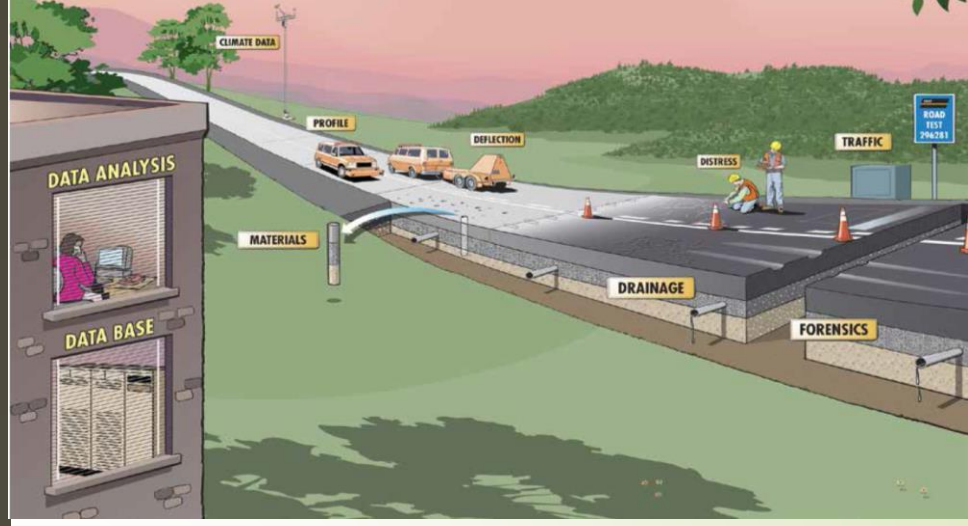
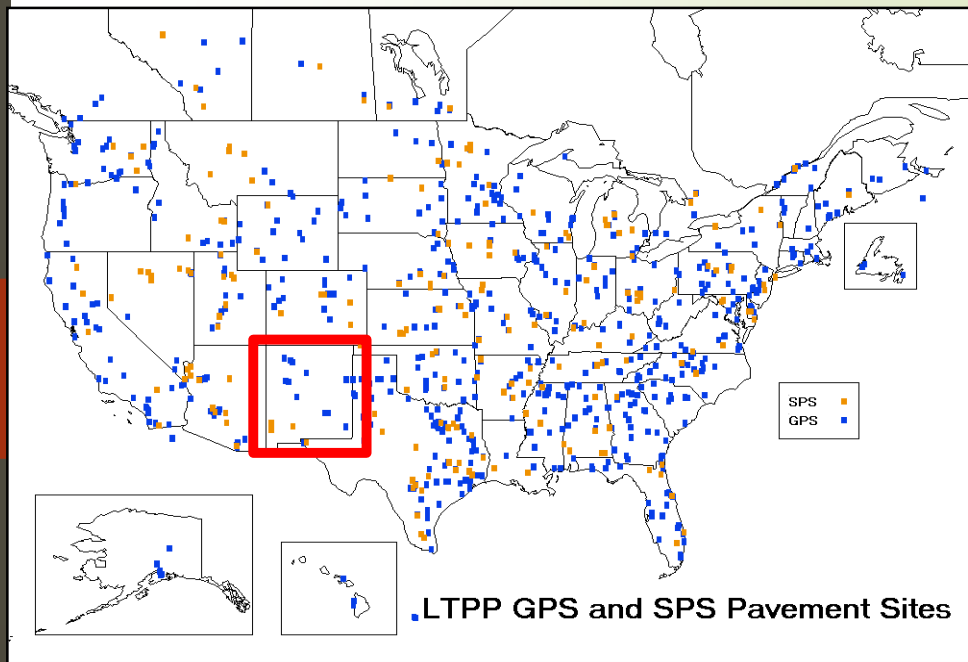
Arizona's Concrete Pavement Research Project (SPS-2)

But First, What Is LTPP?

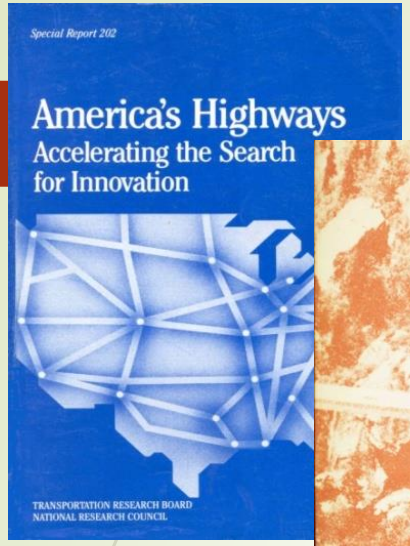


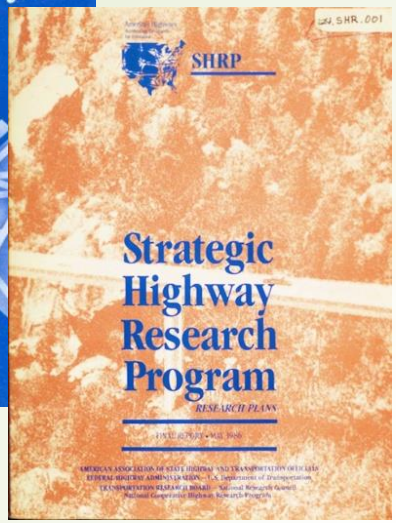
Long Term Pavement Performance (LTPP)

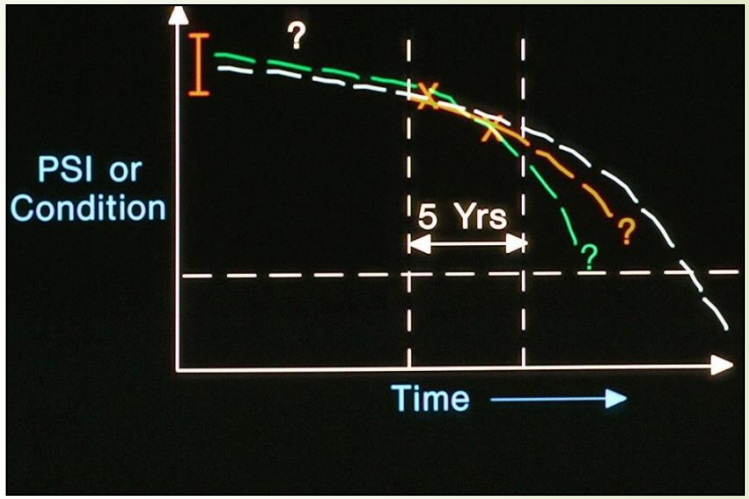


LTPP GPS and SPS Pavement Sites

LTPP's GOAL is…







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

But First, What Is SPS-2?

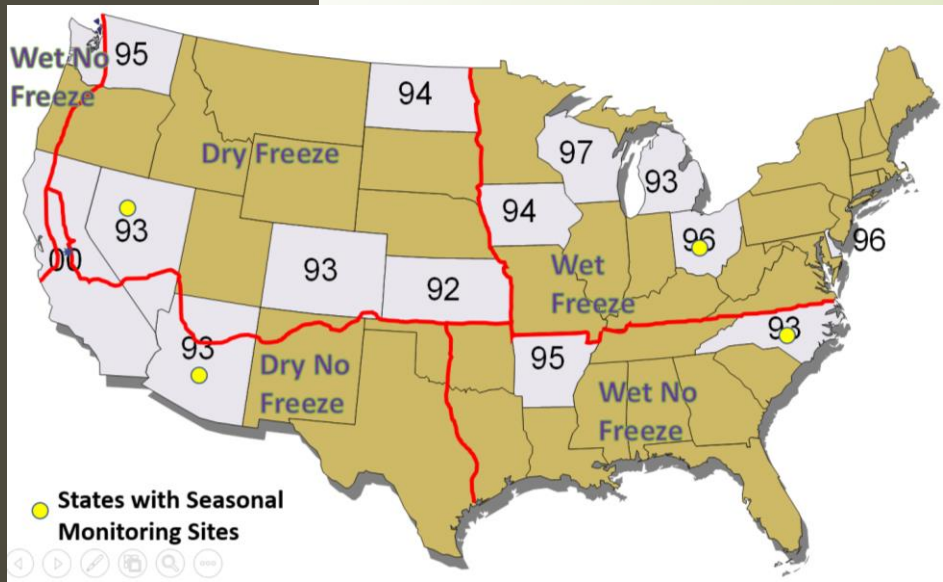
Largest on Going Concrete Pavement Research Project in the World

