



Infrastructure Asset Management

WHICH IS IT?

Asset Management?

Infrastructure Management?

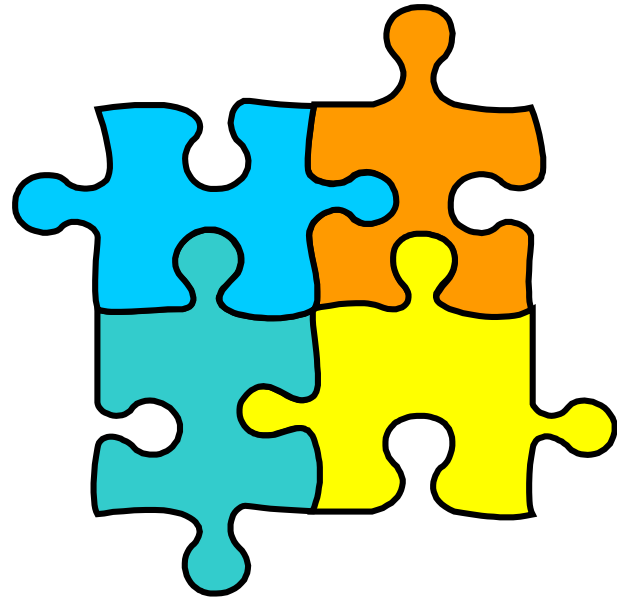
Facility Management?

Goals and Problems

- PMS sets example for the rest of the agency.
- Beware that all groups in your agency may not understand the existing concepts leading to a general system.

Integration

From
MMS, PMS,
and BMS to



AMS

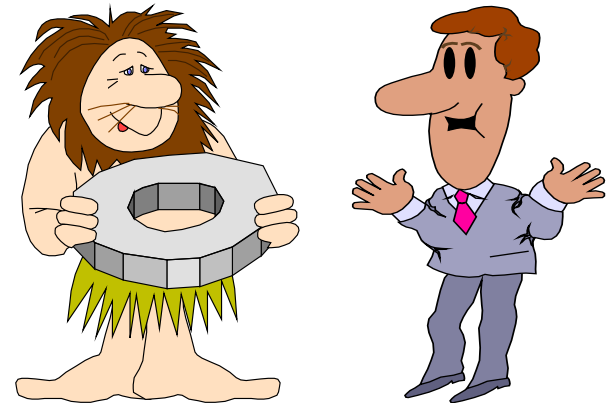
PMS as Role Model

- Success of PMS has led to mandates for other infrastructure management systems
- The future - Advanced integrated management systems

History

Pavement Management initiated systematic management of public investment in infrastructure

The Beginning of Asset Management



History of Pavement Management

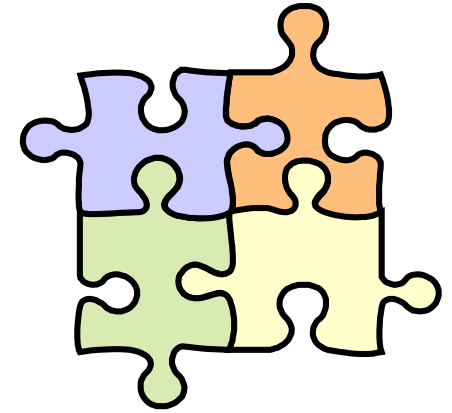
- The First Step: Systematic PM
Processes in 1965 in NCHRP 1-10
- Other significant studies
 - Canada, S.Africa, States
 - FHWA training courses
 - Federal requirements / ISTEA
Legislation

Common Elements

- PMS & BMS share data, analyses, & outputs
- These common elements are generally appropriate for many types of IMS
- Also appropriate for integrated AMS

