

# Industry engagement

## Pavement condition KPI

January 2024

# Session topics

Maximum 15 minutes each

- Intro/recap pre-reading: overview of the 23/24 Pavement condition KPI
- 1. pavement condition outcomes based on funded FWP
- 2. fault identification and management
- 3. tracking maintenance and renewal investment
- 4. stability of pipeline quantities and funding decisions
- Q & A

# Re-cap pre-reading: overview

# Pre-reading, overview and takeaways

Document	Overview	Takeaways
Pavement condition KPI addendum to 23-24 KRA framework PDF attachment	Intent	Understand contributions of both client and contractor
	Definition	75 <sup>th</sup> percentile rut depth mm and 4 related measures
	Business rules	Tools used and need for annual network inspection
	Process	Basic approach for each measure
	Data required	HSD, Juno, Fault data, RAMM, SAP, industry voice
	Measure score table	Interpreted and reported separately from KRA score/reward

# Pre-reading, overview and takeaways

Document	Overview	Takeaways
IAG presentation November 2023	Overview of Pavement condition KPI	Joint accountability – common goal
	Why is this measure important/why this approach	Value of the SH Asset/our core purpose Shift in focus from scoring to understanding
	Approach: What have we done to date	Iterations of KPI concepts and industry consultation Cross-industry working group development of current KPI
	Feedback and next steps	Contractor contribution: <ul style="list-style-type: none"> <li>• fault data</li> <li>• impacts of client delays/stability issues</li> <li>• Optionally: sub-networks/alternate metrics</li> </ul>

# Call outs and queries arising

- Why 75<sup>th</sup> percentile rut depth?...section 1
- Annual network inspection...section 2
- Optional specifications: sub-networks, alternate metrics....sections 1 & 2
- Specifics of data collection requirements, who does what, and timing (establishment phase/assessment phase)...All sections

# Focus: pavement condition outcomes based on funded FWP

# Local forecast pavement condition outcomes based on funded FWP

KPI 5.3.1 Pavement Condition (joint measure)

Sub-network	75 <sup>th</sup> percentile Rut depth (mm)			Alternate pavement condition metric		
	Baseline	Forecast (funded FWP)	Outcome	Baseline	Forecast (funded FWP)	Outcome
High				<i>Optional: Additional pavement condition metric can be proposed for tracking here.</i>		
Medium						
Low						
Alternate sub-network A	<i>Optional: Separation into sub-networks by ONRC is one useful approach due to alignment of asset management strategy. Any additional (or alternative) approach to defining sub-networks can be proposed for tracking here.</i>					
Alternate sub-network B						
Alternate sub-network C						
NOC SH Network						
National SH Network						

This KPI recognises that the outcomes are the joint accountability of both Client and Contractor, and measures the performance of the underlying contributions from both parties.

Pavement condition is the outcome measure and will be tracked using the annually collected High Speed data (75<sup>th</sup> percentile Rutting) to provide context for the following related measures:

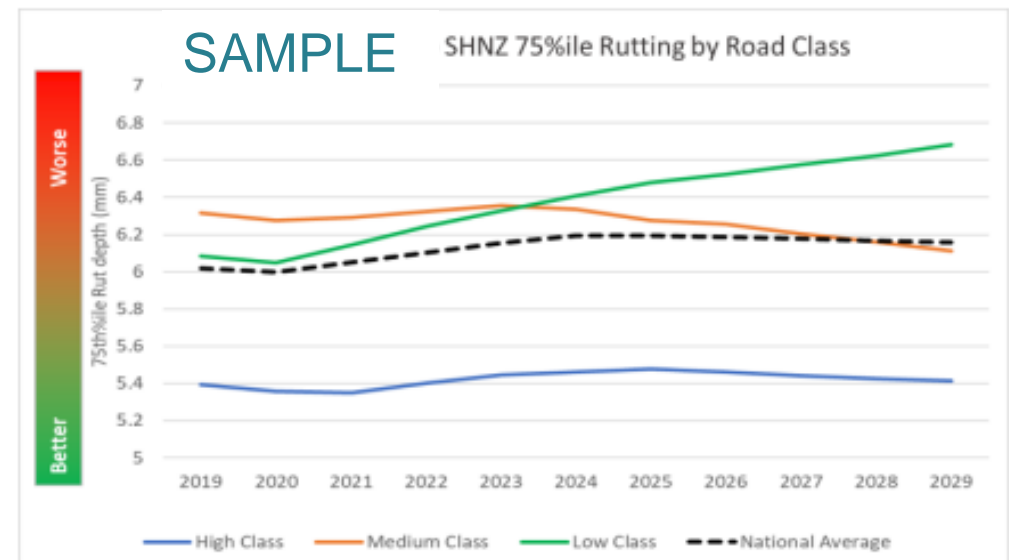
- Achievement of local forecast pavement condition outcomes based on funded FWP
- Fault identification and management
- Ratio of pavement and surfacing maintenance and total Renewal investment
- Stability of pipeline quantities
- Timeliness of funding decisions

