

# **Linking Management Systems to Asset Management Decisionmaking**

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Greeting, personal stuff, etc.

In the next few presentations, you will see a lot about supporting Asset Management.

Saying “more with less” – the more part you have: population, traffic, etc. - the less part you also have: rising costs, limited manpower

Can we work smart enough to come out ahead? Pragmatism... making the right investment the first time...

One central message – In Transportation, there is a critical relationship between level of investment and the level of service.

Not the same for all agencies.

Not measured the same way.

Important for all agencies to know.

You need tools.

We have tools.

## **Outline...**

- **Role of Pavement Management Systems in Asset Management**
- **PMS Issues, What's Different**
- **Protocols and Standards**
- **Priorities**
- **Resources**

Stay tuned

Coming up soon

What I will be talking about.

Let's make this a dialogue.

**Role for Pavement Management:  
Information to support key  
pavement decisions**



**Concepts:**

- **Holistic, sustainable approach**
- **Fundamental to Pavement Investments**
- **“Business Risk” Management**

Managing Pavements involves the whole process

Planning, Design, Construction, Management, Preservation, etc.

Investments in transportation need to be considered permanent, we need to think about how to sustain the system.

Luck doesn't count.

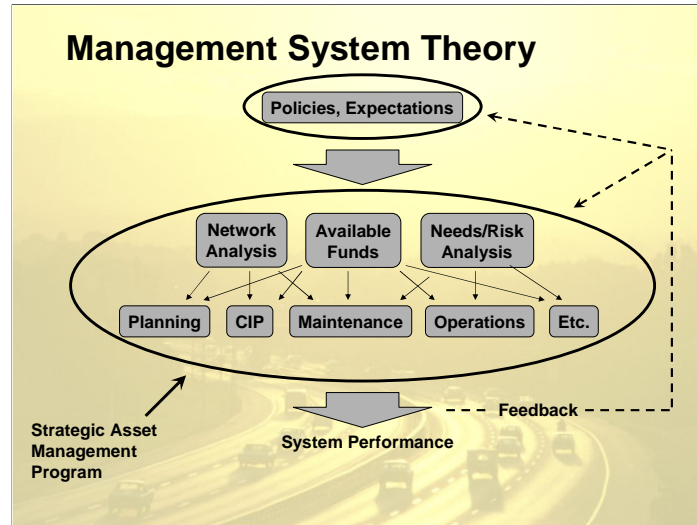
You might want to think of it in investment terms. Condition and performance are why we have pavements; the economics, construction techniques and preservation are the tools we use to get there.

Business Risk is one of the techniques for looking at the “big picture”. In many ways, it is similar to the deterioration curves and analysis techniques we use in pavement management applied to the larger scope. Essentially, it quantifies the probability that an asset will perform at a given level each year it is in service. The greater the probability of declining service, the greater the risk, especially as the asset approaches the end of its life.

Since management systems already have this capability built in, they can play a critical role in getting Asset Management working in an agency.

It is expensive to collect data and process it into information. It is more expensive to make the wrong decisions. Somehow, we have to demonstrate that.

Examples – Indiana claims that some \$60 M could have been saved in the past three years on their Interstate highways through proper use of their PMS. They are working to see that it doesn't happen again.



New take on old concept

Generic Chart shows some of the relationships existing in a DOT

Breakdown: Once you have some **Policies and Expectations** –

Need to know **Inventory & Condition**, the systems analysis

Need to know the **anticipated revenue**

Need to know the **demands on the system** – growth, usage, economic development, what is the risk to the overall mission, etc

Feed into DOT activities and ultimately the decisions that affect **performance**

How well you know and can predict these things influences how well you can make decisions about assets.

Different agencies divide this up in ways to suit their unique situation; some decision charts are a lot more complicated.

