UPDATE ON TXCRCP-ME DESIGN PROGRAM

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Rigid Pavements and Concrete Materials Branch

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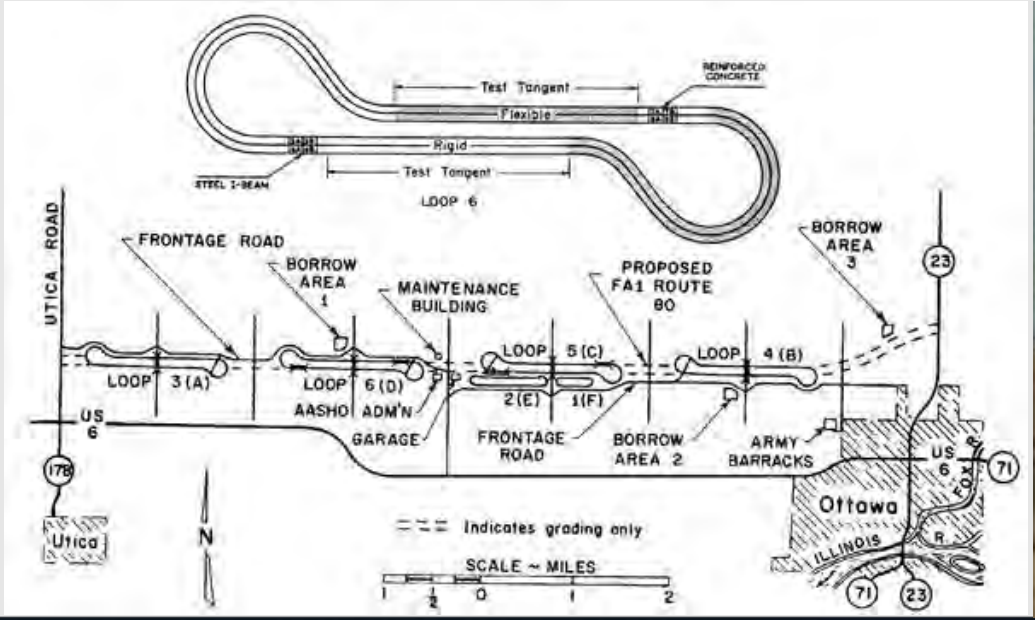
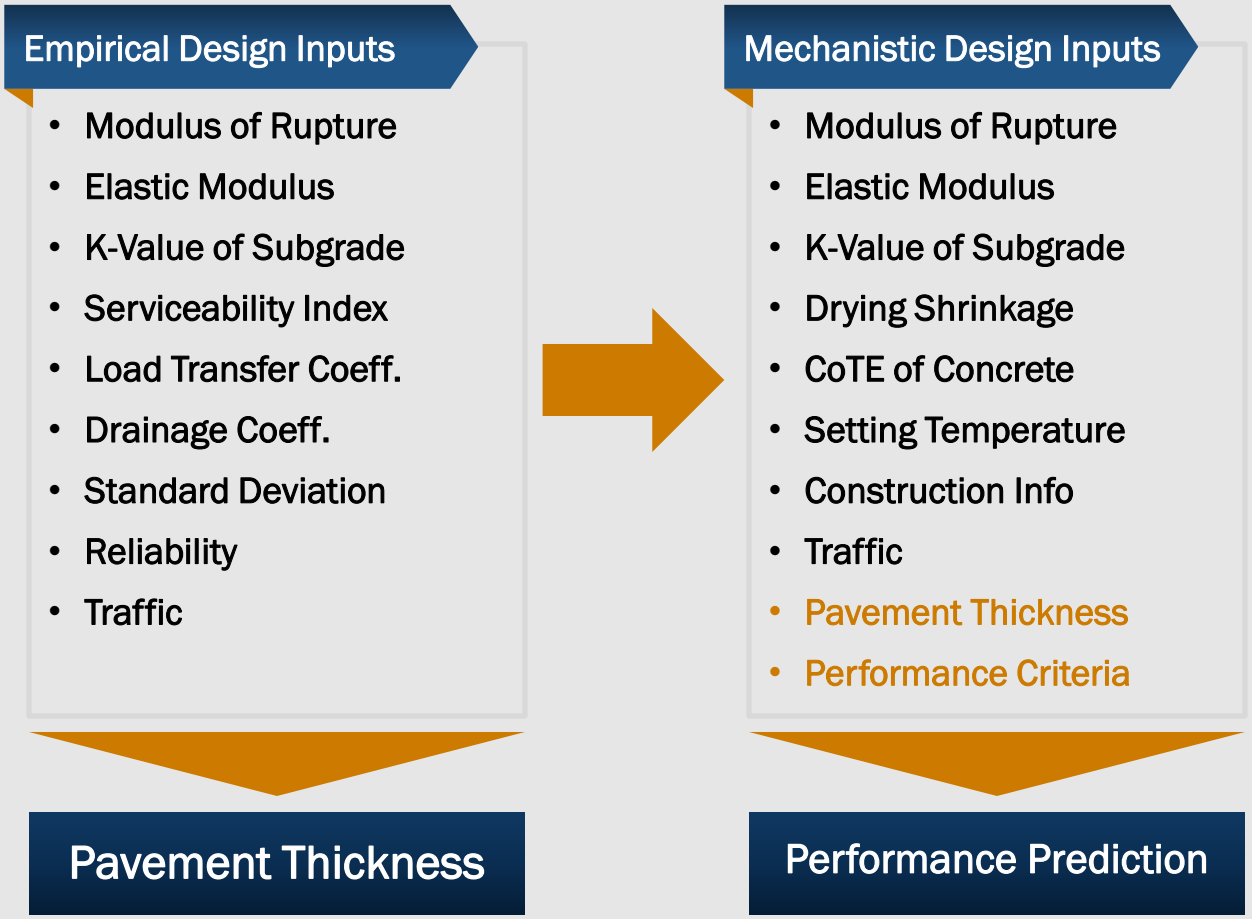
Current Pavement Design Method

