The Institute of Asphalt Technology
Irish Branch

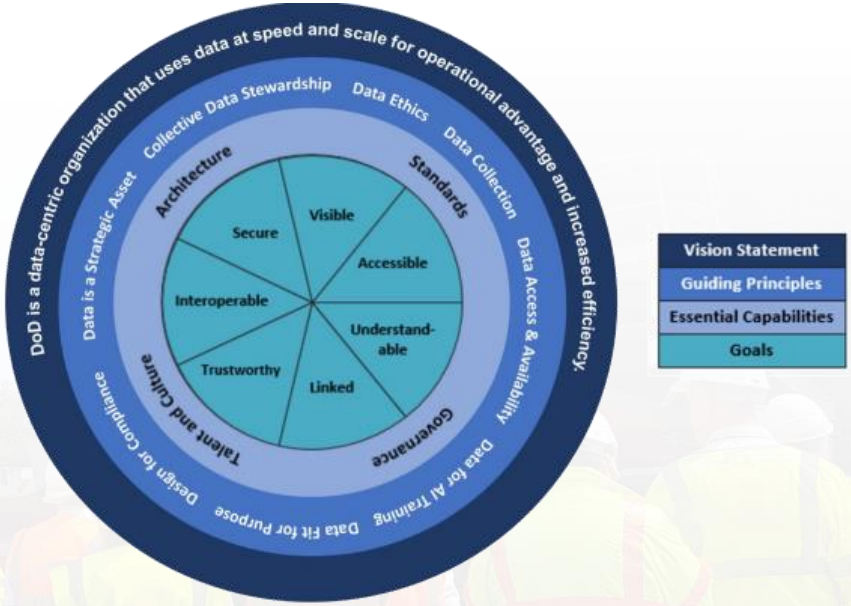
Pavement Data Management and Reporting

RMO
An Oifig um Bainistiú Bóithre
Road Management Office

Stephen Flynn

Data

- Decision making is enhanced and more effective through access to timely (and secure) data.
- Data can provide a fair and accurate representation of operations and management.
- Increasingly data is seen as a strategic asset similar to traditional strategic assets such as personnel, equipment, supply chains etc.



U.S. Department *of* Defense

Data

- Data is a high-interest commodity and must be leveraged in a way that brings both immediate and lasting advantage.
- As an organisation shifts to managing data as a critical part of overall mission, it gains distinct, strategic advantages.
- These advantages will be reflected in more rapid, better-informed decisions through the use of trustworthy and integrated data.

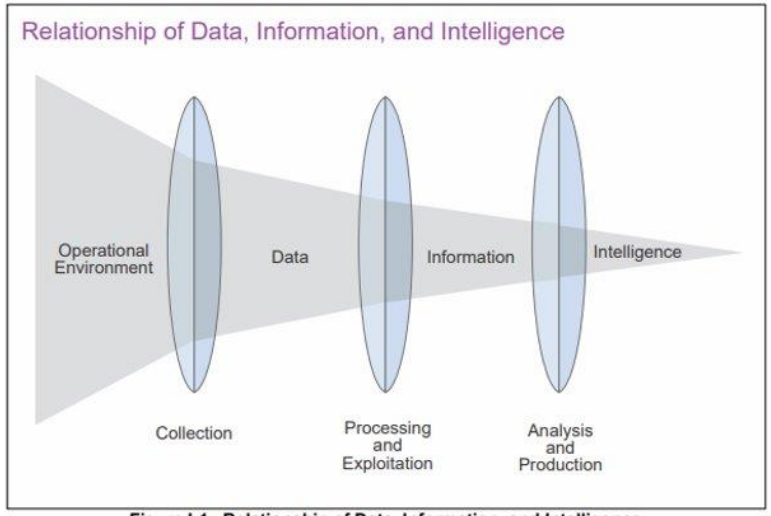
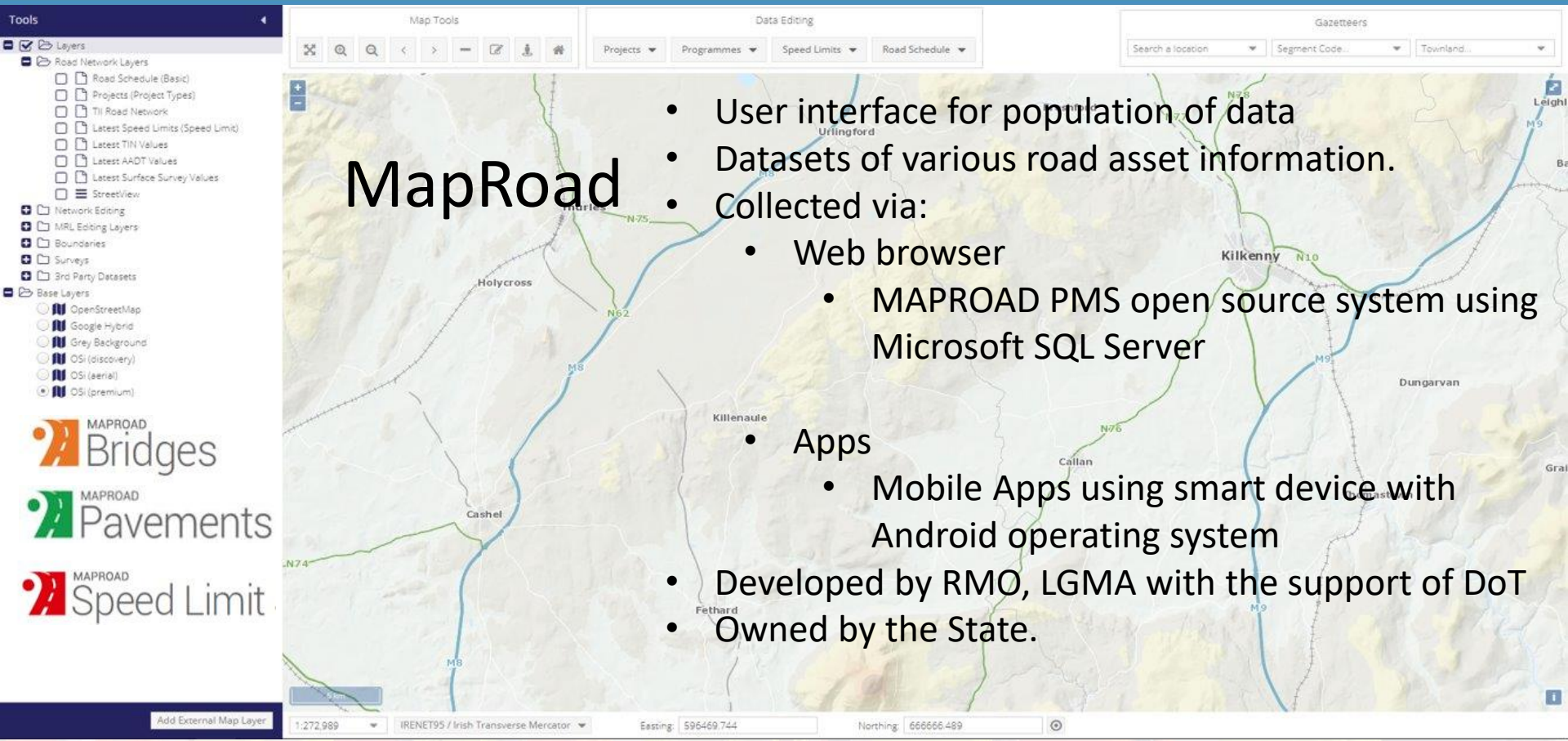


