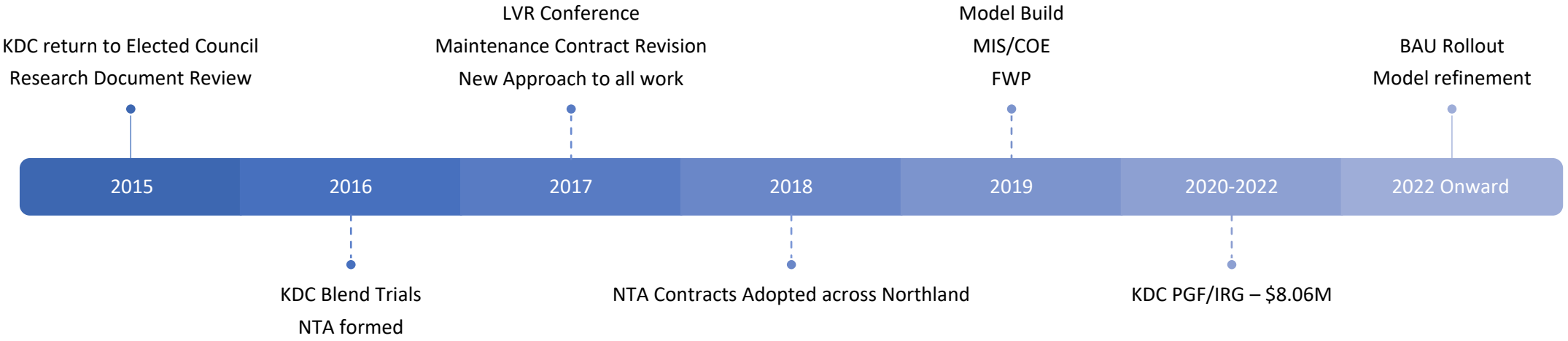
Northland Transportation Alliance

Unsealed Roads – End to End

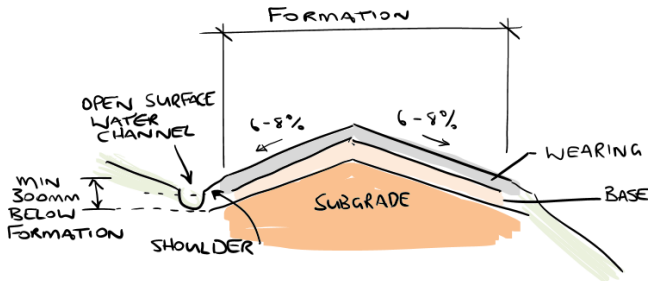
ANDY BROWN & TIM WARD | NORTHLAND TRANSPORTATION ALLIANCE

HISTORY OF OUR UNSEALED COE

LOW VOLUME ROADS WORKSHOP 2022



LOW VOLUME ROADS WORKSHOP 2017



LOW VOLUME ROADS WORKSHOP 2022

- A Brief History of The COE 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

