

Briefing Paper: Unsealed Road Rehabilitations & Maintenance Framework

Reporting Officer: Bernard Petersen

Date: 12 September 2023

Ngā Whāinga | Purpose

To provide Elected Members with information on the Unsealed Road Rehabilitation and Maintenance framework and methodology developed through the Northland Transportation Alliance (NTA). The development of this framework introduces best practice benefits, with a planned delivery rollout, through the existing Road Maintenance & Renewals Contracts.

Horopaki | Context

In 2015 following a return to elected council, the Kaipara District Council (KDC) roading team started a process to better understand unsealed road maintenance practices, seeking improvement opportunities and a material specification better suited to application on unsealed networks.

Following an initial desktop study, in 2016 KDC undertook controlled unsealed road aggregate blend trials which under controlled review, had evidentially shown improvements in pavement longevity, significantly reducing the frequency of future maintenance intervention needs.

With the NTA established, in 2017 the new regionally aligned Road Maintenance & Renewals Contracts went to market with updated material specifications that were developed following the Kaipara trials. While these updated material specifications were included within the contracts from commencement, further work was required to refine and improve on-the-ground best practices and understand network needs before being fully implemented. This refinement and improved understanding was supported through the award of \$8.06M to Kaipara District Council in combined Provincial Growth Fund (PGF) & Infrastructure Reference Group (IRG) funding.

The PGF/IRG funded 'unsealed improvements project' in Kaipara was completed in early 2022, achieving 160 km of unsealed pavement rehabilitation. Through this programme the supporting framework development has now reached a mature state of repetition in providing forward work programmes and embedding on-the-ground best practice principles through alignment and education opportunities with the contractors.

This coming unsealed pavement season, unsealed rehabilitation programmes will be commencing across the region as a direct output of the developed model, for the first time in its entirety.

Ngā Kōrerorero | Discussion

The Unsealed Road framework and model introduces industry recognised Asset Management and Construction best practices across our unsealed networks, documenting everything we do from concept through to completion as a living document. With this document we move away from historic poor practices of blanket metalling at nominal depths, towards a boundary-to-boundary approach of rehabilitation through:

- Understanding existing road usage and traffic demands
- Confirming existing pavement depths and strengths, for designed pavement considerations
- Undertaking associated maintenance improvement activities in advance of pavement, including:
 - Vegetation envelope cut-back,
 - Sight benching,
 - Water table drainage improvements,
 - And culvert renewals
- Understanding historic road specific maintenance and metalling activities

Network road levels of service through the model development have now been differentiated, with reflection of the One Network Road Classification (ONRC) and One Network Framework (ONF), determining road classifications based on road use characteristics. Through implementing this consistent methodology of understanding level of service needs, rehabilitation works can now be designed appropriately to deliver the right width, strength, depth, and material usage for extended pavement longevity, reducing future maintenance interventions. These differentiated levels of service are detailed within the attached slide presentation pack.

The forward work programme output provides a maintenance and renewal recurrence plan, which extends over a period of 20+ years and tracks pavement maintenance intervention requirements. Each year, following a similar process to the sealed pavement rehabilitation validations, a site list is generated from the model which, following initial desktop validation, is then field validated and mutually reviewed by council roading staff and contractors. Once confirmed, pavement testing is undertaken prior to design validation and costing, which further refines the delivery programme for the season.

Due to past poor grading practices, our unsealed road widths have lost consistency, and road aggregates have migrated outwards, often backfilling once defined water tables, and creating wide shoulders, thinning pavement depths, and reducing strength and shape. In addition to the improvements in the rehabilitation processes and practices described above, a further focus through the Unsealed Road Rehabilitation and Maintenance Framework is on best practice maintenance activities. These key areas of focus include grading maintenance at the right time of year, under suitable conditions for optimum moisture content, recovering of materials from drainage features, and reforming road shape. Council led on-site alignment opportunities with contractor inspectors, supervisors and operator personnel have occurred and will continue to be arranged on an as needed basis, to instil best practice expectations. Some improvements have already been observed by Elected Members and customers where these practices have been implemented, with feedback received and shared for further encouragement through our contractors' personnel.

