

# The Future of Pavement Design and PMS

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# Presentation Outline

- Pavement Design
- Pavement Management
- Re-linking PD and PMS
- Research Activities



# Pavement Design

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- Mechanistic-*Empirical* based
- Data intensive
- *Empirical* - requires re-calibration / validation when things change
- Not all factors affecting performance are considered in full, construction, material and spatial variability requires feedback

# Pavement Management System

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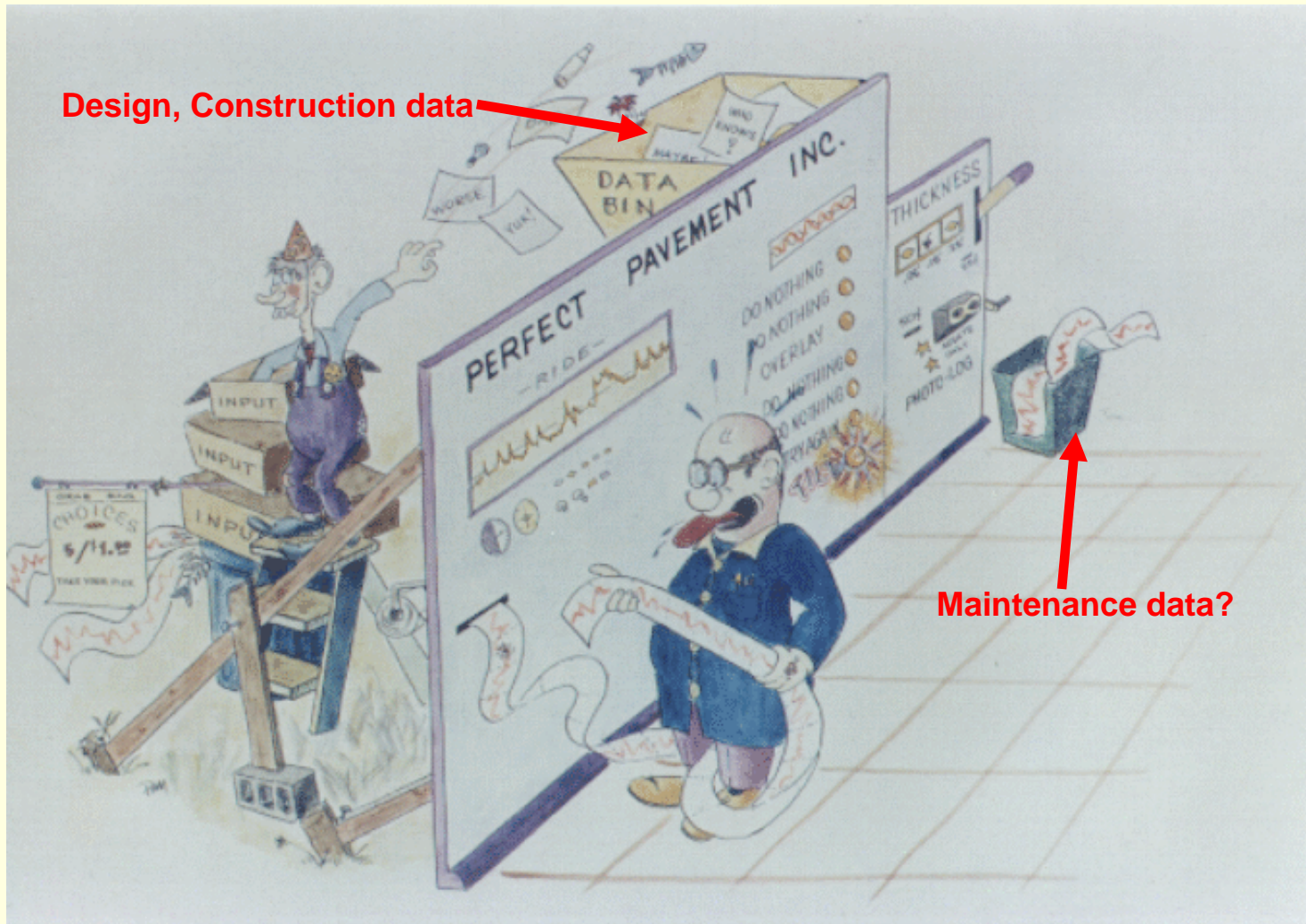
- PMS concept conceived as framework for pavement design – Project Level
- Has since evolved, and in many cases disassociated from pavement design, as a system to optimally manage and maintain pavements - Network Level
- Development of MEPDG has brought to forefront the need and the benefits of re-linking PD and PMS

