ROADS Services Training Group

LOCAL AUTHORITY ROADS CONFERENCE and EXHIBITION - 2022

Radisson Blu Hotel & Spa, Sligo May 2022

LOCAL AUTHORITY ROADS CONFERENCE and EXHIBITION – 2022

MapRoad Asset Management System

Brian Burke
Programme Manager – Pavement Management Unit
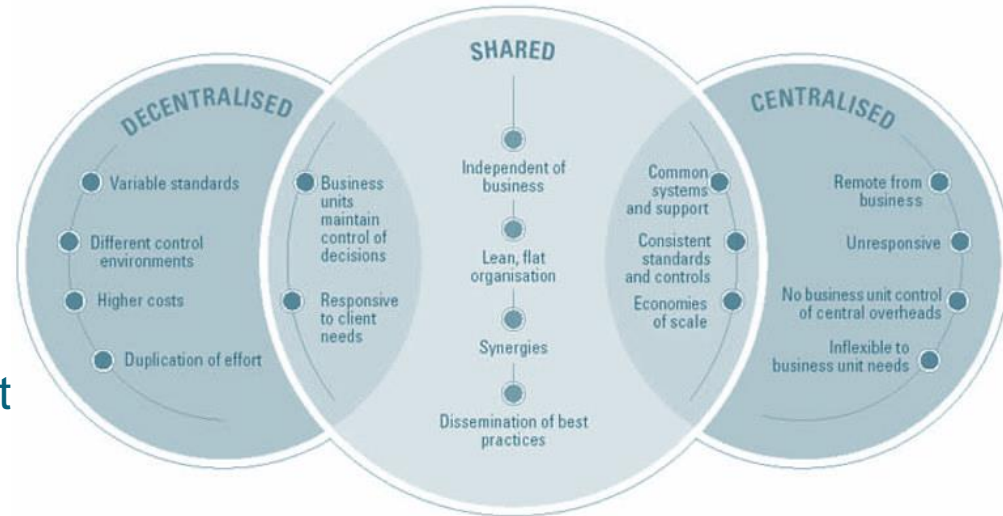Road Management Office

Overview

- Background to the Road Management Office (RMO)

- Guidance Documents associated with Asset Management for Roads

- MapRoad Asset Management System & Associated Apps

- Pavement Maintenance and Management Process

- Creating Projects and Annual Programmes

- Reporting and Process Outputs

Road Management Office

- Provision of Services to support local authorities in their functions

- Main Areas of Work
  - Pavement & Asset Management
  - Roadworks Licensing
  - Public Lighting

- Overarching this is the development and support for the MAPROAD Suite of software to support the areas of work in local authorities.

Decentralised
- Road Authorities
- Municipal Districts
- Engineering Areas

Centralised
- Department of Transport
- Transport Infrastructure Ireland
- National Transport Authority
- Road Safety Authority

Some documents associated with Asset Management for Roads since 2014

MapRoad Asset Management System

- User interface for population of data
- Datasets of various road asset information.
- Collected via:
  - *Web browser*
    - MAPROAD PMS open source system using Microsoft SQL Server
  - *Apps*
    - Mobile Apps using smart device with Android operating system
- Developed by RMO, LGMA with the support of DoT
- Owned by the State.

MapRoad Asset Management System

- Users collect data in the field using a range of Apps

  - PSCI Condition Rating App
  - Works App (Record Projects)
  - Surface Inventory App (Record surface of road)
  - Speed Limits App (Record location of Speed Limit Signs)
  - Bridges App (Carryout Visual and Engineering Inspections)
  - Footways App (Record Hazards and Condition of Footways)
  - MapRoad Public Lighting (Record Inventory and condition of lights)

PSCI App

Works App

Speed Limit Signs App

Bridges App

Footways App

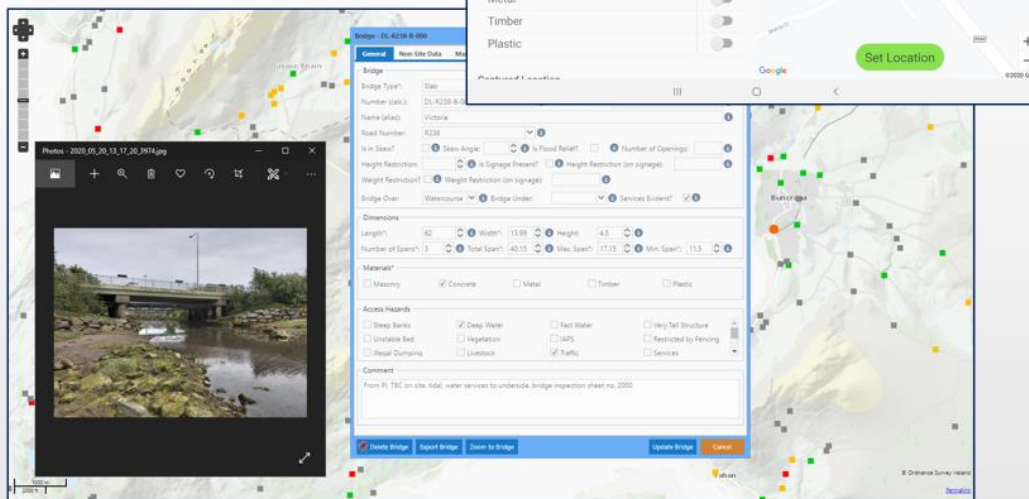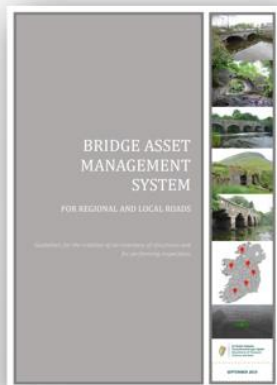MapRoad Public Lighting App