The goal of optimising outcomes will be shared by both parties, seeking to deliver to the collaborative intent of the NOC contract.

Development of the key underlying contributions will continue until baseline performance can be understood.

### Achievement of local forecast pavement condition outcomes based on funded FWP

- As part of the Asset management process, Juno viewer is to be used to forecast 75<sup>th</sup> percentile rutting based on funded FWP
- Sub-networks can be identified as necessary (eg ONRC or other relevant local factors)
- The forecast(s) are compared to the HSD rutting measure to assess if the outcome has been achieved or not.
- Variance is analysed for continuous improvement and for development of the measurement system





# Local forecast pavement condition outcomes based on funded FWP

- JunoViewer model
  - Forecast model to determine predicted/forecasted 75th percentile rutting using baseline FWP (Pavement\_Master)
  - Model reset values derived using historical deterioration rates (in progress) at a network specific level
  - dTIMS= optimised programming model based on funding scenarios at a national level
- Data collection and timing
  - HSD
    - Timing of when the truck goes over the network will affect results due to construction timing
  - 75th percentile rutting agreed as metric
  - Potential additional metrics:
    - Roughness (using IRI not NAASRA)
    - Deflection and Curvature
    - Skid Resistance
    - Texture
  - FWP
    - September Baseline vs November Baseline

# Local forecast pavement condition outcomes based on funded FWP

- Assessment timing
  - Annual assessment of condition
    - Comparing the previous year baseline to current year HSD
    - Comparing current year baseline to current year HSD
  - 3 yearly (NLTP period) interpretation of condition
- Optional selection of alternate sub-networks
  - ONF
  - Network
  - National
  - Corridor
  - Other local factors

# Focus: fault identification and management

# Fault identification and management

Sub-network	Baseline Number of faults	YTD Re-calculated Number of faults	Baseline Fault score (aggregation of square meters weighted by severity)	YTD Re-calculated Fault score (aggregation of square meters weighted by severity)	Alternate metric Baseline	YTD Alternate metric re-calculated	
Year 0 reseal sites							
Sub-network A	Optional: Any additional (or alternative) approach to defining sub-networks can be proposed for tracking here.				Optional: Additional fault metric can be proposed for tracking here.		
Sub-network B							
NOC SH Network							
National SH Network							

## Fault identification and management

- Full pavement and surfacing network inspection is completed each year<sup>2</sup>, identifying all pavement and surfacing faults and assigning severity to them in accordance with established industry guidelines
- Faults are entered in RAMM
- High severity faults should be repaired, and preventative maintenance activities carried out to stop low severity issues becoming high severity
- Faults within Year 0 reseal sites are tracked to ensure treatment in advance of sealing
- Percentage of faults removed before the next annual network inspection is tracked, including fault severity
- An Annual Fault score is calculated:
  - based on area and severity of each fault (eg Severity 4 fault measured at 6 square meters, 6 m<sup>2</sup> x 60% = 3.6)
  - aggregated for the network (as well as any identified sub-networks such as ONRC or other local factors if this is seen as useful for the NOC)

