C-LTPP DATABASE: A REVIEW

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Introduction

In 1989, the C-SHRP (Canadian-Strategic Highway Research Program) launched a national full scale field experiment known as the Canadian Long-Term Pavement Performance (C-LTPP) program.

Between the years, 1989 and 1992, a total of 24 test sites were constructed within all ten provinces. Each test site contained multiple monitored sections for a total of 65 sections. Each of these sites received rehabilitation treatments of various thicknesses of asphalt overlays.

The majority of the overlays used Hot-Mix Asphalt Concrete (HMAC). Several sections used HMAC with the addition of polymer, or a high friction mix, and several others used Reclaimed Asphalt Pavement (RAP).

The C-LTPP program attempted to design and build the test sections across Canada so as to cover the widest range of experimental factors such as traffic loading, environmental region, and subgrade type. The environment types include Wet-No Freeze, Wet-Freeze and Dry-Freeze. This ensured that C-LTPP would encompass the majority of conditions under which pavements are constructed in Canada. It would then be possible to compare results obtained at different test sites (i.e. across traffic levels, environmental zones, soil types) by using a statistical analysis of the factorial population.

Objective

The objective of this report is to assist in providing guidance on the future C-LTPP database. The C-LTPP database needs to be an up-to-date, practical consolidation of pavement data, which can be used by researchers and practitioners for pavement design with potential usage in AASHTOWare DarWin-ME Canadian calibration and management of road networks.

The recommendations herein are directed at making the database useable for practicing engineers, managers and technicians. In addition, every attempt has been made to ensure these recommendations are consistent with other up-to-date pavement databases, such as the larger U.S. LTPP.

Table 1: Project Activities and Responsibilities

Activity	Frequency	Responsibilty
Test Site Identification	One-time	Agency
Pavement Rehabilitation	One-time	Agency
Material Sampling & Testing	Prior, During, and Immediately After the Overlay	Agency
Surface Distress Survey	Prior to Overlay, Yearly	Agency
Longitudinal & Transverse Profile	Prior to Overlay, Yearly	Agency
Benkelman Beam - Long-Term Changes	Prior to Overlay, Yearly (up to 1995)	Agency
Benkelman Beam - Seasonal Variations	Monthly, in One Year	Agency
Benkelman Beam - Spring Factor	Weekly, in Three Different Years	Agency
Falling Weight Deflectometer	Every 2nd Year	C-SHRP/Agency
Environmental Data1	Historical, Yearly	C-SHRP
Traffic Data2	Historical, Yearly	Agency
Skid Resistance	Every 2nd Year	Agency
Pavement Maintenance	As Required	Agency
Video Logging	One-time	Agency