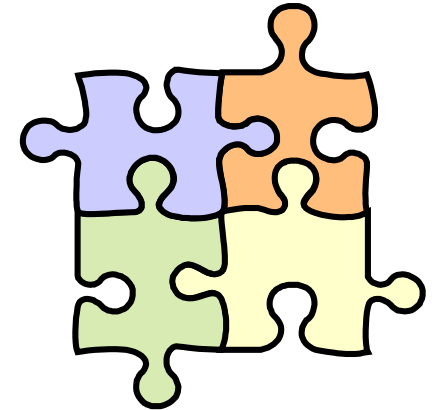
Pavement Management

Is a coordinated
systematic process for
carrying out all activities
related to providing pavements



Asset Management

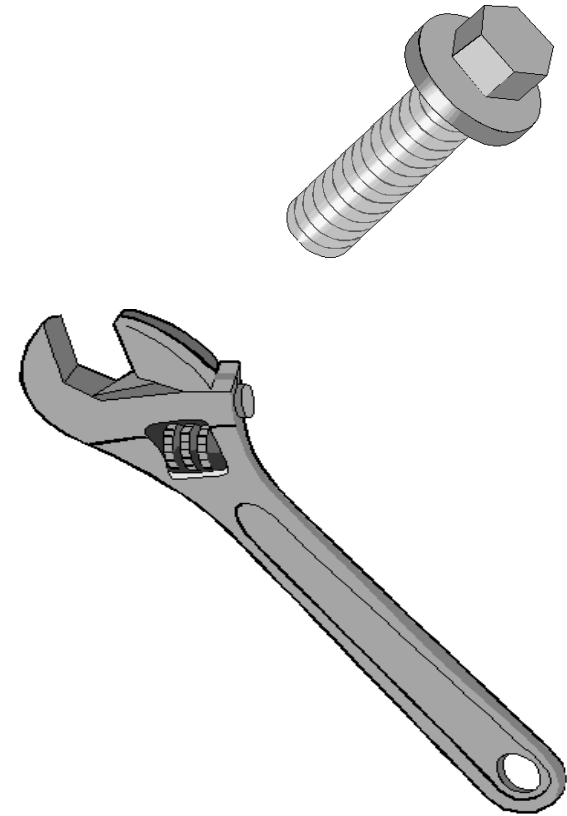
Is a coordinated systematic process for carrying out all activities related to providing and managing assets.



What is Pavement Management Software



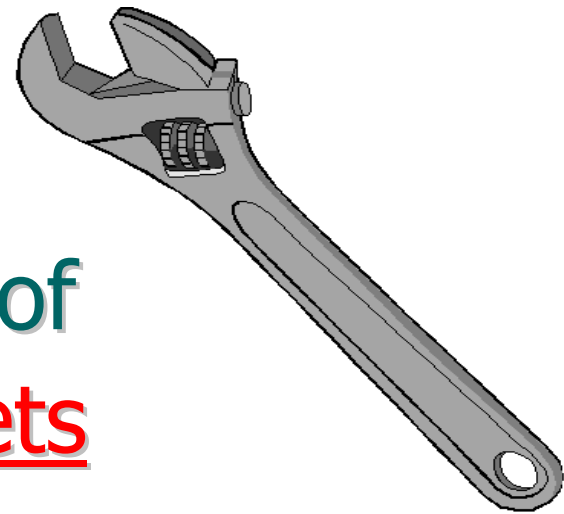
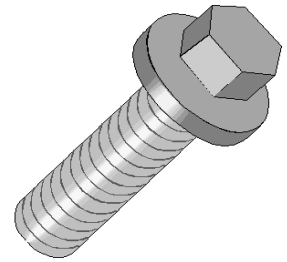
A set of Tools
to Assist
Decision-makers
in Preserving your
network
Pavement Assets