	1	2	3	4	5
Weight	0%	10%	20%	60%	100%

- The Annual Fault score is recalculated each year (or more frequently if desired), and tracked over time, and in context of the related measures in this KPI

## NOC teams are invited to:

- Nominate the point in time to capture baseline faults (preferably between construction seasons and while the pavement surface is dry) and contribute to methodology for establishing baseline
- Upload relevant RAMM Contractor extract into Core share (see example below) to enable aggregation of fault data

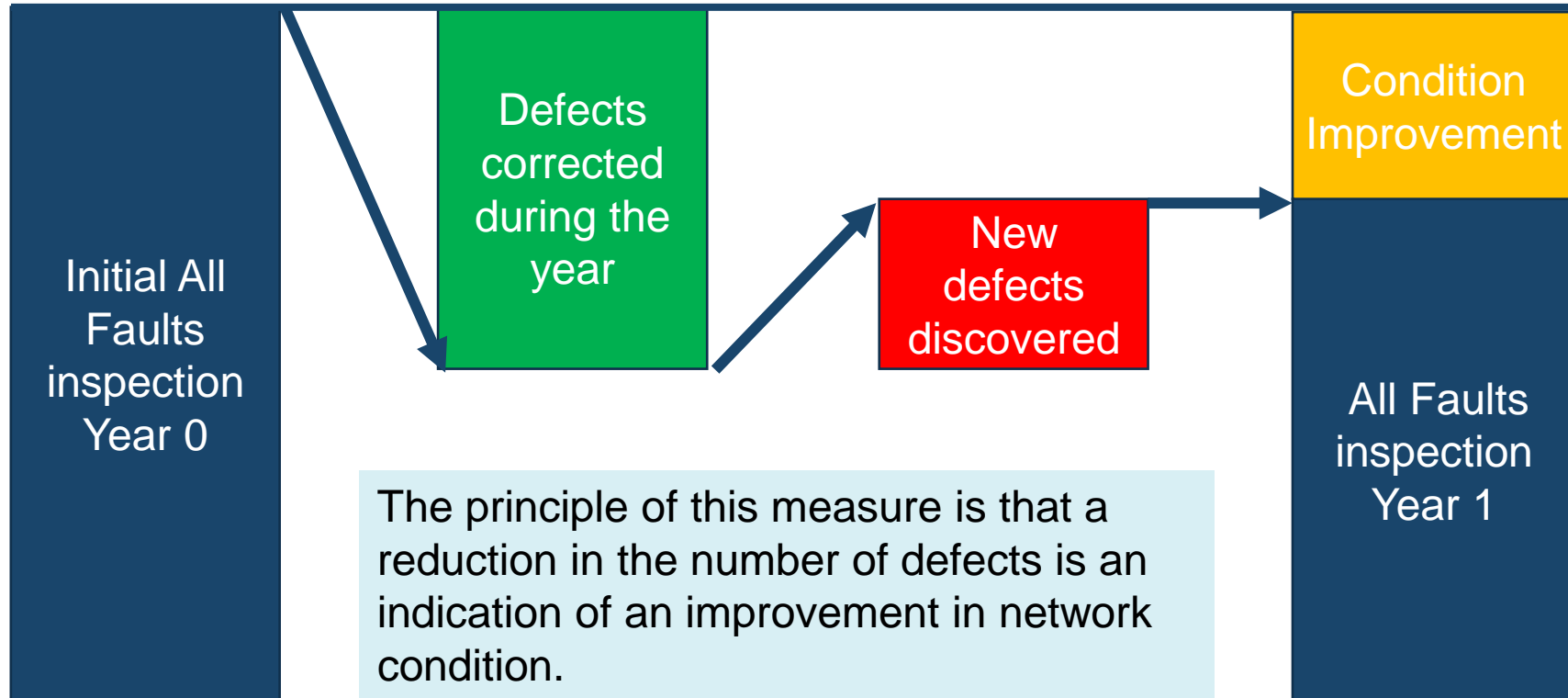
Dispatch	Job Mark	Priority	Fault	Call Statu	Road	Start	End	Leng	Side	Wid	Quantity	Dep
176906	18	4 - OPM Breach	Deformation - Mill and Fill (B)	Entered	123-4567/12.34	1234	5678	15	Right	2	30	100
158734	18	4 - OPM Breach	Deformation - Stabilise 2 Coat (B)	Entered	123-4567/12.34	5432	9876	40	Right	4	160	
176905	17	4 - OPM Breach	Deformation - Mill and Fill (B)	Entered	123-4567/12.34	4321	5555	17	Right	2	14	80
155144	326	3 - Preventive MTC	2nd Coat Seal - Single 3 or 4	Entered	123-4567/12.34	1234	6666	12	Right	2	24	