Strategic Study of Structural Factors for Rigid Pavements

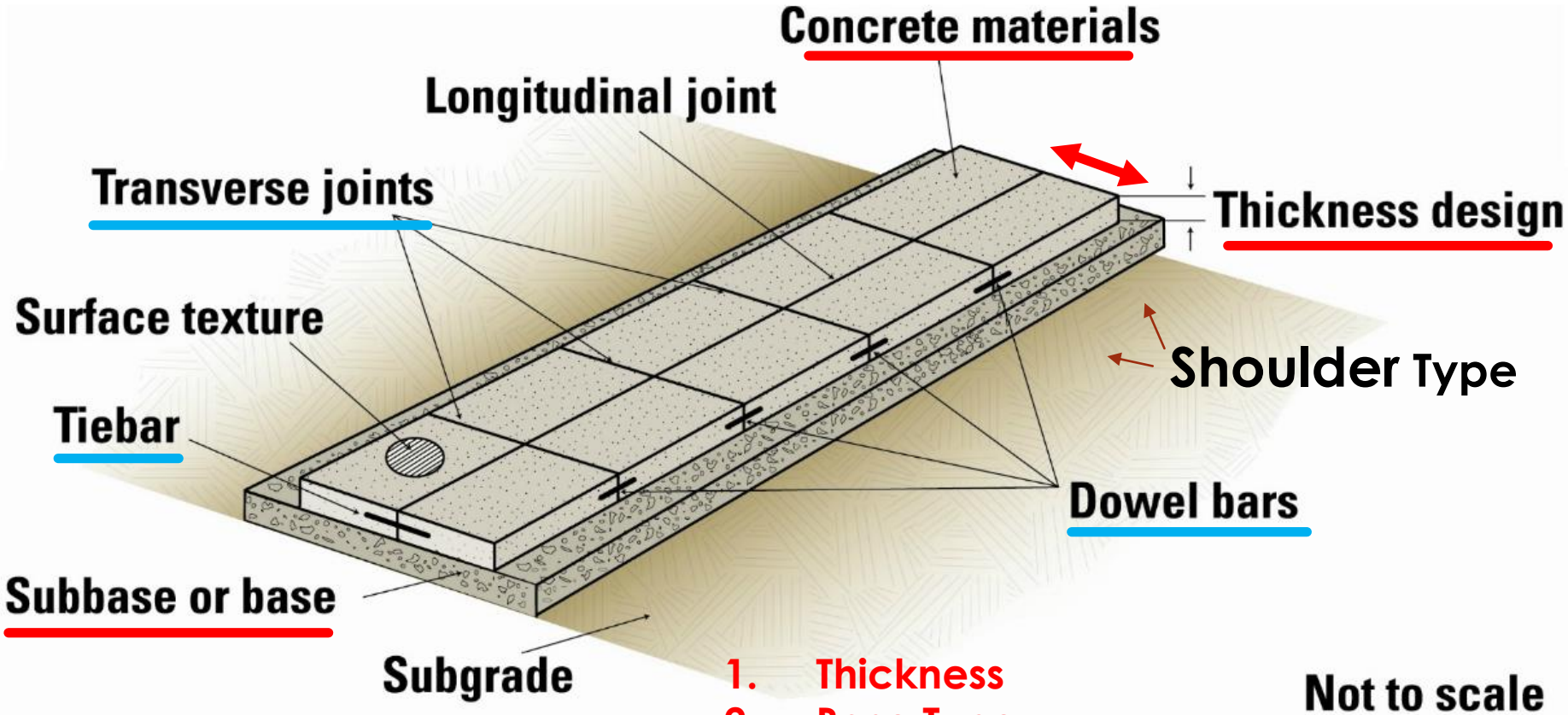
1. Thickness
2. Base Type
3. Concrete Strength
4. Lane Width
5. Drainage

How Was SPS-2 Deployed

- Statistical Design Called for 12 test sections to be constructed in each of 16 states (14 States)
- Statistical Design Called for 192 test sections to be built (168 Constructed)
- Statistical Design called for SPS-2 Core Experiment (12 TS) to have Four States in Each of Four Climate Zones (?)



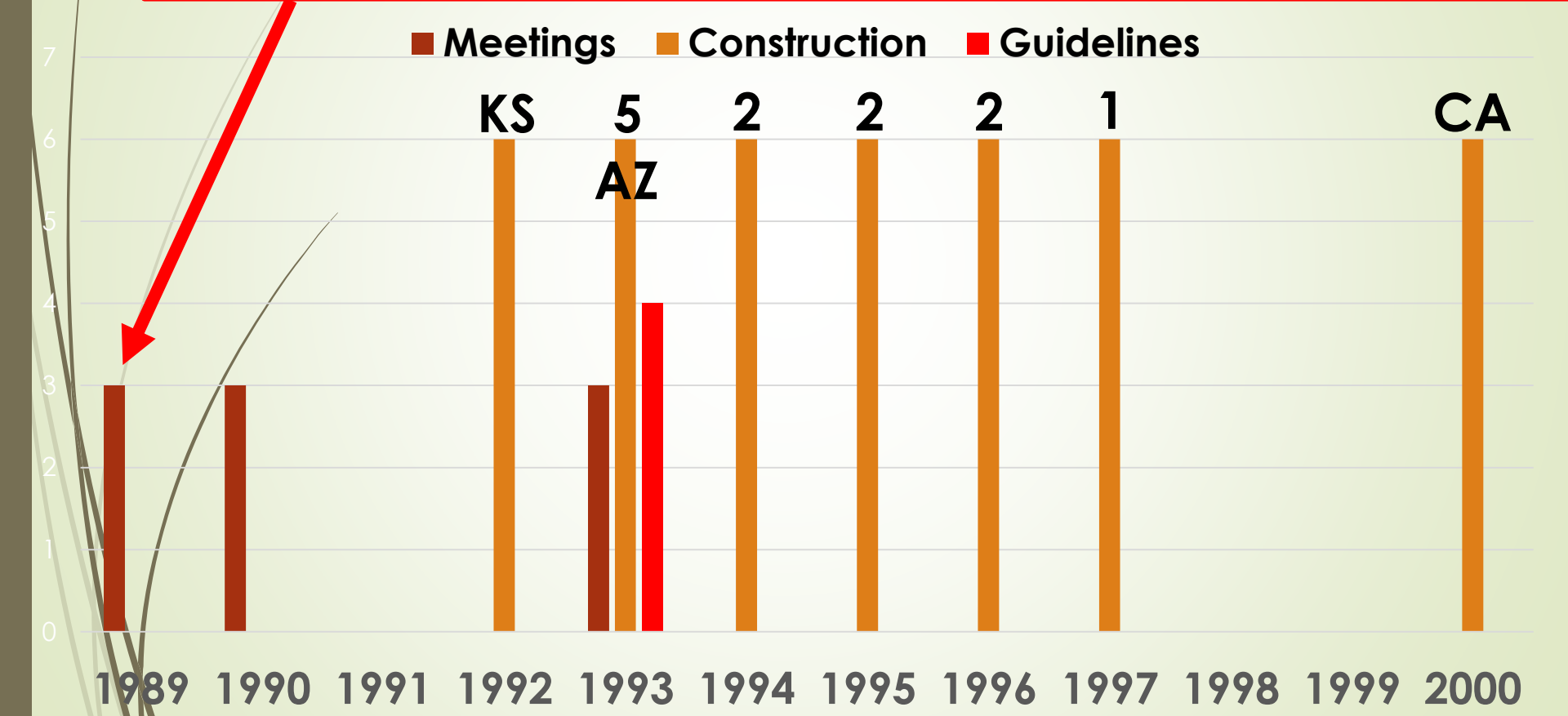
PCCP Design Elements



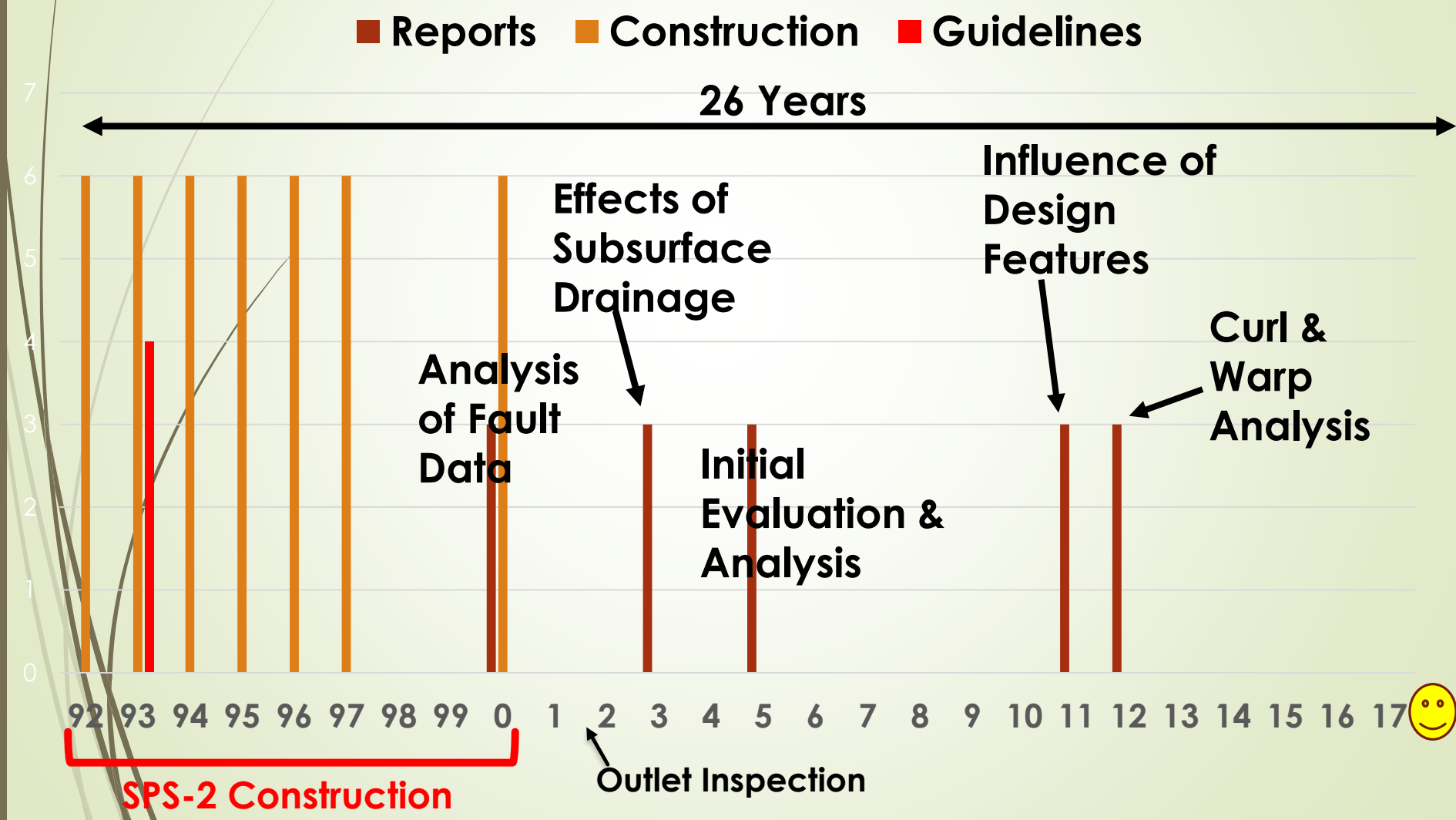
1. Thickness
2. Base Type
3. Concrete Strength
4. Lane Width
5. Drainage

