1.0 INTRODUCTION

Ikram Pavement Management System (iPMS) is a system that keeps the surveyed data and presents the road condition in various formats. This system can be used by user to monitor their road performance and make necessary decision to maintain their roads such as determine long-term funding needs. In addition, iPMS will helps user to ensure their roads were proper maintained.

2.0 BENEFITS

User will attain the following benefits through utilize the functions of iPMS:

i. Monitor road performance in a more effective and efficient method.
ii. Effectively plan for maintenance work according to priority and needs.
iii. Effectively allocate maintenance budget.
iv. Effectively store and retrieve the surveyed data through upkeep the data in the database.

3.0 FUNCTIONS

iPMS consists of the following functions:

i. Upload survey data

This function allows user upload the latest survey data into iPMS database.

ii. View survey data

This function allows user view the survey data such as inventory data, condition data, structure data, etc.

iii. Present road condition in various types of format

This function allows user view the road condition in various types of format such as chart and Geographic Information System (GIS) maps. User will able to generate different types of report easily according to their needs. Types of report that can be generated from iPMS as stated below:

a. Achievement of Key Pavement Performance Indicators (KPPI)
b. Pavement Condition
c. Roughness Distribution
d. Rutting Distribution
e. Crack Distribution

f. GIS map for

- Roughness Condition
- Rutting Condition
- Crack Condition
- Work Plan

iv. Upload and download softcopy of reports

This function allows user to keep the related reports into iPMS database through upload function. User also allows downloading the reports when needed.

4.0 SAMPLE OF REPORT

Sample of the reports are shown in Figure 1 to Figure 4:

4.1 Achievement of Key Pavement Performance Indicators (KPPI)

Figure 1 shows the achievement of KPPI. This report helps user to aware their current road network performance in terms of roughness, rutting and crack.

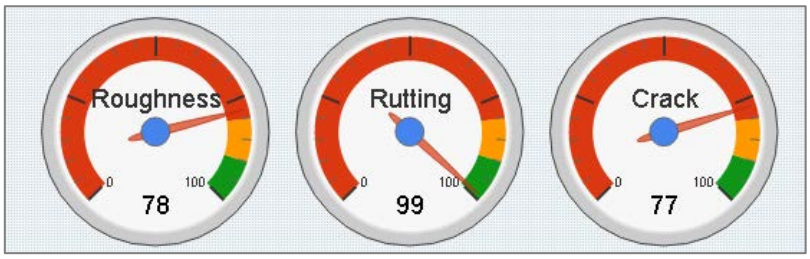

Figure 1: Achievement of KPPI

4.2 Pavement Condition

Figure 2 shows the pavement condition. This report helps user to identify the percentage of the current road network that need to be maintained through the condition of roughness, rutting and crack.

Figure 2: Pavement Condition

4.3 Roughness Distribution

Figure 3 shows the roughness distribution of each road. This report helps user ease to compare the roughness condition among the roads and identify the roads that have roughness problem.

