

# Road Asset Management (RAM) Training

10-13 August 2020

## Session 1: Introduction to RAM

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# RAM is Much More than Road Works





# Fixing pot holes!



Photos courtesy of Area 3

# Dealing with adverse events

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And fixing the road  
when it breaks!

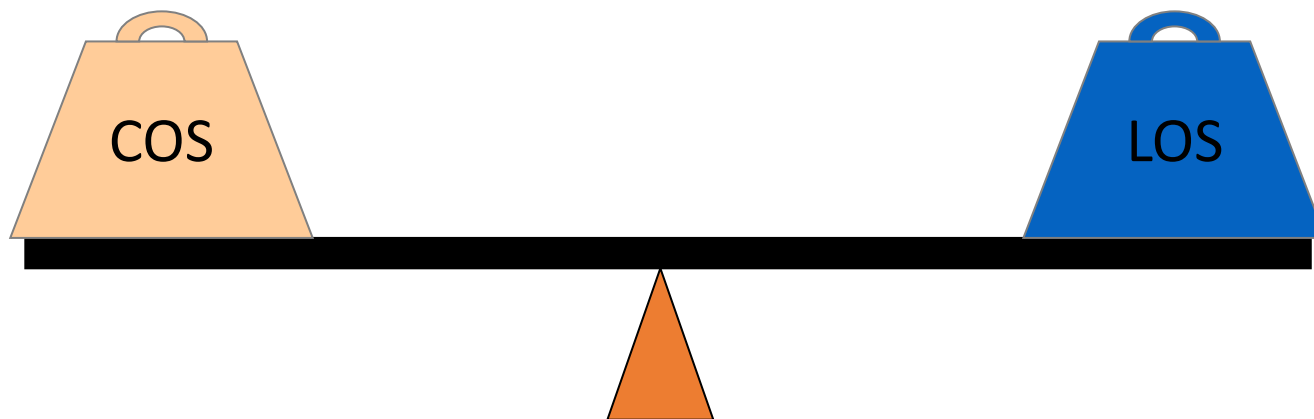
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# Evolution of RAM

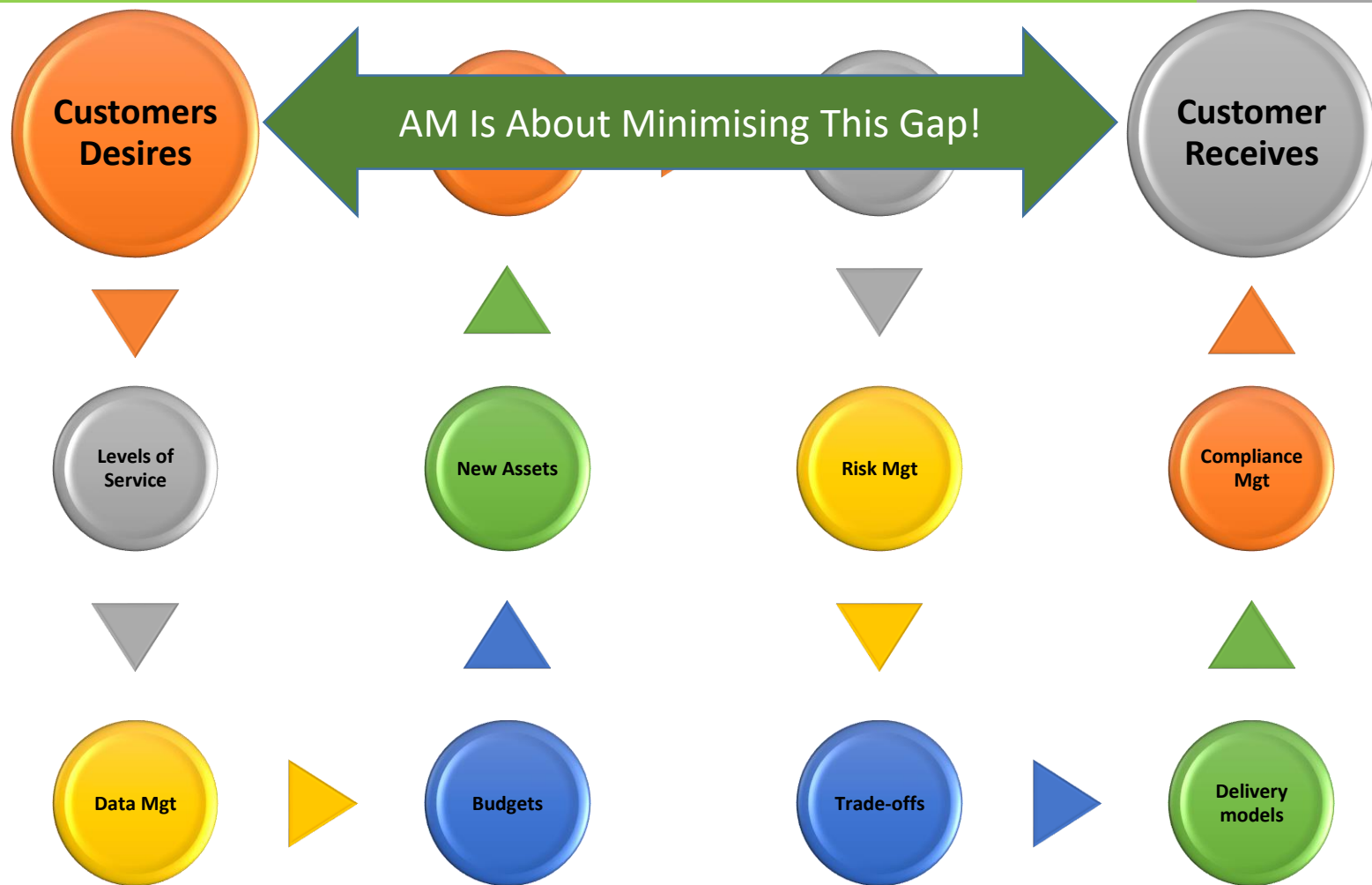
- 1970s
  - Equipment Management
  - Maintenance Management
- 1980s
  - Pavement Management
  - Private Contractors
- 1990s
  - Road Funds
  - Bridge Management
  - Agency Reform
- 2000s
  - Integrated Asset Management Systems
  - Governance
  - Performance Based Contracting



# Asset Management is a Business Model

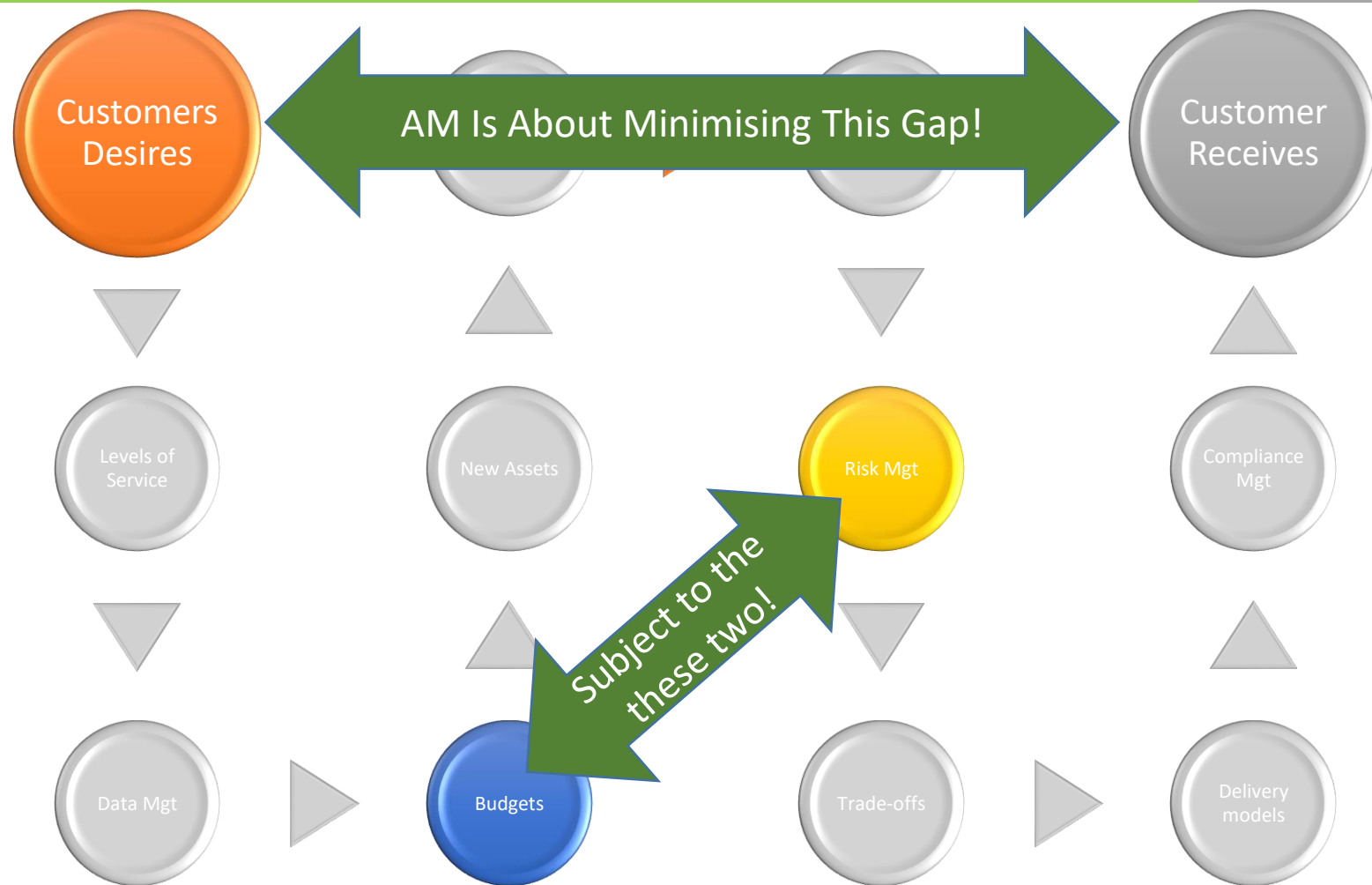


# In Simple Terms





# In Simple Terms



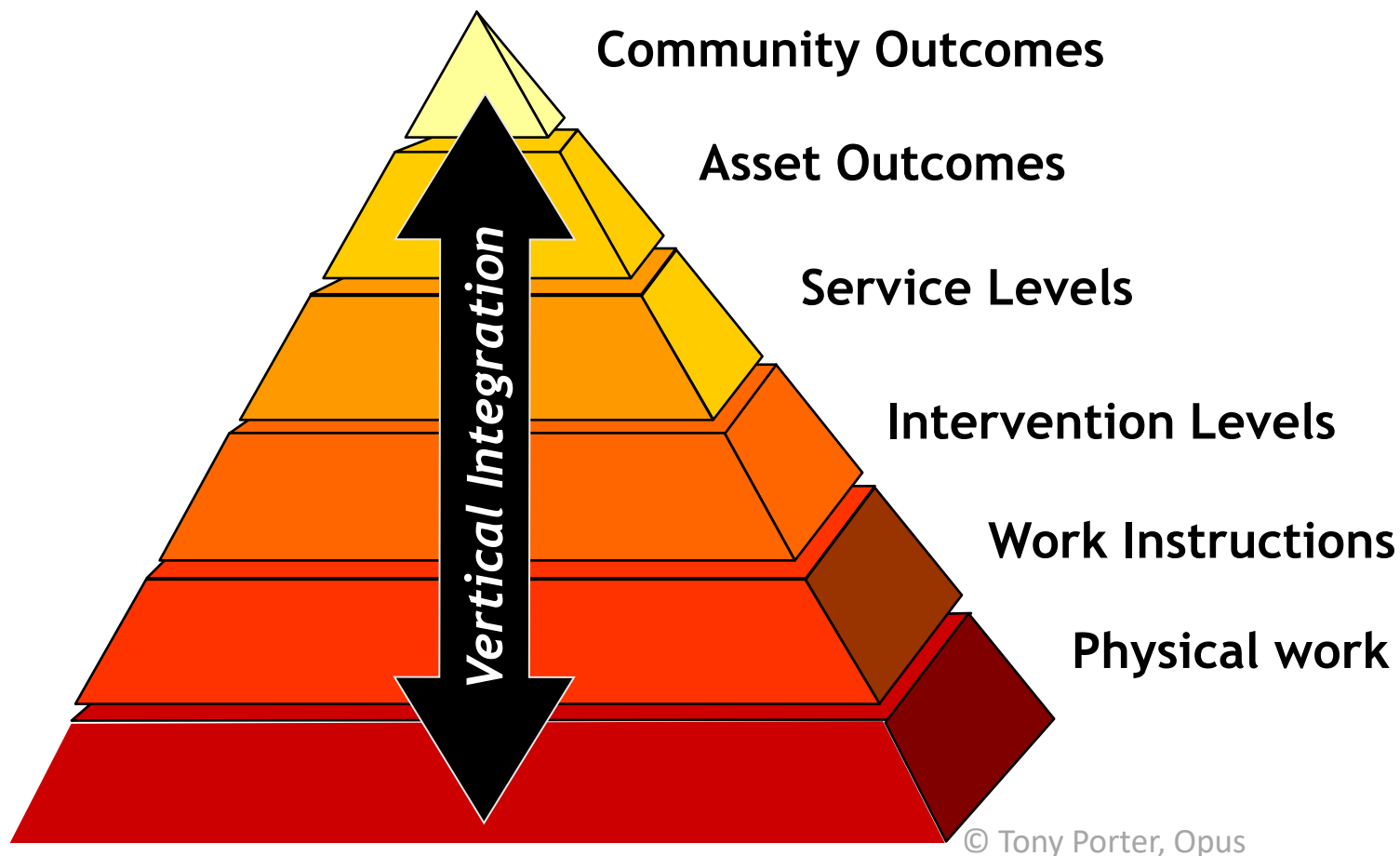
# Defining the Level of Service is Critical