LOW VOLUME ROADS WORKSHOP 2022

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

Differentiated levels of service

LOW VOLUME ROADS WORKSHOP 2022

- 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

LOW VOLUME ROADS WORKSHOP 2022

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

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

Forward Works Plan - PGF

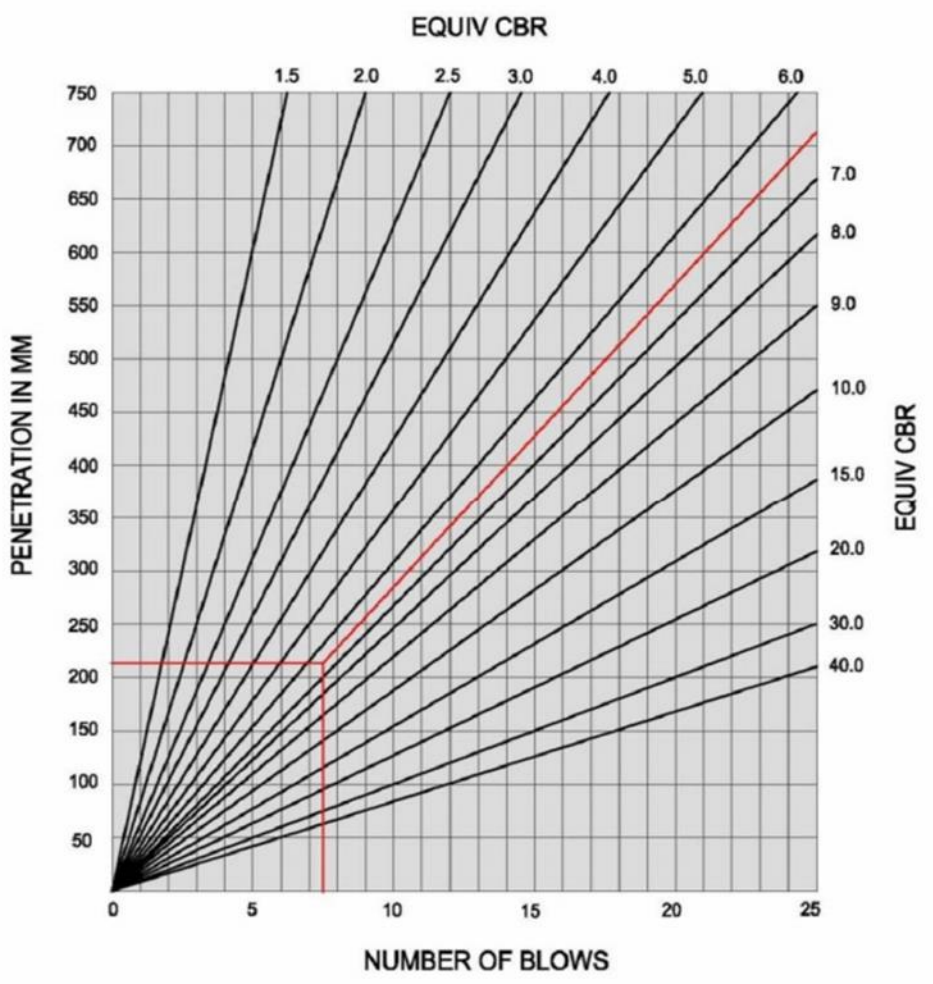
LOW VOLUME ROADS WORKSHOP 2022

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

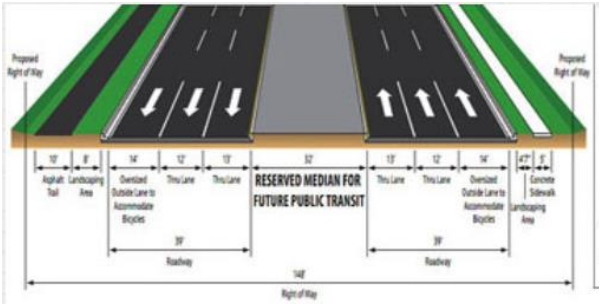
Road ID	Road	Start	End	Length	Programmed Season	LOS Treatment	Treatment
20117	CHARITY HILL RD	626	1653	1027	Season 1	LOS 2 - Non Forestry	Pavement - 100mm and Wearing Course
20131	HOANGA RD	1650	2855	1205	Season 1	LOS 3	Design / Full Rehab
20160	OTUREI SETT RD	281	3129	2848	Season 1	LOS 2 - Non Forestry	Pavement - 100mm and Wearing Course
20165	PUKEHUIA RD	4820	6550	1730	Season 1	LOS 2 - Non Forestry	Pavement - 100mm and Wearing Course
20165	PUKEHUIA RD	6678	7286	608	Season 1	LOS 2 - Non Forestry	Pavement - 100mm and Wearing Course
20165	PUKEHUIA RD	7401	8597	1196	Season 1	LOS 2 - Non Forestry	Pavement - 100mm and Wearing Course
20167	REDHILL RD	6026	7311	1285	Season 1	LOS 1	Rip and Remake
20177	SILLS RD	35	86	51	Season 1	LOS 1	Wearing Course
20177	SILLS RD	93	1995	1902	Season 1	LOS 1	Rip and Remake
20197	KAIHU WOOD RD	511	2094	1583	Season 1	LOS 2 - Non Forestry	Pavement - 100mm and Wearing Course
20197	KAIHU WOOD RD	2094	2793	699	Season 1	LOS 2 - Non Forestry	Pavement - 100mm and Wearing Course
20197	KAIHU WOOD RD	2803	3971	1168	Season 1	LOS 2 - Non Forestry	Pavement - 100mm and Wearing Course
20207	AVOCA NTH RD	2334	4270	1936	Season 1	LOS 1	Rip and Remake
20224	HOUTO RD [KDC]	250	5015	4765	Season 1	LOS 2 - Forestry	Design / Full Rehab
20156	OMANA RD [KDC]	11375	11450	75	Season 1	Band N/A	Rip and Remake
20156	OMANA RD [KDC]	11450	13450	2000	Season 1	Band N/A	Wearing Course
20156	OMANA RD [KDC]	13450	13830	380	Season 1	Band N/A	Rip and Remake
20229	KARAKA RD [KDC]	546	1421	875	Season 1	LOS 2 - Non Forestry	Pavement - 100mm and Wearing Course
20242	MAROPIU RD	0	227	227	Season 1	LOS 3	Design / Full Rehab

