

NATMEC 2002
(May 12-16/02)

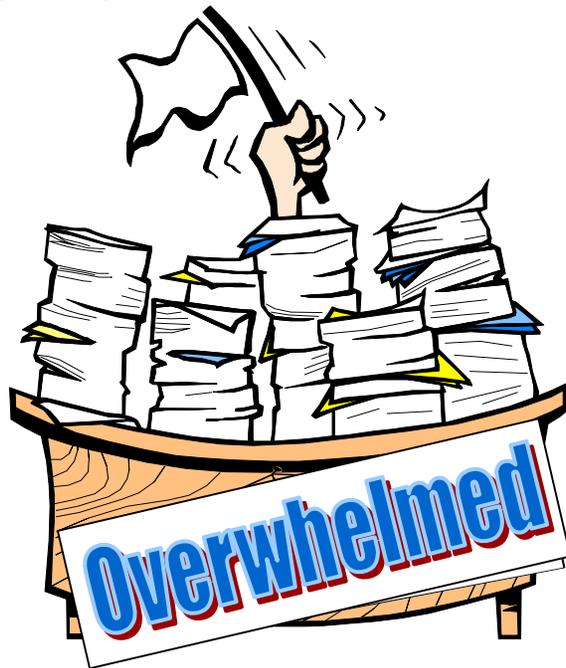
**Data and Information
Integration for
Asset Management**

Summary

- Asset management – the Full Monty
- The asset management process
- Data, information and system needs
- Data, information and system cautions
- Business and I&IT challenges
- Business and I&IT solutions

Presentation Objective

- Insights into data, information and management system integration through asset management



Institutionalizing Asset Management

POLICY
PROCEDURES
PROCESS

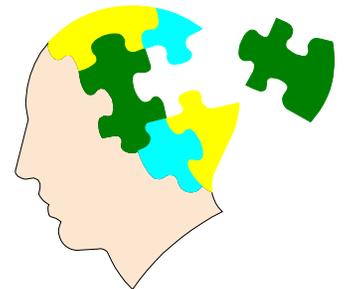
- It is cultural shift
 - Knowledge gaps
 - Strategic gaps
 - Critical mass
- Key needs are not technical
 - Strong, visible, consistent leadership
 - Change management
 - Communicating change
- Lure of the status quo
 - 3 Ps

"I think those deck chairs would look good over here.."



Holistic AM Approach

- A new business approach that covers all phases of investment:
 - Planning and monitoring
 - Analysis, justification and programming
 - Project development
 - Construction
 - Operations and maintenance
- All functional units



Integrate Processes

- Integrate business strategies with financial, economic and technical aspects
- Integrate all management tools
- Integrate investment decision-making
- Streamline business processes
 - Assembly line
 - Calendarized



Improve Analytical Ability

- Ensure analyses are repeatable & auditable
- Provide implications of shifted, accelerated and deferred funding
- Provide ability to compare across modes and asset categories
- Remove analysis paralysis

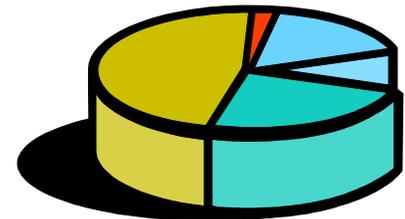


Improve Resource Allocation

- Optimise investments around outcomes
- The right investment, at the right time and the right place
 - Track asset value, condition, life-cycle and depreciation
 - Plan for future needs and compare alternative investment options
 - Recommend best ways to maintain current assets
- Modular business design
 - Core business focus
 - Program reviews

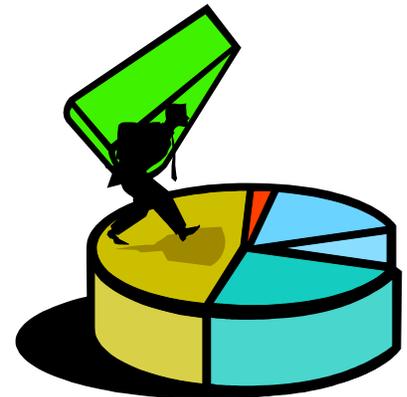
Key AM Components

- Asset valuation
- Performance measurement
- Performance analysis
- Generating and evaluating options
- Trade-off analysis & investment strategies
- Business process improvement