What is an **Asset** Management System

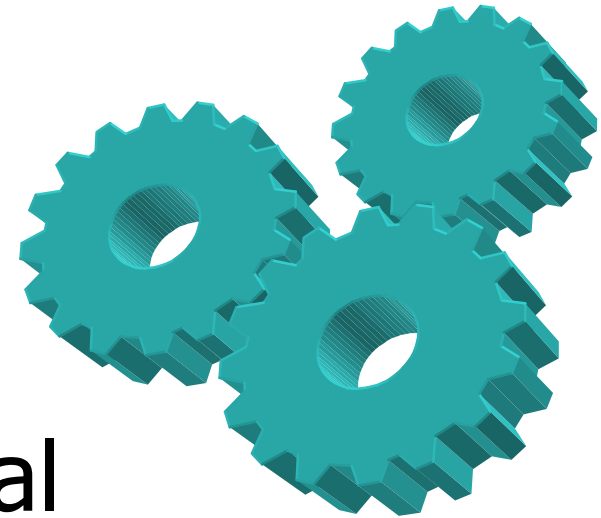


A set of Tools
to Assist
Decision-makers
in Preserving a Set of
Transportation Assets



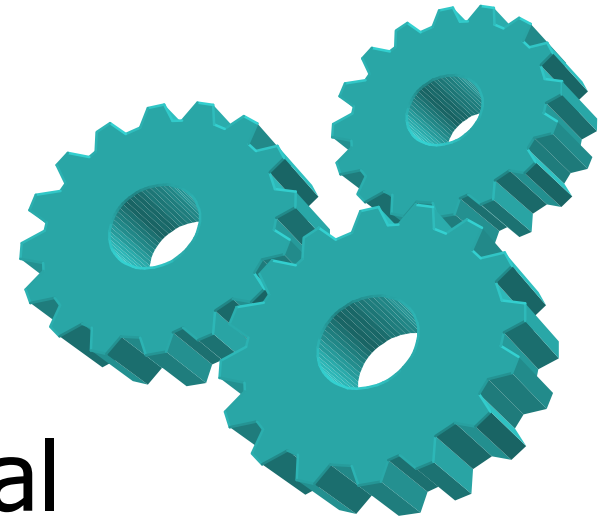
General Structure of Systematic Pavement Management :

Coordinated modules
at several organizational
levels accessing a common
database



General Structure of Systematic Asset Management :

Coordinated modules
at several organizational
levels accessing a common
database



Essential Requirements of PMS

- Easily updated/modified as new information and models become available
- Considers alternative strategies - LCC
- Identifies optimum strategy - LCC
- Bases decisions on rational procedures with quantified attributes, criteria, constraints
- Uses feedback information regarding the consequences of decisions

Essential Requirements of AMS

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Pavement Management System

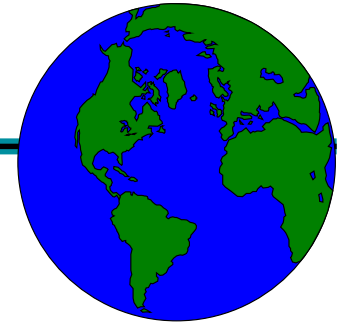
Rational procedures that provide optimum pavement strategies based on predicted pavement performance incorporating feedback regarding the various attributes, criteria, and constraints involved.



Asset Management System

Optimizing asset strategies based on predicted asset performances incorporating feedback regarding the various attributes, criteria, and constraints involved.

Global Decisions



- Many elements in place in agencies but not coordinated in a systematic way
- Need to objectively evaluate and compare projects for all infrastructure
- Hard to give up control

Framework of Integrated Systems

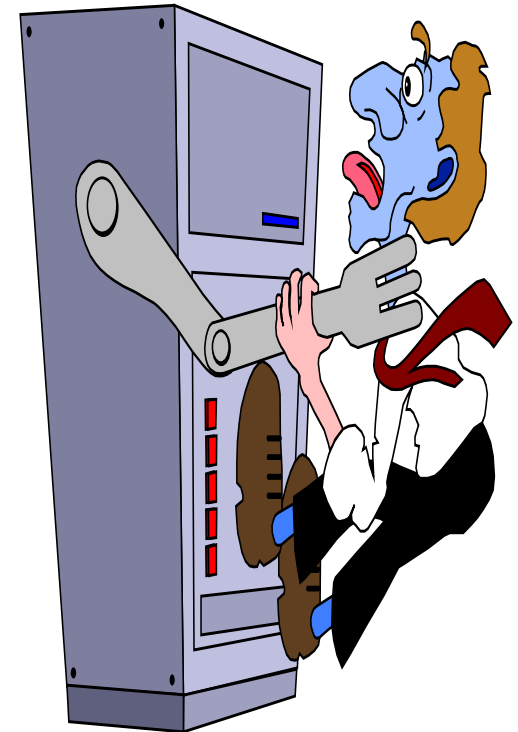
- Strategic decision support
- Multiple criteria decisions
- Assessment of allowable tradeoffs
- Economic evaluation
- Common comparison
- Judgment of decision makers