E Whai Ake Nei | Next Steps

Desktop and field validation of the first two to three years of the forward work programme output for the Far North District has now been completed, with the initial first season's site list reviewed and agreed internally. Ground testing to inform design and confirmation of associated improvement activities is presently underway. A list of confirmed road section locations identified for rehabilitation works over the 2023/24 financial year (spring 2023 and autumn 2024 seasons) are provided in the table below, with other sites to be added as budgets and costs are confirmed:

Unsealed Road Rehabilitation – planned site locations – Spring 2023 Season

Road	Start	End	Length (m)
DUDDY ROAD	880	3200	2320
JAMIESON ROAD (RAWENE)	0	393	393
KUPA ROAD	222	1631	1409
MANGAPUPU ROAD	0	2029	2029
NGAWHITU ROAD	365	2900	2535
OKAKA ROAD	0	2014	2014
ORIRA ROAD	1191	3800	2609
REMUERA SETTLEMENT ROAD	470	3870	3400
SETTLEMENT ROAD	519	1850	1331
TAITA ROAD	52	3065	3013
TAPUHI ROAD	10058	10650	592
TOKAWHERO ROAD	2200	7000	4800
WHARAU ROAD	2133	4684	2551
DIGGERS VLLY ROAD	3996	9000	5004
DUTTON ROAD	0	420	420
GUMFIELDS ROAD	13	5513	5500
HONEYMOON VALLEY ROAD	930	4034	3104

Note: Further site sites may be added as budgets and costs are confirmed

These works are seasonally dependant, with Spring and Autumn periods being most conducive to achieving the desired outcomes. Following design review, we are planning for some pavement works to commence from late September through to mid-November, with associated works continuing throughout summer in preparation for continuing pavement works recommencing during the Autumn (2024) months.

Ngā Tāpiritanga | Attachments

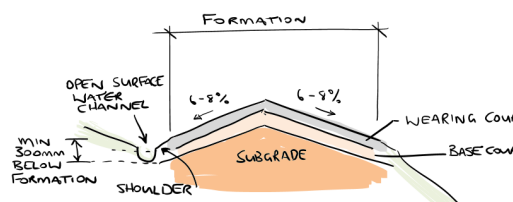
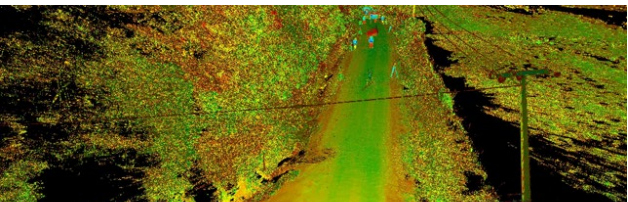
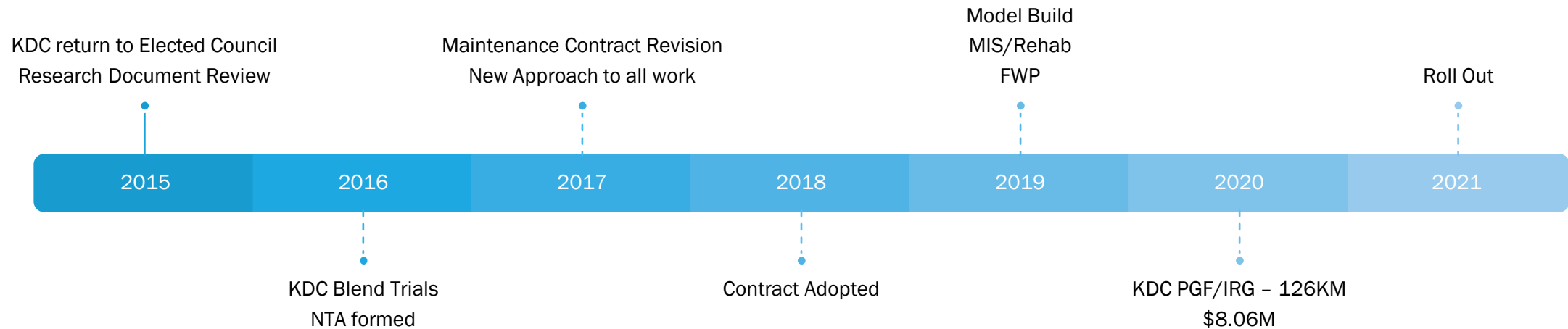
“Unsealed Roads Presentation final – FNDC EDIT”