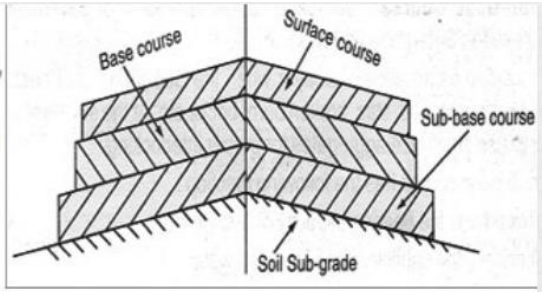
DESIGN

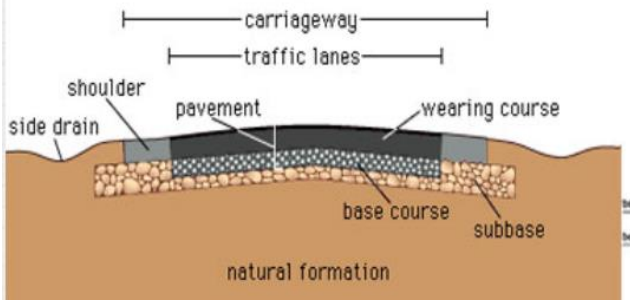
LOW VOLUME ROADS WORKSHOP 2022

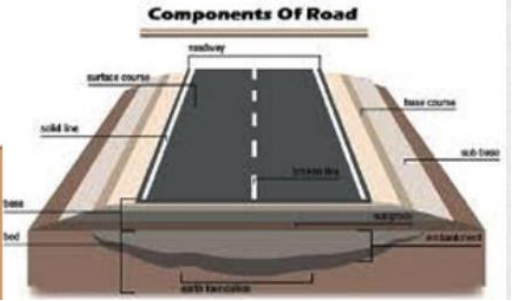


- ARRB and Austroads Guides Followed
- Automation of Calculations
- Automation of Data Look-ups from RAMM
- Confirmed and Agreed Intervention
- Confirmed and Agreed Cost
- Document Saved in RAMM for Future









DELIVERY OF PGF AND IMPLEMENTATION OF COE

LOW VOLUME ROADS WORKSHOP 2022

~~HEAVY METALLING~~ ✗

UNSEALED REHABILITATION ✓

Photo: Inch Road Quarry, Ruawai

NTA
Far North District Council · Kaipara District · Whangarei District Council · Northland Regional Council · Waka Kotahi NZ Transport Agency