- AASHTO 93 Design Method
  - Based on empirical data for AASHTO Road Test built in Illinois during the late 50's
  - Consisted of 7 miles of two-lane pavements in the form of six loops and a tangent, half concrete, half asphalt
  - Most of the concrete sections were JCP not CRCP

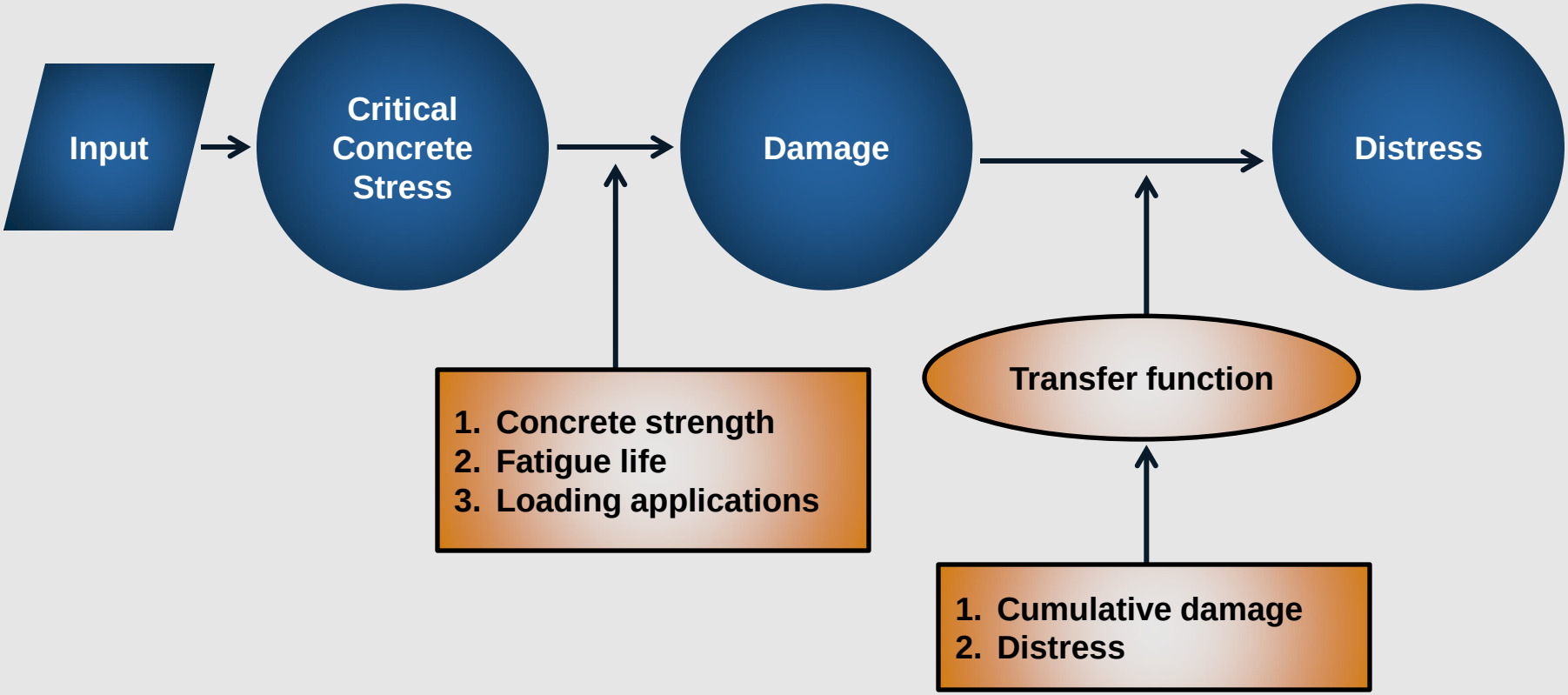


Mechanistic-Empirical Design

- Over the past decade, there has been a push to make pavement design less of an art and more of a science