NORTHLAND TRANSPORTATION ALLIANCE



Unsealed Road – Rehabilitation and Maintenance

HISTORY OF THE UNSEALED ROAD FRAMEWORK



~~HEAVY METALING~~ ✘

UNSEALED REHABILITATION ✔

PAVEMENT TESTING



Photo: Ground Penetrated Radar (GPR) use to measure existing pavement depths

UNSEALED REHABILITATION ✓

ASSOCIATED WORKS



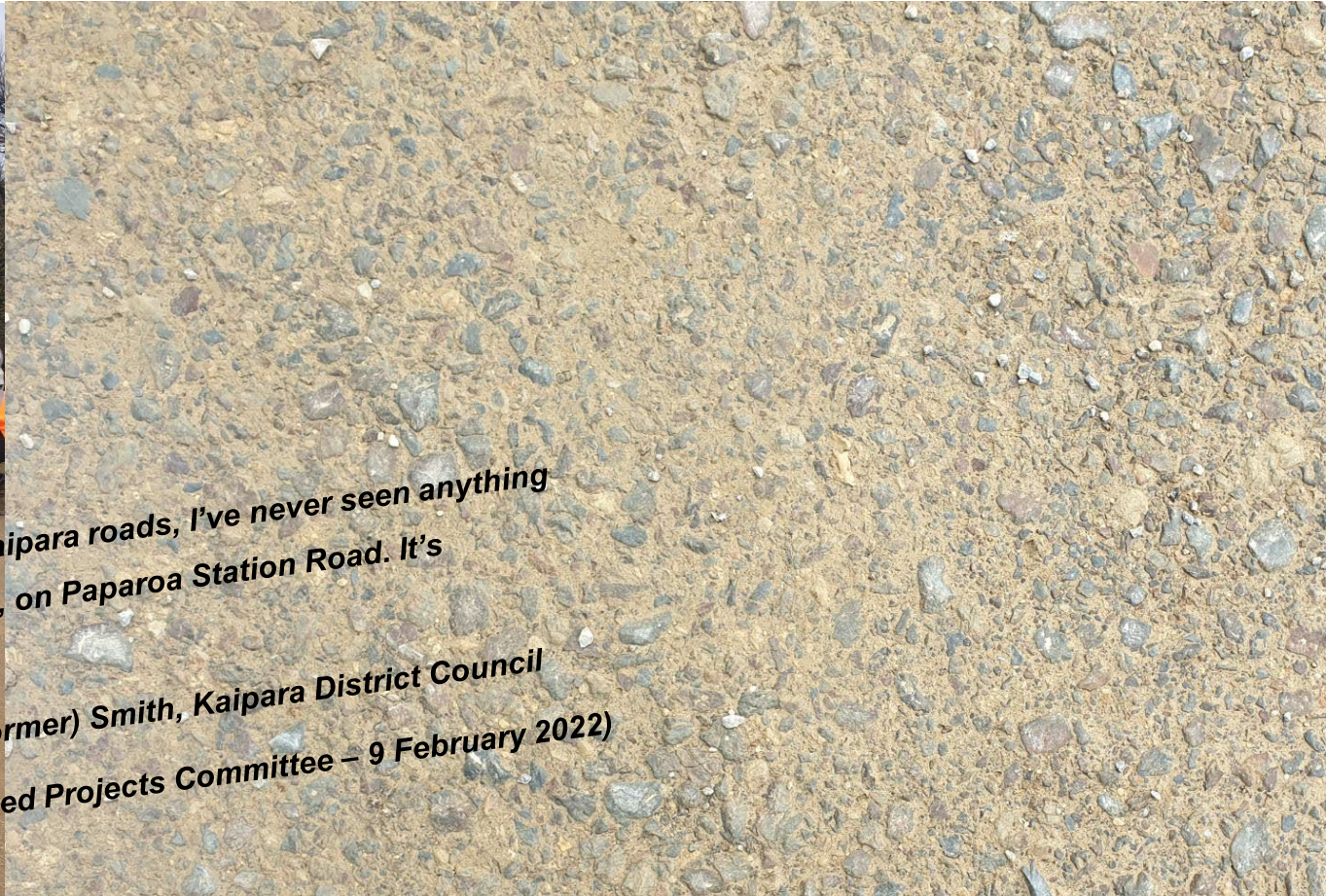
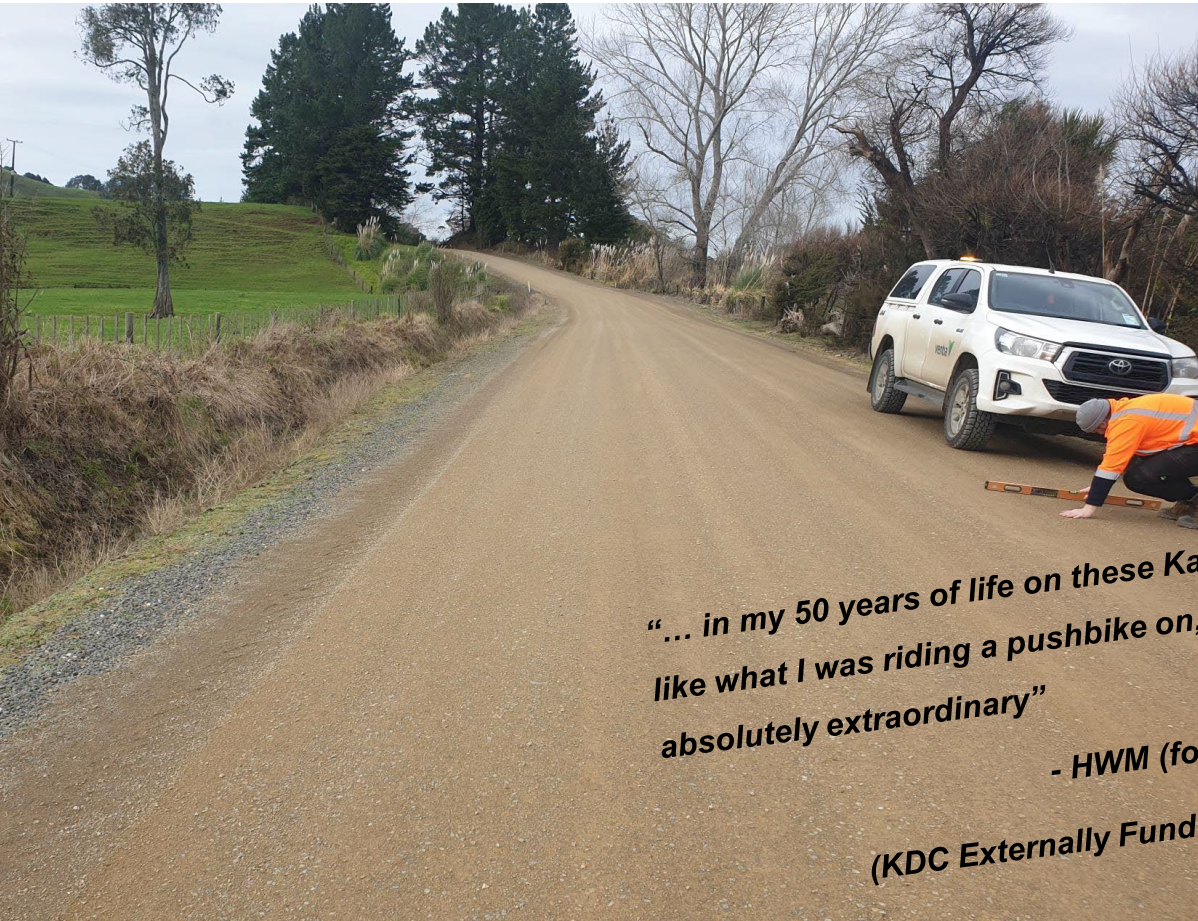
UNSEALED REHABILITATION ✓