**One size doesn't fit all – its all about affordability & risk**



# Asset Management Pyramid





# Delivery of RAM

**Doing things  
right**

Efficiency

Operational

**Doing the right  
thing**

Effectiveness

Tactical

**Setting the  
right  
objectives**

Efficacy

Strategic

**Physical  
Work**

**Work  
Instructions**

**Intervention  
Levels**

**Levels  
of  
Service**

**Asset  
Outcomes**

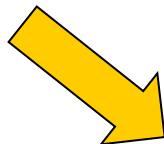
**Community  
Outcomes**

© Tony Porter, Opus

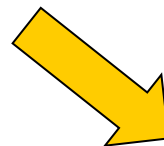
# Implementing AM

- It's About Good Stewardship

**Doing the Right Thing**



**At the Right Place**



**At the Right Time**

# 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)

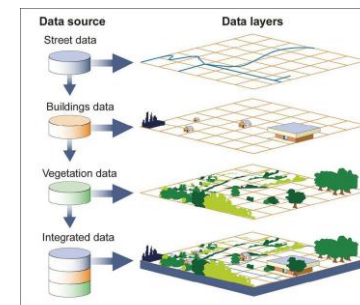


# My Simple Definition

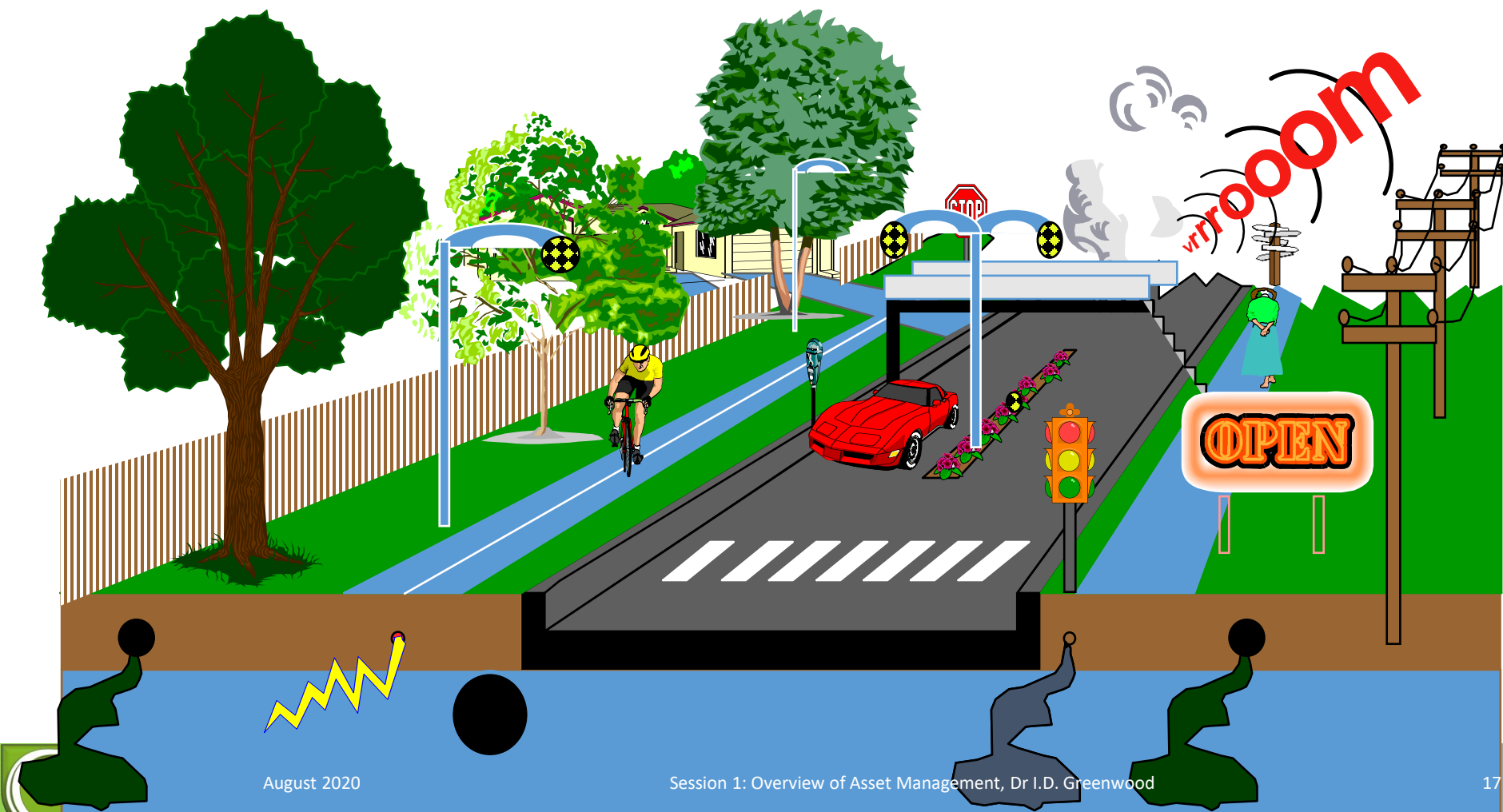
All activities required to define and provide the agreed level of service in the most cost-effective manner for the present and future owners of the asset in a transparent and informed manner.

# What It Isn't (but these are part of RAM)

- Routine or periodic maintenance
- Disaster recovery or climate resilience
- Software solution Asset Management Information System (AMIS)
- Although these are all parts of asset management, by themselves they are no asset management



It is important to remember that a Roadway is about 'more than just traffic'

