

Session : 2 Delivering Value Through Data-Driven Pavement Maintenance

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Delivering Value Through Data-Driven Pavement Maintenance



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 - Investment need, Data Gathering, Intervention Hierarchy
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8. Video - 1min



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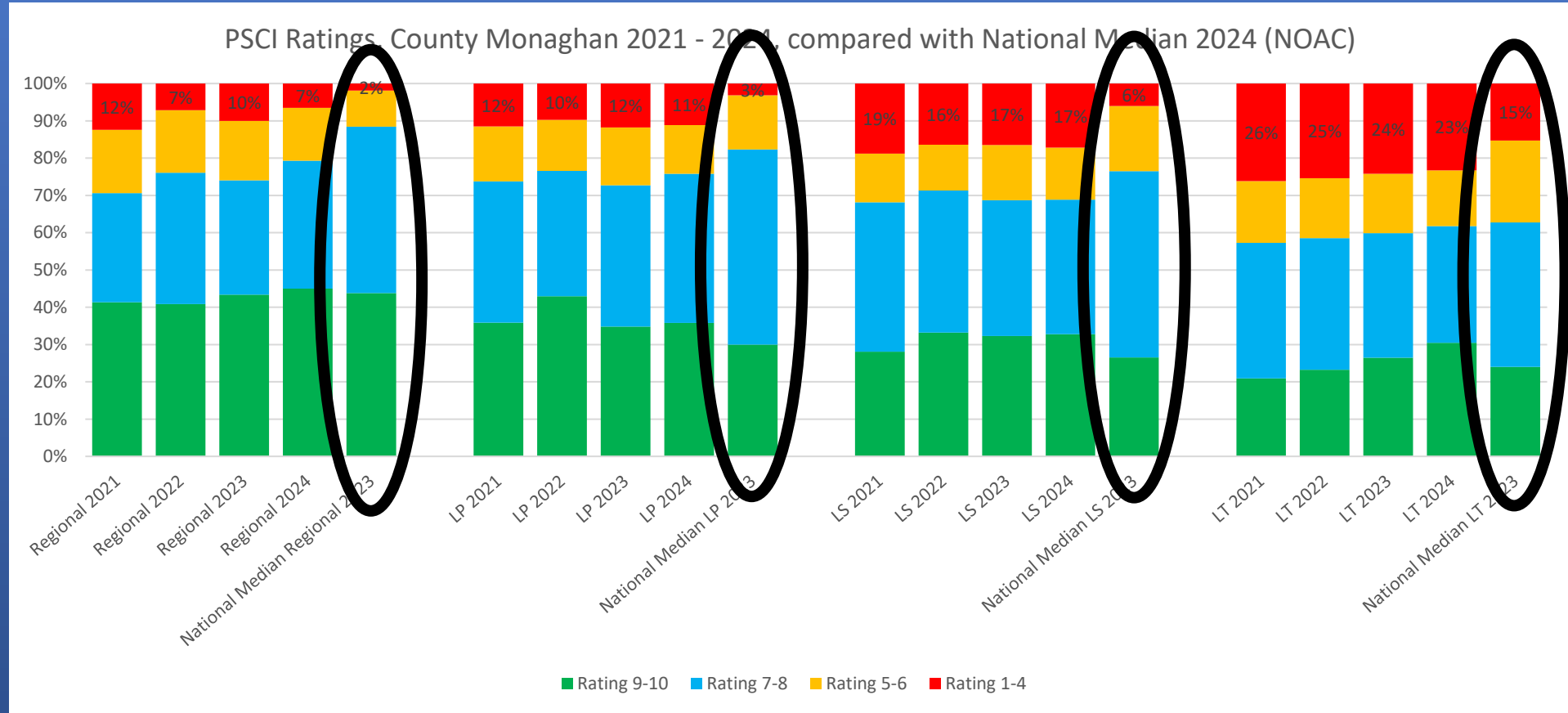


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Status of Monaghan's RLR network

- Higher rate of PSCI 1-4 roads than national median



Monaghan Roads – Scale, Cost and Budget Pressure

Disproportionate Network:

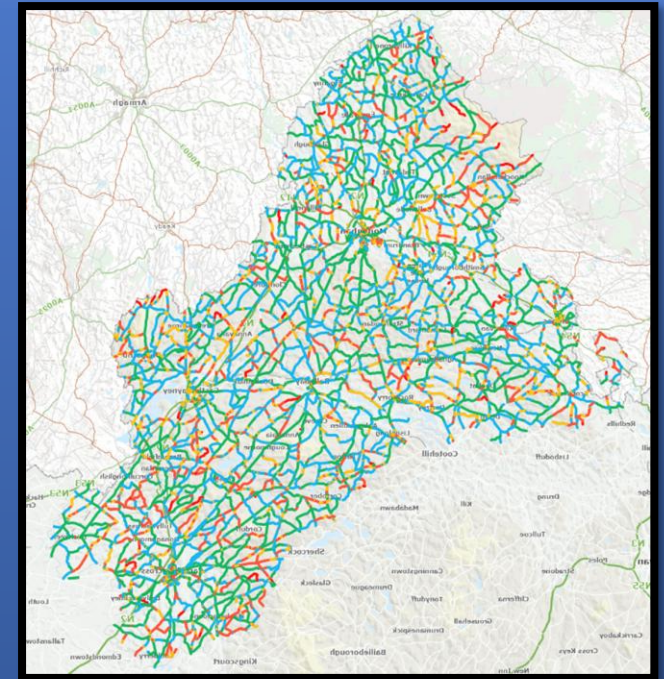
- 2nd highest road network density in Ireland
Large, dispersed rural network which drives higher ongoing maintenance demand.

High Spend Relative to other LA's

- One of the highest allocations on road maintenance nationally
- 26% of total council spend in 2025 was on road maintenance - 3rd highest in Ireland
- Equates to: €428 per person, compared to a national average of €275 per person

Growing Reliance on own Resources

- Own-resources roads funding increased by 26% between 2021–2025
- Total own-resources spend on roads is now €6million per annum



Historic Approach – Prior to 2014

Carrickmacross Municipal District

- 150-200mm single size stone aggregate & Double Surface Dressing
- 22km of road length completed under RI
- 7no additional roads Annually
- Political praise and recognition

North Monaghan Municipal District

- Overlay 100mm of AC20mm & Double Surface Dressing
- 15km of road length under RI
- Criticism and comparison to other MD achievements