KAIPARA DISTRICT
Kaipara te Oranganui • Two Oceans Two Harbours

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PH. 021.953-010

T8 Traffic Control

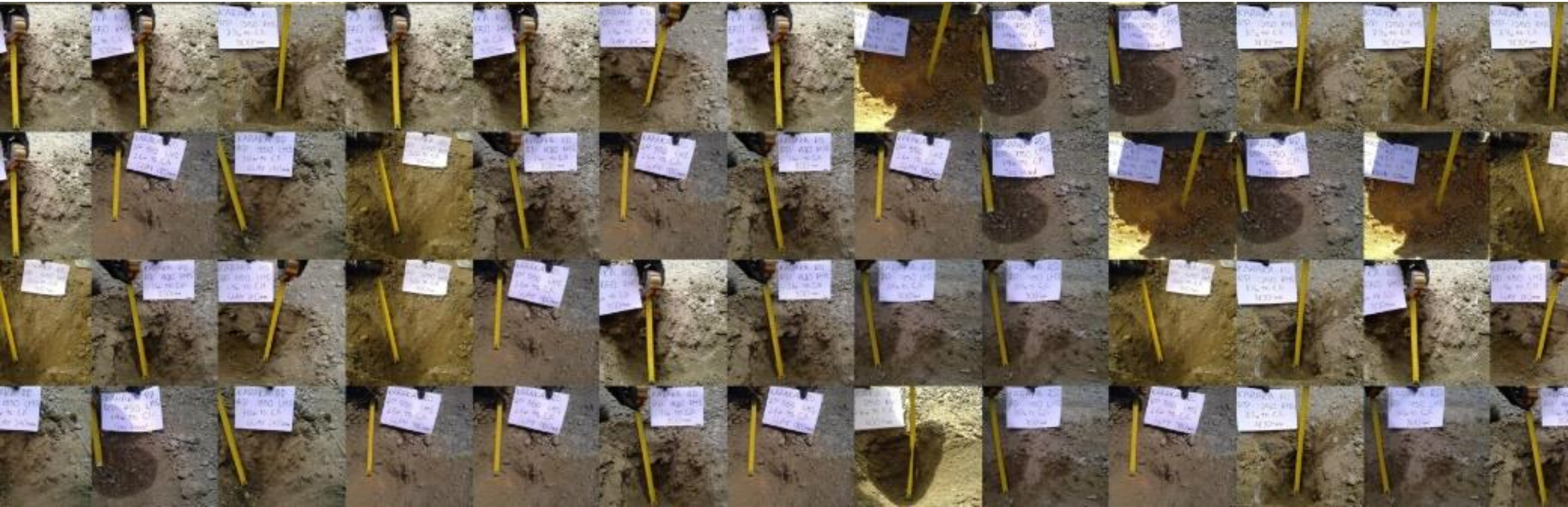
TEAM Vegetation
360° VEGETATION CONTROL

LOW VOLUME ROADS WORKSHOP 2022

UNSEALED REHABILITATION

PAVEMENT TESTING

LOW VOLUME ROADS WORKSHOP 2022



UNSEALED REHABILITATION

PAVEMENT TESTING

LOW VOLUME ROADS WORKSHOP 2022

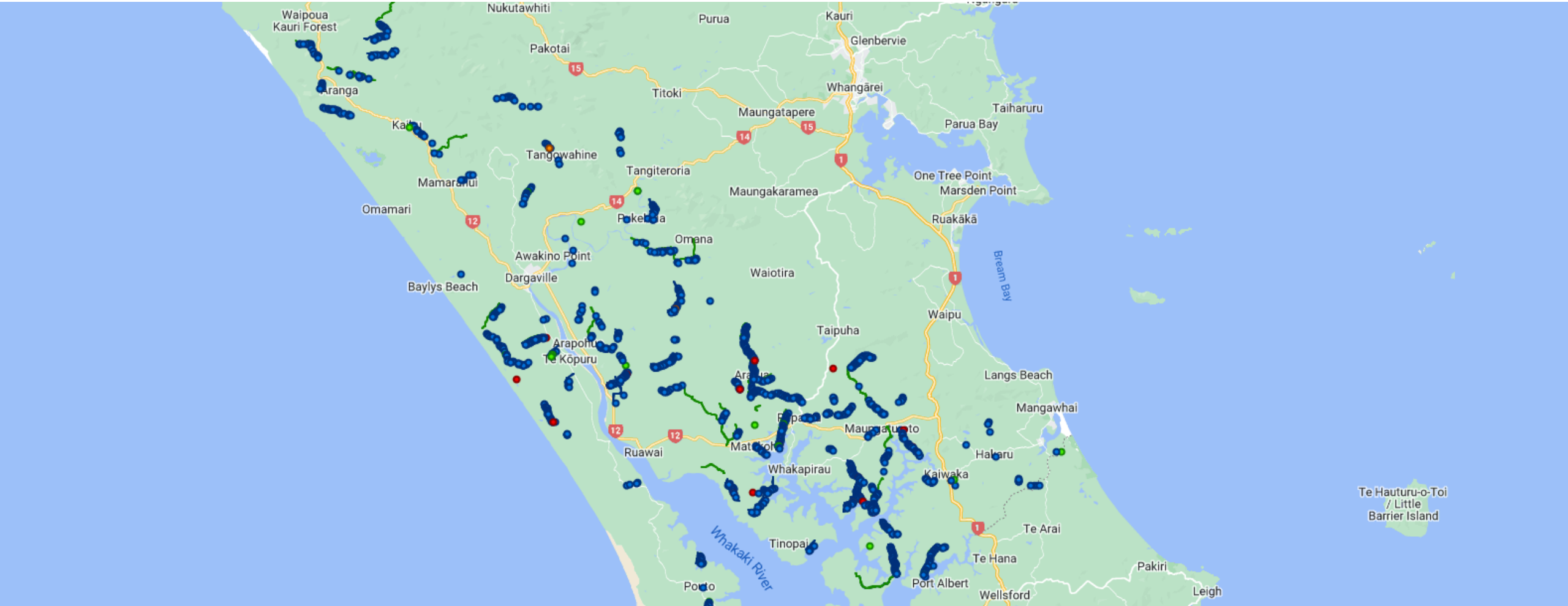
GPRIMAGING Solutions