Common Elements of Management Systems

- Central database
- Analysis / decision support tools
- Geographically based referencing
- User-friendly/consistent interface
- Compatible economic analyses
- Global consideration of resources
- Evaluation of maintenance vs. improvement

Implementation Issues

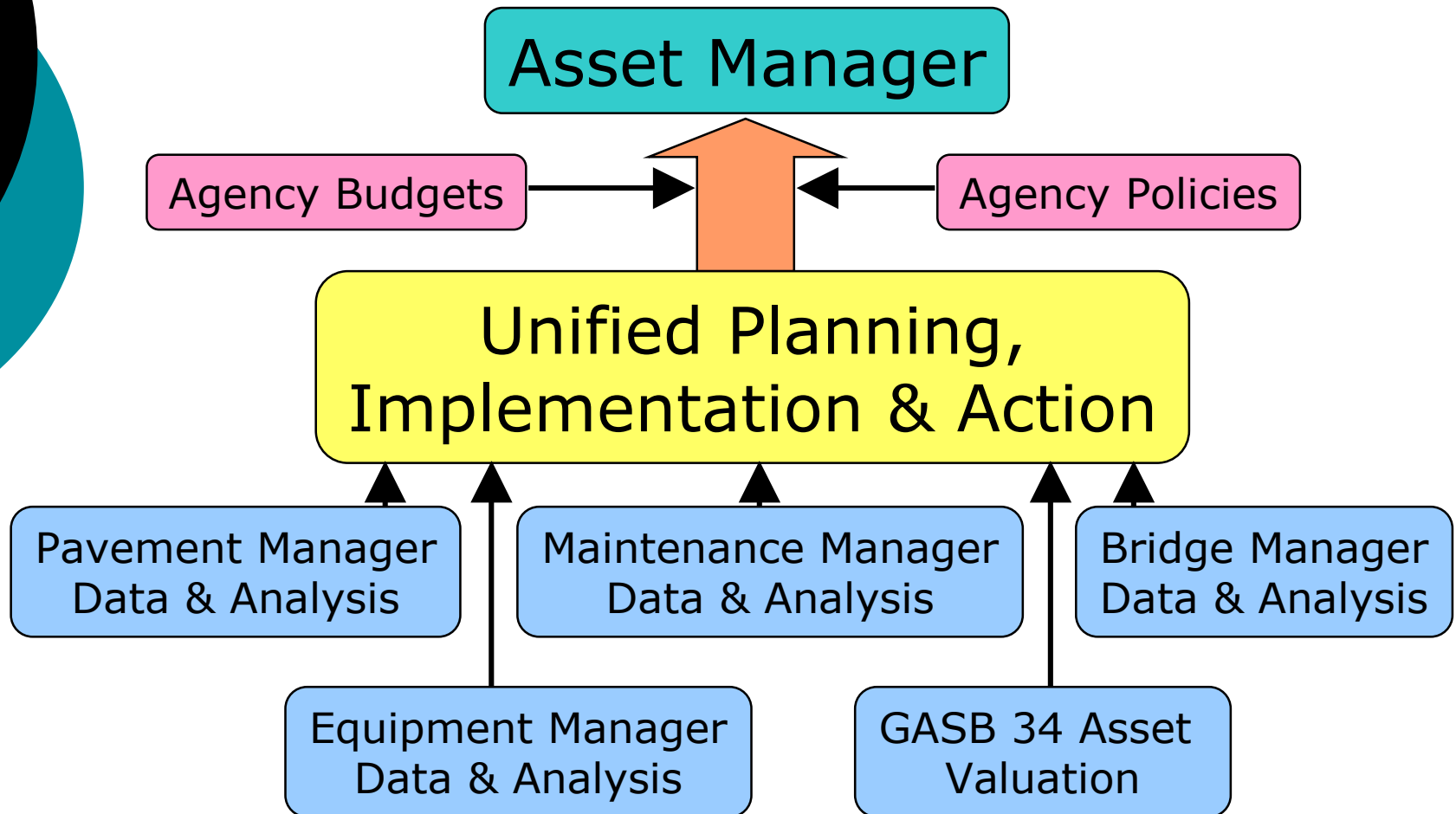
- Institutional issues are important
- Avoid repeating problems experienced in PMS & BMS
- Organizational influences makes effective implementation critical