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2008 Roads RI Programme

Numerous interventions since 2008

18 years later

LT Stone Roads with low traffic volumes seem to represent good value

Tally	Class	Rd No	Road Name	EngArea	Length (m)	Area (sq.m)	Traffic Volumes AADT	Cost (EURO)	PSCI 31/10/2024	Interventions
1	LP	4500	Tullyvaragh- Halls Road	Carrickmacross	933	7,464	550	€74,640	3.0	visit
2	LT	49201	Dunogue Road	Carrickmacross	1,421	4,120	202	€41,209	10.0	Resealed in 2024 PSCI 7 Prior
3	LP	4013	Ouvry to Shercock	Carrickmacross	2,110	9,706	1,203	€160,360	8.0	Resealed in 2010
4	LP	4801	Drumconrath rd to roack chapel	Carrickmacross	1,630	8,150	950	€127,140	10.0	strengthened again in 2023
5	LP	48011	Mokeeran Quarry	Carrickmacross	550	2,750	950	€27,500	9.0	strengthened again in 2022
6	LT	81003	Cornanure	Carrickmacross	644	1,525	120	€34,776	7.0	Programmed for Resealing 2026
7	LS	8640	Drumass	Carrickmacross	825	3,217	466	€56,925	8.0	Resealed in 2021
8	LS	8602	Innishkeen Church	Carrickmacross	1,536	5,376	512	€99,840	4.0	On the 2026 RI Programme
9	LT	86301	Mullaghunshinagh	Carrickmacross	2,123	6,581	123	€129,503	9.0	Resealed in 2024 was PSCI 7
10	LS	8103	Laragh	Carrickmacross	2,623	8,918	450	€167,872	9.0	strengthened again in 2019
11	LT	49102	Mullantlavan	Carrickmacross	1,500	4,200	231	€50,000	4.0	On the 2025 RI Programme
12	LT	87002	Stradeen 3 Roads/Windmill Rd	Carrickmacross	1,210	3,388	113	€70,180	9.0	Resealed in 2018
13	LT	4501	Cordrummenans Upper	Carrickmacross	2,133	9,811	95	€162,108	8.0	Resealed in 2021
14	LP	4103	Brackly	Carrickmacross	1,319	6,463	820	€104,201	8.0	Resealed in 2022
15	LP	4920	Drumgoan	Carrickmacross	1,000	6,000	1,500	€120,000	7.0	Strengthened in 2012
16	LT	86601	Drundrockan	Carrickmacross	1,250	3,625	150	€73,746	5.0	
				Total/Average	22,807	91,294		€1,500,000		
1	LP	1403	Garran Itra to Cavancreevy	North Monaghan	1,870	8,602	812	€180,650	9.0	Resealed in 2020
2	LS	53011	Bellanmaman to Annagola Bridge	North Monaghan	2,003	11,623	400	€191,000	8.0	
3	LT	12222	Donagh to Lisgoah	North Monaghan	2,289	6,867	126	€223,455	7.0	
4	LT	52071	Dundonagh to Derryveen	North Monaghan	990	2,871	124	€100,150	8.0	
5	LT	11521	Tonyfinnigan to Rarutagh	North Monaghan	1,262	3,533	153	€119,890	8.0	
6	LT	12202	Tiraneil to Drumgarn	North Monaghan	1,670	5,611	87	€158,650	10.0	Resealed in 2024
7	LT	13012	Kilcran to Clanickey	North Monaghan	2,802	7,005	98	€263,388	10.0	Resealed in 2024
8	LT	11331	Derilla to Knocknagrave	North Monaghan	1,862	3,654	102	€176,890	8.0	
9	LS	5110	Moybridge to Mullancross	North Monaghan	875	3,063	435	€85,927	10.0	Resealed in 2024
				Total/Average	15,623	52,829		€1,500,000		



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Pavement Assessment & Analysis (Tool Kit)

- Historic Desktop Analysis – AMS, Interventions, Costs, Dates, Location.
- IAPDM Pavement Design – Traffic Volumes, Existing Pavement
- Visual inspection – Validate data
- Budget – Must represent value

Outputs:

- An appropriate design and Intervention for road type
- Councillors – Justification, data driven analysis & designs.
- Cost of RI works - reduced costs and increased output.

