Road Asset Management (RAM)

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Session: Asset Management Information Systems and Decision Tools

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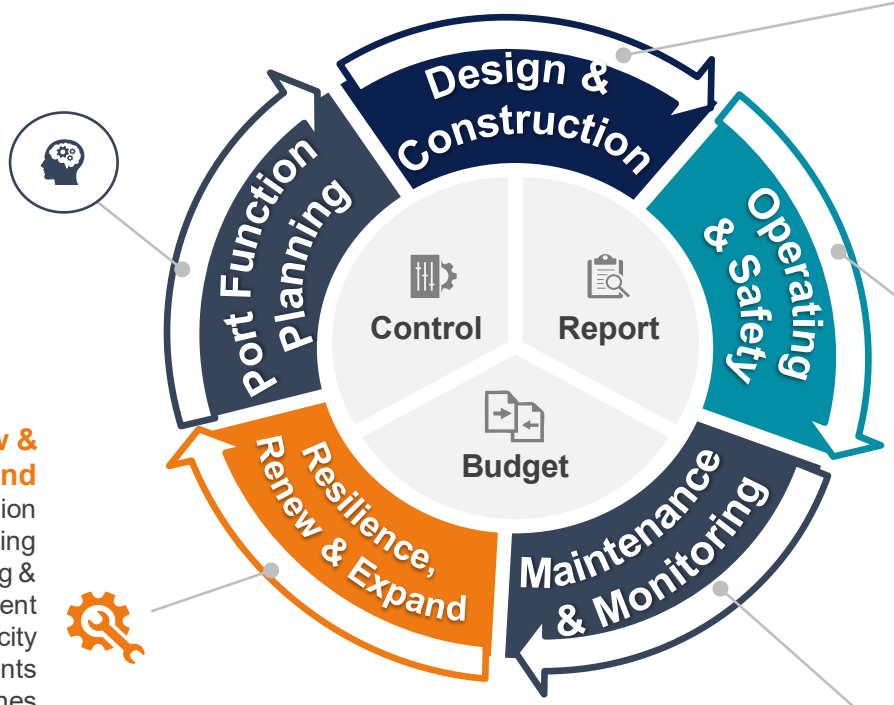
The decisions we make during the life of assets



Design and Construction
- Functional requirements
- Capital budgeting
- Design requirements
- Environmental impact assessment

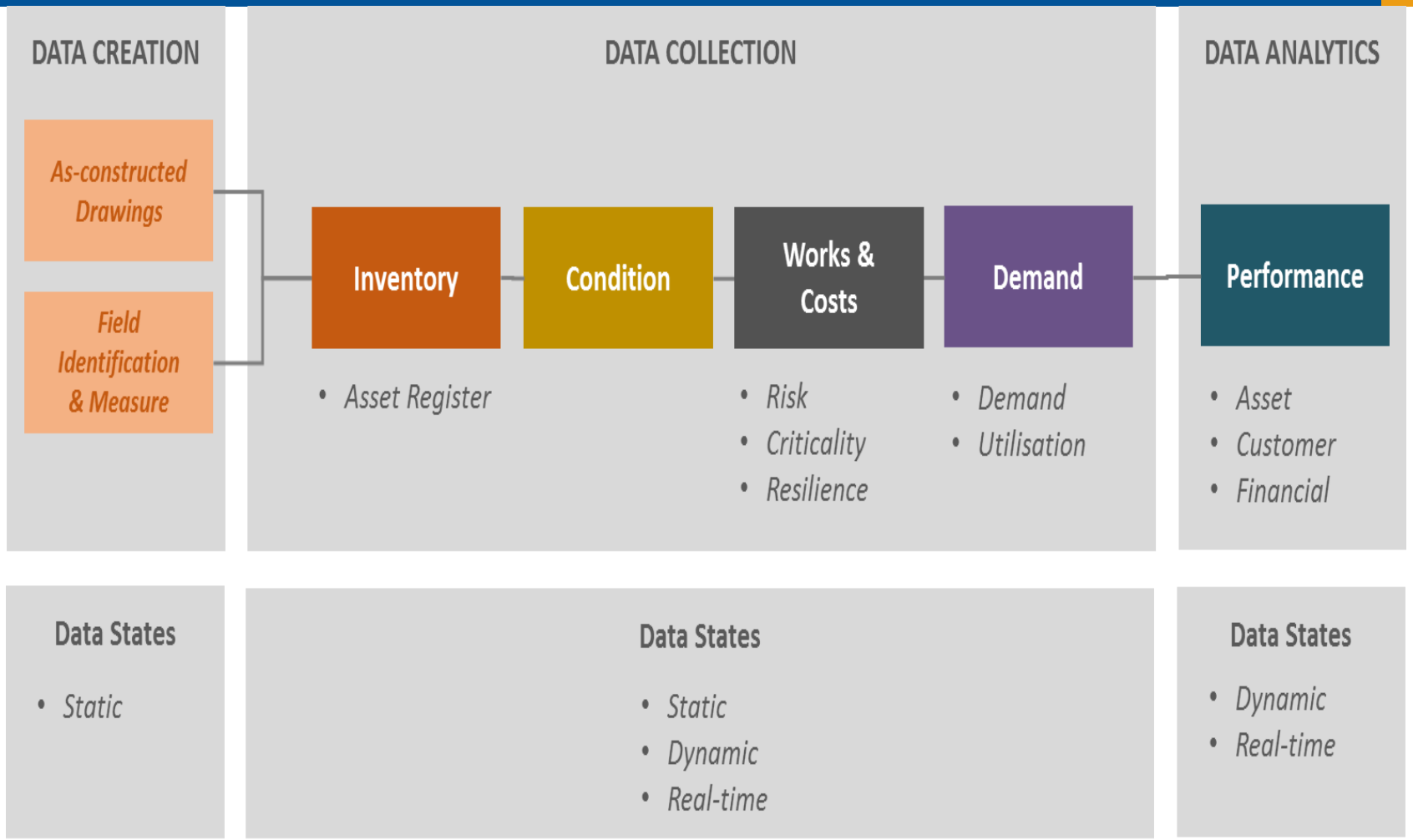
Operations & Safety
- Network management
- Traffic management systems (ITS)
- Worksite safety and traffic management
- Road safety monitoring
- Road safety management and law enforcement
- Overweight control

Maintenance & Monitoring
- Maintenance inspection
- Regular/ preventive maintenance planning
- Maintenance execution
- Contract and workflow management