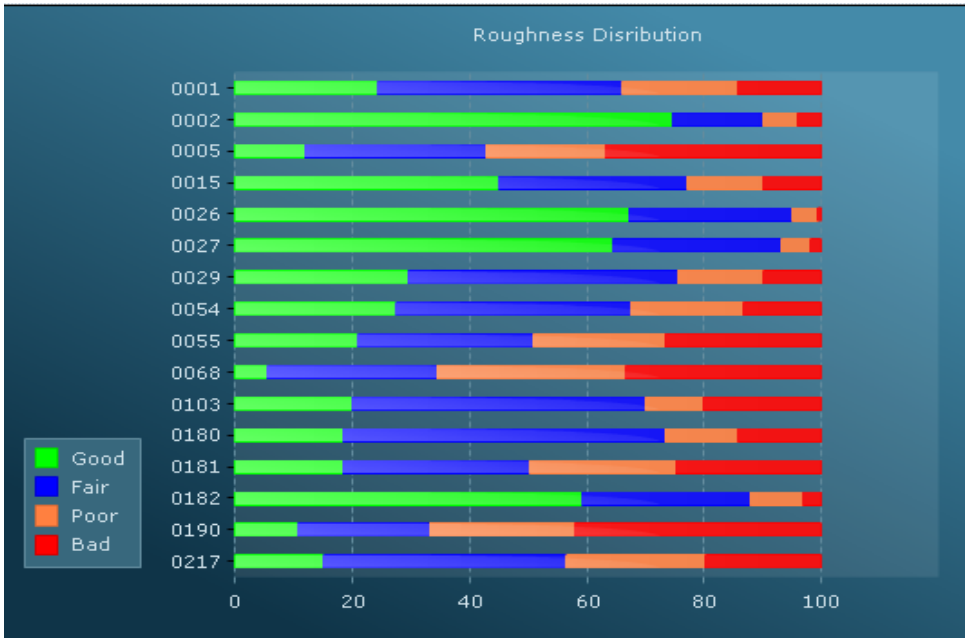

Figure 3: Roughness Distribution

4.4 Geographic Information System (GIS) map

Figure 6 to Figure 8 shows the road condition in a geographical map. These reports will help user to identify the area that with roughness problem, rutting problem or crack problem.

4.4.1. Roughness Condition

Figure 6: GIS Map for Roughness Condition (Sample Data)

4.4.2. Rutting Condition

Figure 7: GIS Map for Rutting Condition (Sample Data)