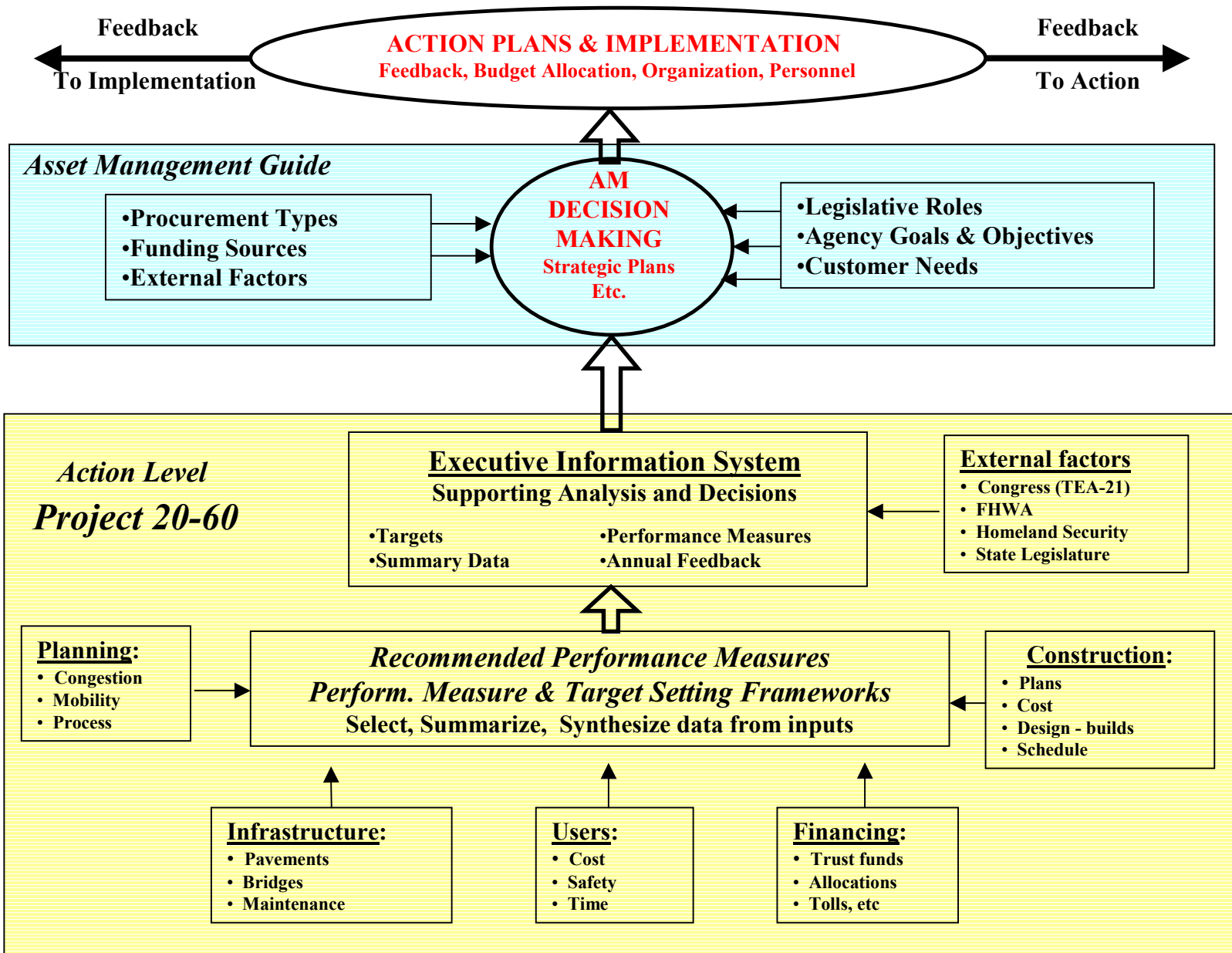


Buzz Words

- Performance Management
- Performance Based Management
- Investment Tradeoff Analysis
- Asset Management
- Efficiency, effectiveness, productivity
- Benchmarking
- Investment preservation