Resilience, Renew & Expand
- Investment decision making
- Reconditioning & refurbishment
- Expanding and capacity improvements
- Route criticality / lifelines
- Exposure/network risk
- Asset resilience improvements
- Coastal protection

Transport Planning
- Demand and capacity management
- Network expansion
- Other modes of transport
- Utilities requirements

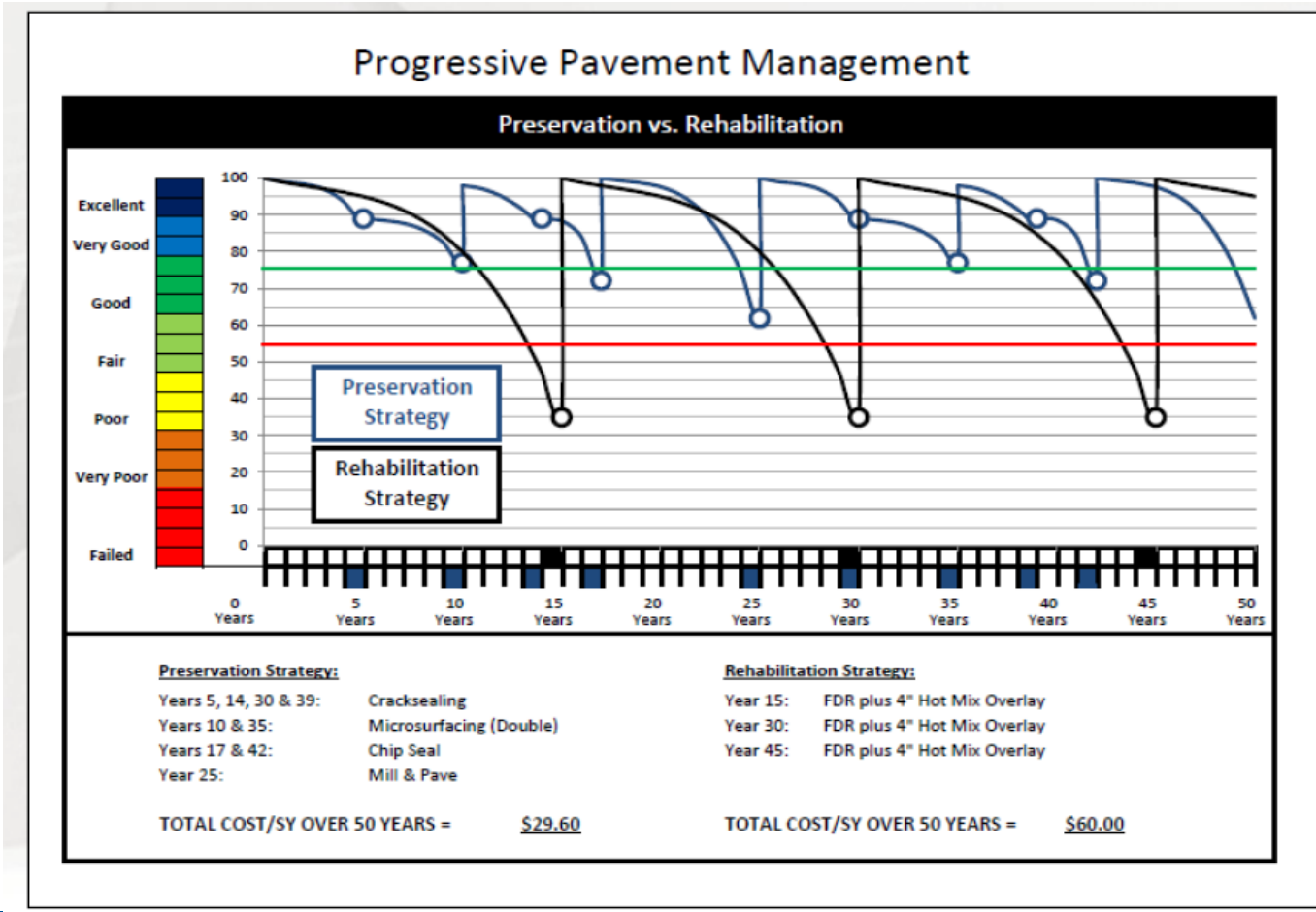
Data Phases Supporting Decision Making



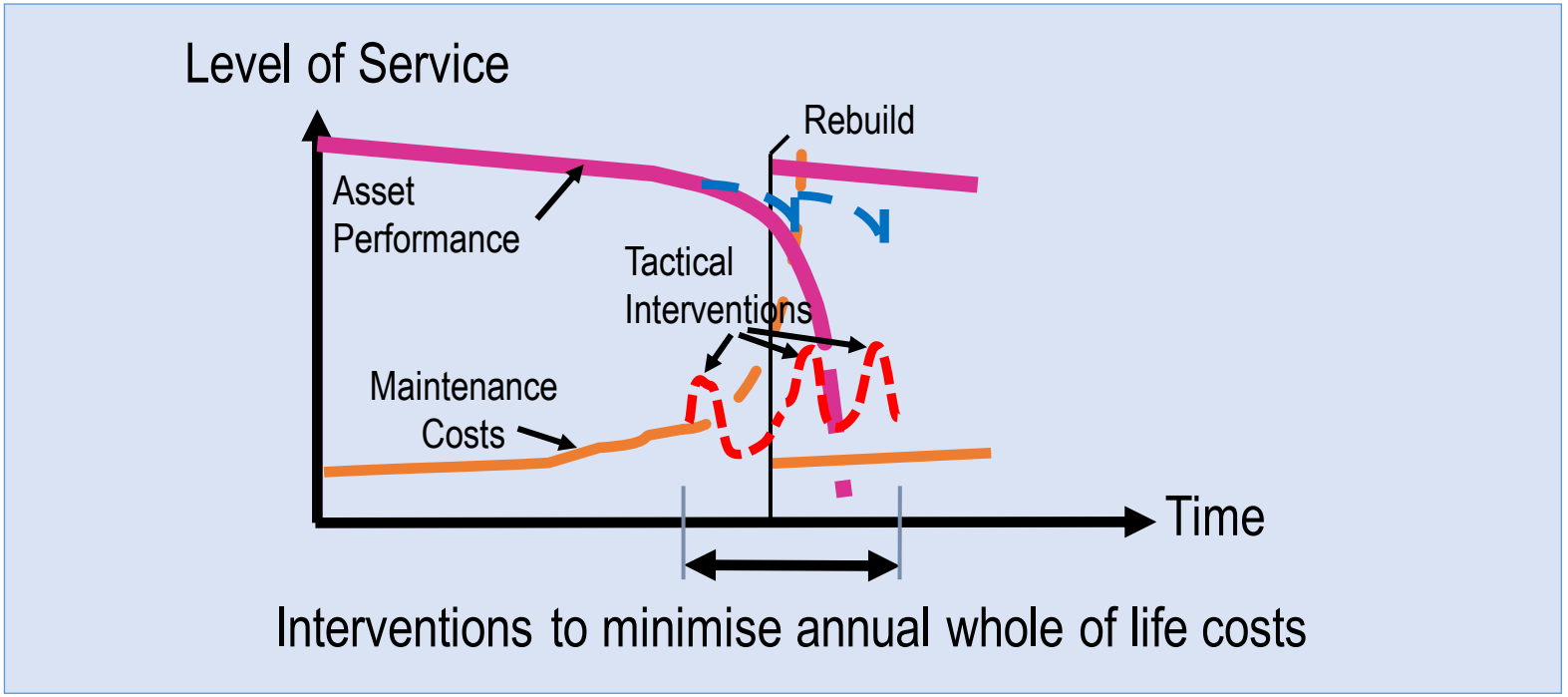
Source: Austroads

Life Cycle Cost Consider the Total Cost of Ownership

- Preservation approach costs less
- That means we are intervening earlier on roads