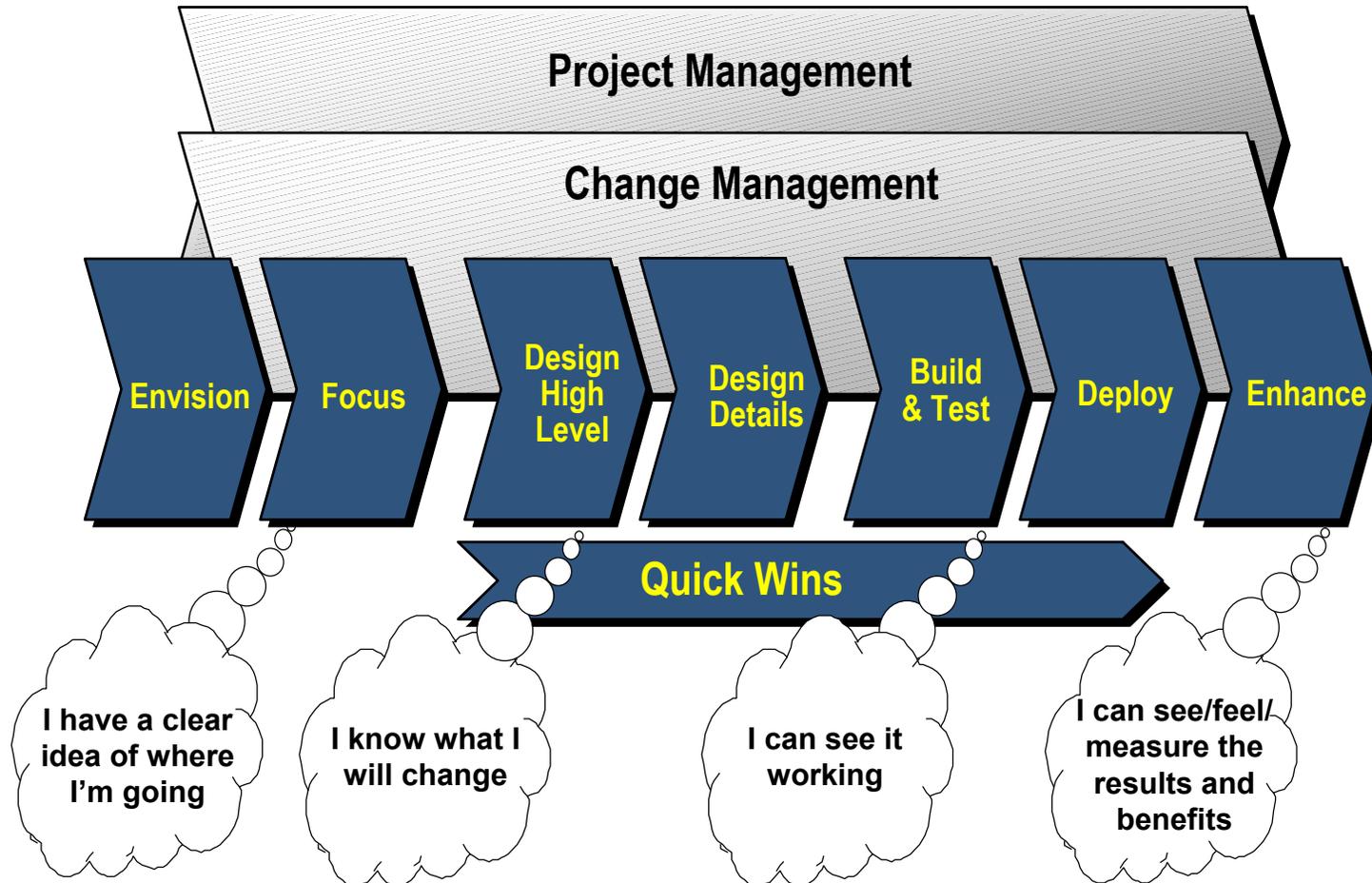


Other AM Components

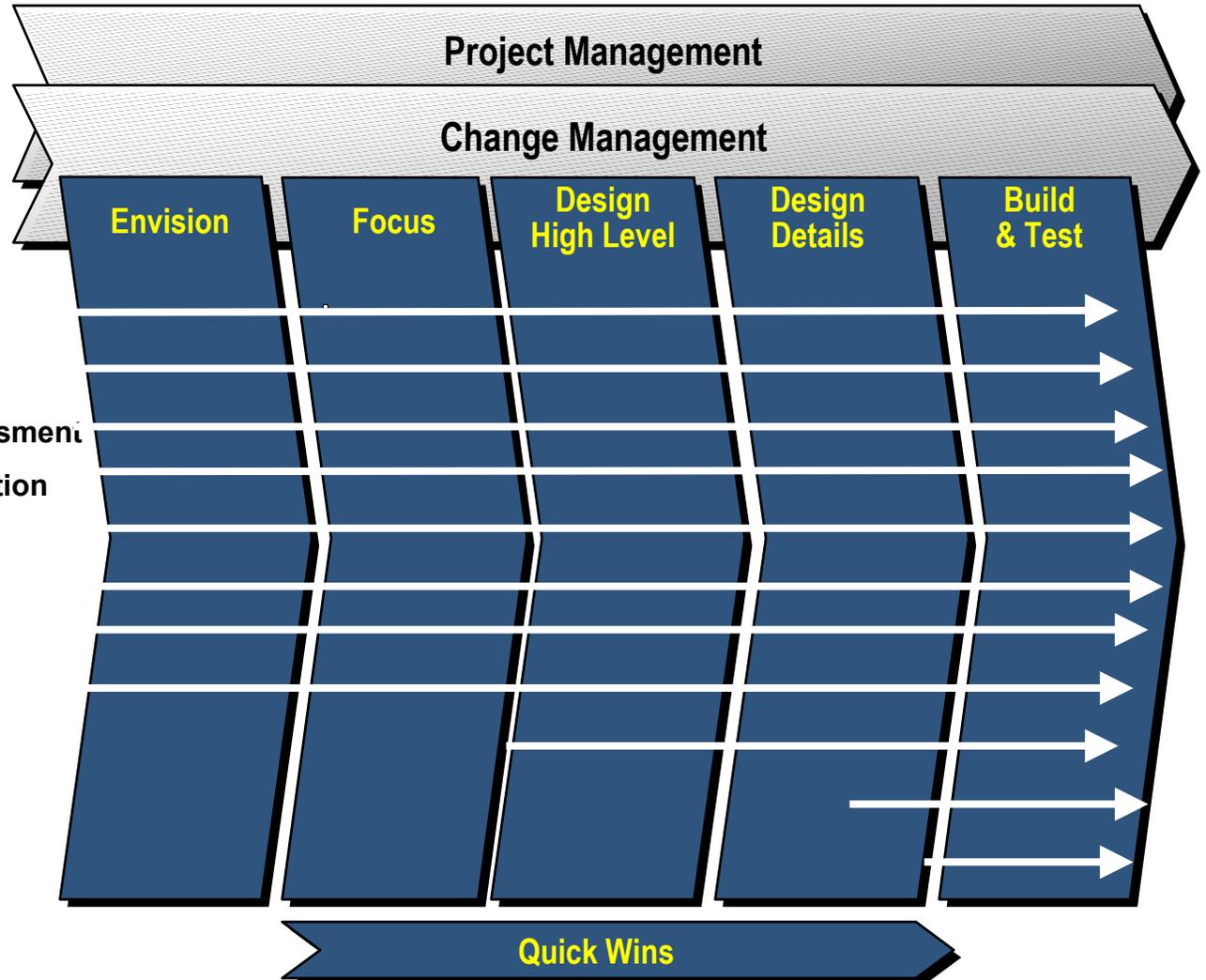
- AM Oversight
 - Scope and cost management & containment
 - AM quality assurance & quality control
 - Process and products
 - Continuous quality improvement
- Linkages with integrated business planning
- Implementation plan
 - Includes asset management competencies
- Training and education plan
- Executive support system



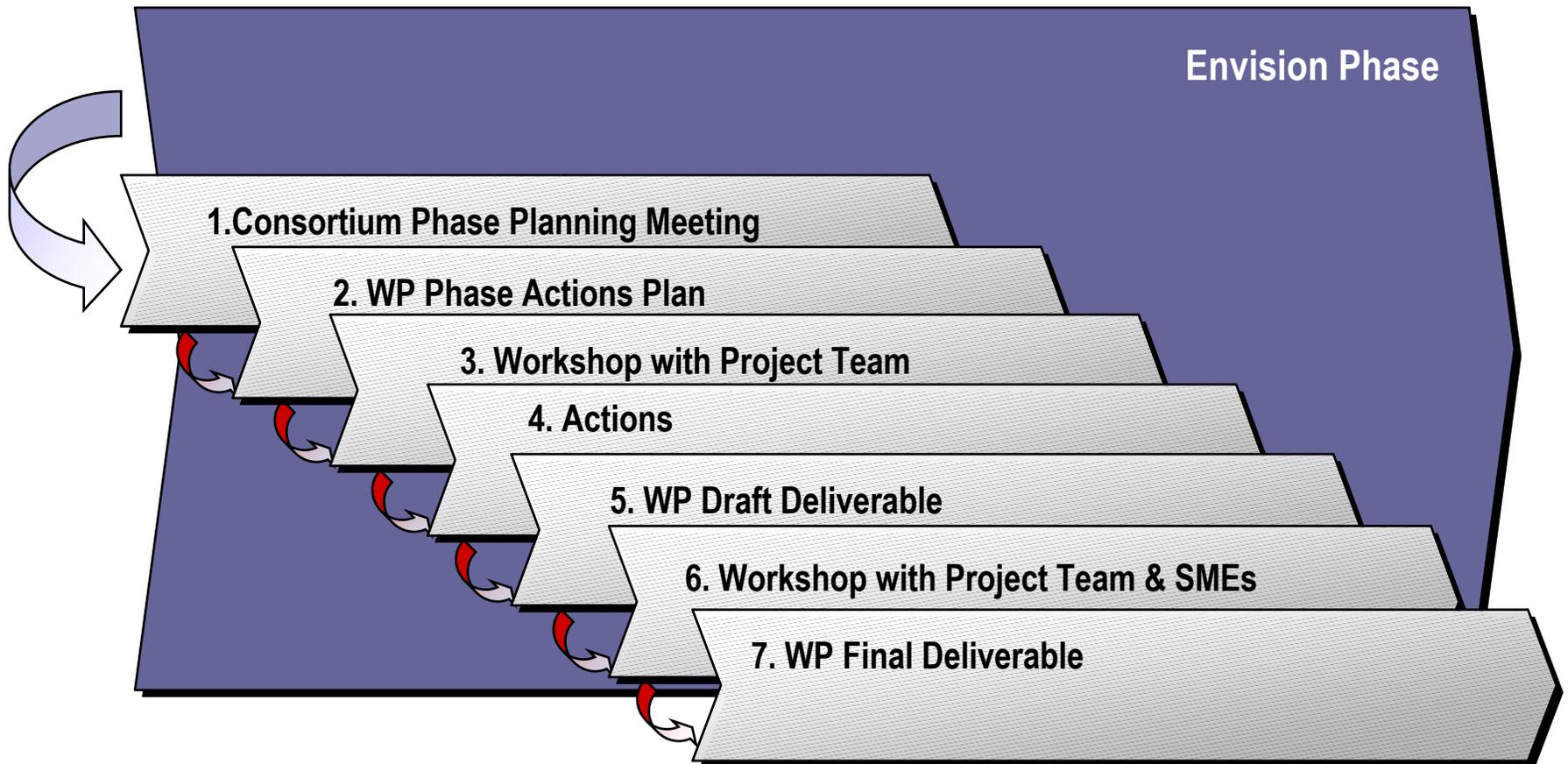
BPI Process (1)