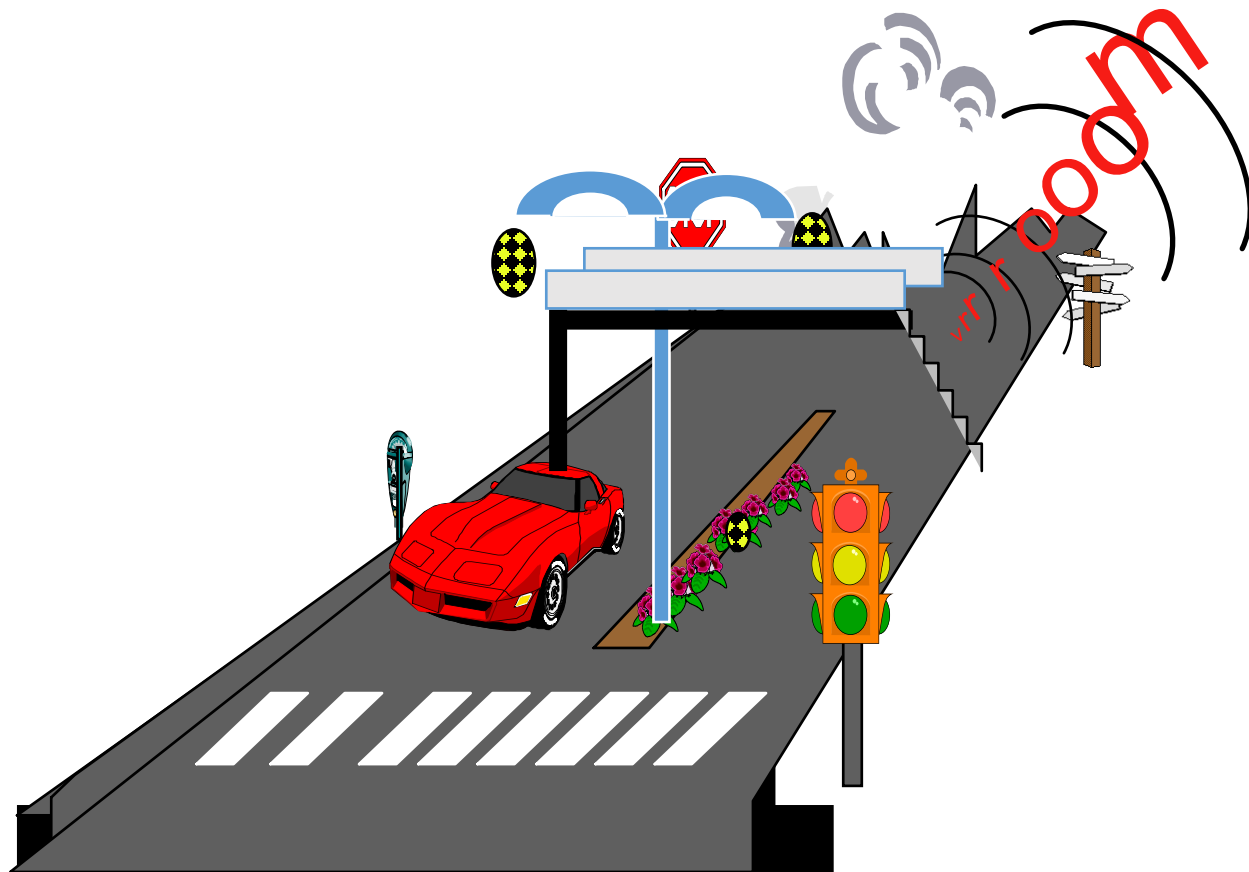




# The Roadway

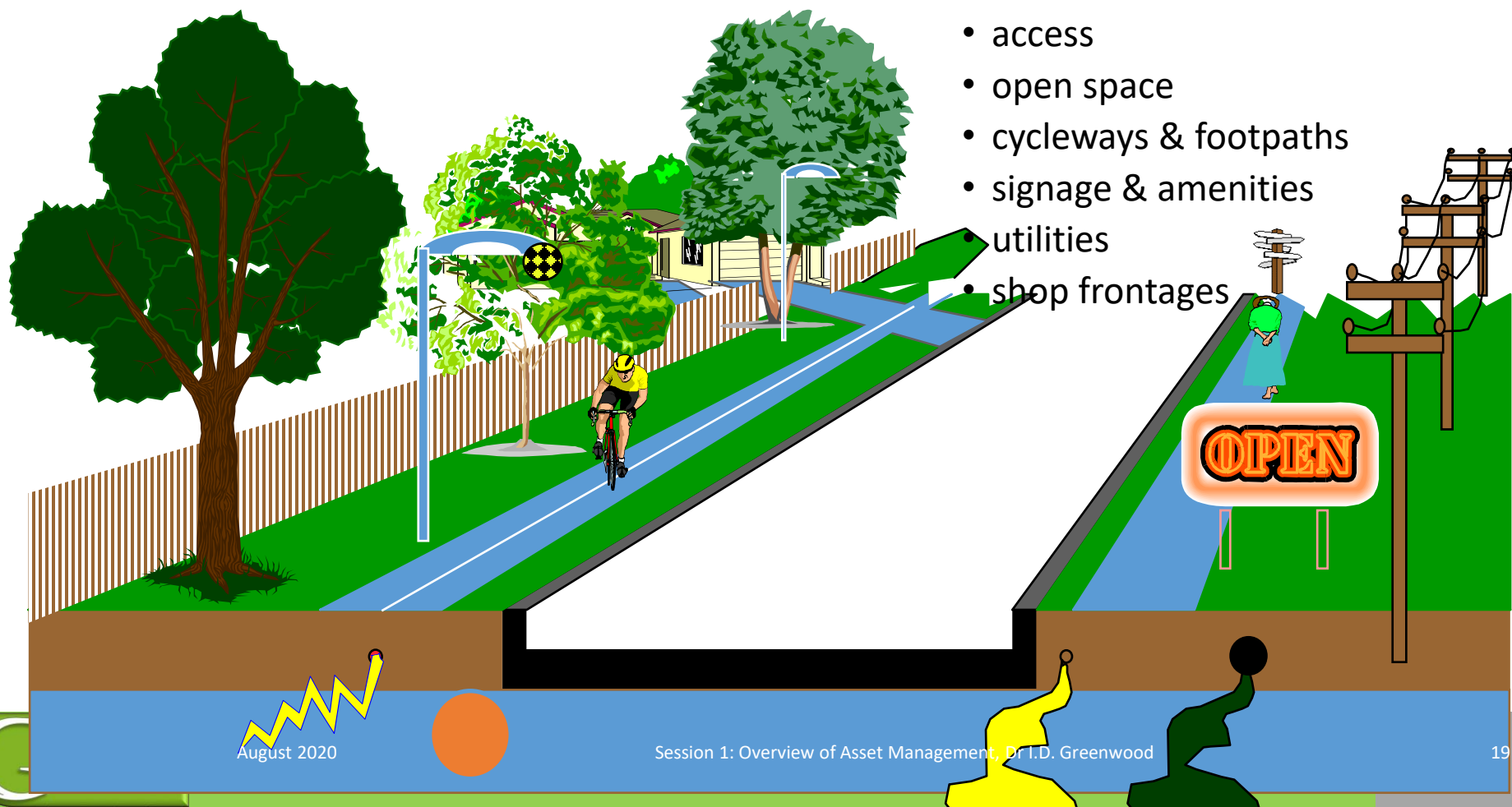
## • Physical Assets

- pavement
- street lighting
- crossings
- bridges
- median strip
- traffic controls
- road surface
- slopes
- etc



# The roadway “Corridor”

- ‘Public Interests’
  - beautification
  - environmental concerns
  - access
  - open space
  - cycleways & footpaths
  - signage & amenities
  - utilities
  - shop frontages





- My personal favourites (cover all asset types)
  - ISO55000
    - Provides the theoretical structure for asset management
  - International Infrastructure Management Manual (IIMM)
    - Provides practical guidance on how to meet the requirements for asset management
- Road specific guidance from:
  - Austroads
    - Guide to Asset Management (GAM)
  - AASHTO
    - AASHTO Transportation Asset Management Guide: A Focus on Implementation

# RAM Provides Answers to

- What do we have?
- What condition is it in?
- What is it worth?
- What do we want it to do?
- What do we need to do to it?
- What risks exist?
- How much will it cost over the long term?
- How will we deliver it?





# Are You An Asset Manager or Facility Management?

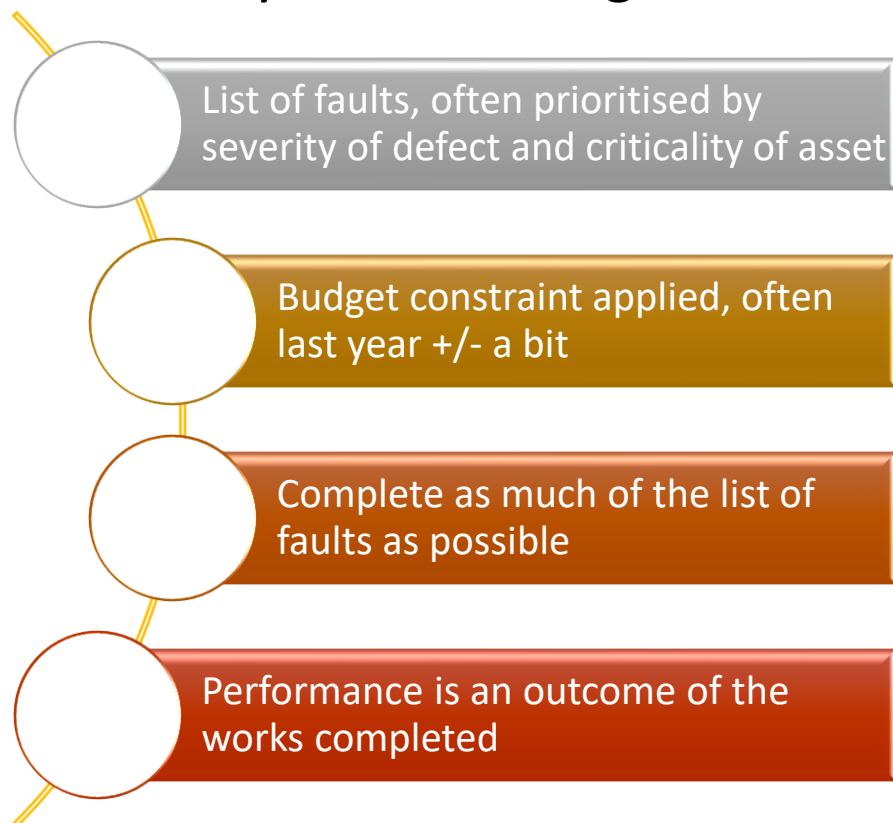
- Many agencies still operate as Facility Managers not Asset Managers

***FM - Find faults and fix as many as we can with the budget available***

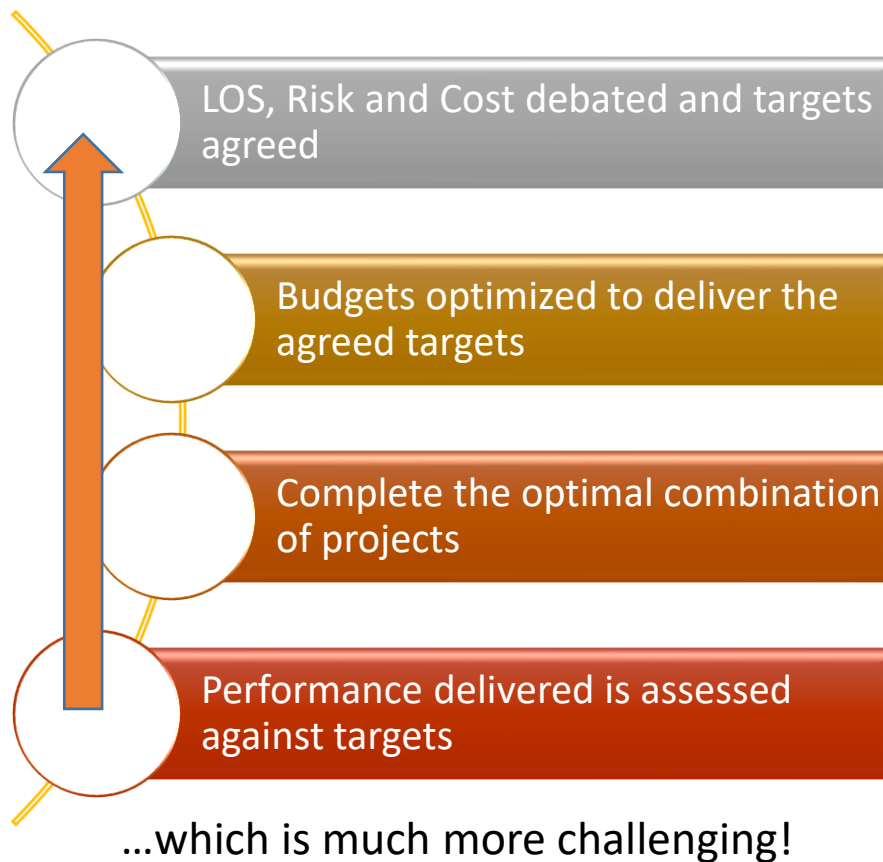
***AM - debate and agree the service level and then deliver it for the least possible cost [whole of life costs]***