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# Base Concept

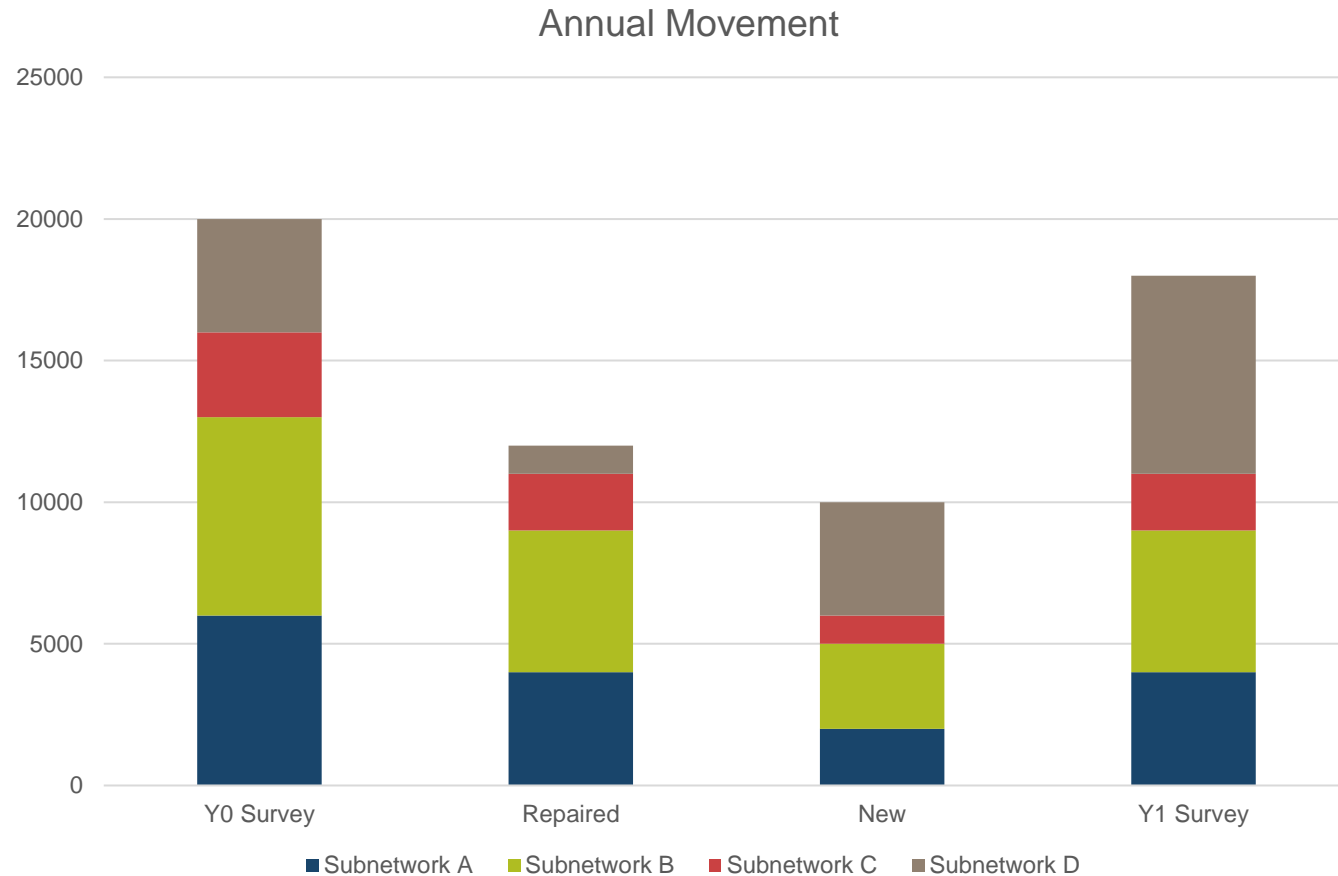


# Challenges

Issue	Solution
Fault Definition	Over time move to RIMS Fault Definitions. In immediate term use established Contractor Definitions.
Detection differences between inspectors	Contractor to manage, potentially with MCM to validate based on a sample. In future move to AI interpretation of video, but keeping AI versions consistent between Y0 and Y1 Surveys
Severity Rating Subjectivity	Contractor to manage, using its MMP processes with spot validation from the MCM