PAVEMENT CONSTRUCTION



UNSEALED REHABILITATION ✓

FINISHED PAVEMENT



“... in my 50 years of life on these Kaipara roads, I’ve never seen anything like what I was riding a pushbike on, on Paparoa Station Road. It’s absolutely extraordinary”

- HWM (former) Smith, Kaipara District Council

(KDC Externally Funded Projects Committee – 9 February 2022)

UNSEALED REHABILITATION ✓

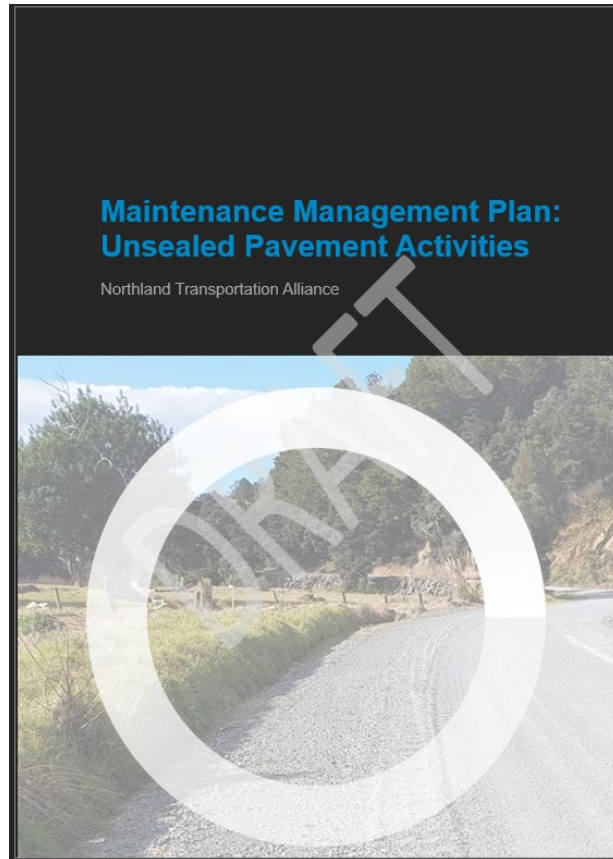
ALIGNMENT OPPORTUNITIES (EDUCATION)





- A Brief History of The Unsealed Rehabilitations Inception
- What's included
 - Model
 - Design
 - Best Practice Asset Management
 - Best Practice Construction
 - What Works for Northland
- How do we use it?
 - NTA
 - Strategy and Planning – FWP Development
 - Maintenance Teams - Delivery

MAINTENANCE MANAGEMENT PLAN



- The Plan
- Documents everything we do from Concept to Completion
- Living Document
- Uses everything available from wider Industry

Differentiated Levels of Service

- LOS 1 – 100mm total pavement, Use GAP40 Paige-Green Compliant if Possible
- LOS 2 NF – 100mm Pavement plus 70-100mm Paige-Green Wearing Coarse
- LOS 2 F – Design Pavement to a maximum of *250mm + 70 – 100mm Paige-Green Wearing Coarse
- LOS 3 - Design Pavement to a maximum of *250mm + 70 – 100mm Paige-Green Wearing Coarse

*Client Accepts Some Risk as Per the Maintenance Contract

ONRC	Classification	Width	Characteristics
Primary Collector	Major	> 6.0m < 8.0m	LOS 3
Secondary Collector	Major	> 6.0m < 8.0m	LOS 3
Access	Major	5.0 - 6.0m	LOS 3
	Minor	4.0 - 5.0m	LOS 2 Forestry
	Minor	4.0 - 5.0m	LOS 2 Private use
Access Low Volume	Minor	4.0 - 5.0m	LOS 2 Forestry
	Minor	3.0 - 4.0m	LOS 2 Private use
	Lane	3.0 - 4.0m	LOS 1
	Track	< = 3.0m	LOS 1

MODEL

- Asset Management Best Practice
- Consistency Across Northland
- Develop Proactive Management of FWP
- Risk Management

