Road Asset Management (RAM) Maturity Assessment

Presentation of Findings

30 March 2021

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Agenda

30 March 2021

AGENDA

Day 1	30 March (Tuesday) 14:00 -16:40 (China Standard Time)
13:50–14:00	**Join Zoom Meeting**
14:00–14:10	**Opening Remarks** • Dr. Iskandar Abdullaev, CAREC Institute Deputy Director • Mr. Thomas Herz, Transport Specialist, CWTC, Asian Development Bank
	Group photo will be taken after the opening remarks
14:10–14:25	**Introductions**
14:25–14:35	**Overview of process taken and the reason why we have undertaken the maturity assessment (quick refresher)** **Speaker:** Dr. Ian Greenwood, Chartered Professional Engineer, and a Fellow of Engineers New Zealand
14:35–16:05	**Going through the findings of the maturity assessment** 1. ***Overall results*** 2. ***Each stage of the RAM process diagram, including draft improvement actions*** **Speaker:** Dr. Ian Greenwood, Chartered Professional Engineer, and a Fellow of Engineers New Zealand
16:05–16:20	**Presentation of overall improvement plan** 1. ***CAREC wide initiatives*** 2. ***Gaps and priorities for immediate interventions*** **Speaker:** Dr. Ian Greenwood, Chartered Professional Engineer, and a Fellow of Engineers New Zealand
16:20–16:35	**Questions & Answers**
16:35–16:40	**Closing Remarks of Day 1** • Eisa Khan Ayoob Ayoobi, CAREC Institute, Head of Capacity Building Division

Overview of Project and Process

10mins

What the Project is Aiming to Achieve

The main objectives of this activity are:

- to conduct diagnostic assessment of all CAREC countries RAM systems in a Training of Trainer (ToT) mode and to produce a RAM maturity assessment framework (in collaboration with CAREC countries RAM leading experts) appropriate to CAREC countries
- to identify priority gaps for immediate capacity building activities
- to provide a holistic direction for design and delivery of systematic and cascading capacity building interventions based on high priority needs to raise the level of RAM practices across the CAREC region
- to adopt the RAM framework to benchmark RAM practices across the CAREC region

Overall Project Timeline

- Training of Trainers workshop
  - 10th Feb (7 weeks ago)
  - Introduced the process and the assessment template
- Weekly follow-up sessions to resolve any questions
- One-on-one sessions on an as-requested basis

- Completed Maturity Assessment templates submitted to Ian & CAREC Institute for analysis

ToT Participants

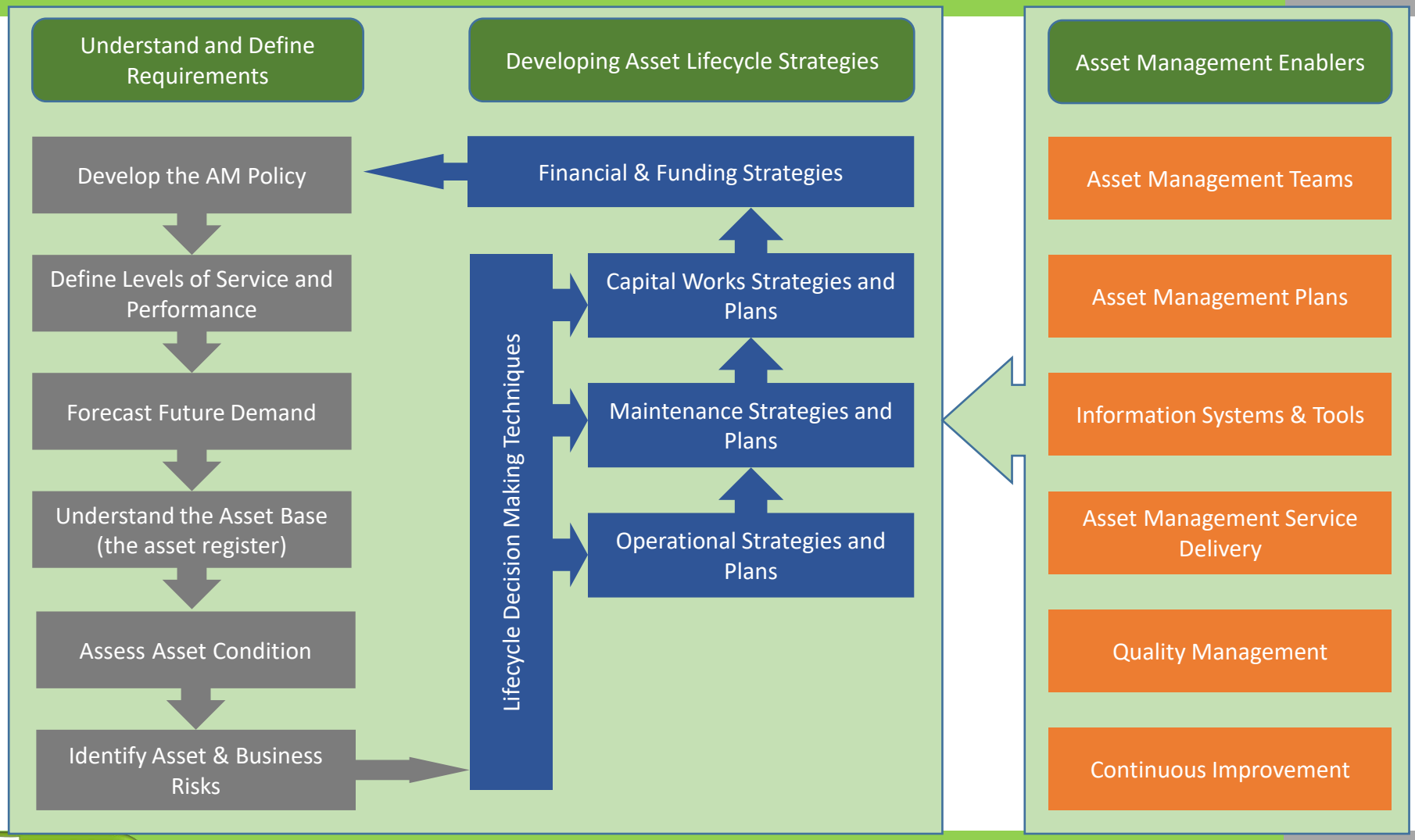
- A massive thankyou to all who participated
- You became very much part of the project team, not just participants at a workshop
- What we have achieved is only through your endeavours

Definitions of Asset Management

- "The combination of management, financial, engineering, economic and other practices applied to physical assets with the objective of providing the required level of service in the most cost effective manner." (IIMM 2011)

- "A systematic process of operating, maintaining and upgrading transportation assets cost-effectively, by combining engineering practices and analysis with sound business practice and economic theory. Also, the management of the physical infrastructure such as pavements, bridges, and airports, as well as human resources (personnel and knowledge), equipment and materials, and other items of value such as financial capabilities, right-of-way, data, computer systems, methods, technologies, and partners." (AASHTO)

International Infrastructure Management Manual (IIMM) AM Process



Same Process, Different Focus

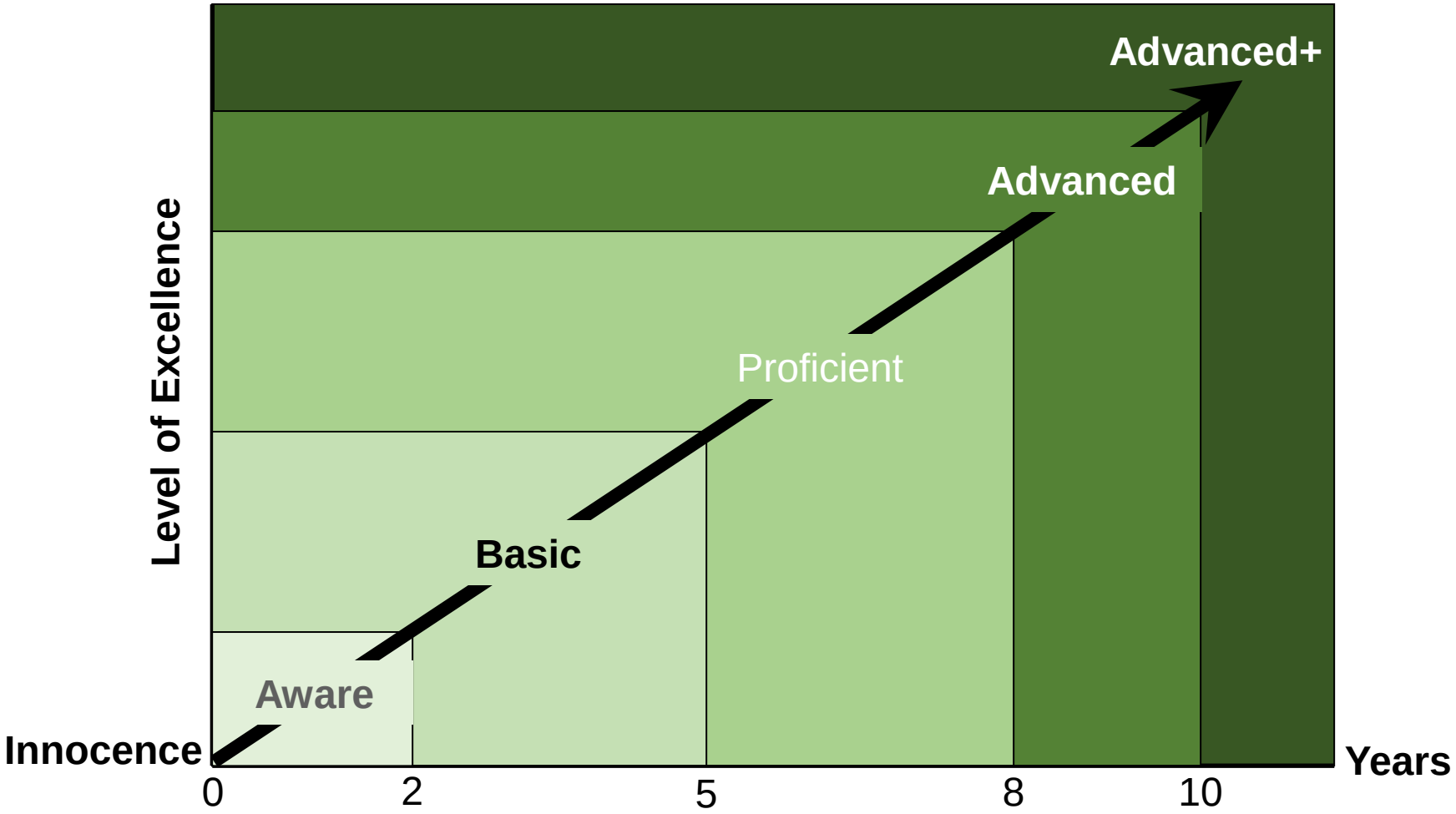
- RAM process can be the same across all road hierarchies, and across all of CAREC nations
- It is the level of detail that changes within each step of the process
  - A road network in a mountainous region will naturally have a greater focus on the identification and management of risks than a road network in a stable plains region
  - An urban network with high growth will be more concerned about forecasting future demand, than will a low growth rural network
  - High volume national highways will naturally be managed at a greater level of effort than minor country lanes
- Don't change the process, change the level of depth you go into each step of the process

Assessment Scale

- 0 = Aware
- 1 = Basic
- 2 = Proficient
- 3 = Advanced
- 4 = Advanced+

- Goal is to ensure at least proficiency across all aspects of RAM within 5-10 years