BPI Process (2)



7 Step Process for Phase Delivery

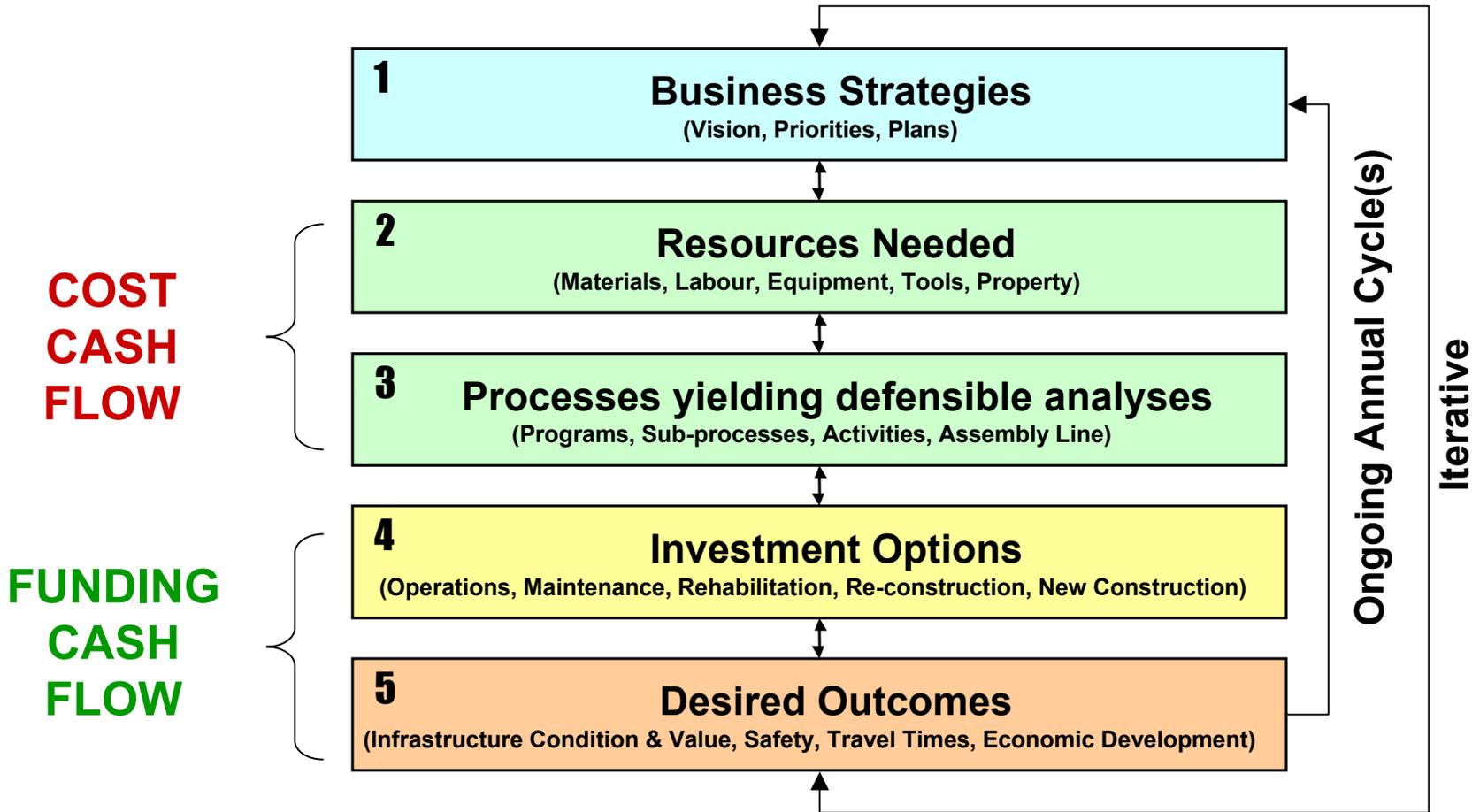


Project Team Coverage

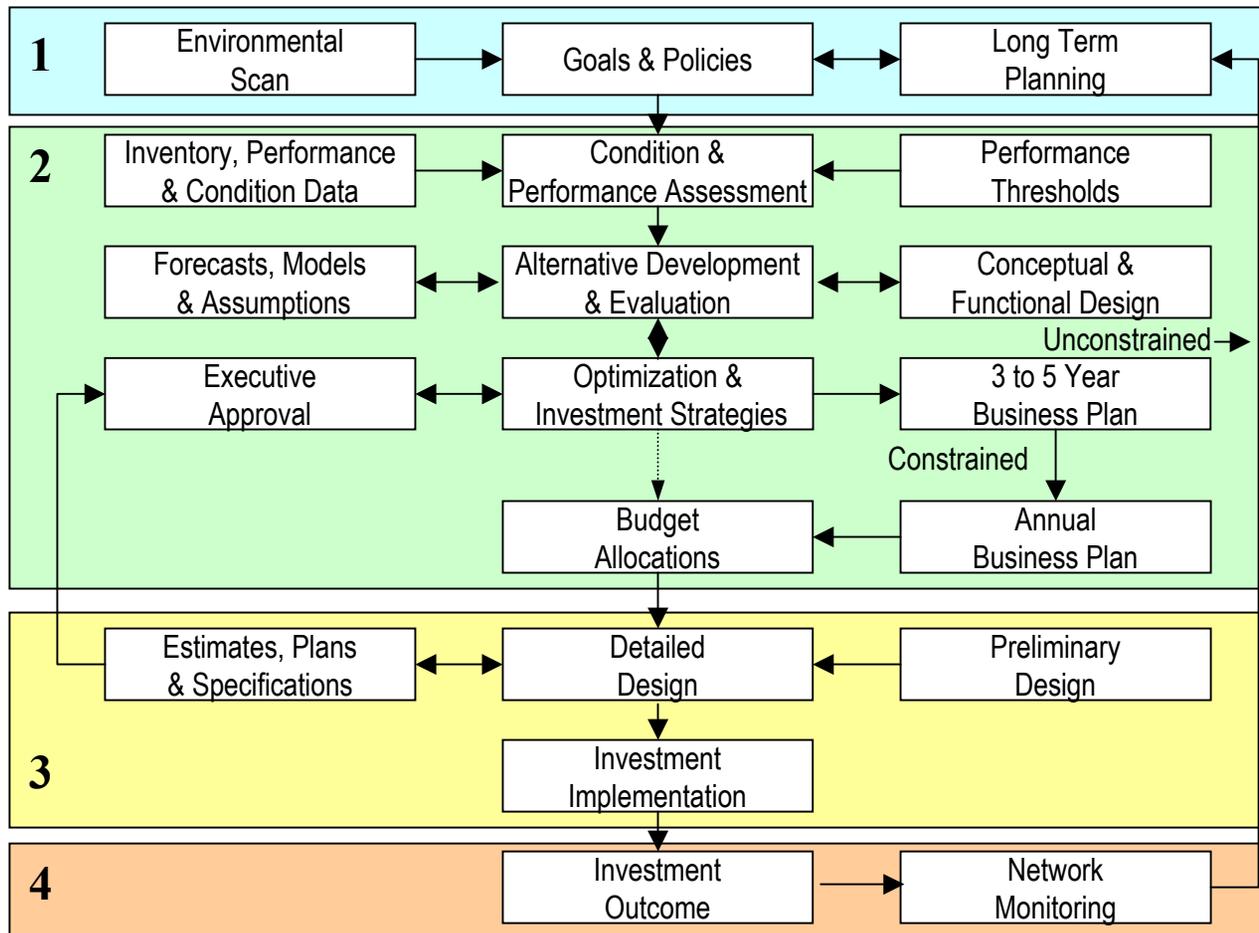
- Maintenance
- Regional Engineering
- Engineering Standards
- Transportation Planning
- Information Technology
- Safety & Traffic
- Property
- Human Resources
- Business Planning
- Inventory
- Finance & Budget
- Superbuild
- Pavement & Bridge
- Programming
- Highway Design
- Capital Planning
- Communications
- Regional Operations
- Districts Operations
- Ministry of Finance
- Geomatics



Simple AM Business Model



Expanded AM Model



BPI Process (3)

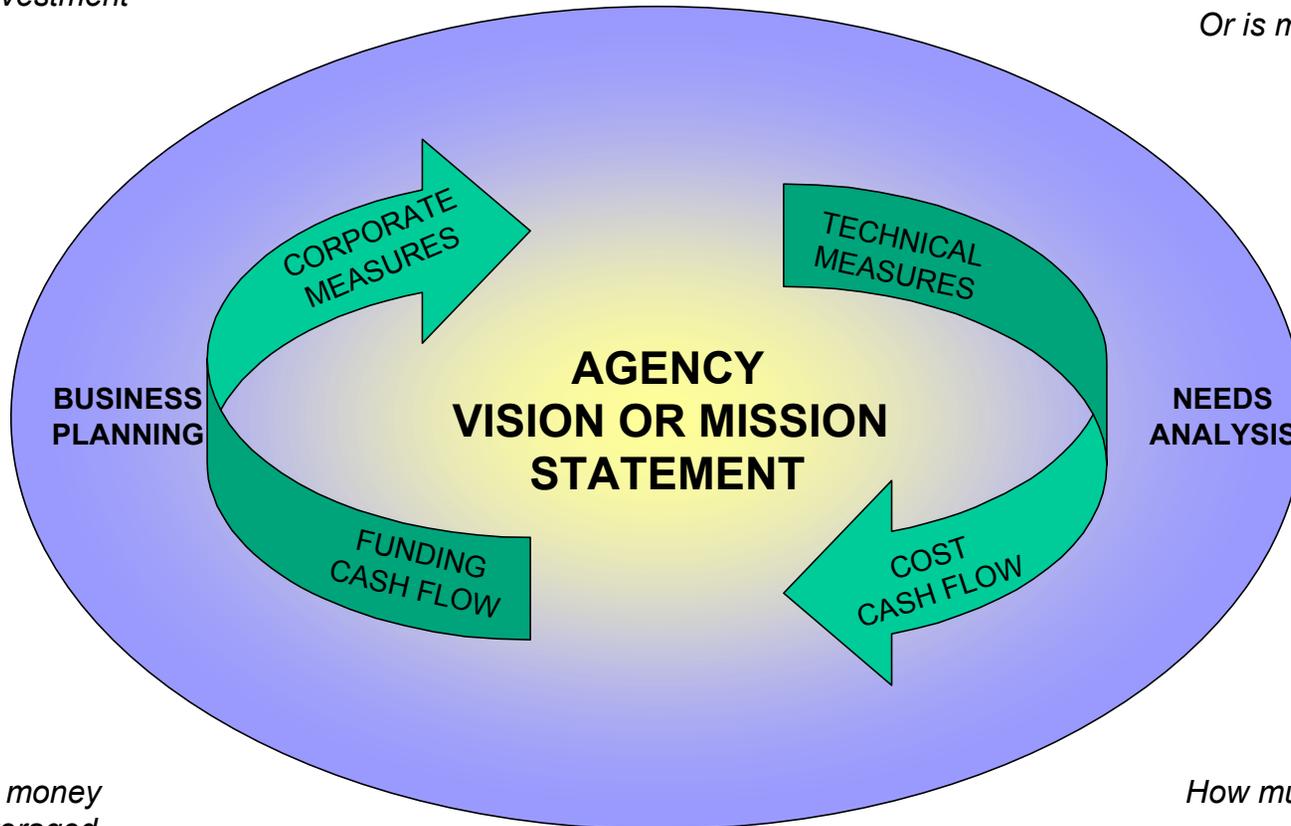
Envision	Focus	Design High Level	Design Details	Build	Implement	Enhance
<p>Case for Change</p> <p>Mobilization Plan</p> <p>Internal Organ. Overview</p> <p>Business Position</p> <p>Holistic Business Model</p> <p>Critical Succ. Factors</p> <p>Key Perf. Indic.</p> <p>Stretch Targets</p> <p>Shared Values and Guiding Principles</p> <p>Readiness for Change Assessment</p> <p>Sponsorship Role Map</p> <p>Business Vision</p>	<p>Communication Plan</p> <p>Focus Area</p> <p>Requirements of Process Customers</p> <p>“As-Is” Process Assessment</p> <p>“As-Is” Technol. Assessment</p> <p>“As-Is” Human Resource Assess.</p> <p>Quick Wins</p> <p>Priority Opport.