Unsealed Road Potential Treatment					
LOS	Treatment	Length (KMs)	WDC (Kms)	KDC (KMs)	FNDC (KMs)
1	TOTPav100	1917	381	664	871
2 - Non Forestry	PAV100WC100	766	218	316	231
2 - Forestry	Rehab	319	15	38	267
3	Rehab	369	61	96	212
Total Forestry		688	76	133	479

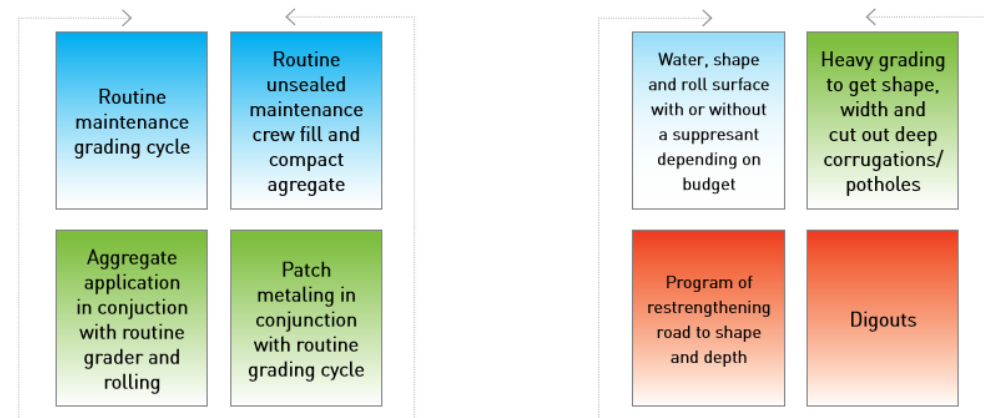
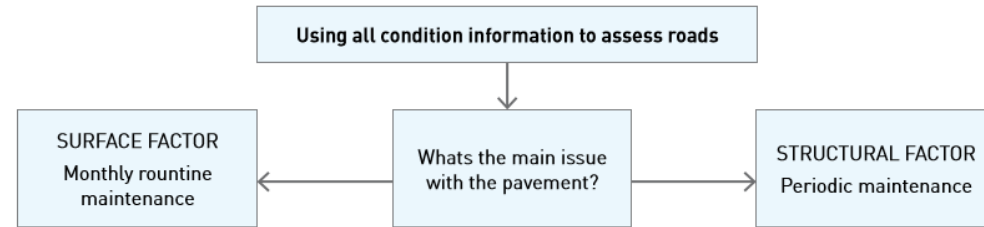
FWP