Figure I-1. Relationship of Data, Information, and Intelligence

U.S. Department *of* Defense

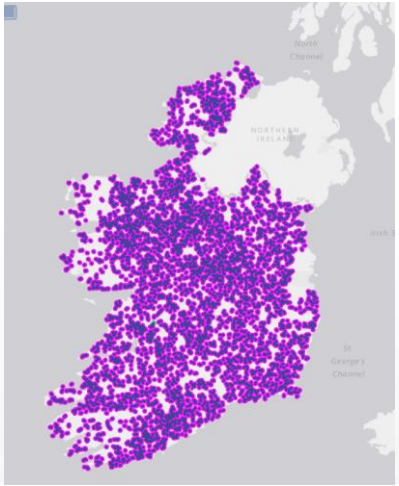


MapRoad

- 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 Projects

- C.20 fields of user input per project
  - Costs, materials, designation, depths, lanes, estimated traffic, dates, names etc.
- C. 10 measured parameters
  - funding, rates, length, PSCI, Machine data etc
- C. 10 calculated fields
  - Rates, Intervention, treatment, stages, project references
- C. 8000 projects annually
- 320000 records +



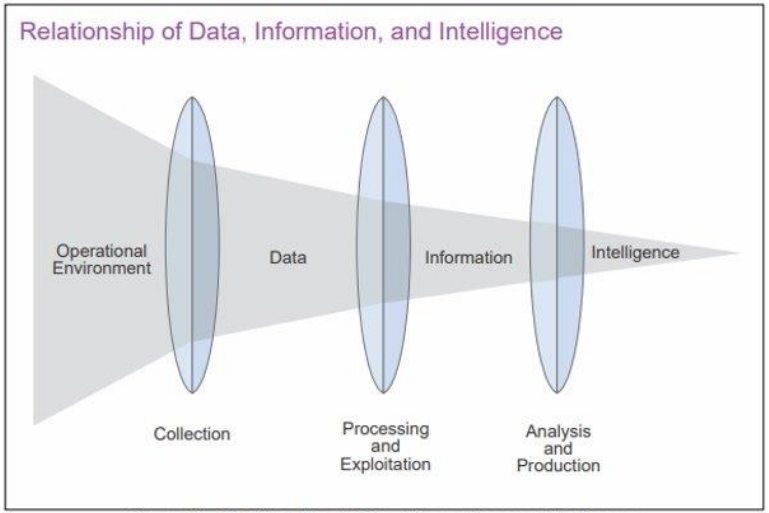


Figure I-1. Relationship of Data, Information, and Intelligence

Layer Tree

Map Tools

Data Editing

Speed Limits | Surveys | Road Schedule | Bridges

Gazetteers

Search for a location | Segment Code... | Townland

Pavement Project (Regional and Local Road): R505 Cross of the Bog towards Doon

General | Works | Expenditure | Benchmarks | Chronology | Files | Validation | Geometry

Mapped/Site Summary

Project Length: 1,299 m | Measured Pavement Width: Unrecorded | Road Schedule Width: 6.60 m

Works Summary

Project Works Length: 1,299 m | Project Average Works Width: 6.50 m | Project Works Area: 8,444 m2

Project Notes

Works Grid

Add Section | Expand All | Collapse All | View Options

Section	Length (m)	Section Width (m)	No. of Lane(s)
0 m - 1299 m	1,299	6.50	2

Layer	Material	Designation	Thickness	Chip Size	Works By	Contractor
All Lanes Width: **6.50 m** Construction Method: **Inlay** Intervention: **Structural Rehabilitation**						
Surface Course	Surface Dre...	Seal & Singl...	0	2/6 (Pre-tr...	LA	
Binder Course	Asphalt Co...	AC 20 dens...	60		Contractor	
Base			0			
Geosynthetics	Metal Geog...	Woven wire...	0		Contractor	
Sub base	Unbound	Granular M...	150		Contractor	
Capping			0			
			210 mm			

Delete | Strip Map | Zoom | Refresh | Save | Cancel

BALLYCOSHOWN

DARKISLAND

Ch. 0m

Ch. 1299m

COOGA LOWER

Google Street View Image Date: 2022-07

View on Google Maps

Google

Keyboard shortcuts | © 2023 Google | Terms of Use | Report a problem

Add External Map Layer | Add ArcGIS REST Layer

Search for layers

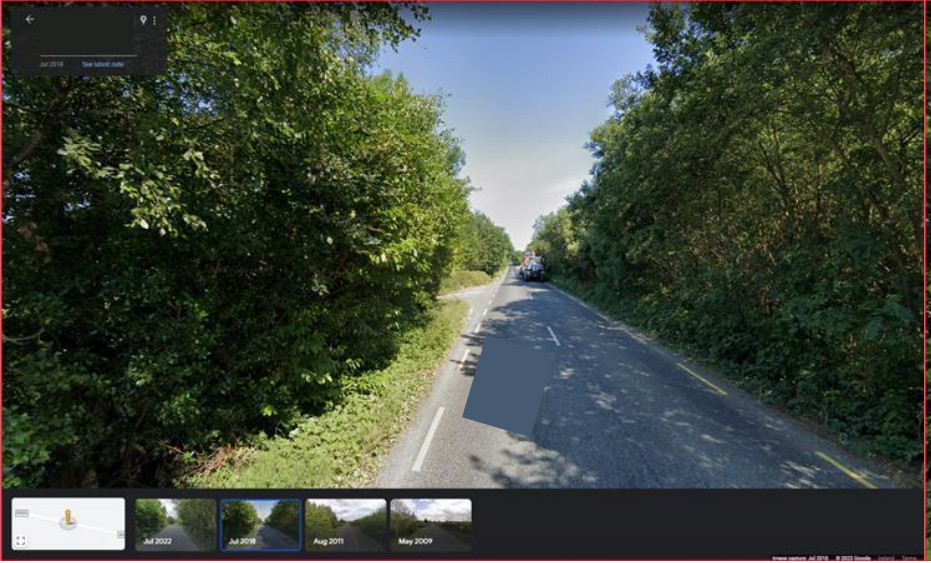
Show visible only

Projects

PULLAGH

1:19,008 | IRENET95 / Irish Transverse Mercator | Easting: 579055.577 | Northing: 650975.412

Logout



Works Grid

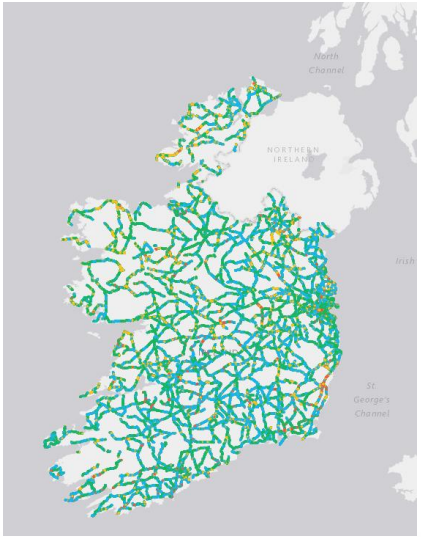
Add Section | Expand All | Collapse All | View Options