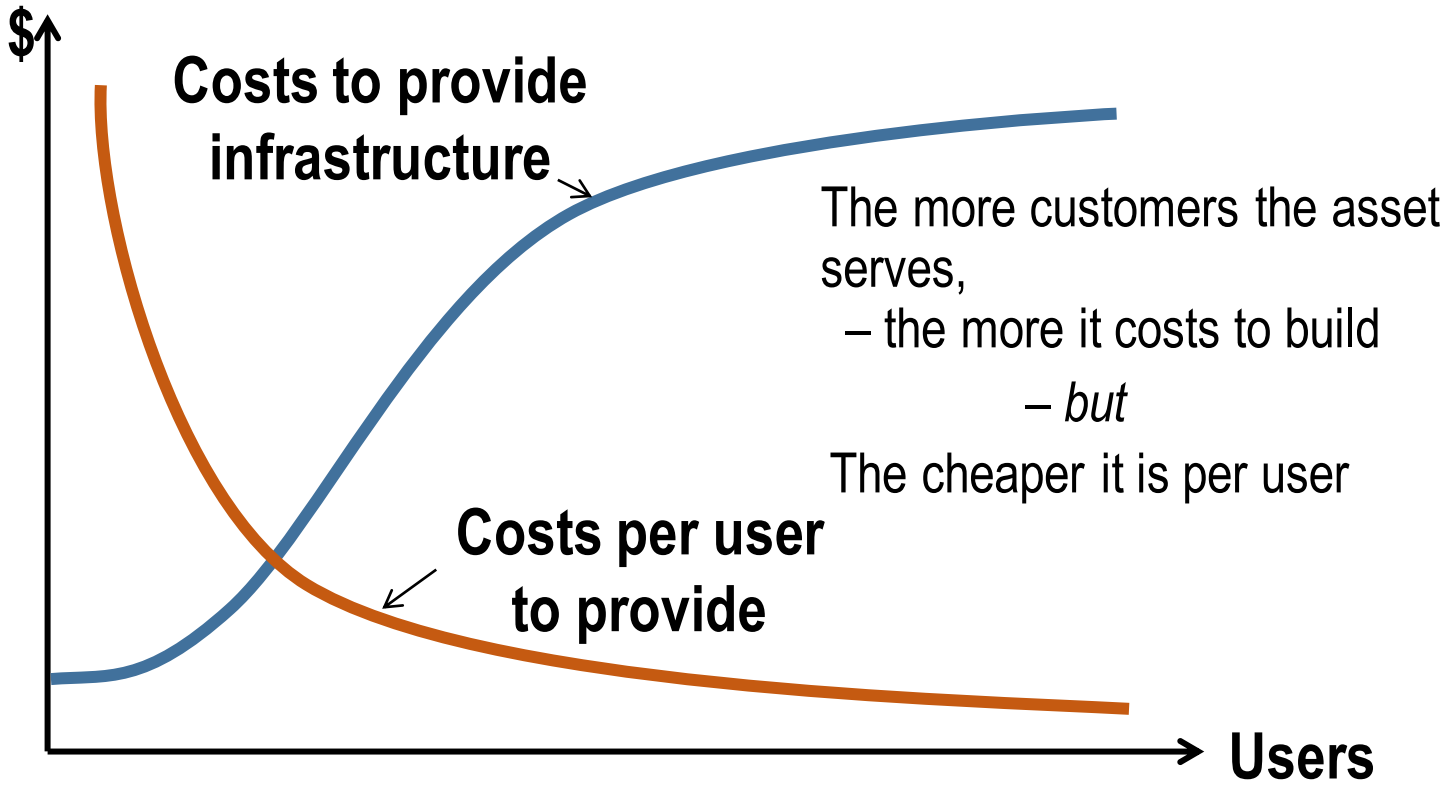


Optimising Value from Assets



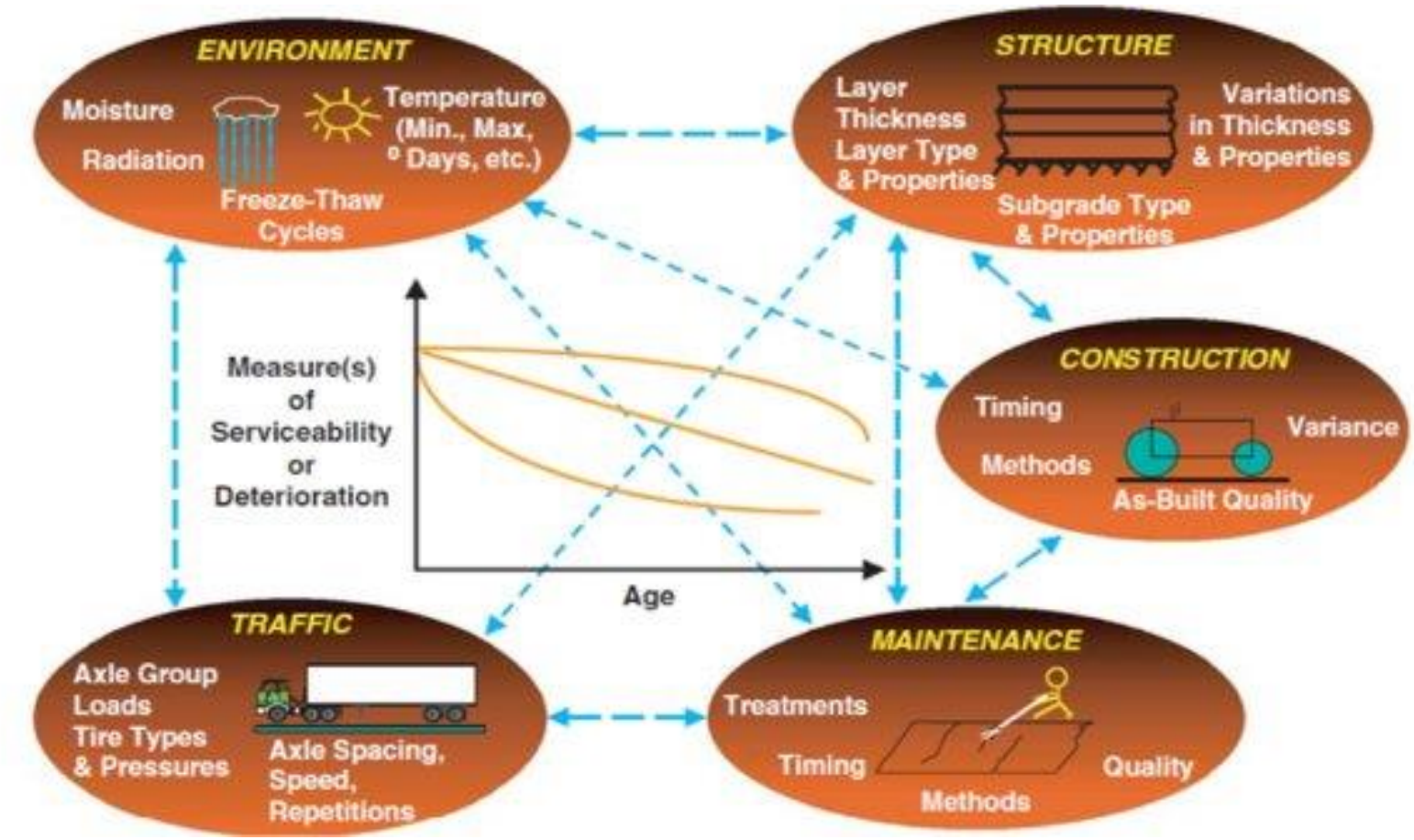
Source: David Fraser

Asset Cost to User



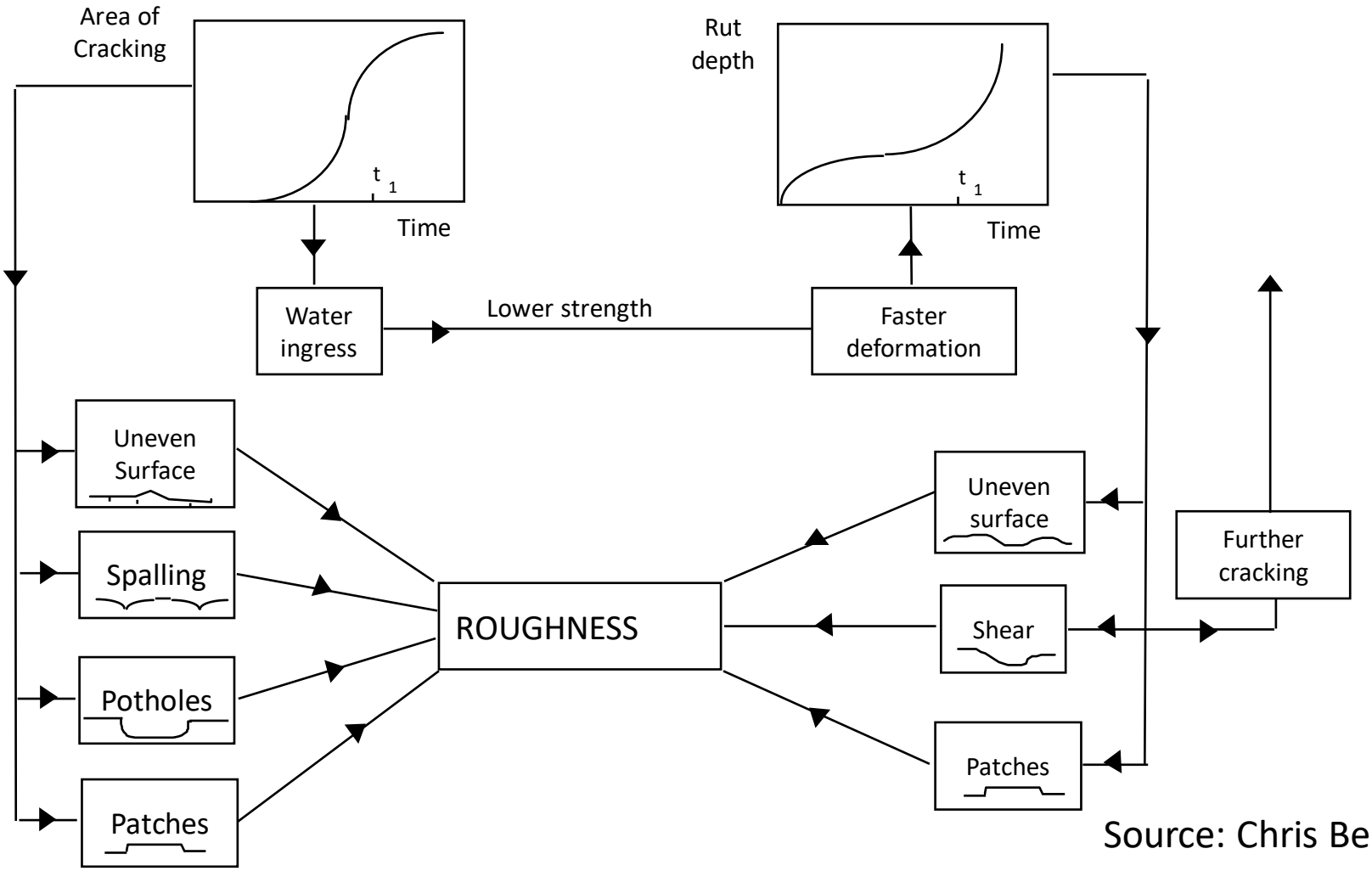
Source: David Fraser

Road Deterioration: Influencing Factors



Source Tighe at al, 2007

HDM-4 Interactions Between Distresses