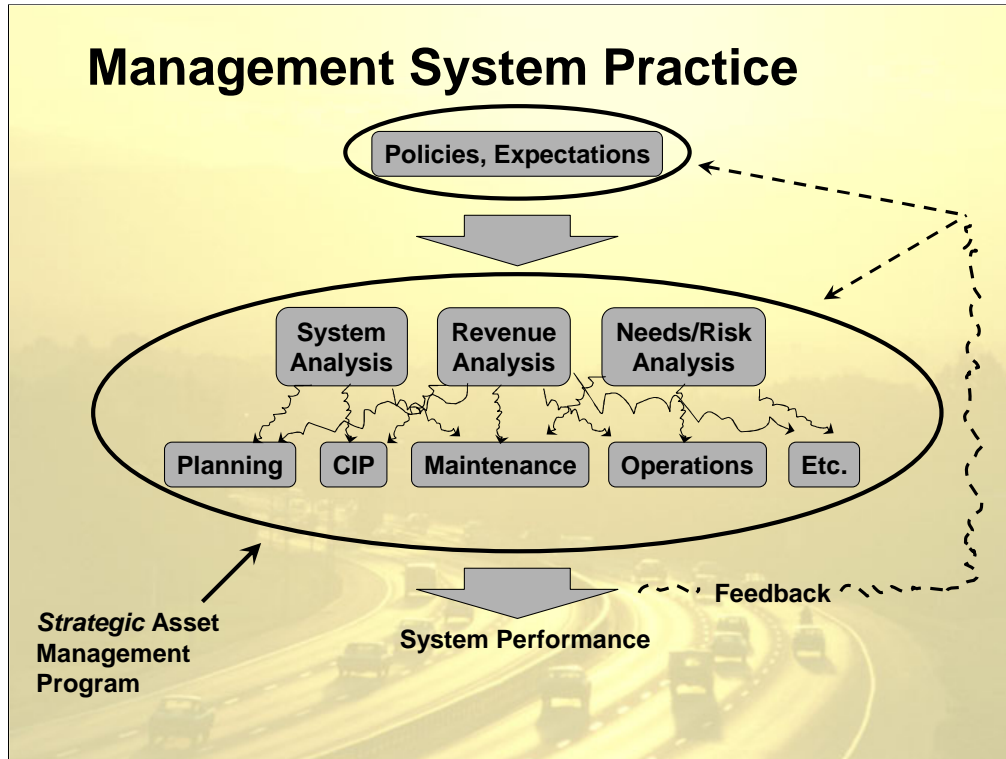
Important **Feedback loop**...

Bottom Line...Easy to see where Management Systems fit in the Theoretical Picture. (System Analysis)

What's the advantage? System performs as planned.

Unplanned events – usually not catastrophic but always **expensive & inconvenient**.

If we do AM right, we can manage that risk and minimize unplanned events



Perhaps a little closer to reality.

Breakdown: Relationships are there but often are not well defined or focused.  
(Tangled)

As a result: Some of the information; Sometimes the feedback loop; Not really strategic; Not really optimum performance

Bottom Line: Management Systems still work but not as well and often they do not work well with other key parts of the agency.

Results: Sacrifice some of the strategic benefits for tactical short-term gains

Harder to predict performance.

More unplanned events.

## Management System Reality:

- **Not always clear Policies and Expectations**
- **Information is not always available**
- **Analyses are not always focused**
- **Performance is not always tracked**



Reality is that we can't always do Asset Management right.

Lots of issues get in the way.

Communications do not always work as well as they should.

Its hard to care about performance when things are running ok.

The links between activities and performance are not always well defined.

Personalities often get in the way.

People retire, systems retire with them.

Sometimes you can't get the information you need for good decisions.

... operating assets at the lowest cost or at best performance may not be the first priority. ...is that ok?

Tracking performance can make some folks nervous.

It takes years to collect enough data to model future performance and fully understand what is going on.

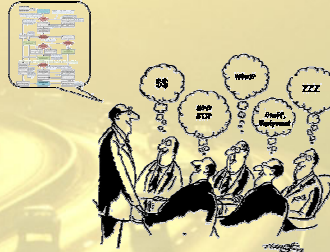
In the meanwhile...