MapRoad Asset Management System

Works App

MapRoad Asset Management System

- Bridge Inventory
- Bridge Inspection data

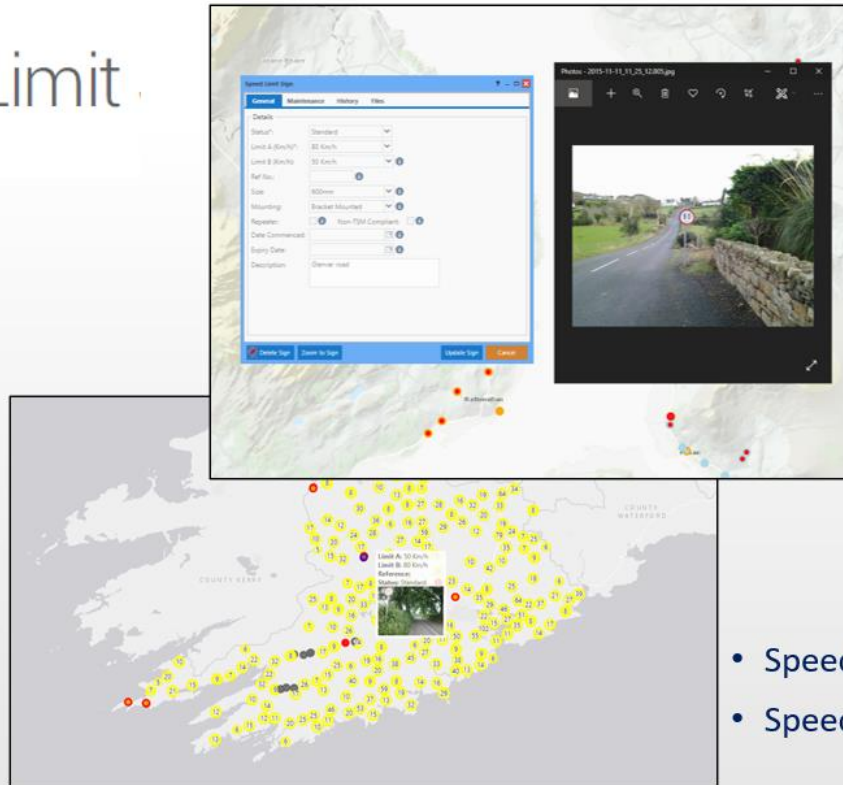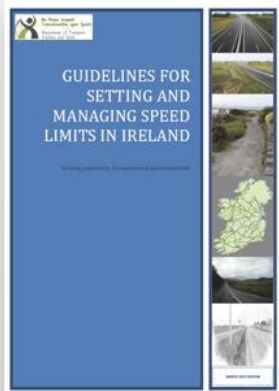# MapRoad Asset Management System
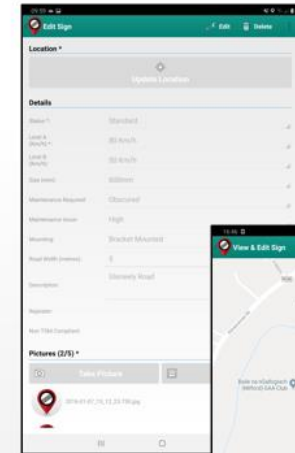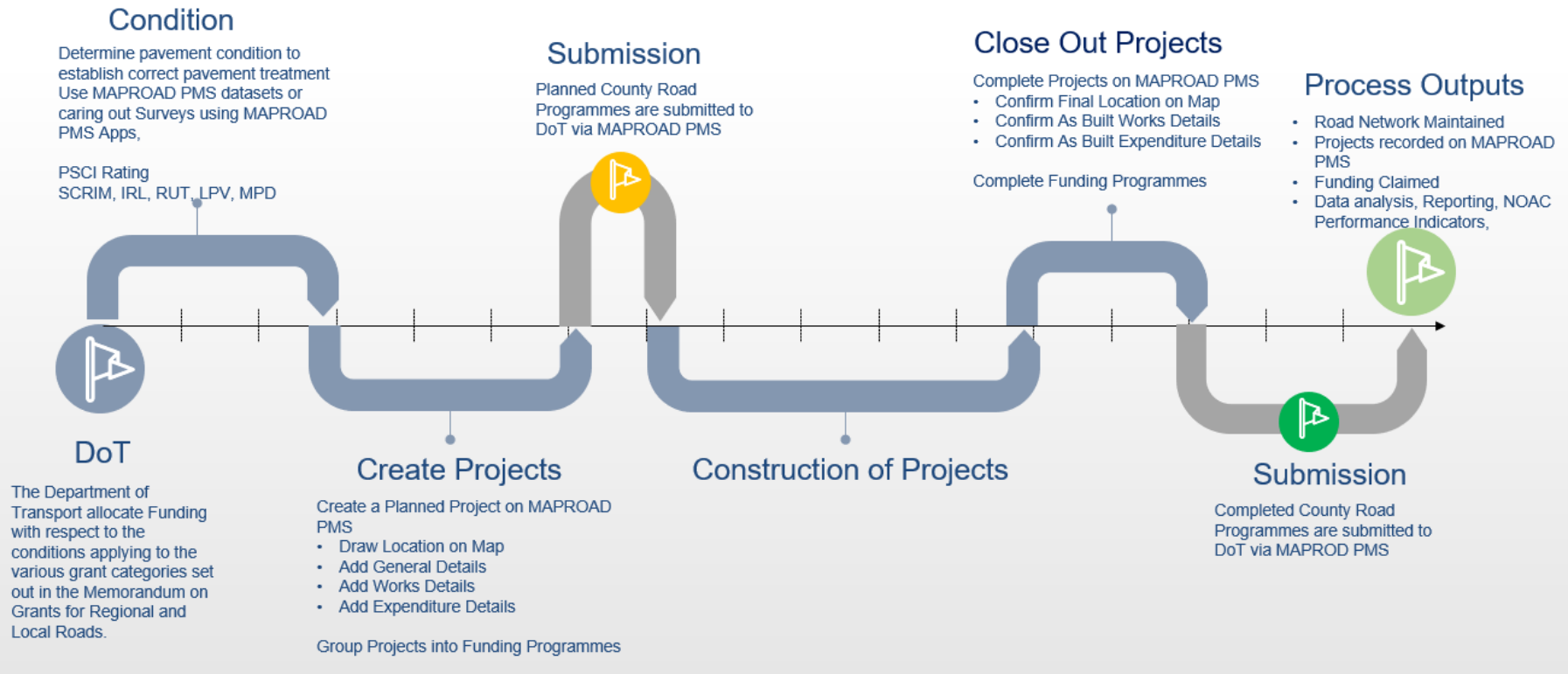