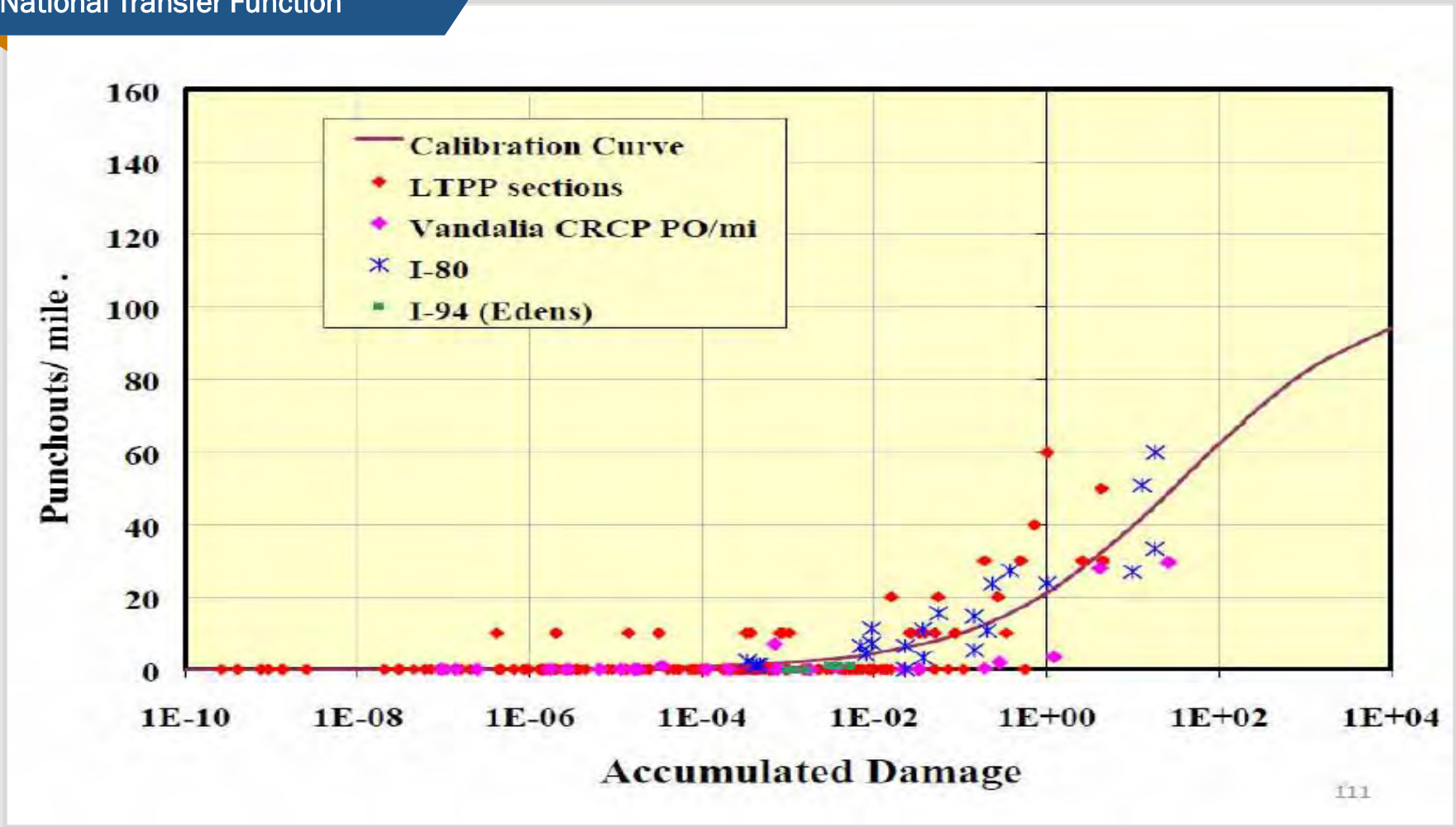


Mechanistic-Empirical Design



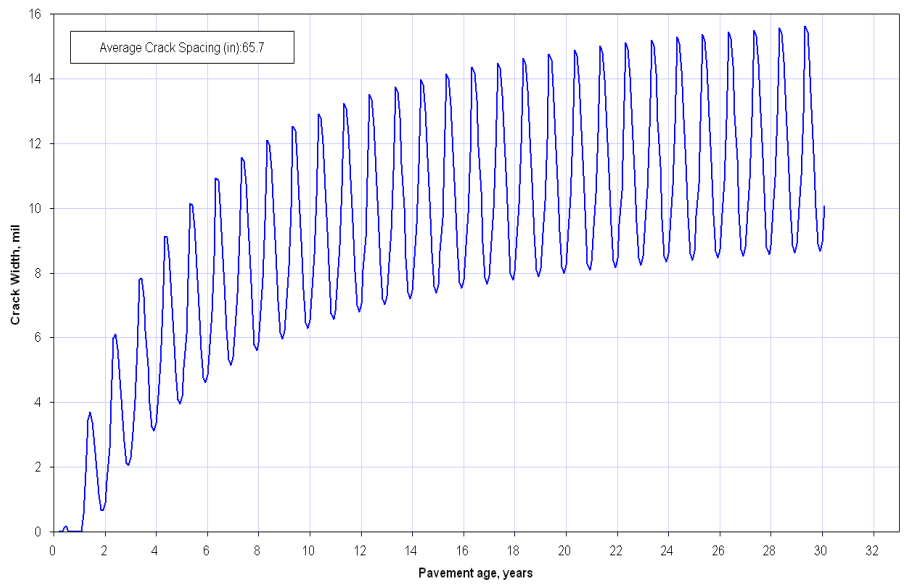
National MEPDG

National Transfer Function