Time Line of SPS-2 Experiment

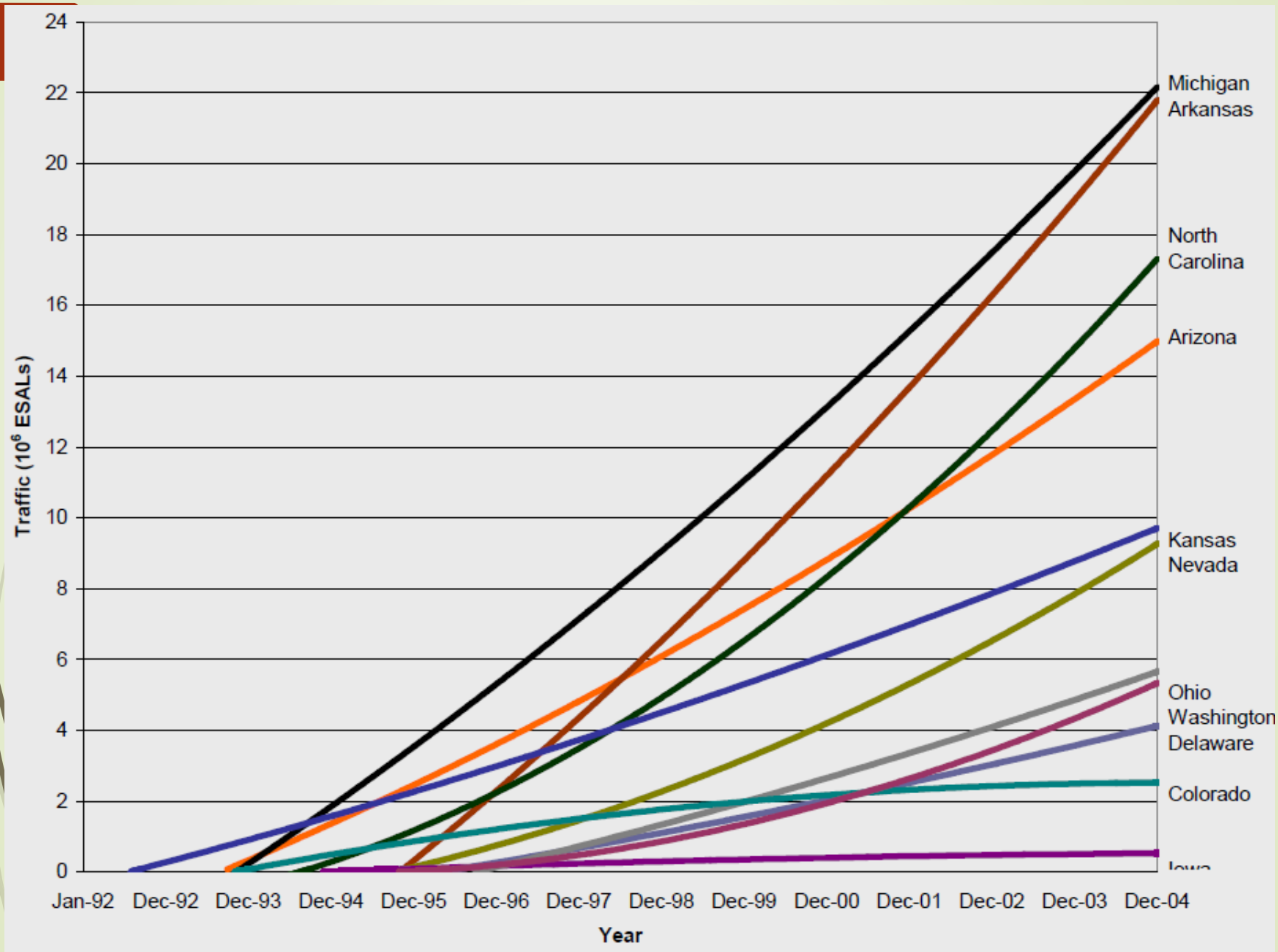
It is anticipated that only a few SPS-2 projects will be built during the 1990 construction season. The remaining test sites will be selected from the identified candidates scheduled for construction in 1991, or even 1992 if necessary