Source: Chris Bennett

Distresses Modeled

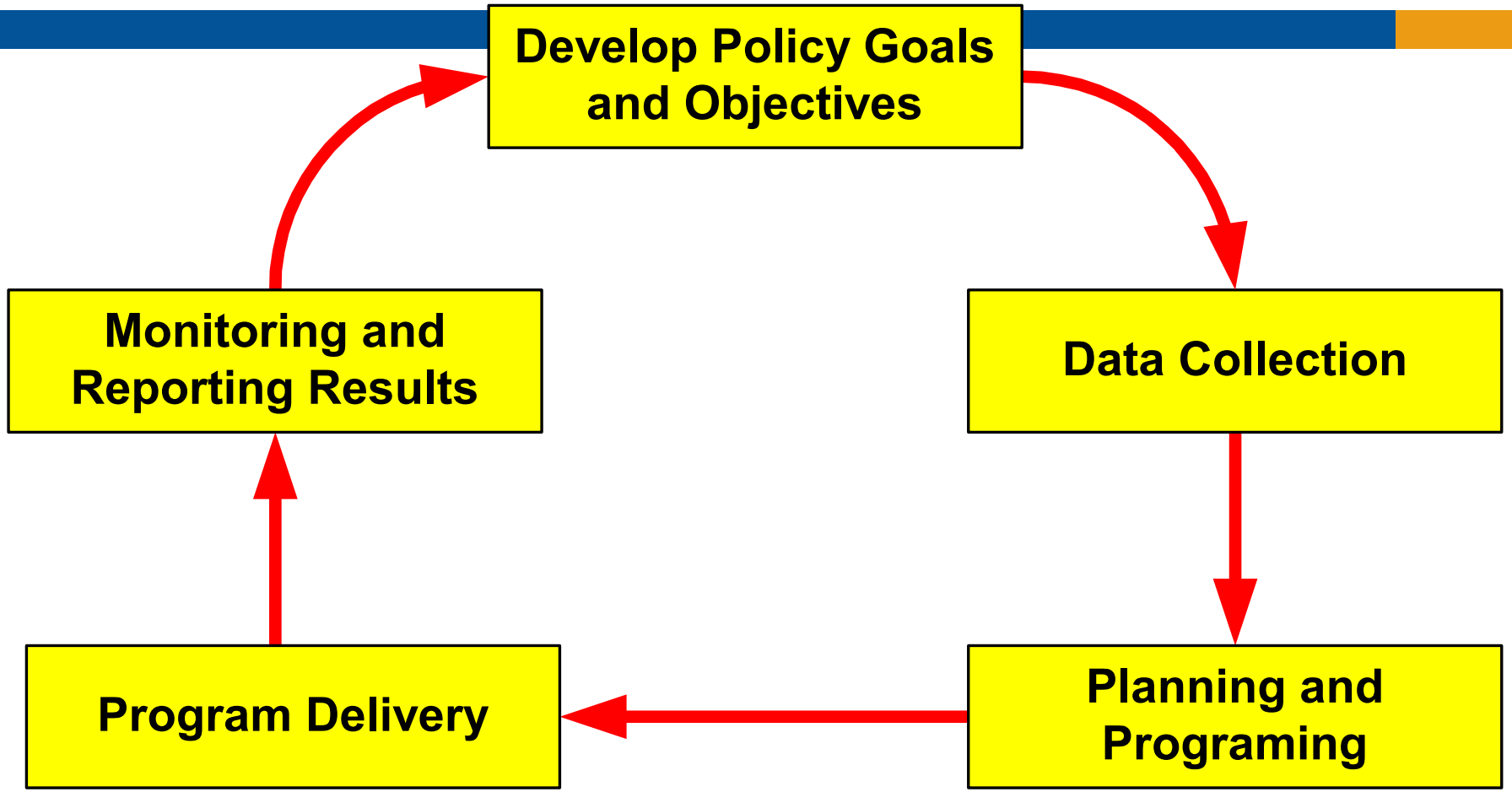
Bituminous	Concrete	Block*	Unsealed
Cracking Rutting Ravelling Potholing Roughness Edge break Surface texture Skid resistance	Cracking Joint spalling Faulting Failures Serviceability rating Roughness	Rutting Surface texture Roughness *not in software	Gravel loss Roughness

Source: Chris Bennett

Road Management System Functions

- Major activities include:
  - Data collection
  - Needs Assessment;
  - Strategic Planning, including budgeting for new development and asset preservation
  - Development, under budget constraints, of multi-year works expenditure programs