4.4.3. Crack Condition

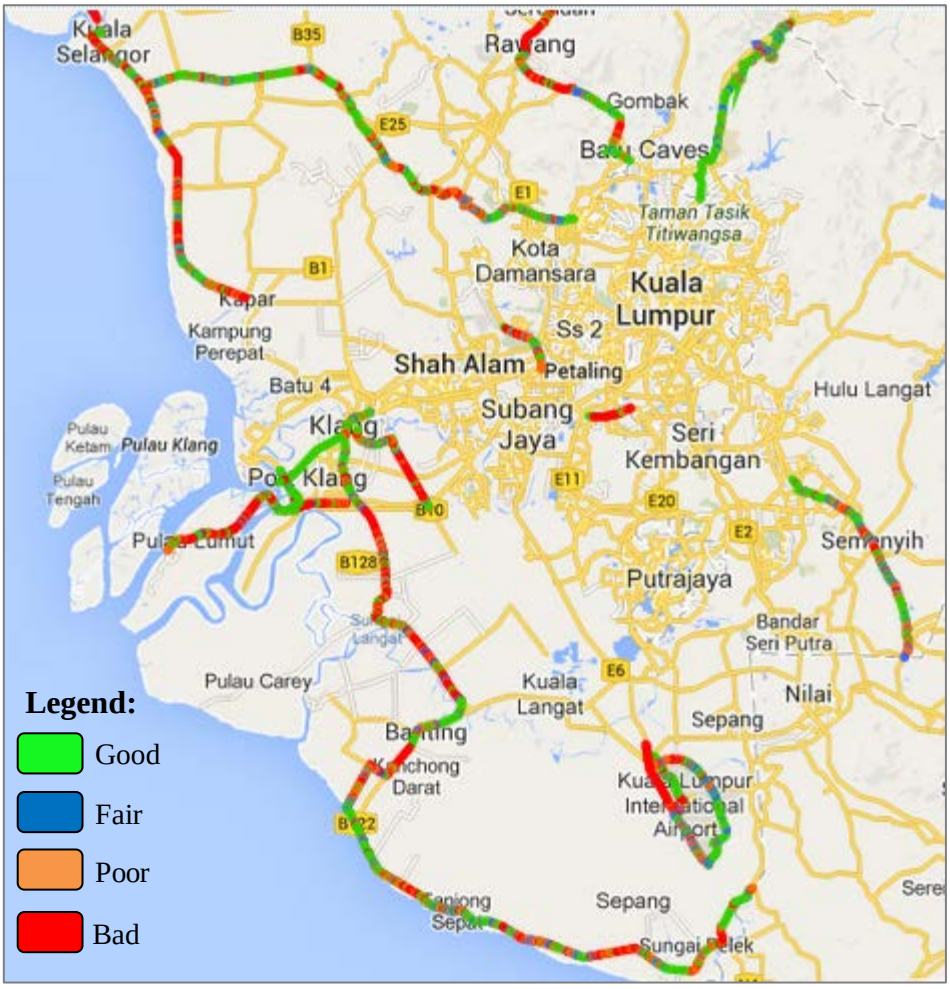

Figure 8: GIS Map for Crack Condition (Sample Data)

1. Proposed Work Plan

1.1 GIS Map

Figure: GIS Map for Proposed Work Plan (Sample Data)

1.2 List of Location Identified for Treatments (Sample Data)

Road No.	Direction	Start km	End km	Treatment Type
0001	1	355.000	355.099	Mill 50mm Pave 50mm
0001	1	355.100	355.199	Mill 50mm Pave 50mm
0001	1	355.200	355.299	Mill 50mm Pave 50mm
0001	1	355.600	355.699	Mill 50mm Pave 50mm
0001	1	412.600	412.699	Partial Reconstruction
0001	1	412.700	412.799	Partial Reconstruction
0001	1	412.800	412.899	Partial Reconstruction
0001	1	412.900	412.999	Partial Reconstruction
0001	1	413.000	413.099	Partial Reconstruction
0002	2	6.800	6.899	Mill 50mm Pave 50mm
0002	2	6.900	6.999	Mill 50mm Pave 50mm
0002	2	7.000	7.099	Mill 50mm Pave 50mm
0002	2	7.100	7.199	Mill 50mm Pave 50mm
0005	1	344.600	344.699	Mill 50mm Pave 50mm
0005	1	344.700	344.799	Mill 50mm Pave 50mm
0005	1	346.700	346.799	Mill 50mm Pave 50mm
0005	1	346.800	346.899	Mill 50mm Pave 50mm
0005	1	346.900	346.999	Mill 50mm Pave 50mm
0005	1	348.900	348.999	Mill 50mm Pave 50mm
0015	2	0.800	0.899	Mill 50mm Pave 50mm
0015	2	0.900	0.999	Mill 50mm Pave 50mm
0015	2	1.000	1.099	Mill 50mm Pave 50mm
0015	2	1.200	1.299	Mill 50mm Pave 50mm
0015	2	1.300	1.399	Mill 50mm Pave 50mm
0026	2	6.400	6.499	Mill 110mm Pave 110mm
0026	2	6.500	6.599	Mill 110mm Pave 110mm
0026	2	6.600	6.699	Mill 110mm Pave 110mm
0026	2	6.700	6.799	Mill 110mm Pave 110mm
0026	2	6.800	6.899	Mill 110mm Pave 110mm
0026	2	6.900	6.999	Mill 110mm Pave 110mm
0026	2	7.000	7.099	Mill 110mm Pave 110mm
0027	2	0.400	0.499	Mill 110mm Pave 110mm
0027	2	0.500	0.599	Mill 110mm Pave 110mm
0027	2	0.600	0.699	Mill 110mm Pave 110mm
0027	2	0.700	0.799	Mill 110mm Pave 110mm
0027	2	0.800	0.899	Mill 110mm Pave 110mm
0068	1	30.500	30.599	Mill 50mm Pave 50mm
0068	1	30.600	30.699	Mill 50mm Pave 50mm
0068	1	30.700	30.799	Mill 50mm Pave 50mm

1.0 INTRODUCTION

Road Inventory Management System (RIMS) is a system that keeps the road inventory information and presents the information in various report formats. This information can be used by the user to monitor their road inventory and make necessary decision to maintain their road inventory.

2.0 BENEFITS

User will attain the following benefits through utilize the functions of RIMS:

i. Effectively store and retrieve the road inventory information through upkeep the data in the database.
ii. Visualize the road inventory available on the roads through strip map.
iii. Ease to identify the road inventory location through geographical map.
iv. Efficiently generate inventory report through the report module.