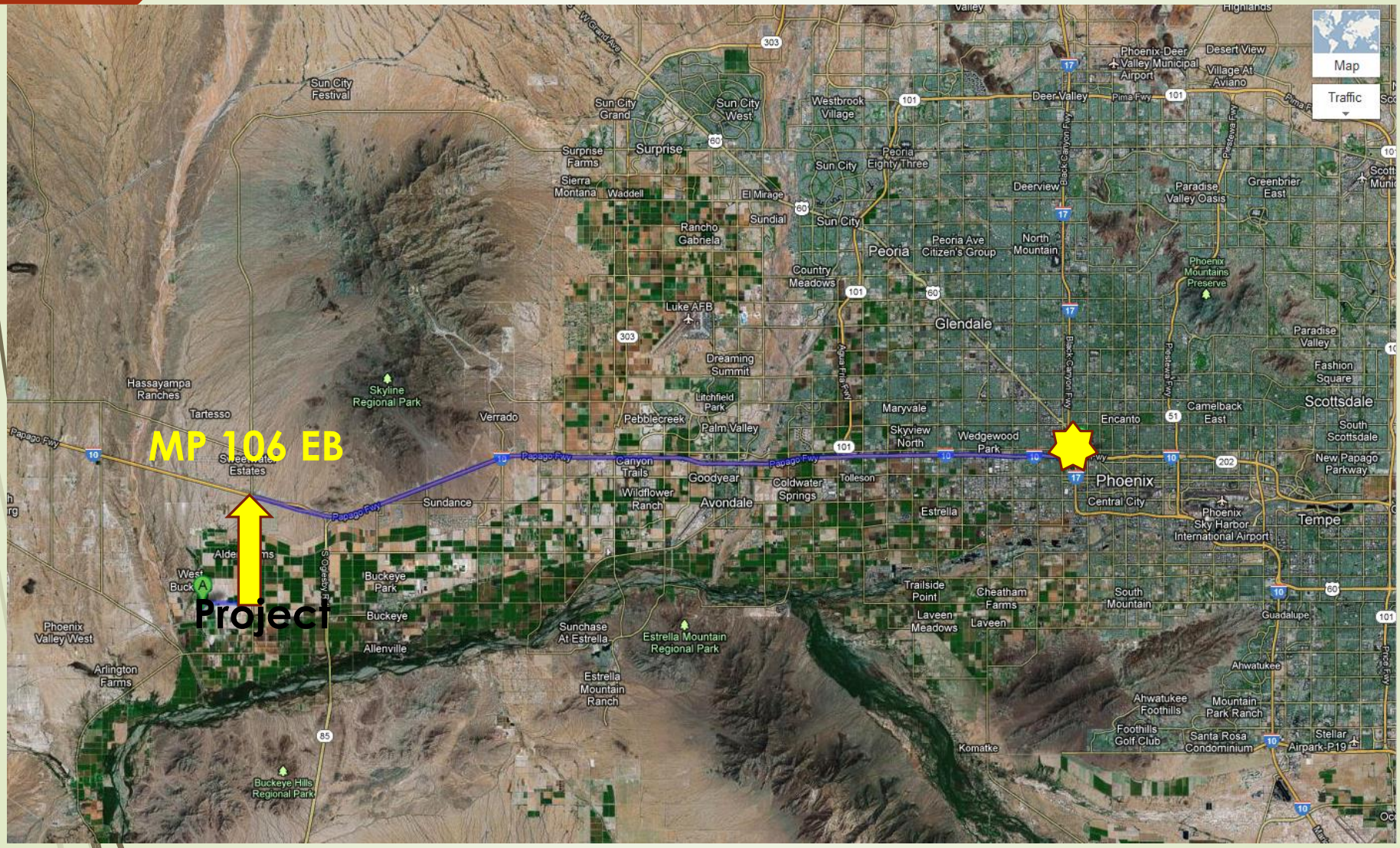
Time Line of SPS-2 Experiment



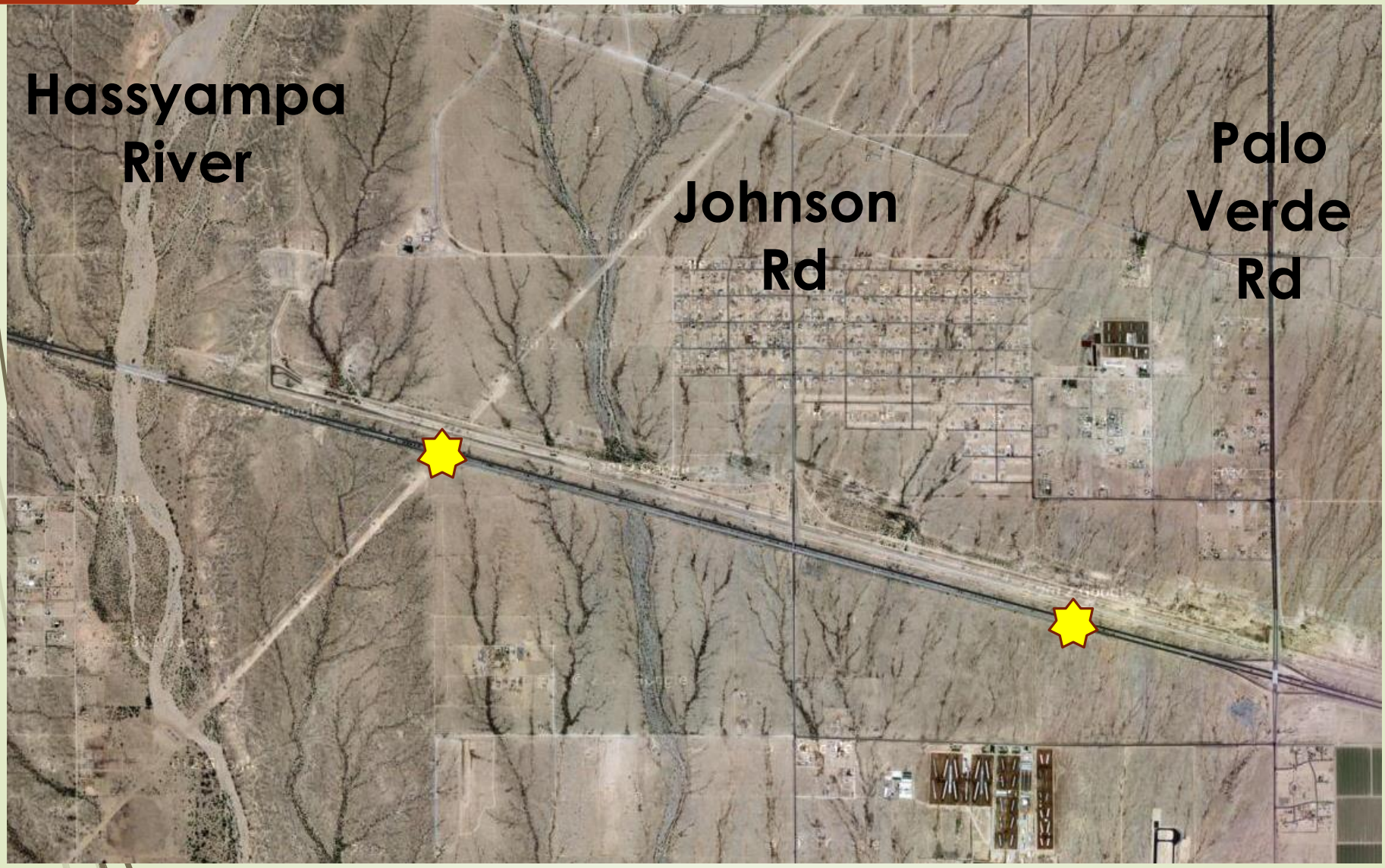
Traffic Levels on SPS-2 Experiments



The Arizona Concrete Pavement Experiment (SPS-2)



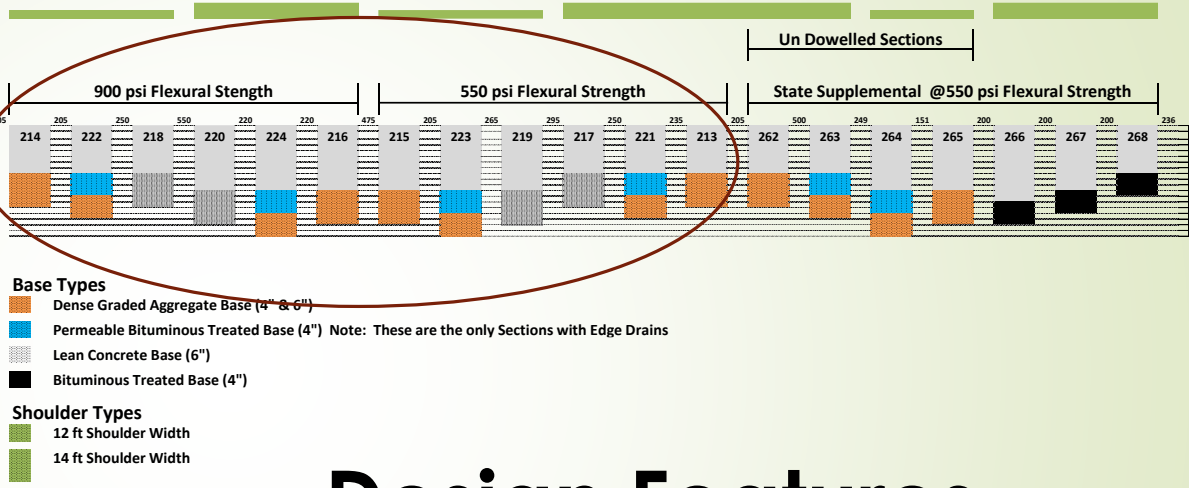
Google Earth Image of Test Sections



Approaching from the West End

Test Section Layout

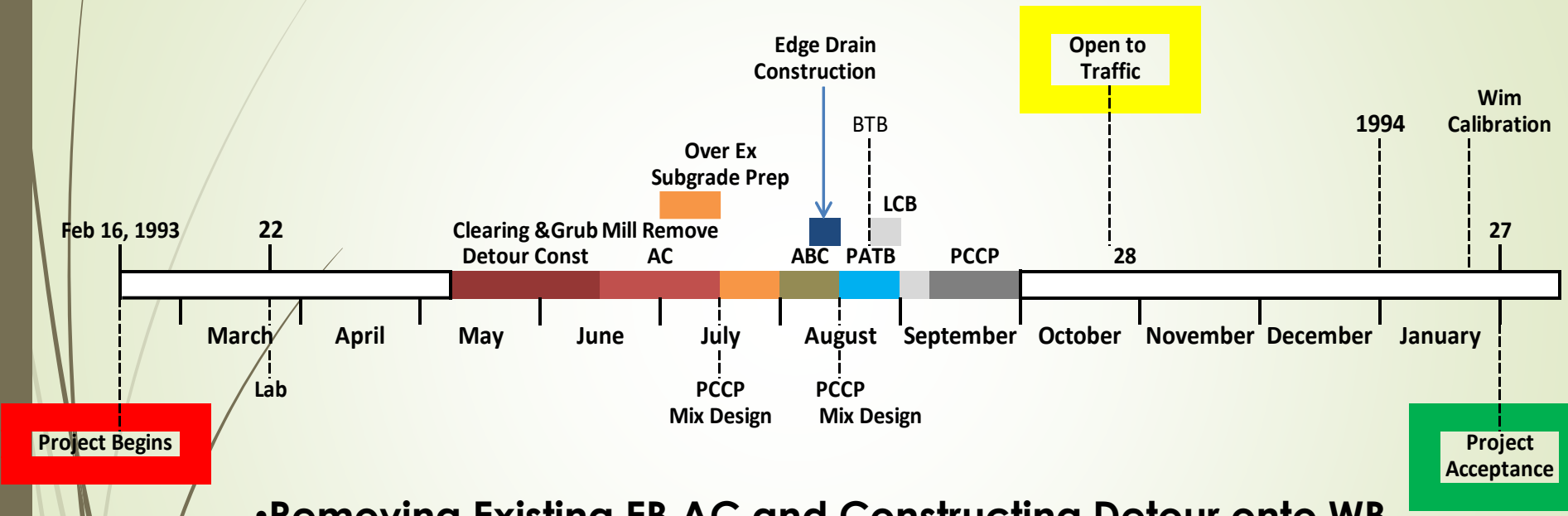
19 PCCP Test Sections



Design Features:

- PCCP Thickness- (2)
- Base Type- (3)
- Concrete Strength- (2)
- Lane Width- (2)
- Drained or Undrained

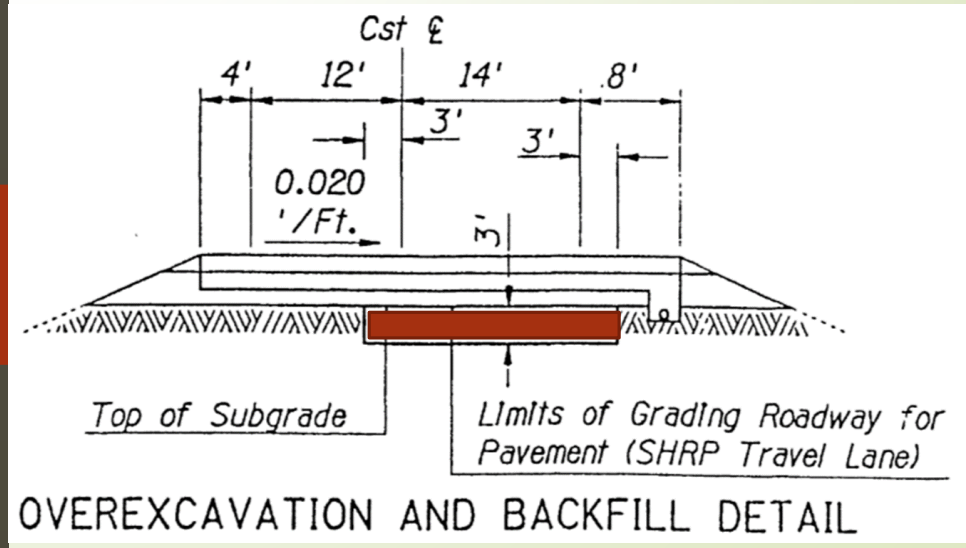
Arizona Project Construction Timeline (6 - 9 months)



- Removing Existing EB AC and Constructing Detour onto WB
- Over Excavating Existing Subgrade 1 ft and Recompacting
- Constructing Edge Drains
- Constructing Aggregate Base, Lean Concrete Base, and Permeable Base
- Constructing 8", 11" and 12.5" Thick PCCP
- Constructing 550 and 900 psi Flexural Strength PCCP
- Constructed Doweled and Undoweled PCCP

