Assessing the Condition of the Irish Regional Road Network- 2018

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Network Survey - Regional

- c. 13,000 centreline kilometres
- Rural and Urban local authorities
- 100% survey
- RSP, SCRIM, Visual
- Lane width measurements every 100 metres
- All to be completed in 2018
- DTTAS contract administered by RMO

PAVEMENT SURVEY STANDARD FOR REGIONAL AND LOCAL ROADS



Survey Equipment

□ Road Condition Data (IRI, Rut & MPD)

- Road Surface Profiler (RSP)
- □ Skidding Resistance Data (SC)
 - SCRIM
- Digital Video Data (Visual Rating)
 - both RSP (.JPeg) and SCRIM (.Avi)

Condition Parameters

- IRI Ride Quality
- LPV3 Ride Quality (Bumpiness)
- Rut Depth Structural
- Visual Rating Overall
- MPD Macrotexture (Safety)
- SC Microtexture (Safety)

Road Surface Profiler (RSP) Dynatest Model 5051 Mark III RSP



International Roughness Index (IRI)

A standardized roughness measurement.

✓ It is a mathematical property of the profile of a single wheel path with units of mm/m or m/km







IRI Relationship with Comfort and Speed

IRI Value	Comfortable Ride Speed	Description	
2	over 120 km/h	Very Smooth	
4	100 to 120 km/h	Smooth	
6	70 to 90 km/h	Perceptible movement	
8	50 to 60 km/h	Some Swaying and Wheel Bounce	
10	40 to 50 km/h	Significant Swaying	
12	30 to 40 km/h	Consistently Rough	
14	< 30 km/h	Very Rough	

Cross Profile – Rut Depth



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Rut Depth

- Indication of Structural Condition
- Caused by heavy traffic and/or inadequate pavement strength
- Rutting can occur in upper layers or in underlying subgrade
- Measured in both wheelpaths in mm

Skid Resistance

□ Frictional properties of the road surface

- Measured using a standard device
- Under standardised conditions

Measurements used to

- Characterise the road surface
- Assess the need for maintenance

Low Speed (< 50 km/h): Microtexture
High Speed (> 60 km/h): Macrotexture

Surface Texture – RSP Laser

- Measured by High Frequency Laser 64 kHz (produces at least 64,000 displacement measurements per second)
- Profile Height measured 2.5 times per mm
- Mean Profile Depth (MPD) in mm calculated
- Measure of macrotexture (texture depth)

SCRIM



SCRIM – Test Wheel Assembly



Forward View Digital Video



Pavement-oriented digital video used to capture the road surface condition.

DTTAS Condition Survey Manual



Visual Rating – Pavement Surface Condition Index (PSCI)

Rating System: 1 to 10

Rating is assigned based on visible pavement distress present.

Overall Rating	Primary Rating Indicators*	Secondary Rating Indicators*
10	No visible defects.	Road surface in perfect condition, like new.
9	Less than 10 % of surface with surface defects ¹	Road surface in very good condition.
8	10% to 30% of surface with surface defects ¹	Little or No Other defects.
7	Greater than 30% of surface with surface defects ¹	Little or No Other defects. Old surface with aged appearance.
6	Less than 20% of Other Cracking ² may be present. <u>Patching</u> generally in <u>good</u> condition. <u>May be out of shape</u> requiring some reduction in driver speed.	Surface defects ¹ may be present. No structural distresses ³
5	Greater than 20% Other Cracking ² present. <u>Patching</u> generally in <u>fair</u> condition. <u>Out of shape</u> requiring reduction in driver speed. <u>Very localised structural distress³ (< 5 sq.m of surface)</u> may be present.	Surface defects ¹ may be present.
4	<u>Structural distress³ present</u> . Rutting or Alligator Cracking for <u>5% to 25% of surface</u> . Short lengths of Edge Breakup/Cracking. Small number of Potholes.	Other defects may be present.
3	Significant areas of Structural distress ³ . Rutting or Alligator Cracking for <u>25% to 50% of surface</u> . <u>Significant</u> continuous lengths with <u>Edge</u> <u>Breakup/Cracking</u> . <u>Frequent Potholes</u> .	Other defects may be present.
2	Large areas of Structural distress ³ . Rutting or Alligator Cracking for <u>over 50% of surface</u> . <u>Severe Rutting</u> (over 75 mm deep). <u>Extensive Patching</u> in very poor condition. <u>Many Potholes</u> .	Very difficult to drive on.
1	Severe Structural distress ³ with extensive loss of pavement surface. Road Disintegration of surface. Many large and deep Potholes. Patching in failed condition.	Severe Deterioration Virtually undriveable.