# Comparison of Approaches

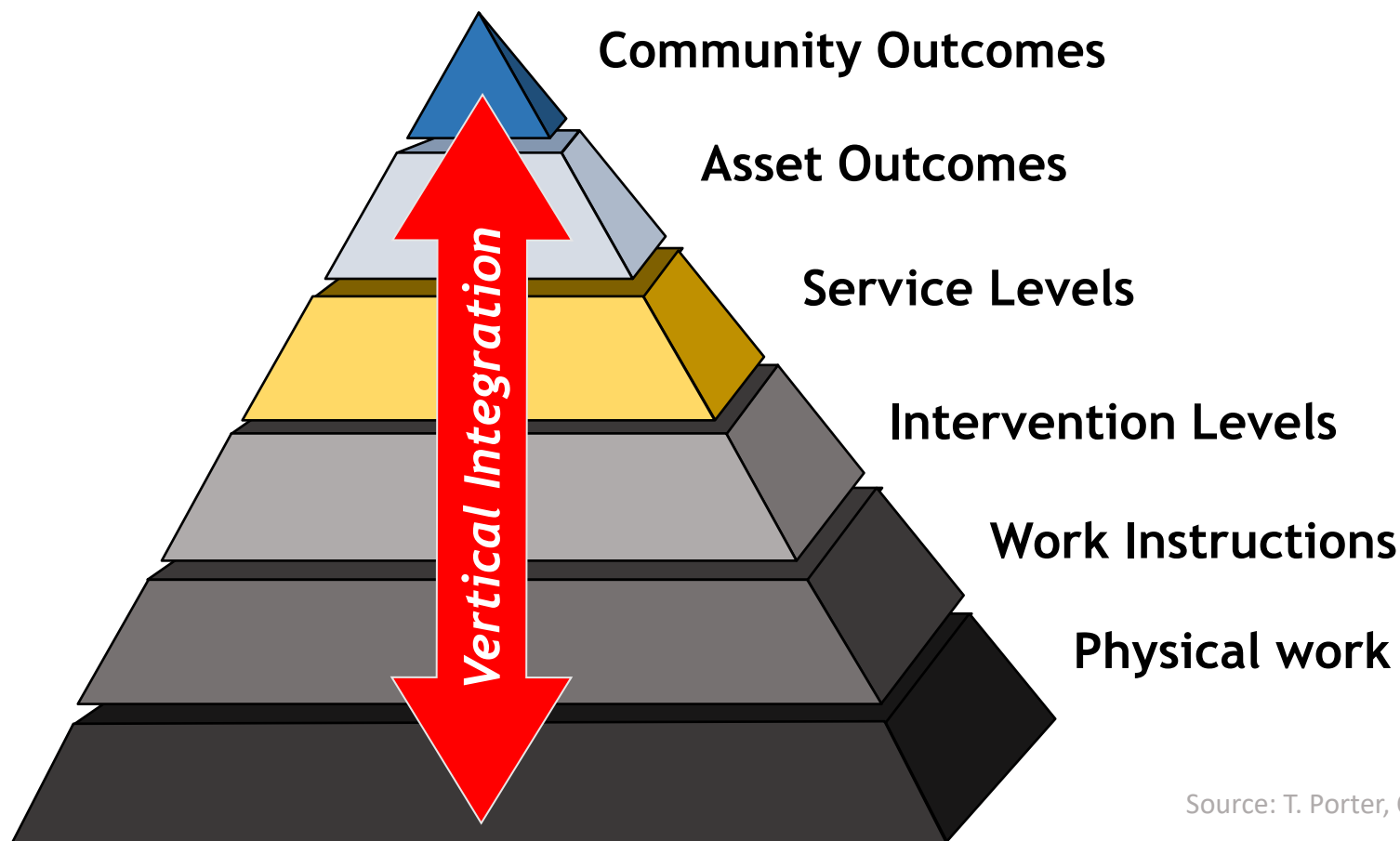
## • Facility/Mtce Management



## • Asset Management



# Alignment of Activities



Source: T. Porter, Opus International Consultants Ltd

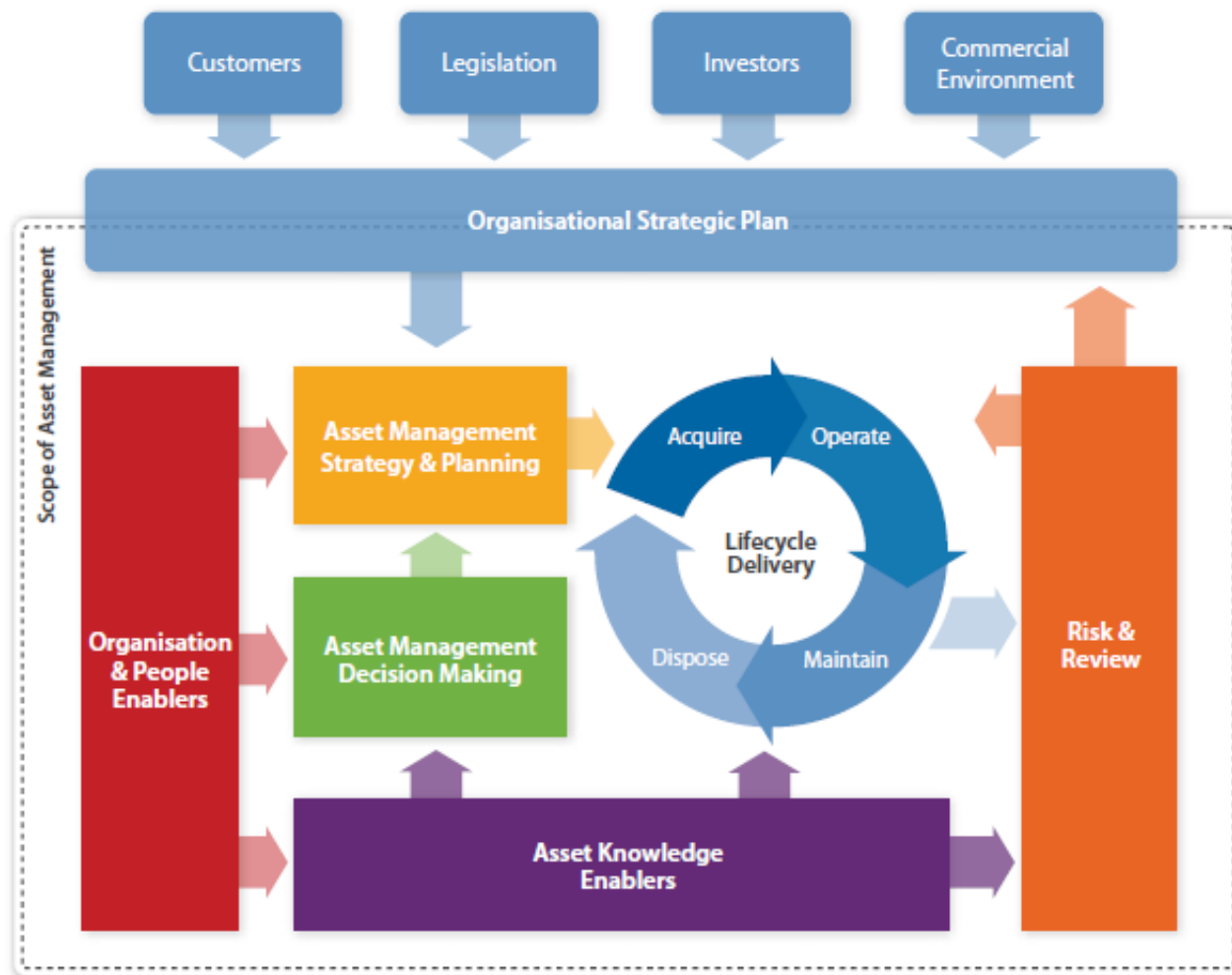
# Extracting the Value



Source: T. Porter, Opus

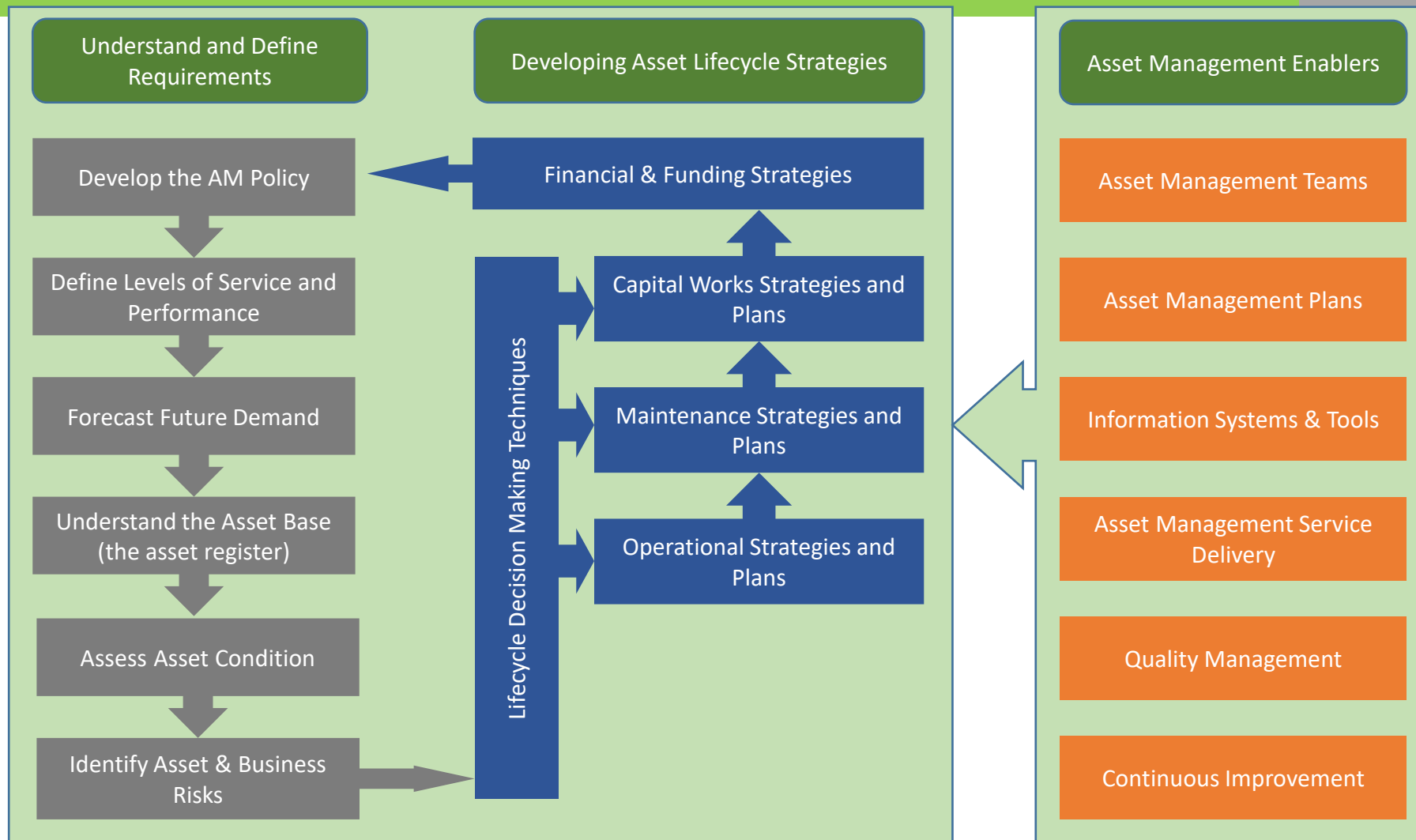


# Institute of Asset Management (UK) Process



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# 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

# Benefits

- Reduced life-cycle costs
- Defined levels of service
- Ability to track performance
- Improved transparency in decision making
- Ability to predict consequences of funding decisions
- Demonstrated asset custodianship
- Decreased financial, operational and legal risk
- Better financial management
- Better communication
- Fewer surprises going forward

# Drivers for Asset Management

- The headlines....

**Lawsuit planned to fix problems in Toronto's social housing units**  
Last Updated: Monday, September 17, 2007 | 9:56 AM ET  
[CBC News](#)

Tenants of Toronto's social housing spaces are planning a multimillion-dollar class-action lawsuit against the province and the Toronto Community Housing Corporation.

**MEMO TO THE PREMIER**  
**Rebuild infrastructure to re-energize economy**  
Oct 11, 2007 04:30 AM  
**ANNE GOLDEN**

Premier, there are many factors that affect the province's economy. Some you can control - the dollar, interest rates, the border, to name a few. But there are other factors you can adopt that can make an enormous difference in the province's economic future.

**Neglect from the start for overpass**  
**LAVAL COLLAPSE**  
By JENNIFER HAMILTON

Years of neglect have left Quebec's bridges and overpasses in such poor shape that a commission of inquiry into the collapse of the Laval bridge is needed to protect the public, a commission headed by former premier Pierre Marc Johnson. The collapse of the bridge killed six people and injured six others.

**TAX**  
**structure**

**On Top Of New Taxes, Water Rates Likely Going Up In Toronto**  
Thursday October 25, 2007  
CityNews.ca Staff

You're going to be paying more if you buy a home or drive a car in the city next year. The city is expected to set you back a few coins more per ride. The city has been a bit behind the chin enough lately, there's now word of another hike in the months to come.

**Tax Will Not Put A Dent In Backlog**  
City to fall further behind on road, facility repairs  
**Kelly Grant**  
National Post

Tuesday, October 30, 2007

Exactly one week after the city adopted home sale and property tax increases, the city committee yesterday unveiled a five-year capital plan that will see the city fall further behind on road, facility repairs.

**Ottawa closes stadium section due to cracks in structure**  
Mayor suggests review, possible redevelopment  
Last Updated: Thursday, September 6, 2007 | 5:35 PM ET  
[CBC News](#)

Part of an Ottawa stadium has been closed to the public after cracks were found in the concrete structure, and Mayor Larry O'Brien says the city may take that as an opportunity to consider redeveloping the surrounding park.

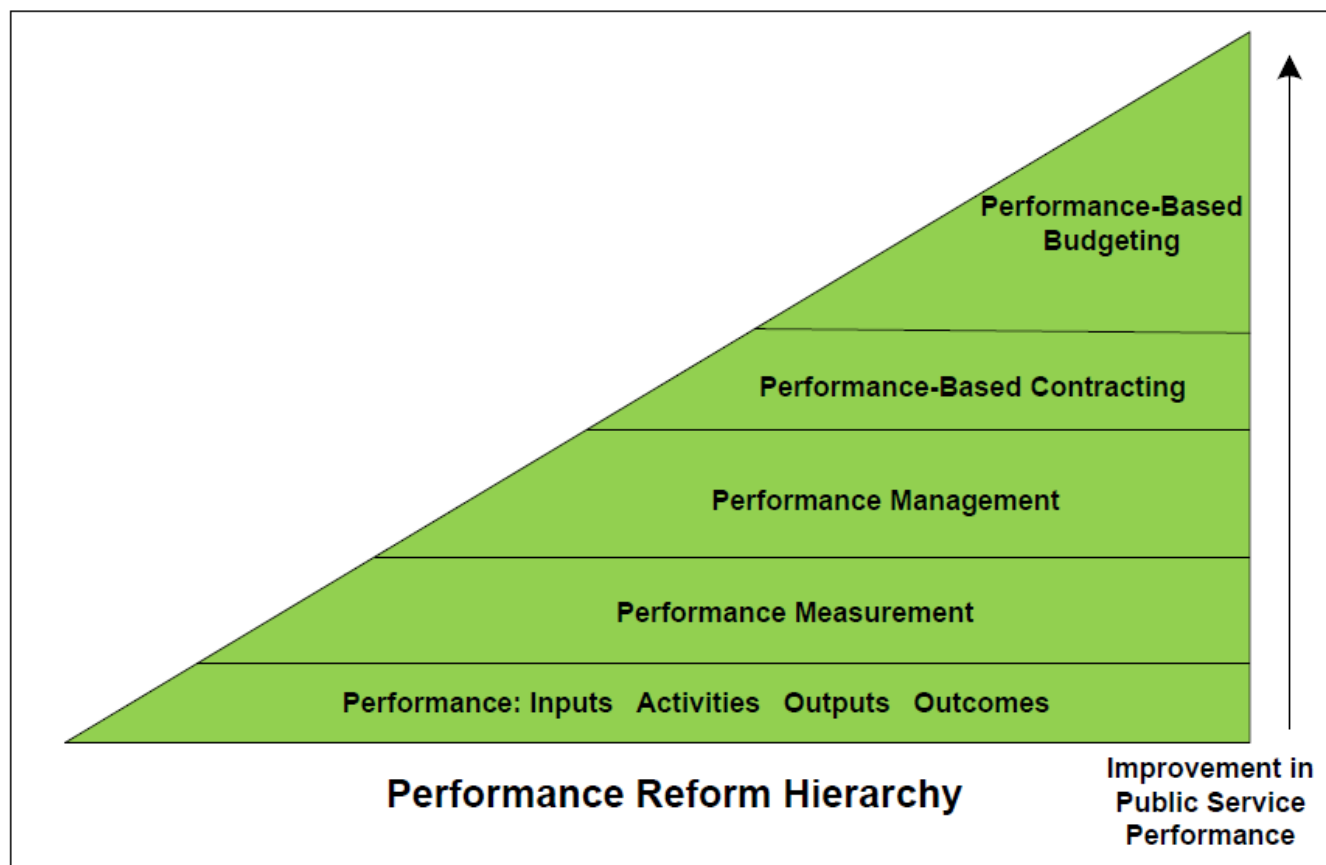
**Not undertaking asset management is one way to make headlines**