Asset Management Cycle

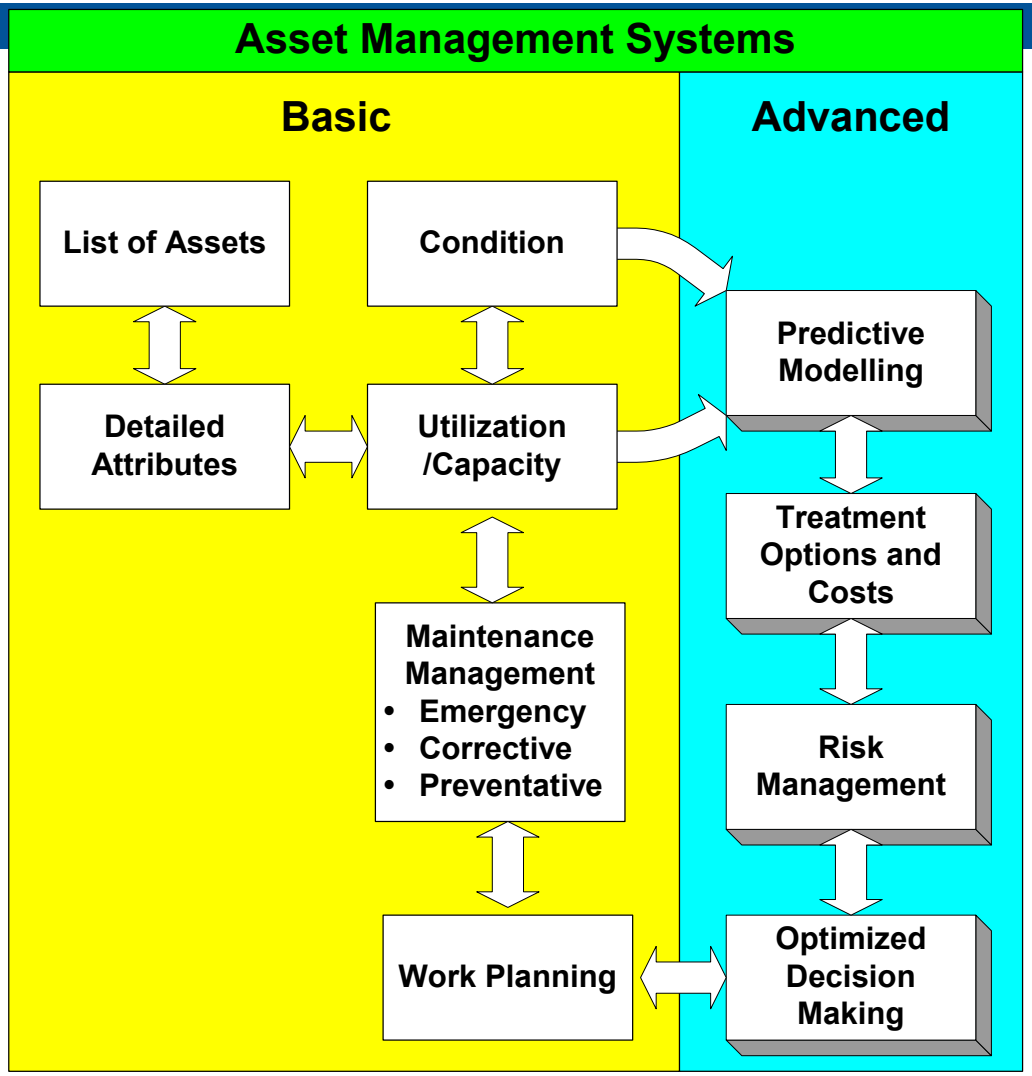


Asset management is a process to strategically manage a transportation system in a cost-effective and efficient manner

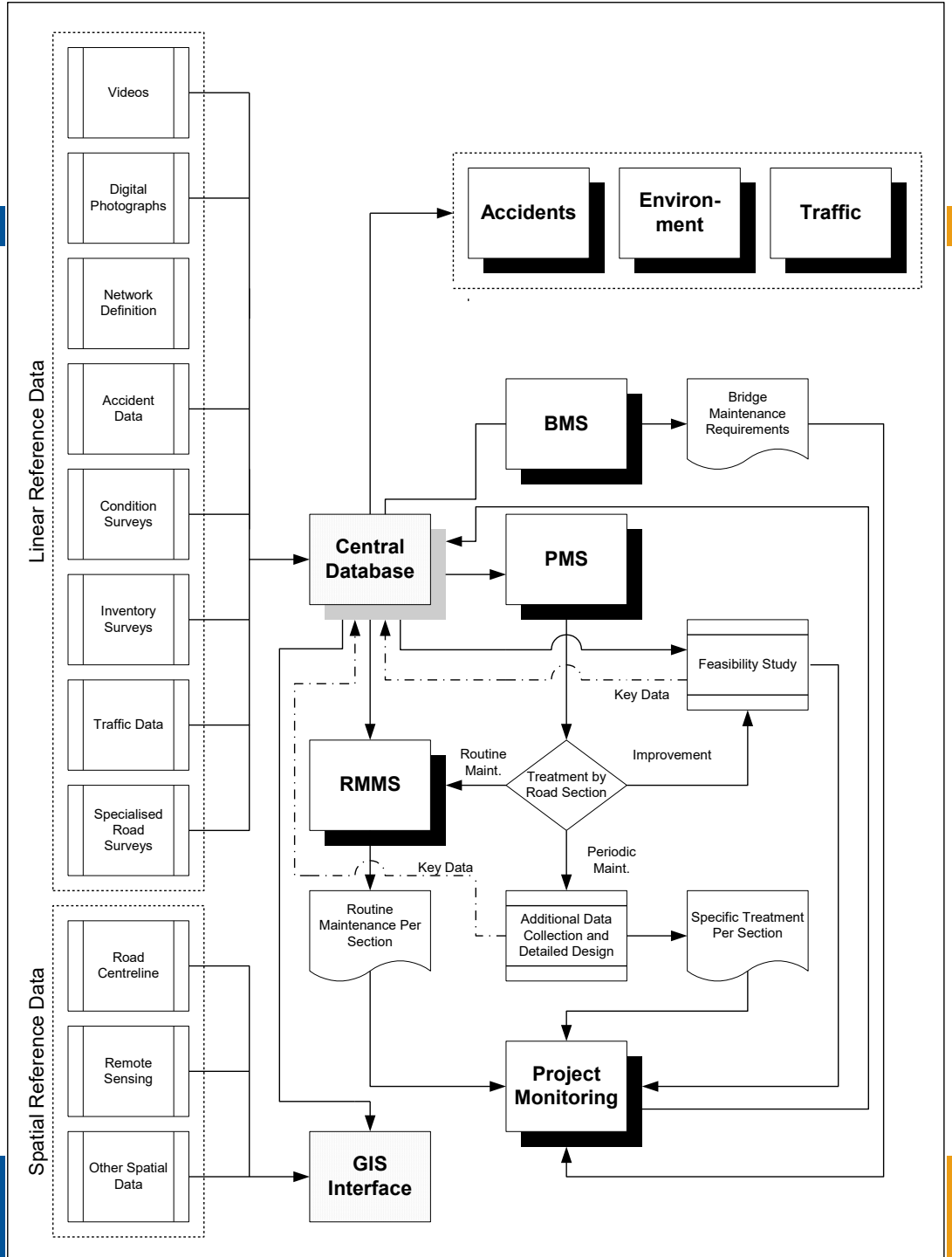
Information Management

- Series of distributed databases
  - Managed and operated by the organizational units most interested in the use of the data,
- Connected through the communication system to be accessible throughout the organization