</p> <p>Design Charters</p>	<p>Best Practice Comparisons</p> <p>“To-Be” Process Model</p> <p>“To-Be” Technol. Model</p> <p>“To-Be” Human Resource Model</p> <p>“To-Be” Measure. Dashboard</p> <p>“To-Be” Validation</p> <p>IT System Requirements</p> <p>HW Selection/ SW Selection (Package SW)</p> <p>Business Case</p> <p>Migration HR Strategy</p> <p>Migration Plan</p>	<p>Detailed Process Descriptions</p> <p>Technical Specs.</p> <p>Organization Structure</p> <p>Delineation of Roles/Resp.</p> <p>Workforce Numbers & Cost</p> <p>Portrait of Desired Behaviors</p> <p>Competency Needs Assessm.</p> <p>Physical Infrastructure Req.</p> <p>Policy / Regulation Changes</p> <p>Committed Project Results and Budgets</p>	<p>Package SW Mods.</p> <p>Custom SW Dev.</p> <p>Implem. Pilots</p> <p>IT Operate. Guide</p> <p>Process/User Man.</p> <p>IT Testing</p> <p>Position/Comp. Profiles</p> <p>Learning Strat. and Materials</p> <p>Measure. System</p> <p>Facility Layout Construction</p> <p>New/Revised Pol.</p> <p>Data Migration</p> <p>Perf. Supp./Recogn.</p> <p>Accept. Test</p> <p>Implem. Plans</p>	<p>Business Solution Rollout</p> <p>Performance Feedback</p> <p>Learning Programs</p> <p>Support Infrastructure</p> <div data-bbox="1389 985 1751 1063" style="border: 1px solid black; padding: 5px; text-align: center;">  </div> <div data-bbox="1380 1078 1780 1349" style="border: 1px solid black; padding: 5px;"> <p>Business Activities, Processes & Tools</p> <p>Change Management</p> <p>IT</p> <p>HR</p> </div>	<p>Continuous Improvement Program</p>