# Drivers for improved AM

- Champion – internal drive to do the right thing
- Crisis – Infrastructure or service failure
- Compulsion – Legislation / Policy / Audit
- Funding – Access to funds dependent on having AM

# RAM Links with Improving Institutional Performance



# The challenges to getting started...

- Institutional inertia
- Organizational silos
- “It’s an accounting issue”
- Software vs. AM / previous bad IT experience
- “Trust me I know what I’m doing”
- Lack of corporate buy in / clear leadership
- Lack of time / training / competency
- Data deficiencies
- Ribbon cutting syndrome
- Desire to muddle / interfere in others business

# International Practice

- Focus on improved understanding and funding of performance/level of service
  - Money is tight, so need to ensure getting best value!
- Clients recognise the value of data and the costs to collect and maintain it
  - Integrated data systems
  - GIS
- Recognition of the role that performance based contracting can play in driving improved AM
- Increasing use of maturity assessments to understand capability, although not always associated with a commitment to achieve a given standard.

# Implementation

- Start with core functions
- Start simple, with something that is sustainable for your road authority
  - Focus on those asset groups that are either high value or high risk
  - Collect only the information that is necessary, not everything you can
- It is easier to add complexity in 5 years time, than it is to simplify a complex system that isn't sustainable
- Single asset management process for all roads, but the level of complexity in each step of the process will normally vary by road class



# Implementing AM

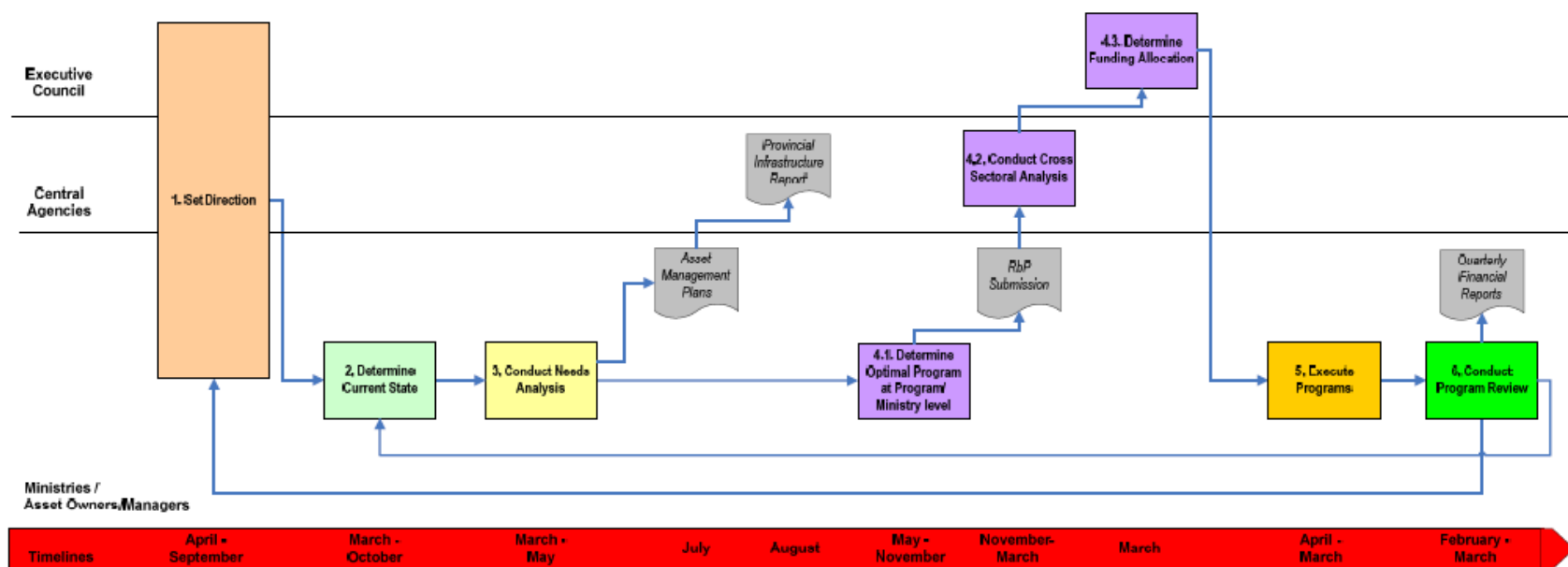
- Starting Out...

- Document where you are
- Current practices and policies
- Looking at changes to move forward
- Understanding the gaps
- Plan for the future



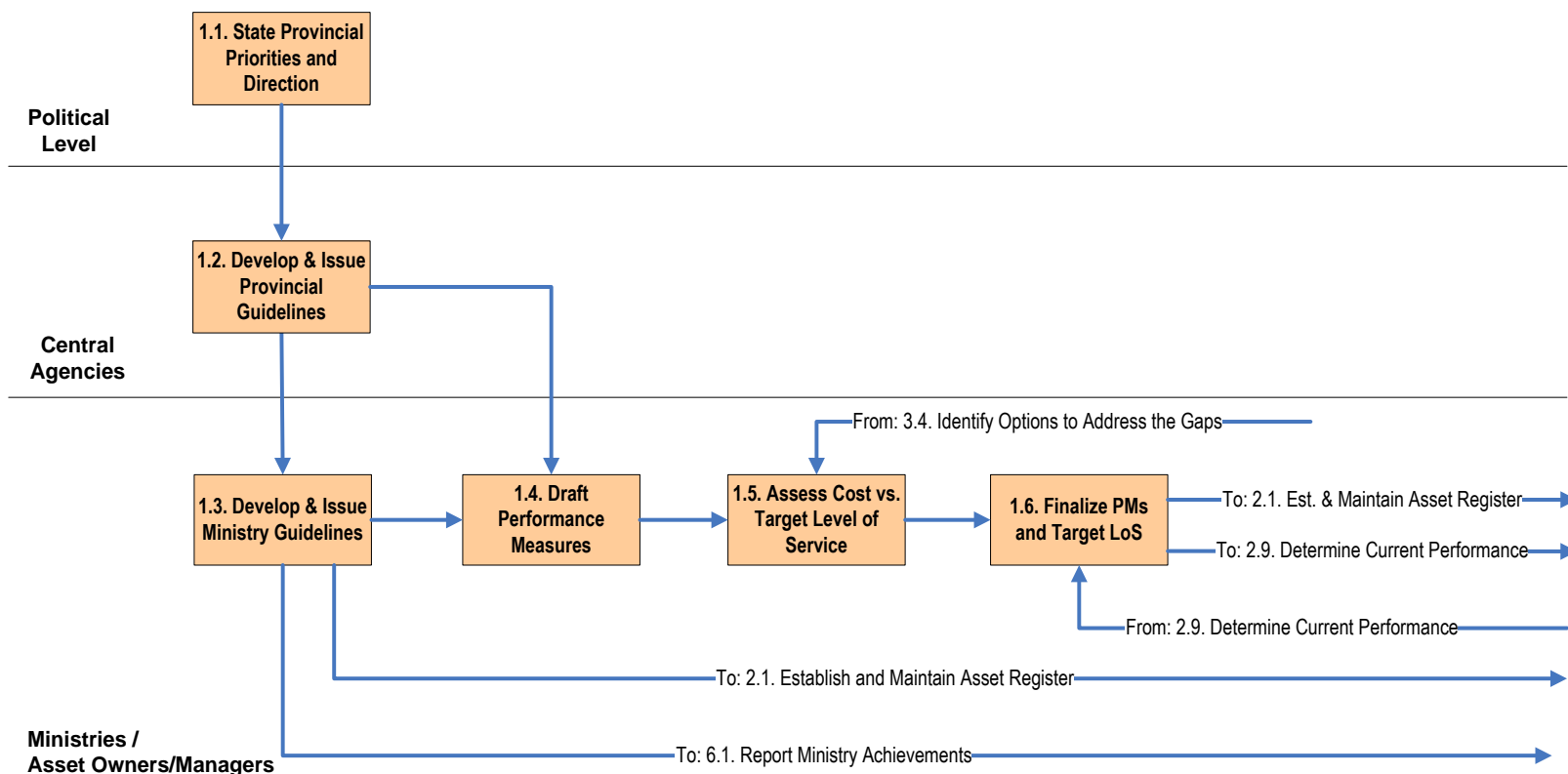
# Example of Documenting Processes

## Infrastructure Asset Management Business Process



# Example of Documenting Processes

## Infrastructure Asset Management Business Process Set Direction



# Example of Documenting Processes

- Detailed for every step of the RAM process

ACTIVITY #1.4. Draft Performance Measures	
Component	Description
Hi-Level Description	<ul style="list-style-type: none"> <li>To interpret the government priorities and the high level performance measures formulated by PIR as they relate to the Ministry and draft detailed performance measures. To supplement PIR performance measures with specific ministry performance measures. Setting desired performance measures and levels of service should encapsulate the views and requirements of stakeholders outside the agency, including: <ul style="list-style-type: none"> <li>- Infrastructure end-users;</li> <li>- People and/or businesses impacted or effected by the infrastructure;</li> <li>- Higher-order government;</li> <li>- Other regulatory agencies (legislation/audit/etc);</li> <li>- Related industry bodies (road agency associations, Council of Ontario Universities, Colleges Ontario, Ontario Hospital Association, etc.)</li> </ul> </li> </ul>
Actors/Roles	<ul style="list-style-type: none"> <li>Ministry Program and Service Delivery staff</li> <li>TPP staff</li> </ul>
Precondition(s)	<ul style="list-style-type: none"> <li>The government has formulated its policy priorities</li> <li>PIR has developed a set of high level performance measures</li> </ul>
Success Outcome(s)	<ul style="list-style-type: none"> <li>The Ministry/TPP has performance measures that are aligned to the government's priorities</li> </ul>
Failed Outcome(s)	<ul style="list-style-type: none"> <li>The Ministry/TPP performance measures are not aligned to the government's priorities</li> </ul>
Input (s)	<ul style="list-style-type: none"> <li>Government priorities</li> <li>PIR Guidelines (including PIR's set of performance measures)</li> <li>Ministry Guidelines</li> <li>Views and requirements of key stakeholders, such as Infrastructure end-users; people and/or businesses impacted or effected by the infrastructure; regulatory agencies (legislation/audit/etc); related industry bodies, etc.</li> <li>Data such as inventory, condition, valuation and management parameters</li> </ul>
Output (s)	Draft Performance Measures
Customers (Internal and External)	<p>Staff in PIR responsible for making informed and prudent decisions on capital assets, such as annual capital budget allocation purposes.</p> <p>Personnel from the Ministry or BPS/TPP that owns the capital asset or is responsible for the ongoing maintenance, stewardship and usage of an asset (Asset Owners/Managers)</p> <p>Financial accounting personnel</p>
Information/Tools Used	Templates, communication tools
Timing/Frequency	Annual update, as part of the AMP. This would be a notional review, except when a new government has been elected