- Speed sign location
- Speed sign maintenance

Pavement Maintenance & Management Process

Condition
Determine pavement condition to establish correct pavement treatment Use MAPROAD PMS datasets or caring out Surveys using MAPROAD PMS Apps,

PSCI Rating
SCRIM, IRL, RUT, LPV, MPD

Submission
Planned County Road Programmes are submitted to DoT via MAPROAD PMS

Close Out Projects
Complete Projects on MAPROAD PMS
- Confirm Final Location on Map
- Confirm As Built Works Details
- Confirm As Built Expenditure Details

Complete Funding Programmes

Process Outputs
- Road Network Maintained
- Projects recorded on MAPROAD PMS
- Funding Claimed
- Data analysis, Reporting, NOAC Performance Indicators,

DoT
The Department of Transport allocate Funding with respect to the conditions applying to the various grant categories set out in the Memorandum on Grants for Regional and Local Roads.

Create Projects
Create a Planned Project on MAPROAD PMS
- Draw Location on Map
- Add General Details
- Add Works Details
- Add Expenditure Details

Group Projects into Funding Programmes

Construction of Projects

Submission
Completed County Road Programmes are submitted to DoT via MAPROD PMS

Department of Transport – Grant Funding

The Memorandum on Grants for Regional and Local Roads provides.

- Information on and defines the conditions governing the allocation and payment of monies to Local Authorities in respect of all grant programmes for Regional and Local Roads.

- General guidance on the carrying out of grant aided works.

- Any pavement interventions across all grant categories or using own resources must also be uploaded to the MAPROAD PMS.

- All projects for RI and RM/SRM are submitted to the DoT and managed through MAPROAD PMS.

- The Restoration Improvement Programme (RI) continues to be the main focus with €260 million allocated in 2021

- The Restoration Maintenance (RM) Programme is the primary programme aimed at protecting road surfaces. €72 million allocated in 2021.

An Roinn Iompair
Department of Transport

**MEMORANDUM
ON GRANTS FOR
REGIONAL AND LOCAL ROADS**

EFFECTIVE 1st March 2021

Condition – Pavement Survey Standard for Regional and Local Roads
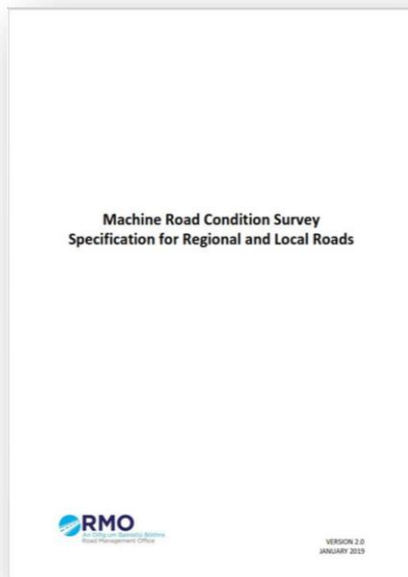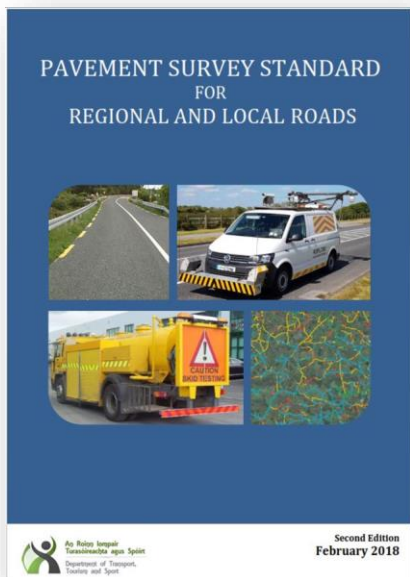
TABLE 3: NETWORK SURVEYS

