

Economic and Engineering Considerations:

**Policy, Planning, Financing and
Revenue**



International Scan on Asset Management:

*Australia, Canada, England, and
New Zealand*



**NCHRP 20-68, Domestic Scan Pilot
Program**

**Best Practices in Transportation Asset
Management**

Asset Management as a Decision Support Tool

Asset management can be viewed as a set of business principles and best practice methods for improving resource allocation and utilization decisions:

- Policy-Driven**
- Performance-Based**
- Analysis-Oriented**
- Information-Informed**
- Accountability and Feedback**

--Federal Highway Administration

In England....

“Asset Management is a strategic approach that identifies the optimal allocation of resources for the management, operation, preservation and enhancement of the highway infrastructure that meets the needs of current and future customers.”



In Victoria, asset management is....

“A systematic process of maintaining, upgrading, and operating physical assets cost-effectively, that...

combines engineering principles with sound business practices and economic theory, and that...

provides tools to facilitate a more organized, logical approach to decision-making, and that...

represents a framework for handling both short- and long-range planning.”



In New Zealand, asset management is....

“To plan, create, acquire, maintain, operate, rehabilitate, replace, and dispose of assets in the most cost effective (sustainable) manner required to meet present and future corporate objectives and demands for service levels.”



What Were the Drivers for Adopting Asset Management Approaches?

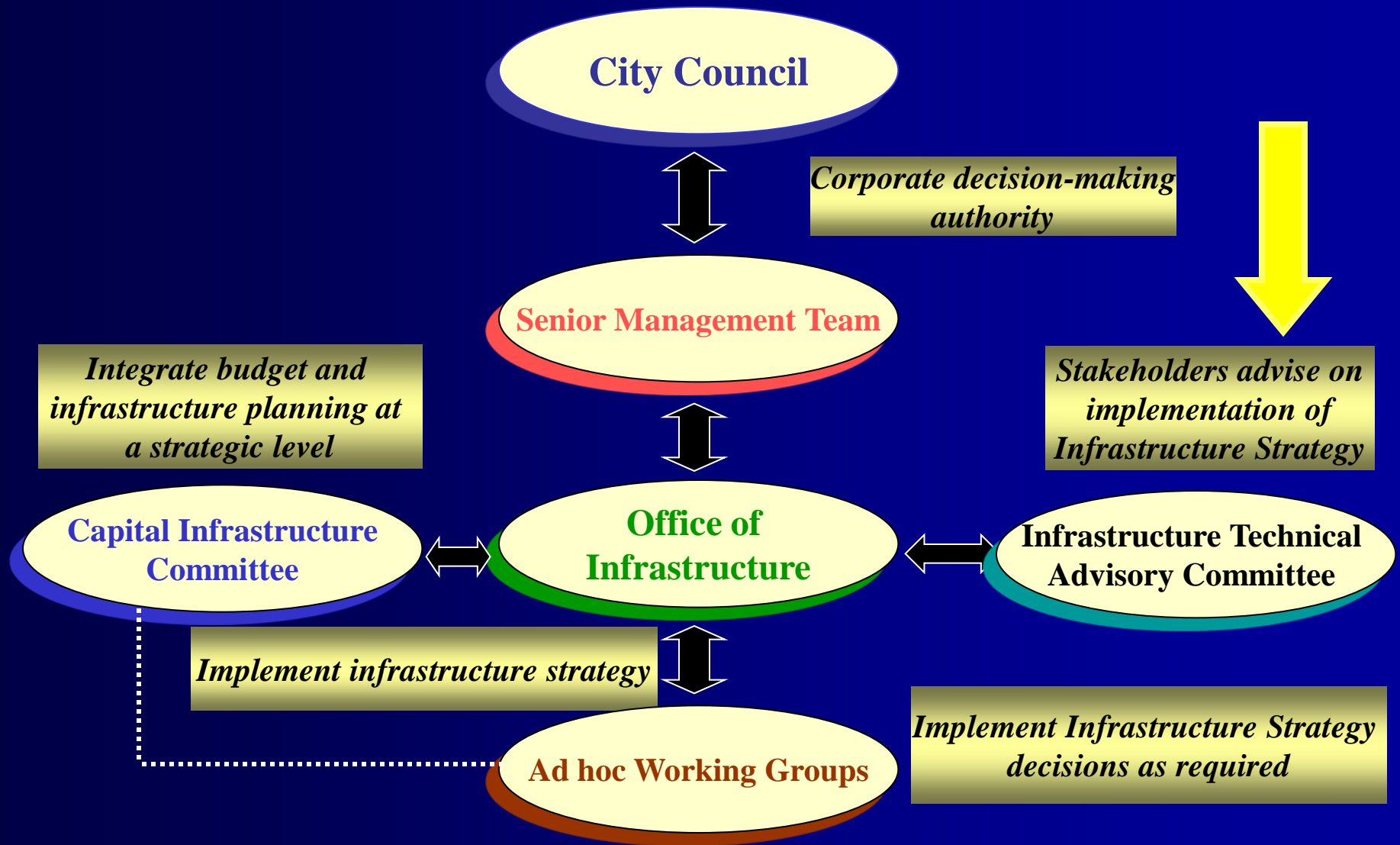
- Limited resources
- Increasing demands on and use of existing infrastructure
- Desire for credibility with elected officials and the public, that is, linking funding to system performance
- Where private provision of services was used, asset management was a way of providing strategic oversight

- Natural evolution in the development of individual infrastructure management systems
- Desire to evolve to a system that allows trade-offs among different asset categories and between asset strategies
- Legislative or governmental mandate, e.g.,
 - Road Management Act in Victoria
 - Local Transport Plan 2 guidance in England
 - Local Government Act in New Zealand
 - And in New South Wales.....

Asset management was integrated into many corporate or agency planning and policy documents, and thus related to decision making in different levels of an organization

for example....