Indicative Timeline



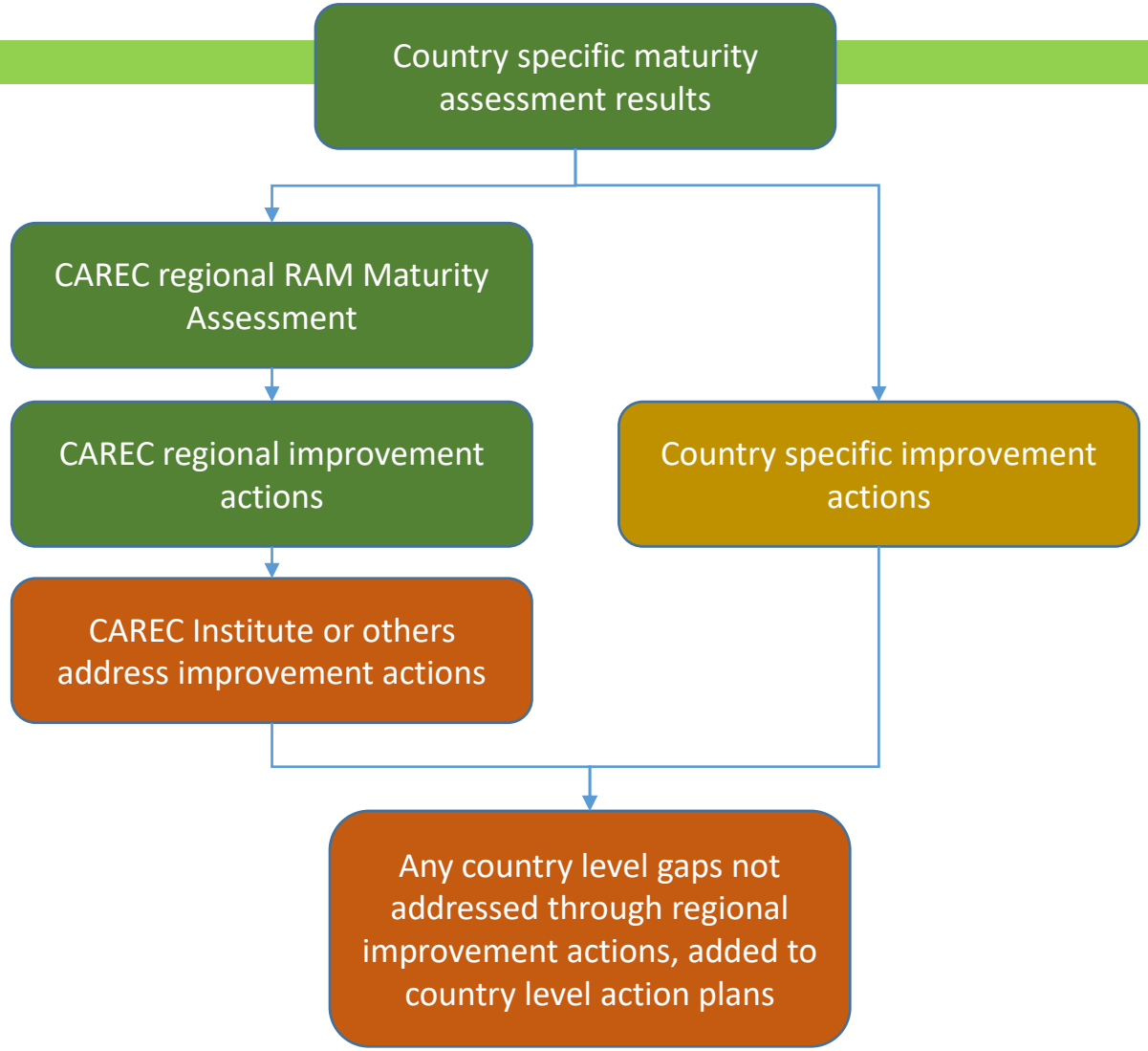
Source: Dr C. Bennett

Improvement Actions

Completed

Completed

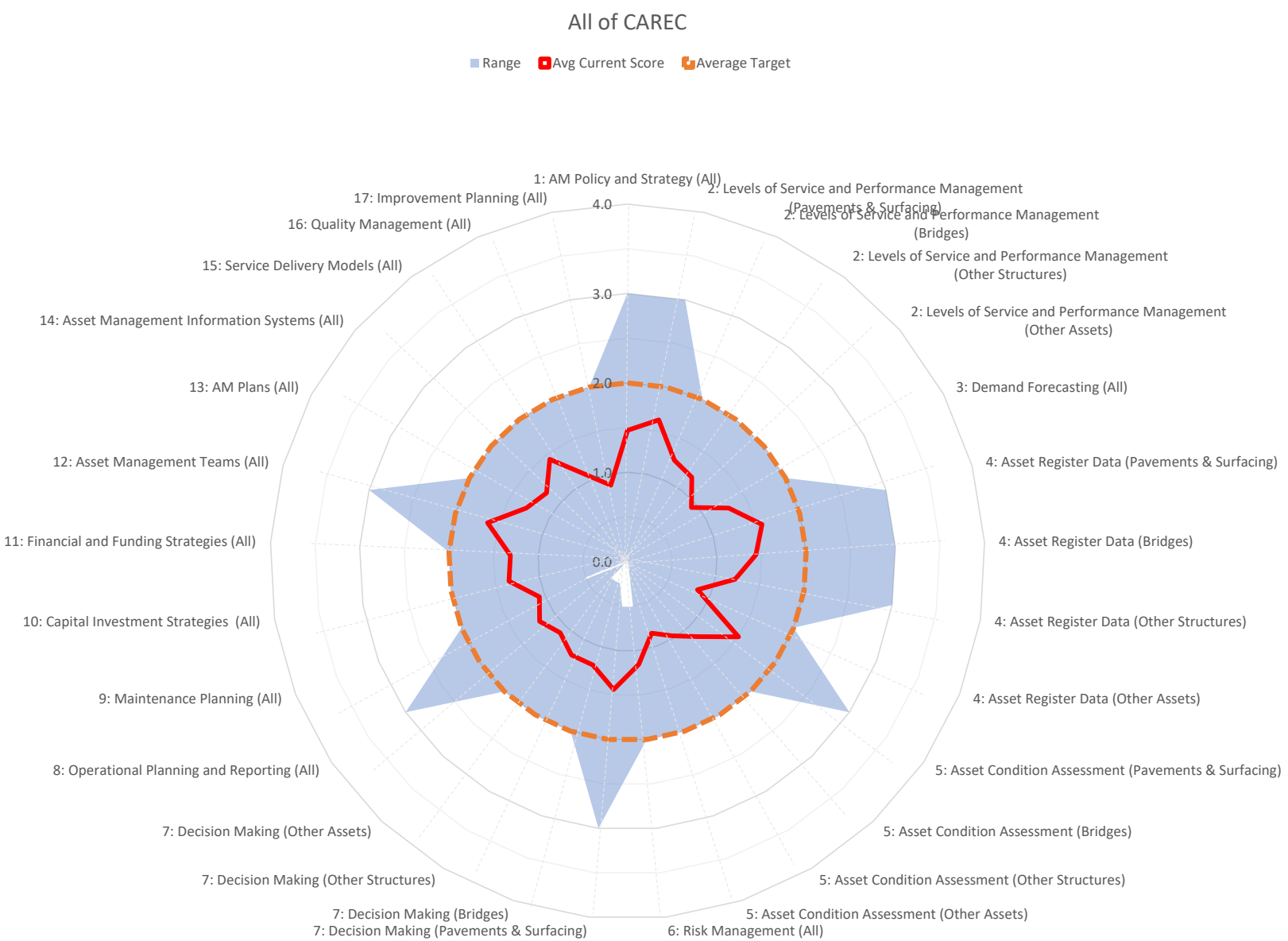
Drafted for discussion

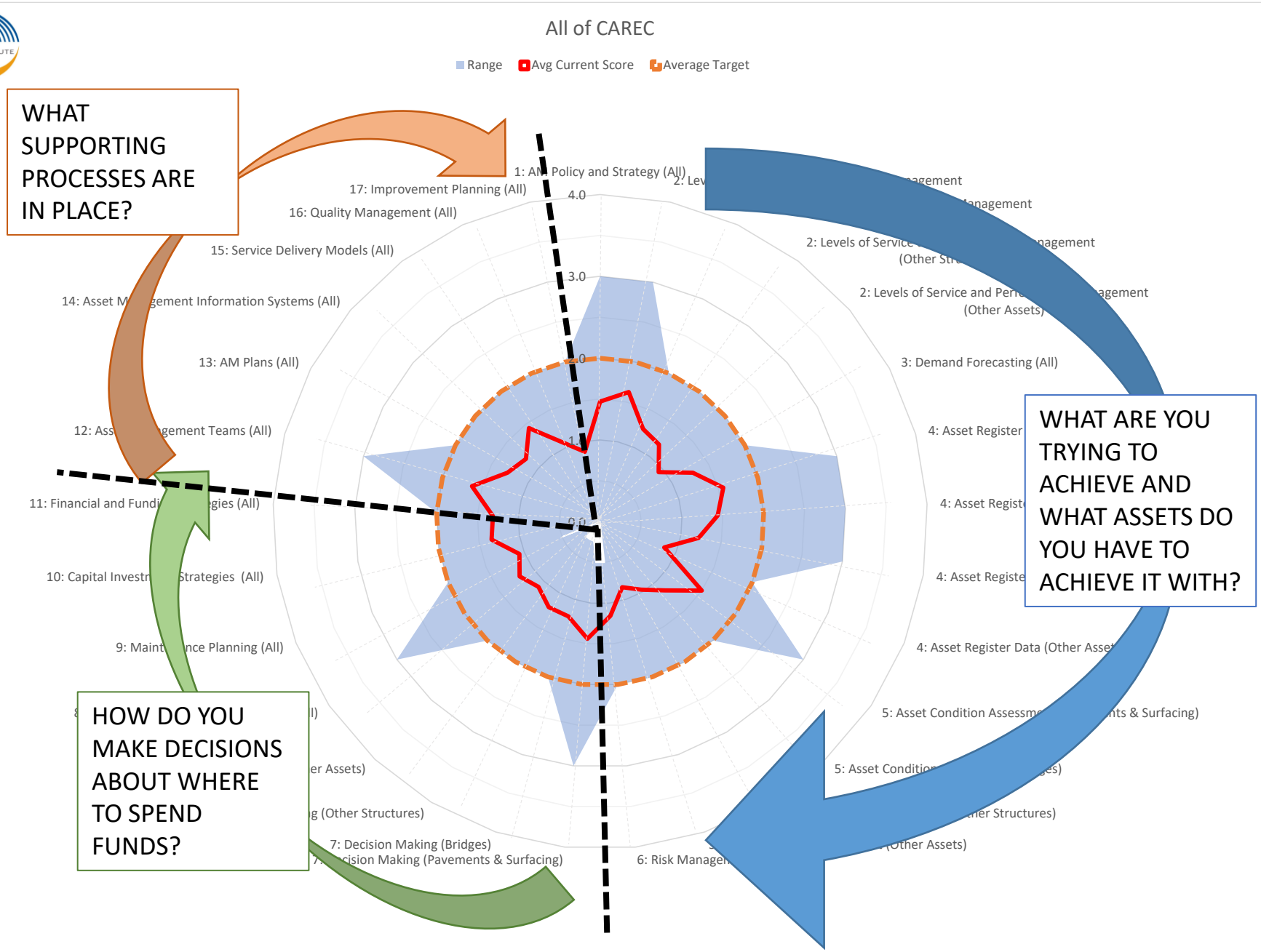


The Findings

Participation

Country	Participated in Workshops	Submitted Template
Afghanistan	✓	✓
Azerbaijan	✓	-
China	✓	✓
Georgia	✓	✓
Kazakhstan	✓	✓
Kyrgyz Republic	✓	✓
Mongolia	✓	?
Pakistan	✓	✓
Tajikistan	✓	✓
Turkmenistan	✓	✓
Uzbekistan	-	-


All of CAREC
Range
Avg Current Score
Average Target
1: AM Policy and Strategy (All)
2: Levels of Service and Performance Management (Pavements & Surfacing)
2: Levels of Service and Performance Management (Bridges)
2: Levels of Service and Performance Management (Other Structures)
2: Levels of Service and Performance Management (Other Assets)
3: Demand Forecasting (All)
4: Asset Register Data (Pavements & Surfacing)
4: Asset Register Data (Bridges)
4: Asset Register Data (Other Structures)
4: Asset Register Data (Other Assets)
5: Asset Condition Assessment (Pavements & Surfacing)
5: Asset Condition Assessment (Bridges)
5: Asset Condition Assessment (Other Structures)
5: Asset Condition Assessment (Other Assets)
6: Risk Management (All)
7: Decision Making (Pavements & Surfacing)
7: Decision Making (Bridges)
7: Decision Making (Other Structures)
7: Decision Making (Other Assets)
8: Operational Planning and Reporting (All)
9: Maintenance Planning (All)
10: Capital Investment Strategies (All)
11: Financial and Funding Strategies (All)
12: Asset Management Teams (All)
13: AM Plans (All)
14: Asset Management Information Systems (All)
15: Service Delivery Models (All)
16: Quality Management (All)
17: Improvement Planning (All)
4.0
3.0
2.0
1.0
0.0


All of CAREC
Range
Avg Current Score
Average Target
WHAT SUPPORTING PROCESSES ARE IN PLACE?
WHAT ARE YOU TRYING TO ACHIEVE AND WHAT ASSETS DO YOU HAVE TO ACHIEVE IT WITH?
HOW DO YOU MAKE DECISIONS ABOUT WHERE TO SPEND FUNDS?
1: AM Policy and Strategy (All)
2: Levels of Service and Performance Management (All)
3: Demand Forecasting (All)
4: Asset Register Data (All)
5: Asset Condition Assessment (All)
6: Risk Management (All)
7: Decision Making (Bridges)
8: Decision Making (Pavements & Surfacing)
9: Maintenance Planning (All)
10: Capital Investment Strategies (All)
11: Financial and Funding Strategies (All)
12: Asset Management Teams (All)
13: AM Plans (All)
14: Asset Management Information Systems (All)
15: Service Delivery Models (All)
16: Quality Management (All)
17: Improvement Planning (All)
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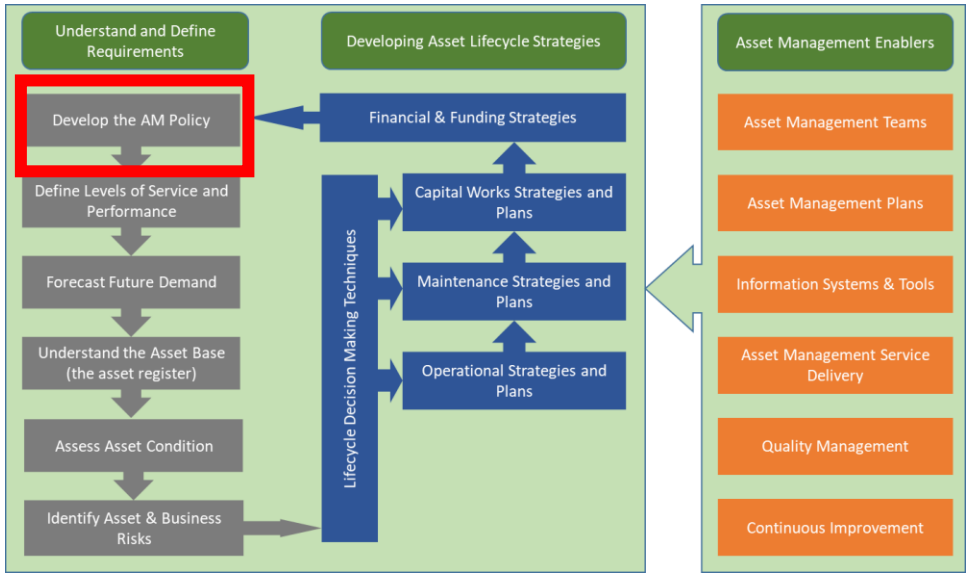
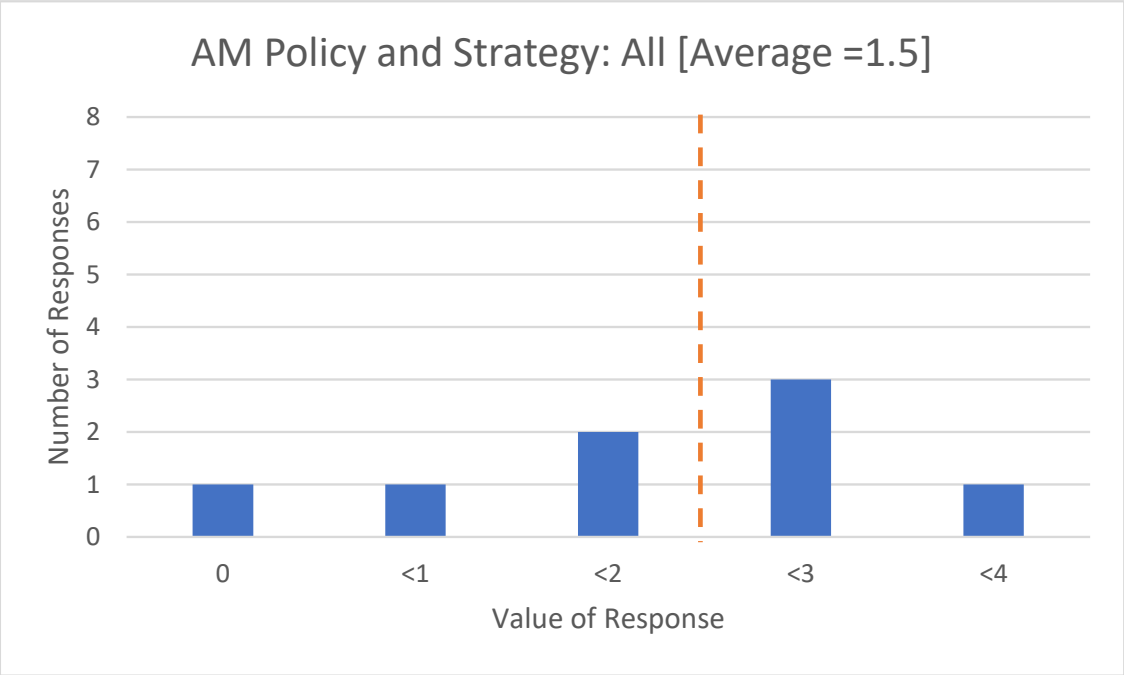
AM Policy