- Integration

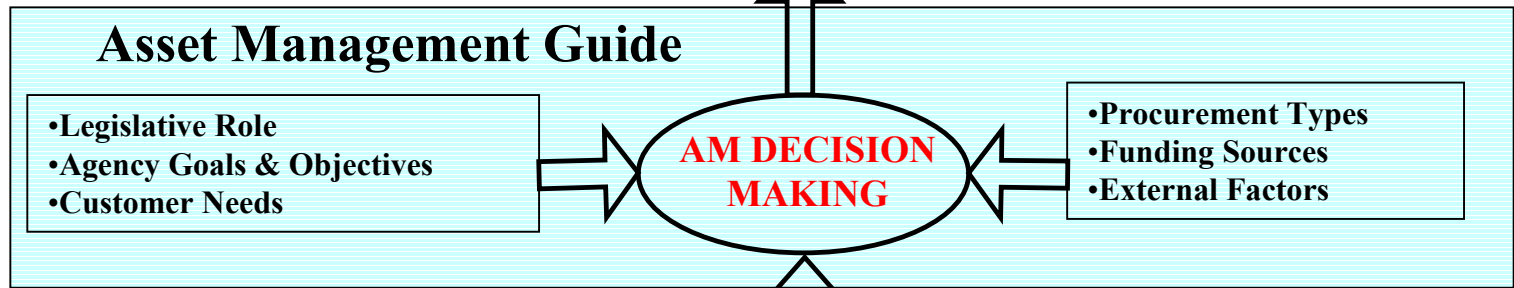
Asset Management Functional Components



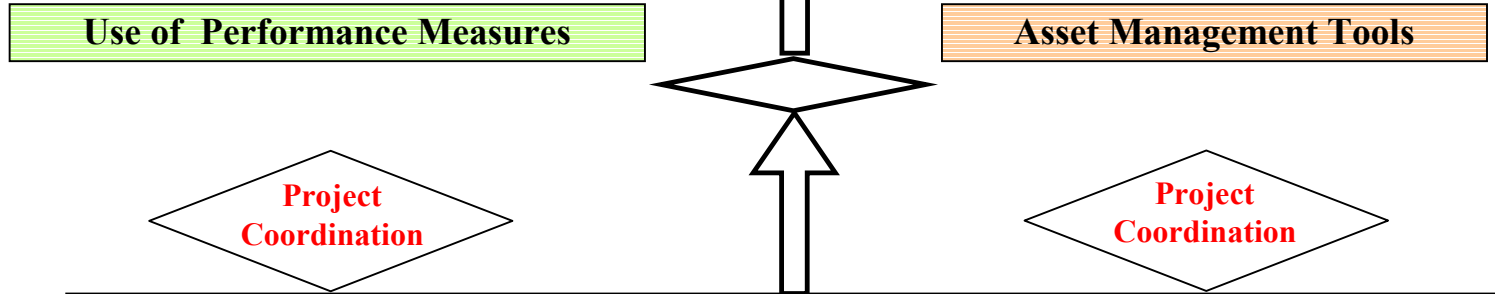


FEEDBACK ← **ACTION PLANS & IMPLEMENTATION**
Programs, Budget Allocation, Organization, Personnel, etc