# Cross-Cutting Issues

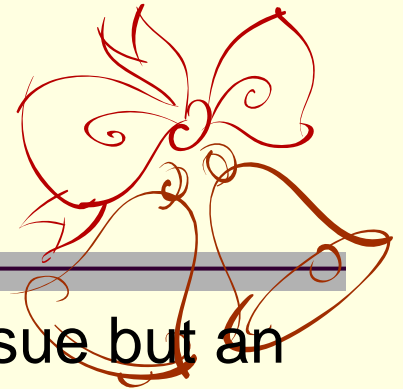
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- Pavement performance models are an integral part of both PD and PMS yet historically these models have been different
- Pavement performance monitoring is a component of PMS for managing pavements but is also the feedback loop for PD
- Design of long-lasting pavements assumes and requires optimally scheduled maintenance and preservation activities recommended by PMS

# State of Practice



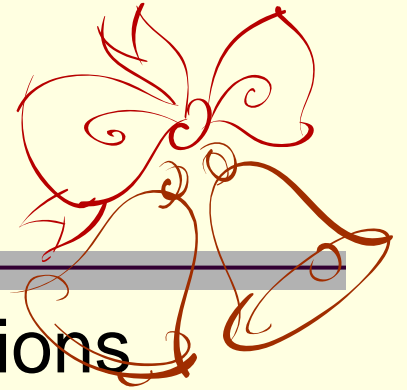
# The Need to Re-Link PD and PMS



- Calibration / validation is not a one time issue but an ongoing activity – an opportune time to plan ahead
- PMS can and will serve as a primary data source for PD inputs - provide data dump for PD
- PMS is best suited to interface with traffic, laboratory and other information systems to provide a single source data dump for PD
- PMS can and should serve as the storage medium for PD inputs not stored elsewhere – integrate PD inputs within PMS

# The Need to Re-Link PD and PMS (cont.)

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- Incorporate PD performance predictions (distress, rutting, IRI etc.) within PMS – becomes the default performance curve and adaptively calibrated with measured performance
- Make every new or rehab section designed with MEPDG an experimental section for future calibration and engineering analysis



# Near Term Opportunities

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- Adoption / transformation of PM data definition / collection / rendition to be consistent with PD distress definitions
- Enhancements to PMS to provide data dump for PD
- Integration and incorporation of PD inputs and performance predictions with PMS
  - Incorporate PD inputs within PMS, integrate materials and related systems
  - Incorporate as-built data within PMS
  - Incorporate PD performance predictions (distress, rutting, IRI etc.) within PMS – becomes the default performance curve adaptively calibrated with measured performance

# Long Term Opportunities

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- M-E based PMS pavement performance models
- M-E based remaining service/structural life predictions
- Role of PMS in innovative contracting – M-E based performance predictions will be key to remaining structural life evaluation at turn-back

# Impacts

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- These project level opportunities will complement network level pavement management
- Network level functions of PMS will continue to play the critical role in systematically maintaining, upgrading and operating the pavement network based on optimization of benefits and minimization of life cycle costs

# Research Activities

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- Development of best practices and guidelines to integrate design, material and construction information with PMS
- Procedures for determining fundamentally based remaining service / structural life (RSL)
- Framework for collection and storage of required data for local calibration of MEPDG using PMS database

# Pavement Design and Pavement Management

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Renewing the vows...



...for better Pavements!

# Questions or Comments?

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