3.0 FUNCTIONS

RIMS consists of the following functions:

i. View and edit road inventory information

   This function allows user to view and edit the road inventory information.

ii. View strip map

   This function allows user visualize the road inventory available on the roads through strip map.

iii. Present road inventory information in various report format

   This function will enable user retrieve the road inventory information through generate different types of report according to their needs. The reports will act as supporting information for the user to make decision on the maintenance activities

   Types of report that can be generated from RIMS as stated below:

   a. Strip Map
   b. Signboard Listing
   c. Kilometer Post Listing
   d. Culvert Listing
   e. Drainage Listing
   f. Inventory Listing by Location
   g. Geographic Information System (GIS) Map

4.0 SAMPLE OF REPORT

Sample of the reports are shown in Figure 1 to Figure 4:

4.1 Strip Map

Figure 1 shows the sample of strip map generated from RIMS. Strip map helps user to visualize the road inventory available on the roads.

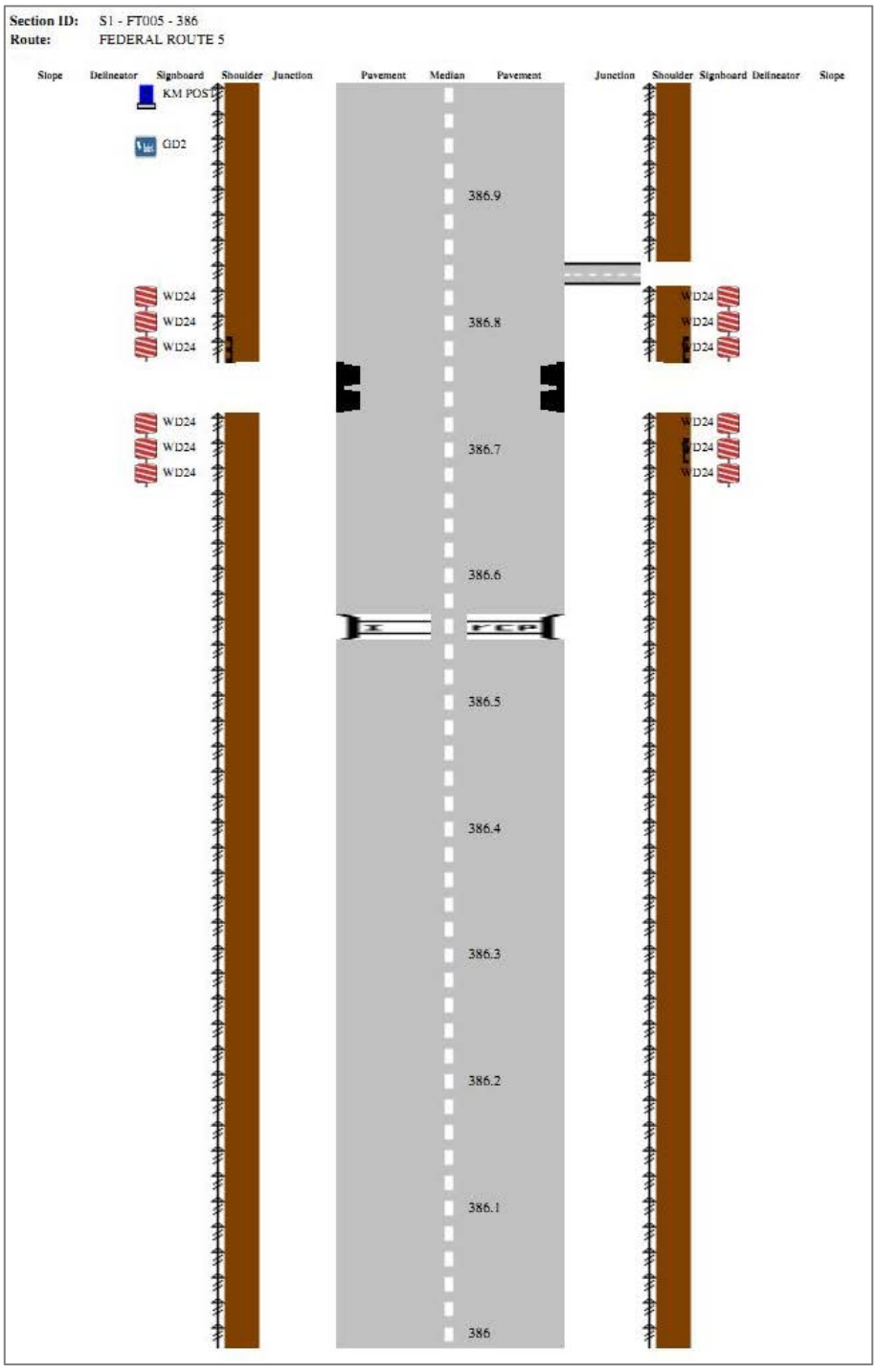

Figure 1: Strip Map

4.2 Signboard Listing

Figure 2 shows the signboard listing. This report helps user to identify the location of the signboard.

Signboard Listing

Area: S1 BANGI
Route: FT026 LEBUHRAYA KLIA

From: S1-FT026-008 **to** S1-FT026-009

Area	Route No.	Section No.	Sub Section No.	Side	Sub Direction	Signboard Type	Actual Photo
S1	FT026	008	0200	Right		GD2 - APPROACH TO ROAD JUNCTION WHERE ONE ROAD IS OF MAJOR IMPORTANCE	
			0500	Left		GD2 - APPROACH TO ROAD JUNCTION WHERE ONE ROAD IS OF MAJOR IMPORTANCE	