Picture is misleading – suggests it is the computer that is the problem – computer=tool; what you do with it determines success or failure.

## What to do?

### Relating to Asset Management means:

- More and better analyses
- Focus on Supporting Investments and Tracking Performance
- Networking



Asset Management tries to bring the thinking together...

Cartoon... Manager talking everyone thinking something different...

Happening now....

Focus ... Performance measures = Bringing a lot of it together. Communications = better information for decision making.

Knowledge of performance leads to expectations which leads to performance measures.

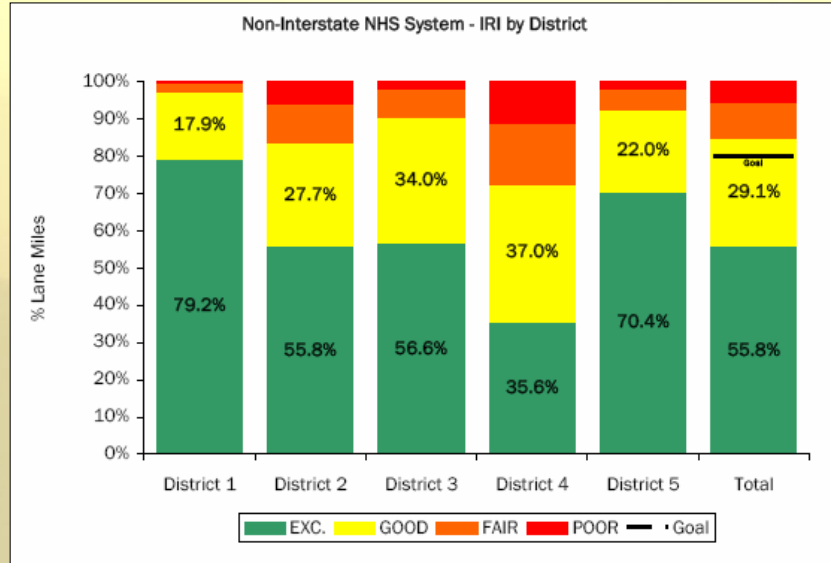
We suggest that Performance Measures be based on tangible things that can be tracked. Like pavement smoothness, bridge element condition, hours of traffic delay

Use Management Systems target these objectives..... powerful tools... Need for Planning/Programming/Maintenance – can even support Construction Quality efforts and others.

Systems not just computer programs – humans have to set priorities, determine what is acceptable, figure ways to determine how long it will last, how much it will cost, who uses the pavement, bridge, sidewalk, etc. ...

Networking ties these efforts into Planning, Programming, Engineering, Finance, Operations, and Maintenance Programs – the bread and butter of every agency.

One way or another you have to deal with the issues;



## MassHighway Scorecard

July 2008

Chart from Massachusetts Scorecard on the Internet.

Charts from PMS illustrate current conditions. Scorecard also provides some description to help interpreting the chart and goes on to describe agency projects and what they are expected to do.

Who reads this? The public has access to it, it is fairly easy to read and understand. Allows PMS information to become part of the political process.



## Pavement Management Systems 101

- **Credibility**
- **Transparency**
- **Paradigm Shift**
- **Cost-effectiveness?**



What is expected out of a management system?

Management systems do three things – Collect data, analyze it, provide reports for decisionmakers (Do we know who they are and what they need?)

There are some major stumbling blocks agencies have to face.

Not everyone believes the Annual Highway Condition Report. (Why or why not?)

Not uncommon to believe that conditions are not as bad as portrayed. (Maybe we painted the picture too bleak?)

Not relatable to an easily understood parameter like “bridge will have to be closed in 2 years”

Management systems should not be a black box. Important to understand what data, what processes, what outputs.. Not everyone needs to understand the math but everyone needs to believe that the analyst does.

Need to ask ourselves:

Do our analysis tools answer the right questions?