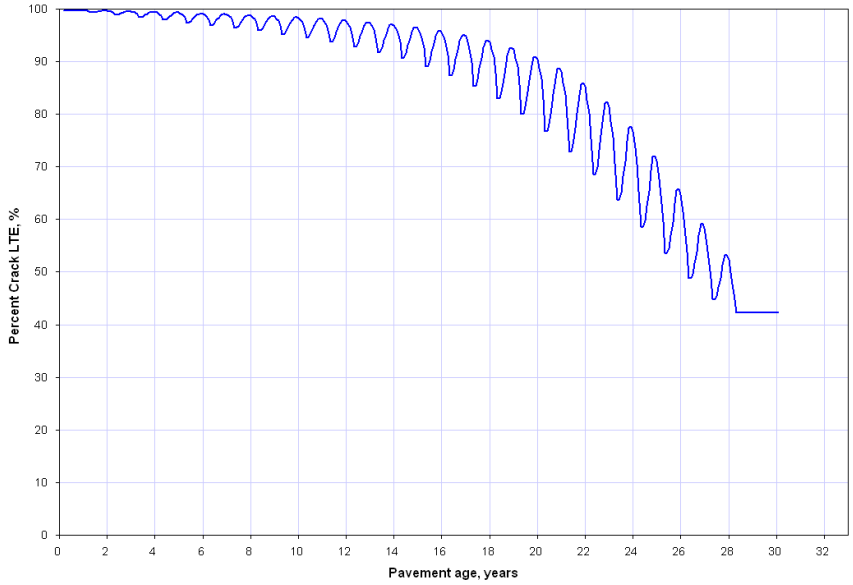


National MEPDG Models

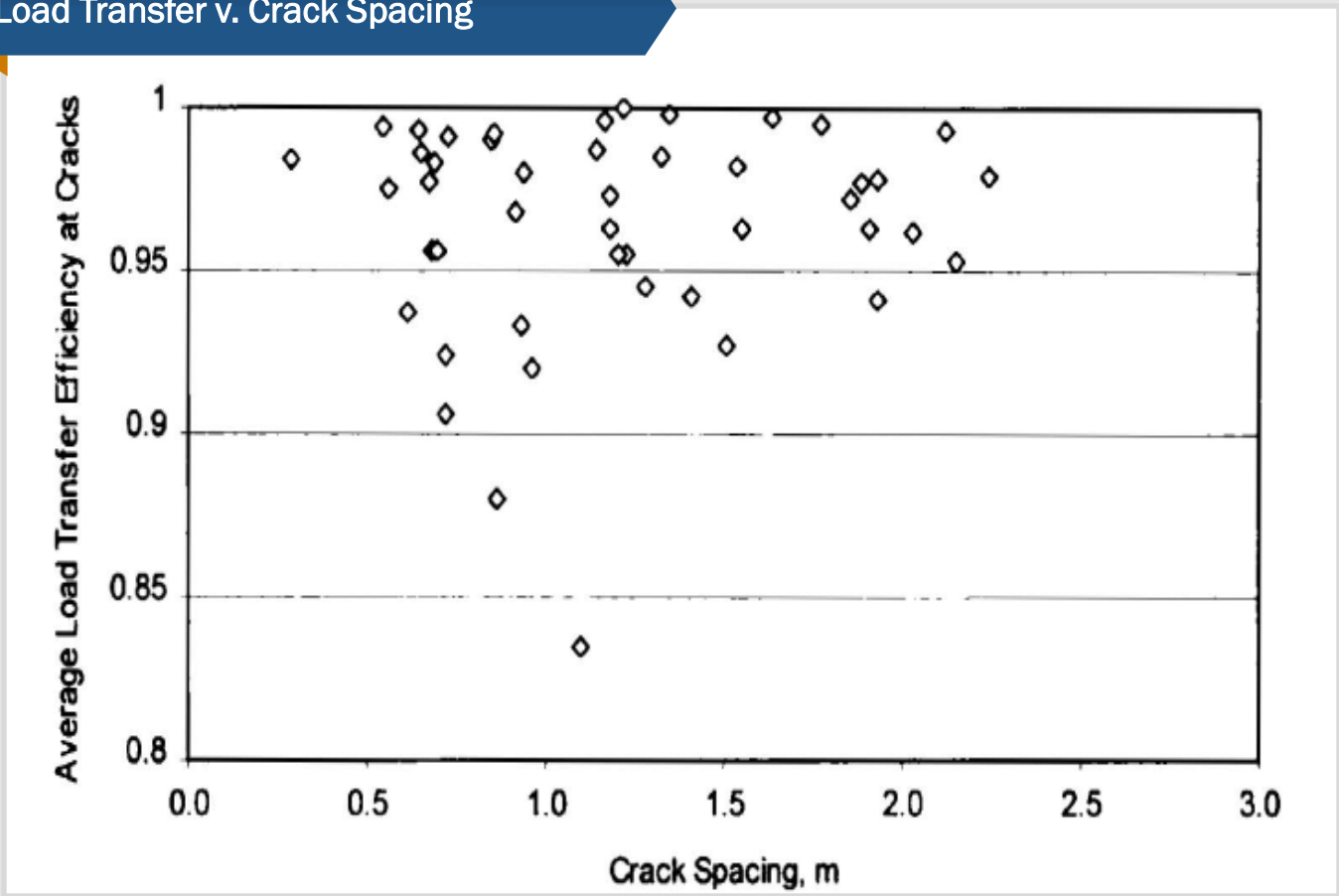
Crack Width



Load Transfer

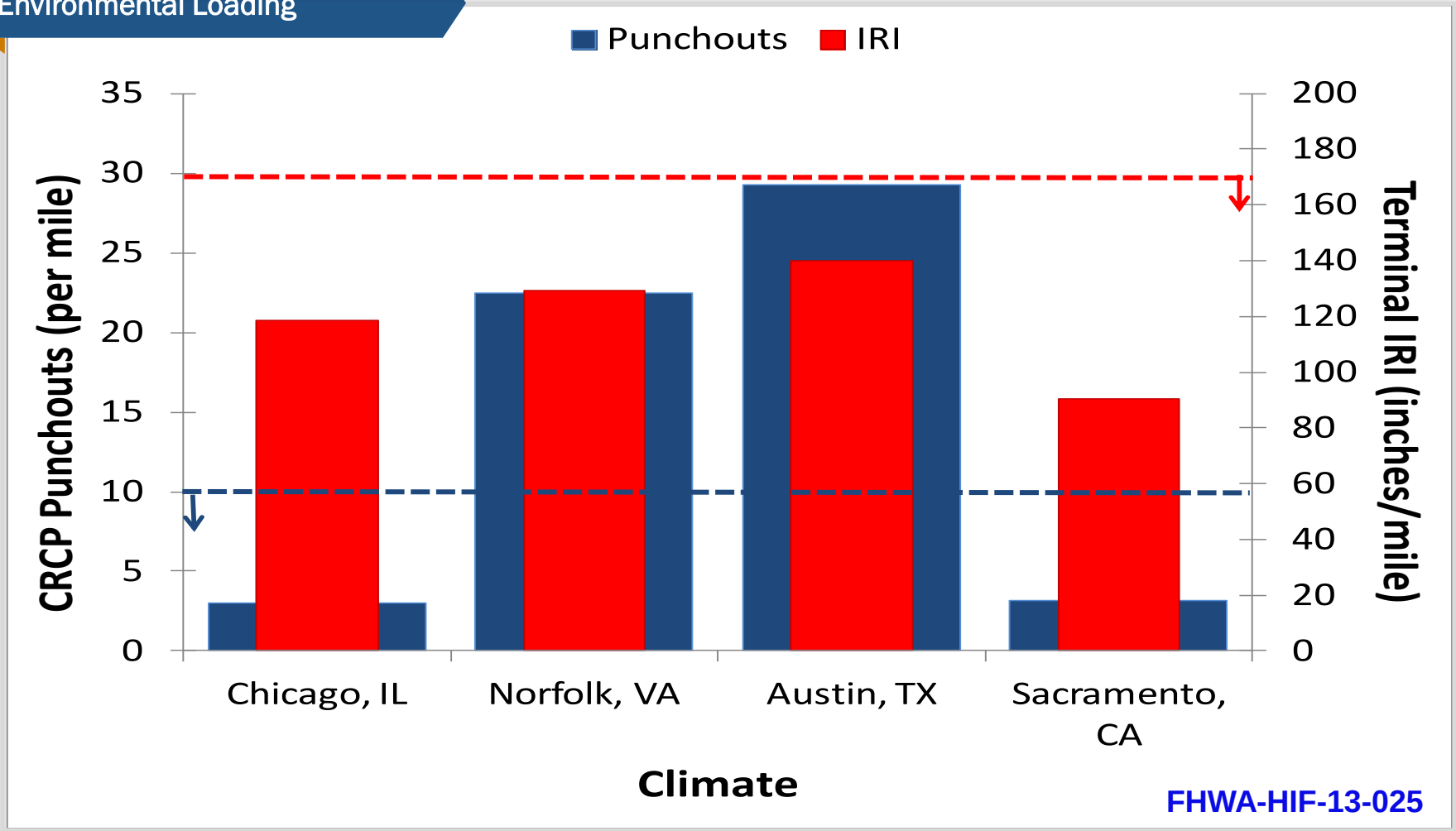


