HOAI
COMMITTED TO SAFE AND SUSTAINABLE MOBILITY

HOAI Webinar 2025 series

Highway Health Check: Mastering Pavement Distress & NSV
6th May 2025

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Pavement Distresses as per IRC 82-2023

Longitudinal Cracks

Cracks parallel to direction of traffic movement

Causes

- Poor joint matching
- Reflective cracks
- HMA Fatigue (onset of alligator cracks)

Transverse Cracks

Cracks perpendicular to pavement centreline

Causes

- Shrinkage of HMA due to low temperatures or asphalt binder hardening
- Reflective cracks

Alligator Cracks

Series of interconnected cracks which are caused by fatigue failure of HMA under repeated traffic loading.

Causes

- Overloaded traffic
- Inadequate structural design
- Stripping at bottom of HMA

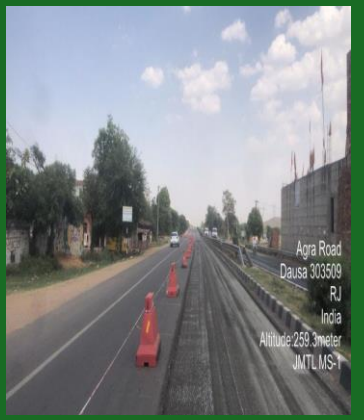
Low and Medium Severity Cracks (<6mm wide cracks)

Crack seal with emulsion

Crack seal with hot bitumen sealant

High Severity Cracks (>6mm wide cracks)

Remove and replace the cracked pavement layer with fresh overlay



Pavement Distresses as per IRC 82-2023

Rutting developed only on top bituminous layers

Rutting developed due to settlement of underlying layers

*(*Source: CRRI)*

Distress: Rutting

Surface depression in the wheel path.

It can either be mix rutting which is restricted to the top layer or sub grade rutting which is majorly due to settlement of subgrade/ underlying layers

Causes

- Insufficient compaction of HMA layers during construction
- Subgrade rutting
- Improper mix design
- Overloaded traffic

Treatment Methodology

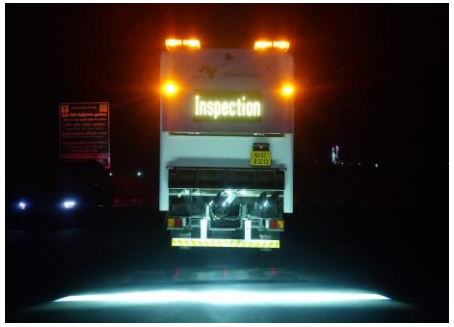
- Low Rutting – Rut box repair
- High Rutting – Patchwork(depth of rehabilitation may be selected based on the distresses layer depth)

Pavement Distresses as per IRC 82-2023

Potholes	Slippage	Shoving	Ravelling	Bleeding
				
Small depressions in the pavement surface that penetrate all the way through HMA Layer. In can be end result of alligator cracks	Crescent shaped cracks generally having two end pointed into the direction of traffic	Plastic movement of bituminous layer due to which a pavement surface bulges out and forms wave	Dislodgement of aggregate particles.	Film of asphalt binder on the pavement surface. Creates a shiny, glass-like reflecting surface that can become quite sticky.
Causes				
- Moisture infiltration through cracks result in potholes	- Inadequate tack coat spraying - Braking impact from traffic	- Weak Subgrade - Improper Rolling - Poor mixing of surface course	- Loss of bond between aggregate particles and asphalt binder - Dislodging due to traffic	- Low HMA air void content - Excessive asphalt binder in the HMA
Rectification Methodology				
- Cold mix repair - If spread over large area, then patchwork may be done	- Patchwork	- Patchwork	- Low & Medium – Microsurfacing - High – Thin overlay/Micro	- Low & Medium – Hot sand application - High – Patchwork

Timely identification of Distresses – Pavement Investigations

Parameters	Investigation
Vehicle Damage Factor (VDF)	▪ Axle Load Survey
Structural Condition Evaluation	▪ Falling Weight Deflectometer (FWD) Survey- Remaining Life Analysis
Functional Condition Evaluation	▪ Condition Survey using Network Survey Vehicle (NSV)/E-NEXCO Eye - Roughness, Rutting, Pavement Distresses
Subgrade and Pavement Layer Properties	▪ Test Pits – Determination of Soil and Granular Layer Properties ▪ Core Cutting – Bituminous Layer Properties
Distress Propagation	▪ Core Cutting
Distress Mapping	▪ Walk through before starting the execution



NSV survey – Determination of Functional Properties

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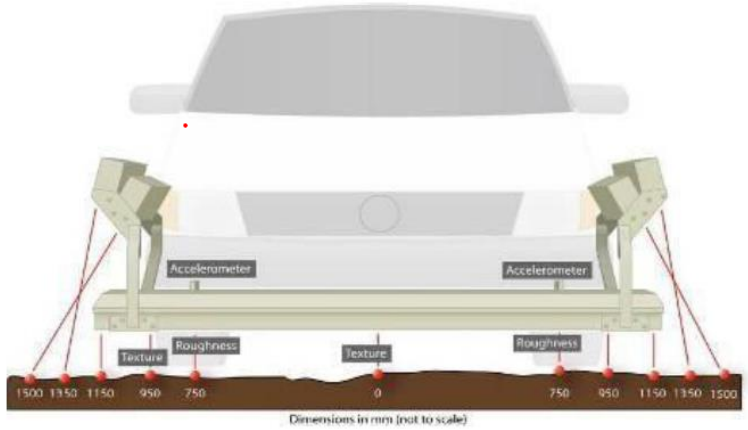
•NSV survey is a method for automatically collecting road condition data including pavement distresses and road inventory details at highway speeds

•The system can capture:
- Transverse Profile (Rut depth)
- Longitudinal Profile (Roughness)
- Pavement distresses by video imaging (cracks, patching, potholes, etc.)
- Pavement texture
- Road Geometry Data (Cross slope, gradient, curvature)
- GPS Coordinates
- Road furniture using video imaging

•Digital Laser Profiler (DLP) integrated into the NSV and consists of eleven lasers. The profiler is capable of measuring:
- Pavement roughness (one laser in each wheel path)
- Rutting (full transverse pavement measurement)
- Macro Texture (outer and inner wheel paths)



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Components of NSV survey

***Digital imaging system*:** These cameras are oriented in a certain configuration to ensure that the information of interest, such as inventory or condition, is being recorded in the camera field of view.

GNSS - GPS provides an accuracy of 5m-15m, while DGPS achieves real time sub-metre accuracy

Pavement Camera for distress identification

Data Acquisition System

***Gipsi-Trac Geometry*:** It uses dead reckoning sensors and GPS data to provide continuous highway maps and road geometry information such as cross slope, grade, and curvature.

***Digital laser profile*:** It uses laser sensors to accurately record the 2D/3D profile of the road surface. The profiler can measure roughness, rutting and pavement texture.

***Distance measuring instrument*:** It uses distance pulses from the vehicle odometer system, or a sensor attached to the drive shaft or a wheel of the survey vehicle, to provide high resolution speed and distance data. Each road inventory and pavement condition parameter will be referenced to the road running distance.

Roughness

Roughness is generally a measure of riding quality of the pavement

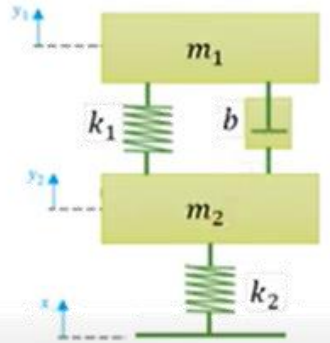
Roughness is a pavement condition parameter which characterizes the deviation in road surface from the intended longitudinal profile.