Table 2: Treatment Measures

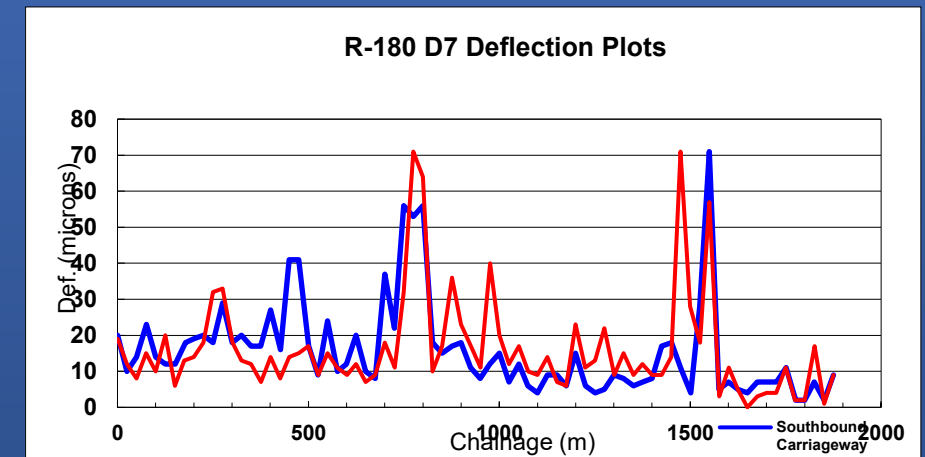
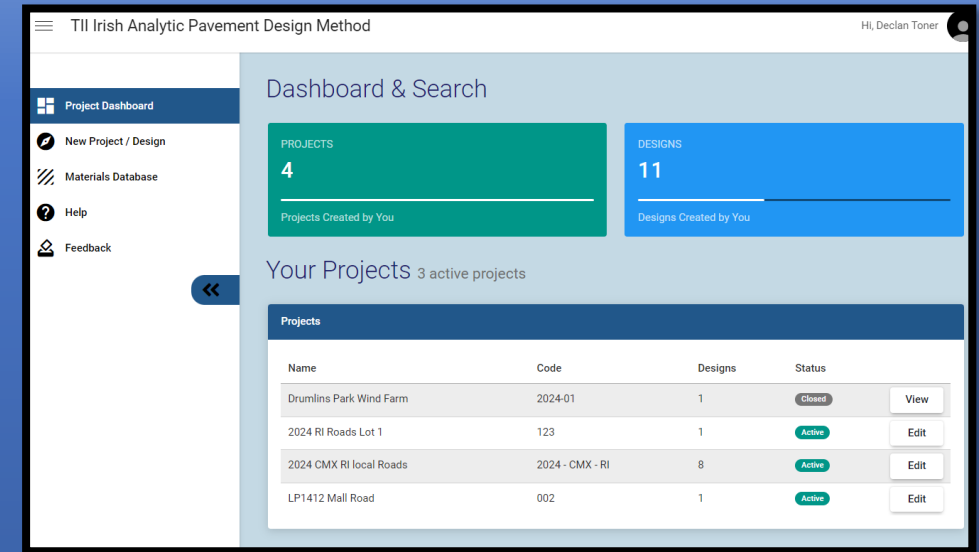
Overall PFA Rating	Treatment Measures	Surface	Structure
10	Routine Maintenance	Excellent	
9		Very Good	
8	Resealing & Restoration of Skid Resistance	Fair	Good
7		Poor	
6	Surface Restoration - Carry out localised repairs and treat with surface treatment or thin overlay.	Fair	Fair
5		Poor	
4	Structural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

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IAPDM Software

- Developed by TII to allow LA's to carry out pavement design in-house
- **Goal** - Targeted Pavement Designs using the mechanical properties of the Constituent Materials and the Products used
- **Inputs:**
 - Existing condition of the pavement – FWD, GPR and Cores
 - Properties of the new material to be laid – Stiffness Modulus
 - Loading Data and Design Life – Traffic Counts
- **Output** – Pavement designed to optimum depths, Clear understanding of existing road condition (Homogeneous Sections)

Review of "Orange Book" is looking to reduce the 85%tile design reliability to 50%tile which will bring design parameters down to values more appropriate for Local & Regional Roads.



IAPDM – Local Roads

- Trial carried out to design in Carrickmacross MD Roads from their 2025 RI Programme using IAPDM
- 11 local roads were investigated
- Traffic Counts and FWD Surveys
- Of these 11 roads, 4 were deemed suitable for a reduced overlay depth
- Remaining 7 roads received 100mm overlay

IAPDM Analysis Local Roads					
Road Number	Road Name	Chainage	Overlay depth	Quantity of Material Saved (T)	Potential Savings
LP 4911	Cumaght Mill	0 - 1800	50mm	846	€ 84,600.00
LT 46012	Drumbo	0 - 1350	50mm	460	€ 46,000
LS 8601	Tattyboy	0 - 550	70mm	120	€ 12,000
LP 4040	Bocks Middle	0 - 1550	70mm	339	€ 33,900
Total				1,765	€ 176,500
Survey Costs:					-€ 17,000
Net Savings:					€ 159,500

Appropriate intervention for road category

The Need for a Strategy

1. Network Condition is Below National Standards
2. High Network Density and Maintenance Burden
3. Financial Pressure and Inflation (Cost of living crisis)
4. Inefficiency of the Current Approach (Optimum design)
5. Climate Change and Sustainability Demands (Added Benefit)
6. Protecting a High-Value Public Asset



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Pilot Pavement Maintenance Strategy