Load Transfer v. Crack Spacing



National MEPDG Results

Environmental Loading



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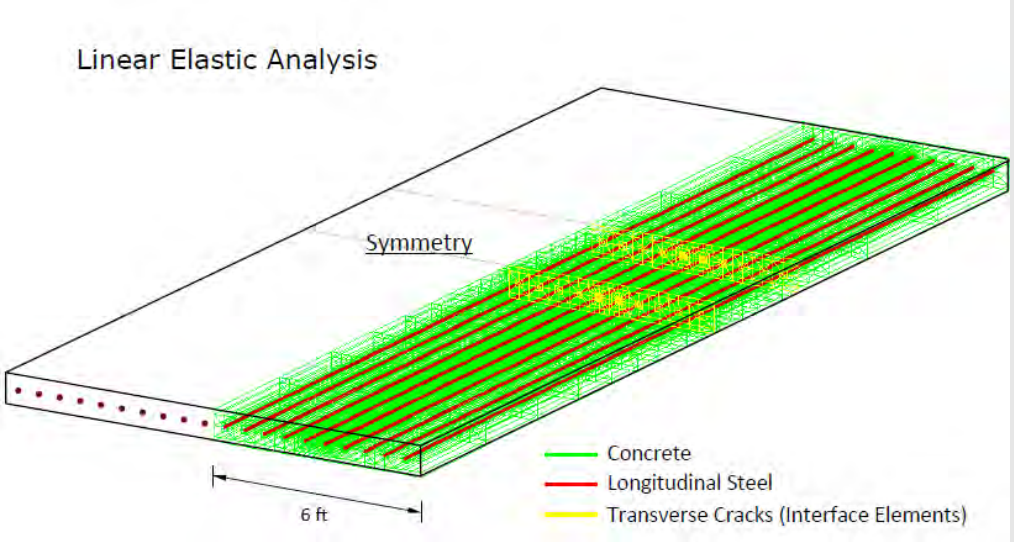
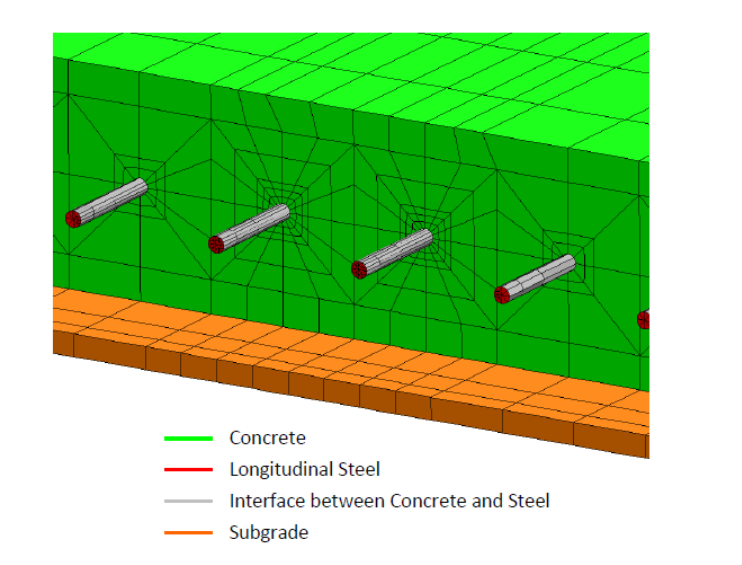
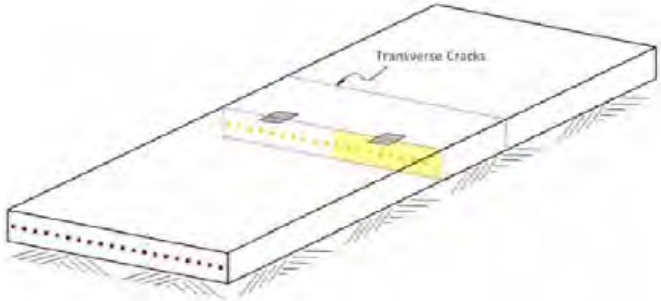
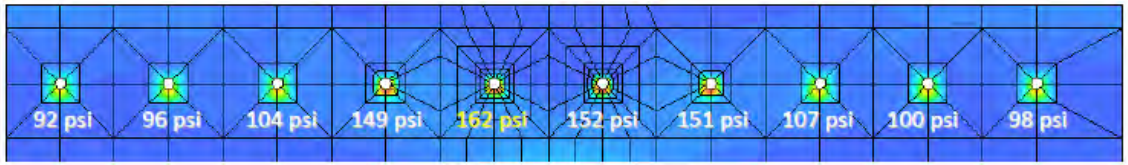
TxCRCP-ME