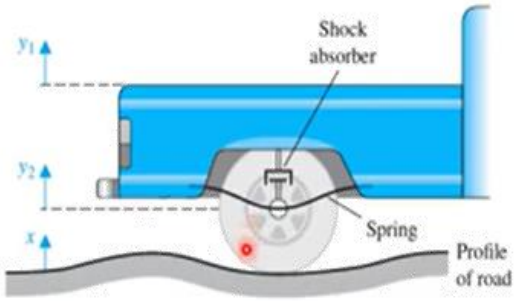
Two lasers along the wheel path measures the longitudinal profile of the road surface.

Profile data is input into Quarter-car model, simulates vehicles response to the road profile

The accumulated response from quarter car model is used to calculate IRI

Sampling is done every 25mm of longitudinal travel and used to estimate longitudinal profile of the road





Quarter Car Model

Rutting

NSV measures rutting using laser profiler. Measures 3m transverse profile with minimum of 11 lasers

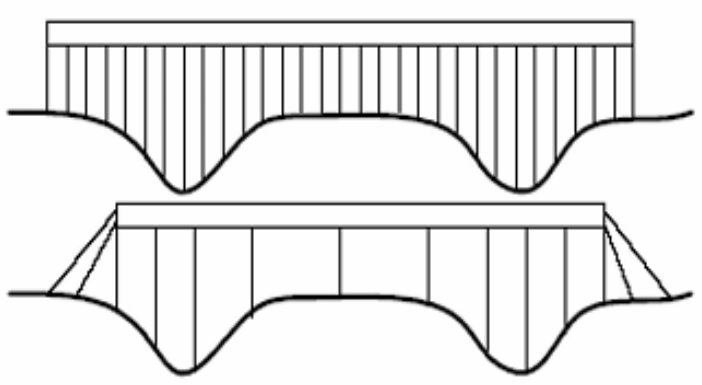
Lasers used to scan the road and create 3D profile

Analysis in specialized software to get rut depth

Full transverse profile at every 50mm longitudinal interval

Measures surface shape and depressions or ruts

Rut depth is measured as the maximum vertical distance between top of pavement surface and bottom of the rut



Various sensor arrays for high speed transverse profile data capture

Source – Guide to Asset Management, Part 5C: Rutting, Austroads

Pavement Distresses

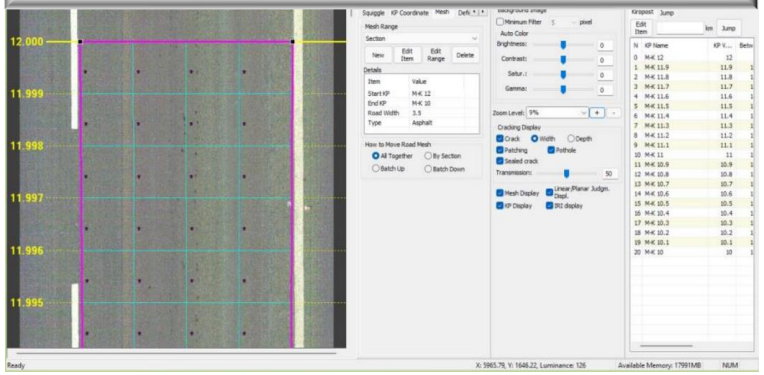
Pavement Images are captured using high resolution video recording and digital cameras

3 cameras facing forward and one facing on the pavement which can record all pavement defects at 10m interval

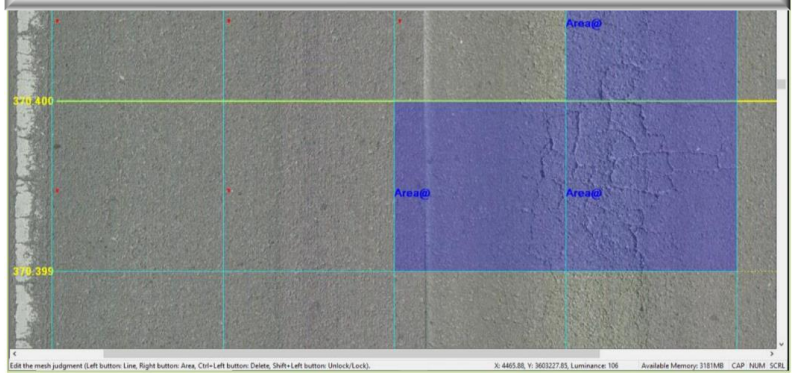
Manual post interpretation of video images and data recording

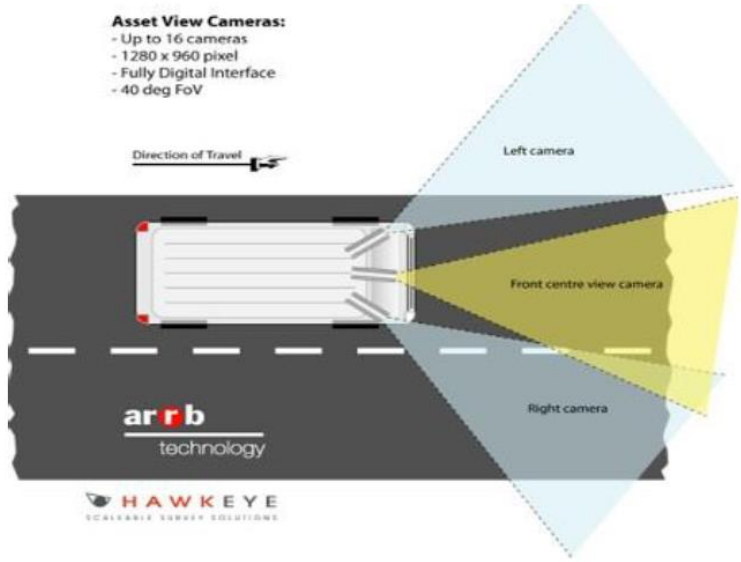
The data captured include type, severity and extent of distresses

Development of Meshes



Manual Analysis of Pavement Condition





Distresses Identified: Cracks, Potholes, Ravelling, Patching, Shoving, Bleeding, Depressions, Edge break, Delamination

Sample Output from NSV survey

Profiler Data

IRI Left WP and Right WP averaged to get IRI average

Rutting measured from DLP, Rut lane is the maximum rutting on the lane

KM Stone	Chainage(km)_From	Chainage(km)_To	IRI Right (m/km)	IRI Left (m/km)	IRI Average (m/km)	Bump Int (mm/km)	Rut Right (mm)	Rut Left (mm)	Rut Lane (mm)	SMTD Macrotexture Right (mm)	SPTD Macrotexture Right (mm)	SMTD Macrotexture Left (mm)	SPTD Macrotexture Left (mm)	Speed (km/h)
	111.2	111.1	1.76	1.9	1.83	1253.73	3.04	2.83	3.79	0.239	0.42	0.195	0.366	53.1
111	111.1	111	1.28	1.7	1.49	990.51	1.56	1.33	1.77	0.26	0.446	0.235	0.415	52.6
	111	110.9	1.45	2.02	1.73	1176.44	1.33	1.23	1.52	0.273	0.462	0.237	0.417	52.9
	110.9	110.8	0.94	1.19	1.07	679.33	1.34	0.84	1.38	0.294	0.488	0.23	0.408	54.3
	110.8	110.7	1.54	1.71	1.62	1087.56	1.43	1.03	1.62	0.262	0.448	0.229	0.407	54.9
	110.7	110.6	1.05	1.59	1.32	868.94	1	1.36	1.47	0.251	0.435	0.229	0.408	52.9
	110.6	110.5	0.95	1.19	1.07	680.83	0.96	1.5	1.59	0.23	0.409	0.201	0.373	52.9
	110.5	110.4	1.27	1.42	1.34	880.87	1.75	1.17	1.83	0.266	0.453	0.228	0.407	53.3
	110.4	110.3	1.28	1.79	1.53	1019.93	1.52	1.48	1.82	0.265	0.452	0.21	0.385	54
	110.3	110.2	0.98	1.44	1.21	781.96	1.26	0.68	1.33	0.26	0.446	0.234	0.39	46.4
	110.2	110.1	1.03	1.33	1.18	760.8	1.83	0.84	2	0.255	0.439	0.234	0.414	34.7