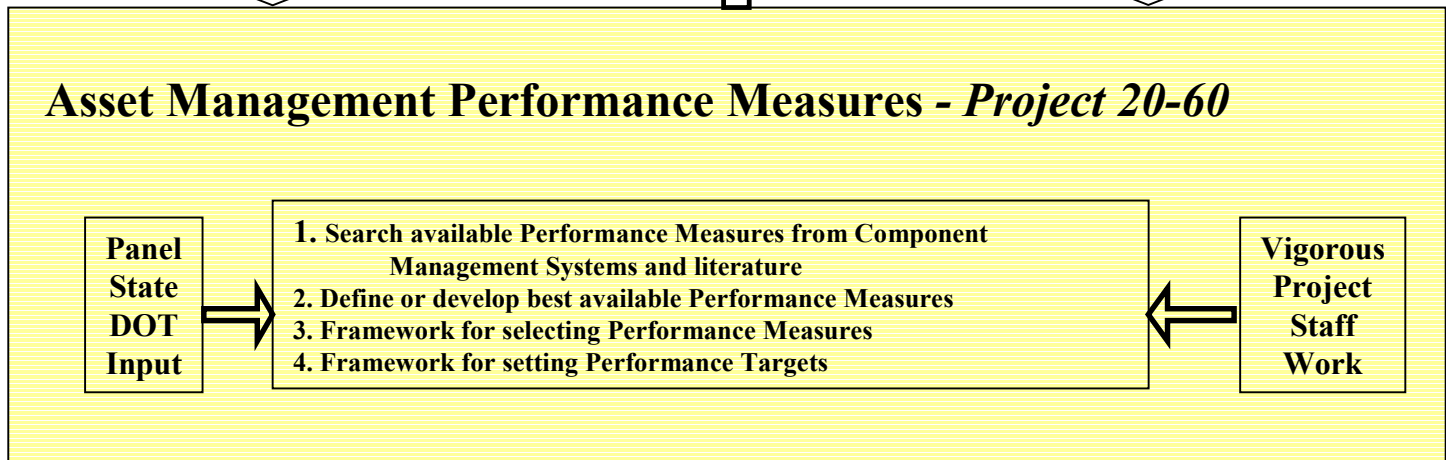
Strategic Decision Level
(Guide Available)



Supporting Projects
(in progress)



Action Implementation Level



Sample Asset Categories

Criteria for Judging Selections

	Congestion/Signs/Safety	Pavements	Personnel	Bridges	Data Available	Cost to Obtain	Accuracy	Bias	Reliability	Relevance	Objectivity
Candidate	#1										
Performance	#2										
Measures	#3										
	#4										

2 Slices of the Matrix will illustrate the types of Measures Category which vary in Asset Category

Highway Asset Categories

- Pavements
- Bridges/Culverts
- Safety Structures
- Traffic Lights
- Signs
- Lighting
- Rest Areas
- Railway Crossings
- Right of Ways
- Buildings, Yards
- Equipment
- Materials
- Intermodal Terminals
- Etc

Judgment

- Ranking
- Weighting
- Rating
- Number of States using

Level of Service Components (Users)

- Travel Time
 - Length of Road System
 - Speed
 - Congestion/Traffic
 - Roughness
 - Road Class
 - Speed Limit
- Safety
 - Congestion
 - Speed
 - Pavement
 - Friction
 - Geometrics
 - Weather
 - Safety Structures
 - Road Class
- Comfort
 - Roadway
 - Roughness
 - Rutting
 - Geometrics
- Costs
 - Delays
 - Congestion
 - (partial) closings
 - Vehicle repairs
 - Vehicle Repairs
 - Accidents
 - Vehicle Damage
 - Injuries occupants
 - Death

Performance Measures Components (Agency)