County	Length (km)	
CARLOW	185	
CAVAN	400	
CLARE	633	
CORK	1368	
CORKCC	37	
DCC	200	
DLR	103	
DONEGAL	782	
FINGAL	254	
GALCC	37	
GALWAY	894	
KERRY	529	
KILDARE	493	
KILKENNY	421	
LAOIS	348	
LEITRIM	332	
LIMERICK	531	
LONGFORD	151	
LOUTH	274	
ΜΑΥΟ	623	
MEATH	575	
MONAGHAN	297	
OFFALY	392	
ROSCOMMON	375	
SLIGO	235	
STHDUB	116	
TIPPERARY	894	
WATERFORD	425	
WESTMEATH	313	
WEXFORD	475	
WICKLOW	460	
	13150	

13,150 km Surveyed

March to September 2018

COUNTY	Avg Of Road Width (m)	
CARLOW	7.30	
CAVAN	6.91	
CLARE	6.77	
CORK	7.11	
CORKCC	9.35	
DCC	10.19	
DLR	8.71	
DONEGAL	6.69	
FINGAL	7.96	
GALCC	9.15	
GALWAY	7.09	
KERRY	6.79	
KILDARE	7.90	
KILKENNY	7.34	
LAOIS	7.60	
LEITRIM	6.79	
LIMERICK	7.20	
LONGFORD	6.82	
LOUTH	7.91	
MAYO	6.72	
MEATH	7.60	
MONAGHAN	7.10	
OFFALY	7.10	
ROSCOMMON	6.96	
SLIGO	6.92	
STHDUB	9.12	
TIPPERARY	7.34	
WATERFORD	7.39	
WESTMEATH	7.51	
WEXFORD	7.08	
WICKLOW	6.86	

Road width measured every 100 m on every Regional Road

Typical LA average close to 7 metres

Higher in Urban Authorities

2018 Regional Roads National Average Values

Parameter	Average
IRI (mm/m)	4.0
Left Rut (mm)	9.2
MPD (mm)	1.4
CSC	0.5
Visual Rating	7.4
LPV 3m	3.7



















Condition Classes for each Parameter

- Very Good, Good, Fair, Poor, Very Poor
- Qualitative
- Easier to Understand and Explain
- Can be used for Key Performance Indicators
- Best Practice Internationally
- Typically report on % Fair or Better

Regional Road 2018 - IRI (% Fair or Better)



Regional Road 2018 - Rut (% Fair or Better)





Regional Road 2018 - PSCI (% at or above 5)

Regional Road 2018 - PSCI (% at or above 7)



Regional Road 2018 - CSC (% Fair or Better)



Regional Road 2018 - MPD (% <= 0.6mm)



Outturn Condition Parameters

- □ IRI Ride Quality
- Rut Depth Structural
- □ Visual Rating Overall
- □ MPD Macrotexture (Safety)
- □ SC Microtexture (Safety)
- □ Reported for every 100 metre sample unit on the entire Regional road network.

PSCI Rating	Pavement Treatment / Works Type	Treatment Code	Permitted Grant
10	Routine Maintenance	22	DG
9	Routine Maintenance	IId	DG
8	Percealing and Pertoration of Skid Periotoneo	RS	
7	Researing and Restoration of Skid Resistance	(or SD)	CI, KIVI, DO
6	Surface Restoration Carry out localised repairs and treat with	SR	CI, RI, DG
5	Surface treatment or thin overlay Works can include combinations of: - Pothole Repair (PR); Edge Repair (ER); Drainage Works (D) and Surfacing		
4	Structural Rehabilitation	50 / 51	CI, RI, SG, DG
3	Structural Overlay / Inlay (Urban)	30 / 31	
2	Pond Posonstruction	DD	CI, RI, SG,
1	Road Reconstruction	ΝN	DG

TABLE A1: TREATMENT / WORKS TYPE CATEGORIES AND CODES WITH CURRENT PERMITTED GRANTS

Mapping Parameters to Treatments

Road Reconstruction Example

- IRI > 7 or
- Left Rut Depth > 25 mm or
- Visual Rating of 1 to 2

Mapping Parameters to Treatments

Restoration of Skid Resistance Example

• Visual Rating of 7 or 8

Also

 Visual Rating of 9 or 10 AND (MPD <= 0.6 mm OR SC <= 0.3)

Summary

- c.13000 km of Regional Road Surveyed in 2018
- Comparisons with 2011 study
- New Class Definitions for Parameters
- Maintenance Treatment Categories from Machine Survey and Visual Survey combined
- All Data loaded into MapRoad
- Reporting at National and Local level
- Backlog Calculation at National Level