Data/Info Needs for Asset Management

*What were the investment
Outcomes...*

*What needs repair
Or is missing,,,*

*This is all you're
going to get...*



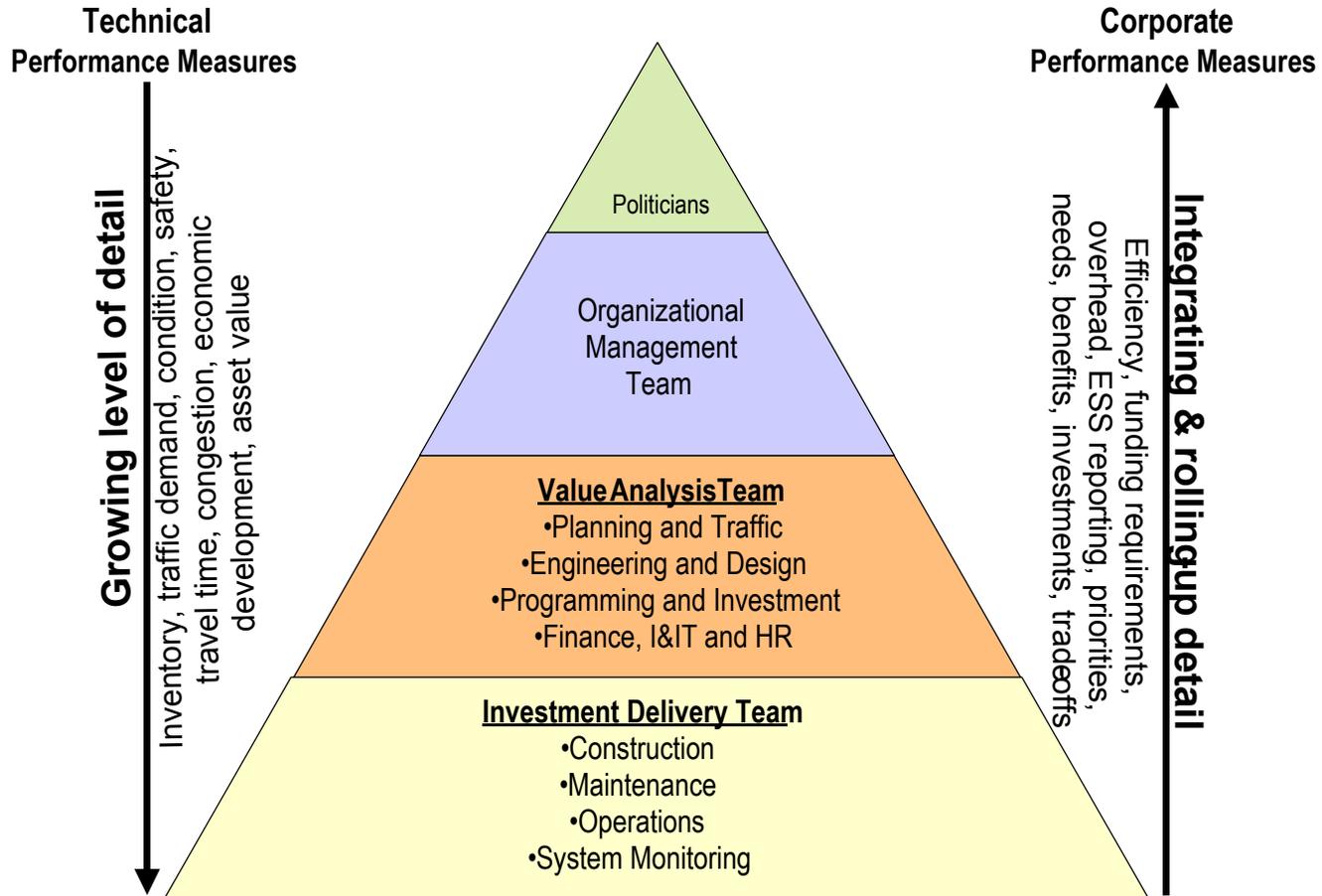
*What are the
Alternatives...*

*How much money
Can be leveraged...*

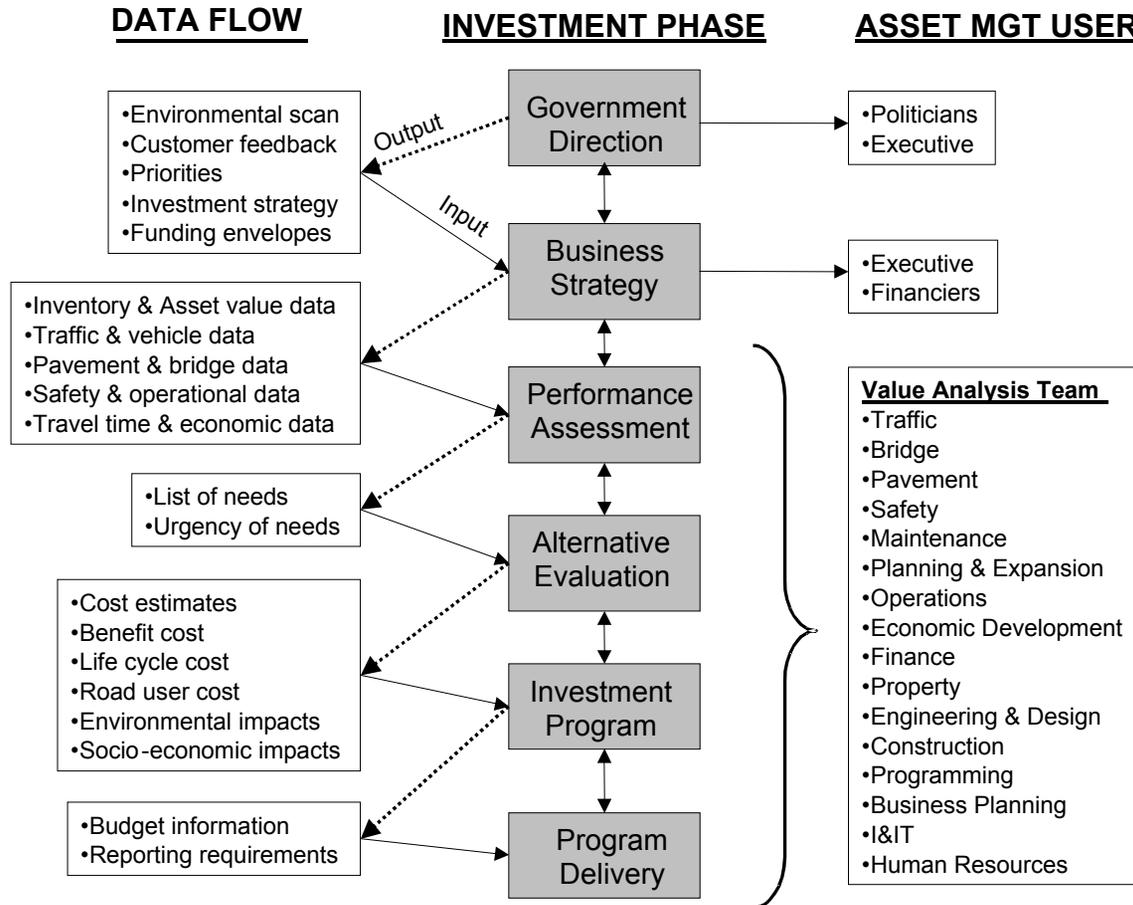
How much will it cost...

