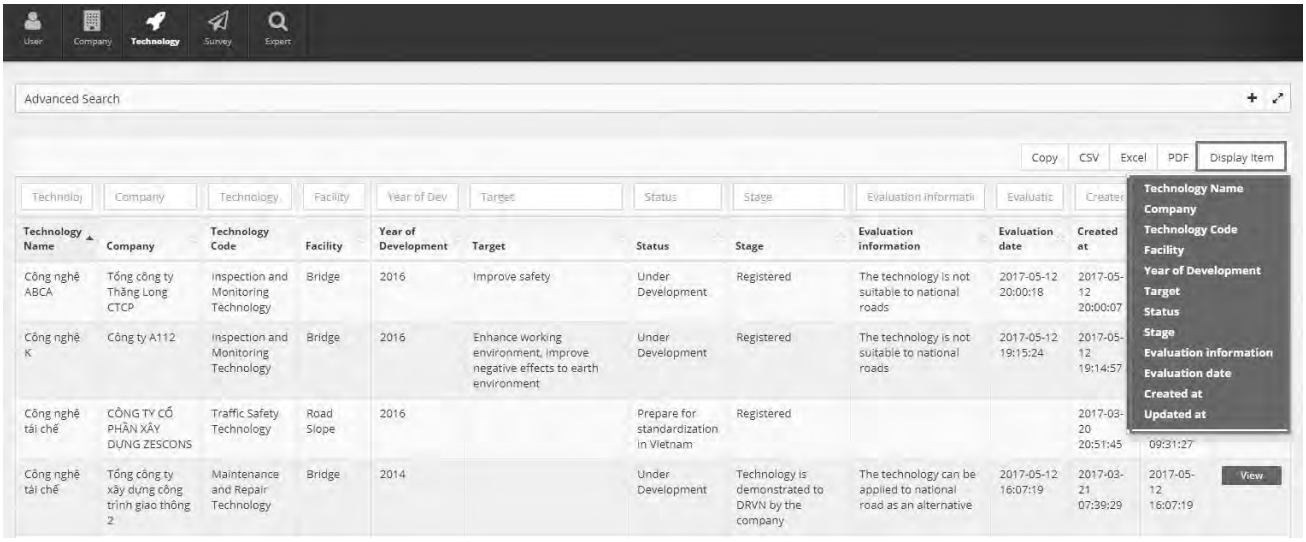
- Copy function: Click button Copy to Copy data of technology



- 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)

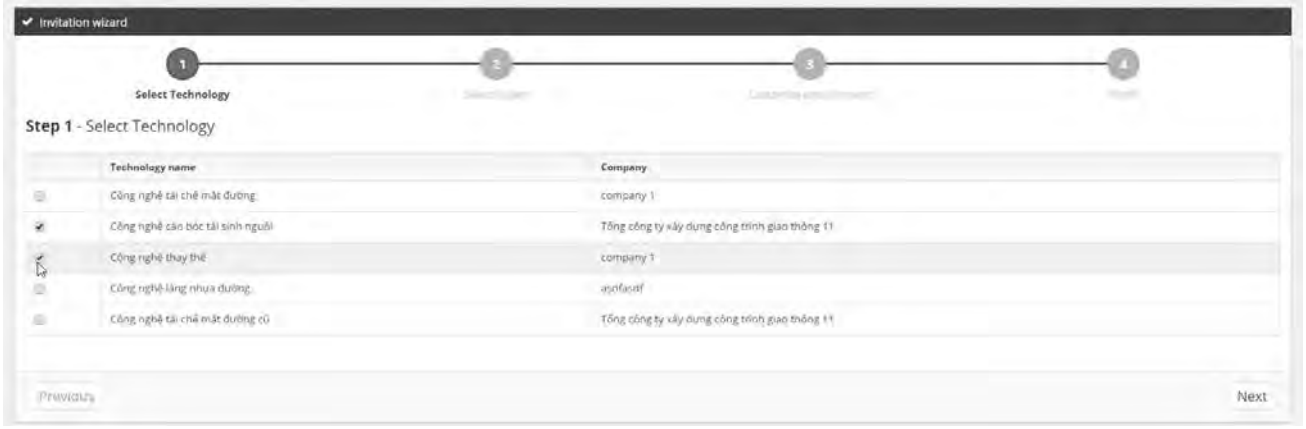


- Column visibility function: View/ Hide column in “Technology list” table
  - Step 1: Click button Display Item
  - Step 2: Choose name field to view/hide data