- The AM Policy provides the authority to implement all aspects of the RAM program
  - Provides a tangible commitment to RAM in its full context

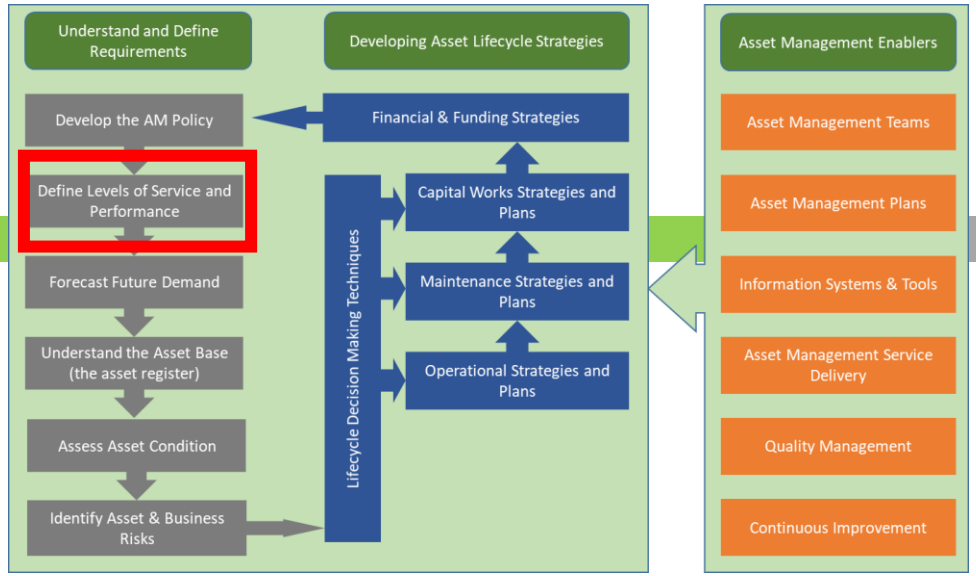


AM Policy

- Half the responses scored above 2 which is a good result
- However with an average of 1.5, there remains work to improve this aspect
- Improvement Action: Develop a RAM policy template

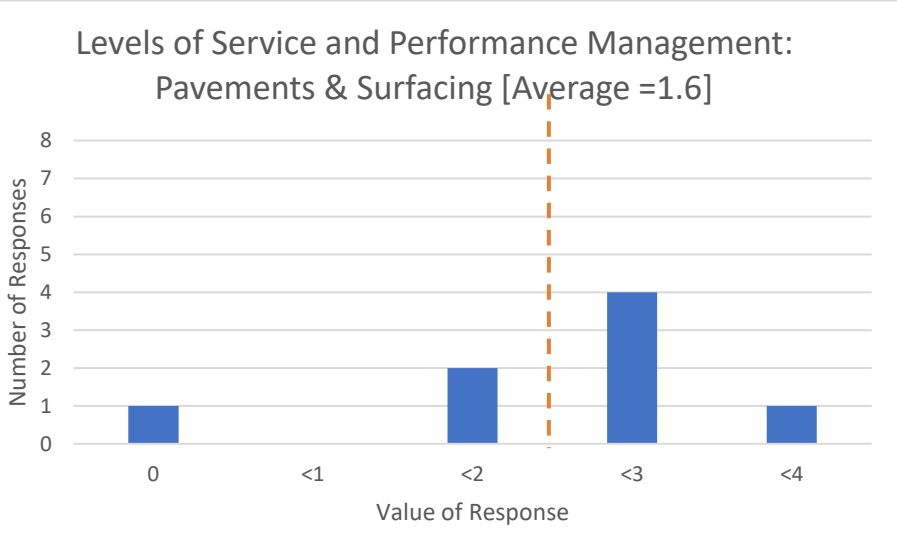


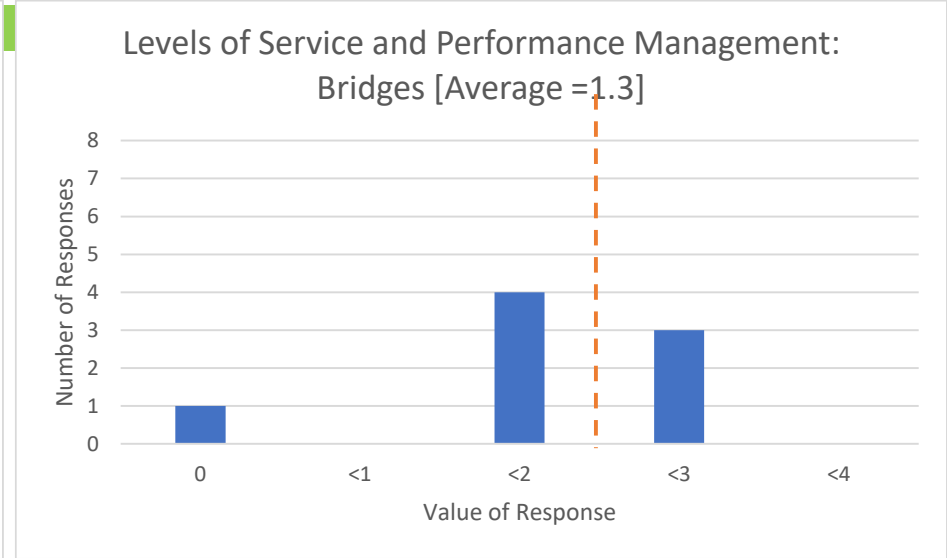
Service Levels

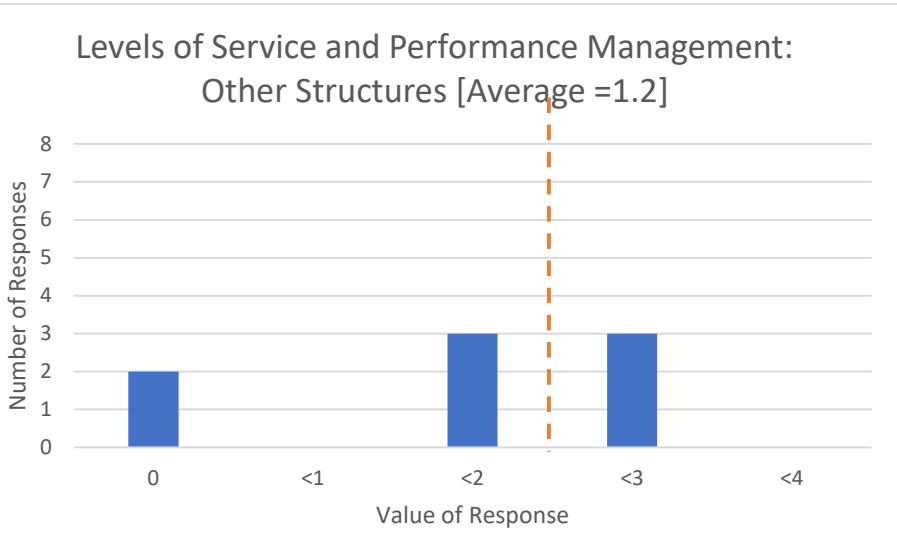


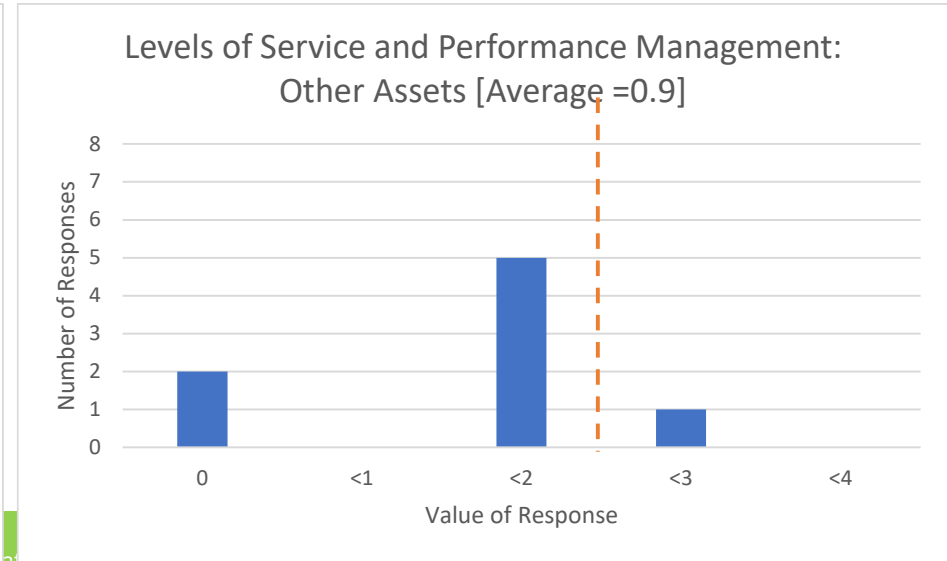
- Define what it is that you are trying to deliver, in words that the customer understands
- We don't build roads, rehabilitate roads, or maintain roads for the fun of it, we do that to deliver a service level (whether explicitly stated or not)
- Service levels are about more than just the condition of the road
  - Most authorities mention Efficient, Safe, Informed, Cost-effective in their service level statements

Service Levels









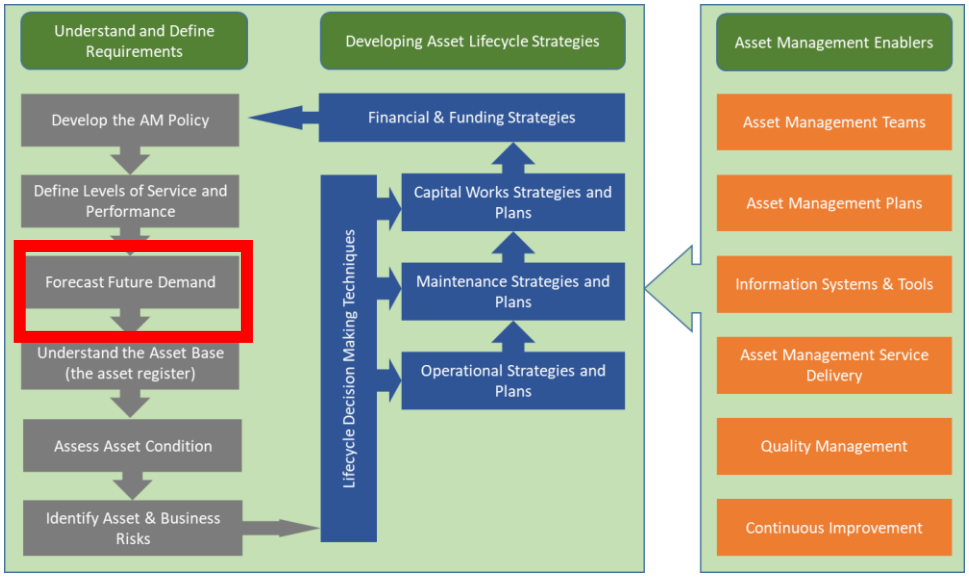
Service Levels

- Service levels for Pavements and surfacing was highest rated of all aspects of RAM
  - But still averaging below 2
- Service levels for other asset types much less advanced
- Results are consistent with international experience

- Improvement action: Developing a range of service level indicators and performance measures for all asset types that countries can adopt if desired

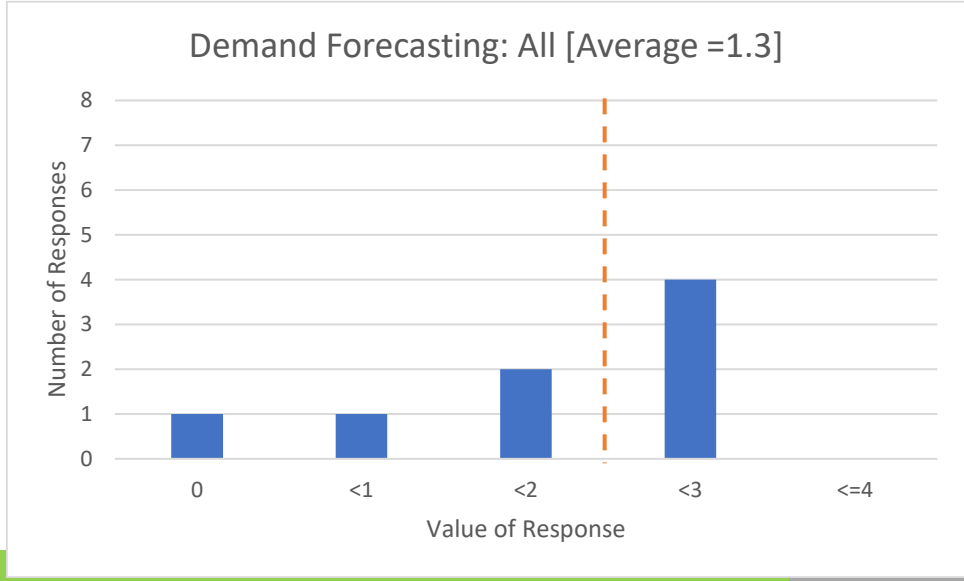
Future Demand

- Helps identify when expansion works will be required, along with future loading on the existing infrastructure.