What is a good investment package...

Performance Measures



High Level Data/Info Flow



Lot's of Data & Information

85th percentile delay
85th percentile intersection delay
85th percentile speed
AADT & SADT
AADT & SADT growth factors
Access control
Access density
Accident frequency & location
Accident prone locations
Accident rate
Accident severity
Activity centres served
Adjacent land use
Advisory speed
Age of pavement
Airports
Annual maintenance cost
Average delay
Average intersection delay
Average speed
AWDT
Barrier walls
Bicycle facilities
Bridge age
Bridge area
Bridge condition
Bridge flares
Bridge length
Bridge name
Bridge number
Bridge restricted clearance
Bridge seismic rating
Bridge type
Buildings & yards
Capital cost
Car pool lots
Clear zones
Clear zones depth

Communication equipment
Computer Hardware
Computer software
Cross slope
Culvert condition
Culverts
Data collection equipment
Data collection sites
Date of construction
Design speed
DHV or DHV factors
District
Duration of closure
Ending kilometre
Fences and noise barriers
Ferries and docks
Free flow speed
FTMS Cameras and equipment
Full or partial closure
Geo-referencing
Goods transported
Grade
Guard rail
Guard rail condition
Highest hourly volume
Highway LOS
Horizontal curve
Hydrological problem sites
Imports & exports
Inspection stations
Interchange ramps
Intersection cross traffic
Intersection density & spacing
Intersection LOS
Known wildlife crossings
Laboratories
Lane treatment
Lane width

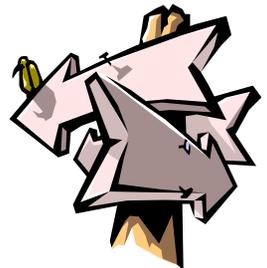
Lighting
LOS at interchanges
LOS of off-highway movements
Mainline LOS at interchanges
Material stockpiles
Median
Median type
Mobile Offices
Number of lanes
O/D pattern of goods
Ramp LOS interchanges
Other ramps
Parts inventory
Pavement
Pavement Condition Index
Pavement Condition Rating
Pavement markings
Pavement type
Peak hour factor
Peak hour growth factor
Peak period factor
Peak period growth factor
Pedestrian facilities
Pipeline crossings
Planned or unplanned closure
Posted speed
Project B/C
Project LCC
Project NPV
Property
Quarries and Pits
Railway crossings
Reason for closure
Region
Remaining life of pavement
Remote airports
Rest areas
Ride Condition Rating

Route number
Seasonality factor
Segment Length
Segment number
Service classification
Shoulder condition
Shoulder treatment
Shoulder width
Sidewalks and bike paths
Signals and loop detectors
Signs
Slope instability sites
Spacing of interchanges
Spring weight restriction
Starting kilometre
Strategic classification
Summer maintenance class
Summer weight restriction
Tele-communications crossings
Time to adjacent activity centre
Trip purpose
Tunnels
Urban/sub-urban/rural
Utilities
Utility crossings
V/C ratio
Value of goods
Vehicle classification
Vehicle occupancy
Vehicles and equipment
Vertical curve
VKMT
Weekend factor
Weigh scale ramps
Weigh scales and WIMS
Weight of goods
Winter maintenance class
Winter weight restriction



Lot's of Systems & Applications

- Asset inventory and condition database;
- Locational referencing, geographic information system (GIS) and mapping;
- Bridge management system (BMS);
- Pavement management system (PMS);
- Traffic volume information system;
- Integrated safety management system;
- Maintenance management system;
- Asset valuation system for management and financial accounting;
- Financial program to manage in-year expenditures (cost allocation to asset);
- Budget report system;
- Project management system and/or design management tool;
- Contract payment system;
- Claims information management system;
- Cost estimation systems;
- Benefit cost model;
- Life cycle cost model (if not part of BMS and PMS);
- Land management system;
- Regional fee appraisal system;
- Equipment management system;
- Human resource and payroll systems;
- Consultant/Contractor inventory and performance system;
- Contract preparation system;
- Computer aided design tool;
- Aggregate information system; and
- Other systems and tools e.g. drainage, signs, guide rail, culverts, etc.



Lots of This



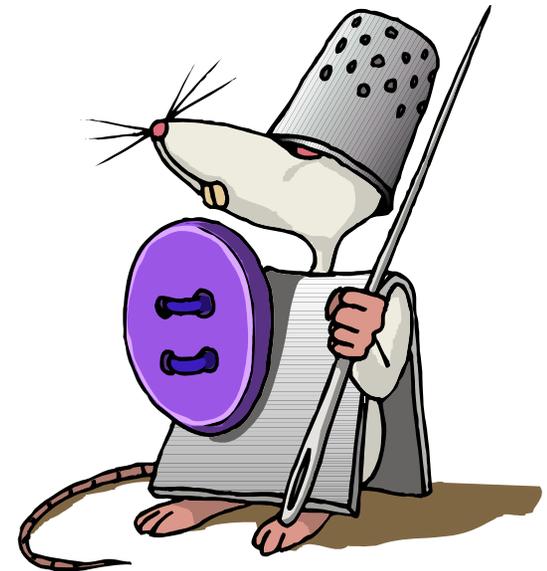
Not Enough of This



Never enough of this...