Section	Length (m)	Section Width (m)	No. of Lane(s)
0 m - 1299 m	1,299	6.50	2

Layer	Material	Designation	Thickness	Chip Size	Works By	Contractor	Length (m)	Width (m)	Area (m2)	Unit Cost (€/m2)	Volume (m3)	Unit Cost (€/m3)	Cost (€)
All Lanes Width: **6.50 m** Construction Method: **Inlay** Intervention: **Structural Rehabilitation**													
Surface Course	Surface Dressing	Seal & Single SD	0	2/6 (Pre-tr...	LA		1299.00	6.5	8,444				
Binder Course	Asphalt Concrete	AC 20 dense bin 40/60 des	60		Contractor		1299.00	6.5	8,444				
Base			0				1299.00	6.5	8,444				
Geosynthetics	Metal Geogrid	Woven wire mesh	0		Contractor		1299.00	6.5	8,444				
Sub base	Unbound	Granular Material Type B - Clause 804	150		Contractor		1299.00	6.5	8,444				
Capping			0				1299.00	6.5	8,444				
			210 mm										

MapRoad Surveys

- PSCI
  - C. 3.5M records since 2011
- Machine Data
  - 475,000 scrim records
  - 600,000 rut/ IRI records
  - C. 300,000 images



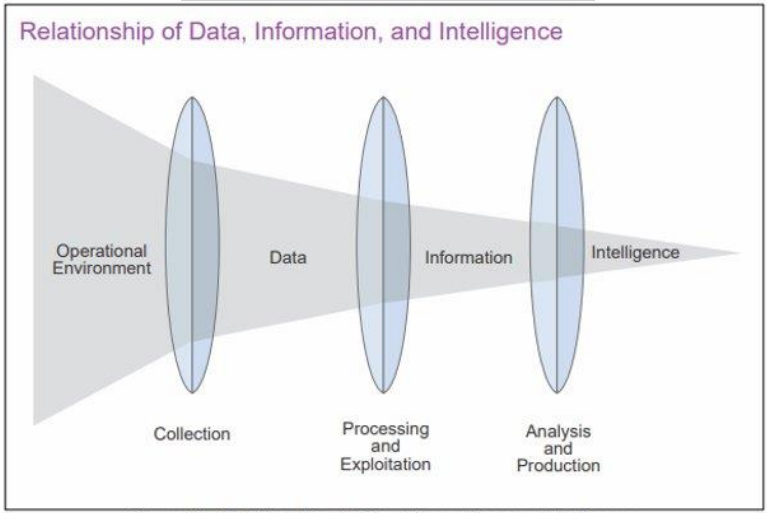
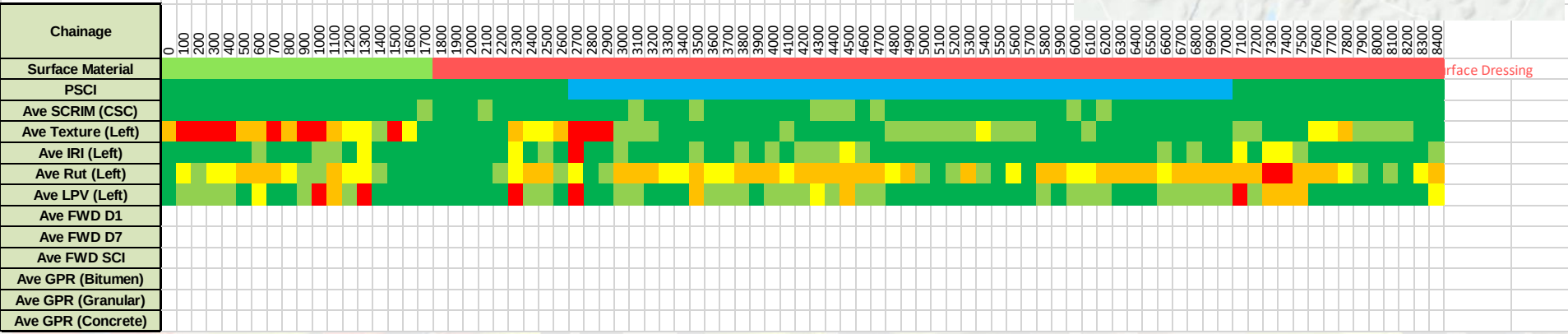


Figure I-1. Relationship of Data, Information, and Intelligence

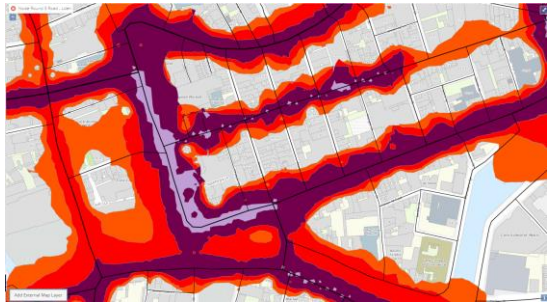
MapRoad Surveys

Total Length:	8485	m
Road Segments:	R-207-6,R-207-7,R-207-8,R	



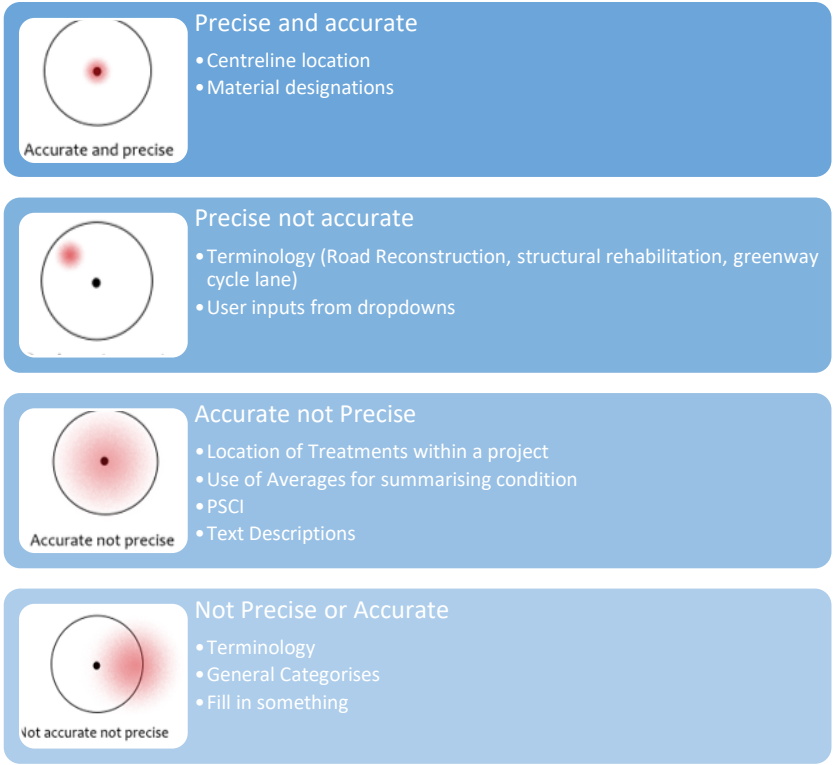
MapRoad Other Datasets

- Active Travel Infrastructure
- Collisions (partial data set)
- Traffic impact
- Roadworks
- EPA layers
- MapMaker Data (2023)