BI is the most used unit in India for roughness. As per IRC: SP:16-2004, IRI is converted to BI

$$BI = 630\ (IRI)^{1.12}$$

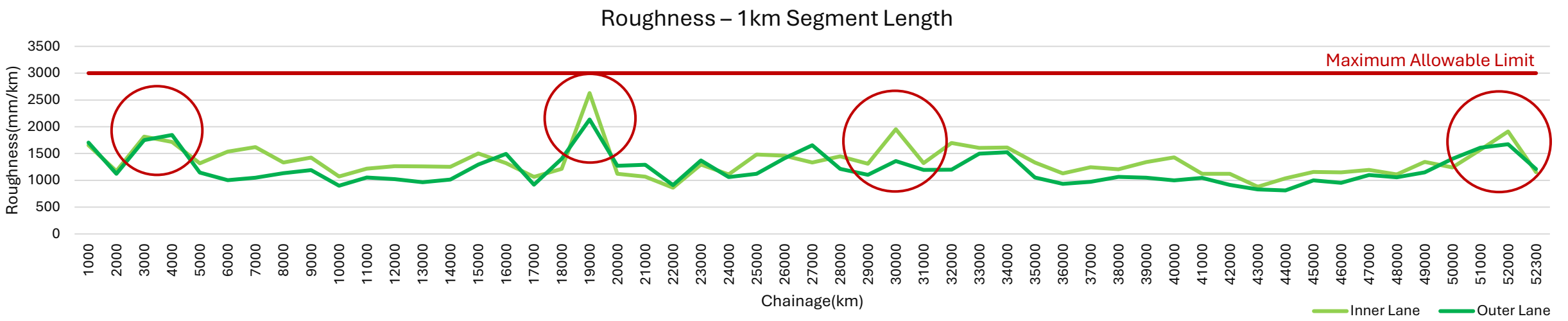
Texture Details also derived

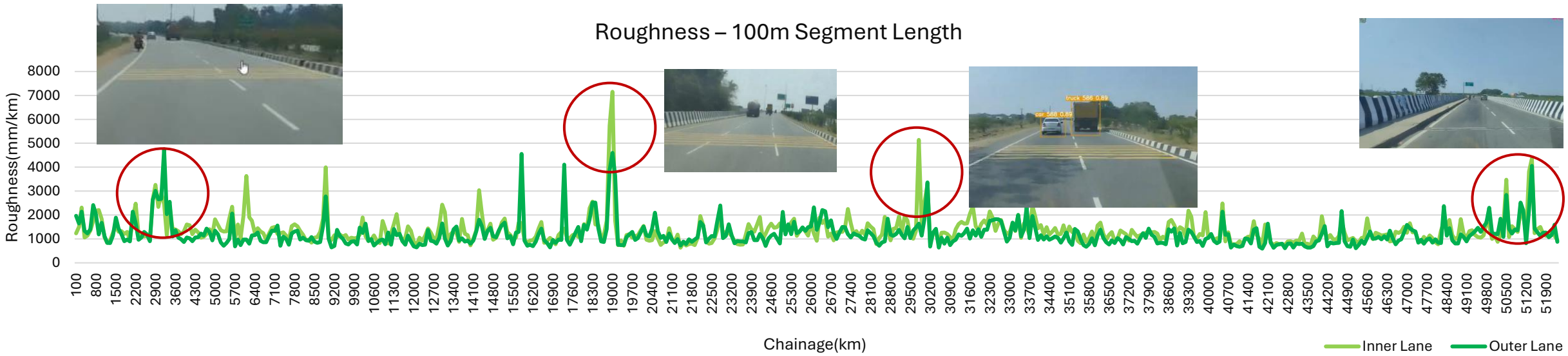
Pavement Condition Data

Kerb Stone (km)	Kerb Chainage (km)	Longitudinal Cracks Severity	Longitudinal Cracks Extent	Transverse Cracks Severity	Transverse Cracks Extent	Alligator Cracks Severity	Alligator Cracks Extent	Block Crack Severity	Block Crack Extent	Pothole Severity	Pothole Extent	Ravelling Severity	Ravelling Extent	Patching Se
	175.01	None	None	None	None	None	None	None	None	None	None	None	None	None
	175.02	None	None	None	None	None	None	None	None	None	None	None	None	None
	175.03	None	None	None	None	None	None	None	None	None	None	None	None	None
	175.04	None	None	None	None	None	None	None	None	None	None	None	None	None
	175.05	None	None	None	None	None	None	None	None	None	None	None	None	None
	175.06	None	None	None	None	None	None	None	None	None	None	None	None	None
	175.07	None	None	None	None	None	None	None	None	None	None	None	None	None
	175.08	None	None	None	None	None	None	None	None	None	None	None	None	None
	175.09	None	None	None	None	None	None	None	None	None	None	None	None	None
	175.1	None	None	None	None	None	None	None	None	None	None	None	None	None
	175.11	None	None	None	None	None	None	None	None	None	None	None	None	None
	175.12	None	None	None	None	None	None	None	None	None	None	None	None	None
	175.13	None	None	None	None	None	None	None	None	None	None	None	None	None
	175.14	None	None	None	None	None	None	None	None	None	None	None	None	None
	175.15	None	None	None	None	None	None	None	None	None	None	None	None	None
	175.16	None	None	None	None	None	None	None	None	None	None	None	None	None
	175.17	None	None	None	None	None	None	None	None	None	None	None	None	None

Pavement distress data consist of severity and extent of each type of distress

Analysis of Roughness





Analysis of Roughness

- Higher roughness is usually observed at locations of Transverse Bar Markings/Rumble Strips, Structure Joints, Toll Plaza locations.
- Short segment length(100m) used to identify localized irregularities like potholes or bumps. Identify sections for immediate rectification.
- Longer segments(1000m) are used to assess the overall average roughness of road section. Less sensitive to local failures, gives general pavement condition.