TXCRCP-ME





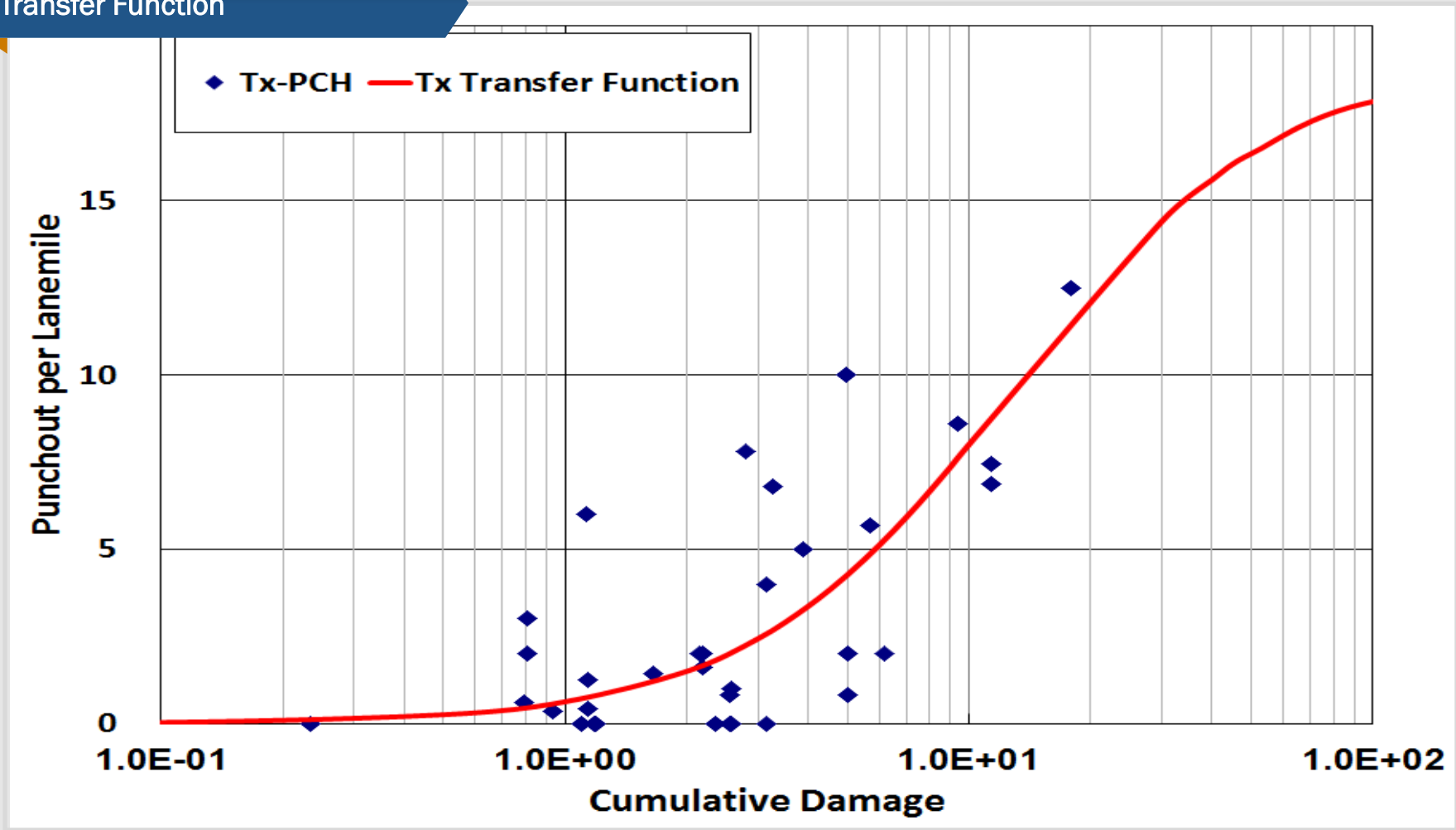




- Large stress occurs around longitudinal steel.

TXCRCP-ME

Transfer Function



TXCRCP-ME

TxCRCP-ME v0 6 1-10-2014.xlsm - Microsoft Excel

CRCP DESIGN PROGRAM BASED ON MECHANISTIC-EMPIRICAL PRINCIPLES

Developed under TxDOT Research Project 0-5832

To run the program, follow the steps below.

1. Click "Formulas" and "Calculation Options" and select "Manual."
2. Provide input values.
3. Press "Ctrl" + "k."

A. Project Identification

District	HOU
County	Harris
Highway	IH-10
CSJ	253-02-012
Direction	EB
Station (Begin)	142+50.00
Station (End)	352+00.00

B. Design Parameters

Design Life (year)	30
Number of Punchouts per Mile	10

C. Design Traffic

Design ESAL per Lane	50,000,000

D. Concrete Layer Information

Thickness of Concrete Layer (in.)	10
Concrete Setting Temperature (F)	90
28-Day Modulus of Rupture (psi)	620

E. Base Layer Information

Base Type	ASB
Base Thickness (in.)	5
Modulus of Base Layer (ksi)	200

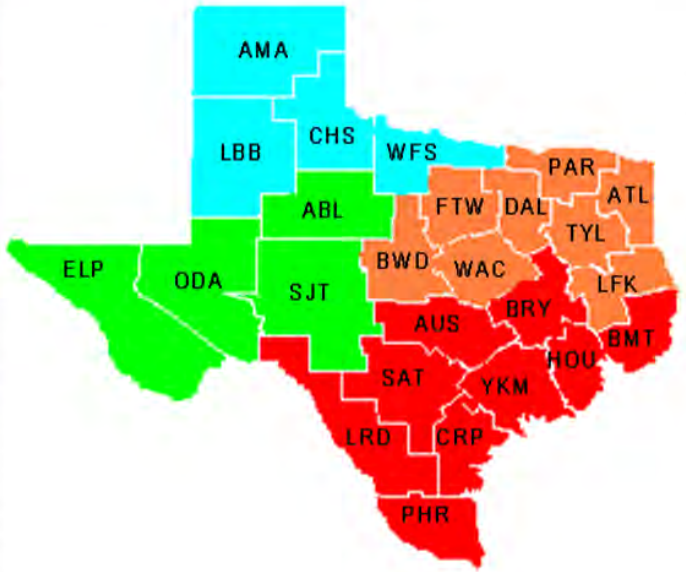
F. Subgrade Layer Information or K-Value