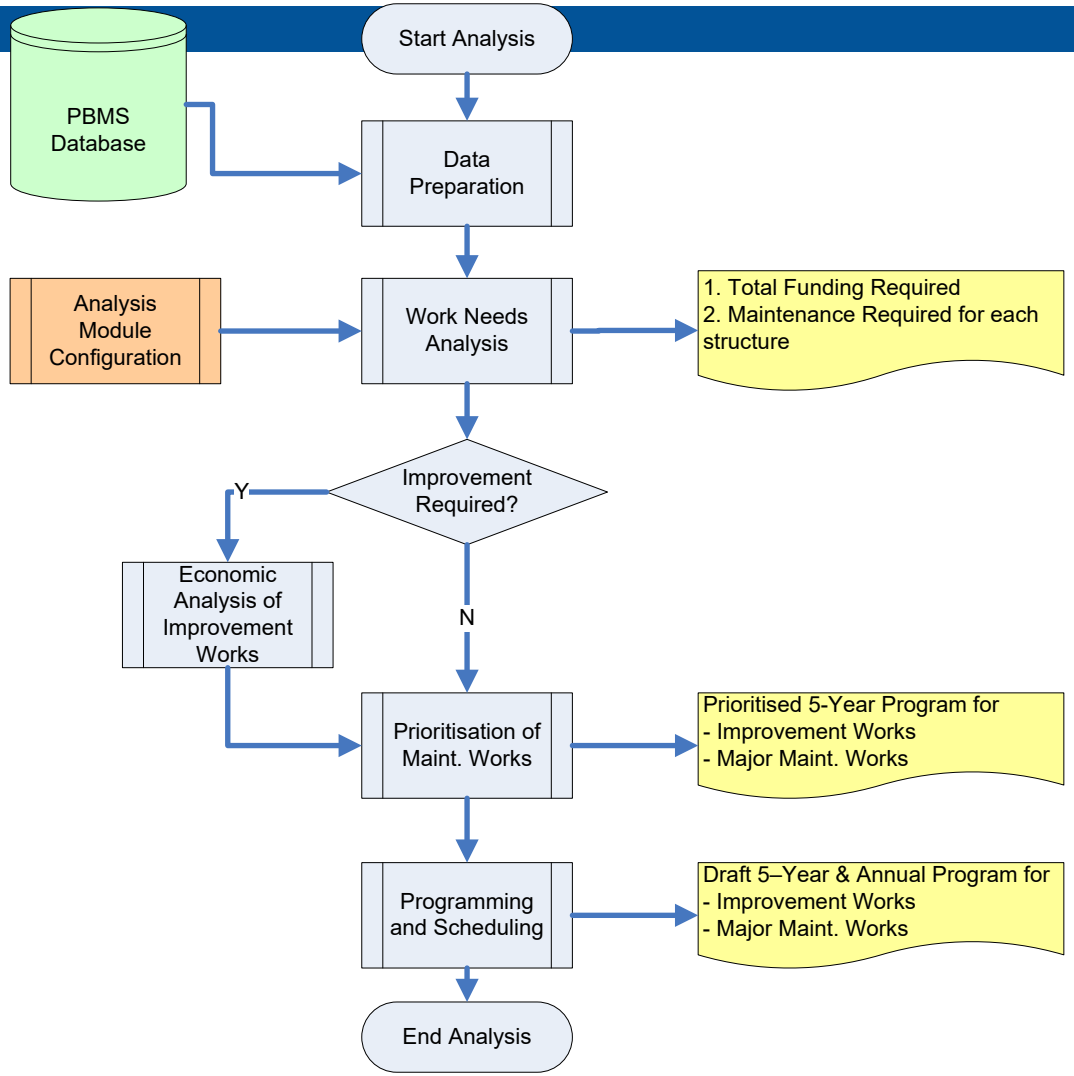
Basic and Advanced Systems



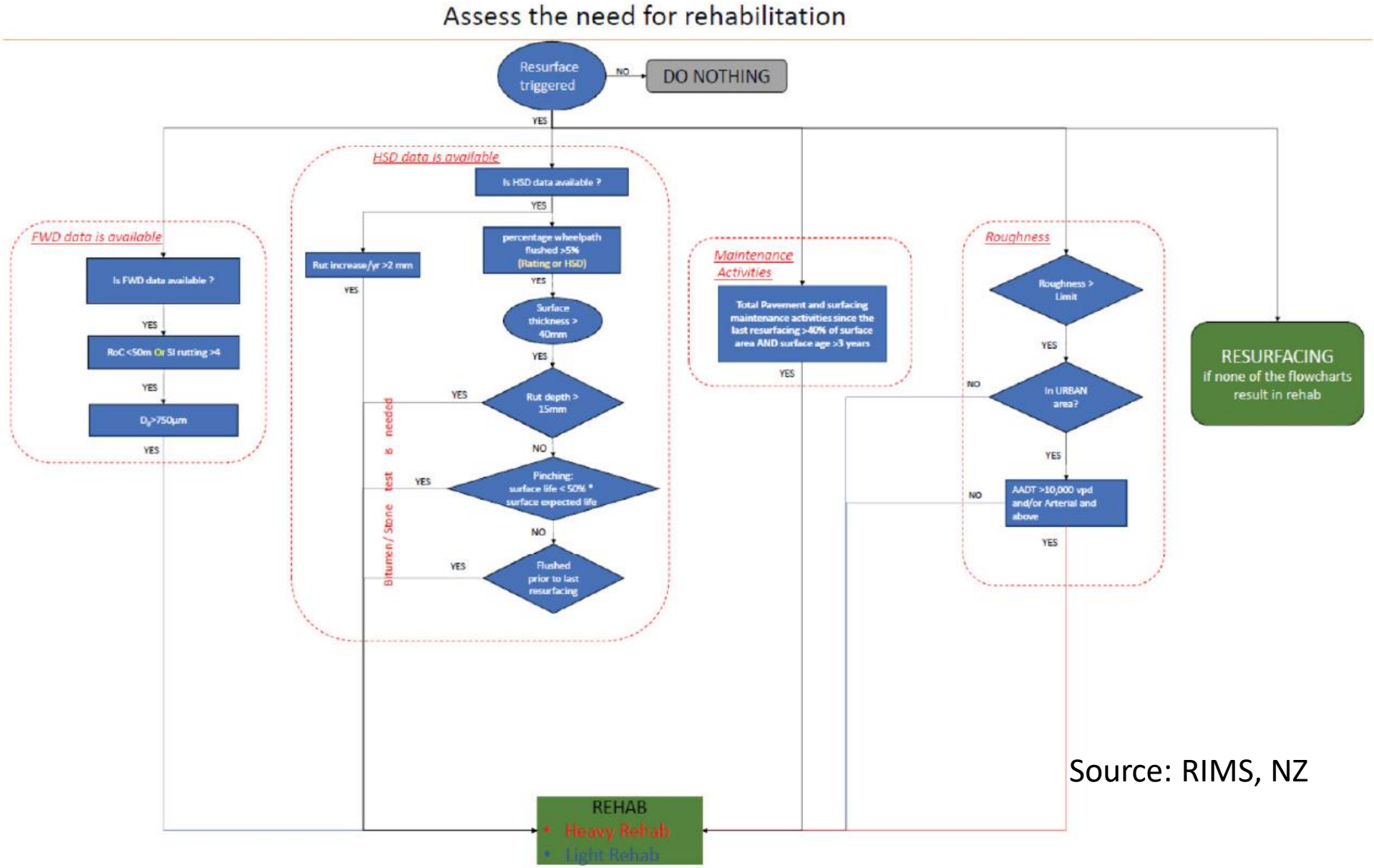
Road Management System Framework



Analysis and Business Process



Example of Decision Tree



Source: RIMS, NZ

Selecting the Right Tool

Correct Approach

- Business Process Analysis
  - Determine the function and role of the PMS in the agency, required features
- System Design
  - Design the system around the institution's capabilities
- Select and Adapt/Customize Existing Software
- Simple analyses
- Implement and provide ongoing support