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

UNSEALED REHABILITATION

ASSOCIATED WORKS

LOW VOLUME ROADS WORKSHOP 2022



UNSEALED REHABILITATION

ASSOCIATED WORKS

LOW VOLUME ROADS WORKSHOP 2022

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UNSEALED REHABILITATION

PAVEMENT CONSTRUCTION

LOW VOLUME ROADS WORKSHOP 2022

UNSEALED REHABILITATION

PAVEMENT CONSTRUCTION

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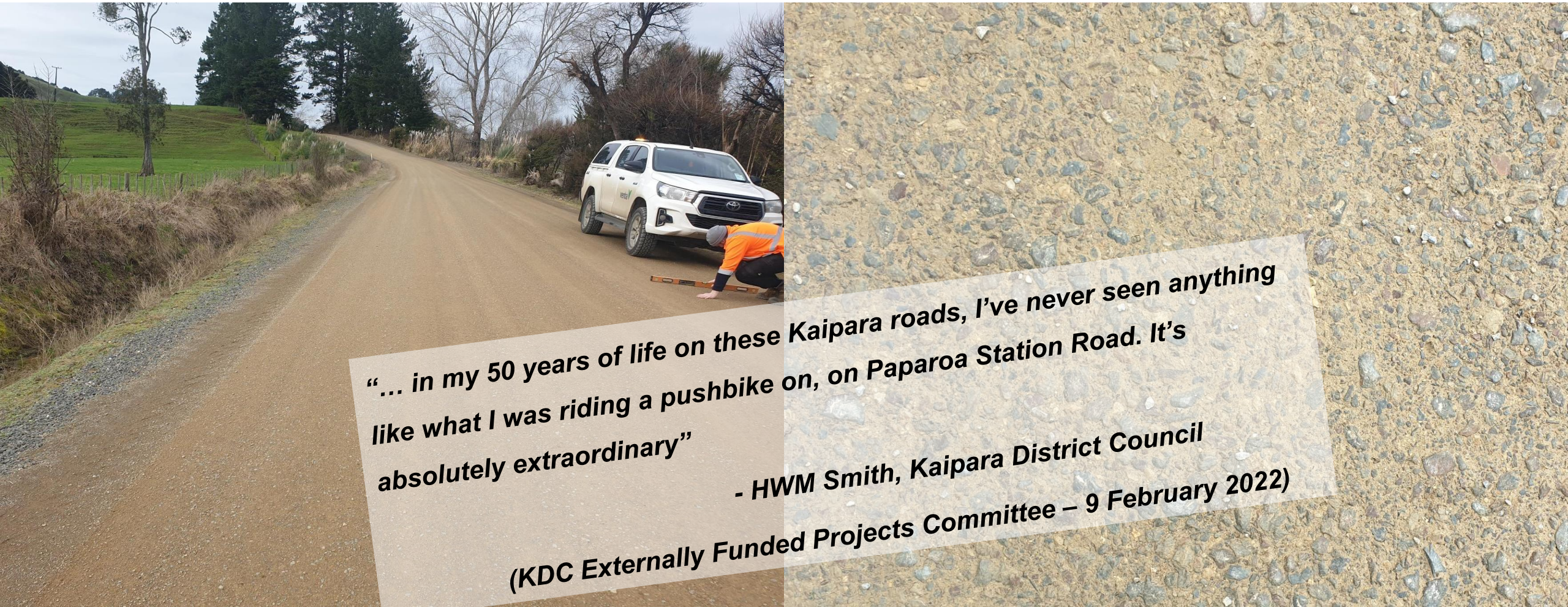
UNSEALED REHABILITATION