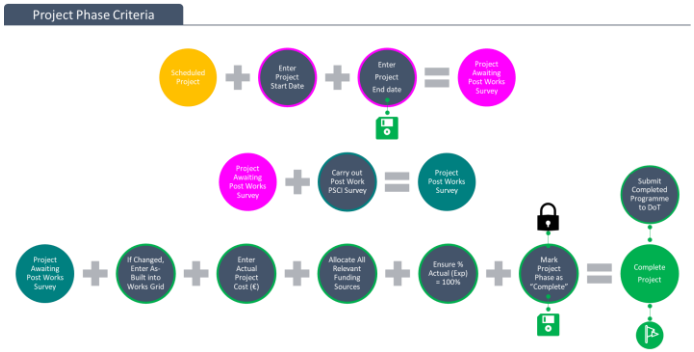
Data

- Data can be collected by machine or by user inputs or calculated based on user inputs
- Quality can vary
  - Precision and accuracy
    - User inputs
    - Mapping and systems
    - aggregation
  - Standards (or lack of)
  - Not a core business function



MapRoad Improving Accuracy and Precision

- Adding Processes
- Adding Warnings
- Quality Checking and Validation
- Use of Calculated Fields
- Feedback from and to users



Warning Level	Description
	The 'Construction End Date' on the 'General' tab needs to be set to move to the Awaiting Post-Works Survey phase
	Post-Works PSCI Survey not complete
	Input Actual project cost
	Contractor name is missing in one or more Works Section Details
	Input End Date

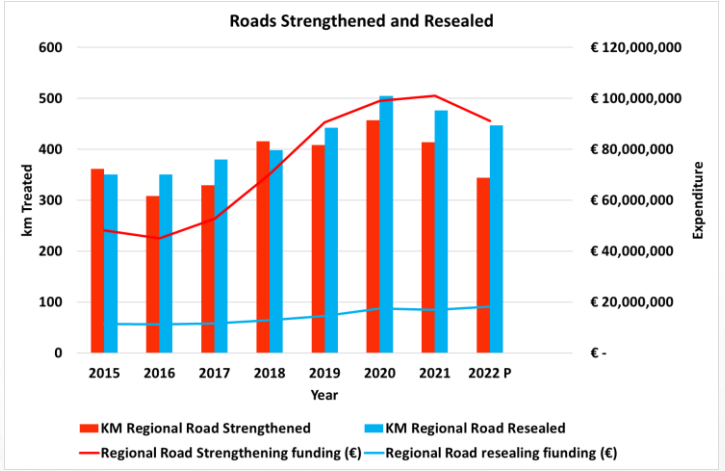
Construction Method	Material Grouping	Thickness / Size (mm)	Intervention	Treatment	Intervention Code
At Grade	Bound	0	Routine Maintenance	Maintenance	RM
At Grade	Bound	0	Resealing(RSR)	Resealing	RS
Inlay or Overlay	Bound	>0 <=70mm	Surface Restoration	Strengthened	SR
Inlay or Overlay	Bound & Semi-Bound	>0 <=100mm	Surface Restoration	Strengthened	SR
Inlay or Overlay	Bound & Unbound	>0 <=150mm	Surface Restoration	Strengthened	SR
Inlay or Overlay	Bound	>70mm <=250mm	Structural Rehabilitation	Strengthened	STR
Inlay or Overlay	Bound & Semi-Bound	>100mm <=250mm	Structural Rehabilitation	Strengthened	STR
Inlay or Overlay	Bound & Unbound	> 150mm <=250mm	Structural Rehabilitation	Strengthened	STR
Inlay or Overlay	Bound, Semi-Bound, Unbound	>250mm	Road Reconstruction	Strengthened	RR

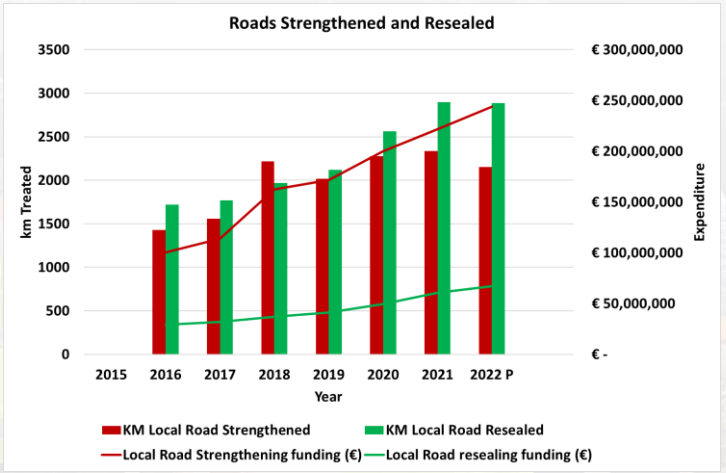
Some Outputs

Expenditure and Treatments

- RMO has gathered high level output data on behalf of authorities for NOAC since 2015.
- Expenditure on roadway pavement rehabilitation has increased from €186M to €420M
- Length of road treated has increased from 3800km to over 6100km