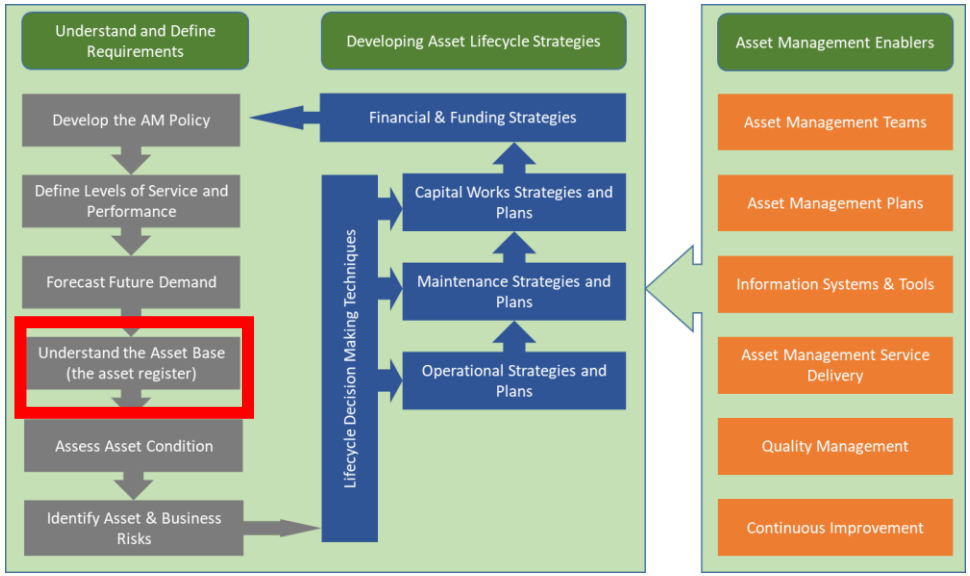
Future Demand

- For many, there is significant scope to look further at how demand may change in the future.
- A comprehensive network level traffic counting and axle load monitoring program would be a good advance
- Improvement Action: Develop a TOR for the development of a network level traffic monitoring program

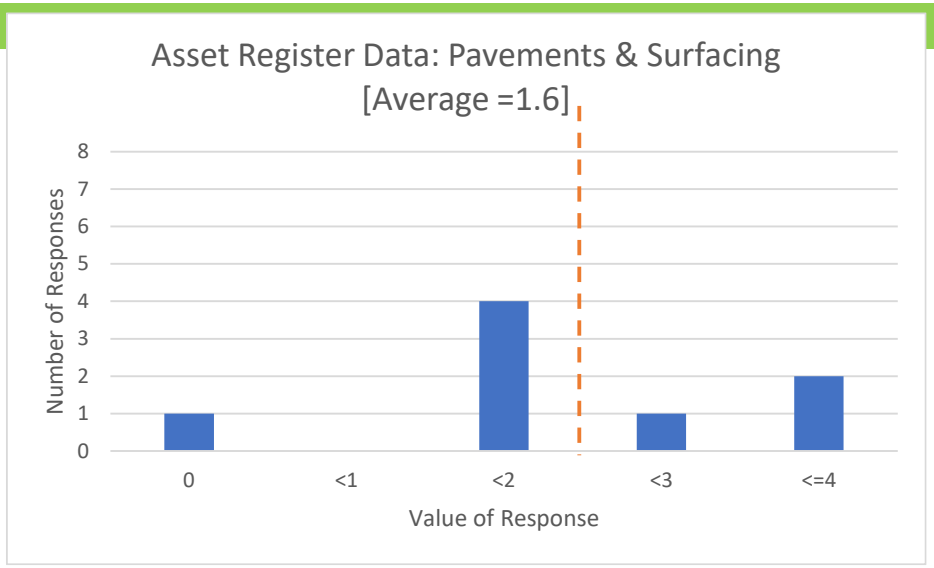


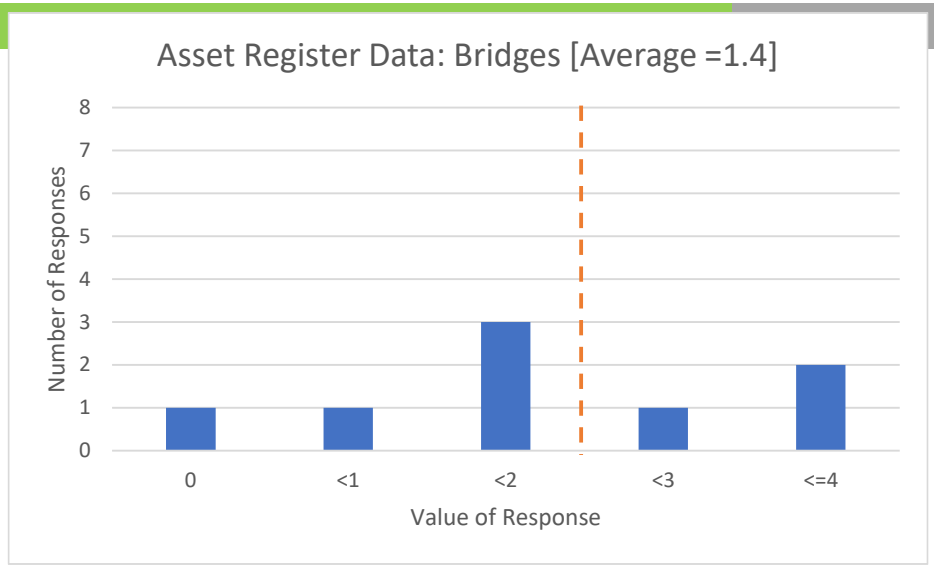
Asset Register

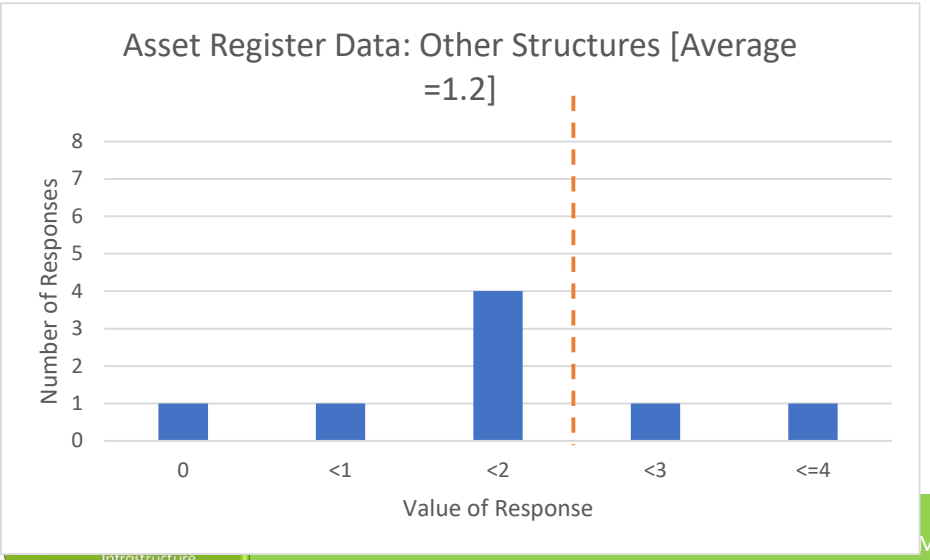
- List of the physical assets you have
- At an appropriate level of detail / componentisation

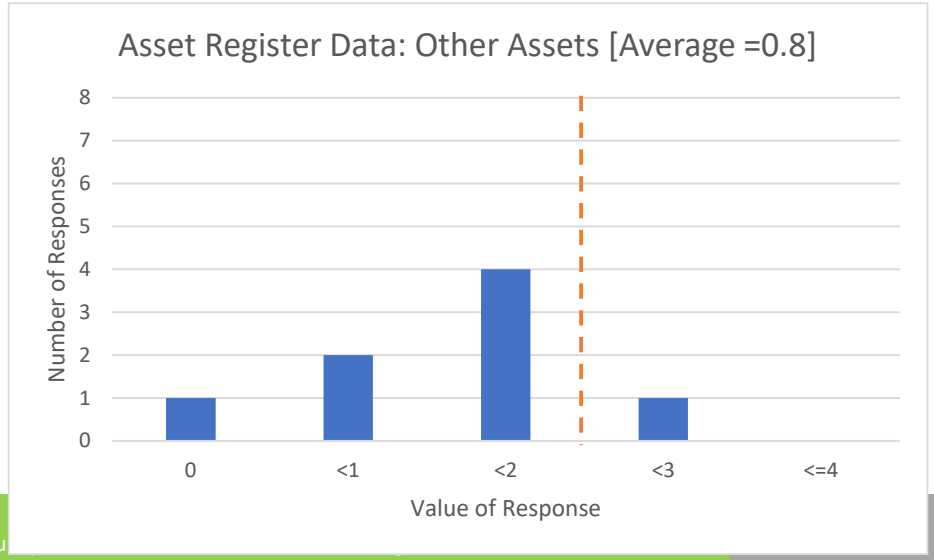


Asset Register









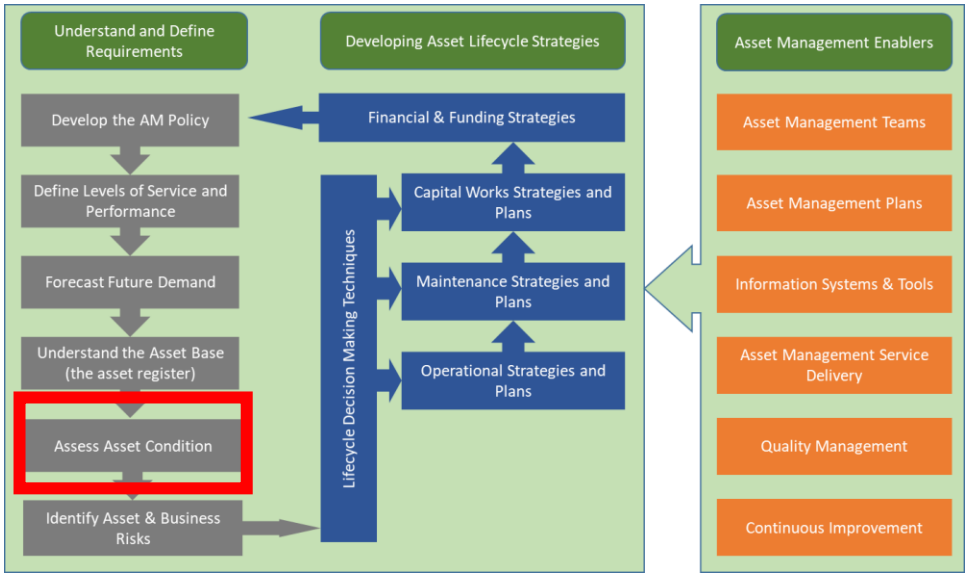
Asset Register

- Significant gaps in knowing what assets exist
- Makes determining long term budget needs very difficult
- Not able to complete reliable asset valuations

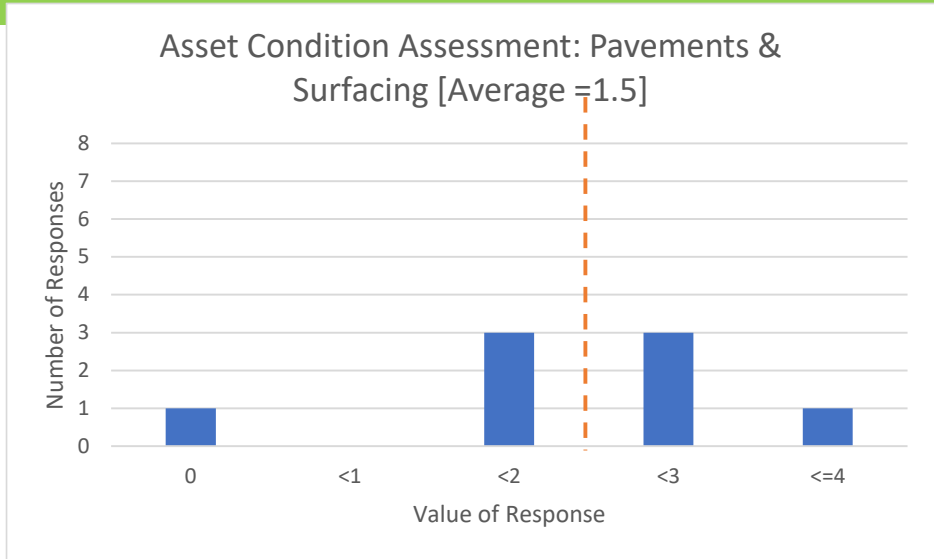
- Improvement Action: Develop guidance on minimum data to be collected for major asset types.