- Costs
 - Operations
 - Personnel
 - Equipment
 - Materials
 - Contracting Out
 - Training
 - Real Estate/Right of Way
 - Utilities
 - Lawsuits
 - Taxes
- Resources
 - Personnel
 - Highway Asset Evaluation
 - Budgets
- Asset Values (Optimization)
 - Quality Management
 - Purchase/Lease
 - Construction
 - Rehabilitation
 - Maintenance
 - Depreciation
 - Safety
- Performance Measures for
 - Pavements, Bridges, etc
 - Routine Maintenance
 - Rehabilitation, etc.
- Other parameters
 - Traffic, Load Spectrum
 - Construction Details, etc

Judgment Criteria

- Measurability
- Data availability
- Cost to obtain
- Reliability
- Applicability
- Relevance
- Level of Importance
- Complexity
- Understandable
- Practical
- Analyzable

Other Stakeholders

- Legislature
- Contractors
- Materials Suppliers
- FHWA
- GASB34
- Etc

Asset Management Integration

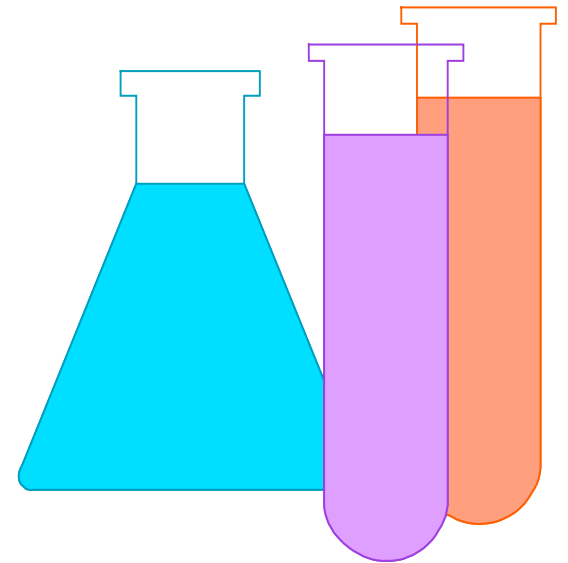
- Current NCHRP Asset Management Efforts **Imply** Lack of Understanding of **Existing** Efforts by Top Managers

Asset Management Integration

- They imply that Existing Management Systems Don't Consider Life Cycle Costs
- Not true

Asset Management Integration

- How Should You
(We) Deal with AMS
Efforts?



Address the Challenge

- Important to demonstrate value of PMS, MMS, BMS to Administrators
- Learn all capabilities - Super User
- Provide useful results quickly
- Explore interaction possibilities
- Discuss the needs of other agency groups

Solutions and Opportunities

- New technology in your PMS.
- Many existing capabilities and benefits
- Client / Server Architecture - Enterprise
- Share information with entire agency
- Interoperability with other systems

Infrastructure Versus Systems Engineering

- Infrastructure Engineering
 - Maintenance
 - Pavements
 - Bridges
 - Traffic Facilities
- Systems Engineering
 - Advanced Management Systems
 - Client/Server Solutions
 - Integrated SQL Relational Database Server Core

Better Infrastructure Asset Management

- Much new research is needed
- Integrated systems will mature
- More cost-effective management
- Continual improvement
- Optimum global investment strategies

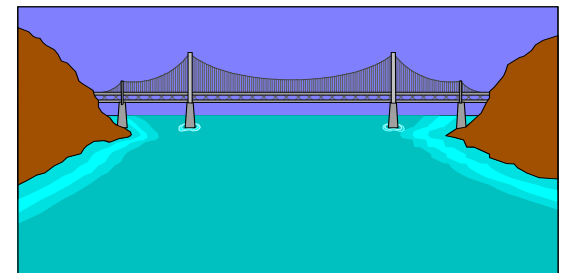


Performance/LoS/ Customer Satisfaction

- “Performance Based Management”
- Identify
 - performance criteria
 - objective measures of these
- Performance Reporting
 - to legislators (justify budgets/get more!)
 - to public

Asset Management needs Detailed Data

Asset Management can
not be done without
Data from Pavement
Management, Bridge
Management and
Maintenance
Management Systems



Asset Management Implementation

- YOU **Are** Asset Managers
- We Must Try to Make That
Clear to your Administrator