IRC 82-2015 & IRC 82-2023

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IRC 82-2015

Defect(type)	Range of Distress		
Cracking(%)	<5	5-10	>10
Ravelling(%)	<1	1-10	>10
Potholes(%)	**<0.1**	**0.1-1**	**>1**
Shoving(%)	<0.1	0.1-1	>1
Patching(%)	<1	1-10	>10
Settlement and Depression (%)	<1	1-5	>5
Rut depth (mm)	<5	5-10	>10
Roughness	<1800	1800-2400	2400-3200
Rating	2.1-3	1.1-2	1
Condition	Good	Fair	Poor

Pavement condition rating is assessed for each distress and average of rating gives final pavement condition rating

IRC 82-2023

Defect(type)	Weightages	Range of Distress		
Cracking(%)	0.12	<5	5-10	>10
Ravelling(%)	0.10	<1	1-10	>10
Potholes(Nos.)	**0.16**	**<1**	**1-2**	**>2**
Shoving(%)				
Patching(%)	0.08	<1	1-10	>10
Settlement and Depression (%)				
Rut depth (mm)	0.14	<5	5-10	>10
Roughness	0.40	<1800	1800-2400	>2400
PCI		80-100	40-80	<40
Condition		Excellent - Good	Satisfactory - Fair	Poor - Fail

Pavement condition index for each distress is evaluated based on each of the distress extent. Final PCI is arrived at by taking weighted average of the PCIs

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Review of Distress Limits as per Concession Agreements

Distresses	IRC 82-2023	Schedule L		Schedule K	Schedule F		Schedule K – BOT Concession Agreement	
	Excellent - Good; Satisfactory - Fair; Poor - Fail	Desirable Limits	Acceptable Limits	Acceptable Limits	Desirable Limits	Acceptable Limits	Desirable Limits	Acceptable Limits
Roughness	<1800 **1800-2400** >2400	2000mm/km (Allowable Tolerance +/- 5%)	3000mm/km	2500mm/ 2750mm in a stretch of 1km	2.8/ 2000mm/km	4.0/ 3000mm/km	2000 mm/km	**2400mm/km**
Cracking	**<5%** 5-10% >10%	Nil	No unsealed cracks>6mm on 95% of project highway	5% of road surface in 1km	Nil	<10% of any 50m section and/or 0.5Sqm at any location	Nil	**<5% subject to limit of 0.5Sqm for any 50m length**
Rutting	**<5mm** 5-10mm >10mm	10mm rutting in length more than 5% of project highway	10mm rutting in length upto 10% of project highway	10mm in more than 2% of the road surface in 1km	<10mm for any 50m section and/or length of section<5m	<10mm for any 50m section and/or, length of section <10m	Nil	**<5mm**
Corrugation and Shoving		-	-	-	Nil	<1Sqm at any particular section and depth<10mm	Nil	<0.1% of area

Review of Distress Limits as per Concession Agreements

Distresses	IRC 82-2023	Schedule L		Schedule K	Schedule F		Schedule K – BOT Concession Agreement	
	Excellent - Good; Satisfactory - Fair; Poor - Fail	Desirable Limits	Acceptable Limits	Acceptable Limits	Desirable Limits	Acceptable Limits	Desirable Limits	Acceptable Limits
Bleeding/ Skidding		-		Nil	Nil	<1% for any 50m section and/or 0.25 Sqm at any location	Nil	<1% of area
Ravelling/ Stripping of bituminous surface	**<1%** 1-10% >10%	-		<10Sqm	Nil	<3% for any 50m section and/or 1 Sqm at any location	Nil	**<1% of area**
Potholes 1. Upto 75mm deep 2. >75mm deep	**Nil** 1-2 >2	Nil Nil	2 Nos. of size<5Sqm Nil	Nil	Nil	<5 Sqm in area and 10mm in depth	Nil	**<0.1% of area and subject to limit of 10mm in depth**
Pavement Condition Index	**80-100(2.1-3)** 40-80(1.1-2) <40(<1)	-	-	-	>85	**>70**	3	**2.1**

International Standards for Roughness

FHWA Pavement Roughness Thresholds

Federal Highway Administration. 1999
http://www.fhwa.dot.gov////policy/1999cpr/index.htm. Accessed August 1, 2002.

Pavement Condition	Good	Fair	Poor
IRI (m/km)	1.5	1.5 – 2.68	>2.68

Japanese Roughness Standards

(Source: https://www.researchgate.net/publication/334363605)

Pavement Condition	New Constructed Roads	Repair or Maintenance
Expressways	<=1.6	<=3.5

Indian Roughness Standards as per IRC 82-2023

Pavement Condition	Good	Fair	Poor
IRI (m/km)	2.55 (1800mm/km)	2.55 – 3.3 (1800-2400mm/km)	>3.3 (>2400mm/km)

Austroads Roughness Standards

(Source: Guide to Asset Management, Part 5B: Roughness, Austroads)

Road function	New construction (Segment Length 500m)	Isolated areas	Segment Length>500m
Freeways and other high-class facilities	1.6	4.2	3.5
Highways and main roads (100km/h)	1.9	5.3	4.2
Highways and main road (<80km/h)	1.9	6.1	5.3

International Standards for Rutting

Indian Rutting Standards as per IRC 82-2023

Pavement Condition	Good	Fair	Poor
Rut depth(mm)	<5	5-10	>10

Japanese Standards for Rutting

(Source: **Pavement Survey Guidelines of Japan, 2020)**

Pavement Condition	Rectification threshold
Rut depth(mm)	25

Russian Standards for Rutting

(Source: https://doi.org/10.1088/1757-899X/753/5/052019?)

Estimated speed, km/h	Rut depth(mm)	
	Permissible	Limit (immediate rectification)
>120	4	20
120	7	20
100	12	20
80	25	30
60 and less	30	35

FHWA Pavement Rutting Thresholds

(Source: Federal Highway Administration. 1999 http://www.fhwa.dot.gov////policy/1999cpr/index.htm. Accessed August 1, 2002)

Pavement Condition	Good	Fair	Poor
Rut depth(mm)	5.3	5.3-10.6	>10.6

Chinese Standards for Rutting

(Source: Ministry of transport)

Pavement Condition	First class highways and expressways	Standard maintenance intervention
Rut depth(mm)	>15	>25

Malaysian Standards for Rutting

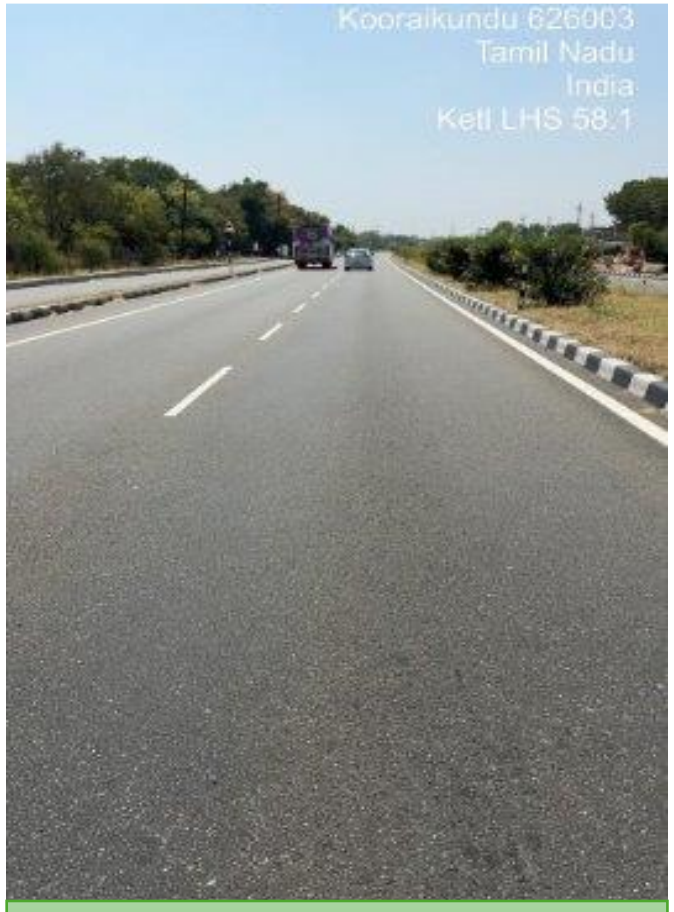
Source: Impact of Rutting on Traffic Safety: A Synthesis of Research Findings, Ali Fares , Man-Nok Wong, Tarek Zayed and Nour Faris *