Figure 1: Distribution of C-LTPP Sites

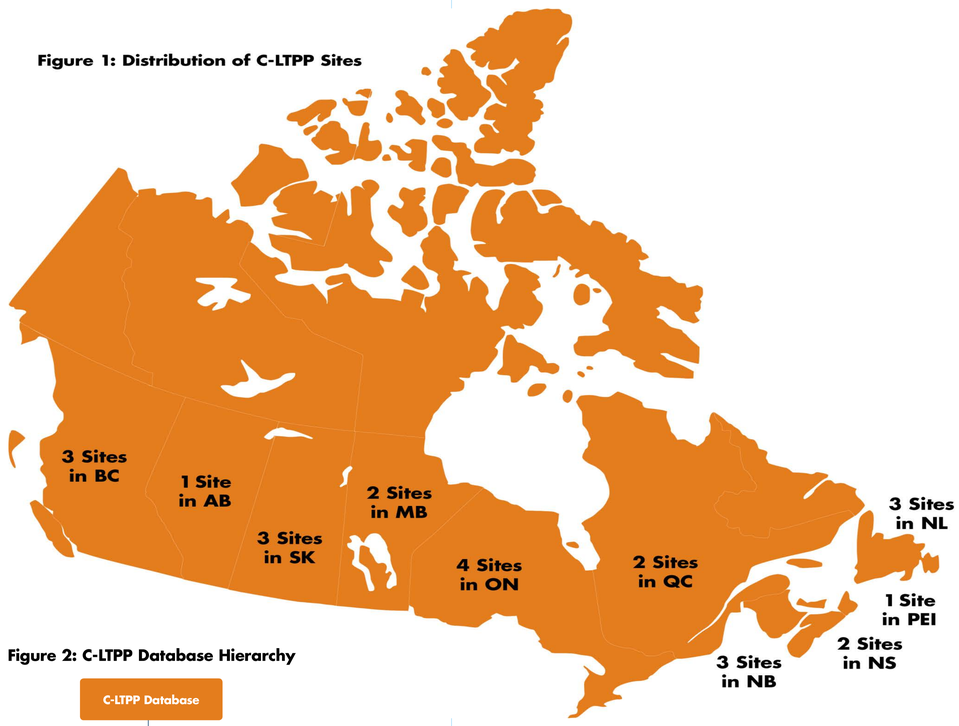


Figure 2: C-LTPP Database Hierarchy

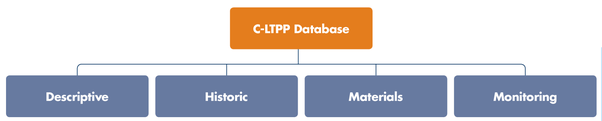


Figure 3: Descriptive Module Hierarchy

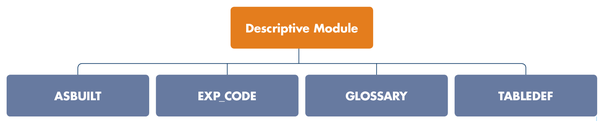


Figure 4: Historical Module Hierarchy

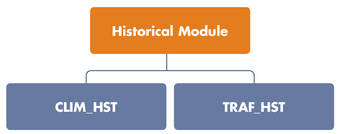


Figure 5: Materials Module Hierarchy

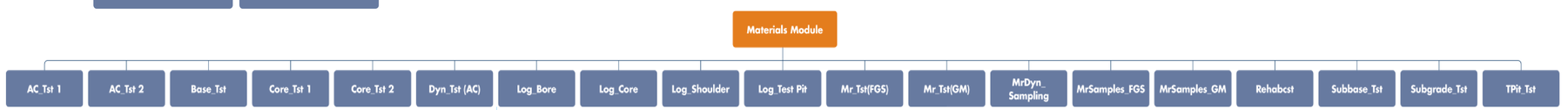
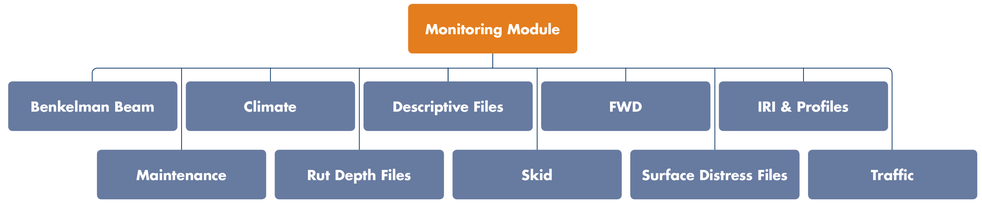


Figure 6: Monitoring Module Hierarchy



Conclusions

The C-LTPP database has established a national pavement database and provides a national framework for continued pavement research initiatives. However, several improvements can be made to help achieve C-SHRP's goals of developing improved methodologies and strategies in the rehabilitation of flexible pavements and developing pavement performance prediction models.

In general, all data modules require improvements. The Monitoring and Materials data modules require the most significant amount of effort to improve data quality and data usability.

Looking to the future, the largest component of highway pavement programs and budgets will be directed at improved rehabilitation and maintenance for existing pavements, rather than on new construction. The C-LTPP program has many rehabilitated test sections that have some monitored data several years before rehabilitation and were continued to be monitored after rehabilitation until the end of their service lives or until the end of the C-LTPP program in 2009.

The key drivers for establishing the C-LTPP program still exist today, more than 20 years after the initiation of test section monitoring. There is a rich base of information still to be harvested from C-LTPP studies that will aid in improving the performance of pavements. The C-LTPP program will provide benefits and deliver accomplishments for the foreseeable future.

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