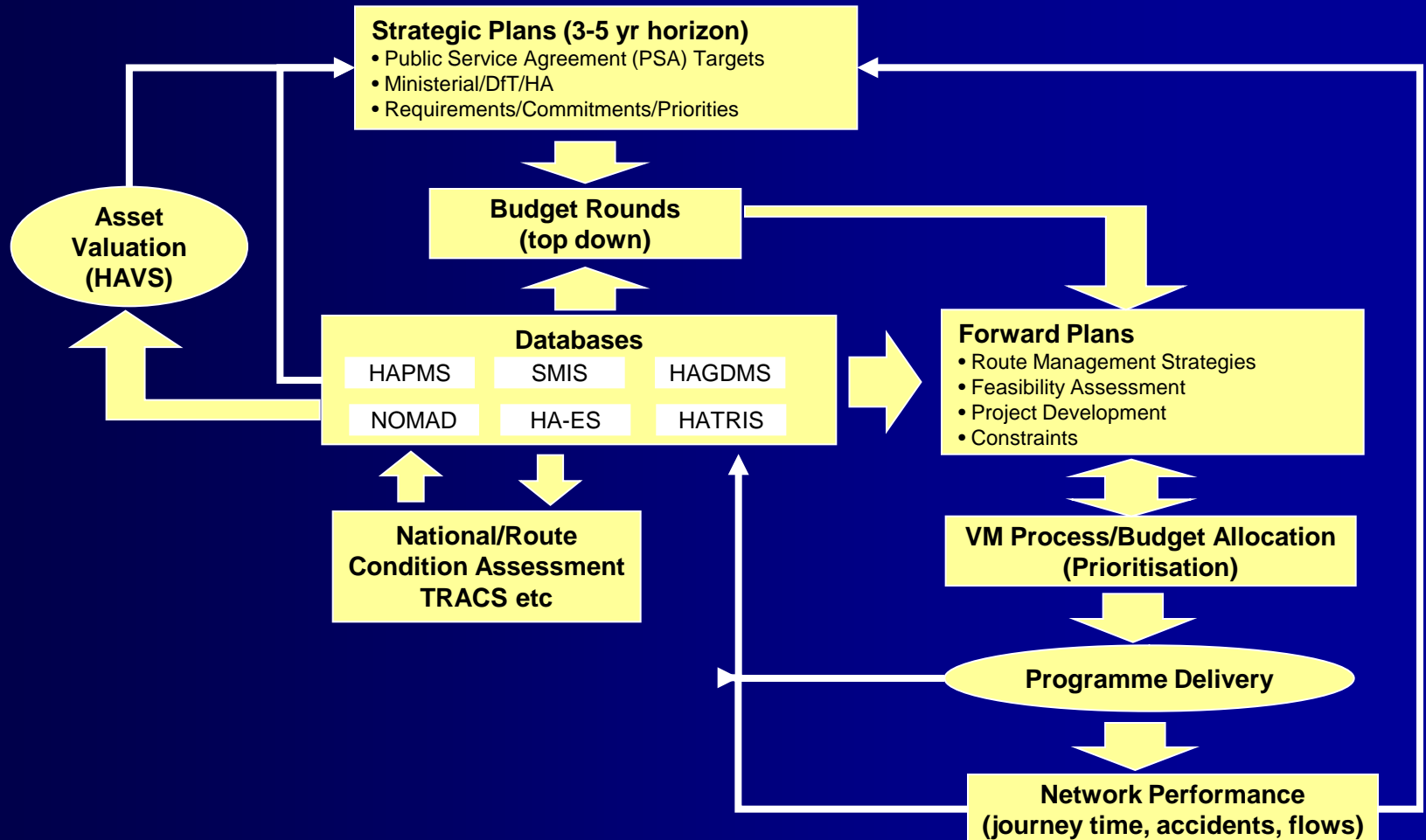
Infrastructure Management Approach in Edmonton



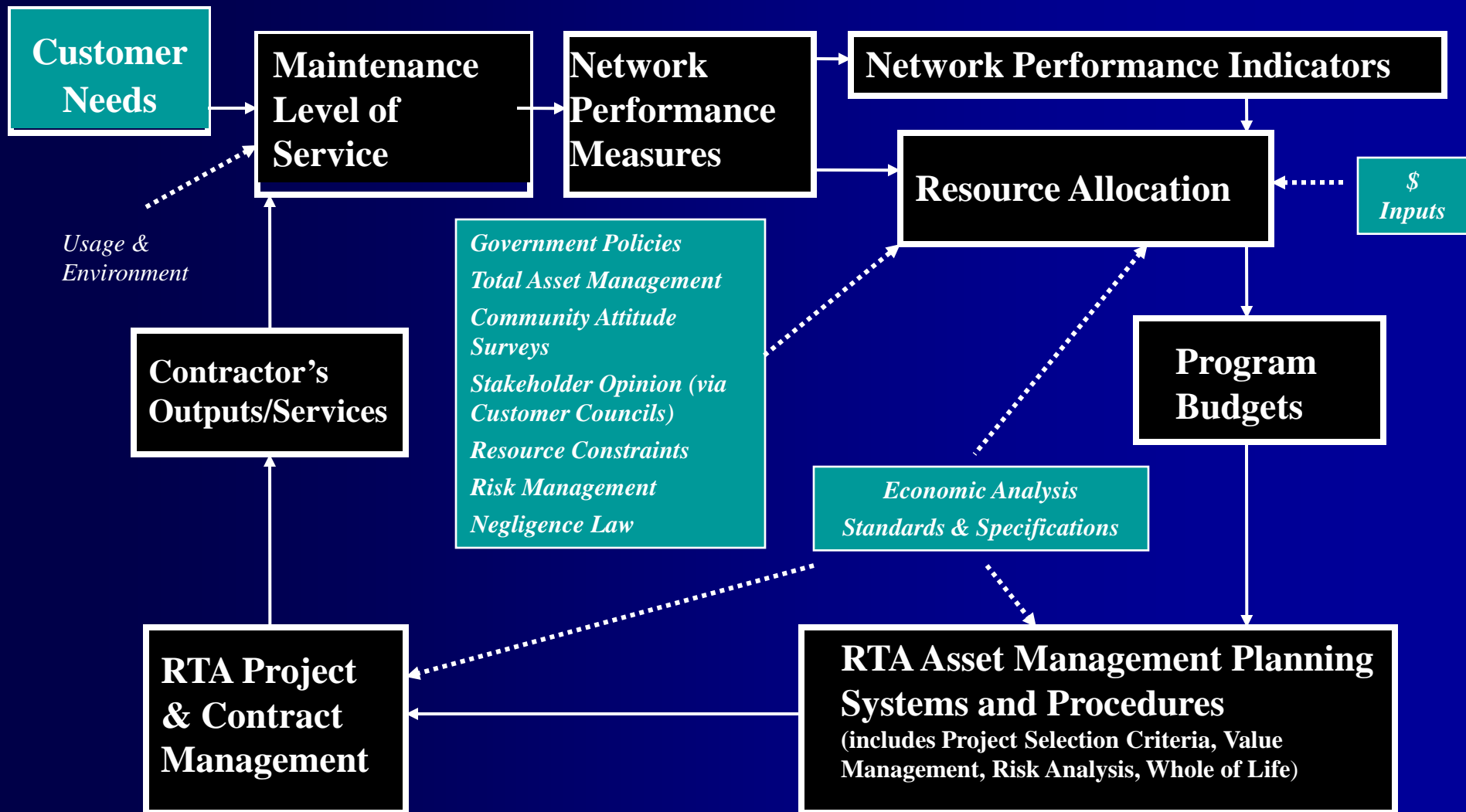
Use of Asset Information in London

- Best value performance indicators (BVPI & BCI)
- Project prioritization
- Modelling for business planning and asset maintenance
- Fund redistribution
- Valuation of assets