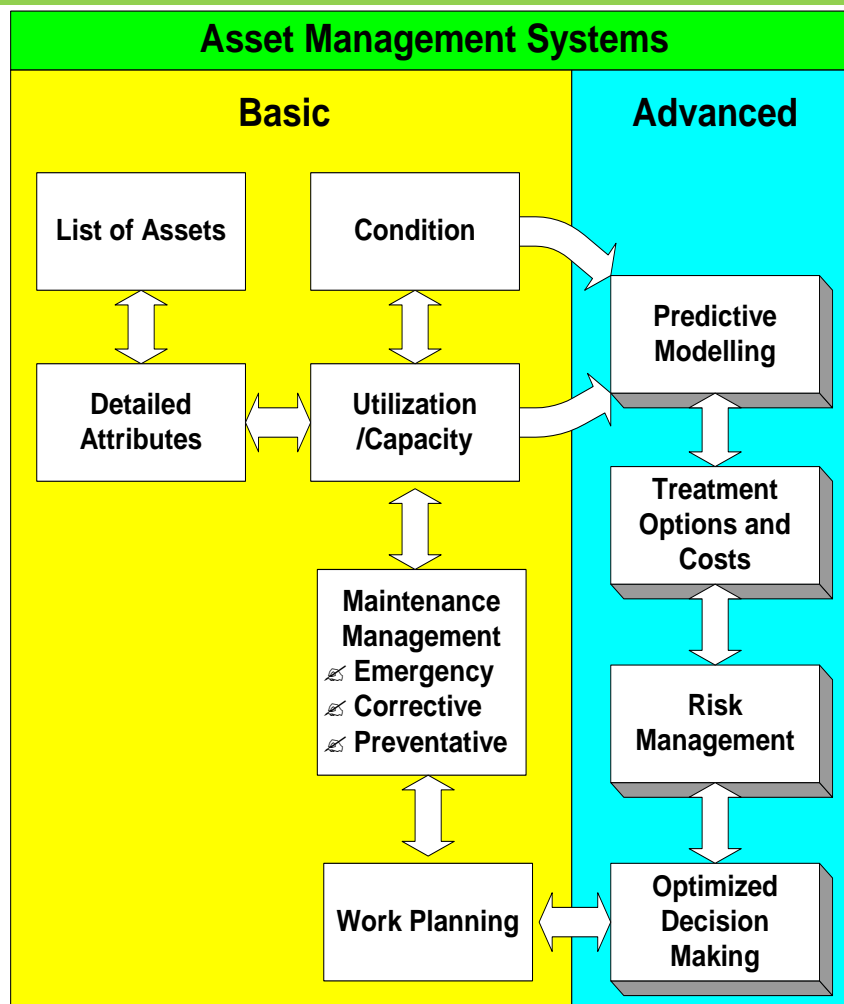
# Implementing AM

- Manageable Chunks

- Incremental
- Achievable
- Asset specific
- Pilot area

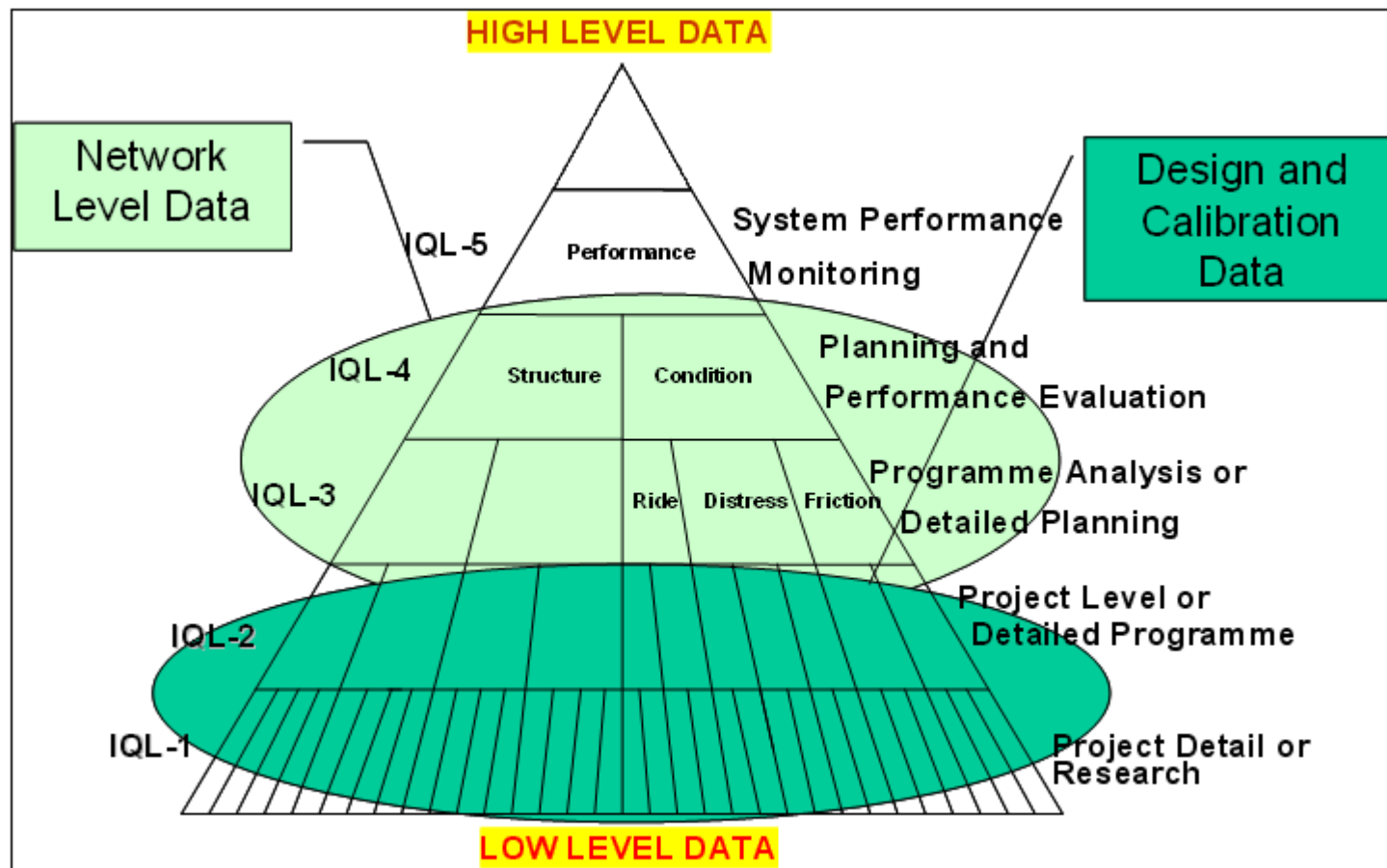


# Adopt Appropriate Approach





# Appropriate Data Collection



# Implementing AM

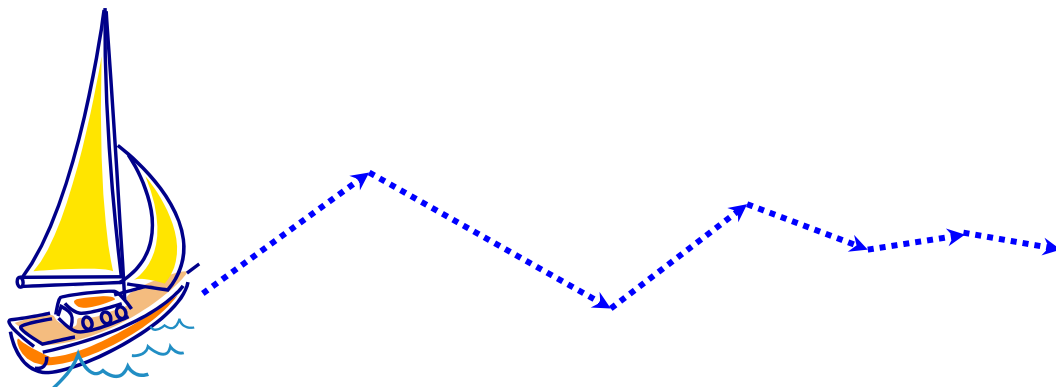
- Can be a Bumpy Ride

- People changes
- Leadership
- Organizational
- Complacency
- Loss of Focus



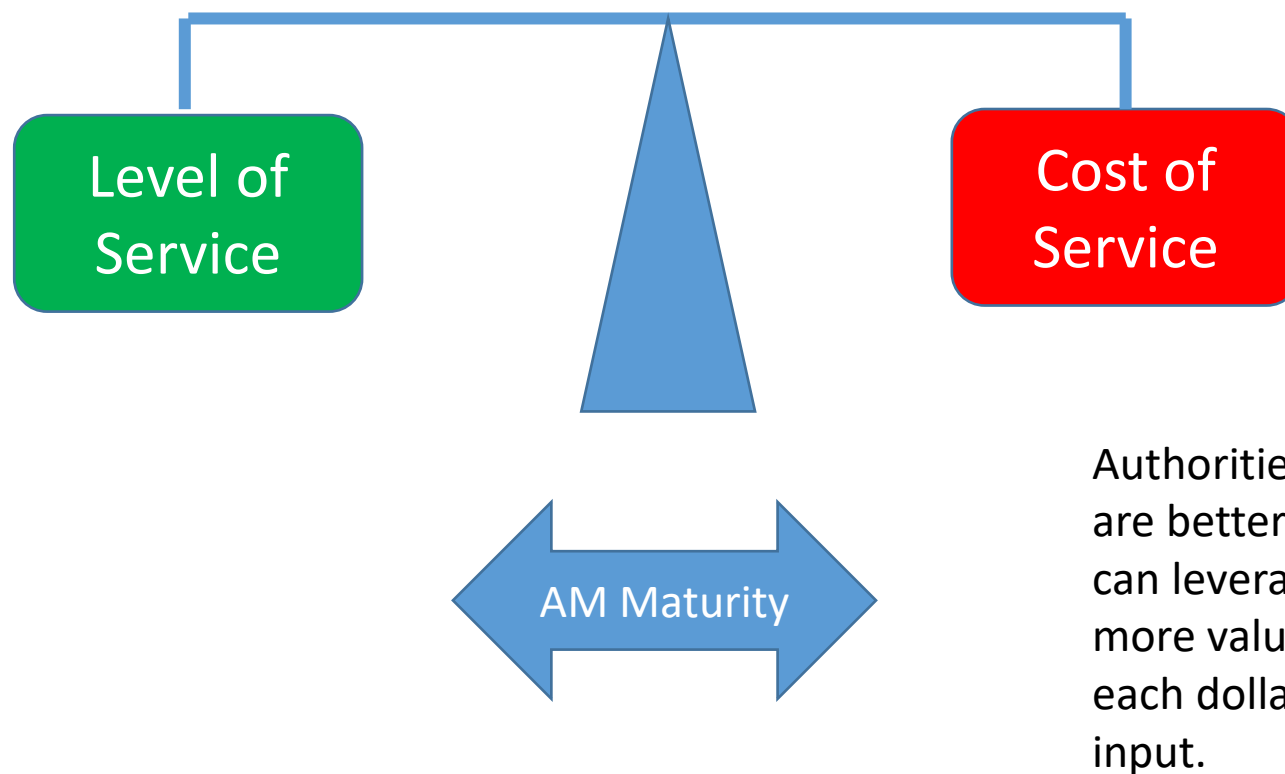
# Implementing AM

- Requires Course Corrections



# AM Maturity Assessments

# AM Maturity Moves the Fulcrum



# AM Maturity Assessments

- Very good way to benchmark current RAM practice
- Assist in developing the improvement plan
- Formally monitor progress
  - RAM has historically suffered from not been able to demonstrate the benefits (or even progress) from investment in RAM
- Many different assessment processes available, some public and some via commercial entities
  - I strongly recommend the use of assessment processes that are independent of a commercial consulting firm.