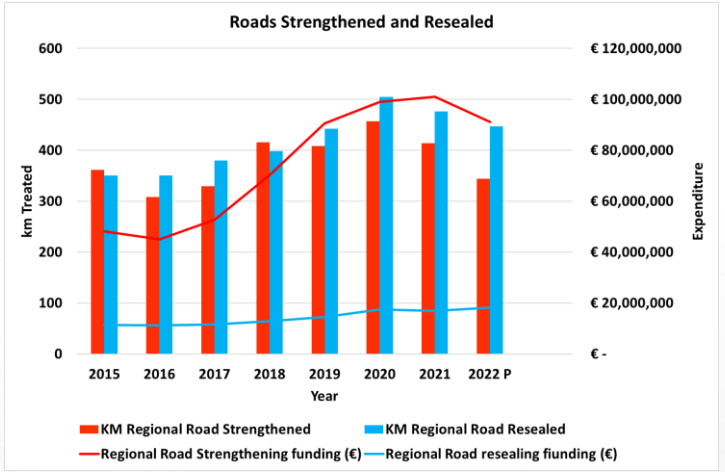
- 2022 figures are provisional

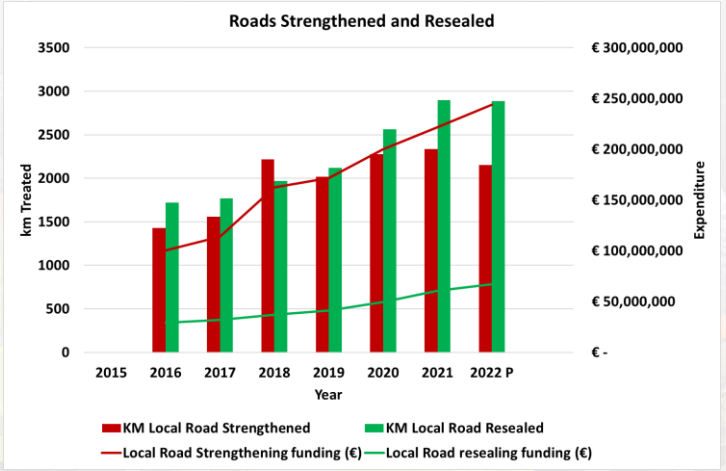




Expenditure and Treatments

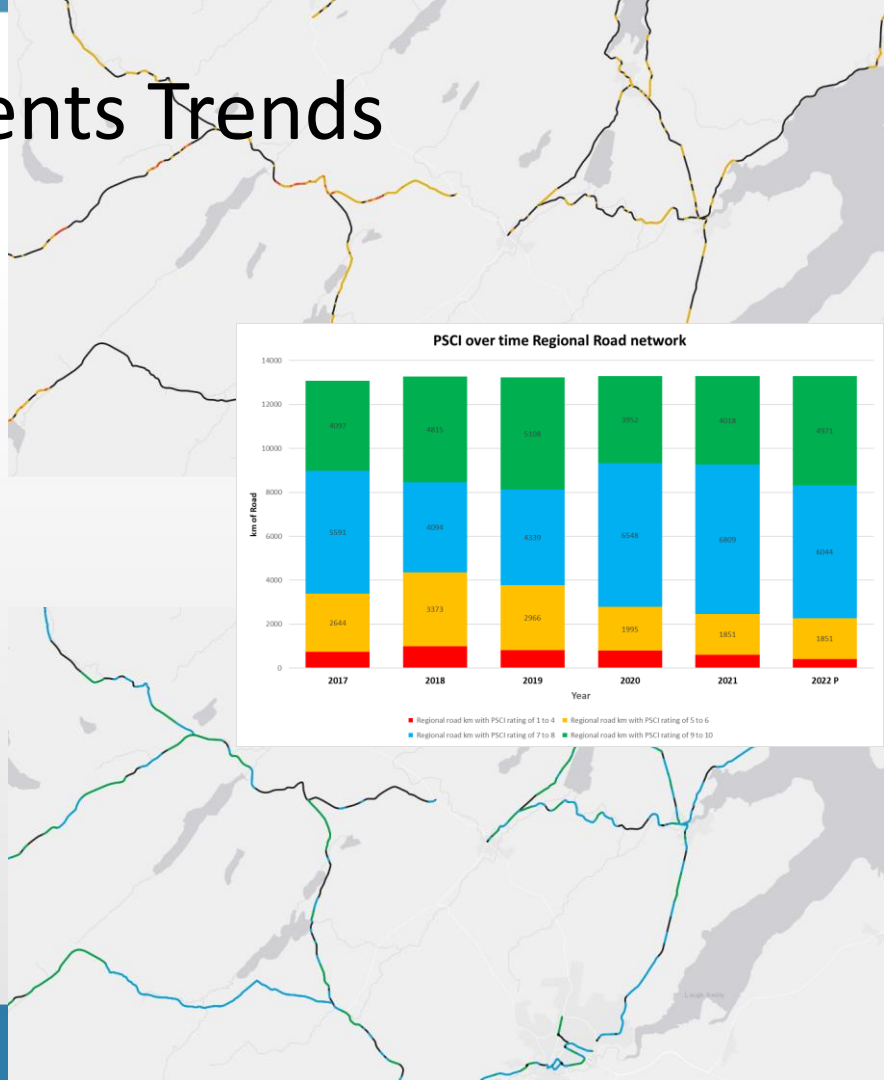
- For Regional Roads
  - between 2.3% and 3.4% strengthened annually
  - between 2.6 & 3.8% resealed annually
  - variability between authorities
- For Local Roads
  - between 1.7% and 2.8% strengthened annually
  - between 2.1% & 3.5% resealed annually
  - variability between classes and authorities
- Inflation has had an impact but not the full story.





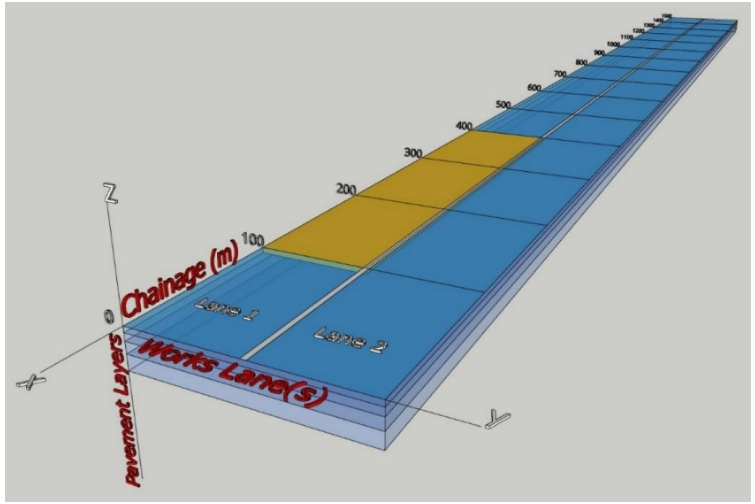
Expenditure and Treatments Trends

- Regional Road network has improved overall
- A level of self assessed KPIs could be in place
- Better selection of routes to be treated
- Treatments have changed
  - Asphalts vs unbound
- Cost of strengthening has increased
- Influence of data availability



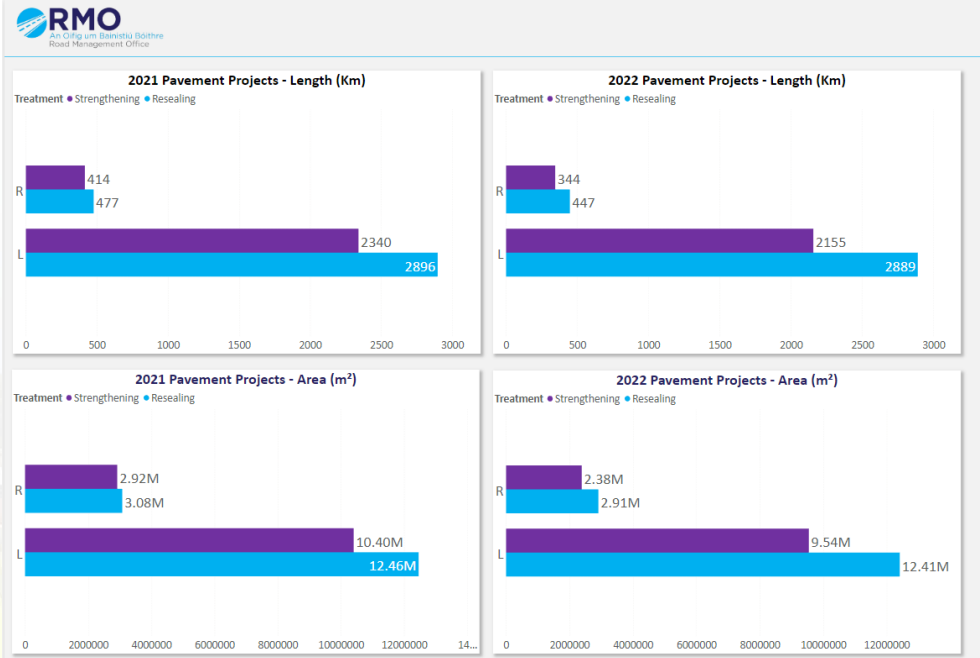
MapRoad

- MapRoad 5.0 introduced in 2020 created a more detailed methodology for recording treatments
- Areas courses, depths and designations of materials can be prescribed more accurately and precisely.
- Tools like Power BI allow analytics at national level drillable to MD level or route / project level.