Wrong (but typical) Approach

- Select software before project starts or write new software
- Fit the agency's activities into the software
- Adopt too intensive data collection
- Complex system and analyses

Technology

- Key Success Factor:
  - **The IT components should be appropriate**
- To Achieve This:
  - System predictions relevant
  - Need a strong IT division – or outsource
  - Need an IT strategy
  - RMS must fit into IT strategy
  - RMS must be properly supported from an IT perspective

Commercial Off-the-Shelf (COTS) Software

- Most large commercial organizations have policy of using COTS instead of custom software because:
  - Lower cost
  - Independence – many consultants Timeframe – implemented much faster
  - Experience – reflects inputs and testing from a larger number of users
  - Functionality – more functions
  - Ongoing development – continual upgrades and improvements
  - Exchange of ideas – conferences and other users

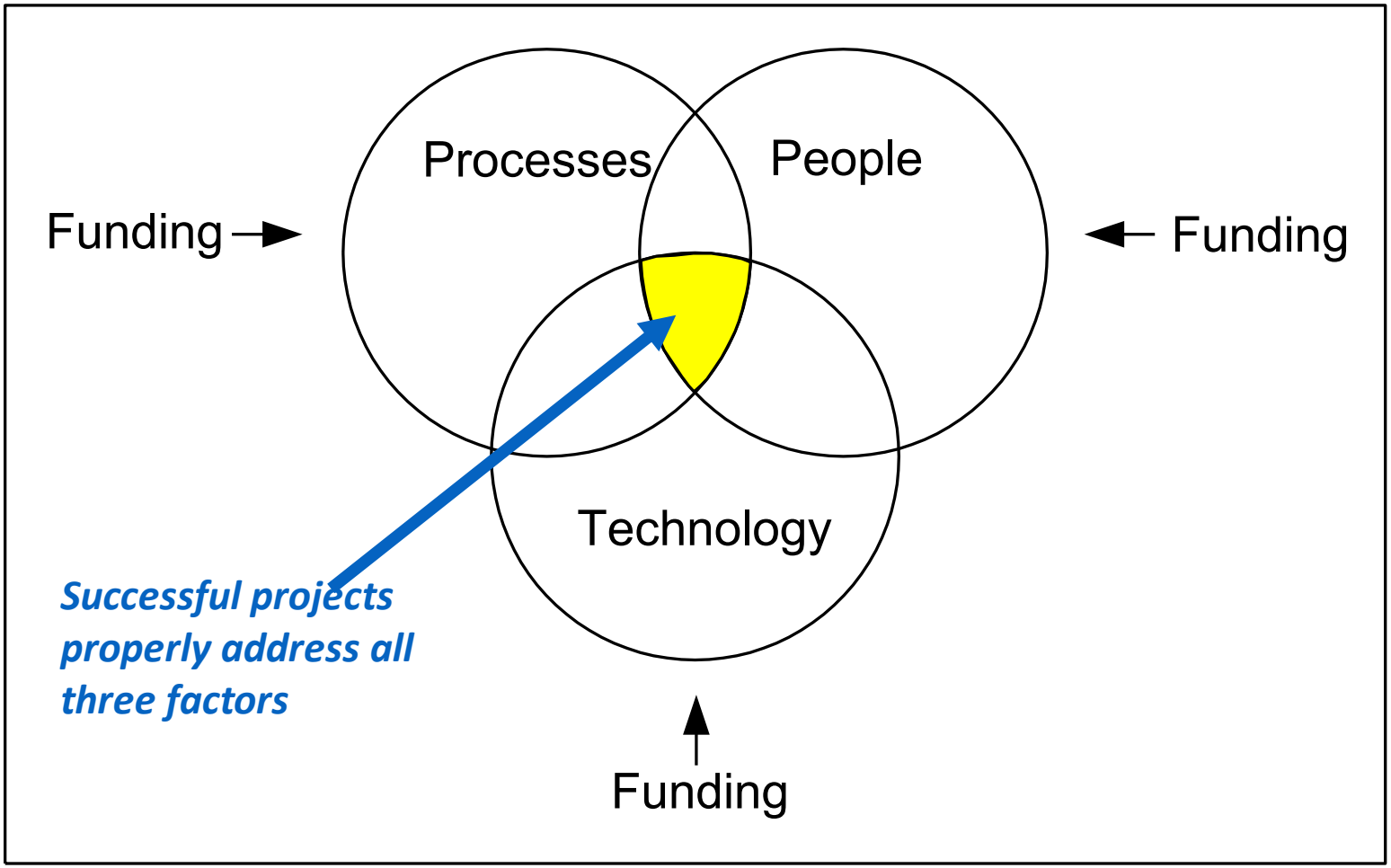
COTS - Disadvantages

- Requirements – Functionality may not be *exactly* what is required
- Customization – time to develop new ideas may take longer since other clients also need to be taken care of
- Cost – agency may have problems meeting ongoing support and maintenance agreements

COTS - Recommendations

- COTS from a good supplier is almost *always* preferable to custom development
- Several packages available
- Careful review and assessment required prior to procurement
- Biggest issue is that client's business processes do not exactly match the software
  - Software can usually be modified
  - Often, business processes should be improved

System Implementation - The Key to Success



Training and Capability Development Strategy

"Education is the most powerful weapon which you can use to change the world." – Nelson Mandela

- **Development of people skills is the most important step for a country to improve asset management practices**
- The Training and Development Program for Asset Management should be **supported by the highest possible level** in order to be successful
- Training and development is **not a once-off initiative**
- Learning does not only occur in the traditional "classroom setting". A wide **range of training mechanisms** has to be provided
- Where appropriate, training should also provide opportunities for candidates to receive **formal recognition through obtaining higher qualifications**

Recognition

- Slide Based on:
- *McPherson, Kevin; Bennett, Christopher R.. 2006. Success Factors for Road Management Systems. Transport Notes Series; No. TRN 29. World Bank, Washington, DC. © World Bank. https://openknowledge.worldbank.org/handle/10986/11777 License: CC BY 3.0 IGO."*

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