Can the data support the kind of information needed?

Are we presenting an accurate picture?

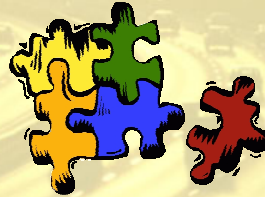
In the future:

Suggest that more statistics will be needed – like “96% probability that pavement will need rehabilitation in 6 years” (Story of CEO & percentages needed)

Need to make gradual but well documented changes – important to know impacts on performance curves.

## **What's Different?**

- 1. Asset Management is at all levels**
- 2. Data supporting Preservation programs**
- 3. Maintenance is project level.**
- 4. Performance monitoring**
- 5. Transparency**



What's different in PMS today.

We already mentioned about needing to link PMS with other systems and offices. Doing that will require some changes

Focus on particular areas – Network performance for Asset Management.

Preservation programs are time critical and need to catch distresses earlier than what might be needed otherwise.

Coordination with Maintenance will require linking to projects and close attention to linear referencing systems.

Agencies may also want to use PMS information for tracking performance – probably not requiring more data collection but probably more analysis.

The “black box” has to disappear. Managers do not want to know about every detail of a network analysis but they need to know that you know what the computer is doing. They need understand what the output means and that there are limitations on predictions. More than ever, it all points to credibility in the system.

### Setting Standards

- Measuring pavement data
  - Data quality
  - Interpreting pavement measurements
  - Using automated equipment
- 
- Need these to assure repeatability in the data!
  - Important for users to understand standards



There is a lot riding on Pavement Management data.

Need to define what we measure, What level of Accuracy and What level of precision can be delivered.

Standards are the tools.

FHWA worked with AASHTO about 8 years ago on standards for rutting, cracking, ride quality, and faulting. These became provisional standards.

These are scheduled for the ballot to become full standards soon. (IRI already is a standard.)

Sponsoring an ETG consisting of States, Equipment Manufacturers, Consultants and FHWA to take a second look and recommend changes. If you have thoughts for the ETG...

Some of the thoughts...

One standard to quantify cracks by length, location, width, and direction; another to classify - better for automated equipment but does it give the right information?

Mesh analysis used in Europe – divides road into mesh then collect data based on whether crack is present or not. Size of mesh not defined, depends on computer capability.

Many agencies starting to use scanning lasers devices from INO for rutting. Standard needs to work with that method.

It is important to have standards even if all data is collected in-house.

## Management System Priorities: The Federal Perspective

- Effectiveness
- Data Quality
- Analysis Tools
- System Integration
- Leadership
- Workforce Capabilities



Effectiveness is the Key Issue – Management systems can be expensive and need to deliver value to the system – getting it into the decision making process;  
Quantifying benefits

Data Quality includes data collection, QC/QA, contracting measures, calibration, certification, new technologies, etc.

Improving existing applications, using engineering applications, tying to other analyses in the agencies, Research into new methods such as performance curves for preservation activities.

Integration is the buzzword today – Even if physically connecting data is not practical, there are ways to connect programs and make use of all of the information

We believe that there needs to be a **champion** in every agency and champions at the national level. Management Systems contain the information to drive the programs and we need to get that message forward on every level.

Improve skill levels nationwide; share best practices; improve overall management of pavements, support preservation efforts.

We are still defining our role, but the focus is on assistance not requirements (HPMS is about requirements but that is an effort to improve the quality of the information going to Congress.)

## Resources...Pavement Management

### Training Available:

**“Pavement Management Systems:  
Characteristics of an Effective Program”**

**NHI Course 131116**

**Free!!!**

### Publications:

**“Pavement Management Catalog”**  
2008 Edition

**“Pavement Management Systems:  
The Washington State Experience”**



Available resources

Also, Pavement Management Peer Exchange – details forthcoming.

## **For more information...**

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Contact the Division Office in your State or contact us directly.  
We have resources to help.

I can get you connected to the right person quickly.