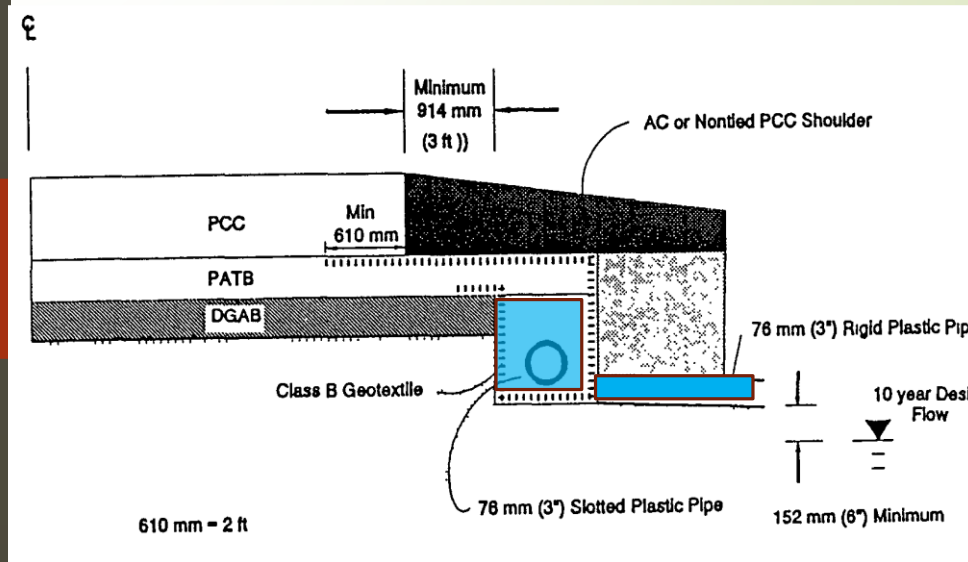
Subgrade Construction

Subgrade Preparation



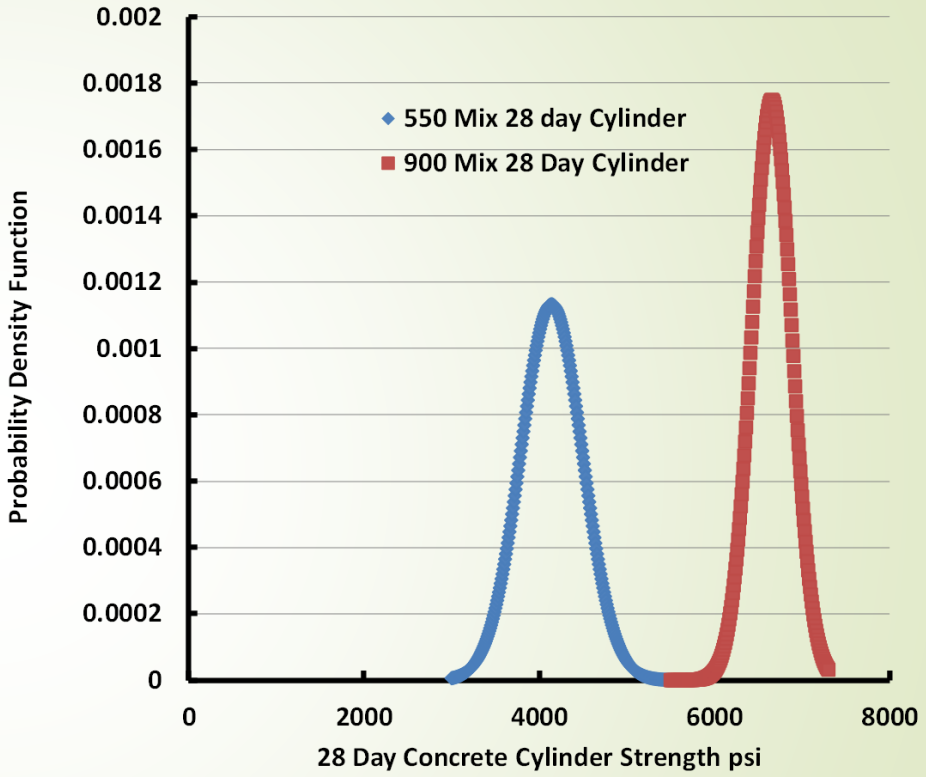
OVEREXCAVATION AND BACKFILL DETAIL

Drained and Undrained



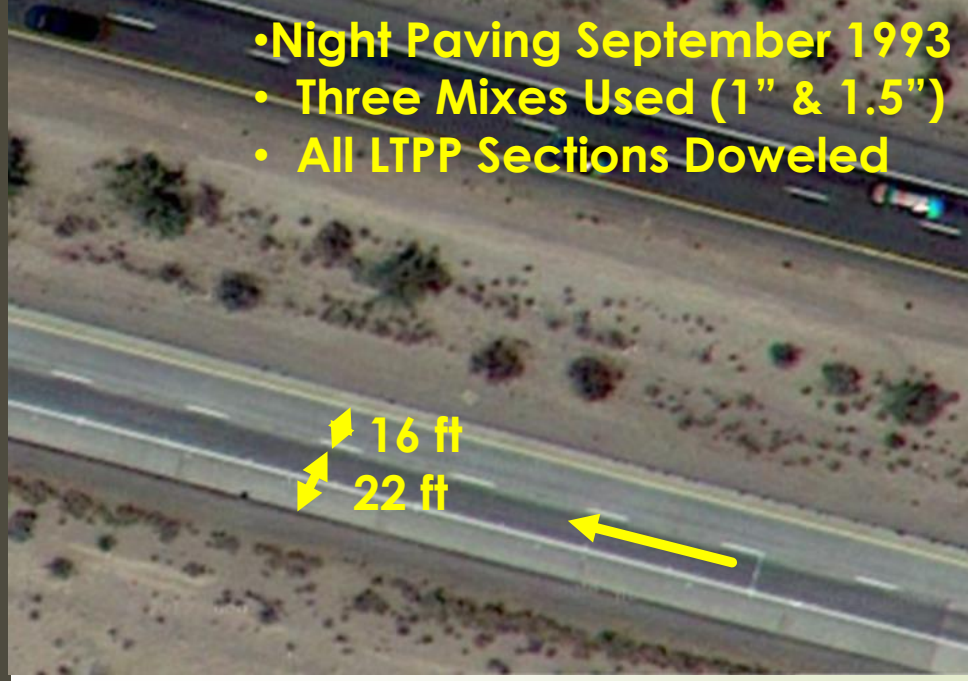
Base Construction

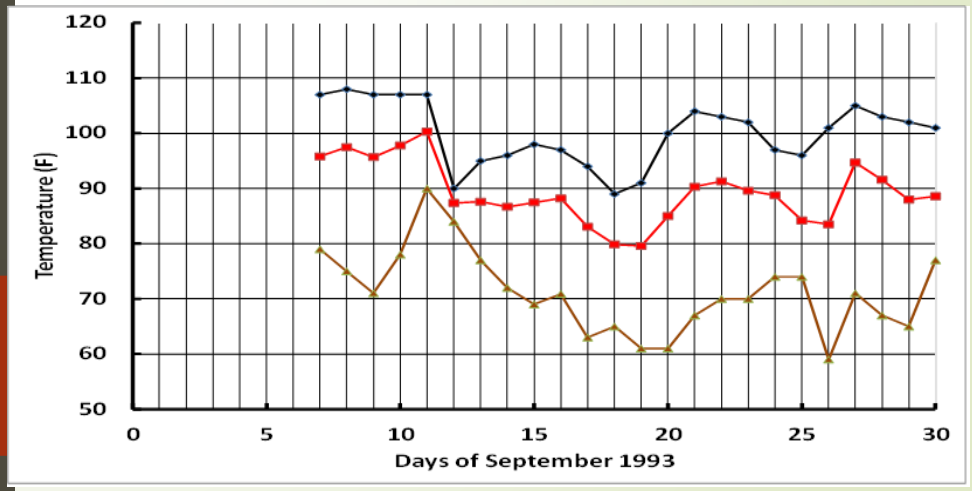
Concrete Strength



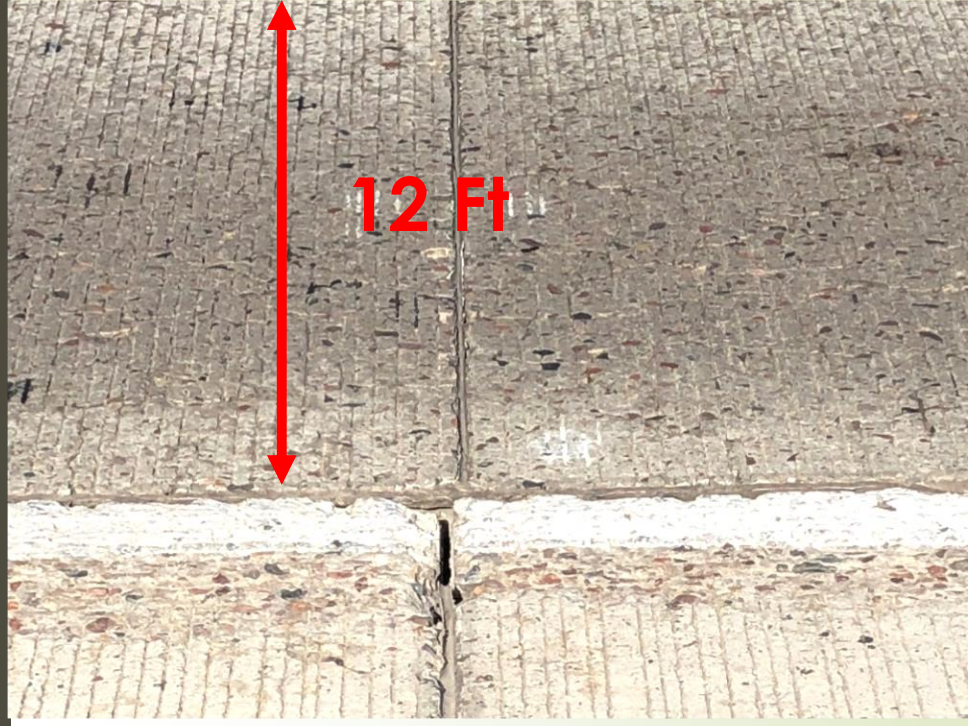