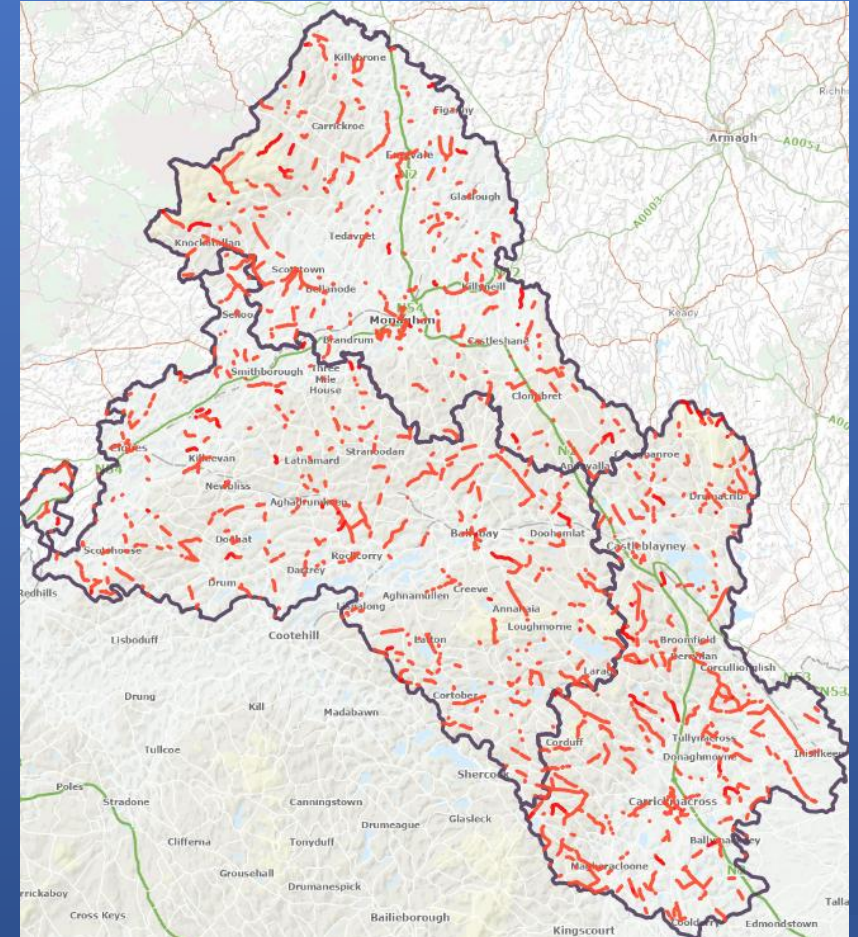
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Scale of investment needed based on current practice

- County Monaghan 2024; 397km PSCI 1-4
- National median 2023; 207km PSCI 1-4
- 190km PSCI 1-4 roads to be strengthened to meet national median
- Strengthening = €43.16/m² 2024. Assume 4m average width.
- Additional funding of ~ €33m required to achieve national median