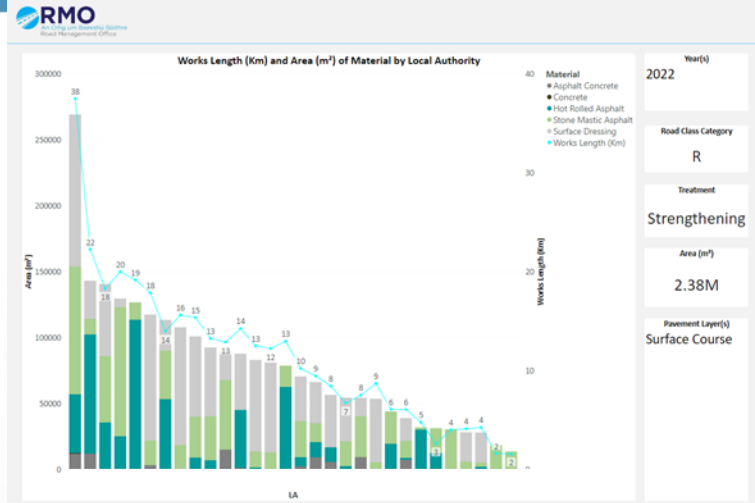
Local & Regional Roads 2021 & 2022

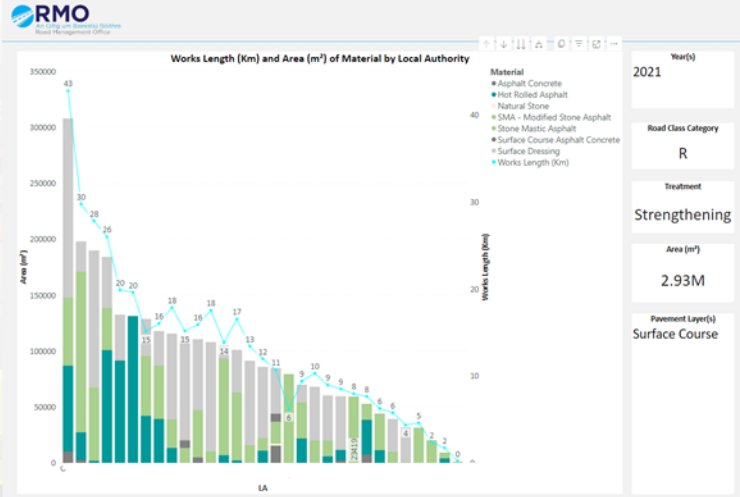
- 758km of Regional road strengthened in 2021/2022
- 924km of Regional road resealed in 2021/2022
- 4495km of local road strengthened in 2021/2022
- 5785km of local road resealed in 2021/2022
- Over 53,000,000 m2 of surfacing
- 2,240,000m3 of materials used in strengthening



Surface Course in Strengthening **Regional** Roads

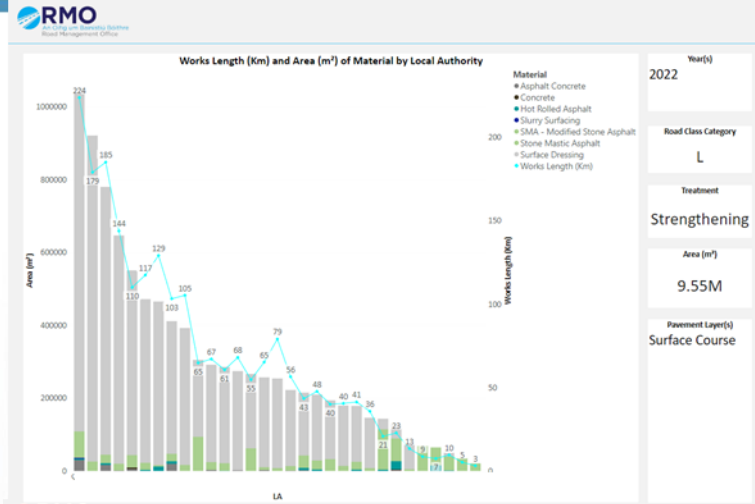
- Majority Surface Course used in strengthening is surface dressing however Asphalts are dominant in many authorities and increasingly so.

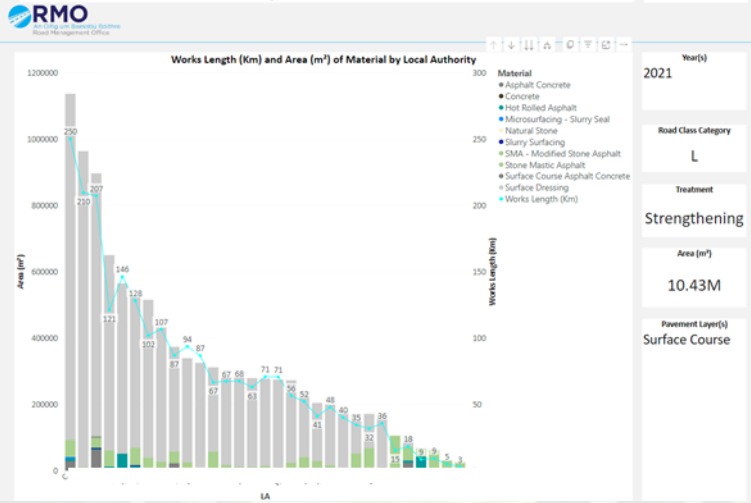




Surface Course in Strengthening **Local** Roads

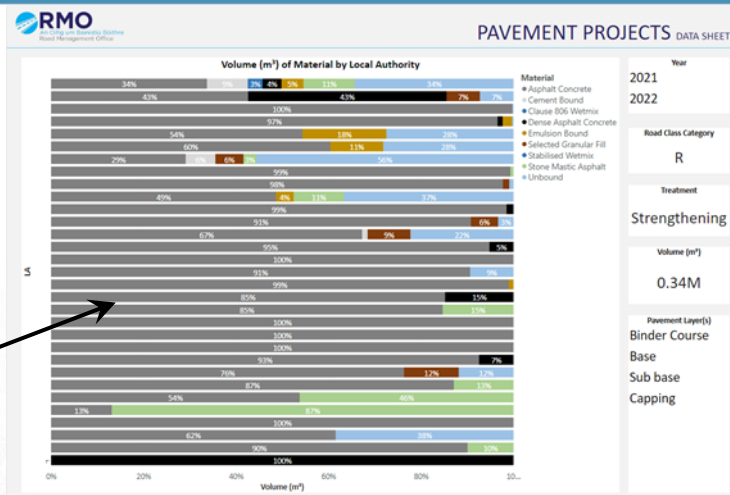
- Majority Surface Course used in strengthening is surface dressing outside urban authorities

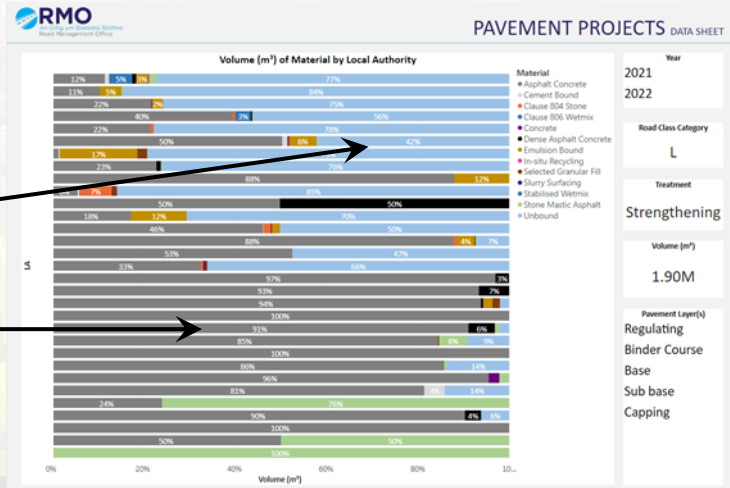




Strengthening Materials

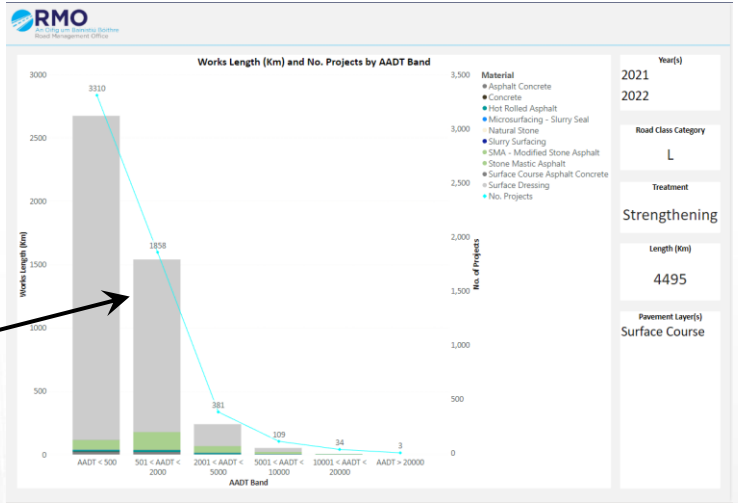
- On **regional roads** the majority of strengthening treatments involve the use of asphalts.
  - There remains a significant number of projects that use unbound materials only
- For **local roads** the majority of strengthening is carried out using unbound materials however an increasing number of rural authorities use asphalts