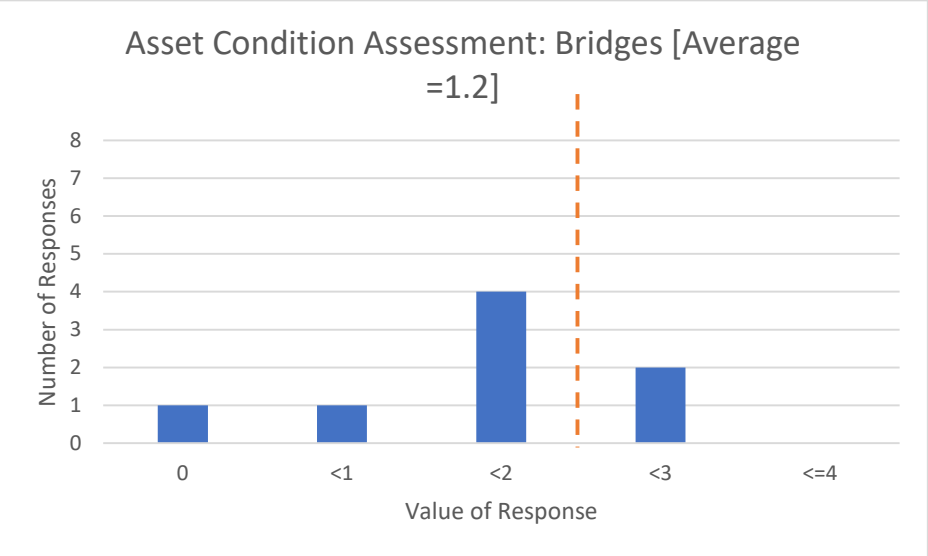
Asset Condition

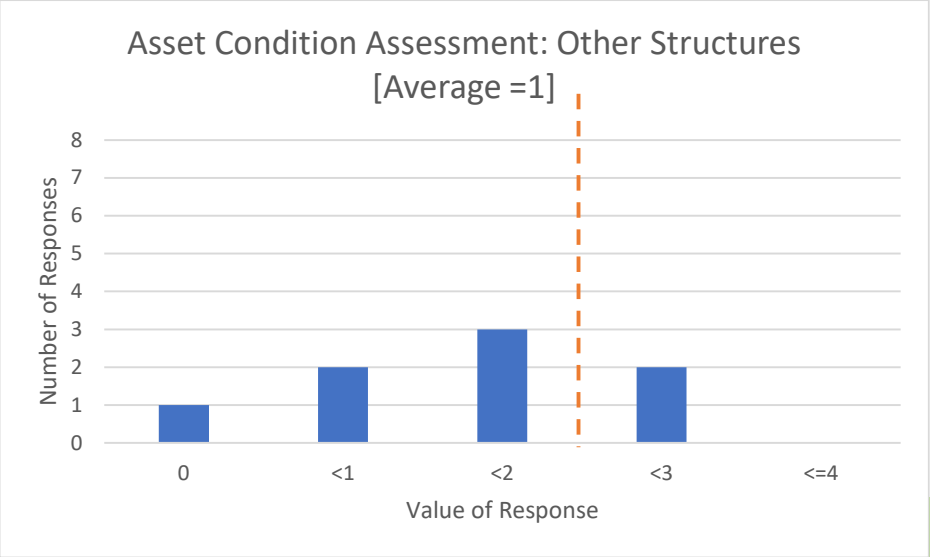
- Physical measure of the asset condition

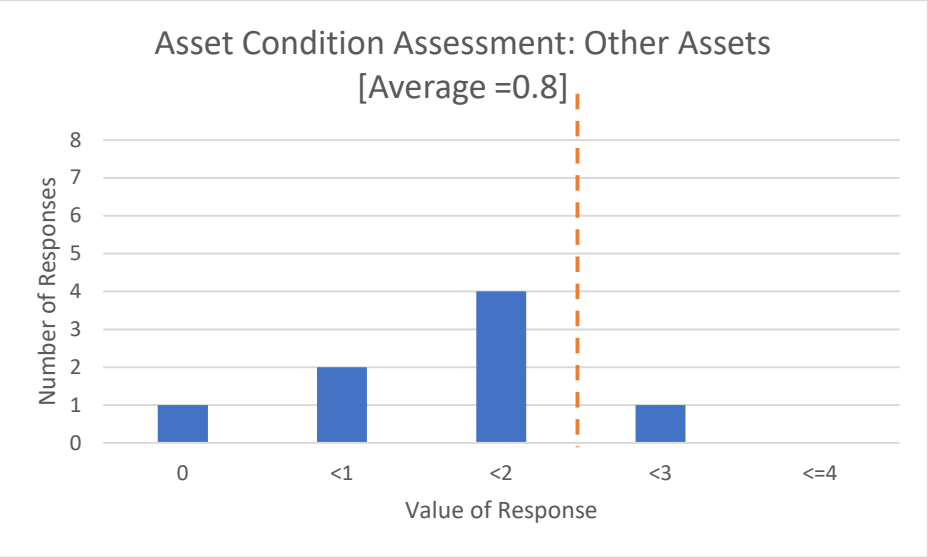


Asset Condition









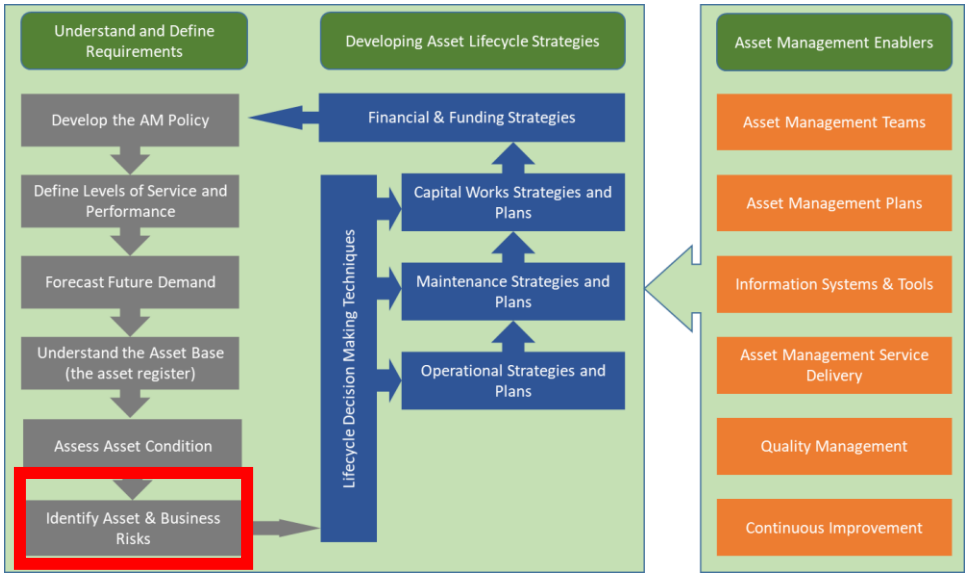
Asset Condition

- Similar trend to Levels of Service and Asset Registry
  - And as expected based on international experience

- Improvement Action: Develop guidance on recommended data collection for major asset types (what to collect and how often)

Risk

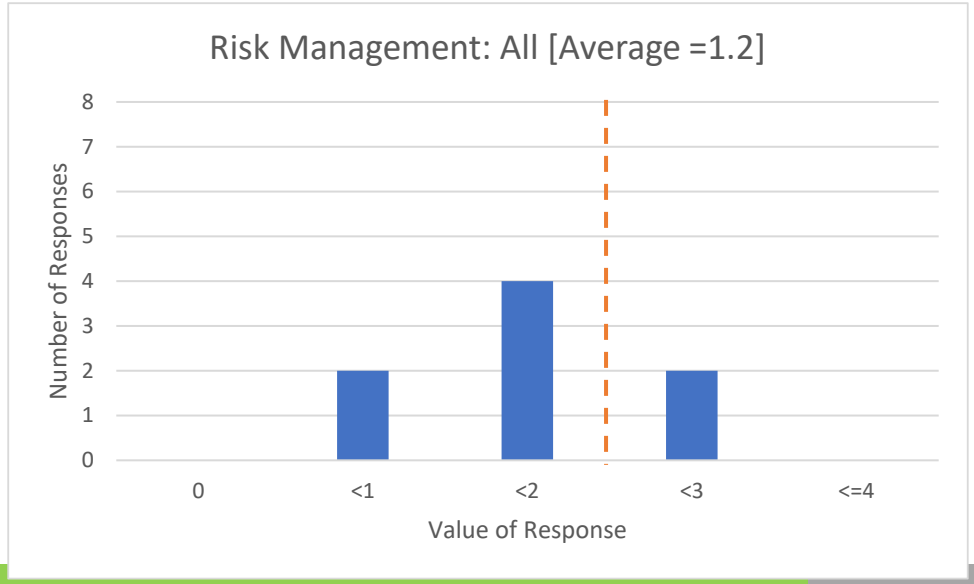
- Depends heavily on the nature of your road network
- May have an understanding of the risk, although it may not be in a formal process



Risk

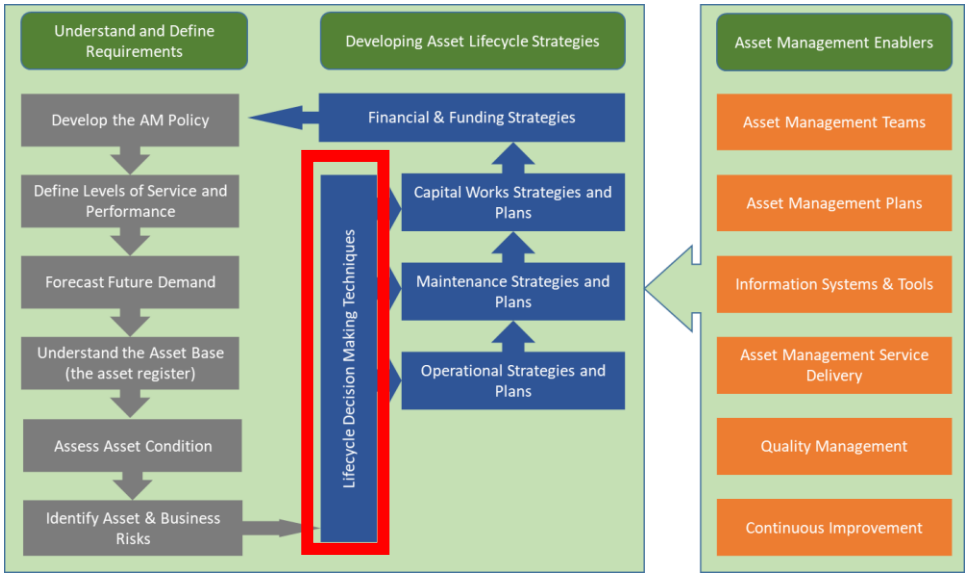
- While risk is understood and addressed from a practitioner perspective, there isn't a well structured approach to risk management.

- Improvement Actions: Develop guidance on defining route criticality, and a risk management framework

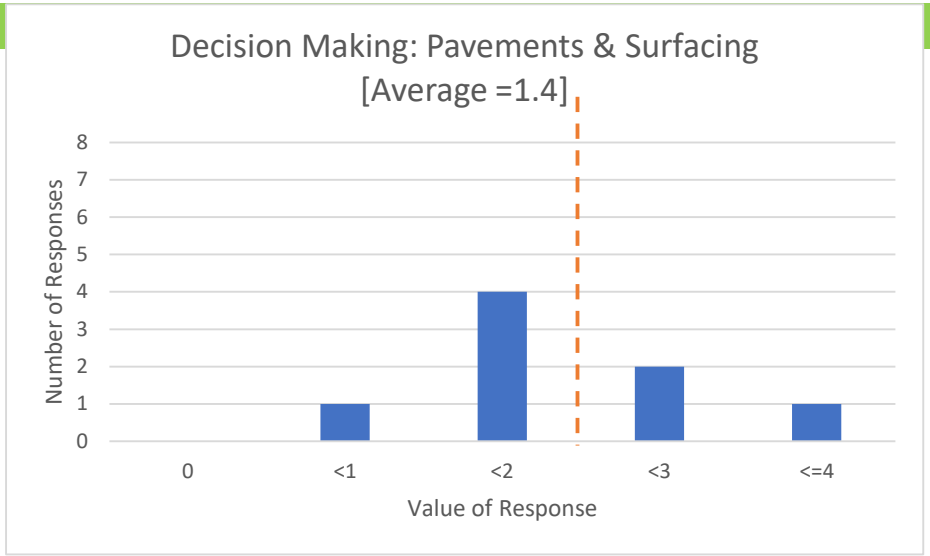


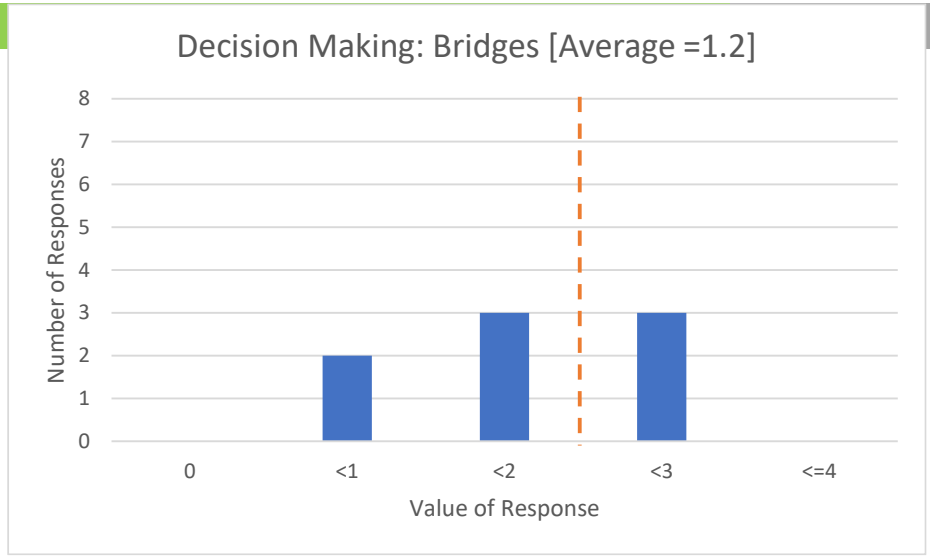
Lifecycle Decision Making

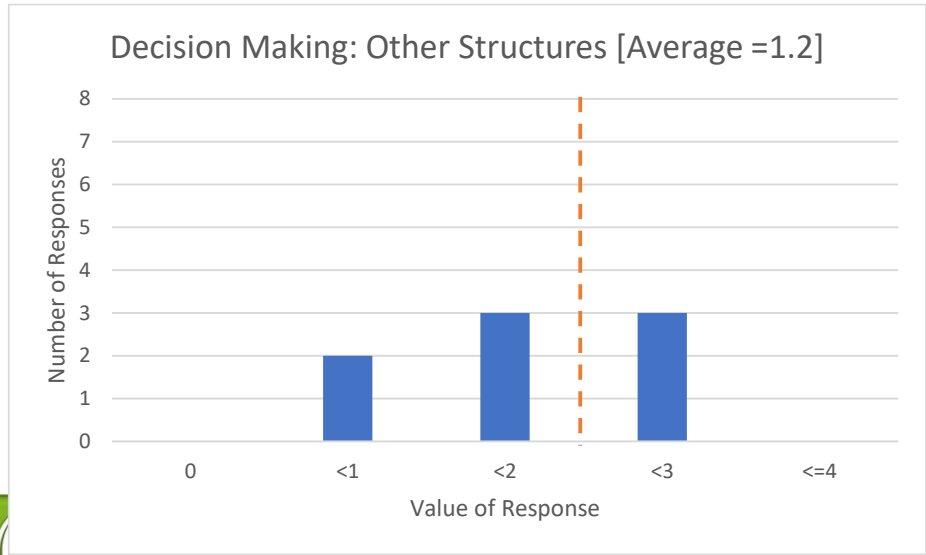
- What techniques are used to determine where to invest available funds