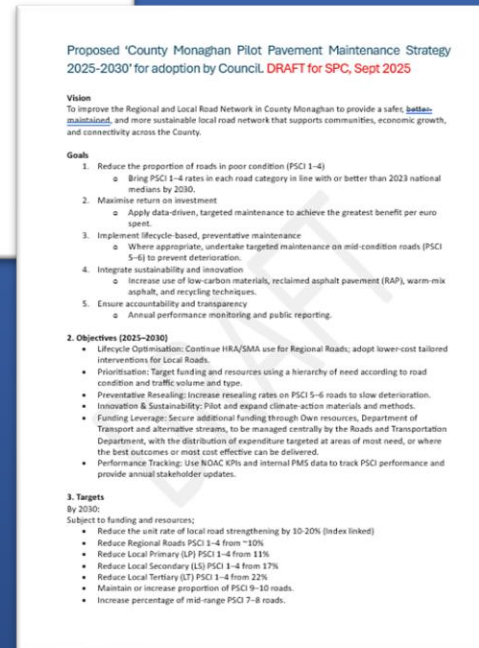
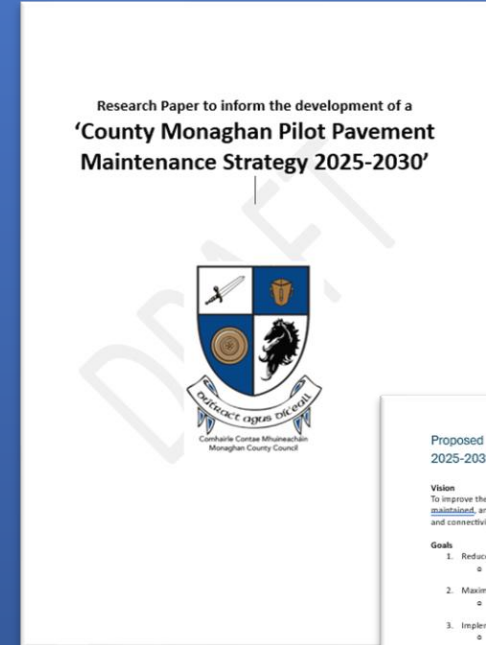


Change is Needed to achieve improvements!

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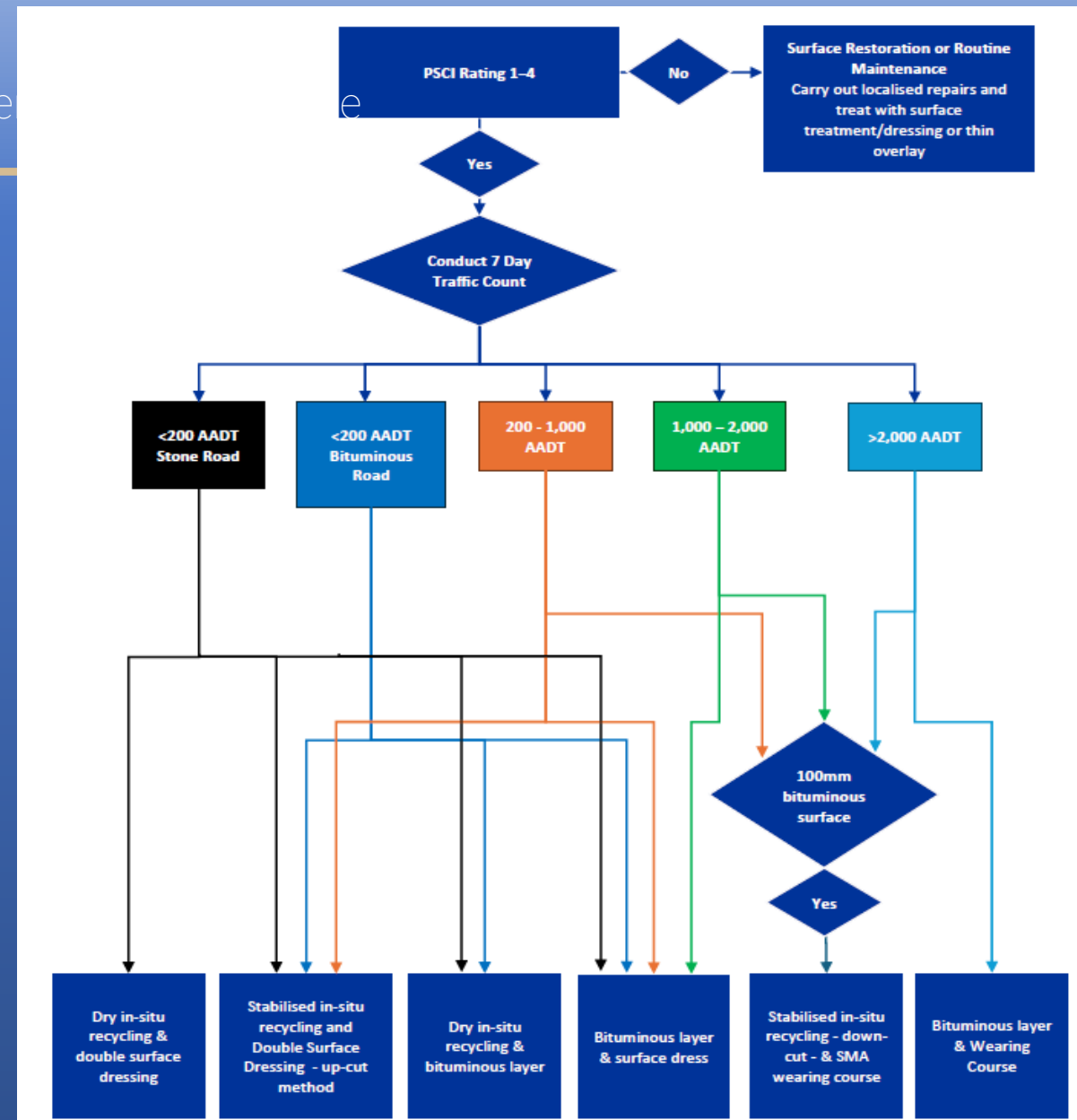
Information gathered to inform the Strategy