- Develop the Plan
- Desktop Validation
- Field Validation
- Detailed Design

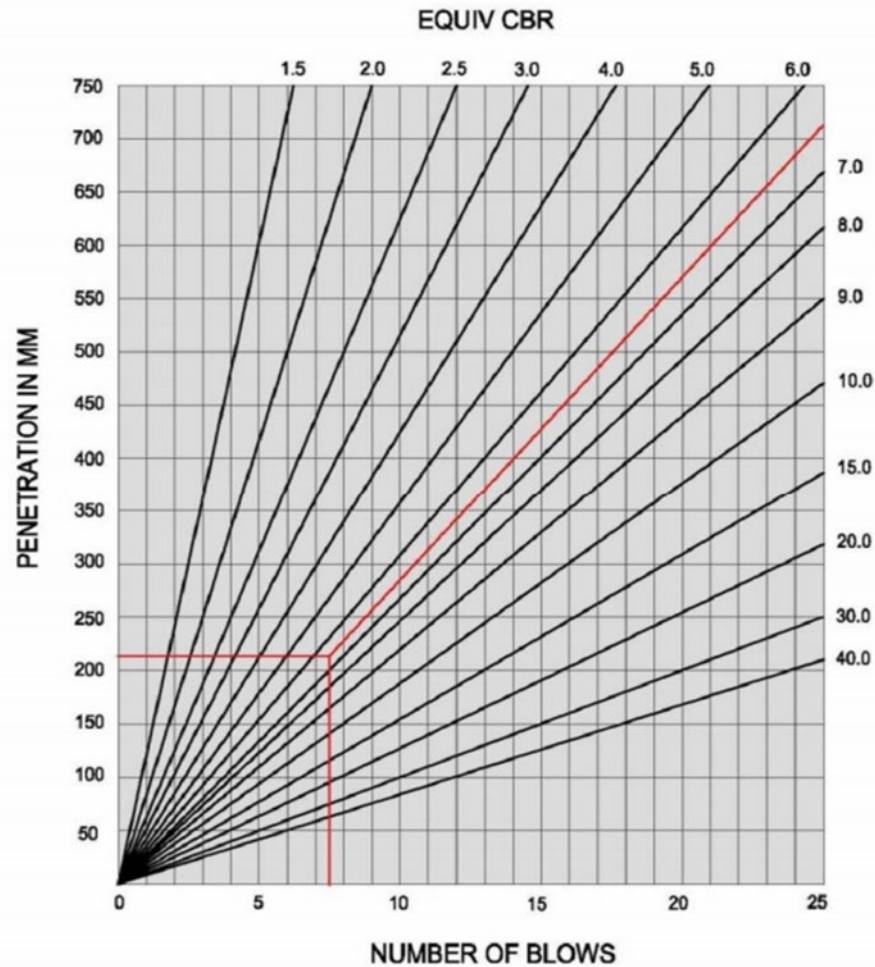
Year	2021/22	2022/23	2023/24	2024/25	2025/26	2026/27
Treatment						
TOTPAV100 20 Year Intervention	46.0	47.9	46.6	44.0	44.9	44.9
PAV100WC100 15 Year Intervention	13.7	17.4	16.0	16.1	16.2	16.4
Rehab 10 Year Pav Design	46.8	46.9	47.9	46.3	48.0	47.5
Wearing Course (Band 2 Non-Forestry) (kms) - 7 year interval	13.7	17.4	16.0	16.1	16.2	16.4
Wearing Course (Band 2 Forestry & Band 3) (kms) - 5 year interval	46.8	46.9	47.9	46.3	48.0	94.3



