LTPP InfoPave™
Extracting Information out of LTPP Data

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Overview

1) Introduction to LTPP

2) Data visualization in LTPP InfoPave

3) Extracting information out of the data

4) Discussion
LTPP’S GOAL IS…

to provide answers to **HOW** and **WHY** pavements perform as they do!
LTPP InfoPave

- Enhance Access and Understanding
- Improve Utilization
- Disseminate Information
LTPP DATA VISUALIZATION
Map: Locate Sections
Toggle (Go To...)

This image displays a user interface for managing pavement assets. The interface includes options for viewing sections by location, selecting data, and exporting tables. Various tools are available for data analysis, including data pivot, data selection and download, section timeline, table export, map section by location, map data by location, media videos, media images, MEPDG inputs, section summary report, auxiliary data export, and ready-to-use datasets. Additionally, there are options for viewing pavement cross-sections and distresses.
Section Timeline

- General
  - Age
  - Experiment Type
  - Study
  - Section
  - Monitoring Status
  - Location
  - Maintenance and Rehabilitation
  - Roadway Functional Class

- Structure
  - Surface Type
  - Base Type
  - Subgrade Type

- Climate
  - Climatic Region
  - Freezing Index (Annual)
  - Precipitation (Annual)
  - Temperature (Annual)

- Traffic
  - Avg. Annual Daily Traffic (AADT)
  - Avg. Annual Daily Truck Traffic (AADTT)

- Performance
  - Deflection (8-kip, wheel path)
  - Fatigue Cracking
  - Faulting
  - Longitudinal Cracking
  - Longitudinal Profile (IRI)
  - Transverse Cracking
  - Transverse Profile

There are 2509 sections currently selected.

State/Province: Florida
Section: 12:0503

Traffic:
- Average Daily Volume
- Days of Data
- Average Daily Percent Truck
- Climate:
  - Precipitation
  - Temperature
  - Humidity
  - Wind
- Construction:
  - Construction No

Section Timeline

- View by: All

2012
- Profile data collected
- Climate data captured

2011
- Distress data collected
- Climate data captured
Section Summary Report

Data

Average Annual Freezing Index

Average International Roughness Index (IRI)

Average International Roughness Index (IRI)

Total Area of AC Fatigue Cracking
Data Selection and Download

Find Sections

General
- Age: 30 - 55 (years)
- Experiment Type
- Study
- Section
- Monitoring Status
- Location
- Maintenance and Rehabilitation
- Roadway Functional Class

Structure
- Surface Type
- Base Type
- Subgrade Type

Climate
- Climatic Region
- Freezing Index (Annual)
- Precipitation (Annual)
- Temperature (Annual)

Traffic
- Avg. Annual Daily Traffic (AADT)
- Avg. Annual Daily Truck Traffic (AADTT)

Performance
- Deflection (9-kip, wheel path)
- Fatigue Cracking
- Faulting
- Longitudinal Cracking
- Longitudinal Profile (RI)

Data Selection and Download

There are 730 of 2509 sections currently selected. Total 2 filters are selected.

Find:

Data Attributes
- Basic
- Additional
- All

AC PAVIAS Distress Survey Ratings (72 Sections)
- High Severity Transverse Crack Length (m)
- Water Bleeding And Pumping Number
- Water Bleeding And Pumping Length (m)
- High Severity Patches Area (sq m)
- Low Severity Transverse Cracks Number
- Medium Severity Patches Area (sq m)
- Record Status
- High Severity Wheel Path Longitudinal Crack Length (m)
- Medium Severity Wheel Path Longitudinal Crack Length (m)
- Medium Severity Transverse Crack Length (m)
- Low Severity Wheel Path Longitudinal Crack Length (m)
Interactive Help (Guided Tour)

Data Classification

After finding your desired sections, you can select your required data nodes under Structure, Climate, Traffic, and Performance categories. This data classification is organized according to primary and advanced data. The legend key on top describes the type of data classification.

Performance

- Deflection (9-kip, wheel path)
- Fatigue Cracking
- Faulting
- Longitudinal Cracking
- Longitudinal Profile (IRI)
- Transverse Cracking
- Transverse Profile

Structure

- General Section Information
  - Section Experiment Type and Improvement (M&R) History
  - Compiled Section Data (Layout and Structure History)
  - GPS Coordinates
  - Age (Inventory)
- Pavement Structure (Representative Structure and Related Data Sources)
  - Representative Pavement Structure (Section Level)
- Material - Layer Properties and Field Sampling (Test, M&R, Inventory)
  - AC
  - FCC
  - Bound Base/Subbase
  - Unbound Base/Subbase
  - Unbound Base/Subbase and Subgrade (Applied To Both)
  - Subgrade
  - Surface Treatments
- Feature - Drainage, Joints, Shoulder, Reinforcement (Monitored, M&R, Experiment Specific, Inventory)
  - Joints
- Maintenance and Rehabilitation (M&R)
  - Improvement (M&R) Details
  - AC Treatments
  - FCC Treatments
  - Joint Seal
  - Patching
  - Grinding, Milling, Grooving

Add to Selection

Climate

Show Advanced Data Classification

Previous Next End Tour
Sample Application 1: IRI trends following various rehabilitation treatments on AC

Sample Application 2: Cracking trends on JPCP pavements with various structural properties

Sample Application 3: Comparison of AC pavement profiles following various maintenance treatments