PCCP Thickness

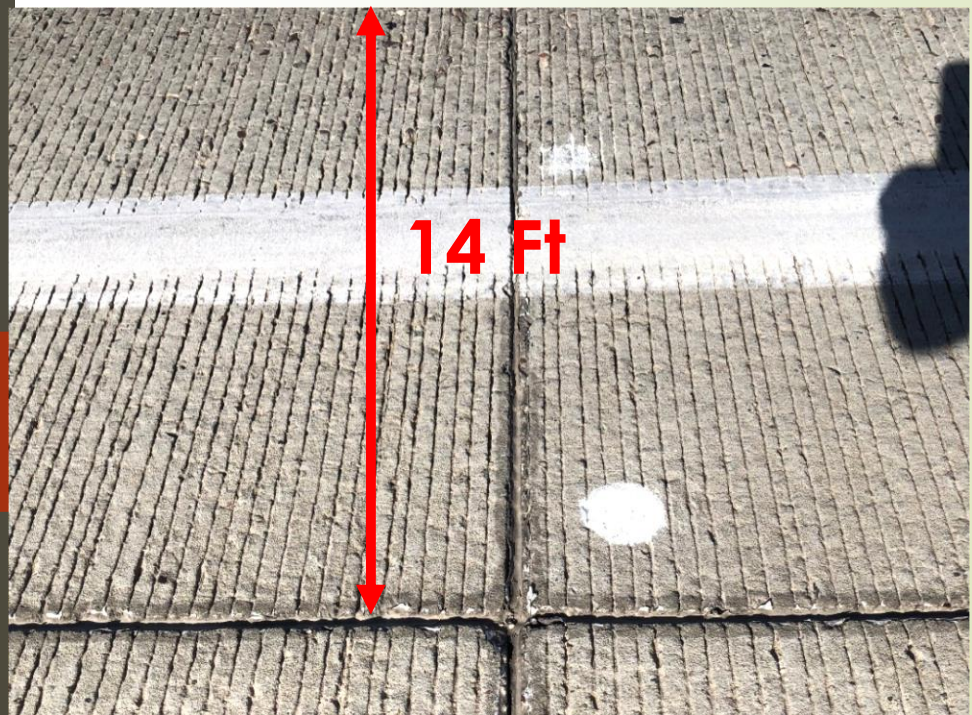
8” & 11”





Lane Width

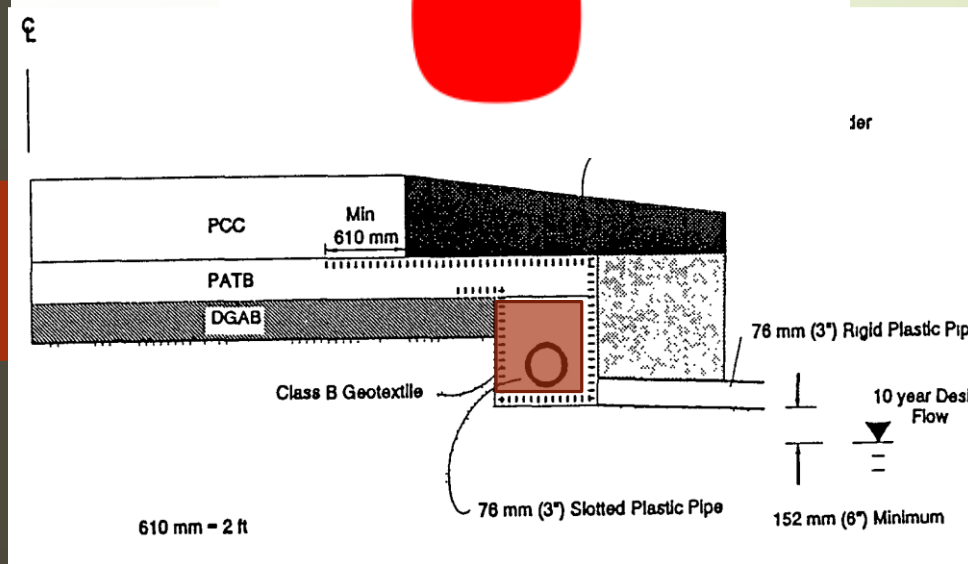





So What Have We Learned After 25 Years

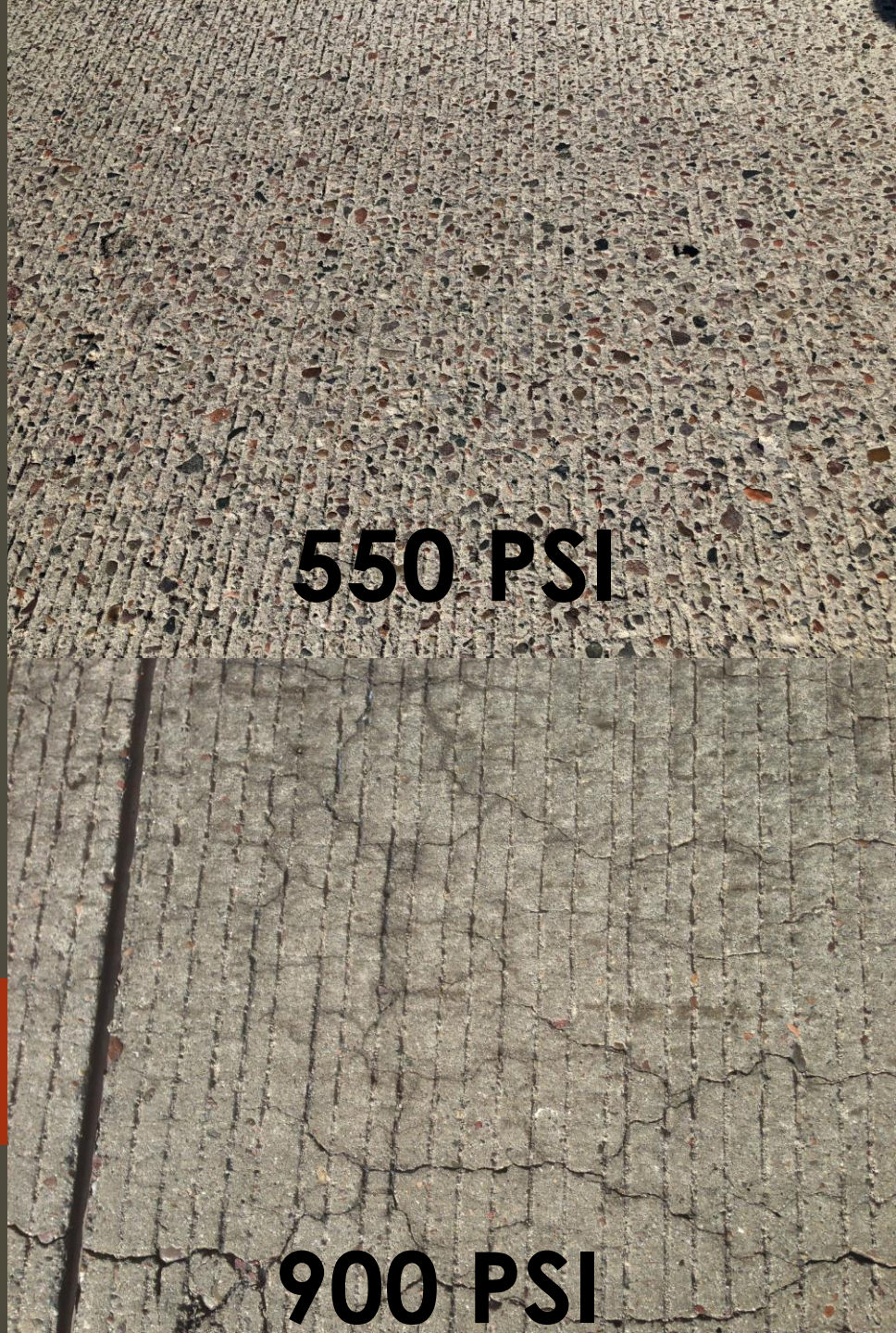
Subgrade Construction

Drained and Undrained



Base Type

Concrete Strength



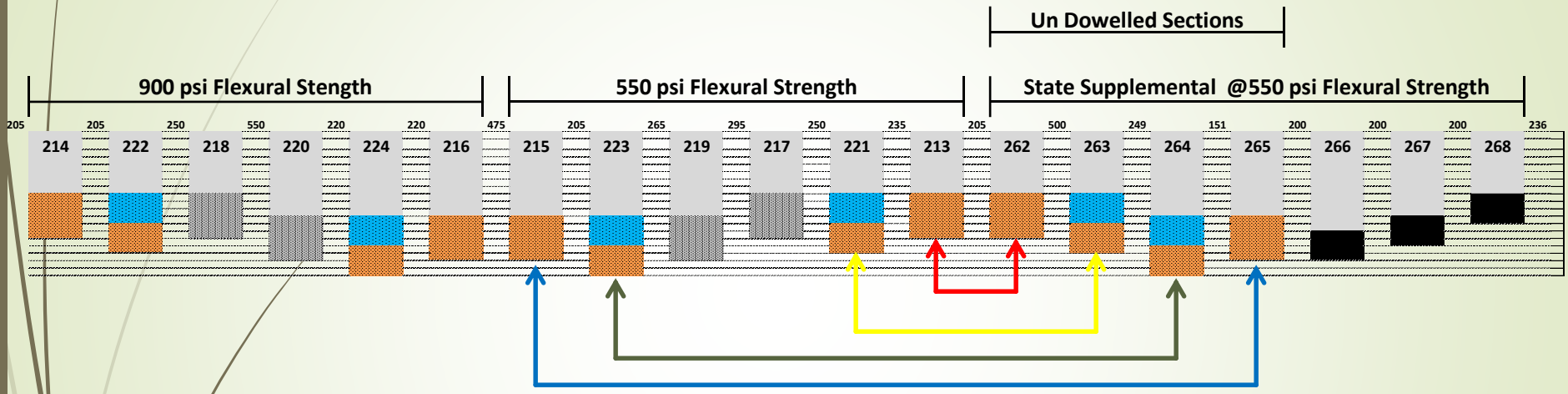
Lane Width

PCCP Thickness

8” & 11”