Asset Type	Machine Survey		PSCI Visual Survey	
	Frequency	Coverage	Frequency	Coverage
Regional Roads (R)	6 years	100%	2 years	100%
Local Primary Roads (LP)	2 years	10%	2 years	100%
Local Secondary Roads (LS)	2 years	5 %	2 years	100%
Local Tertiary Roads (LT)	5 years	5%	5 years	100%

TABLE 4: 'BEFORE' AND 'AFTER' WORKS/PROJECT SURVEYS

Asset Type	Machine Survey (RR, SO and SR works)		PSCI Visual Survey (All works)	
	Frequency	Coverage	Frequency	Coverage
Regional Roads (R)	Every year	100%	Every year	100%
Local Primary Roads (LP)	Every year	10%	Every year	100%
Local Secondary Roads (LS)	Every year	10%	Every year	100%
Local Tertiary Roads (LT))	Every year	5%	Every year	100%

Condition – Pavement Survey Condition Index (PSCI)
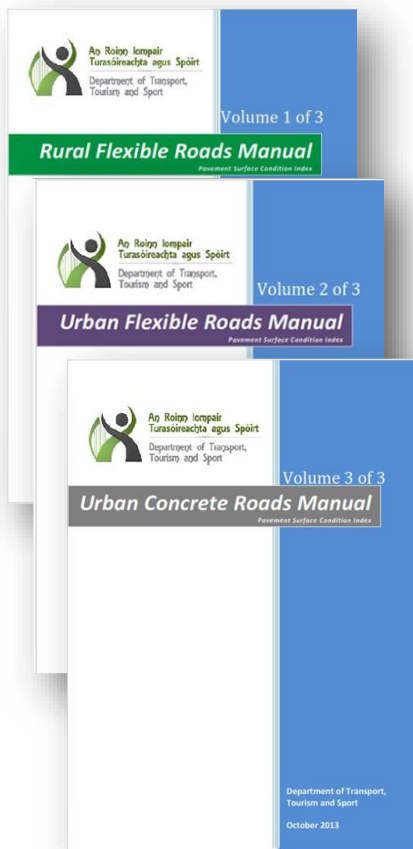
Table 1: The PSCI Rating System

Overall PSCI Rating	Primary Rating Indicators*	Secondary Rating Indicators*
10	**No Visible Defects.**	Road surface in perfect condition.
9	**Minor Surface Defects[1].** Ravelling or Bleeding ≤10%.	Road surface in very good condition.
8	**Moderate Surface Defects[1].** Ravelling or Bleeding 10% to 30%.	Little or No Other defects.
7	**Extensive Surface Defects[1].** Ravelling or Bleeding ≥ 30%.	Little or No Other defects. Old surface with aged appearance.
6	**Moderate Other Pavement Defects[2].** Other Cracking ≤ 20%. Patching generally in Good condition. Surface Distortion requiring some reduction in speed.	Surface defects[1] may be present. No structural distress[3].
5	**Significant Other Pavement Defects[2].** Other Cracking ≥ 20%. Patching in Fair condition. Surface Distortion requiring reduction in speed.	Surface defects[1] may be present. Very localised structural distress[3] (< 5 m[2] or a few isolated potholes).
4	**Structural Distress[3] Present.** Rutting, Alligator Cracking or Poor Patching for 5% to 25%. Short lengths of Edge Breakup/Cracking. Frequent Potholes.	Other defects may be present.
3	**Significant Areas of Structural Distress[3].** Rutting, Alligator Cracking or Poor Patching for 25% to 50%. Continuous lengths with Edge Breakup/Cracking. More frequent Potholes.	Other defects may be present.
2	**Large Areas of Structural Distress[3].** Rutting, Alligator Cracking or Very Poor Patching for ≥ 50%. Severe Rutting (≥ 75mm). Extensive Very Poor Patching. Many Potholes.	Very difficult to drive on.
1	**Extensive Structural Distress[3].** Road Disintegration of surface. Pavement Failure. Many large and deep Potholes. Extensive Failed Patching.	Severe Deterioration. Virtually undriveable.

- 3 Manuals for varying Road Environments and Materials

- Two day training required in order to carry out PSCI Survey.

- 10-1 Colour Rating Index

Volume 1 of 3
Rural Flexible Roads Manual
Pavement Surface Condition Index

Volume 2 of 3
Urban Flexible Roads Manual
Pavement Surface Condition Index

Volume 3 of 3
Urban Concrete Roads Manual
Pavement Surface Condition Index

Department of Transport, Tourism and Sport
October 2013

An Roinn Iompair
Turasóireachta agus Spóirt
Department of Transport, Tourism and Sport

Pavement Surface Condition Index (PSCI) Analysis in MapRoad

Data imported and updated to MAPROAD PMS via PSCI App

Filter Mapped Data in MAPROAD PMS, By Columns. PSCI Rating, Road Class, Date etc.

Condition – Machine Survey Data Capture

Machine Surveys captured at a network level on the Regional roads and at a sample level on the Local roads including pre/post project surveys

Data is captured by a service provider and uploading into MAPROAD via a purpose built data importer

IRL (International roughness index)
RUT (Groove in Road)
LPV (Longitudinal Profile Variance)
MPD (Road Texture

SCRIM (Skid Resistance)

Condition – Machine Survey Data Analysis in MapRoad

Use the Mechanical Surveys Folder. Select a Layer to display the mechanical data parameter; SCRIM, IRI, etc

Point data displayed in the map

Data imported to MAPROAD PMS by Mechanical Survey Contractor using an upload facility

Condition – Machine, PSCI, Surface Data Analysis MapRoad Via a StripMap

Select a Route on the map and export a STRIPMAP report to display all survey data in a schedule against the chainage of the selection.