Descriptive Framework of Asset Management at England's Highways Agency



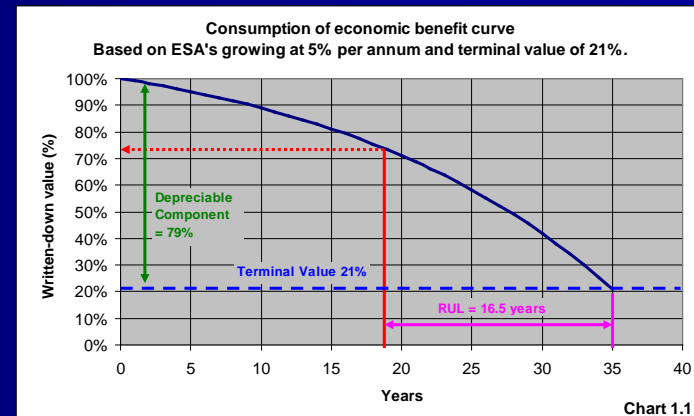
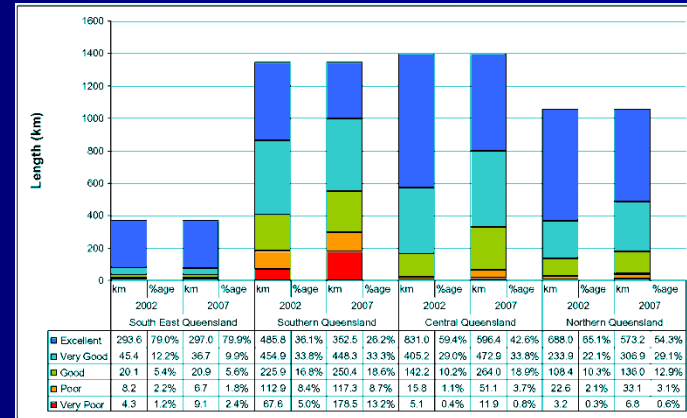
Program Governance in New South Wales: Infrastructure Assets



Queensland's Business

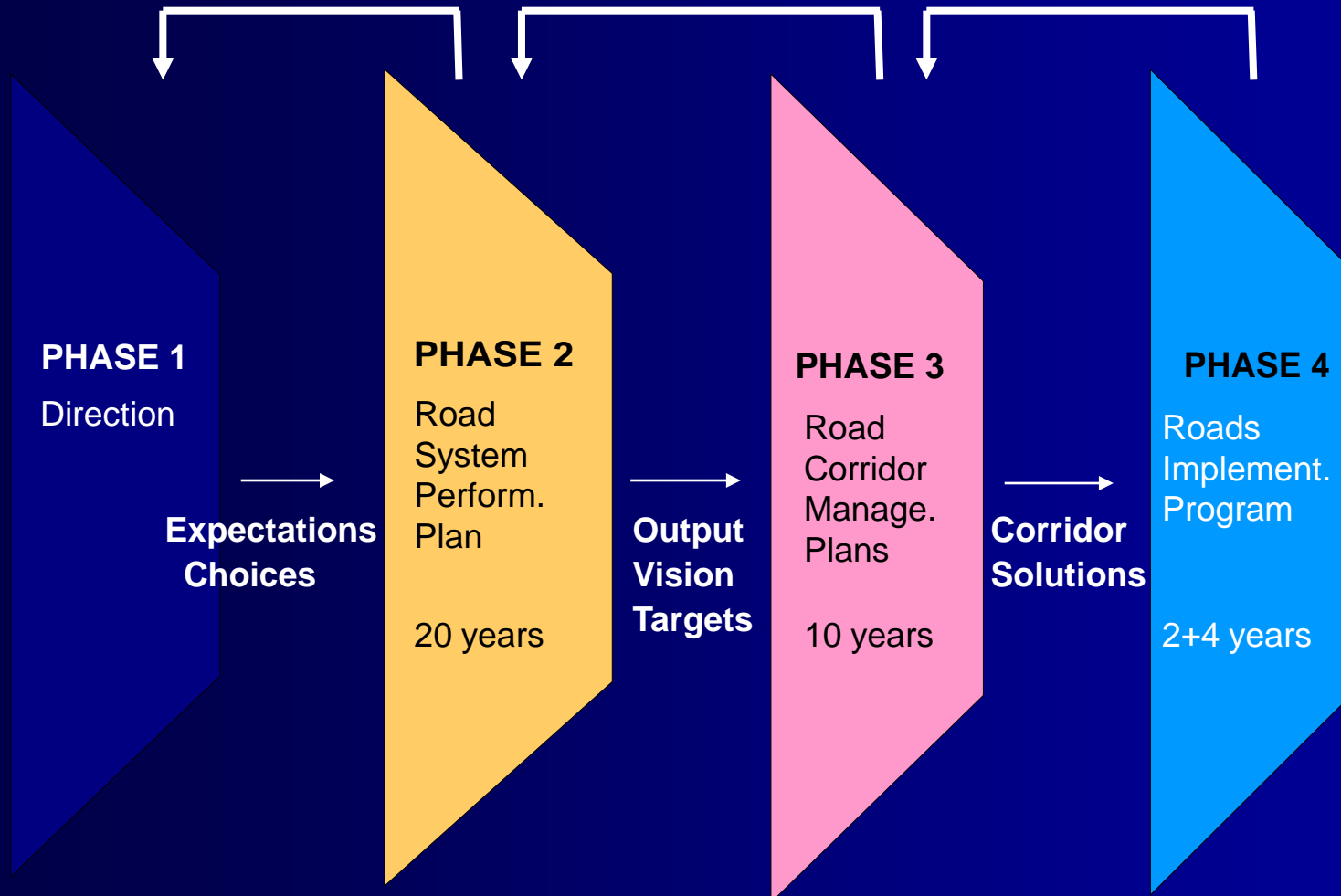
Decision-making Needs--Corporate level

- Road condition performance reporting
- Network asset investment studies
- Corridor planning
- Asset valuation