Sample Application 4: Evaluation of pavement structural condition using available FWD deflection data

www.InfoPave.com: Help → Application Samples
Problem Statement #1

Objective: Investigate effects of rehabilitation treatments on flexible pavement performance using International Roughness Index (IRI) data

Approach: compare IRI trends on various sections of one SPS-5 site

Selection Criteria:
- SPS-5 experiment
- AADTT < 1000 trucks/day
- Wet-no freeze climatic zone
### Downloaded Data

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<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
<th>F</th>
<th>J</th>
<th>K</th>
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### Additional Table

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<td>1 Drop height position 1, target load 27KN (6kips) - 380kpa for standard</td>
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Rehabilitation Treatments Data

the SPS-5 site in Oklahoma

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<th>Overlay Materials</th>
<th>Overlay Thickness</th>
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<tr>
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<td>Milling</td>
<td>Recycled</td>
<td>3”</td>
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</table>
IRI Trends on SPS-5 in Oklahoma

IRI (m/km)

Survey Date

AC Overlay July 1997

Control Section: No Overlay

Thin RAP Overlay, No Milling

Thick RAP Overlay, After Milling

Survey Date

Oct-95 Jul-98 Apr-01 Jan-04 Oct-06 Jul-09 Apr-12

IRI (m/km)

Control, No Overlay
thin RAP, no milling
thick RAP, no milling
thick AC, no milling
thin AC, no milling
thin AC, with milling
thick AC, with milling
thick RAP, with milling
thin RAP, with milling
Sample Application Findings

On Oklahoma SPS-5 site:

- Milling existing pavement surface resulted in more effective treatments in reducing the IRI
- Thicker overlays resulted in lower IRI increase rates
- Thin overlay with recycled asphalt pavement and without milling had the highest rate of increase in IRI
- There is no difference between the performance of overlays with recycled and virgin asphalt materials
Problem Statement #2

Objective: Investigate effects of structural factors on performance of jointed concrete pavements

Approach: compare cracking, faulting and IRI trends on various sections of one SPS-2 site

Selection Criteria:
- SPS-2 experiment
- AADTT > 2000 trucks/day
- Wet-freeze climatic zone
% Slabs Cracked Transversely (SPS-2 Michigan)

DGAB: Dense-graded aggregate base
LCB: Lean Concrete Base
PATB: Permeable asphalt-treated base
Longitudinal Crack Length (SPS-2 Michigan)

DGAB: Dense-graded aggregate base
LCB: Lean Concrete Base
PATB: Permeable asphalt-treated base
Faulting (SPS-2 Michigan)

DGAB: Dense-graded aggregate base
LCB: Lean Concrete Base
PATB: Permeable asphalt-treated base

Survey Date

Average Joint Faulting at Wheel Path (mm)

-0.25 inch - 5.7

0.25 inch

May-90 Jan-93 Oct-95 Jul-98 Apr-01 Jan-04 Oct-06 Jul-09 Apr-12 Dec-14

Survey Date

8.6 in. on DGAB
8.9 in. on DGAB
11.2 in. on DGAB
11.4 in. on DGAB
8.5 in. on LCB
7.1 in. on LCB
10.9 in. on LCB
11.1 in. on LCB
8.2 in. on PATB
8.4 in. on PATB
11 in. on PATB
11.2 in. on PATB

DGAB: Dense-graded aggregate base
LCB: Lean Concrete Base
PATB: Permeable asphalt-treated base
IRI (SPS-2 Michigan)

- DGAB: Dense-graded aggregate base
- LCB: Lean Concrete Base
- PATB: Permeable asphalt-treated base

Survey Date
- May-90
- Oct-95
- Apr-01
- Oct-06
- Apr-12
- Sep-17

Average IRI (m/km)
- 170 in/mi
Sample Application Findings

On Michigan SPS-2 site:

• The very thin slab (7”) has exhibited higher amount of transverse and longitudinal cracking
• Base type does not seem to have affected amount of cracking
• The amount of faulting is negligible (less than 1/8”) on all sections
• Drainage in asphalt treated bases has reduced the amount of roughness compared to other types of base layers
EXTRACTING INFORMATION OUT OF LTPP DATA

- Proposed MAP-21 requirements
  - Establish performance targets
  - Develop a data quality management program
- Develop pavement performance models
- Set performance-based pay adjustment factors
- Evaluate effectiveness of maintenance and rehabilitation
- Generate the inputs for AASHTOWare Pavement ME Design Software
1. Any other suggestions to facilitate data visualization?
2. How to help new users get familiar with the website?
   - www.InfoPave.com: Help → How To Videos
   - www.InfoPave.com: Help → Application Samples
3. Other problems that could be solved using LTPP data?
4. How to provide preliminary evaluations to identify availability of data for specific research topics?

Please submit your feedback at http://www.infopave.com/Help/CustomerSupport or email to ltppinfo@dot.gov.
InfoPave Help

Announcements
- LTPP Program Soliciting WMA Sites in Wet-Freeze Region
- TRB Webinar: LTPP InfoPave™ - Visualization to Facilitate Extraction of Information out of Data
- 2015 T&DI/ASCE-LTPP International Data Analysis Contest
- SPS-10 Presentation at Arizona Pavements/Materials Conference
- Interactive LTPP Data Analysis Strategic Plan

How To...

Presentations
Application Samples
Explore how our users are utilizing LTPP InfoPave to solve pavement engineering problems.

Release Notes
Updated

Frequently Asked Questions

Customer Support

LTPP 2014 and Beyond
New

Site Map
New

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LTPP Team

LTPP Professional Network

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New