Condition - Benefits

- Monitor the condition of the Network

- Forecasting. Assess backlog of deficiencies

- Demonstrate return on investment i.e. Value Engineering

- Reporting, Analysis, Cause and Effect

Creating Projects – Annual Programmes of Works
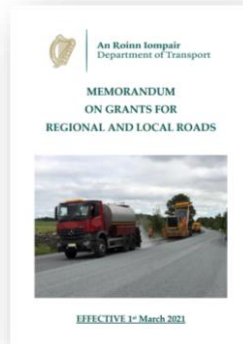
- Standardised process for grant funding (DOT)
- Method and specifications
- RMO promote compliance
- RMO record Metrics with LAs – DOT, NOAC
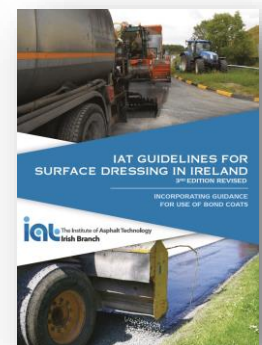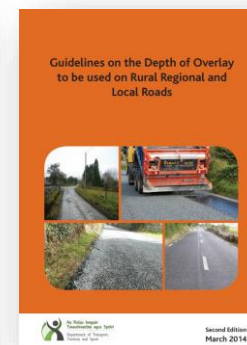
Create Projects – MapRoad System Process ensuring data quality

- The system guides the User to avoid wrong turns
- Programmes and Projects with have to meet specific criteria to progress through their Phases
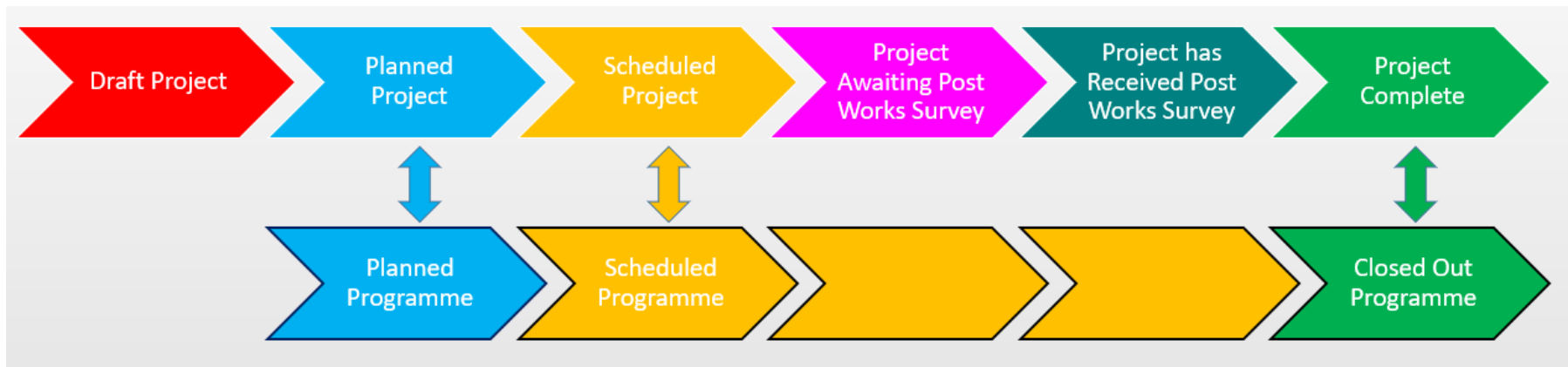
Criteria Required to enable a Project to progress Phases
Scheduled Project
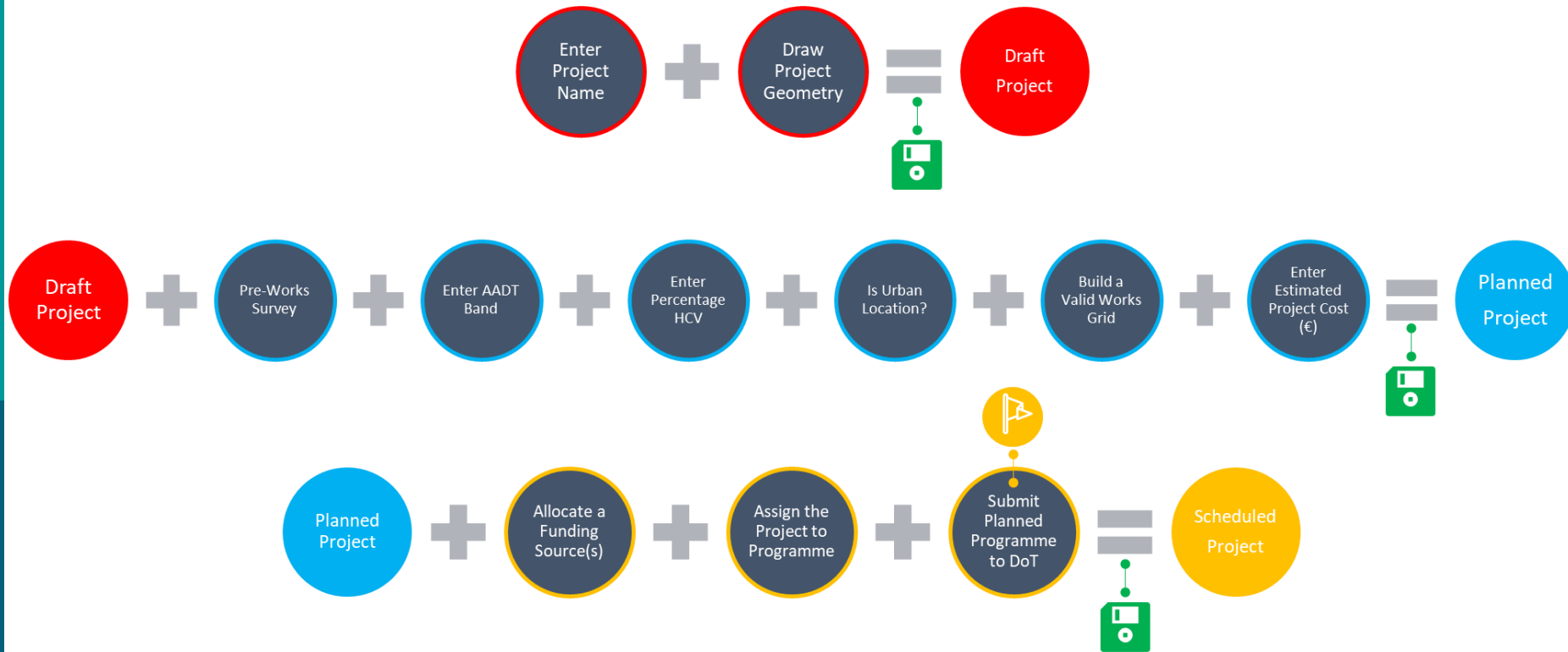
MAPROAD Pavements Project Form (Planned)