Thicker is Better

Comparison of Doweled to Undoweled



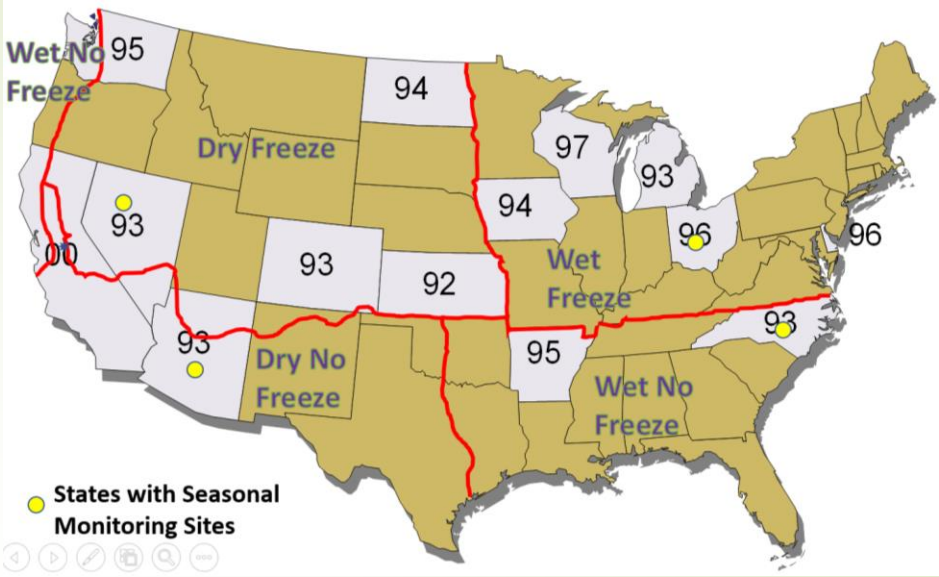
SPS-2 Core Experiment 12 TS

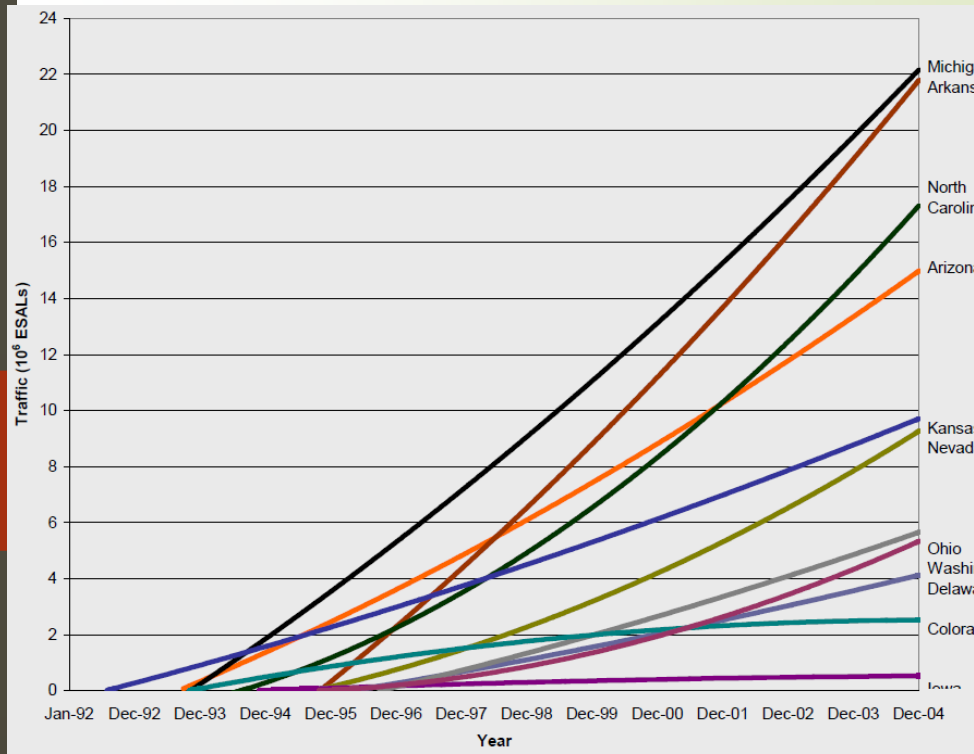
SPS-2A JPCP 6 TS

SPS-2B JRCP 12 TS

State Supplemental Sections

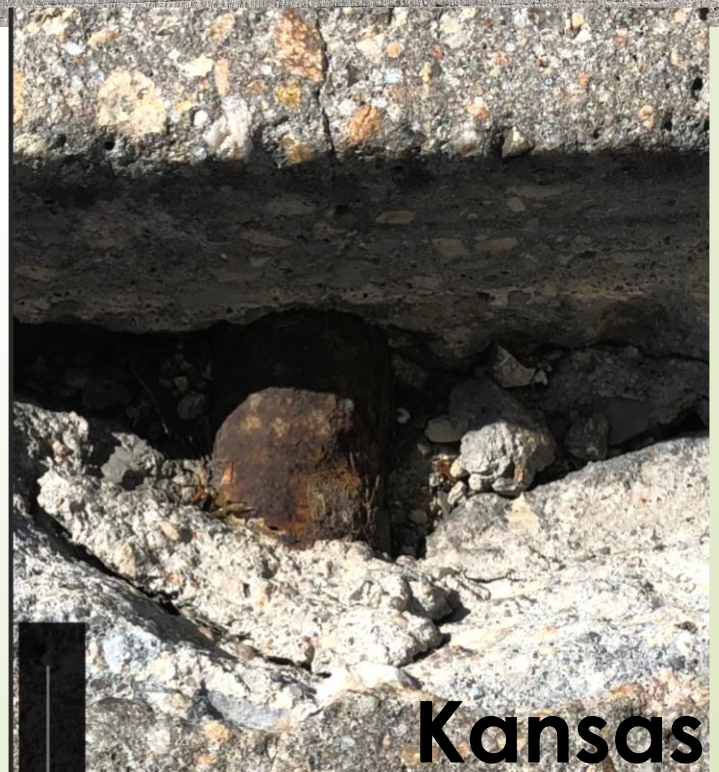
What About the Other SPS-2?