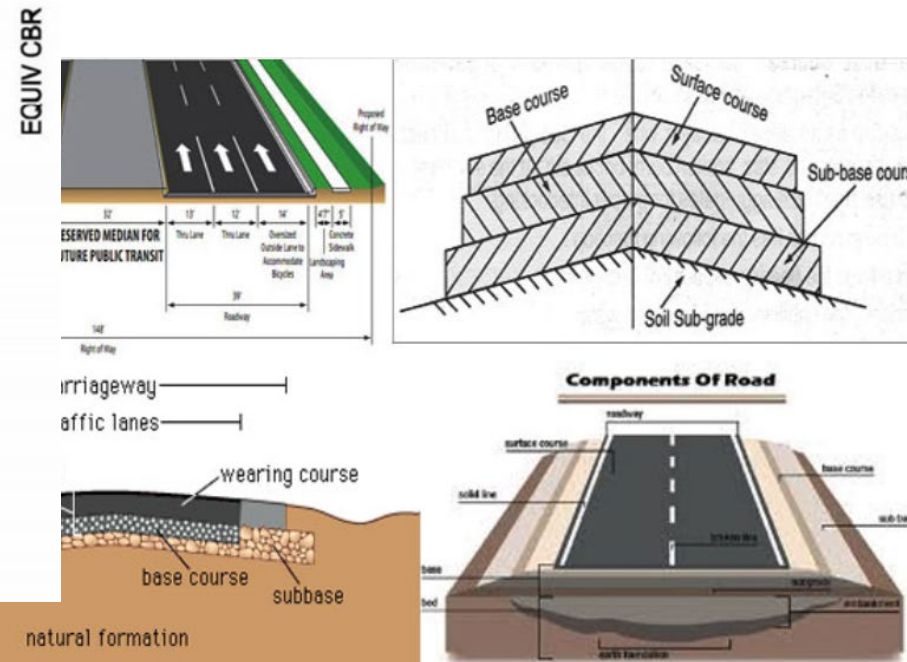
Sources of Condition Information



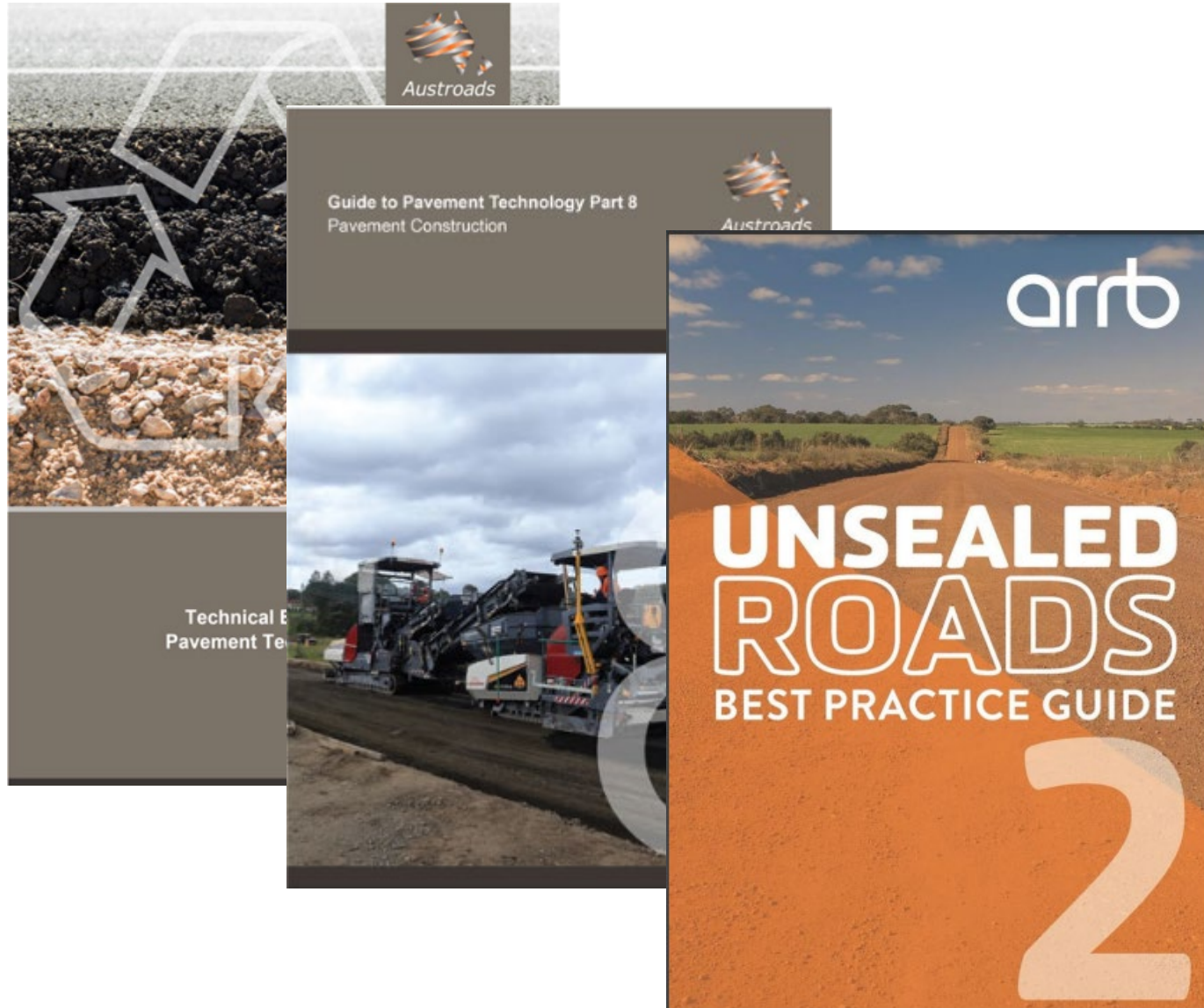
DESIGN



- ARRB and Austroads Guides Followed
- Automation of Calculations
- Automation of Data Look-ups from RAMM
- Confirmed and Agreed Intervention
- Confirmed and Agreed Cost
- Document Saved in RAMM for Future



CONSTRUCTION



- Austroads/ARRB
- Maintenance Contract
- Drainage
- Recycled Materials
- Post construction Audit
- Close out Dispatch