Capture of Construction Details
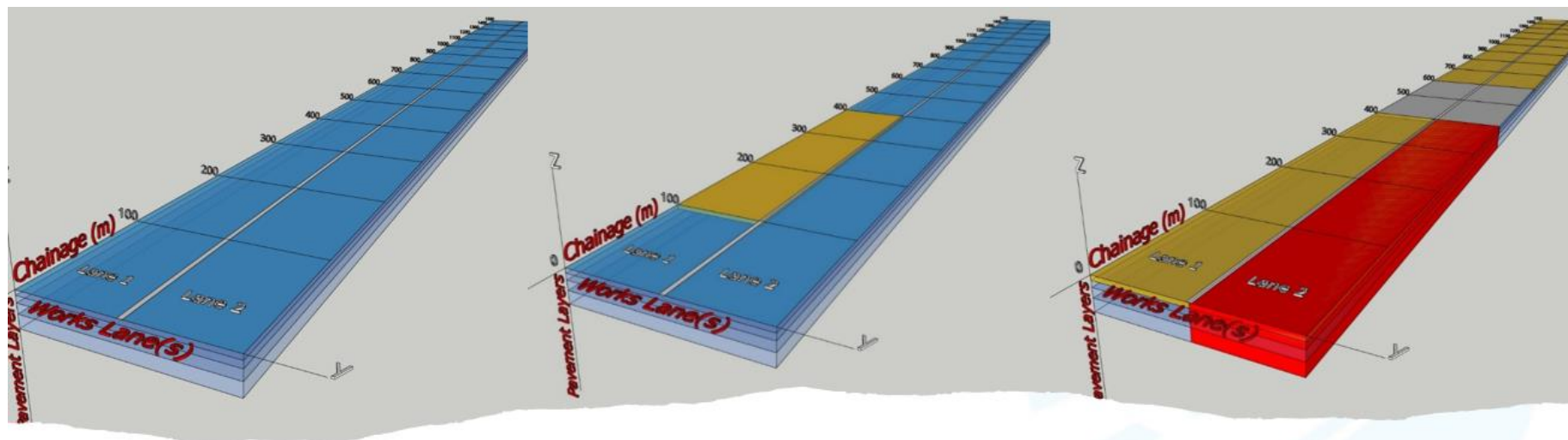
Projects now recorded across three Axis.

X - Chainage (m): Longitudinal distance in meters along road pavement. A Project can be transversely divided into a "Section" by setting a Chainage From and Chainage To.

Y - Lane(s): Transverse distance in meters across a road pavement. Works by lane can now be defined.

Z - Pavement Layers: Thickness in mm by road pavement layer. Pavement Layers can now be defined by any Section in any Lane.

Submission of Roads Programmes Year Start Inputs

- All projects for RI and RM/SRM are submitted to the DoT and managed through MAPROAD in line with DoT circulars

- Form B is a Excel List of Programme/Project Details and is exported and emailed to DoT via MAPROAD on submission of that Programme. At this stage Submission is of the Planned Programmes/Projects

An Roinn Iompair
Department of Transport

**MEMORANDUM
ON GRANTS FOR
REGIONAL AND LOCAL ROADS**

EFFECTIVE 1st March 2021

Pavements Project Form Complete

Complete Projects on MAPROAD PMS
- Set Project Phase as Complete after all Project Criteria have be met
- Output Returns i.e. Complete projects and subsequent RI & RM programmes to be submitted to the DoT by 31st Dec annually

Reporting – Form A (Regional & Local Roads Investment Programme Outputs)

As part of the ongoing monitoring of the regional and local roads investment programme. The Department of Transport requires all LA's complete and return Form A in relation to outputs year on year.