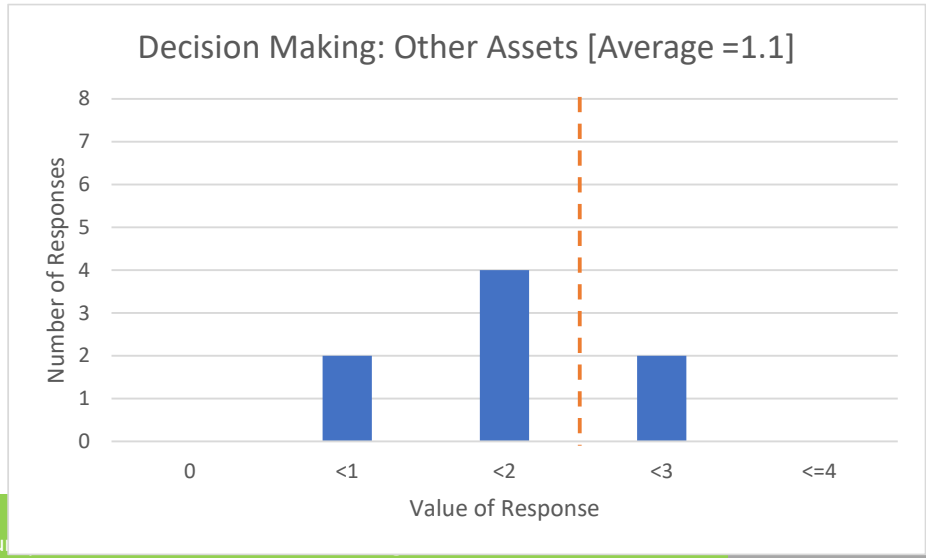


Lifecycle Decision Making









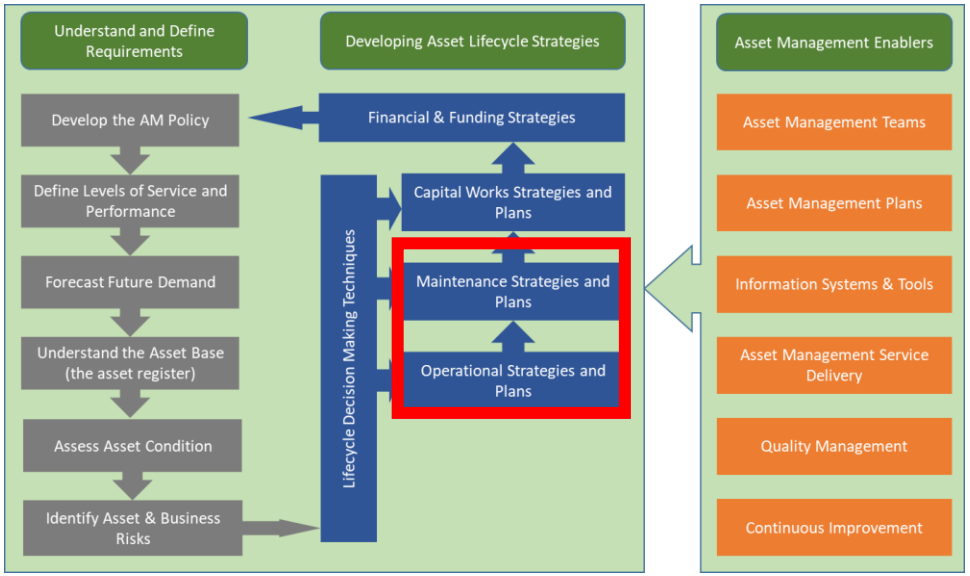
Lifecycle Decision Making

- Following international trends, decision making is generally better for pavements and surfacings, and of lesser quality for the other (less critical) assets.

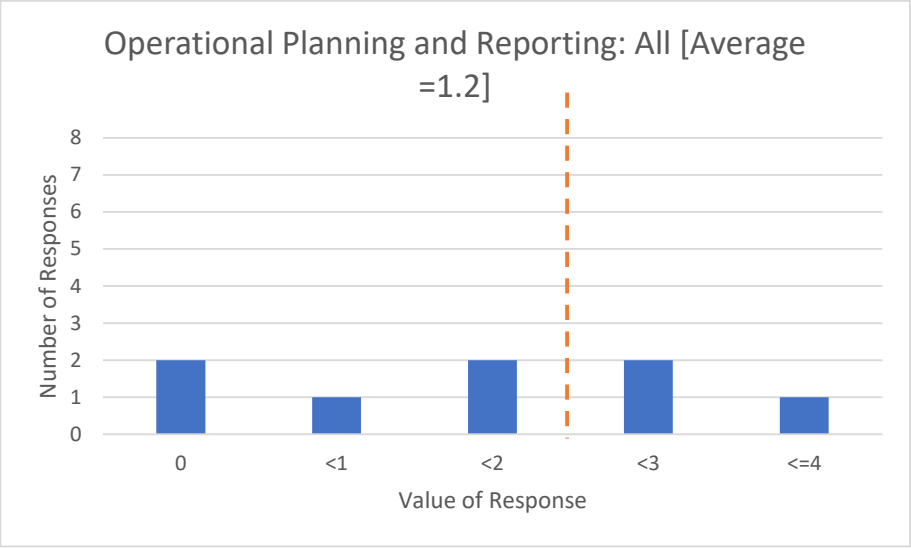
- Improvement Action: Ensure that investment decisions are aligned with RAM Policy, and appropriately utilize maintenance cost data to generate lifecycle cost forecasts.

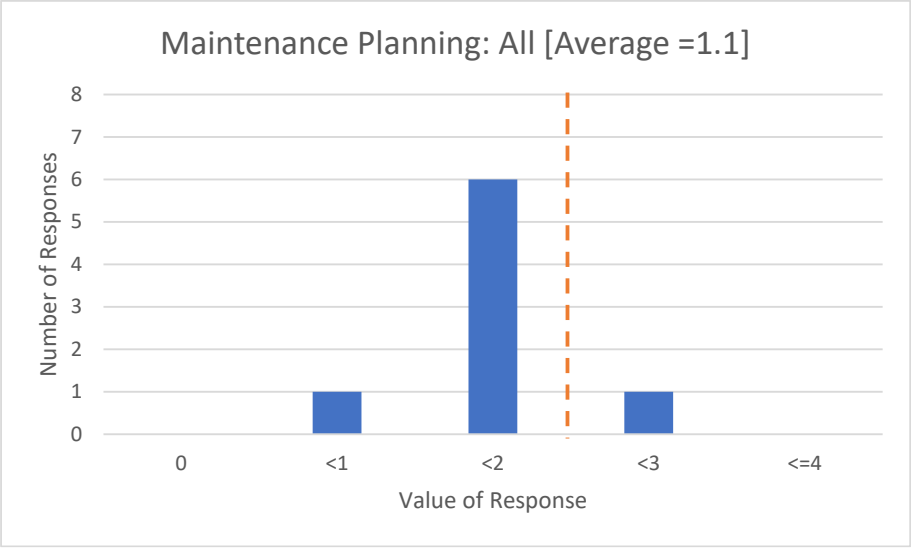
Operations & Maintenance

- Operations and Maintenance (O&M) covers the day-to-day activities
  - Operations: e.g. Ramp signalling, peak hour pricing
  - Maintenance: Filling potholes, cleaning drains, sealing cracks



Operations & Maintenance

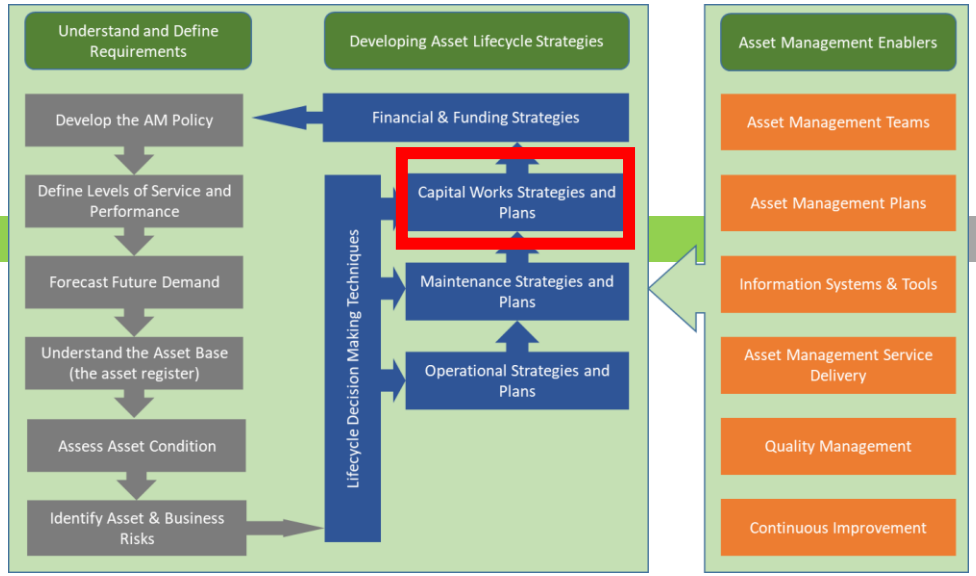




- Operations – Improvement Action: Assistance in developing emergency response plans.

- Maintenance – Improvement Action: Business case for increasing maintenance funding

Capital Works

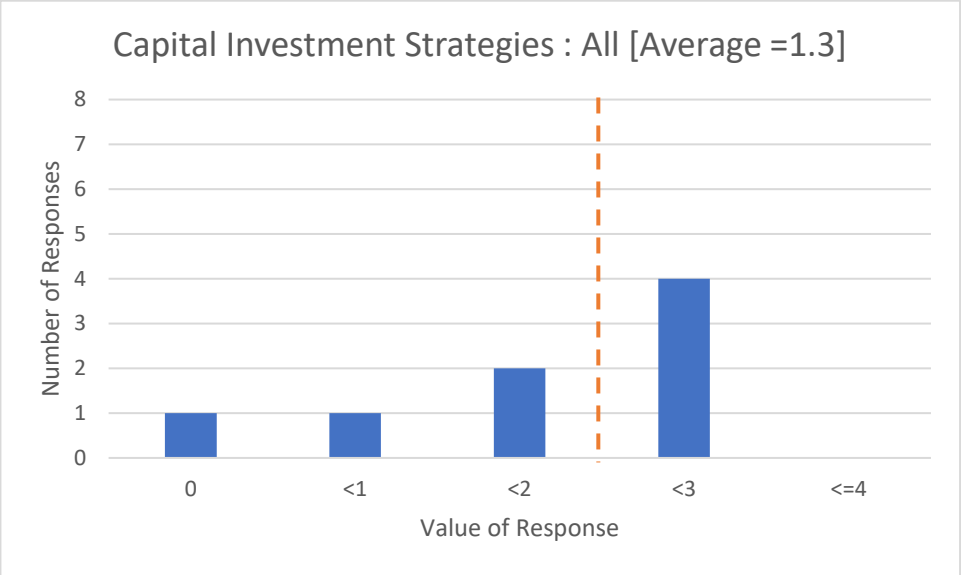


- Typically two aspects:
  - Renewals
  - Expansion works

  - Renewals
    - Quantity estimated through a combination of predictive modelling (HDM-4), historic records, and asset valuation parameters
    - While impacting on the long term durability of the network, many renewals (especially resurfacings) do not impact significantly on the road users experience
  - Expansion works
    - From traffic modelling, road safety investigations or similar

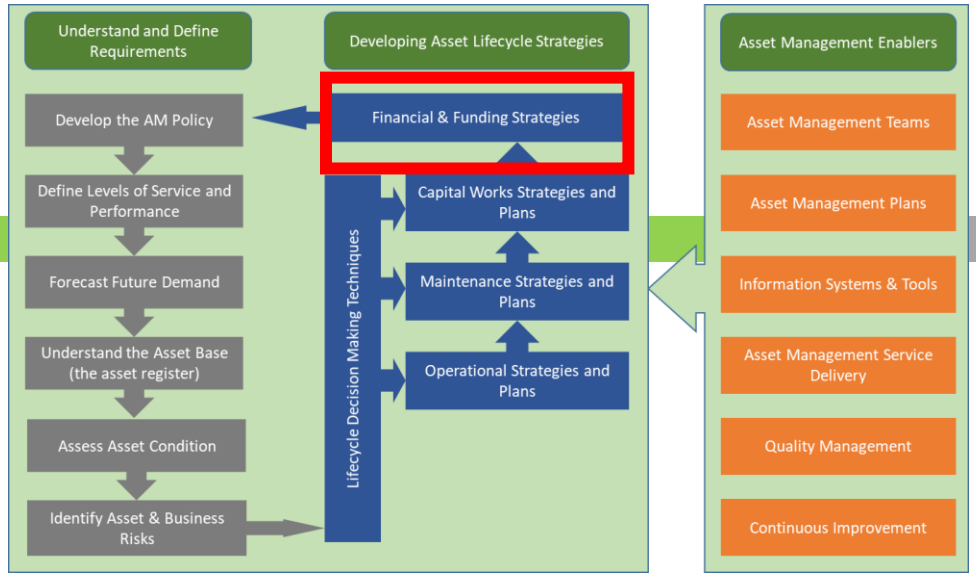
Capital Investment Strategies

- Half of respondents indicated a 3-5 year capital works plan was in place
- Some just responding as budget becomes available



- Improvement Action: Support to produce an evidence based 5 year capital investment plan (including renewals, capacity expansion, asset condition and asset valuation)

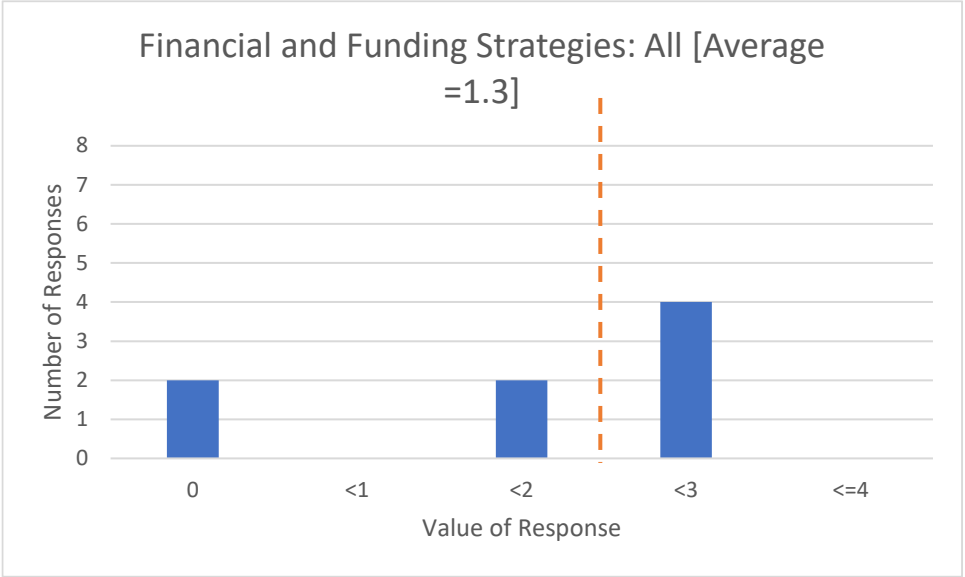
Financial & Funding Strategies



- What is the optimal balance of investment between operations, maintenance and capital works to deliver the agreed levels of service?
- How should that cost be funded?
- If not affordable, then where will the budget constraints do the least harm?