Aligned Decision Making in Queensland

Performance - Strategic Fit, Affordability, Fit For Purpose



Road System Performance Plan

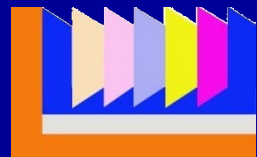
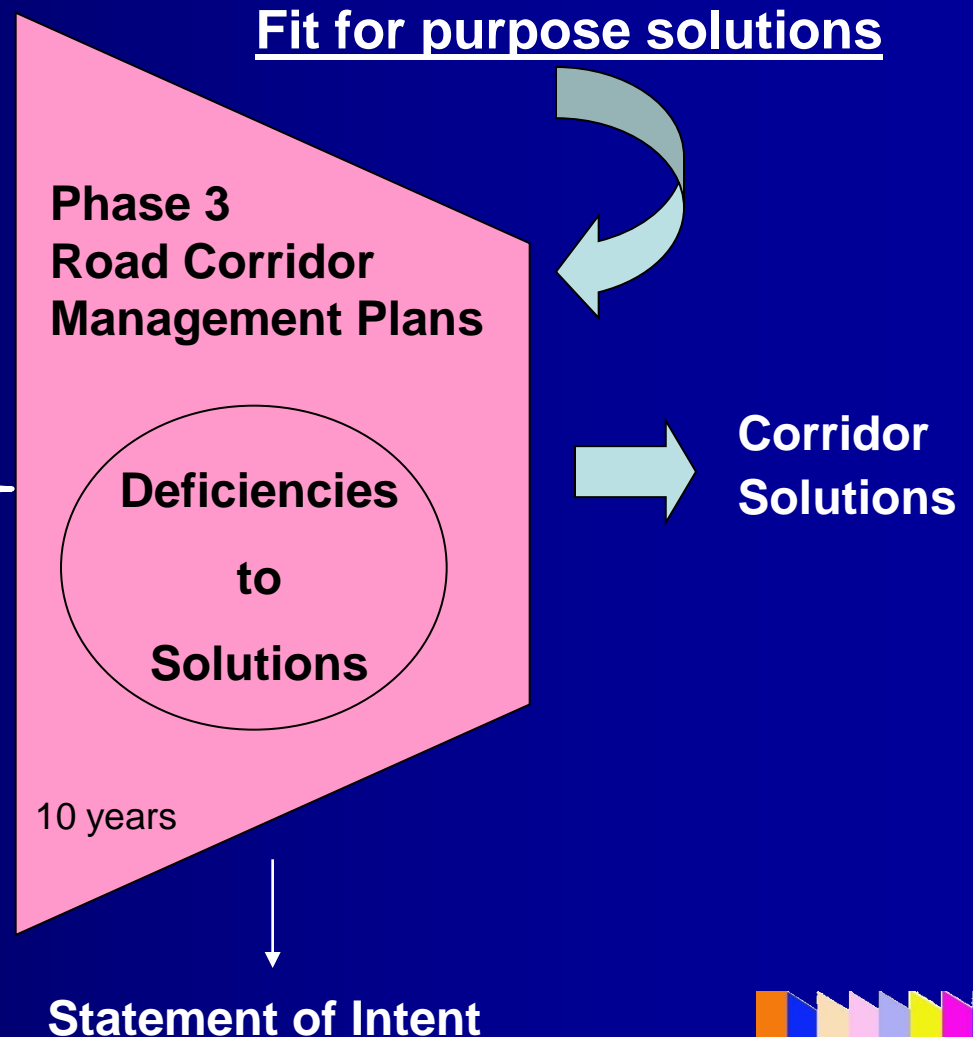
Meeting gov't outcomes

- Strategic financing plan
- Priority network plan
- Strategic asset metrics
- Strategic delivery metrics
- Network safety analysis



Road Corridor Management Plan

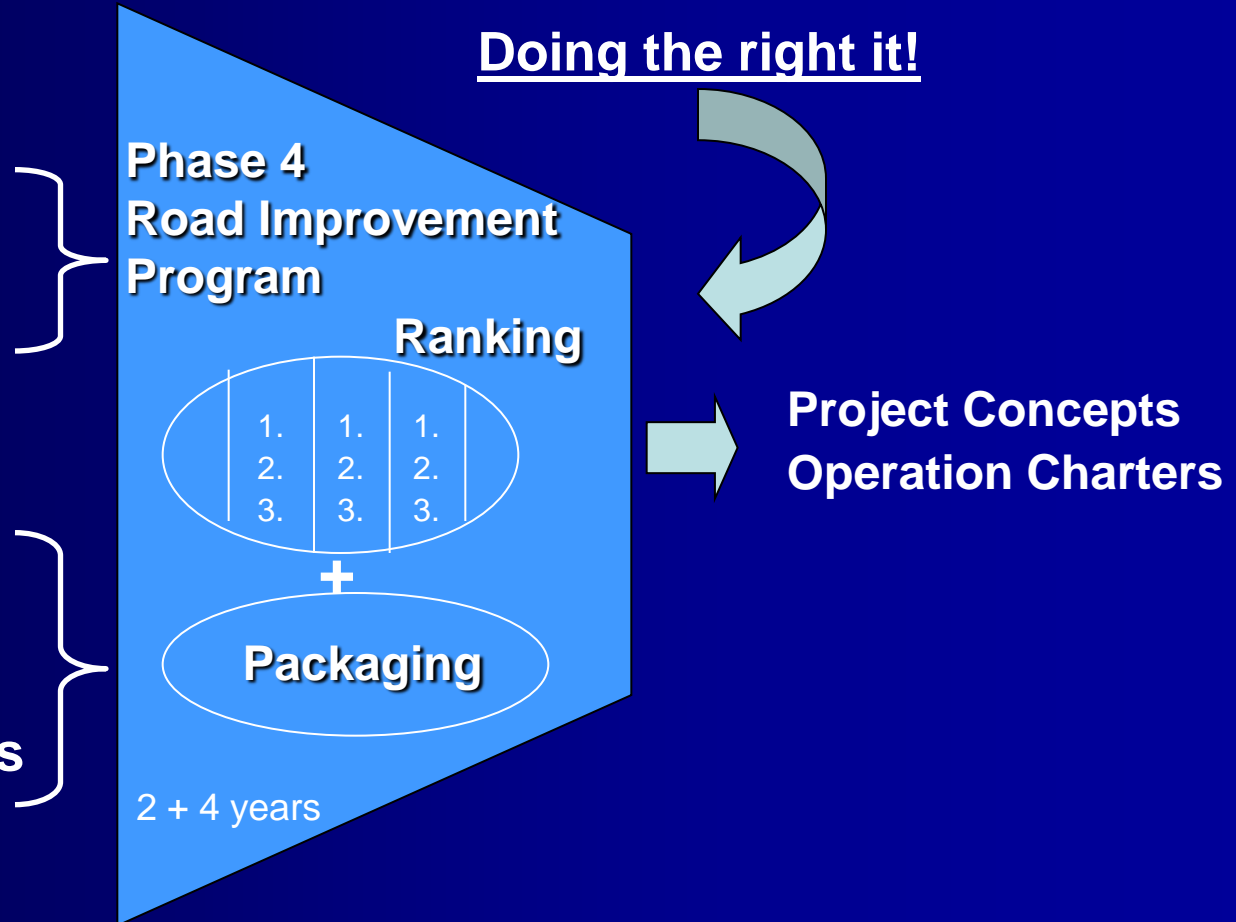
- Output vision targets
- Link strategy
- Road corridor envt'l. assess.
- Cultural recognition
- Corridor studies
- Target road surface index
- Risk , slope stability