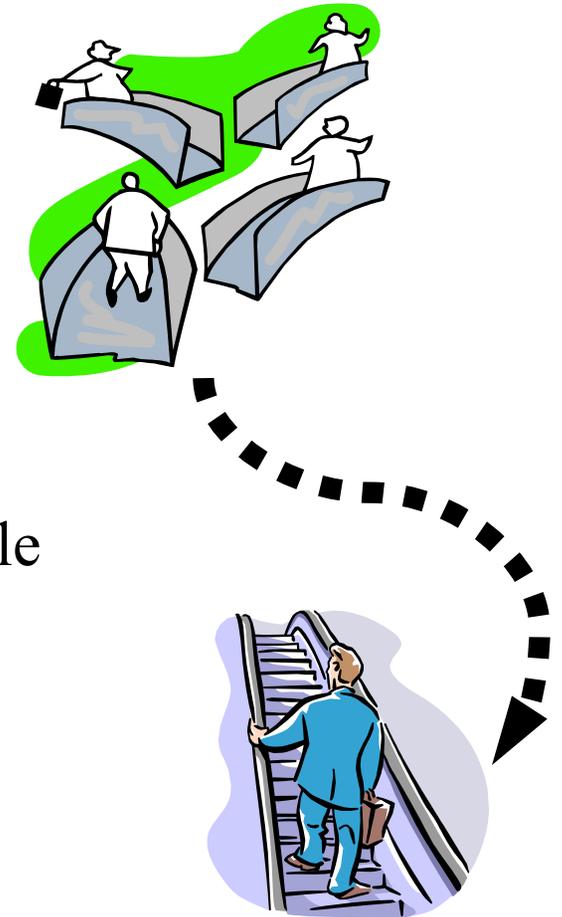
Business I&IT Challenges

- I&IT integration with business
 - Services & products
- Co-ordination & duplication of efforts
 - Ownership & autonomy
 - Owner of “cross-functional” systems
- Awareness & prioritization of needs
 - Squeaky wheel vs greatest need
- Funding availability
 - Justification to leverage funding
 - Life cycle needs



Data & Systems Challenges

- Management systems
 - Not integrated
 - Not designed for asset management
 - Sharing data & information
 - ESS potential
- Data & information
 - What is minimum required, affordable
 - Common geo-referencing
 - Data is not sexy
 - GASB & PSAB impacts



AM I&IT Solution

- Strategic business and tactical focus
 - To-be Asset management model
 - Governance
 - Organization
 - Process
 - Cycles
 - I&IT as business investments
 - Service Level Agreement(s)
-  Executive Support System