Pavement Condition	Low	Medium	High
Rut depth(mm)	0 - 10	5 -20	>20

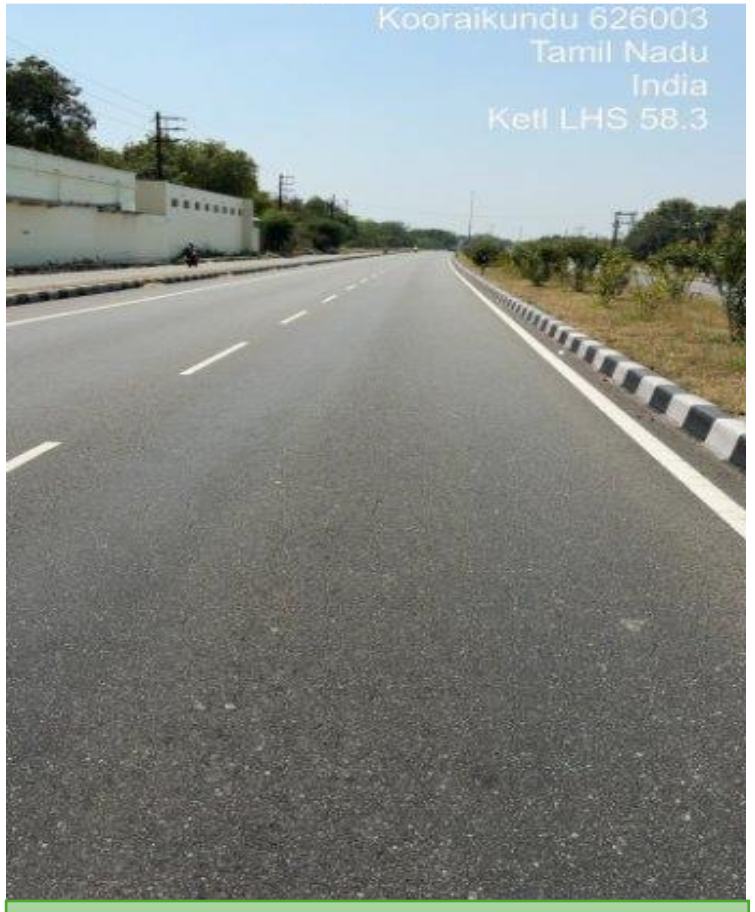
Rutting Limit for Rectification

Does rut depth from 10-15mm really warrant any treatment???

Rut depth – 12mm



Rut depth – 14mm



Rut depth – 13mm

International Standards for Cracks

Indian Rutting Standards as per IRC 82-2023			
Pavement Condition	Good	Fair	Poor
Cracks(%)	<5	5-10	>10

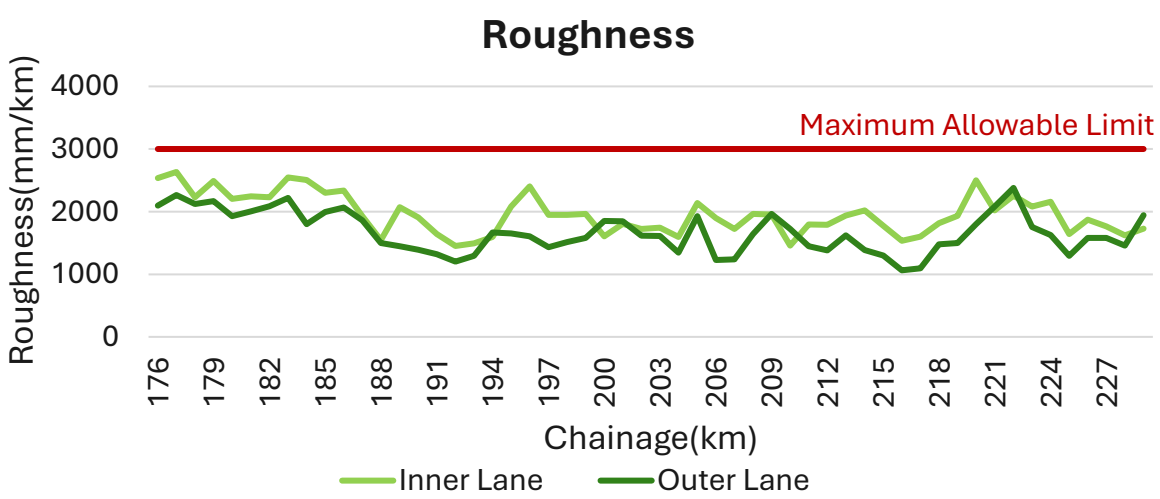
Japanese Standards for Cracks
(Source: Pavement Survey Guidelines of Japan, 2020)

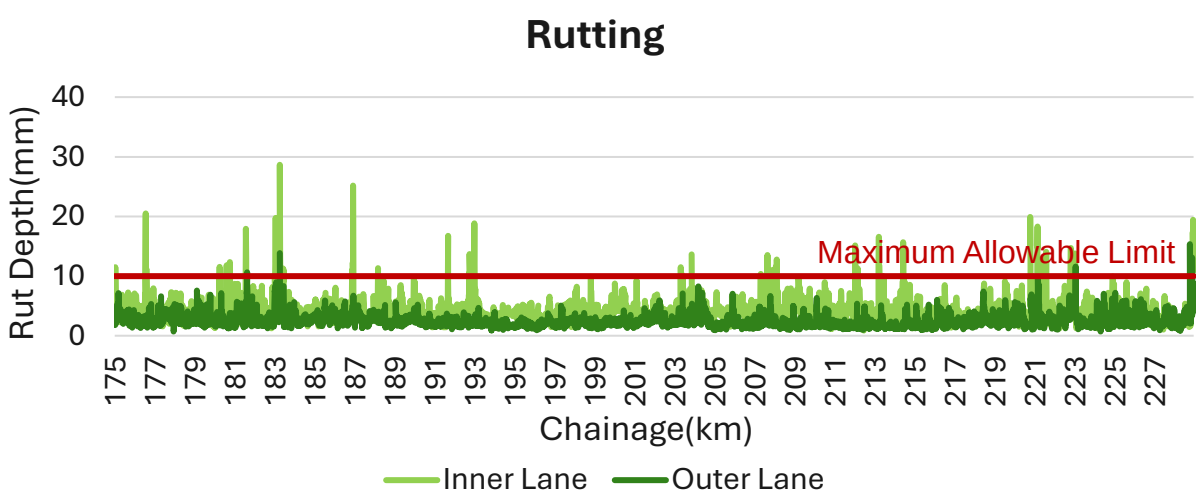
Pavement Condition	Rectification threshold
Cracks (%)	20

FHWA Pavement Cracks Thresholds
(Source: Federal Highway Administration. 1999 http://www.fhwa.dot.gov////policy/1999cpr/index.htm. Accessed August 1, 2002)