Road Improvement Program (RIP)

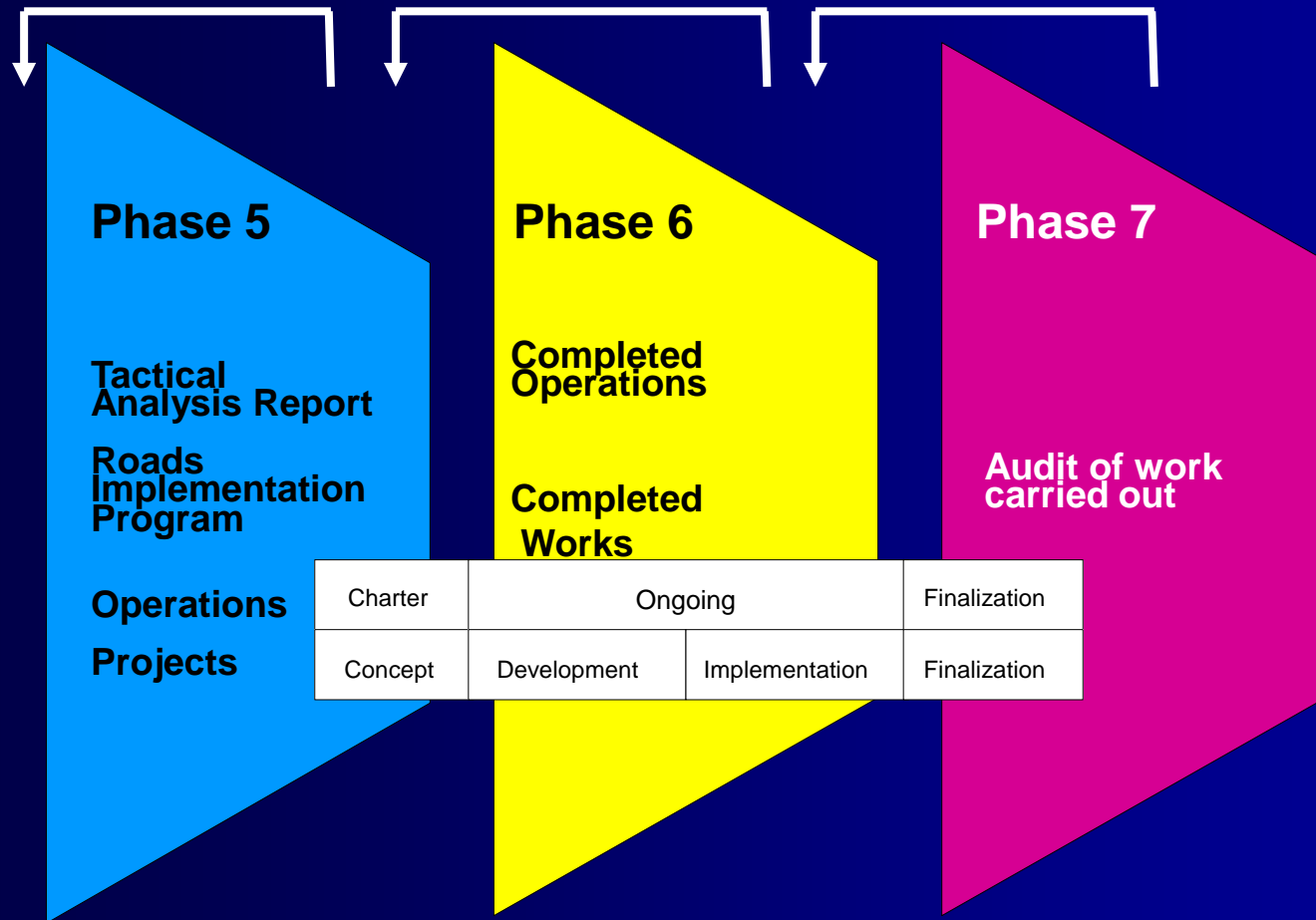
- Ranked solutions
- Work elements

- Employment
- Economy of scale
- Political commitments



Co-ordination of Program, Project & Works Management

Performance - Strategic Fit, Affordability, Fit For Purpose



Doing it right!

Learn from doing

Proof we got it right



Information Reporting Hierarchy in Victoria

Example of Reports

Purpose of Reports

Performance indicators;
condition and performance

Performance monitoring
against org'l goals

Dashboard
Reporting

Program delivery;
project monitoring

Operational performance
monitoring

Project
Reporting

Network
Performance
Reporting

Alternatives/strategies
selection; asset preserve

Integration of planning
and programming

Road Program Consolidated
Evaluation and Scenario
Reporting

Performance indicators by
program and asset type

Asset condition and
maintenance report

Road Safety
Program
Evaluation

Road System
Management
Program
Evaluation

Traffic &
Transport
Program
Evaluation

Corridor and site-
specific analysis reports

Asset physical
condition reporting

Area Analysis

Route Analysis

Road Section Analysis

Point Location Analysis

Minnesota DOT's Highway System Operations Plan Linkage to Statewide Plan Strategic Directions

Strategic Direction 1 “Safeguarding What Exists”	Statewide Plan Policies	HSOP Performance Categories and Measures
	Preservation Preserve Essential Elements of Existing Transportation Systems	Infrastructure Maintenance and Preservation 1. Bridge preventive maintenance 2. Pavement preventive maintenance 3. Pavement patching 4. Signal and lighting maintenance
		Supporting Infrastructure Management 1. Building functional adequacy 2. Fleet management life-cycle utilization 3. Building maintenance 4. Electronic communication coverage 5. Electronic communications management 6. IT infrastructure preservation

Performance Measures

- Three Key Measures
 - Condition
 - Utilization
 - Functionality
- Common Framework Across Infrastructure Types
- Ministries Develop Specific Measures