Soil Classification of Subgrade	GW
Subgrade K-Value (psi/in.)	150

G. Support Condition

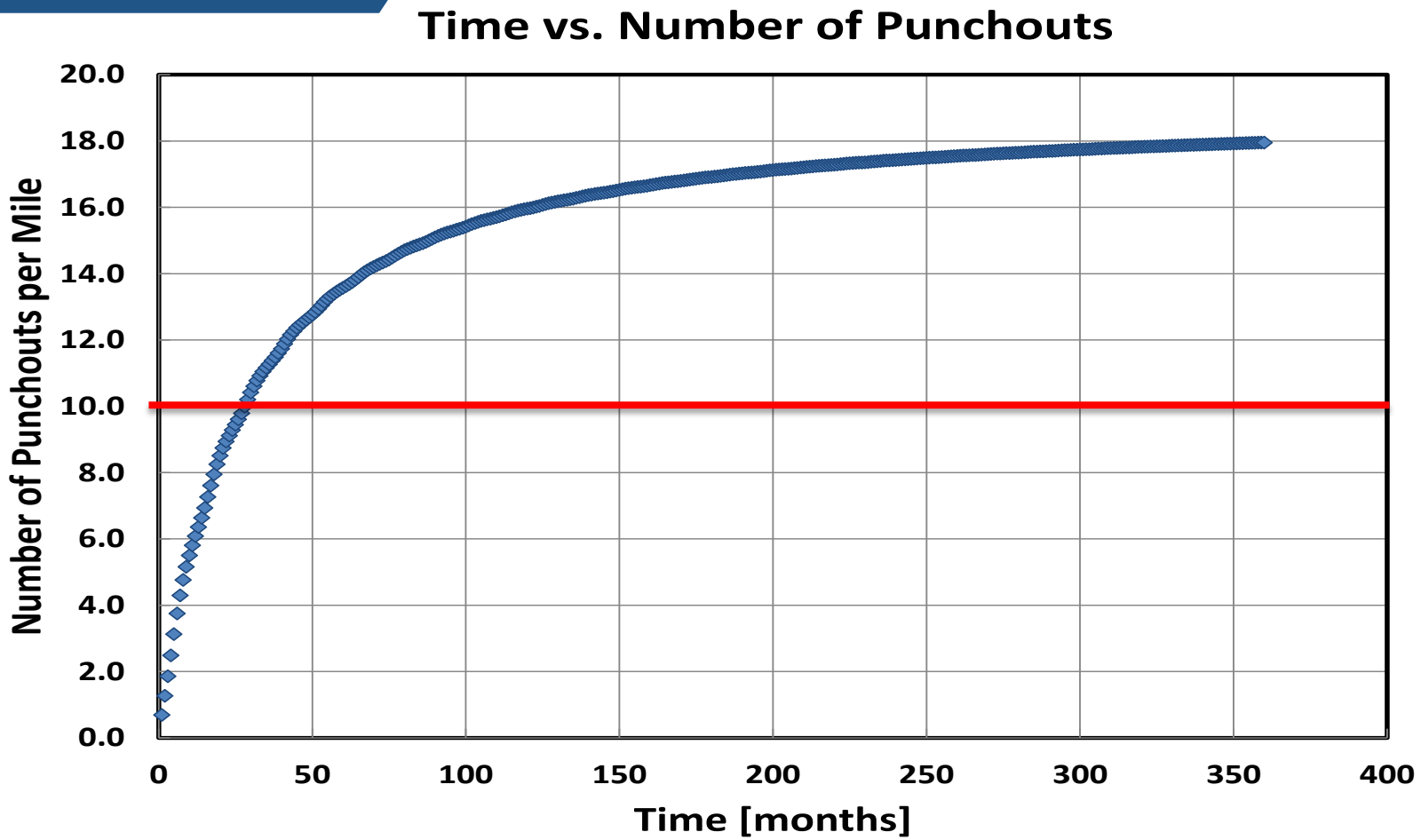
Composite k (psi/in.)	300

Required Input
Optional Input
Derived Value



Input | Temperature | k-Table | Composite k | S-Table | Stress | Final Result | Analysis Result | Time vs. Punchout

Time vs. Punchouts



Implementation Plan

- Finalizing program and performing sensitivity analyses
- Begin revising Pavement Design Guide to incorporate TXCRCP-ME for designing CRCP
- Hold Regional Training Seminars this Summer
- Hope to start using new program with projects that are incorporating new 2014 specifications

QUESTIONS?