			0580	Right		GD5 - DESTINATION SIGN	
			0600	Right		GD2 - APPROACH TO ROAD JUNCTION WHERE ONE ROAD IS OF MAJOR IMPORTANCE	
			0700	Right		GD5 - DESTINATION SIGN	
			0980	Right		GD2 - APPROACH TO ROAD JUNCTION WHERE ONE ROAD IS OF MAJOR IMPORTANCE	
		009	0150	Right		GD5 - DESTINATION SIGN	

Figure 2: Signboard Listing

4.3 Culvert Listing

Figure 3 shows the culvert listing. This report helps user to identify the location of the culvert and details of the culvert such as types, length, etc.

Culvert Listing

Area: S1 BANGI
Route: FT026 LEBUHRAYA KLIA

From: S1-FT026-000 **to** S1-FT026-012

Area	Route No.	Section No.	Sub Direction	Sub Section No.	Culvert Type	Culvert Length (m)	Culvert Size (mm)	Remark
S1	FT026	006		0250	DOUBLE REINFORCED CONCRETE PIPE	42.0	1,000	
		007		0030	DOUBLE REINFORCED CONCRETE PIPE	42.0	1,000	
		008		0280	TRIPLE REINFORCED CONCRETE PIPE	42.0	1,000	
				0550	TRIPLE REINFORCED CONCRETE PIPE	42.0	1,000	
				0900	TRIPLE REINFORCED CONCRETE PIPE	42.0	1,000	
		009		0300	TRIPLE REINFORCED CONCRETE PIPE	42.0	1,000	
				0550	TRIPLE REINFORCED CONCRETE PIPE	42.0	1,000	
		010		0550	TRIPLE REINFORCED CONCRETE PIPE	42.0	1,000	
				0970	TRIPLE REINFORCED CONCRETE PIPE	42.0	1,000	
		011		0260	TRIPLE REINFORCED CONCRETE PIPE	42.0	1,000	
				0780	SINGLE REINFORCED CONCRETE PIPE	25.0	1,000	
		012		0150	SINGLE REINFORCED CONCRETE PIPE	24.0	1,000	
					Total:	**469.0**	**12,000**	

Figure 3: Culvert Listing

4.4 Geographic Information System (GIS) map

Figure 4 shows location of signboard in a geographical map. These reports will help user to identify the location of signboard.