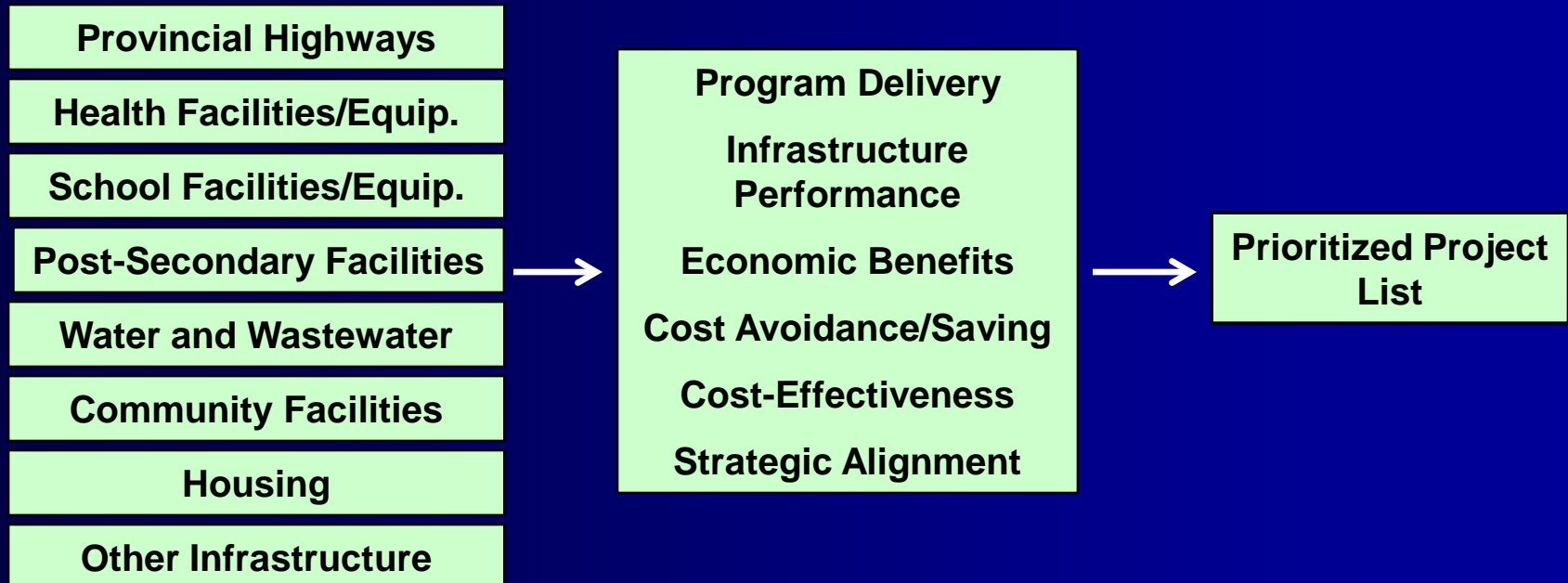


Project Prioritization

Infrastructure Requirements

Prioritization Criteria

Cross-government Priorities

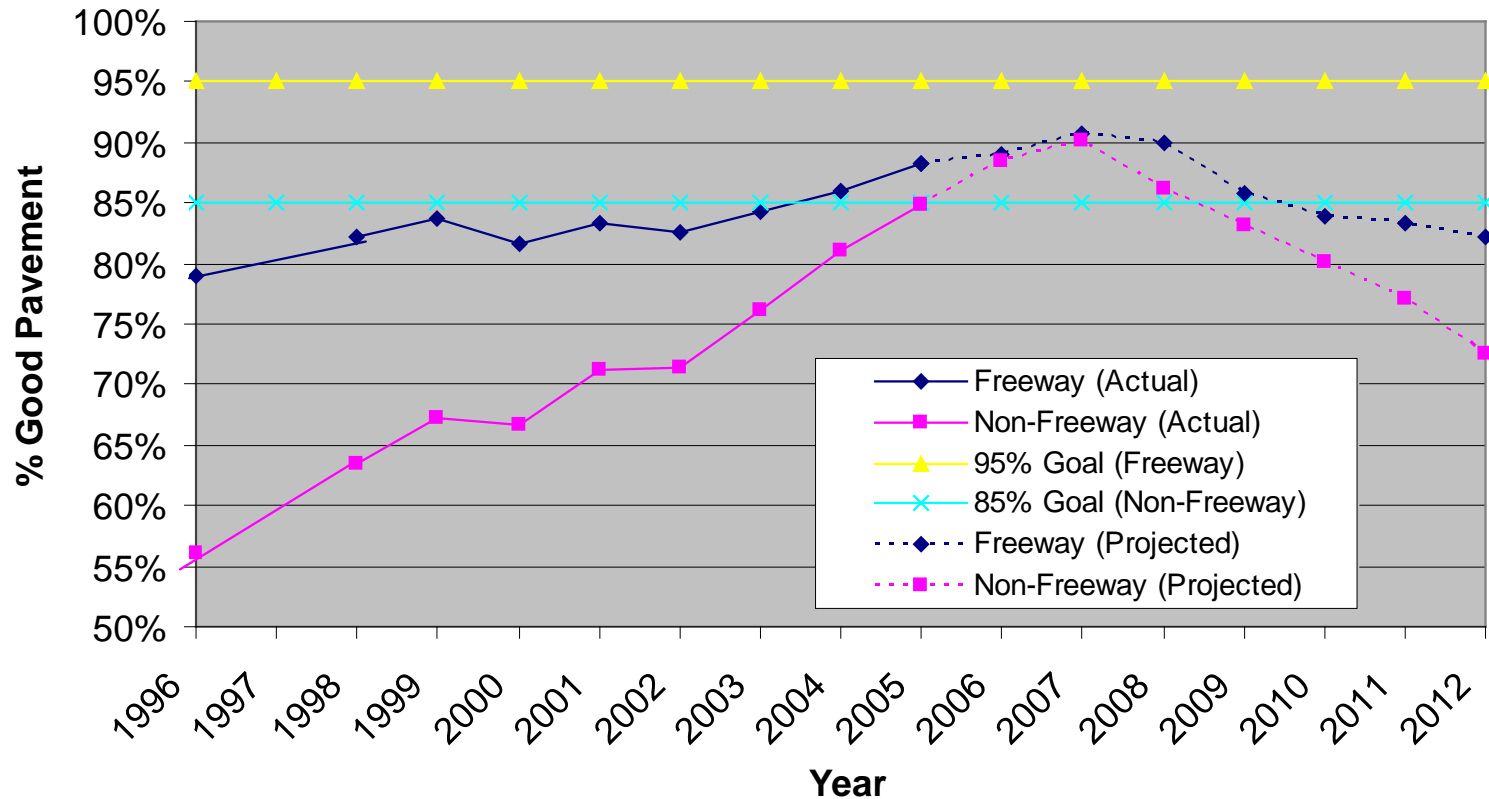


In those sites visited, experience showed clear relationship between asset management as a decision support tool and the securing of funding for transport investment