- Review of past practice – Good & Bad
- Review of current pavement condition and trends
- Modelling of performance over coming years if no changes are made
- Review of Budgets, eligibility and distribution of expenditure
- Review of Surface Restoration works undertaken in 2024
- Engagement with stakeholders; Councillors, SPC and Senior Management Team
- Trial Initiatives piloted in 2025:
 - Dry in-situ recycling
 - Stabilised in-situ recycling
 - Microsurfacing
 - Combinations & hybrid options



Road Strengthening – Hierarchy of Interventions

- Hierarchy provides a more equitable approach to budget expenditure – clear & transparent
- Strategy will ensure monitoring and review of new interventions – can update/change if required
- MapRoad asset management system will ensure monitoring and maintenance of roads into the future
- Incorporates cold-mix RAP as a pavement option



Proposed Hierarchy of Interventions - RM

Priority	Road Type/AADT	Comment
1	Stone Road (<200 AADT)	Early maintenance will prevent further deterioration and is likely to result in long-term cost and carbon savings, as the lifespan of the road will be extended and maintained in good condition.
2	Bituminous Macadam road where existing surface dressing layer has deteriorated, however the surface course shows no signs of defects.	Early maintenance will prevent further deterioration and is likely to result in long-term cost and carbon savings, as the lifespan of the road will be extended and maintained in good condition.
3	Bituminous Macadam road where existing surface dressing layer has deteriorated, however the surface course shows no signs of defects.	Defects in the road surface may make it less appropriate for surface dressing – the defects may re-appear after surface dressing, negating the benefit of surface dressing the road. Should the road deteriorate to PSCI rating 6/7, surface restoration treatment such as micro-surfacing may result in a better longer-term outcomes.
4	Stone Road (>200 AADT)	Stone roads with higher traffic volumes are likely to deteriorate due to the action of traffic. Surface restoration such as dry in-situ recycling with a bituminous layer, or stabilised in-situ recycling (up-cut) may be more appropriate to achieve longer term benefits.
_**	SMA**	It is not generally appropriate to surface dress SMA/HRA roads. A new wearing course layer is typically required.
-	HRA	