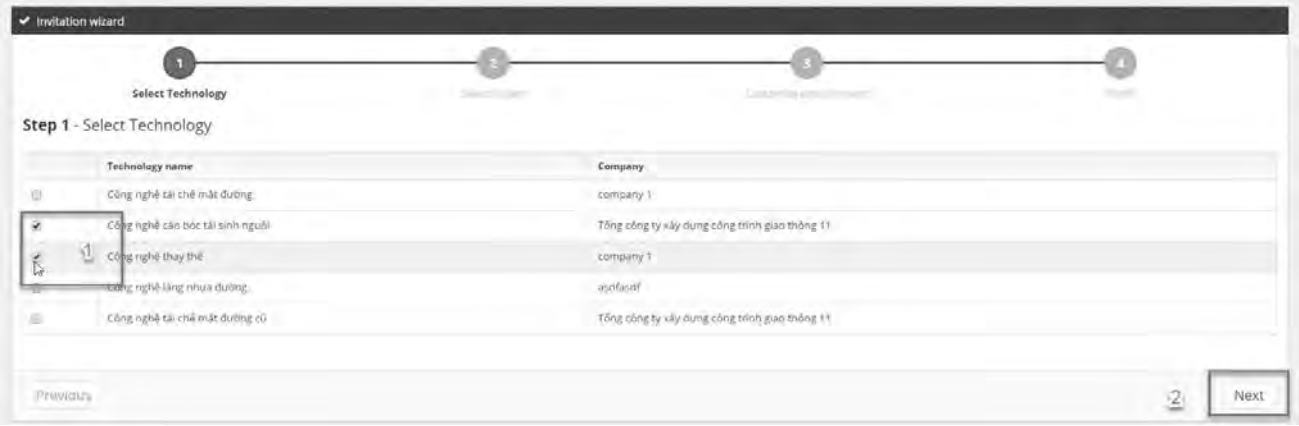


V) SURVEY MANAGEMENT

- 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.



  - Step 1: Select Technology to survey, then click button Next to transfer the technology information.



- Step 2: Select experts, who evaluate the technology, then click button Next to send invitation e-mail which has linkage which access to the technology information. If re-select Technology, click button Previous

- 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.

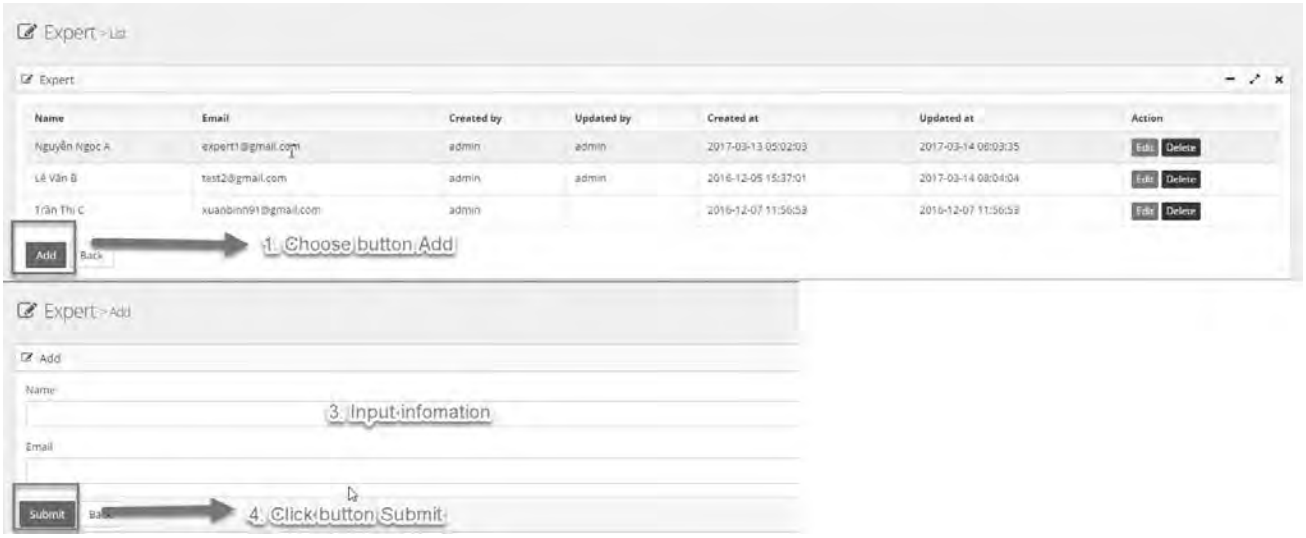
NOTE:

- The system sends evaluation requests by system language (English / Vietnamese). When DRVN staff conducts survey management and sends request to experts, the e-mail 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.

VI) EXPERT MANAGEMENT

- Purpose: Manage Experts accounts of Competent Organizations
- Manipulation of Expert Management

- Add new Expert
  - Step 1: Click button “Add”, then the system shows Add new Expert screen
  - Step 2: Enter Add new information: Full name, Email
  - Step 3: Click button “Submit” to save Expert information.



- Edit Expert information
  - Step 1: Select Expert to Edit
  - Step 2: Click button “Edit”
  - Step 3: Enter information to Edit for Expert
  - Step 4: Click button “Submit” to save information

- Delete Expert
  - Step 1: Select Expert to delete
  - Step 2: Click button “Delete”