Developing Investment Strategies

Pavement Condition: Michigan DOT

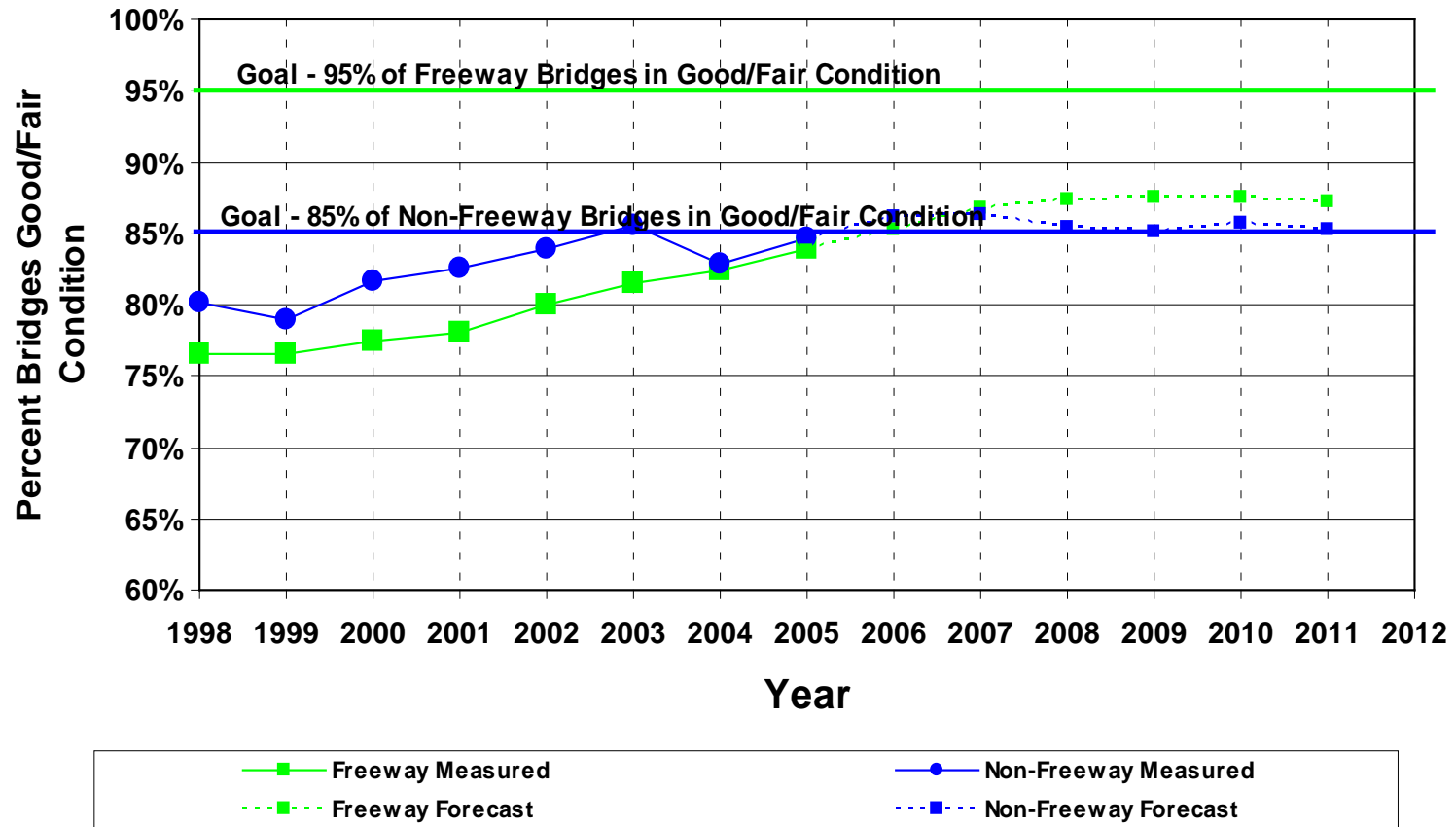
System Condition 1996-2012



Developing Investment Strategies

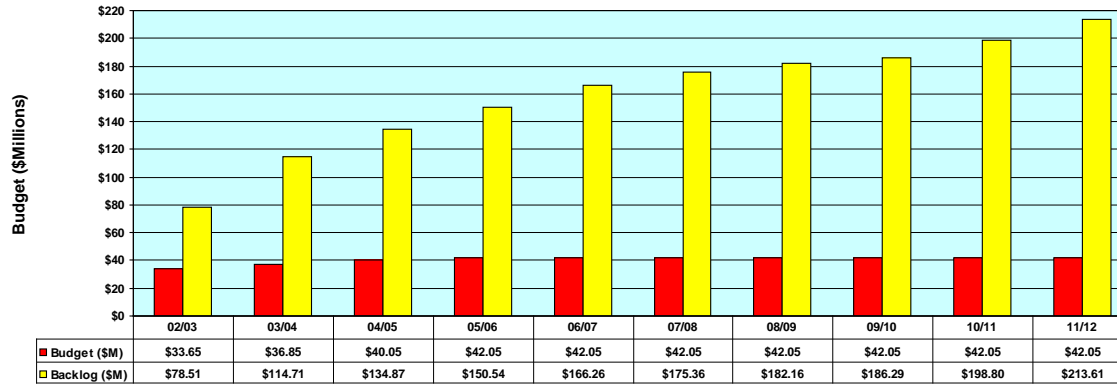
Bridge Condition: Michigan

Statewide - Bridge Condition

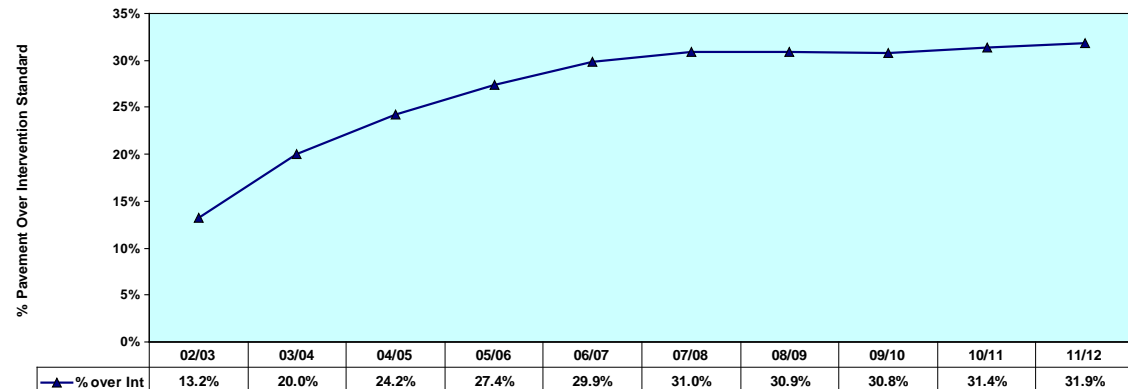


"Maintain 2005/06 Funding Level Out to 10 Years" Scenario--Brisbane

Total Network - all Traffic Densities



Total Network - all Traffic Densities



With respect to a research
agenda.....