Doing the easy repairs, rather than the important ones	Subnetworks to give visibility of where is the maintenance need and where the maintenance effort is going.

The aim of this process is not to compare between contractors or between networks, but rather how has the subject network performed over the year.

# Acknowledging Road Classifications

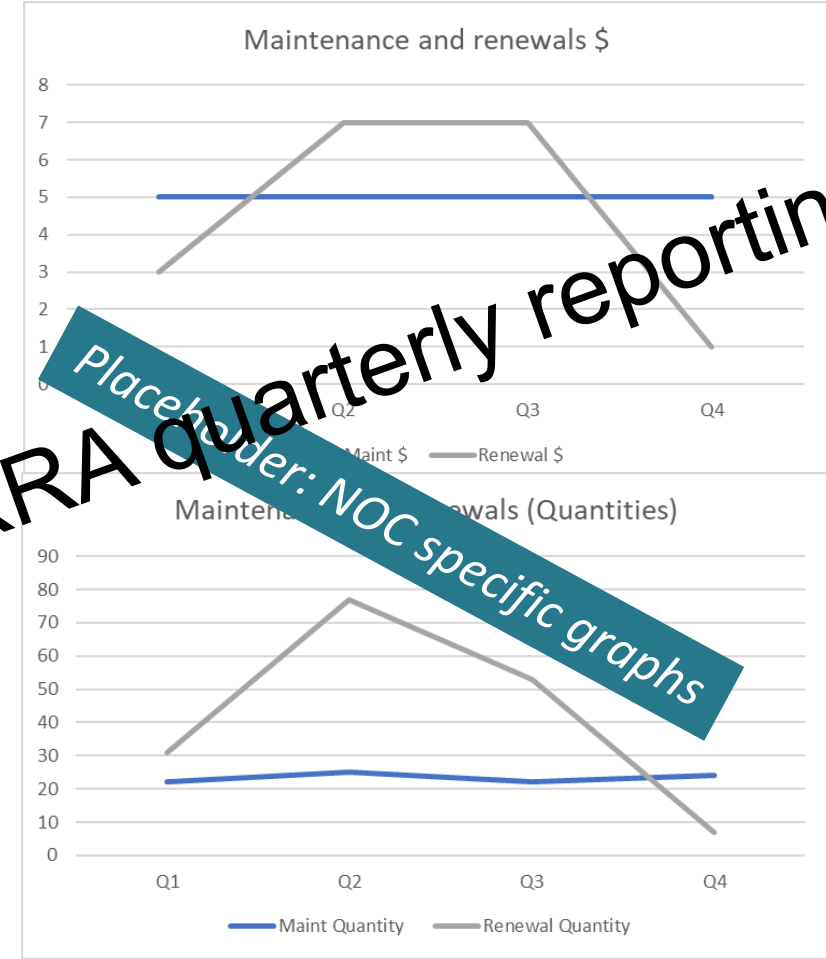


The Intention is to this to become a shared Management Tool, which requires consideration of Road Classification or other form of subdividing the network. Contract Boards to agree the appropriate Subnetworks