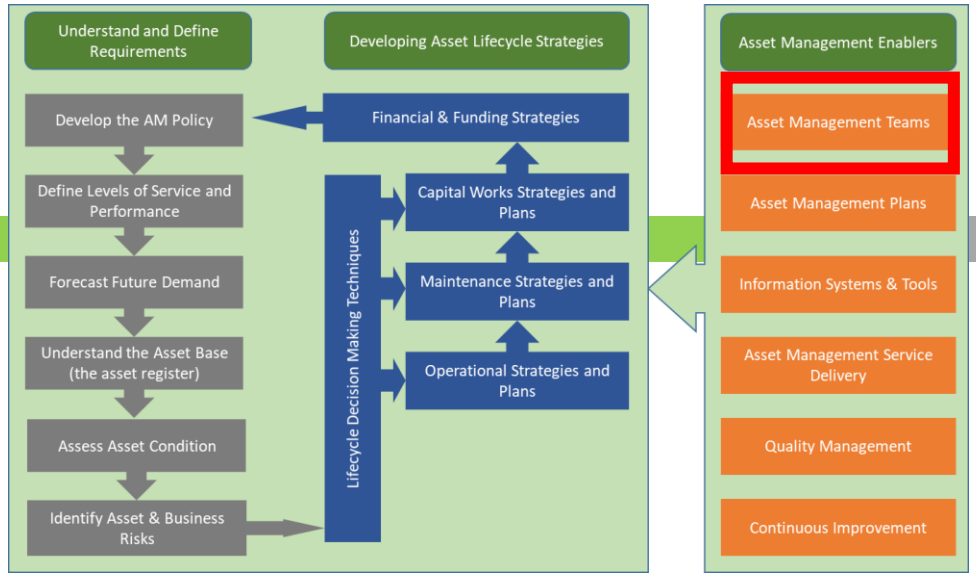
Financial & Funding Strategies

- In many cases forecast financial needs are based on past trends, or no forecast exists.
- Half of respondents indicated a 3-5 year financial forecast was in place



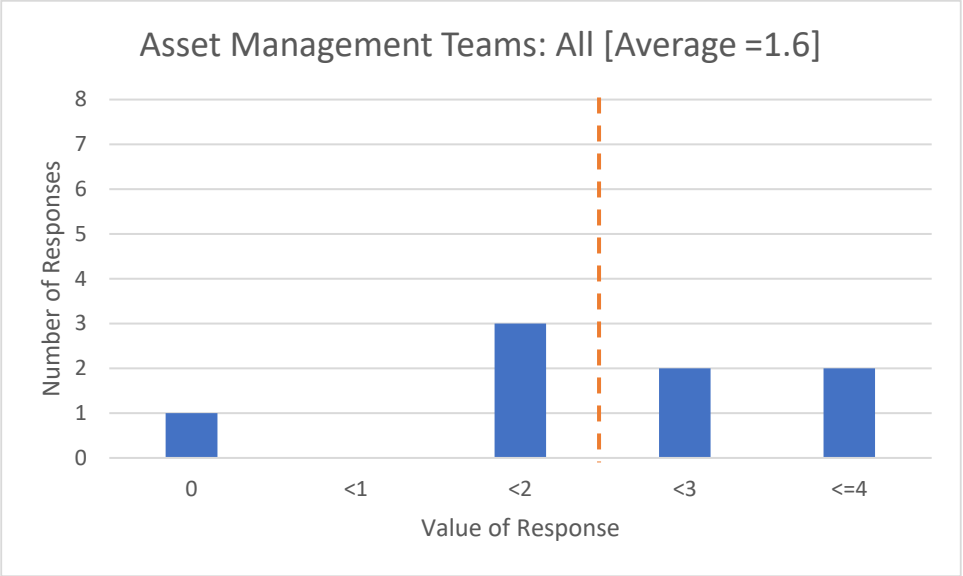
- Improvement Action: Align with development of 5 year capital investment plan, to identify funding needs for all aspects of the asset (including RAM, operations, maintenance and capital)

RAM Team



- In charge of making sure compliance with the RAM Policy is occurring
- While RAM requires an organisational wide approach, it takes a small team to oversee it
- To be effective the RAM Team needs to be able to influence the budget allocation process
  - Otherwise necessary change will not occur
- Various models for the RAM Team exist
  - Important to have a direct to the senior decision makers in the road authority

RAM Team

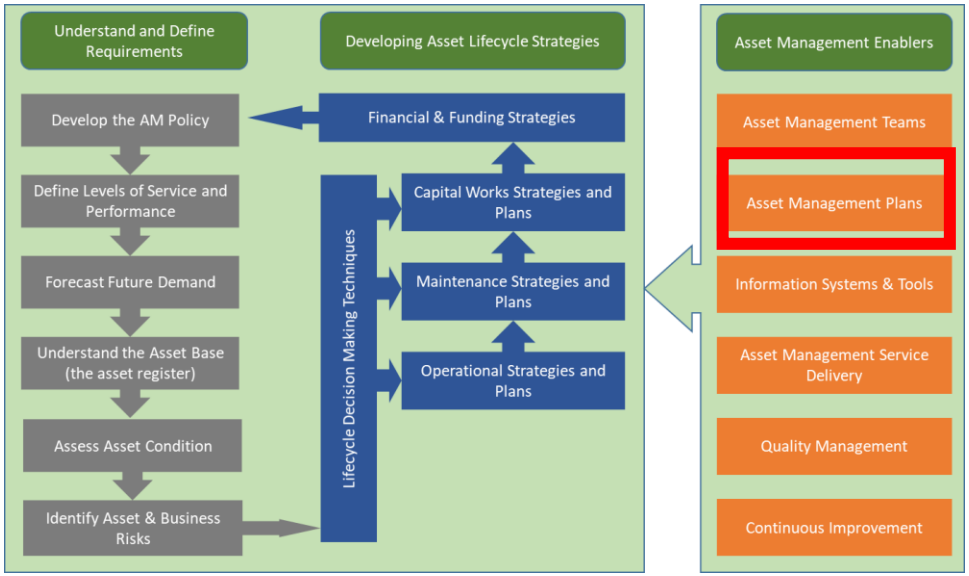


- One of the stronger aspects of RAM overall – but needs to be considered against the fact that overall the level of RAM needs to improve.

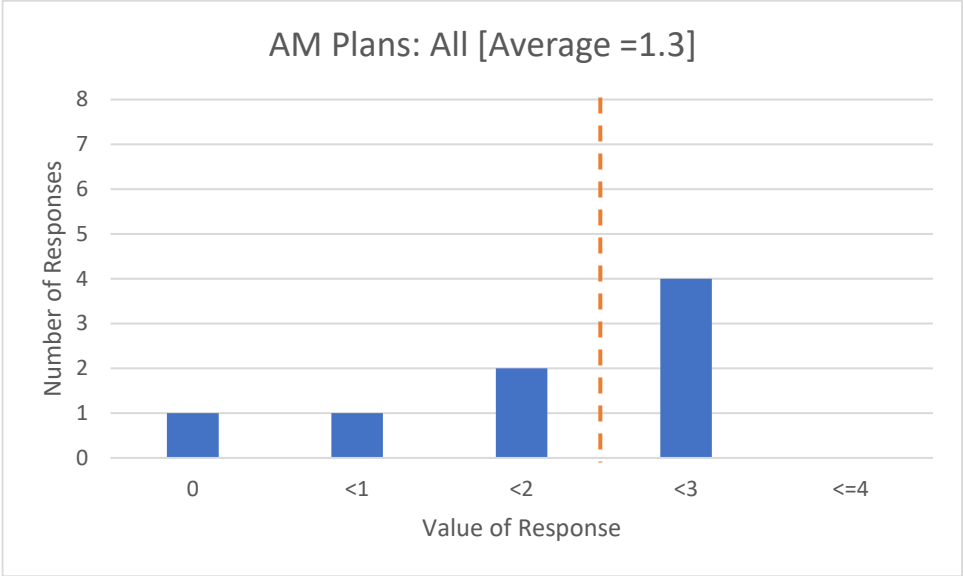
- Improvement Action: Provide some benchmark indicators for the human resources needed to appropriately manage a road network under various delivery models.

AM Plan

- The AMP is a document that records past achievements and identifies future activities both in relation to investment in the assets, but also in the way they are managed
- Should provide summary information on each step of the process



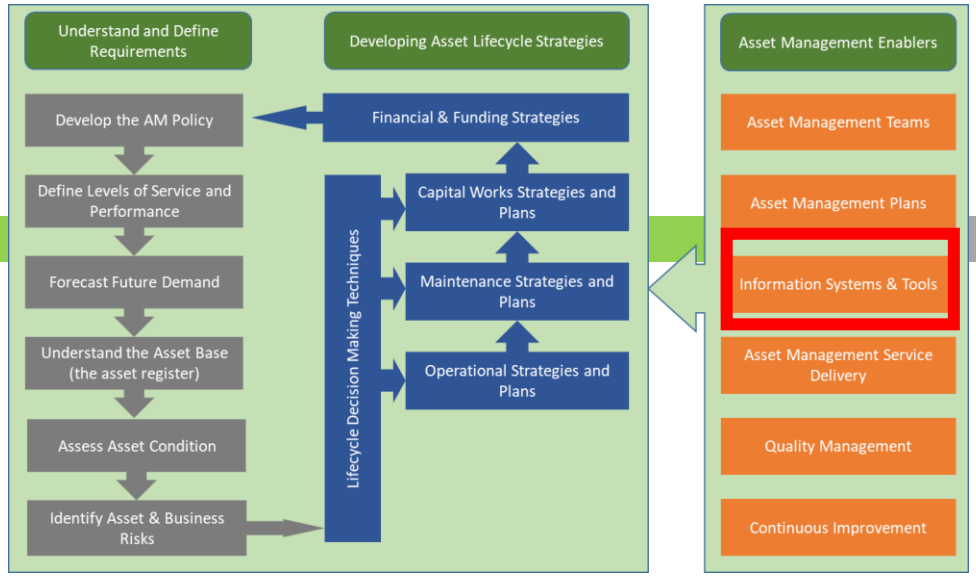
AM Plan



- Many authorities do not have an AMP or only have the basic inputs to one in place.

- Improvement Action: Produce an AMP template

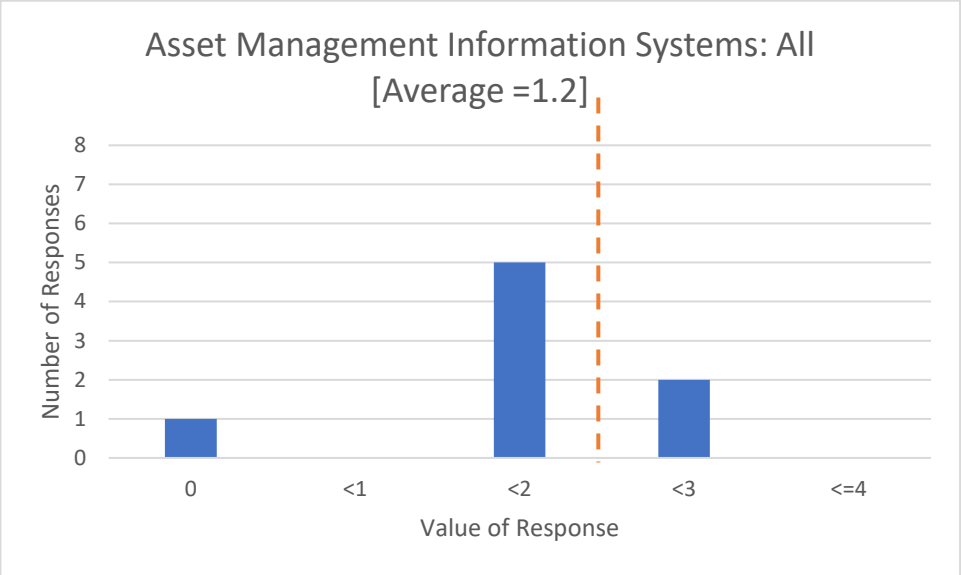
AMIS & Tools



- RAM involves a lot of data, so need an appropriate Asset Management Information System (AMIS)
- Most modern AMIS
  - GIS interface
  - Web based
  - Multi-asset (pavement, bridges, signs etc)
  - Modular
- Also need some form of Decision Support Tool (DST)
  - Can be simple decision tree that does prioritisation
  - Or complex optimisation tool such as HDM-4