*Priority for Restoration Maintenance works on PSCI 7-8 Roads

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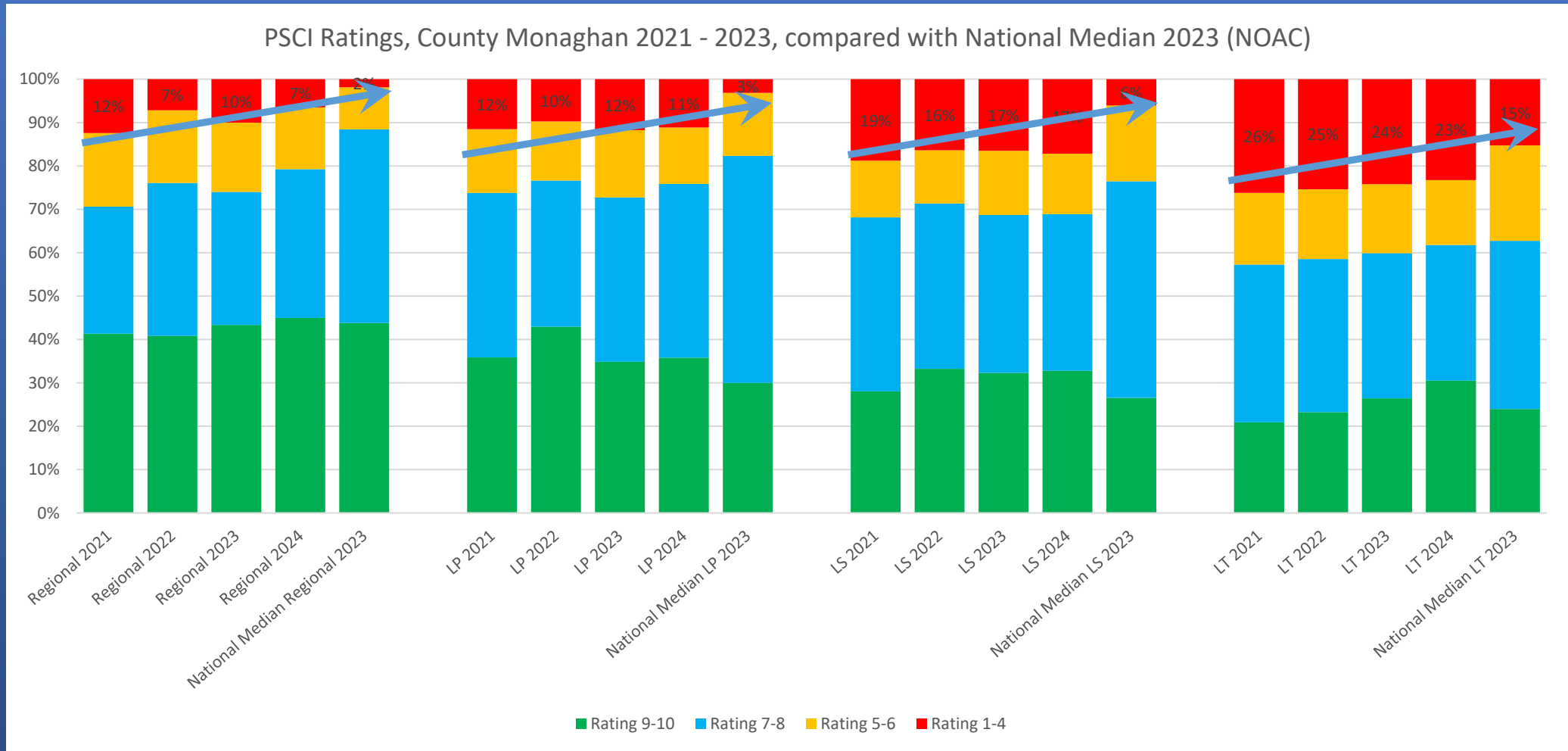
Trial Initiatives, 2025

- Current typical practice (Up to 2024):
 - 100mm DBM overlay
 - Double surface dress
 - €43.67/m² in 2023
 - Ranked 28/31 Local authorities for cost
- 2025 Trial initiatives:
 - Dry in-situ recycling of stone roads (up to 75% cost savings)
 - Stabilised in-situ recycling of bitmac roads (up to 60% cost savings)
 - Microsurfacing of PSCI 5-6 roads (up to 50% cost saving)
 - Combinations of options available, designed specifically for each road and traffic loading
 - Added environmental benefit; Lower carbon



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Objectives of a Strategy?... Improve PSCI 1-4



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Next Steps

- Continue implementation of the strategy using the agreed hierarchy and prioritisation framework
- Carry out a mid-term PSCI survey and formal review at Year 3 Implement evidence-based refinements arising from the mid-term review
- Continue delivery through Years 4–5 with ongoing monitoring
- Complete a final PSCI survey at Year 5 to assess overall performance
- Use results to inform future funding and support national roll-out of the approach





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and associated Local Authority
to be considered by the panel.**