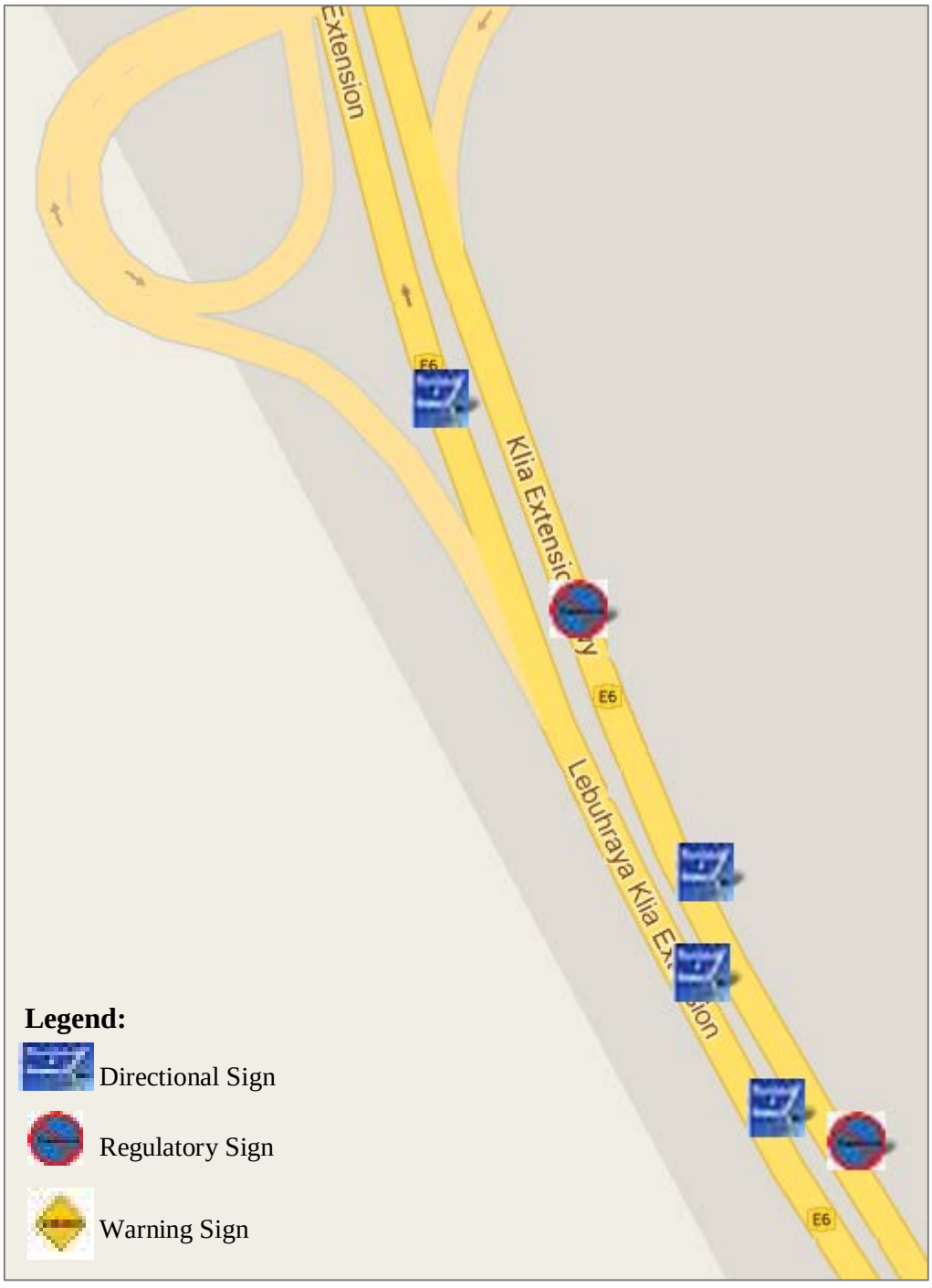

Figure 4: GIS Map for Signboard