Data & System Requirements

APPENDIX 2 - PRELIMINARY AS-IS HIGH LEVEL PROCESS MAP

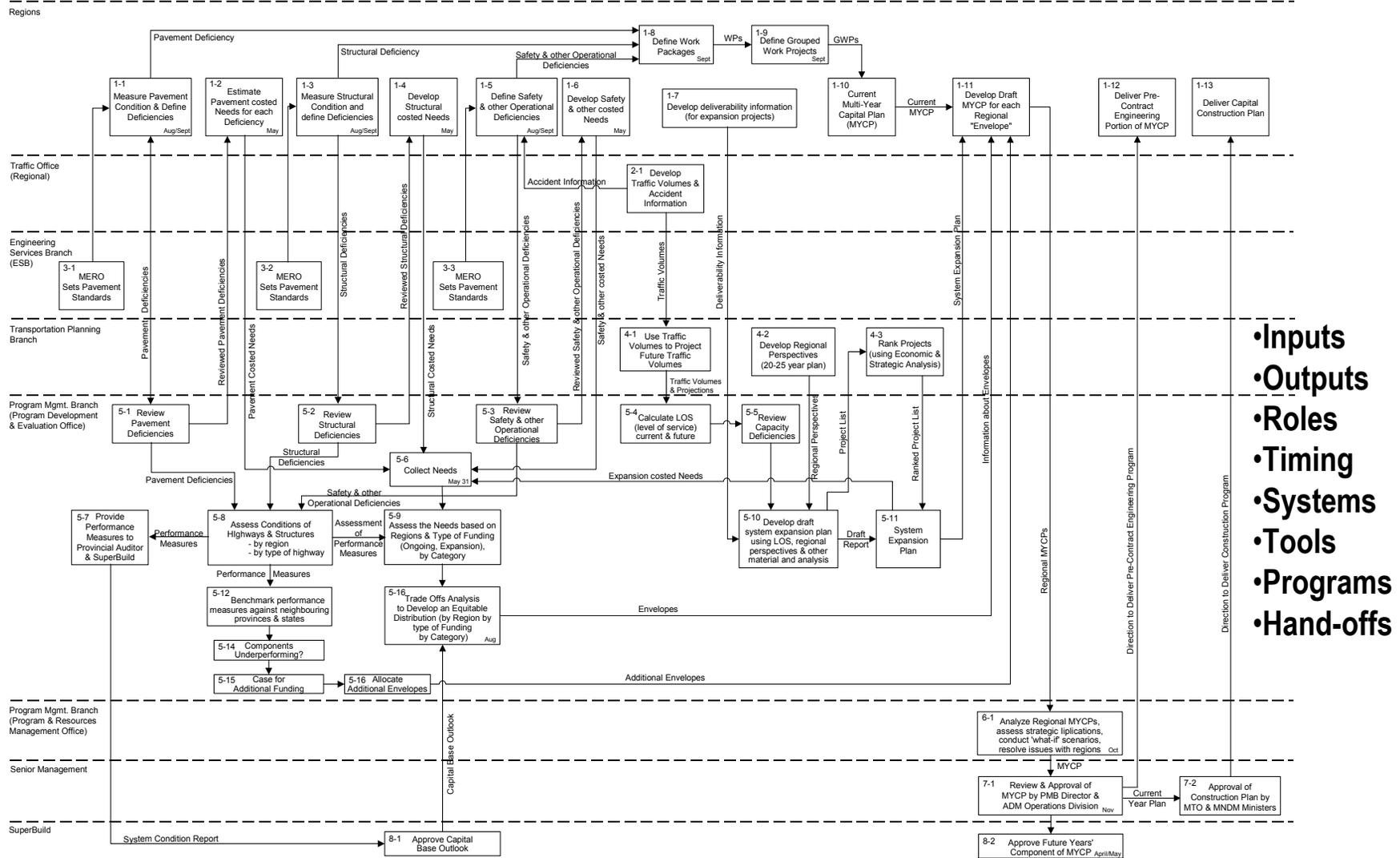


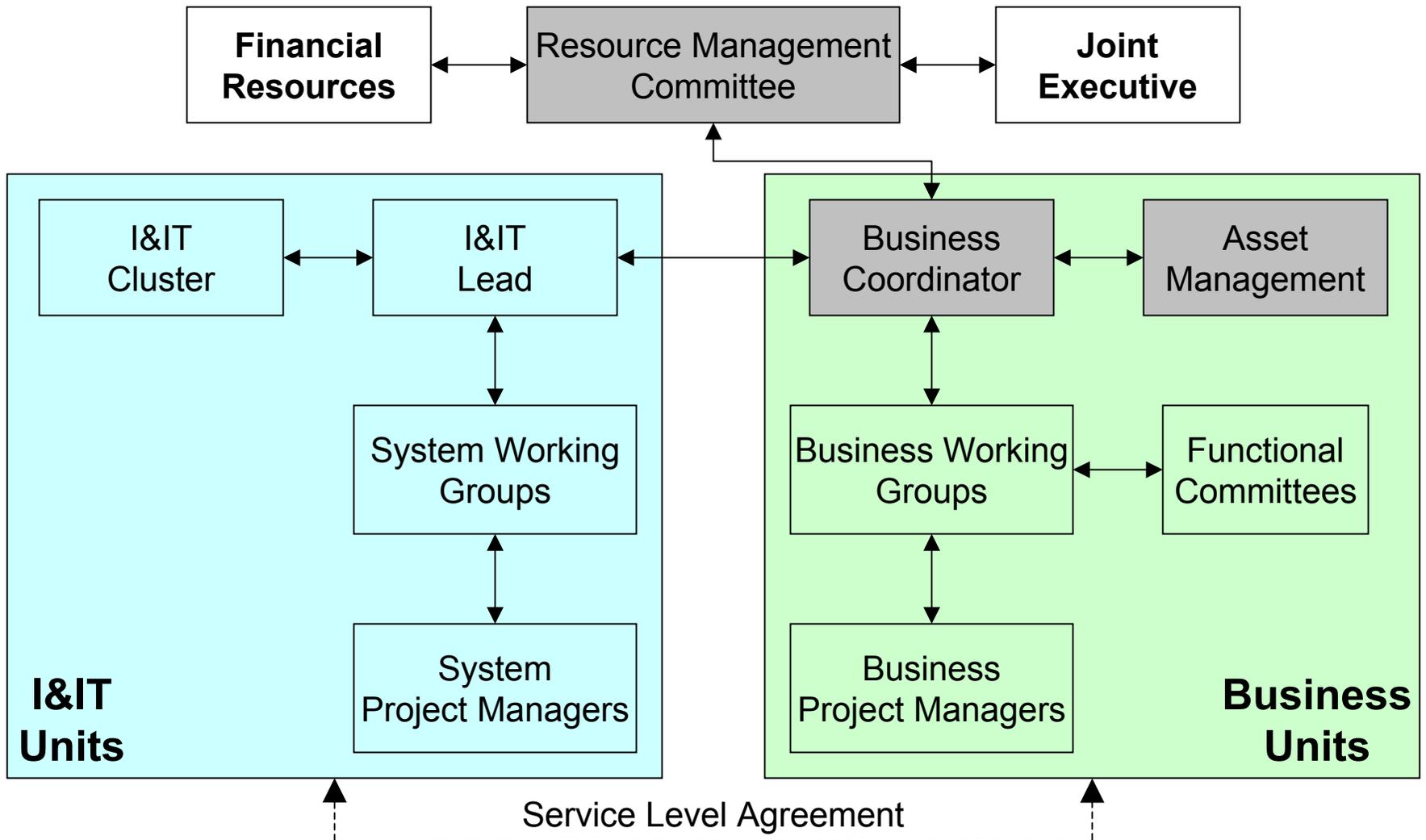
Figure 3.2a
Ministry of Transportation
Asset Management Business Framework

Key New Governance Roles

- Resource Management Committee
 - Approves all I&IT projects, funding & priorities
 - Signs off on Service Level Agreement (SLA)
- Application & Data Business Coordinator
 - Ensure I&IT investments meet the needs of the business
 - Integrate across functions and business units
 - Integration & harmonization of management systems
 - Data collection and storage, and analysis needs met
 - Compile, prioritize I&IT needs and recommend funding
 - Develop, maintain & monitor SLA



Governance Organization

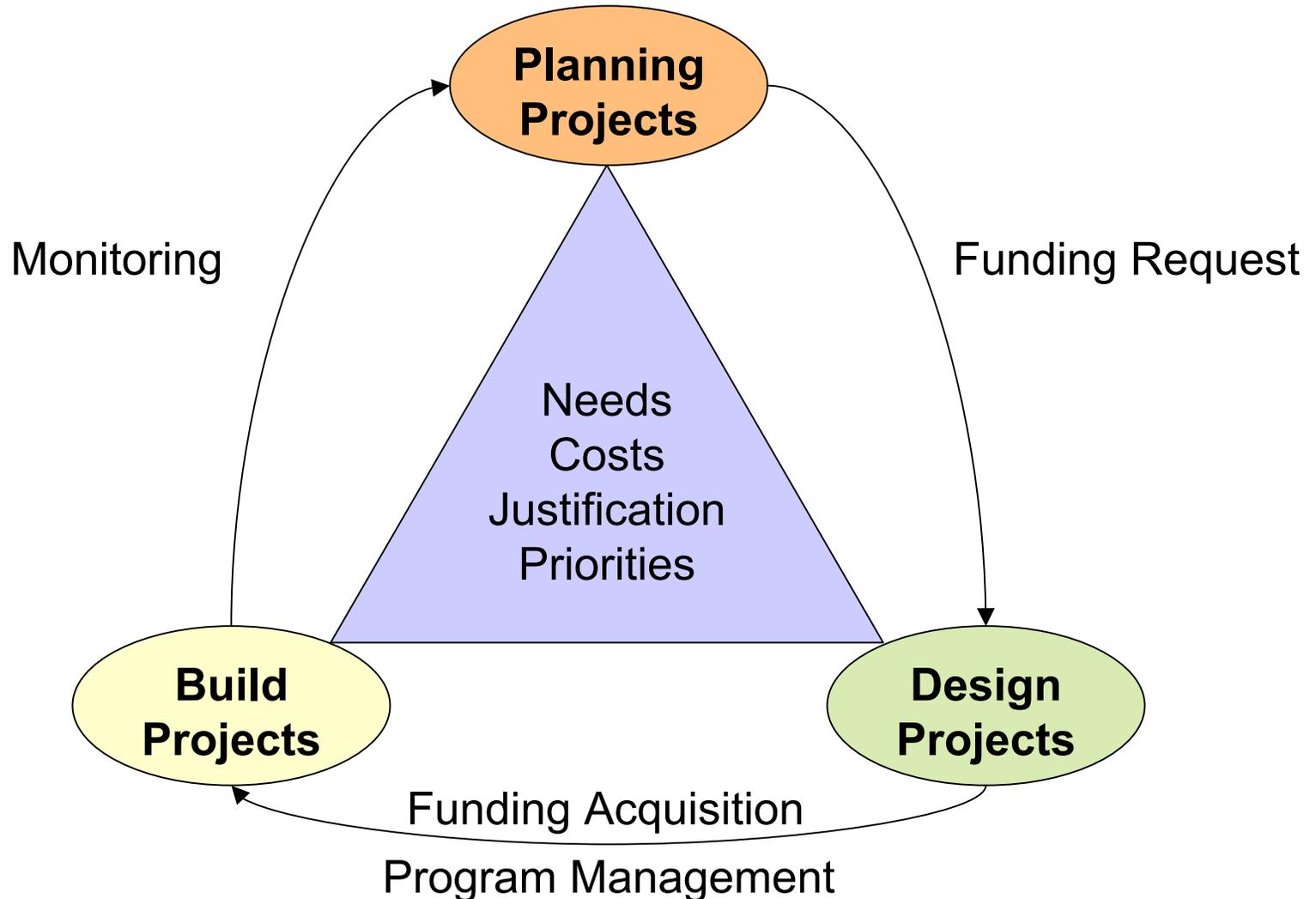


Business Working Group Role

- Review I&IT proposals and insure integration cross-functionally
- Identify gaps, new technologies, opportunities to improve & funding alternatives
- Review needs, costs & priority of all proposals
- Recommend investment strategies
- Membership
 - Regions, Engineering, Maintenance, Construction, Programming (Planning), I&IT, Asset Management
 - Must be knowledgeable in IT and business function
 - Will meet every two months

3 Phase Governance Process

(Annual Cycle)



Service Level Agreement Goals

- Roles & responsibilities of I&IT & Business
- Scope of services I&IT can provide
 - Process for out of scope business needs
- Service constraints & pre-defined maintenance
- Level of service expectations & metrics
- Escalation path for issues and problems





Executive Support System

- Must have data, info & system integration
 - Data clean-up, remove redundancies
 - Data quality, availability & commitment
- Drill down and roll up information
 - Normalize investment information
- ESS attributes
 - Easy to use, graphic and strategic
 - Short term, long term and immediate answers
 - High level trade-offs
 - Data & information rules