# New Zealand Government Capital AM Assessment Process

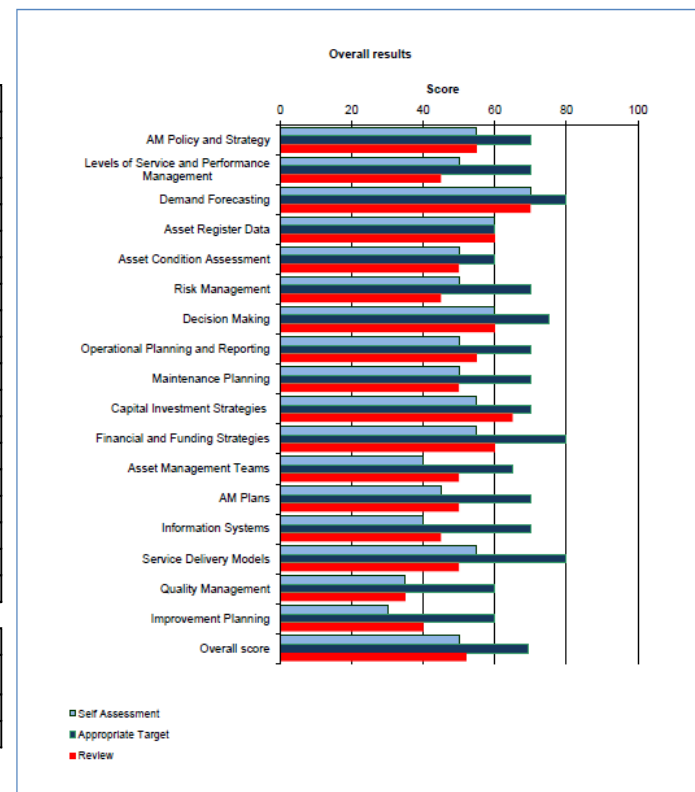
- Relatively simple. 17 questions with guidance on how to score each

## Summary results

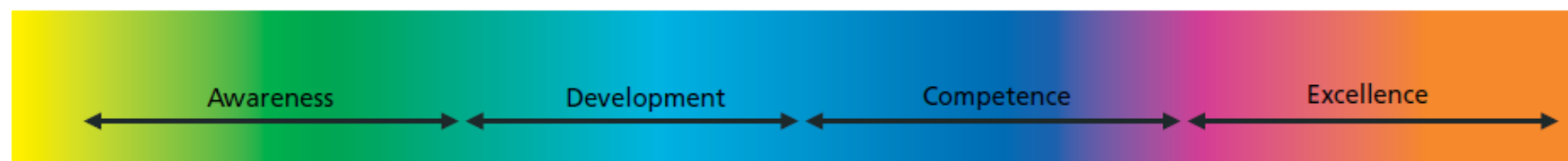
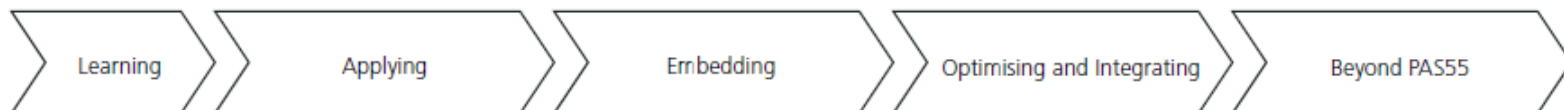
Reference	Question	Summary Results	Self Assessment	Review	Appropriate Target	Difference
IIMM 2.1	1	AM Policy and Strategy	55	55	70	15
IIMM 2.2	2	Levels of Service and Performance Management	50	45	70	20
IIMM 2.3	3	Demand Forecasting	70	70	80	10
IIMM 2.4	4	Asset Register Data	60	60	60	0
IIMM 2.5	5	Asset Condition Assessment	50	50	60	10
IIMM 2.6	6	Risk Management	50	45	70	20
IIMM 3.1	7	Decision Making	60	60	75	15
IIMM 3.2	8	Operational Planning and Reporting	50	55	70	20
IIMM 3.3	9	Maintenance Planning	50	50	70	20
IIMM 3.4	10	Capital Investment Strategies	55	65	70	15
IIMM 3.5	11	Financial and Funding Strategies	55	60	80	25
IIMM 4.1	12	Asset Management Teams	40	50	65	25
IIMM 4.2	13	AM Plans	45	50	70	25
IIMM 4.3	14	Information Systems	40	45	70	30
IIMM 4.4	15	Service Delivery Models	55	50	80	25
IIMM 4.5	16	Quality Management	35	35	60	25
IIMM 4.6	17	Improvement Planning	30	40	60	30
		Overall score	50	52	69	19

## Summary Results

2 Understanding and Defining requirements	56		68	13
3 Developing Asset Management Lifecycle Strategies	54		73	19
4 Asset Management Enablers	41		68	27
Total	50		69	19



# IAM Maturity Rating Levels



Maturity Level 0	Maturity Level 1	Maturity Level 2	Maturity Level 3	Maturity Level 4
The elements required by PAS55 are not in place. The organisation is in the process of developing an understanding of PAS55.	The organisation has a basic understanding of the requirements of PAS55. It is in the process of deciding how the elements of PAS55 will be applied and has started to apply them.	The organisation has a good understanding of PAS55. It has decided how the elements of PAS55 will be applied and work is progressing on implementation.	All elements of PAS55 are in place and are being applied and are integrated. Only minor inconsistencies may exist.	Using processes and approaches that go beyond the requirements of PAS55. Pushing the boundaries of Asset Management development to develop new concepts and ideas.

**Figure 1** *Maturity Scale*

# Network Rail (UK) in 2009

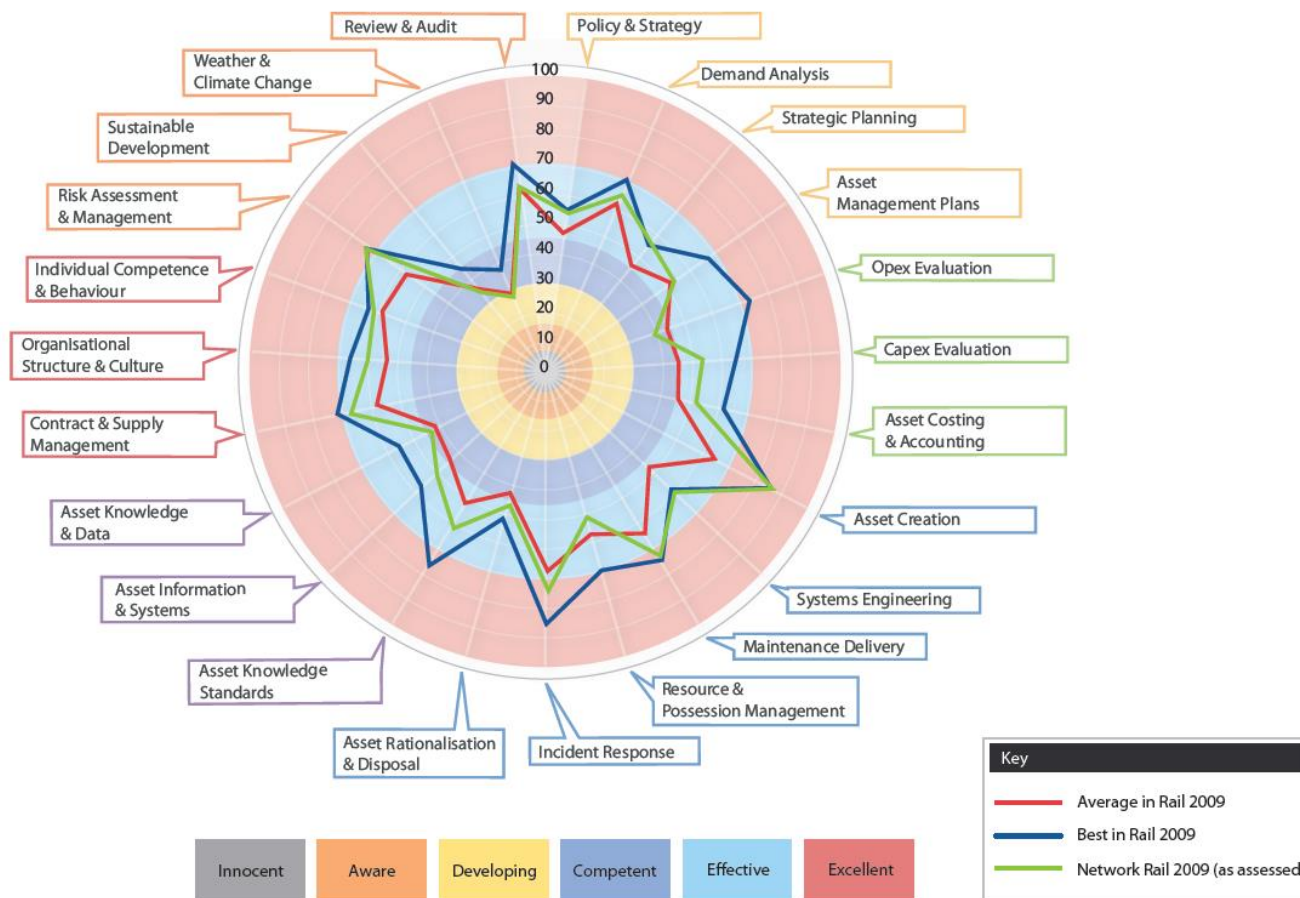
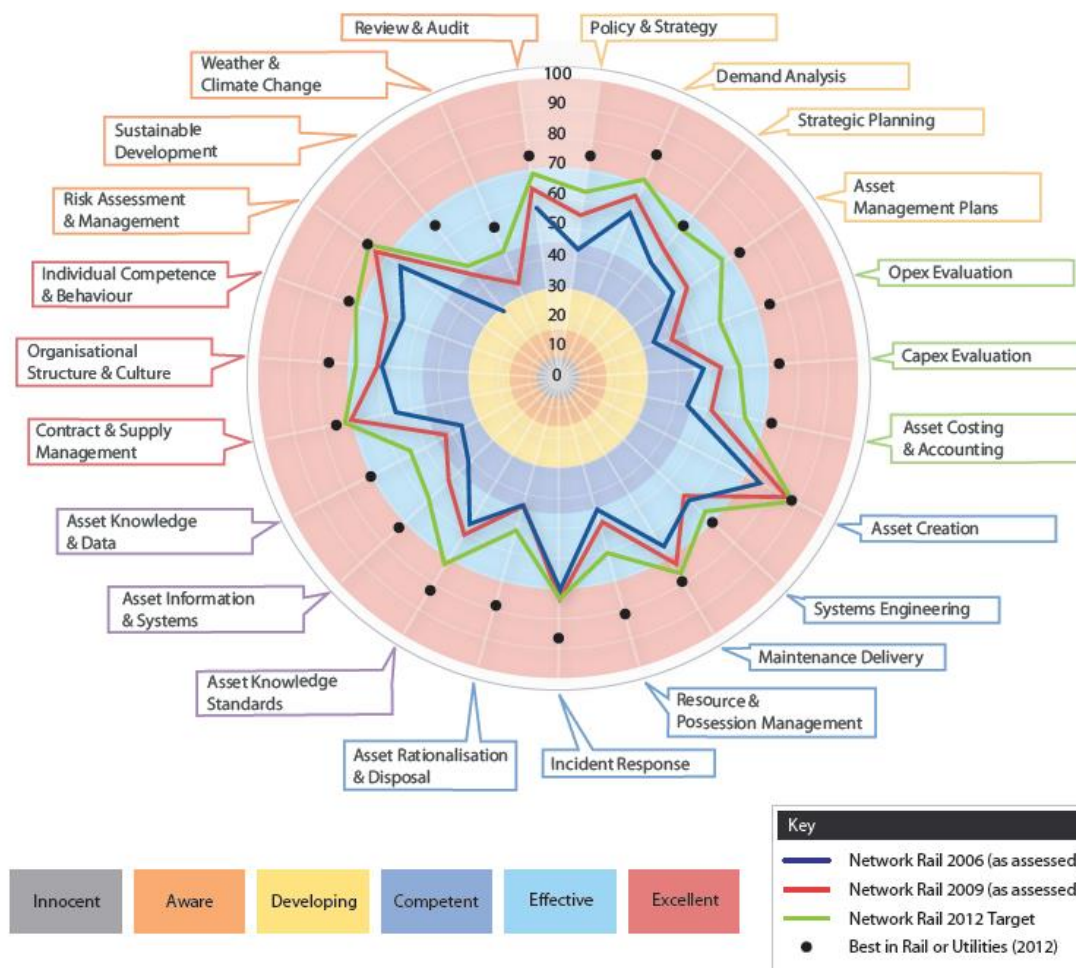