FINISHED PAVEMENT

LOW VOLUME ROADS WORKSHOP 2022



"… 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 Smith, Kaipara District Council

(KDC Externally Funded Projects Committee – 9 February 2022)

18 MONTHS LATER…

LOW VOLUME ROADS WORKSHOP 2022

LOOKING FORWARD

LOW VOLUME ROADS WORKSHOP 2022

DESIGN AUTOMATION

LOW VOLUME ROADS WORKSHOP 2022

Road Information to be Populated

Council	Road Number	Carriageway No
KDC	337	1901

Populate these cells to change the road carriageways

Lookup	KDC3371901
Road Name	ACCESS RD
Carriageway Start	5058
Carriageway End	6040
Hierarchy	ACCESS
Characteristics	Band 1
ADT	74
HCV Percentage	11
Length	982
Insitu Average Width	5.03m
Area	9,876m²

Pavement Requirements (Based on Road Characteristics)	
Pavement Width Required (based on chatacteristics)	4
Pavement Depth Required (based on characteristics)	100
Wearing Couse Required (based on characteristics)	No Wearing Course
Pavement Lifecycle (based on characteristics)	20

The lifecycles used are

- Band 1 – AADT is less than 100 vehicles per day - 20-year Lifecycle, Routine maintenance and aggregate replacement where needed,
- Band 2 – AADT is between 101 and 200 vehicles per day - 15-year Lifecycle, 100mm Pavement layer with Paige – Green Wearing course at a 7-year Lifecycle average,
- Band 2 Forestry use – AADT is between 101 and 200 vehicles per day and forestry operations occur - 10-year Lifecycle on pavement plus 5-year return on Paige-Green Wearing course,
- Band 3 – AADT is greater than 101, HCV is high and forestry operations occur daily – 10-year Lifecycle on pavement plus 5-year lifecycle on Paige-Green Wearing course.

Location / RP	Side	Insitu - Trafficable Pavement Width	Is the width of this section wider than the desired level of service?	Required width reduction to meet the desired level of service	Total Pavement Depth	Layer 1 Materi
5058						
5100	L	5	Yes	1	86	GAP2
5200	R	10	Yes	6	56	GAP2
5300	L	5	Yes	1	54	GAP2
5400	R	5	Yes	1	52	GAP2
5500	L	5	Yes	1	60	GAP2
5600	R	4	No	0	85	GAP2
5700	L	4.5	Yes	0.5	90	GAP2
5800	R	5	Yes	1	83	GAP2
5900	L	4	No	0	51	GAP2
6000	R	5	Yes	1	60	GAP2

BAU FORWARD WORKS PLAN

LOW VOLUME ROADS WORKSHOP 2022

Total Lengths	
Do Minimum (kms)	666
Overlay 100mm (kms) - 15 year interval	316
Rebuild (kms) - 10 year interval	136

Year	2021/22	2022/23	2023/24	2024/25	2025/26	2026/27	2027/28	2028/29
Treatment								
Do Minimum (kms)	34.0	33.6	33.2	33.2	33.4	33.8	36.4	3
Overlay 100mm (kms) - 15 year interval	20.9	21.3	21.8	20.3	21.6	18.6	22.0	1
Rebuild (kms) - 10 year interval	13.1	15.1	9.5	14.9	14.0	12.9	14.3	1
Wearing Course (Band 2 Non-Forestry) (kms) - 7 year interval	20.9	21.3	21.8	20.3	21.6	18.6	22.0	4
Wearing Course (Band 2 Forestry & Band 3) (kms) - 5 year interval	13.1	15.1	9.5	14.9	14.0	26.0	29.4	2