# Focus: tracking maintenance and renewal investment

# Tracking of pavement and surfacing maintenance and total renewal investment

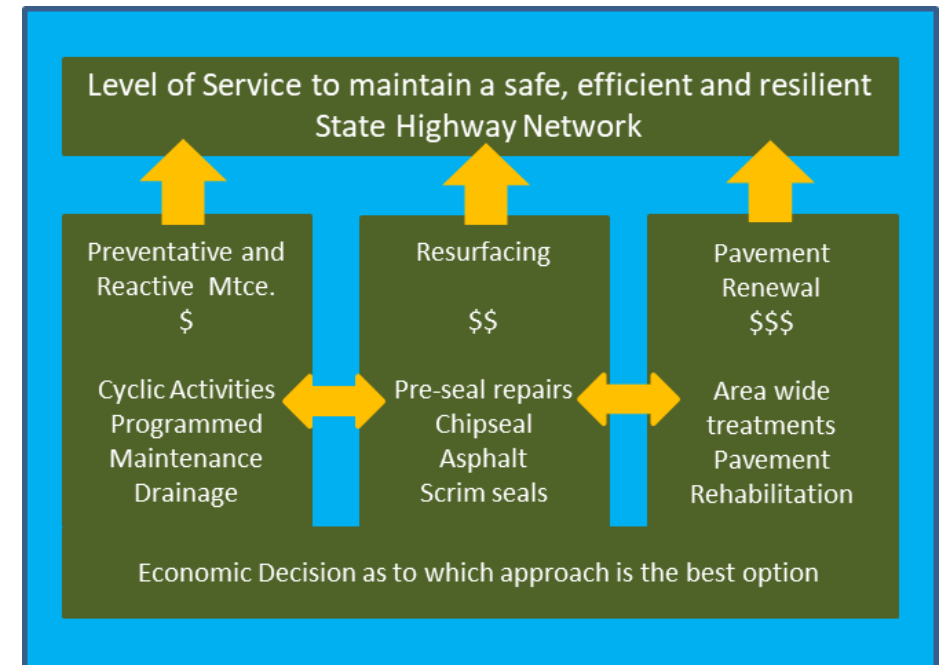
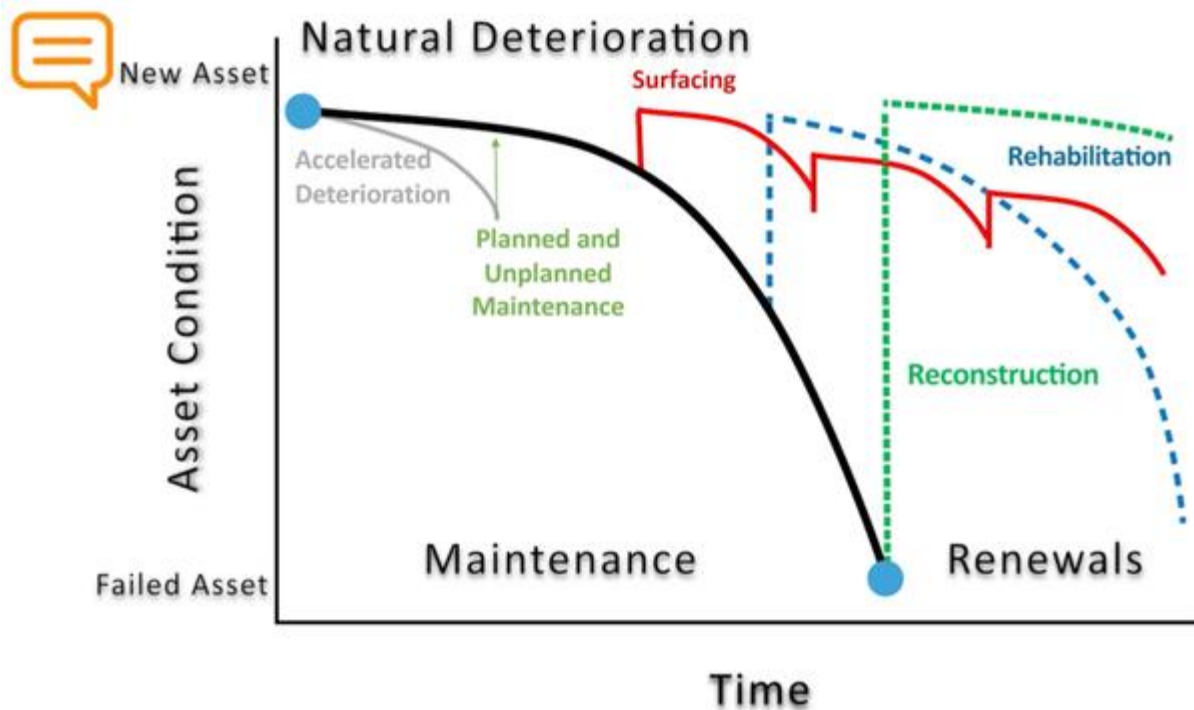
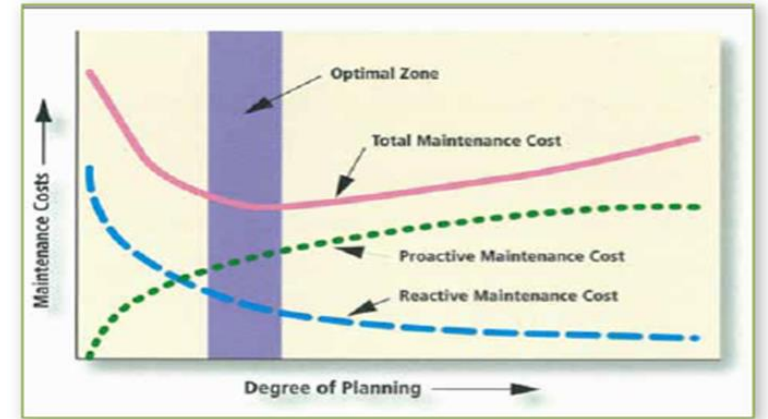