Decision Context	Example Research Questions
Creating Institutional Responsibility	Influence of Different Org'l Structures and Decision Making Contexts? Role of (and in) Concessions?
Establishing Performance Goals/ Targets	Trade-offs of Different Performance Levels Information Needs? Level of Certainty of Performance Levels?
Operations Priority Setting	Use in Rehabilitation and Maintenance? Relationship to Other Org'l Goals? Level of Analysis Sophistication?
Capital Investment Priority Setting	Trade-offs among Asset Categories Risk Assessment Tools? Total Asset Portfolio Assessment?
Systems Feedback	Type and Level of Information Needed? Evidence of Performance Change?

Some form of risk assessment was used by all of the agencies in their asset management program.

RTA (New South Wales) Program

Governance

Tactical risk management for small scale projects & services

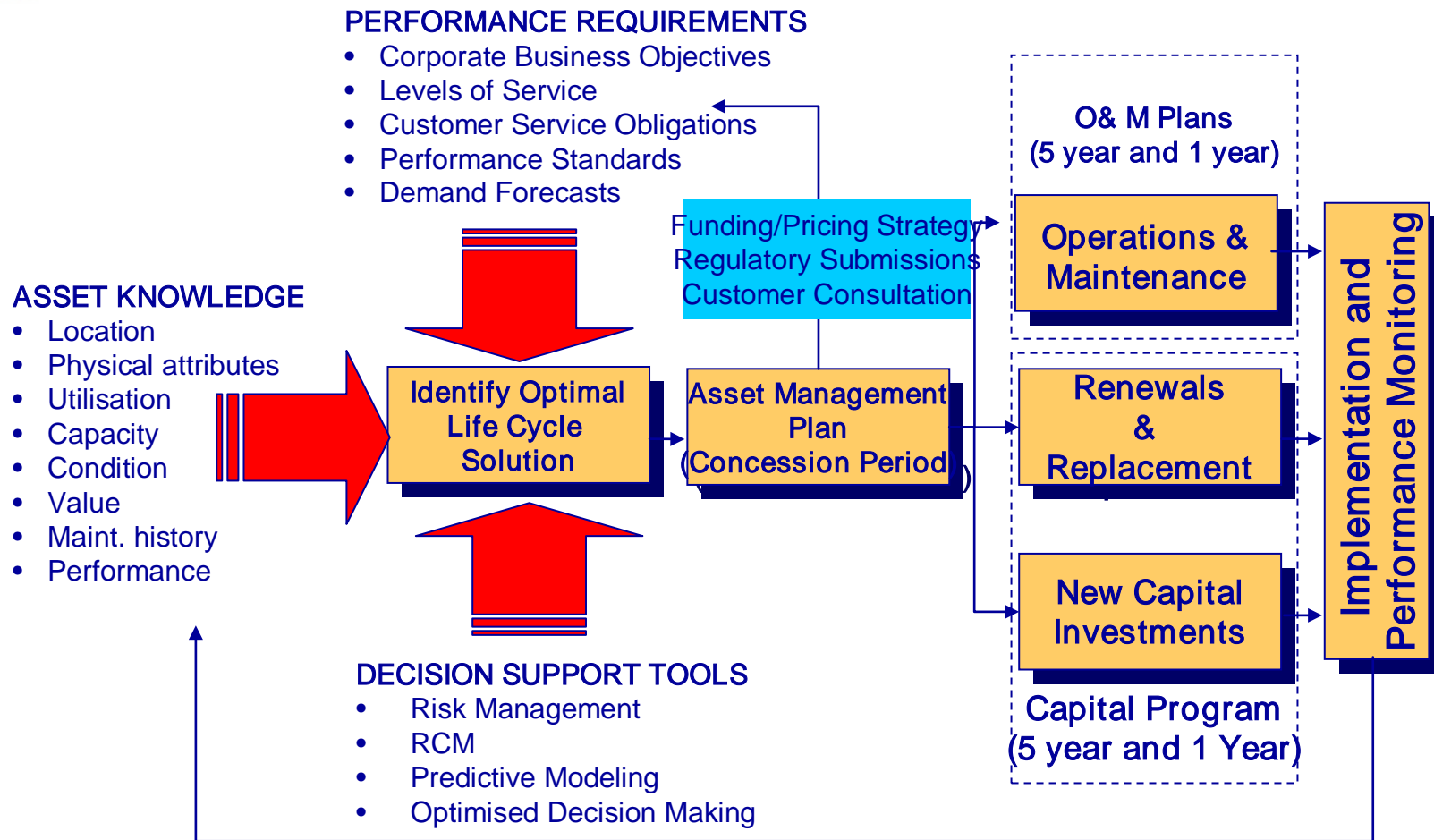
- Australian / New Zealand standard for risk management
- Use of corporate risk evaluation criteria
- Network-wide deficiency analyses
- Possible event scenarios of customer/service interactions
- Modernise network to safety standards for safe access – excluding mobility & economic development

Strategic risk management balance between safe access, mobility & economic development

Program Delivery

The institutional learning experience with public/private partnership (P3) projects has led to more careful incorporation of strong asset management principles in P3 agreements and concessionaire deeds.

Asset Management



In the final analysis, value depends on the benefits (perceived and real) associated with the use of asset management tools and principles

Benefits as Defined in Brisbane



- Provides a strategic direction and a corporately consistent planning framework for the City's physical asset and property management
- Ensures that facilities and assets are adequate to meet assessed needs (community service expectations)
- Improves utilization of the Council's asset portfolio
- Optimizes preservation of all retained assets at the lowest life cycle cost
- Identifies surplus assets and maximizes the return, in both revenue and benefit, from the disposal process.

Thank You