Pavement Condition	Good	Fair	Poor
Cracks(%)	5	5-20	>20

Interpretation of NSV data

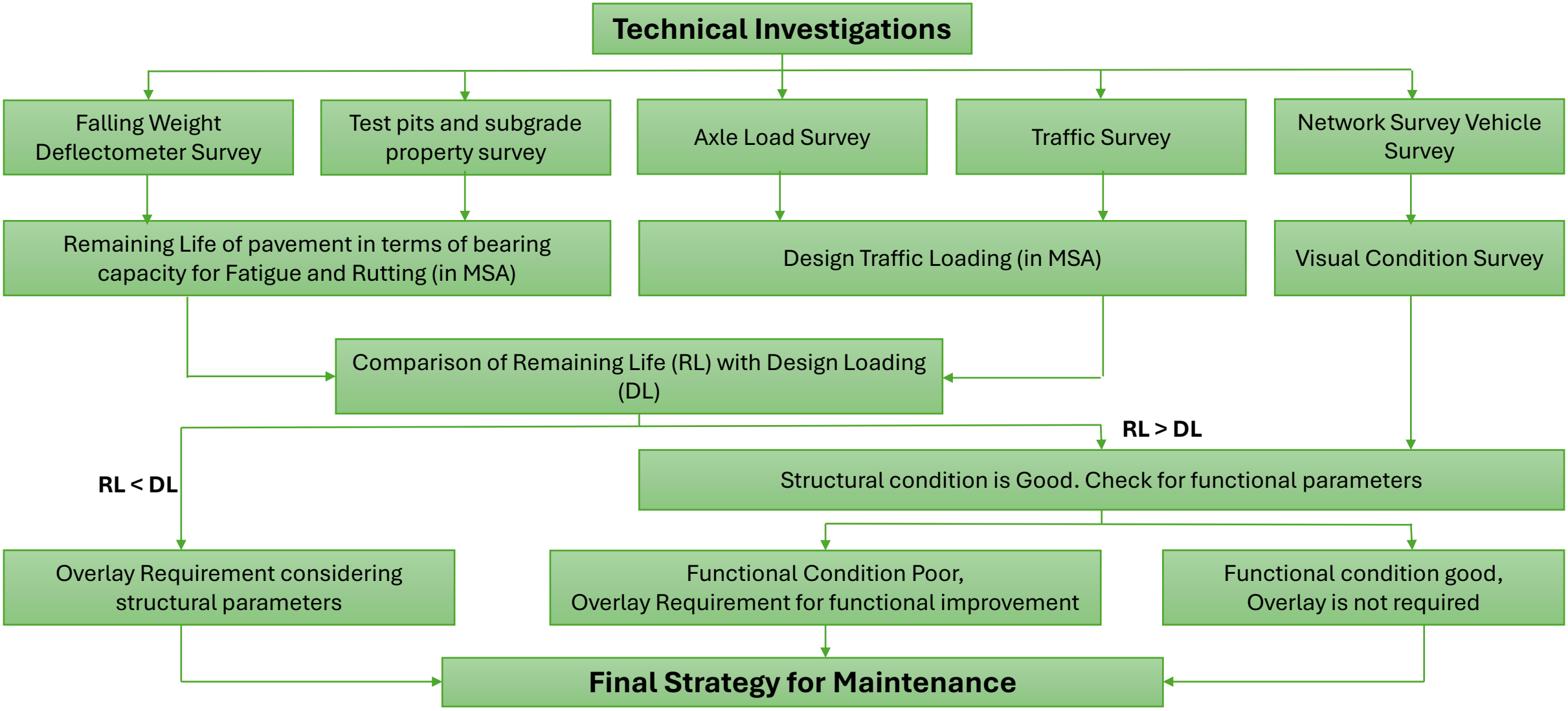




LHS	Outer Lane	Longitudinal Cracks	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		Transverse Cracks	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		Alligator Cracks	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		Roughness	2229	2229	1797	1438	2100	1454	1524	1392	1594	1308	3616	1672	1308	1052	1570	1074	1462	1805	2596	2661	2785	3413
		Rutting	2	2	2	2	2	2	2	2	2	2	4	2	2	2	2	2	2	2	3	2	2	2
		Remaining Life	304	304	304	304	304	304	304	304	307	307	307	307	307	307	307	307	307	307	119	119	119	119
	Inner Lane	Longitudinal Cracks	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		Transverse Cracks	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		Alligator Cracks	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		Roughness	2164	2164	2132	1547	2277	1119	1837	1687	1524	1104	2277	1940	1126	1209	1400	1438	1164	1323	2910	2579	2678	3060
		Rutting	5	5	5	4	6	4	5	5	4	4	10	5	3	4	6	6	5	4	6	5	4	3
		Remaining Life	454	454	454	454	454	454	454	454	449	449	449	449	449	449	449	449	449	449	442	442	442	442
Chainage(km)		From	62.295	62.300	62.400	62.500	62.600	62.700	62.800	62.900	63.000	63.100	63.200	63.300	63.400	63.500	63.600	63.700	63.800	63.900	64.000	64.100	64.200	64.300
		To	62.300	62.400	62.500	62.600	62.700	62.800	62.900	63.000	63.100	63.200	63.300	63.400	63.500	63.600	63.700	63.800	63.900	64.000	64.100	64.200	64.300	64.400
RHS	Inner Lane	Longitudinal Cracks	0	0	0	1	2	0	1	1	0	0	0	0	0	0	0	0	1	0	1	1	1	1
		Transverse Cracks	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		Alligator Cracks	0	0	2	5	1	0	5	3	0	0	0	0	0	0	0	0	0	0	0	1	0	0
		Roughness	1687	1687	1362	3194	2318	2719	1293	1156	1346	3667	2843	1774	2367	1331	1300	1209	1119	1255	2375	2269	2432	2968
		Rutting	7	7	6	8	5	5	7	3	3	5	6	6	5	6	5	4	6	4	5	7	7	5
		Remaining Life	854	854	854	854	854	854	854	854	860	860	860	860	860	860	860	860	860	860	878	878	878	878
	Outer Lane	Longitudinal Cracks	0	0	0	2	2	1	1	2	3	1	3	1	1	0	1	1	0	0	1	1	1	0
		Transverse Cracks	1	0	0	1	1	2	0	0	2	0	1	1	0	0	0	0	0	0	0	0	1	0
		Alligator Cracks	0	0	3	1	0	0	5	4	1	14	3	0	1	0	0	0	0	0	0	0	0	0
		Roughness	1742	1742	1996	3345	3210	3719	1438	1217	1578	2424	3421	1853	1640	1648	1656	1469	1308	1408	1964	2092	2943	2802
		Rutting	4	4	4	5	4	4	4	4	4	5	5	5	6	6	5	4	4	4	4	4	4	5
		Remaining Life	38	38	38	38	38	38	38	38	871	871	871	871	871	871	871	871	871	871	886	886	886	886

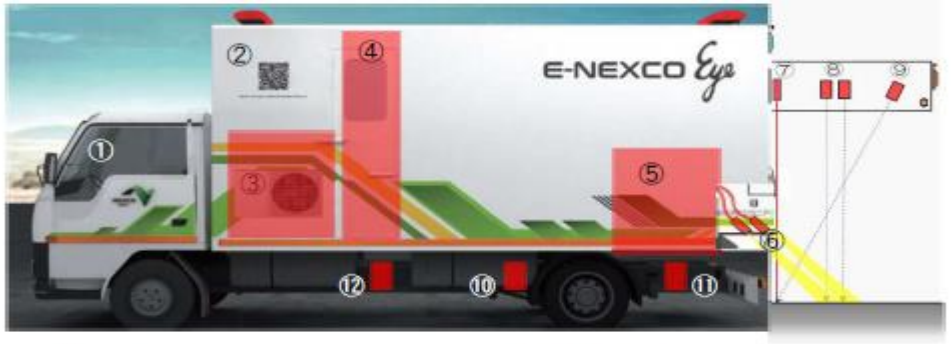
	Cracks		Rutting		Roughness	
	0	5%	0	5mm	0	2000mm/km
	5%	10%	5mm	10mm	2000mm/km	3000mm/km
	>10%		>10mm		>3000mm/km	