AMIS

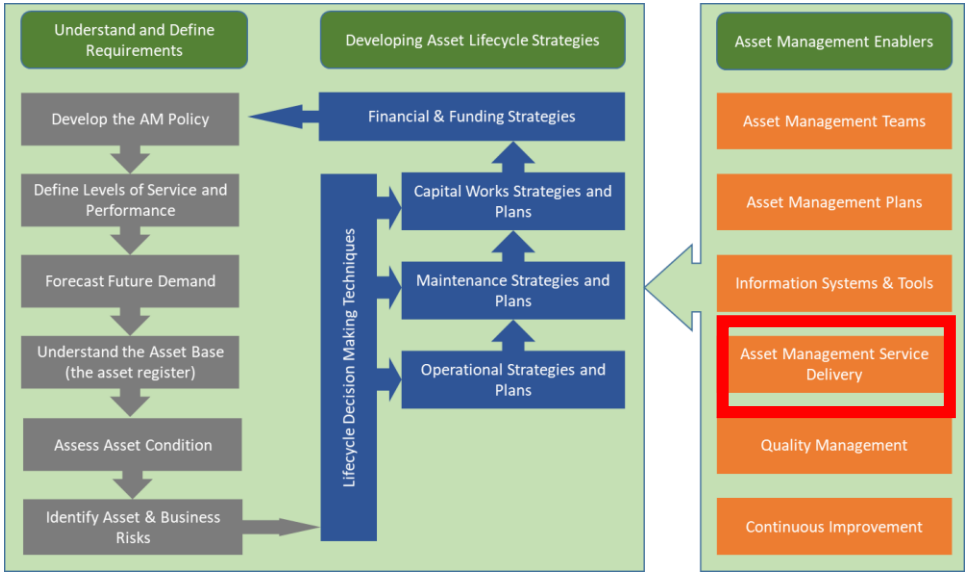
- Most don't have a corporate style AMIS
  - Majority operating with basic spreadsheets or simple databases



- Improvement Action: Produce ToR for consultant to work with road authority to determine needs and support procurement of an AMIS

Service Delivery

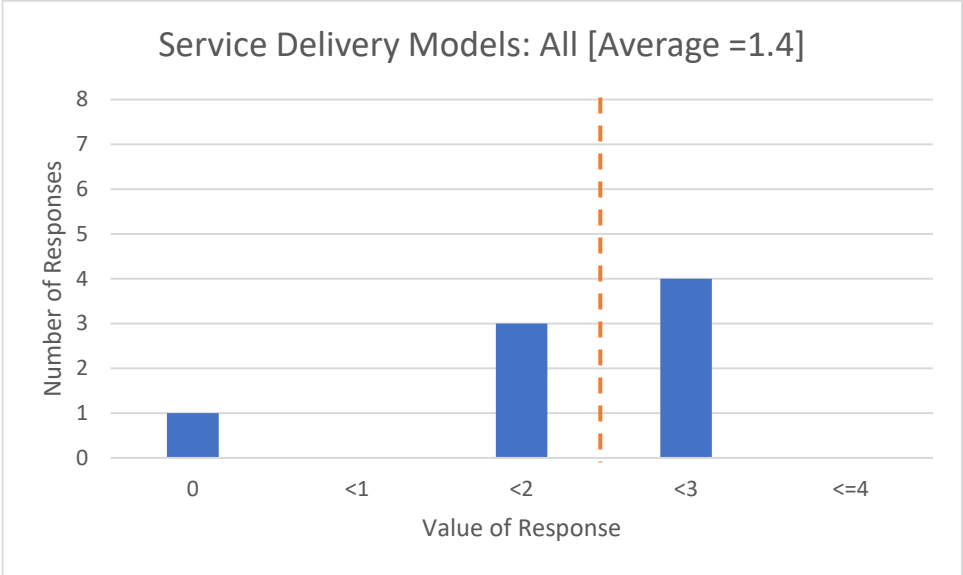
- How will you deliver the asset management and physical works?
  - In-house, or external?
- Strategic activities should be kept in-house, while lower level activities can benefit from full or partial outsourcing.
- Some contractual models (e.g. performance based maintenance contracts) have been shown to drive RAM initiatives.



Service Delivery

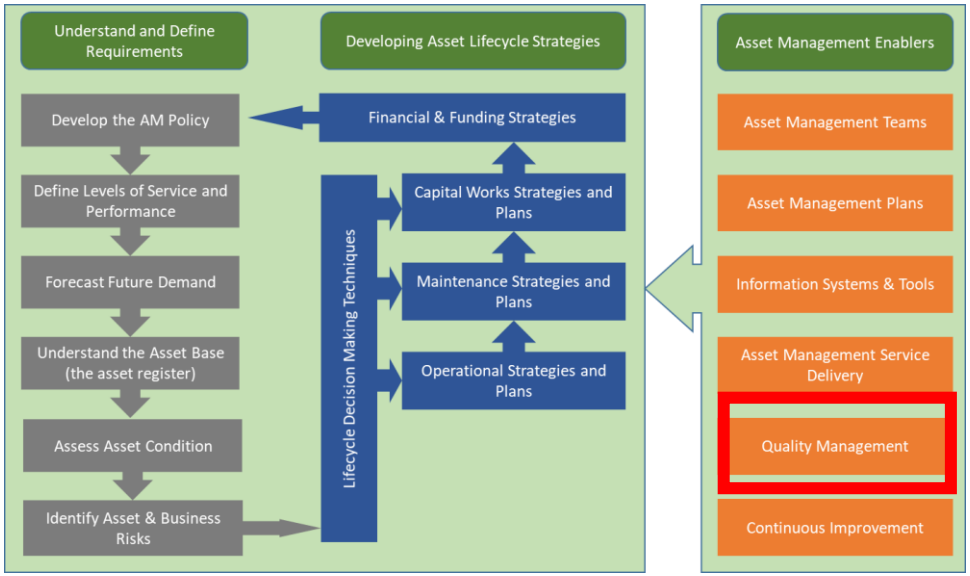
- Majority of authorities have engaged in some form of outsourcing of works or consulting services

- Improvement Action: Workshop (online) on various contractual models (from force account to PBC)

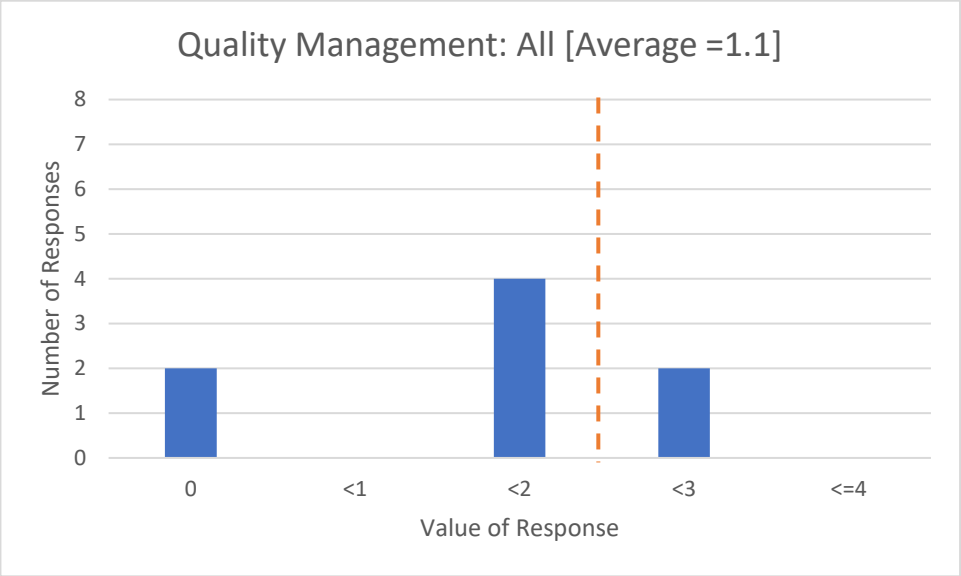


Quality Management

- As with any other aspects of activity, a quality management oversight is required to ensure compliance with the RAM processes
- One of the biggest causes for failure of RAM is where sound processes are bypassed for budget allocation and works program generation
  - Results in an undermining of all aspects of RAM



Quality Management

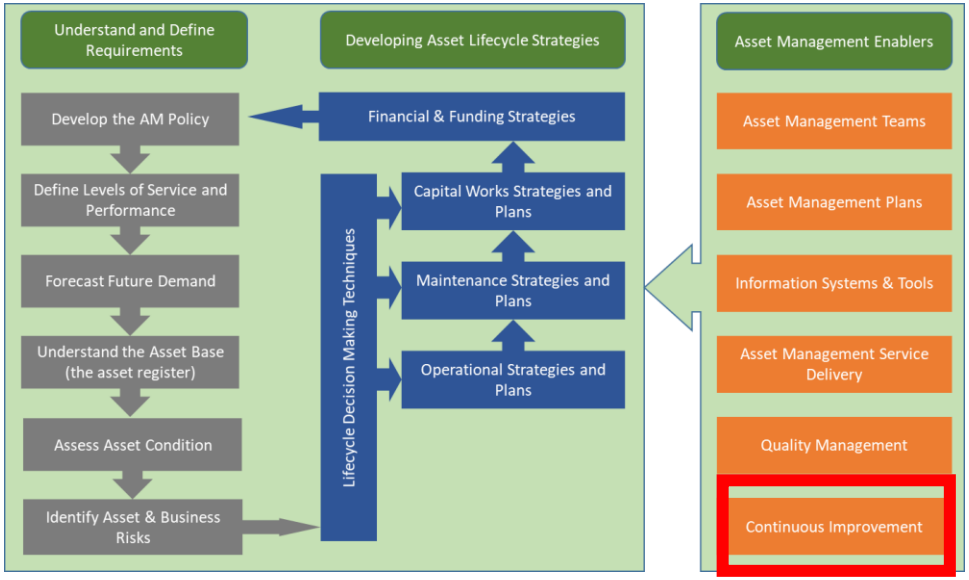


- Key activities are document for most road authorities

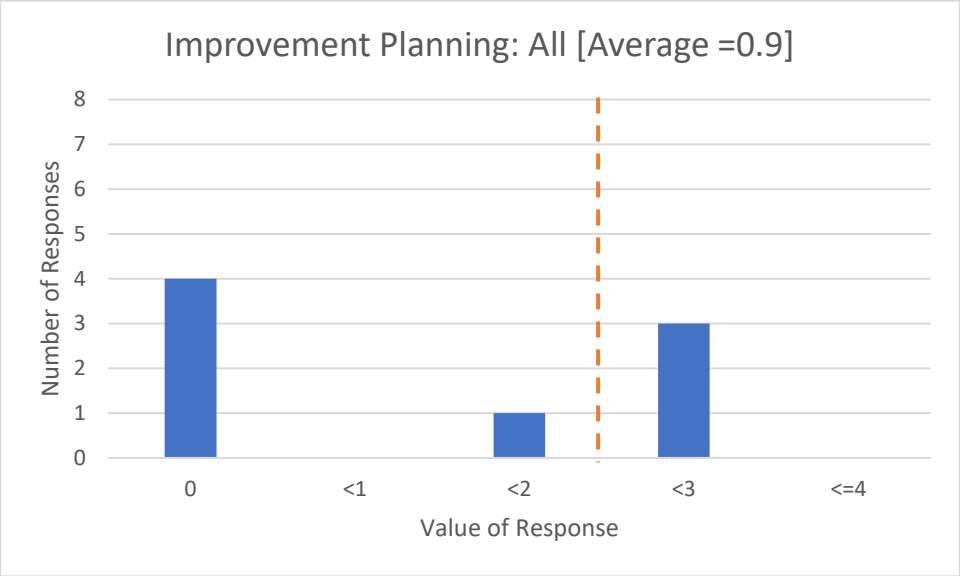
- Improvement Action: Encourage ongoing documenting of processes and associated auditing [each country knows how to document processes and to conduct audits, so likely linked to resource availability rather than capability]

Improvement Plans

- Start simple, with the data you have, then improve
  - 5-10 years to become competent at RAM
- Improvement actions should be prioritised and funded, and managed as a program in its own right
  - Assigned to the AM Team to deliver, but often using resources from across the road authority



Improvement Plans



- One of the weaker areas overall, with half of respondents having no RAM improvement plan in place

- Improvement Action: Country specific support to take findings from this Maturity Assessment and turn into an Improvement Plan

The Draft Improvement Plan

How CAREC Institute can help the region

Country specific improvement plans fit in beneath these

Aspect of RAM	Improvement Action	Priority
Policy	Develop a RAM policy template	High
Levels of Service	Developing a range of service level indicators and performance measures for all asset types that countries can adopt if desired	Medium
Future Demand	Develop a TOR for the development of a network level traffic monitoring program.	Low
Asset Register	Develop guidance on minimum data to be collected for major asset types.	High
Asset Condition	Develop guidance on recommended data collection for major asset types (what to collect and how often)	High
Risks	Develop guidance on defining route criticality, and a risk management framework	Low
Lifecycle Decision Making	Ensure that investment decisions are aligned with RAM Policy, and appropriately utilize maintenance cost data to generate lifecycle cost forecasts.	Medium
Operations	Assistance in developing emergency response plans.	Low
Maintenance	Business case for increasing maintenance funding.	Medium
Capital Works	Support to produce an evidence based 5 year capital investment plan (including renewals, capacity expansion, asset condition and asset valuation).	Medium
Funding Strategies	Align with development of 5 year capital investment plan, to identify funding needs for all aspects of the asset (including RAM, operations, maintenance and capital).	Medium
AM Team	Provide some benchmark indicators for the human resources needed to appropriately manage a road network under various delivery models.	High
AM Plans	Produce an AMP template.	High
AMIS & Tools	Produce ToR for consultant to work with road authority to determine needs and support procurement of an AMIS.	Medium
Service Delivery	Workshop (online) on various contractual models (from force account to PBC).	Medium
Quality Management	Encourage ongoing documenting of processes	Low
Improvement Plan	Country specific support to take findings from this Maturity Assessment and turn into a country level Improvement Plan.	High

Next Steps

- Review the draft improvement actions
  - Do they go far enough?
- Are the priorities correct?
  - High = deliver within next 12 months
  - Medium = within 2 years
  - Low = within 5 years
- Workshop on 6th April to confirm these
- Final report to be produced
- Country assessments returned with overlay of regional results

Q&A session