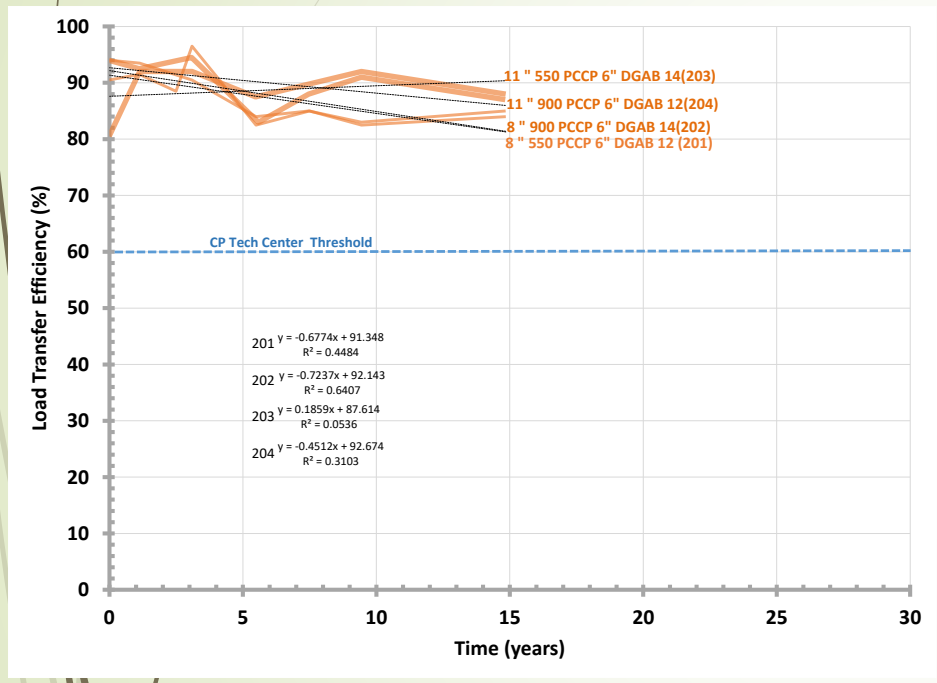
Cracking Over Dowels

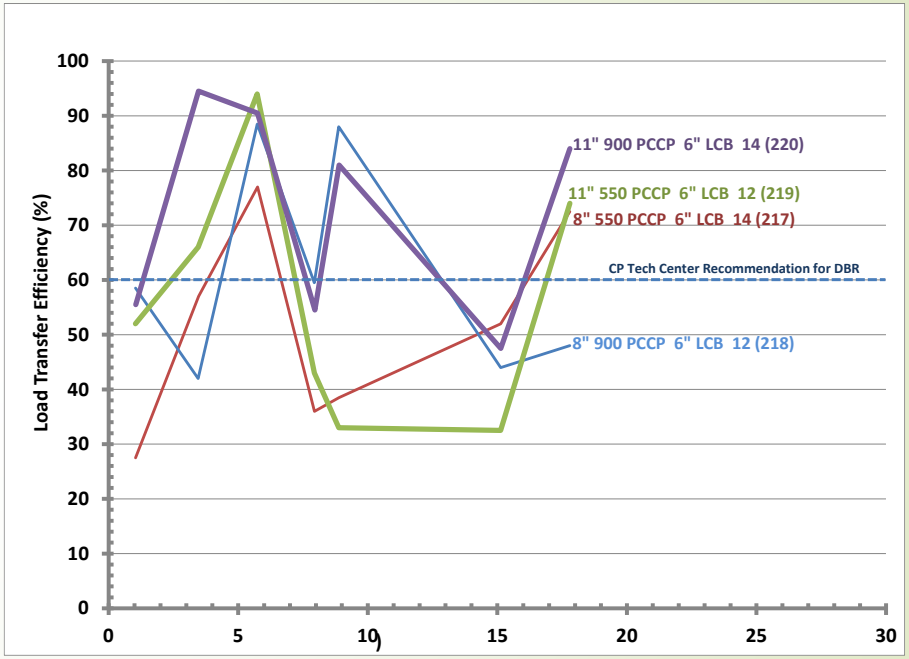
8” PCCP



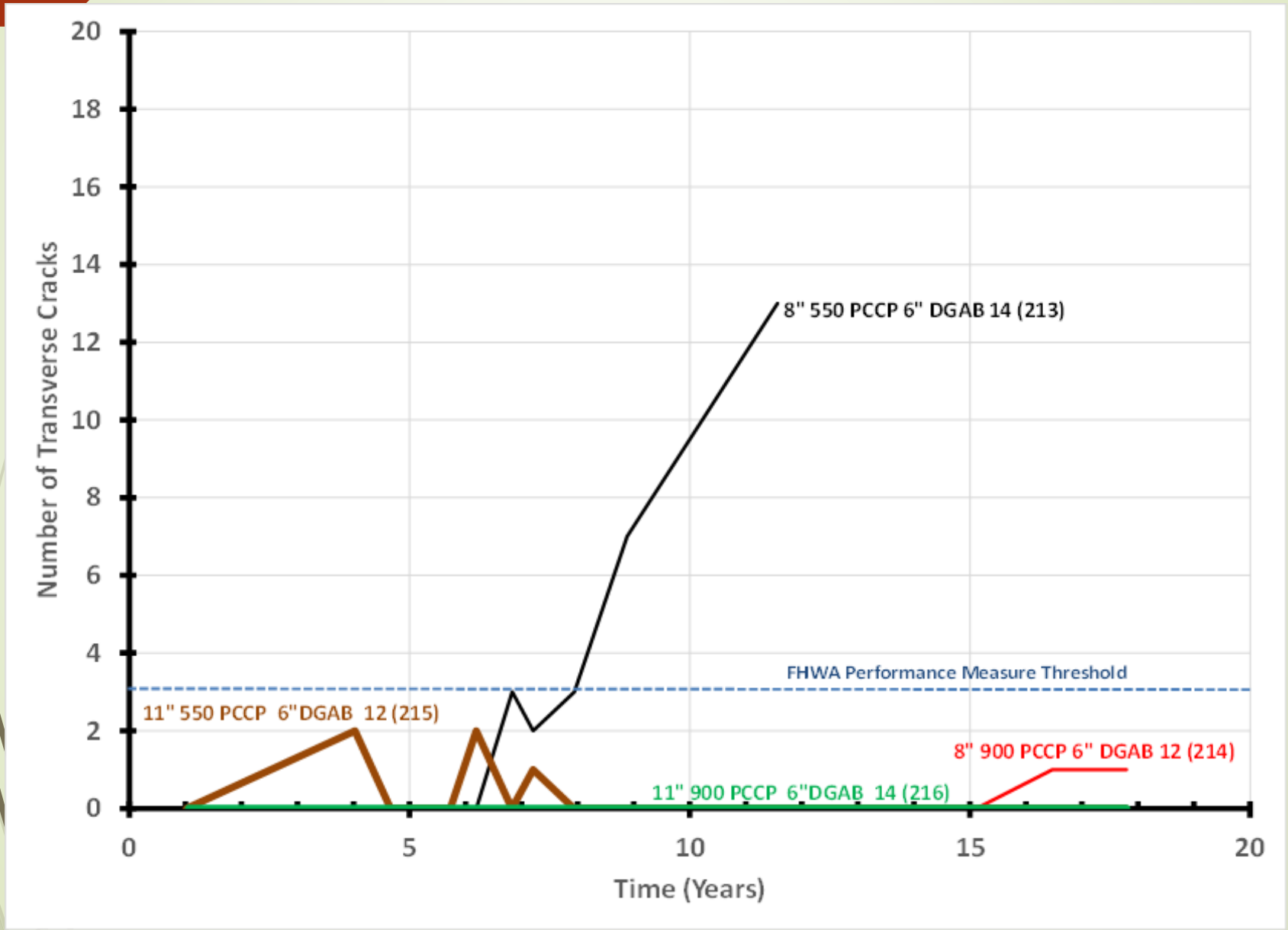
Shoulder Type

Issues with LTE as Performance Measure





Transverse Crack Count as Performance Measure



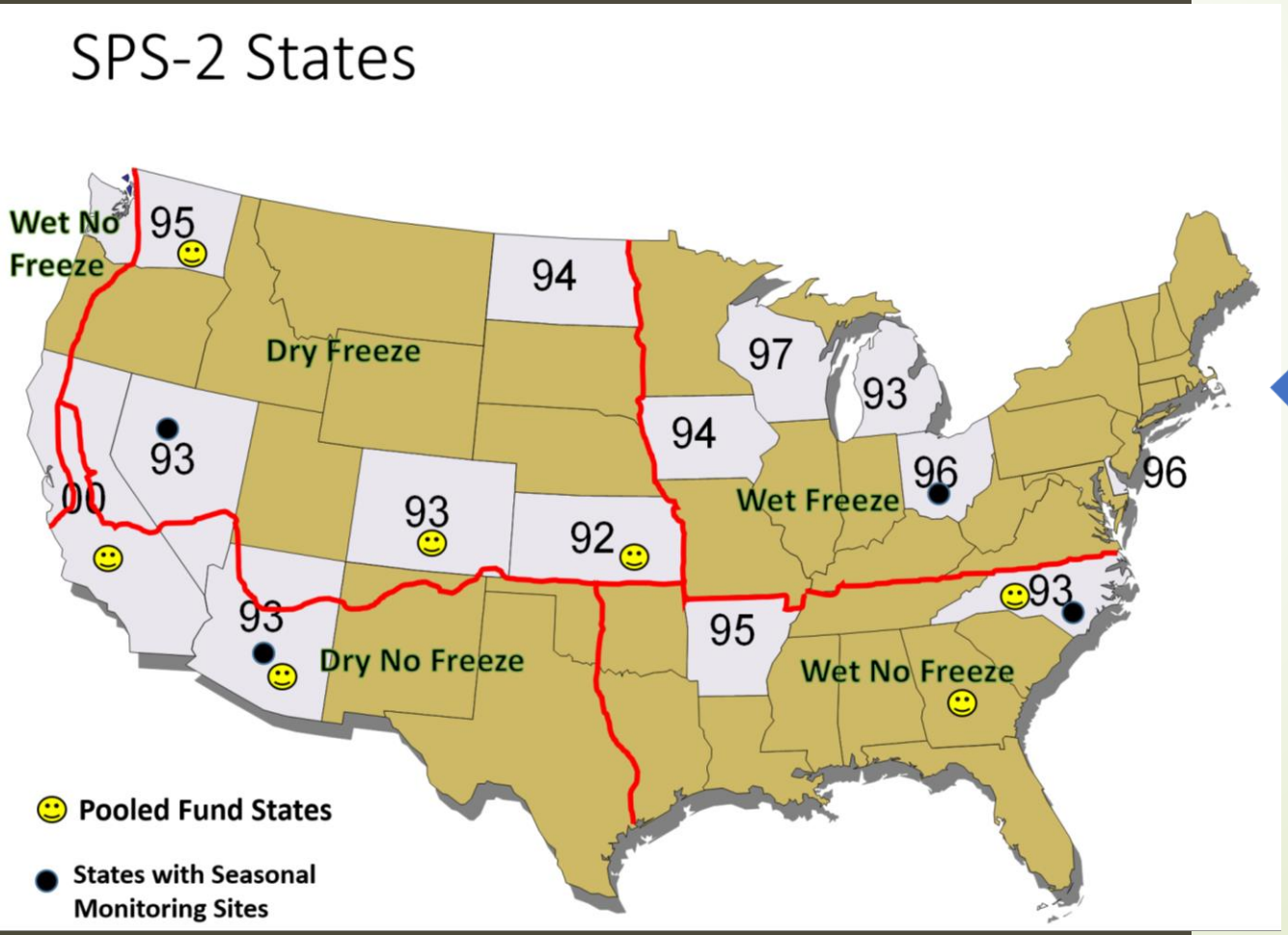
Conclusions (My Opinions)

- PATB Performed Best for Initial Smoothness and Rate of Progression of Roughness
- LCB performed worst with transverse cracking and most influence of Widened Shoulder
- 550 psi Mix Out Performed 900 psi
- Widened Traffic Lanes Create a Higher Potential for Longitudinal Cracking

SPS-2 Pooled Fund Reports

- NCE Report:
  - SPS-2 PAVEMENT PRESERVATION EXPERIMENT COMPARISON OF PAVEMENTME AND ACTUAL PERFORMANCE

SPS-2 Pooled Fund Reports



Arizona SPS-2 Tech Day

Questions?

Thank You!

IGGA
International Grooving & Grinding Association
Your Pavement Preservation Resource since 1972

The End!