

Using Pavement Management Software to Optimize Your Pavement Preservation Program – The Montgomery County

Introduction by:

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 Overview of Comprehensive Pavement Management

What Functionality Should a County's PMS Software Have?

Montgomery County Story

Comprehensive Pavement Management

More than just Software

- Cradle to Grave Approach
 - Project-specific Designs
 - Utilizing the Toolbox
 - Project-specific Contract Documents
 - Thorough Inspection
- Land Development
 - Ensuring Durability of New Infrastructure
- Utilities





Should Have Been CIR



Should Have Been FDR



Design and Build it Correctly4 Projects - All <6-Months Old</td>











Pavement Management Software to Optimize Your Pavement Preservation Program

The

Montgomery County

Story

Montgomery CountyPavement Management System

24,000 Segments Management Setup Compatible to County Practices Created Street Inventory File Data Compatible with County's GIS Data Initial Road Rating Data Completed □ June 2008 to August 2008

KEI Go

Goals

Network Level Planning Tool Predicting the Future Rigorous Budget Analysis Project Level Tools Historical Database Design Tool Automating Project List Process Neighborhoods Integration with other Departments/Agencies



Budget Analysis ToolProject Level Design Tool

Research Tool



Budget Analysis - What if scenarios Status Quo Increase Budget Decrease Budget Repair Strategies • Optimized vs. Worst First CIR vs. Remove and Replace Goal Setting



- Unique Pavement Types
 - Thick Pavements vs. Thin Pavements
 - High Traffic vs. Low Traffic
 - GABC Base vs. Recycled Base
 - Hot Mix w/ Micro-Surfacing vs. No Micro-surfacing
- Different Treatments by Classification, etc.
 - Multiple Decision Trees
- Unique Performance Models

Lintegration with KEI Asset Management:

- Sidewalks
 - ADA, Walkable Communities, Safe Routes to School, etc.
- Safety Improvements
 - Realignments, Intersections, Friction, etc.
- Drainage/Utilities
 - Cut Policies, Coordinate Activities, etc.
 - ■WSSC

GIS Map - Waterline Project Conflicts



GIS Map - Waterline Project Conflicts <u>Pop Window</u>



Montgomery County **KEI** Pavement Management System

Implementation Started - May 2009

Management Setup

- Optimization Analyses, Multi-year Funding Reports and Backlog (Benefit) Reports
- Completed August 2009



Backlog Analysis aka "Monetary Impact" of Deterioration

Benefits of Optimization

"Sustainability"

Worst-First Budgets



Optimized Budgets

Network Condition - Optimized Budget Comparisons



Worst-First vs. Optimized \$10 Mil./Yr.

Network Condition - \$10 Million Per Year Budget - Optimized vs. Worst First











10 Yr. Comparison: Optimized vs. Worst-First

<u>Funding</u> <u>Level</u>	<u>Worst-First</u>	<u>Optimized</u>	<u>Decrease in</u> <u>Backlog</u>
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Multi-Constraint Analysis

Goal Setting

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AgileAssets Multi- Constraint Examples

Scenario No. 41 – PCI Threshold Varies to 70, Reconstruction Varies to 10%, Limiting Funds

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	<u>Maximum %</u> <u>Reconstruction</u>	<u>Minimum</u> <u>PCI</u>	<u>Maximum %</u> <u>Reconstruction</u>	<u>Minimum</u> <u>PCI</u>					
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Comparison of Different

Repair Alternatives

CIR vs. Tradition Recon



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	2011 Backlog- Conv Recon = \$223 million- CIPR= \$156 million\$ 67 million2016 Backlog- Conv Recon = \$429 million- CIPR= \$243 million\$186 million	

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Project Level Tools



In 1995 – Pavement Management Analysis
Thin HMA w/ Little Base
Most Streets – M/H Severity Fatigue Cracking
Selected Repair – FDR w/ Cement

Town-wide Waterline to be installed in 3 Years
Decided to Seal, Patch & Micro













Cold In-place Recycling

Main road through an Industrial Park Trash Transfer Station More than 200 Trash Trucks/day - 6 days a week ■ 20 Trailers per day - 6 days a week Concrete Plant Crane Rental Business Several Manufacturers

Many Warehouses

Cold In-place Recycling

- Pavement Cross-Section
 - 6 to 16 inches of Asphalt/Aggregate
 - "Evolutionary" Road (widened twice)
- Pavement Condition
 - Severe structural failure
 - Severe Cross-Slope and Profile Problems
- In 1994 5 inch CIR Base & 2 inch Overlay



- Work Histories
 - Track all Work Done to a Segment
 - Contract Based
 - Historical Repository Attach Documents, Photos, etc.
 - Very Helpful for:
 - Design of Repairs
 - Development/Update of Performance Models
- Pavement Layer Information
 - Automatically Built by Entering Work Histories
- Condition Histories







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Reviewing Performance data
What works vs. What doesn't
Fine tuning decision models
Creating more classifications
thick vs. thin
w/ micro & w/o micro
w/ GABC vs. FDR vs. CIR

good vs. poor drainage

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Work Histories <u>Attachments</u>



Condition History





Questions?