Strategy Preparation for Overlay

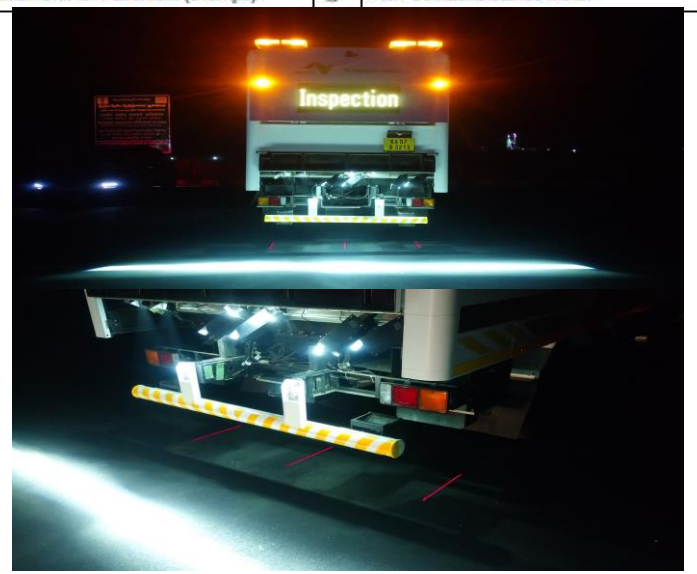


E-NEXCO Eye

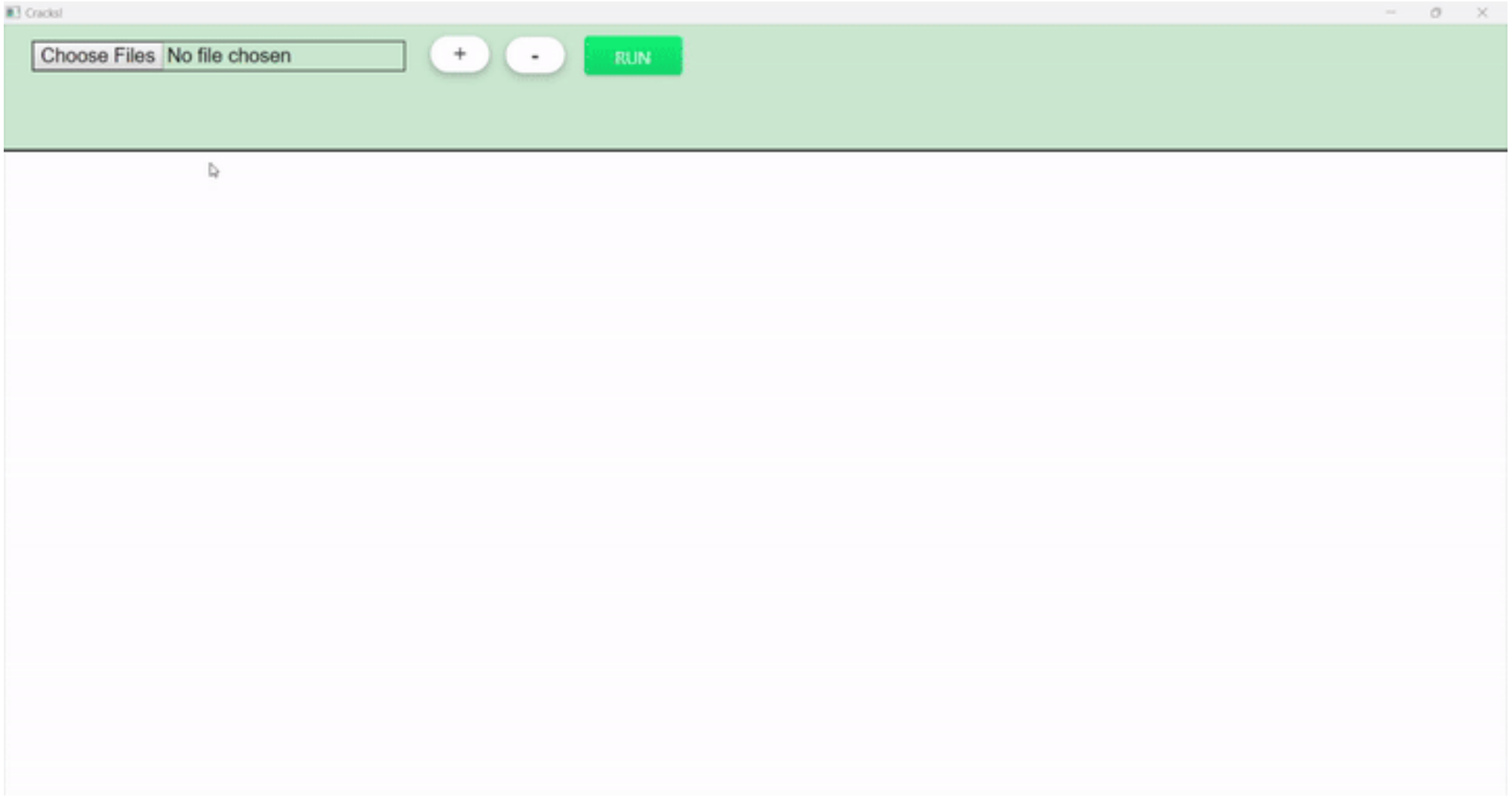
- Developed jointly by **NEXCO East** and **Cube Highways** for Indian conditions
- Capable of measuring Roughness (IRI), Rutting and Pavement distresses accurately when running at a speed of 100km/hr
- Roughness is measured using three line sensors in a lane
- Rutting is measured with an accuracy of 1mm and can gathers road profile 1mm laterally and 1cm longitudinally
- Capable to take pictures with a clarity equivalent to 1800-million-pixel image by area camera to determine pavement distresses accurately



