30 Years - 20 State DOTs
Trends in Pavement Management observed through real world Implementation at the State DOT Level.

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&
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Deighton Associates Limited
Agenda

- Acknowledgements
- Introduction
- Custom Systems and COTS Solutions
- Performance Indexes
- Deterioration Models and Transition Probability Matrices
- Project Sectioning
- Migration to Asset Management
- Enterprise Wide Solutions
- The Next 30 Years
Acknowledgements

• Co – Author
  President Deighton Associates Limited

• 21 State DOTs
  Arkansas, Colorado, Connecticut, Indiana, Iowa, Louisiana, Maine, Massachusetts, Mississippi, New Hampshire, New Jersey, North Dakota, Ohio, Oklahoma, Pennsylvania, Puerto Rico, Rhode Island, South Dakota, Utah, Vermont, West Virginia
Introduction

- Toronto (1985)
- Toronto (1987)
- San Antonio (1994)
- Durban (1998)
- Seattle (2001)
- Brisbane (2004)
- Calgary (2008)
- Santiago (2012)
**Custom Systems vs COTs Solutions**

- Custom Systems
  - Mainframe based
  - Costly to Develop
  - “Reinventing the Wheel”
  - A solution for RIDOT could not easily be transferred to PennDOT
  - Data was not readily available to make true “data driven decisions”
**Custom Systems vs COTS Solutions**

- **COTS Solutions**
  - Solutions are configured for an agency – not specifically programmed
  - Solutions can mature overtime through configuration
  - Solutions share the same basic principles but are flexible
  - Costs are generally more affordable
  - Data is now generally available to make true data driven decisions
  - Analysis and Optimization technologies have greatly increased
Custom Systems vs COTS Solutions

• COTS Solutions

  ▪ Truly flexible COTS solutions can be expanded to include multiple assets
  ▪ CDOT includes:
    • Bridges (major structures)
    • Culverts (minor structures)
    • Buildings
    • Fleet Equipment
    • Geo Hazards
    • ITS Devices
    • Pavements
    • Traffic Signals
    • Walls
    • Tunnels
Condition and Performance Measures

- One Overall Composite Index
- Several Composite Indexes
- Individual Indexes
- Level of Service Measures
Calculating Indexes from Low, Moderate, High Severity Extents

Regression of Indexes into deterministic performance Models by family.
Curve Clustering - Resulting in Multiple Curves for Each Family
Ohio DOT uses a 9x9 Transition Probability Matrix to predict distress in 9 different combinations of Extent and Severity.
PennDOT uses a 4x4 matrix to predict extents of Null, Low, Moderate and High Severity distress.
PMS FOR STRATEGIC ANALYSIS AND TACTICAL PROGRAM DEVELOPMENT

- PMS role has expanded
  - Strategic Analysis
    - Funding Needs
    - District / Regional Allocation
    - Level of Service Analysis
    - Performance Goals and Targets
  - Tactical Analysis
    - Program Development
    - Pavement Preservation
    - Long Term Analysis
FIXED PROJECT LENGTH SEGMENTS

vs.

VARIABLE LENGTH SEGMENTS

Weighted Average

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100 | 130 | 160

9th International Conference on Managing Pavement Assets | May 18-21, 2015
FIXED PROJECT LENGTH SEGMENTS

VS.

VARIABLE LENGTH SEGMENTS

Coring Log

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Select GPR virtual core or the calibration core that you want to see in more detail.

The details of the GPR Visual Core will be shown by the GPR Data tab.
THE NEXT 30 YEARS

- 20th International Conference on Managing Pavement Assets in 2045
  - Web Based Enterprise Wide Solutions
  - Seamless data integration
  - Increased Performance Measures
  - New Performance Prediction Technologies
  - New Optimization Technologies