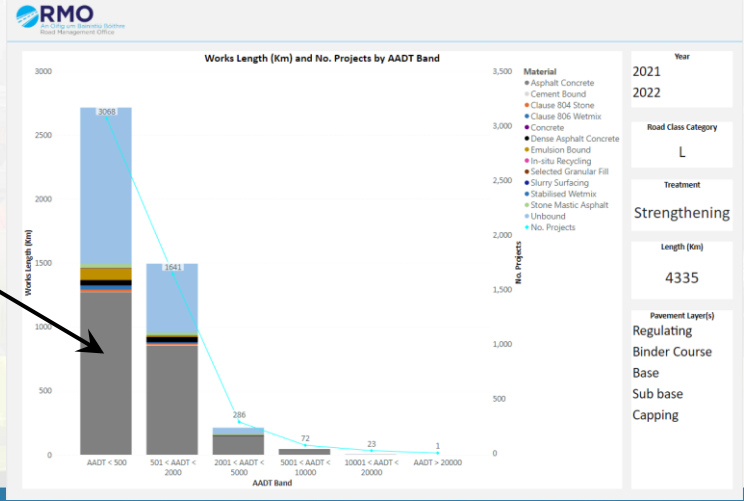




Treatment of **Local Roads** by estimated traffic count

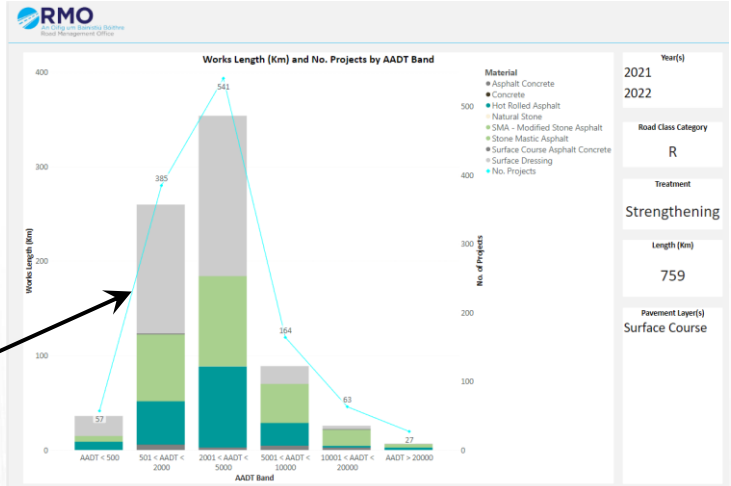
- Generally Local Roads are low volume (< 500 AADT)
- Surface Treatment is over 90% surface dressing
- Strengthening Materials are increasingly Asphalts.
  - Typical depth of material 60mm
- Unbound material still on some projects at significant AADT
  - Typical depth of unbound material 150mm

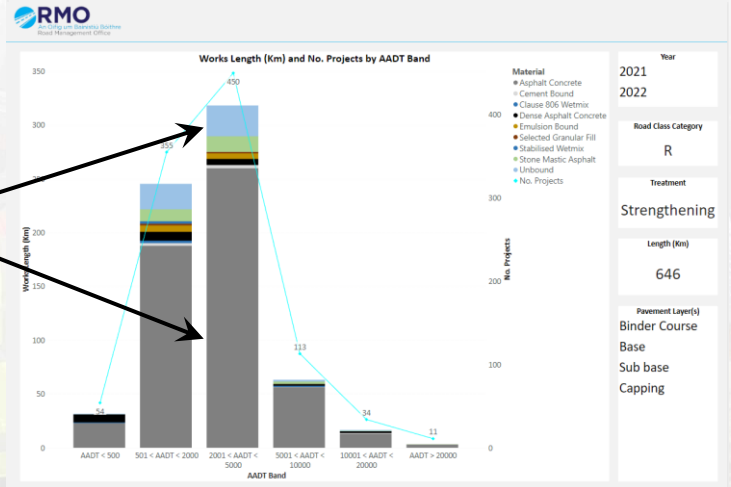




Treatment of **Regional Roads** by estimated traffic count

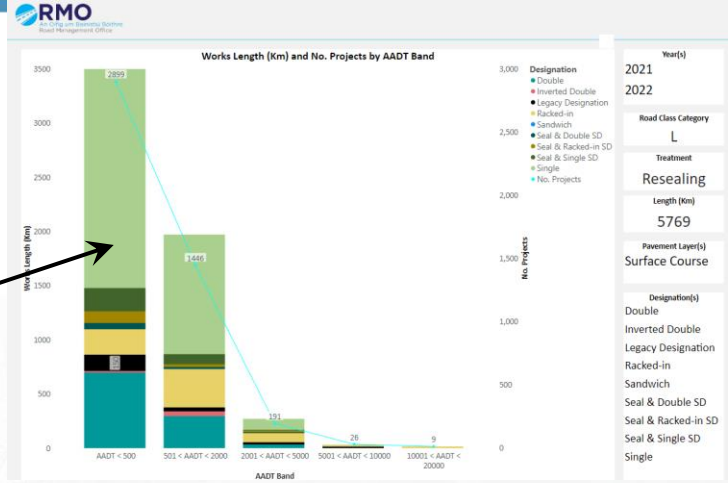
- Typically Regional Roads are c. 2000 AADT
- Surface Course varies Surface Dressing, HRA, SMA
- Strengthening Materials are increasing Asphalts.
  - Typical depth of material 60mm
- Unbound material still on some projects at significant AADT
  - Typical depth of unbound material 150mm