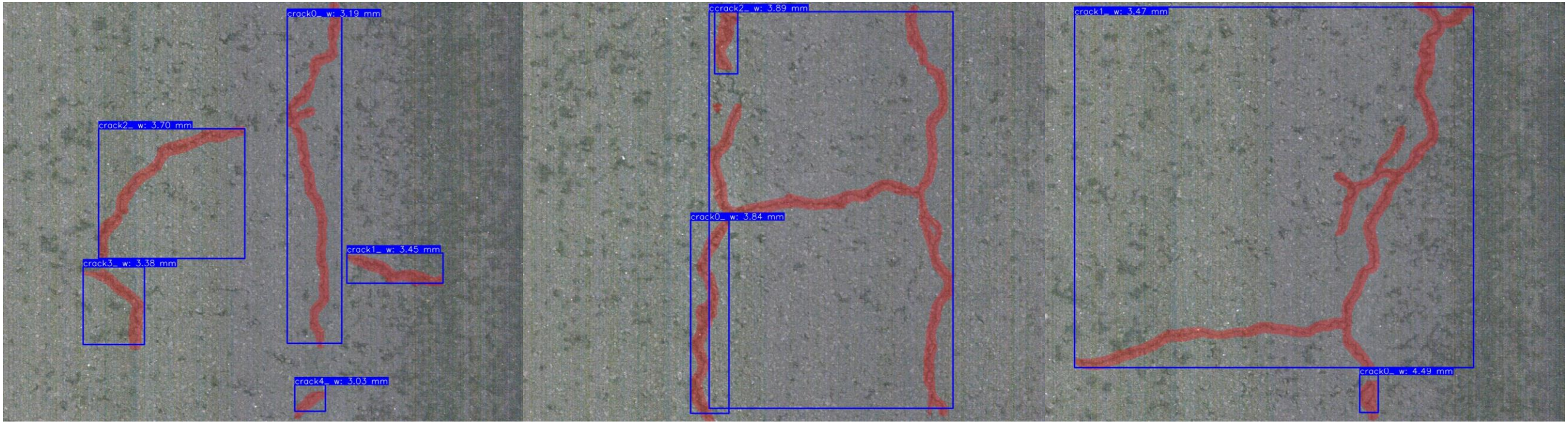
①	Driver's Area	⑦	High Power Laser
②	Monitor & Key Board (for Operation)	⑧	Color Line Sensor Cameras for Pavement (2)
③	Electric Power Generator	⑨	Multi Scan 3D Camera
④	PC Rack	⑩	Laser Displacement Meter
⑤	Light Source	⑪	3D Inspection Equipment Integrated with Laser Camera
⑥	Irradiation Unit for Pavement (8 lamps)	⑫	Non-Contact Distance Meter



Automatic Cracks Identification



Automatic Cracks Identification



- Automatic cracks identification tool developed based on AI/ML is having capability to measure the width of the crack
- Even cracks of minor in nature (<3mm) can also be identified
- It presents an average width of the complete inter-connected width
- This helps in prioritizing the maintenance activities and to understand the crack propagation

Automatic Cracks Identification

HOAI
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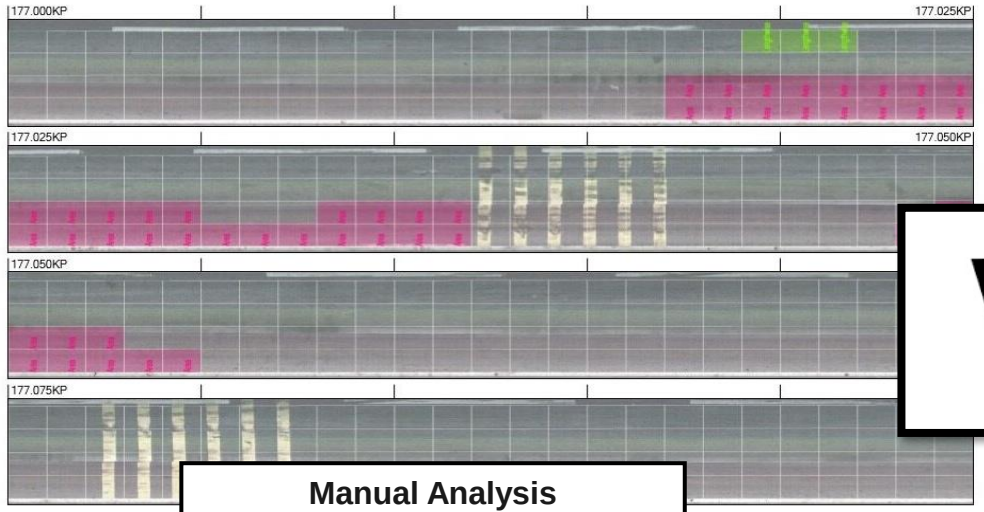
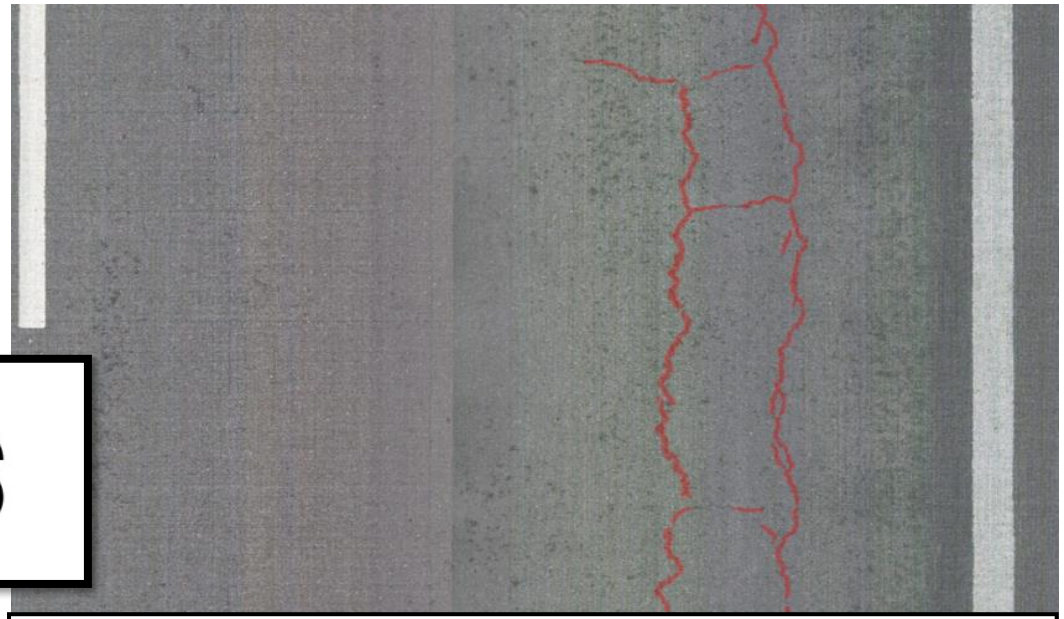
Subject: Road surface survey
Road Name: JMTL
Inbound/Outbound Segment: Inbound
Lane Segment:
Output Range: 177.0-177.1
Date of Shot: 2023/04/19
Description:

KP	Cracking Evaluation (25m) Rate / (Degree)					Cracking Evaluation (100m) Rate / (Degree)				
	Number of Cracking		Pothole Area (m²)	Patching Area (m²)	Rate / (Degree)	Number of Cracking		Pothole Area (m²)	Patching Area (m²)	Rate / (Degree)
	Planar	Linear				Planar	Linear			
177.000 ~ 177.025	16	3	0.000	0.000	16.900	48	3	0.000	0.000	12.225
177.025 ~ 177.050	24	0	0.000	0.000	24.000					
177.050 ~ 177.075	8	0	0.000	0.000	8.000					
177.075 ~ 177.100	0	0	0.000	0.000	0.000					



Manual Analysis

Vs



Using Automatic Pavement Distress Identification Model

Manual analysis v/s AI model		Manual Analysis	
		N	Y
AI model	N	45553	29
	Y	2407	11

- **~95%** Accuracy in comparison with Manual Analysis
- After removing false positives, the accuracy level increases to **99%**

- One person does 4lanekm/day whereas in the developed AI model, it takes 12min to process the cracks data collected from ENEXCO Eye.

Athaang INFRASTRUCTURE | CUBE HIGHWAYS | HIGHWAYS INFRASTRUCTURE TRUST | isadak an Abertis company | INTERISE | MAPLE HIGHWAYS | NXT INFRA | ROADIS | sekura Safe. Secure. Sustainable. | SAFEWAY | VINCI HIGHWAYS

HOAI

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Thank you