

Introduction of Long-Term Pavement Performance Program

Data Pave 97

LTPP INFORMATION SYSTEM

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Introduction

- LTPP program is a 20-year study of in-service pavements across North America
- Its goal is to extend the life of highway pavements
 - › through investigation of the long-term performance of various designs of new and rehabilitated pavement structures
 - › using different materials and under different loads, environments, subgrade soil and maintenance practices
- Strategic Highway Research Program (SHRP)
- Federal Highway Administration (FHWA)



Background

- The first 5 years of studies by SHRP
 - › 1987-1992, 150 Millions
 - › World's largest pavement performance database (over 6,000 variables in 400 tables)
 - › asphalt, pavement performance, concrete and structures, and highway operations
- An FHWA-managed effort
 - › After July 1992, 15 years
 - › Turner-Fairbank Highway Research Center



Objectives of the LTPP Program

- Evaluate existing design methods
- Develop improved design methodologies and strategies for the rehabilitation of existing pavements
- Develop improved design equations for new and reconstructed pavements
- Determine the effects of loading, environment, material properties and variability, construction quality, and maintenance levels on pavement distress and performance
- Determine the effects of specific design features on pavement performance
- Establish a national long-term pavement database



Type of Data Collected

- Inventory
- SPS Construction
- Material Testing
- Climatic & Seasonal
- Traffic
- Maintenance & Rehabilitation
- Monitoring
 - › automated distress, manual distress, friction, longitudinal profile, cross profile, deflection (FWD)



LTPP Experiments (GPS)

- GPS-1 Asphalt Concrete (AC) on Granular Base
 - GPS-2 AC on Bound Base
 - GPS-3 Jointed Plain Concrete
 - GPS-4 Jointed Reinforced Concrete
 - GPS-5 Continuously Reinforced Concrete
 - GPS-6A Existing AC Overlay on AC Pavements
 - GPS-6B Existing AC Overlay on AC Pavements
 - GPS-7A Existing AC Overlay on PCC Pavements
 - GPS-7B New AC Overlay on PCC Pavements
 - GPS-9 Unbonded PCC Overlays on PCC Pavements
- (about 1,100 pavement test sections)



LTPP Experiments (SPS)

- SPS-1 Strategic Study of Structural Factors for AC Pavements
- SPS-2 Strategic Study of Structural Factors for Rigid Pavements
- SPS-3 Preventive Maintenance Effectiveness of AC Pavements
- SPS-4 Preventive Maintenance Effectiveness of Rigid Pavements
- SPS-5 Rehabilitation of Asphalt Concrete Pavements
- SPS-6 Rehabilitation of Jointed PCC Pavements
- SPS-7 Bonded PCC Overlays on Concrete Pavements
- SPS-8 Environmental Effects in the Absence of Heavy Loads
- SPS-9 Validation of SHRP Asphalt Specification and Mix Design (Superpave)



(Original experimental design: about 1,600 sections at 200 locations, not all available)



Seasonal Monitoring Program (SMP)

- Primary Objective: variations in temperature and moisture content
- sixty-four sites (GPS & SPS)
- intensively monitored in alternate years
 - › Climatic data throughout that year
 - › Pavement strength conducted monthly
 - › Surface characteristics obtained seasonally
 - › A minimum of 3 monitoring cycles over six years is expected



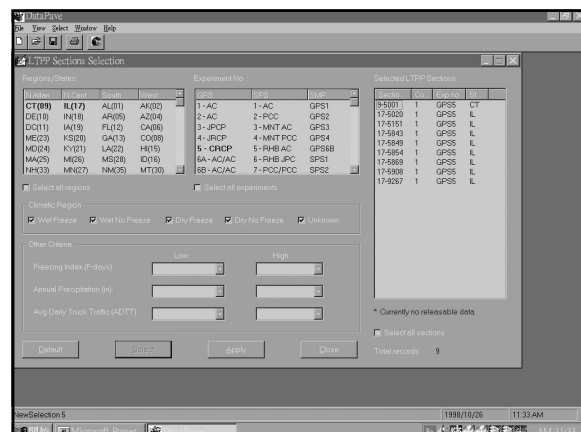
Requesting Data

- Data Sampler and Data Request (1994)
- DataPave 97
- Additional Data (Omitted Tables)
 - › Very large tables (MON_Profile_Data, and MON_Rut_X_Y)
 - › Deflection data (MON_Dynatest_Drop_Data)
 - › Climatic data (ENV_Monthly_Parameter)
 - › Axle load distributions (daily traffic summaries, raw classification, weight records, 80MB/yr)



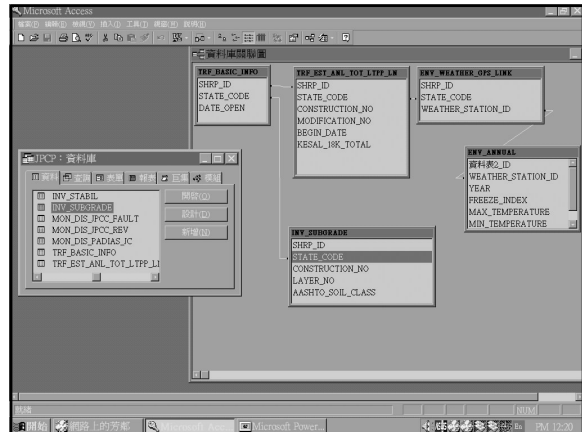
DataPave 97 Program

- Scope of DataPave
 - › Section Selection module: by Criteria or Map
 - › Map module
 - › Section Presentation module
 - › Chart/Trend module
 - › LTPP Database Exploration & Extraction module
- Data Structure
 - › IMS Modules
 - › Tables
 - Data Elements



Microsoft Access Program

- 資料表
 - › 記錄/篩選/進階篩選/排序
 - › 插入/表單/表單精靈
 - › 工具/資料表關聯圖
- 查詢
 - › 設計檢視/簡單查詢/交叉資料表查詢/
 - › 尋找重複資料查詢/尋找不吻合資料查詢
- 其他自動表單與報表功能



International Participation

- 30 countries participate in the LTPP study
- Many countries have adopted the LTPP IMS for data entry and processing
- Each country has customized their database for the software, data types & testing methods
- How about Taiwan, R.O.C. ?



THANKS FOR YOUR ATTENTION!

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