2021 Grant Allocations.
Restoration Improvement **(RI)** €260m
Restoration Maintenance **(RM)** €42m
Supplementary Restoration Maintenance **(SRM)** €30m
Discretionary Grant **(DG)** €84.4m
Drainage Grant **(DR)** €20m
Community Involvement Scheme **(CIS)** €15.6m
Specific Improvement Grant **(SG)** €16.6m
Strategic Regional and Local Road Grant Projects **(SRLR)** €24.3m
Climate Change Adaptation and Resilience **(CCAR)** €22.4m
Former National Roads **(FN)** €8.1m

2021 Own Resources **(OR)** € XX m

Regional & Local Roads Investment Programme
FORM A: Programme of Works Completed (Outputs) for 2019
LocalAuthority: -

Restoration Improvement Grant (RI)
2019 Outputs Achieved

Restoration Improvement Grant (RI)		
2019 Outputs Achieved		
2019 Actual Grant Expenditure on RI Works	no.	
Total Number of Improvement Schemes	no.	
Sum total of project lengths	m	
Sum total of project areas	sq.m	

Reporting - Process Outputs

Asset Maintained

7000+ Projects recorded yearly on MAPROAD PMS
(80,000+ @ €2.1B total)

Data Sharing

Local Authority Monthly Reports

NOAC Local Authority Performance Indicator Report

Reporting - Process Outputs

Developing Inspection Apps to display data from
MAPROAD to ESRI portals.

Reporting - Process Outputs

Number of road openings licensed Nationally in 2021 (bar chart): NP 821, NS 1,694, R 11,488, LP 15,213, LS 16,101, LT 17,893

RMO — An Oifig um Bainistiú Bóithre, Road Management Office map
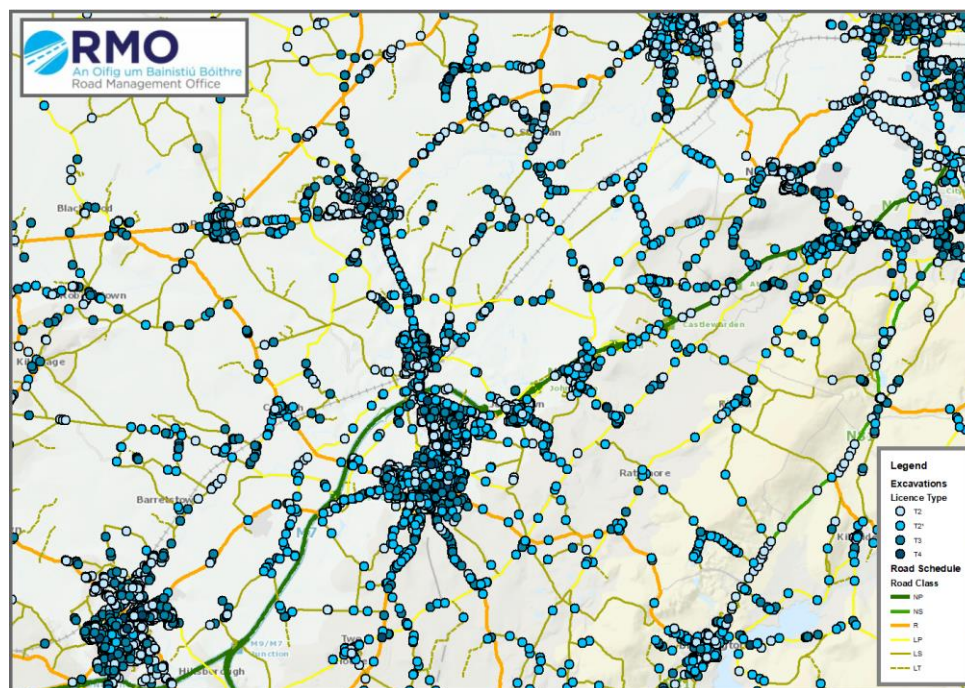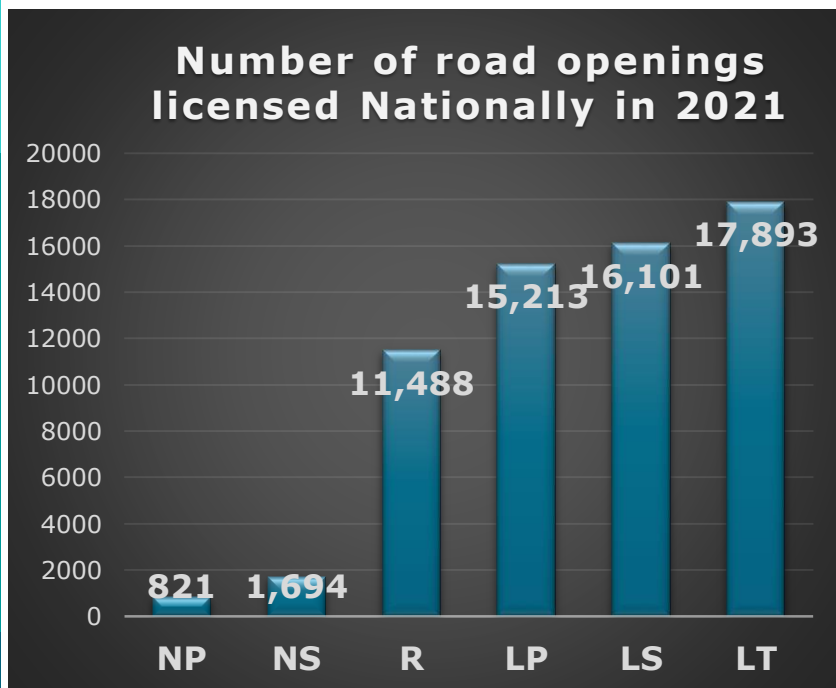
- 8 years of spatial data from MRL can now be associated with the road network
- Ongoing integration of data will define Long Term Impacts of Road Openings
- New MRL functionality requires association of all openings with a segment
- All authorities should ensure a licence inspection process is in place to promote compliance with the guidelines and minimise impact.
- Development of an MRL inspection App is currently in progress