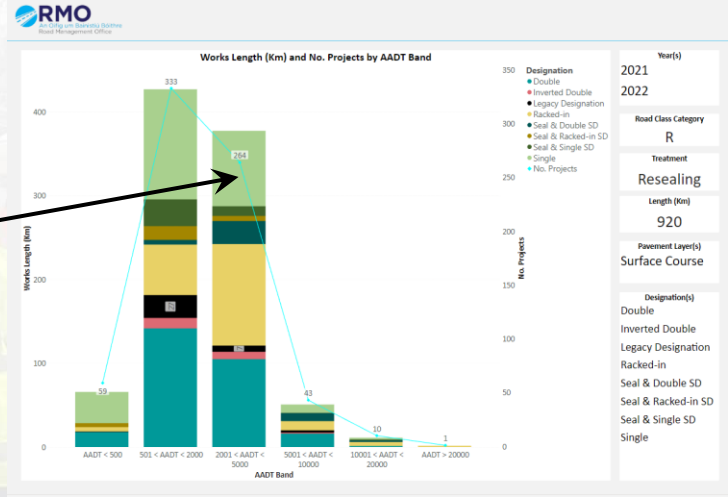




Surface Dressing Designation on **Resealed Roads** by estimated traffic count

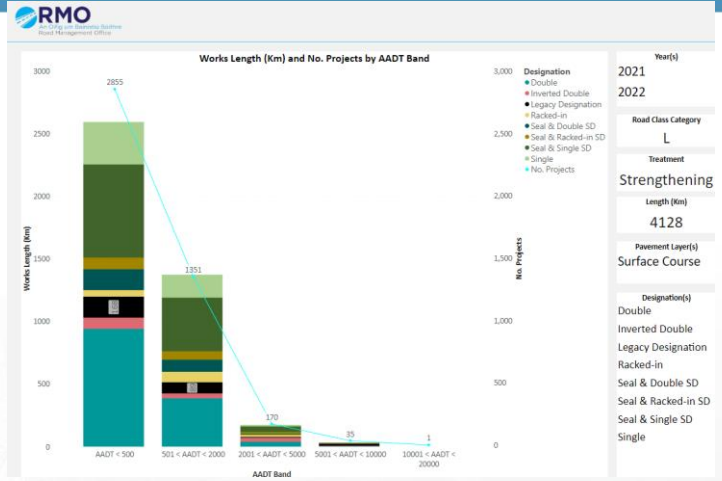
- Dominant designation is single surface dressing on local roads up to 2000 AADT with some Double Surface dressing and Racked in.
- On regional roads single surface dressing is also significant including above 2000 AADT.
- Further work need with users to clarify these statistics

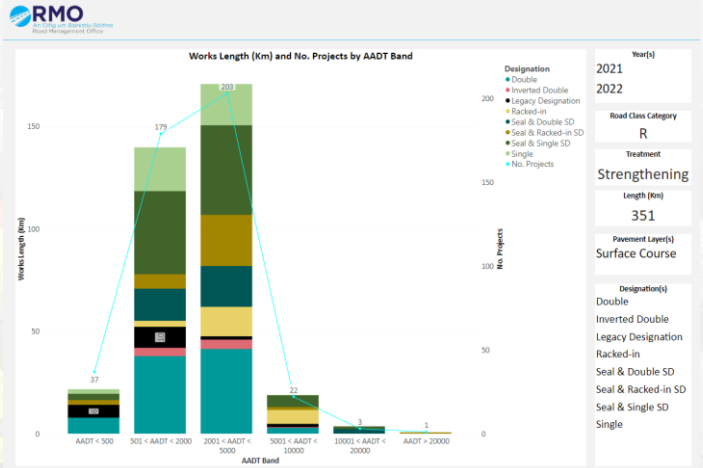




Surface Dressing Designation on **Strengthened Roads** by estimated traffic count

- Dominant designation is seal an single surface dress or double surface dress.
- Seal and racked in an seal and double surface dressing also.
- Significant single dressing





Treatment of Roads related to pre-works PSCI

- Resealing treatment well aligned in the majority of cases with pre-works PSCI
- Similarly with Strengthening PSCI before is well aligned with condition
- Some condition rating is legacy.

Some Reflections

Reflections

- Many common approaches to treatment across authorities
  - Some practices that need further investigation and clarification
- Treatment methods have changed over last 10 years
  - Asphalts increasing in use.
- Further development of validations and feedback from users will make the system more accurate and precise

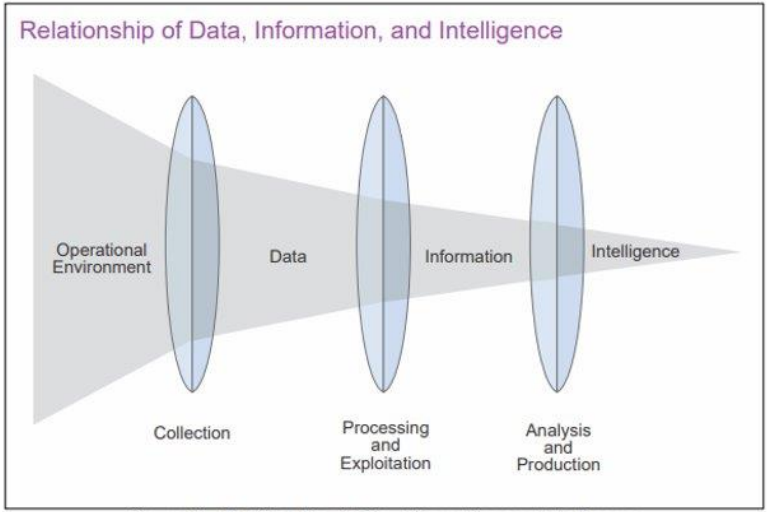


Figure I-1. Relationship of Data, Information, and Intelligence

Reflections

- Developing intervention levels could assist in guiding users in treatment selection
- Data allows assessment of backlog calculations and forecasting for expenditure
- Data improves transparency for the public in decision making

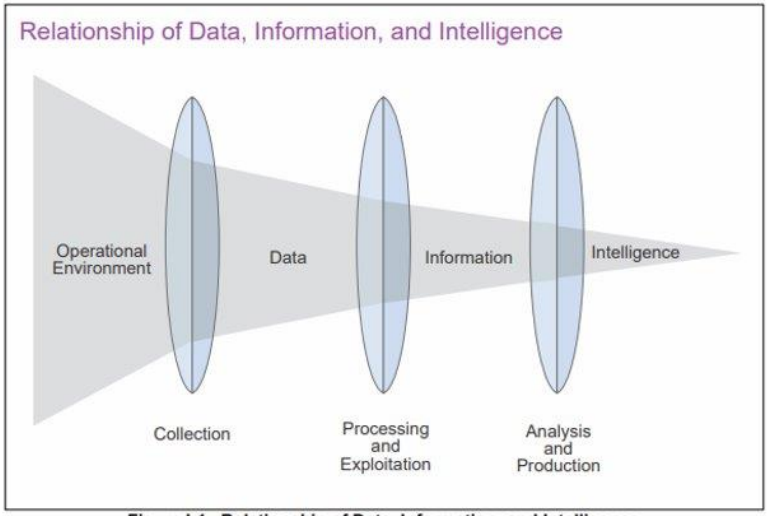


Figure I-1. Relationship of Data, Information, and Intelligence

The Institute of Asphalt Technology
Irish Branch

Reflections

- Over 1.05M m3 of material laid in 2022.
- 480,000m3 of Asphalts over 1475km of projects – 66,000 lorry loads
- 570,000m3 of unbound materials over 955km of projects -71000 lorry loads
- Are these the correct treatments for our objectives
  - Climate Action / Circular Economy / Level of Service

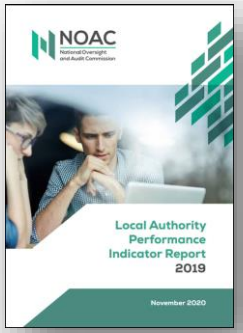
The Institute of Asphalt Technology
Irish Branch

Asset Maintained

MAPROAD Pavements

8000+ Projects recorded yearly on MAPROAD AMS (80,000+ @ €2.1B total)

Local Authority Monthly Reports



NOAC Local Authority Performance Indicator Report

The Institute of Asphalt Technology
Irish Branch

Thank you

(just remember its data not data)

RMO
An Oifig um Bainistiú Bóithre
Road Management Office