Indicative content included in KRA quarterly reporting

- Tracking of pavement and surfacing maintenance and total Renewal investment
- RAMM will be used to report the value and quantity of Annual surface and pavement maintenance activities
  - Renewal investment will be tracked using both spend (from SAP) and physical quantities (from RAMM)
  - The measures will be tracked together to monitor the levels of maintenance and renewals and how they contribute to pavement condition

# Maintenance and renewal

- Re-use model under development for P&S Lifecycle asset management plan
- Maintenance and renewal options are driven by level of service achievement as well as long term asset preservation



# Intended outcome

Develop greater understanding of:

- how renewals investment and maintenance investment affect one another
- Insight:
  - what good looks like
  - any issues or opportunities

# Focus: stability of pipeline quantities and funding decisions

# Stability of pipeline quantities and funding decisions

Information product and delay/issue	Impact description	Estimated tangible impact on network condition outcomes
SM018 draft release delayed from 6 June till 18 October.	Need to mobilise resources in shortened window and potentially in conflict with other asset mgmt tasks	

Indicative content included in KRA quarterly reporting

- Stability of pipeline quantities and Timeliness of funding decisions
- Waka Kotahi will track pipeline quantities at regional and national level
  - Waka Kotahi will track funding decision making, and communication of funding decisions, mapped against documented timelines
  - Delays will be identified, and consideration given to the downstream impacts or disruption caused and how this effects pavement condition outcomes

KPI 5.3.1 Pavement Condition (joint measure)

# Data collection specifics

- Any arising funding decision delay can be added as a new row to the table:
  - Issue description (either party)
  - Impact description (either party)
  - Estimated tangible impact on pavement condition (supplier)
- Collated in quarterly KRA reports

# Q & A



# Ngā mihi

# Appendices