Cost

Year	2021/22	2022/23	2023/24	2024/25	2025/26	2026/27	2027/28	2028/29
Treatment								
Do Minimum (incls drainage) ($) + $500000 Grading	$ 1,009,490.00	$ 1,004,615.00	$ 997,955.00	$ 998,525.00	$ 1,001,615.00	$ 1,006,760.00	$ 1,045,745.00	$ 993,380.
Overlay 100mm (kms) - 15 year interval	$ 730,905.00	$ 744,765.00	$ 763,980.00	$ 709,310.00	$ 757,260.00	$ 651,280.00	$ 770,035.00	$ 681,765.
Rebuild (kms) - 10 year interval	$ 719,730.00	$ 830,170.00	$ 520,740.00	$ 820,655.00	$ 769,285.00	$ 711,095.00	$ 789,195.00	$ 725,670.
Wearing Course (Band 2 Non-Forestry) - 7 year interval	$ 469,867.50	$ 478,777.50	$ 491,130.00	$ 455,985.00	$ 486,810.00	$ 418,680.00	$ 495,022.50	$ 908,145.
Wearing Course (Band 2 Forestry & Band 3) - 5 year interval	$ 294,435.00	$ 339,615.00	$ 213,030.00	$ 335,722.50	$ 314,707.50	$ 585,337.50	$ 662,467.50	$ 509,895.
Total/Yr	$ 3,224,427.50	$ 3,397,942.50	$ 2,986,835.00	$ 3,320,197.50	$ 3,329,677.50	$ 3,373,152.50	$ 3,762,465.00	$ 3,818,855.

CONTINUED INTEGRATION

LOW VOLUME ROADS WORKSHOP 2022

Scala Penetrometer Sites

Refresh | Add | Columns | Groups | Filter | Export | Bulk Change | Bulk Replace | Settings | Action

Loc...	Road	Side	Pavement Depth	Layer 1 Material	Layer 1 Thickness	Layer 2 Material	Layer 2 Thickness	Subgrade Material	Scala 100	Scala 200	Scala 300	Scala 400	Scala 500
12395	ARARUA RD [KDC]	Left	100	All passing 40MM sieve	100			CLAY	6	3	3	2	2
14995	ARARUA RD [KDC]	Right	100	All passing 20MM sieve	100			CLAY	4	4	3	4	4
17295	ARARUA RD [KDC]	Left	180	All passing 20MM sieve	80	Lime Rock	100	CLAY	5	5	5	5	5
450	ARI ARI RD	Left	250	Graded all passing 40mm sieve	40	Graded all passing 65mm sieve	210	SILT	8	8	15	10	9
1050	ARI ARI RD	Right	250	Graded all passing 40mm sieve	250				22	17	20	23	10
350	AVOCA RD	Right	400	All passing 20MM sieve	50	Graded all passing 65mm sieve	350	CLAY	2	5	7	1	2
600	AVOCA RD	Left	250	Graded All Passing 25mm Sieve	50	Graded all passing 40mm sieve	200	CLAY	3	5	8	8	8
1600	AVOCA RD	Right	330	Graded All Passing 25mm Sieve	30	Graded all passing 40mm sieve	300	CLAY	2	2	4	4	5
2610	AVOCA RD	Left	180	Graded All Passing 25mm Sieve	180			CLAY	12	5	2	1	2
3200	AVOCA RD	Right	150	Graded All Passing 25mm Sieve	150			CLAY	9	4	4	4	5
4010	AVOCA RD	Left	100	Graded All Passing 25mm Sieve	100			CLAY	4	3	2	3	3
5215	AVOCA RD	Right	325	Graded All Passing 25mm Sieve	25	Graded all passing 40mm sieve	300	CLAY	5	6	5	5	9
5925	AVOCA RD	Left	500	Graded All Passing 25mm Sieve	150	Clay	100	CLAY	4	3	4	5	8
7000	AVOCA RD	Right	300	Graded All Passing 25mm Sieve	100	Graded all passing 40mm sieve	200	CLAY	3	2	4	3	2
8000	AVOCA RD	Left	100	Graded all passing 40mm sieve	100			CLAY	17	5	3	2	3
8990	AVOCA RD	Right	250	Graded All Passing 25mm Sieve	100	Graded all passing 40mm sieve	150	CLAY	5	3	4	3	5

LOW VOLUME ROADS WORKSHOP 2022

END