Reporting - Process Outputs

Statistics – Pavement Management
Resealing 2015 - 2021

Road Class	Typical width (m)	Expenditure	Length Treated (km)	% of network	Average per year (%)
R	7.53	€80,774,110	2476	19%	2.6%
LP	4.75	€109,004,114	5153	22%	3.1%
LS	3.75	€106,822,909	6007	18%	2.5%
LT	3.25	€36,541,142	2208	9%	1.2%
Other	-	€555,252	5.4	-	
Total		€333,697,529	15,851	16%	2.2%

Reporting - Process Outputs

Statistics – Pavement Management Strengthening 2015 - 2021

Road Class	Typical width (m)	Expenditure	Length Treated (km)	% of network	Average per year (%)
R	7.53	€506,808557	2954	22%	3.2%
LP	4.75	€481,636640	5463	23%	3.3%
LS	3.75	€443,755235	6973	21%	3.0%
LT	3.25	€212,430498	3170	12%	1.8%
Other	-	€15,757,728	28	-	
Total		€1,660,388,660		18%	2.6%

Reporting – 2021 Intervention Outputs

- 6334 projects
- 6,200km of pavement interventions on NNR
- €400M spent

€77m   **3407 km**
Resealed

€174m   **1838 km**
Surface Restoration

€134m   **864 km**
Structural Rehabilitation

€13m   **93 km**
Road Reconstruction

| Overall Rating	Treatment Measures	Surface	Structure
10	Routine Maintenance		Excellent
9			Very Good
8	Resealing & Restoration of Skid Resistance	Fair	Good
7		Poor	
6	Surface Restoration – Carry out localised repairs and treat with surface treatment or thin overlay.	Fair	Fair
5		Poor	
4	Structural Overlay - Required to strengthen road. Localised patching and repairs required prior to overlay.		Poor Overall
3			
2	Road Reconstruction - Needs full depth reconstruction with extensive base repair.		Very Poor Overall
1			Failed Overall

Reporting – 2021 Materials Outputs

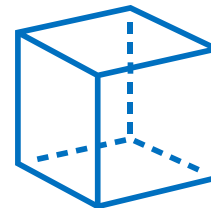## 1.3 million metres cubed of road material laid in 2021
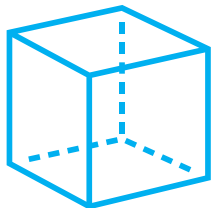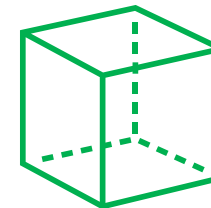

Surface
122,000 m³
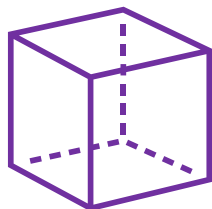
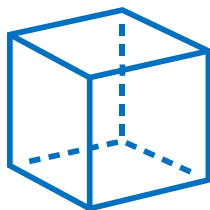**Binder**
422,500 m³
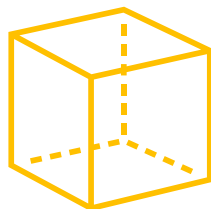
Base Course
125,000 m³
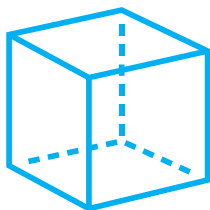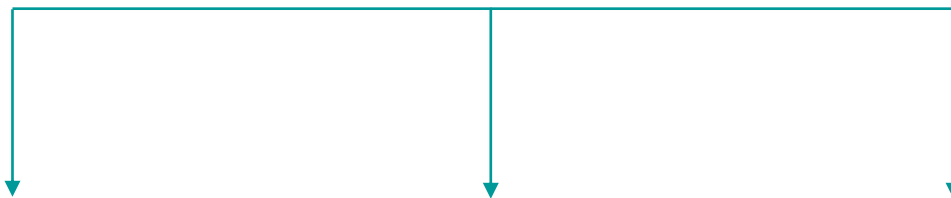
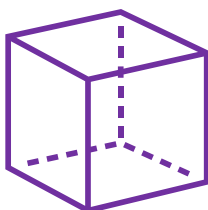**Sub Base**
631,000 m³

Capping Material
7,200 m³

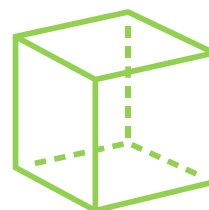# Reporting – 2021 Materials By Designation Outputs

Sub Base
631,000 m³

**Type C
Cl. 804
423,800 m³
67%**

**Type D – Wet
Mix Cl. 806
189,600 m³
30%**

**Recycled
Material
14,650 m³
0.02%**

MapRoad Future Development Modules

- Circular Economy
- Carbon calculator
- Alternative materials

MapRoad Future Development Modules

- Currently scoping and designing future modules within MapRoad in areas of
  - Active Travel Pedestrian and Cycling Infrastructure
  - Drainage
  - Climate Adaptation
  - Capturing TII National Projects

Drainage

Active Travel

Thank You