Diagram 4. Comparison of Network Rail to Average and Best in Rail

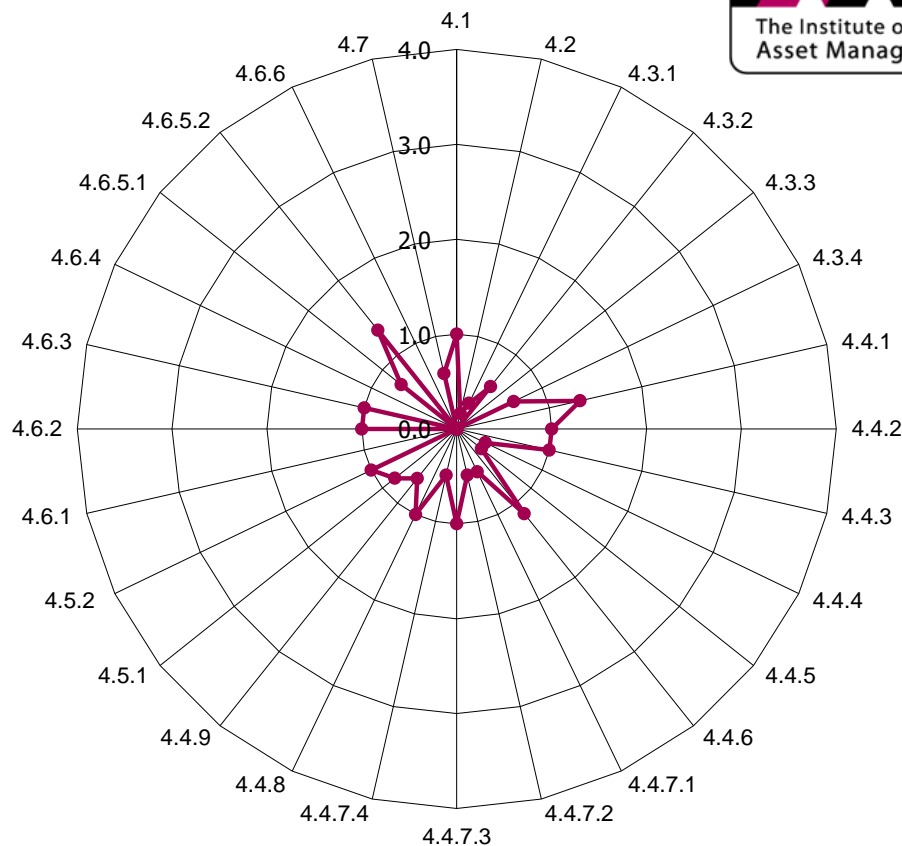
# Network Rail (UK) Target for 2012



## No. Clauses

- 4.1 General requirements
- 4.2 Asset management policy
- 4.3.1 Asset management strategy
- 4.3.2 Asset management objectives
- 4.3.3 Asset management plan(s)
- 4.3.4 Contingency planning
- 4.4.1 Structure, authority and responsibilities
- 4.4.2 Outsourcing of asset management activities
- 4.4.3 Training, awareness and competence
- 4.4.4 Consultation, participation and communication
- 4.4.5 Asset Management System documentation
- 4.4.6 Information management
- 4.4.7.1 Risk management process(es)
- 4.4.7.2 Risk management methodology
- 4.4.7.3 Risk identification and assessment
- 4.4.7.4 Use and maintenance of asset risk information
- 4.4.8 Legal and other requirements
- 4.4.9 Management of Change
- 4.5.1 Life Cycle Activities
- 4.5.2 Tools, facilities and equipment
- 4.6.1 Performance and condition monitoring
- 4.6.2 Investigation of asset-related failures, incidents and nonconformities
- 4.6.3 Evaluation of compliance
- 4.6.4 Audit
- 4.6.5.1 Corrective & Preventative action
- 4.6.5.2 Continual Improvement
- 4.6.6 Records
- 4.7 Management review

## Assessment Page



The RADAR chart shows the average score range per clause





Lack of AM Maturity  
Doesn't Prevent  
Having Good Assets!

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# Implementing RAM Takes Time

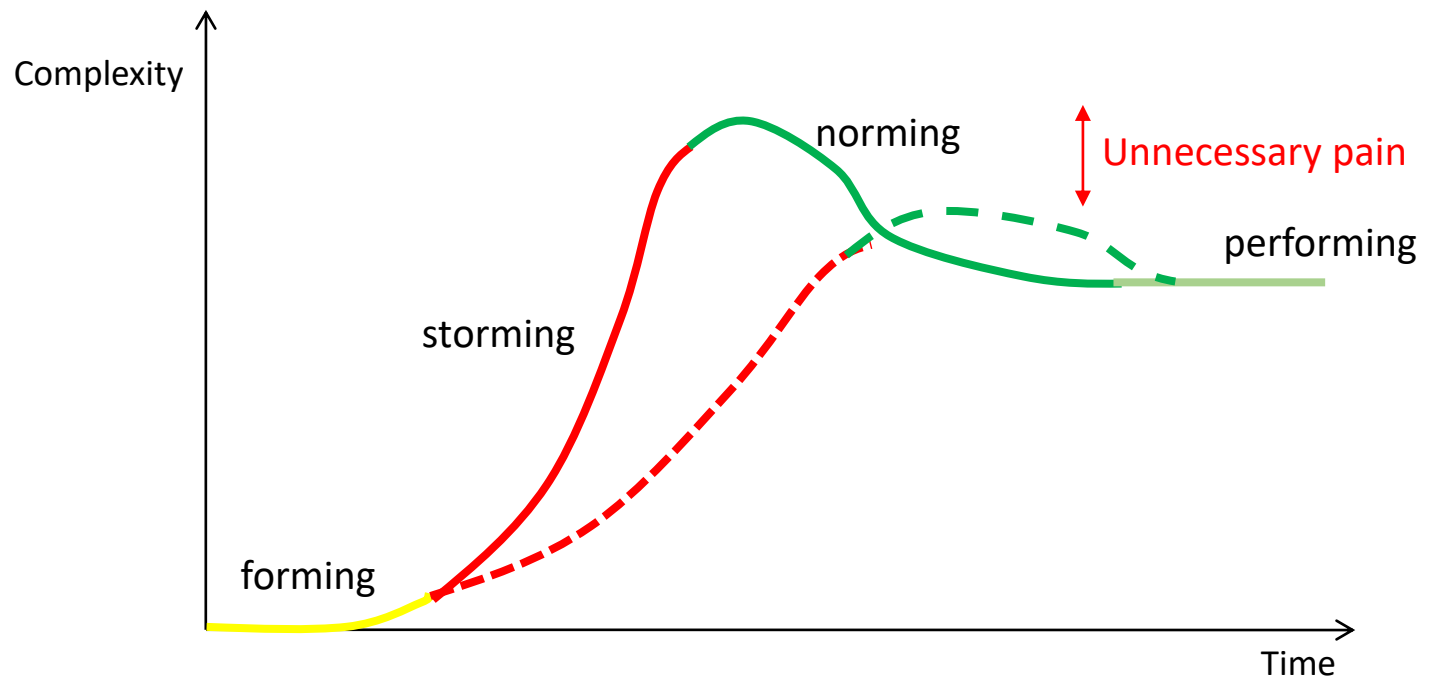
- Like good wine, asset management takes time to mature
  - Need to lay vintage before any improvement can start
  - Start now!
  - Write down your assumptions
  - Next year's plans will definitely be better



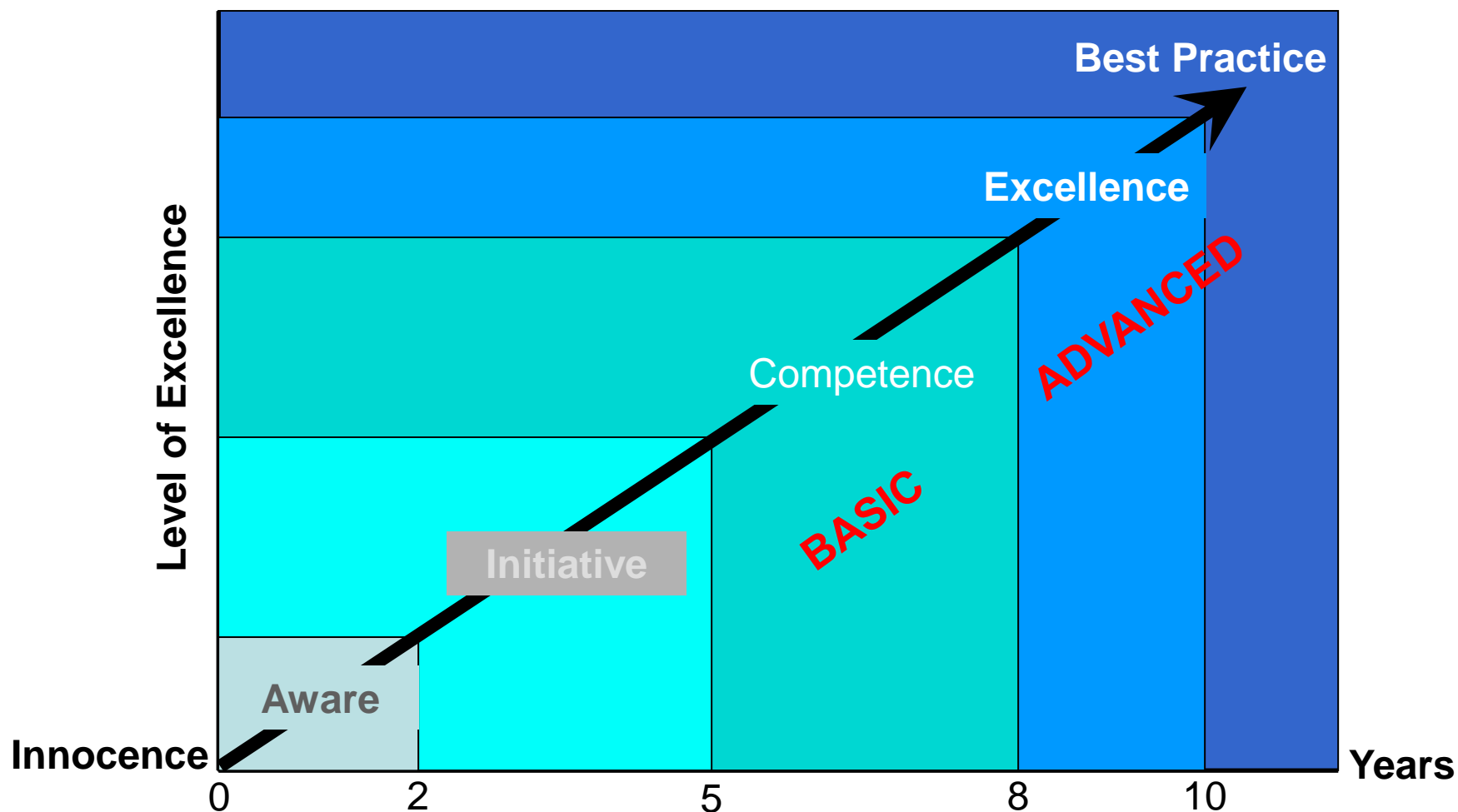


# Timeline

- Avoid being over complicated and over use of excessive temporary resources
  - Make RAM your 'business as usual'
  - Avoid unnecessary pain



# Indicative Timeline



# Summary

1. RAM is a business process, linking all activities back to the level of service you are seeking to deliver
2. While the focus on different parts of the process will vary between road authorities, the process itself can remain constant
3. The better you are at RAM, the more value you can get from each dollar you put into the system
4. RAM Maturity Assessment can help identify gaps and develop improvement actions
5. Start out simple, add complexity to RAM only when absolutely necessary
6. Good RAM is a marathon, not a sprint.