# ASSOCIATION of MODIFIED ASPHALT PRODUCERS
# 8th ANNUAL MEETING

**Feb. 12th to Feb. 14th 2007**

**Fairmont Copley Plaza Hotel**

**BOSTON, MA.**

# Pennsylvania's Experience with

# MODIFIED ASPHALTS

# Pre – Superpave to Now

# RESEARCH PROJECT # 87-50C

# POLYMER MODIFIED ASPHALTS

# Transportation Research Record #1661 (1999)

# WHY the RESEARCH?

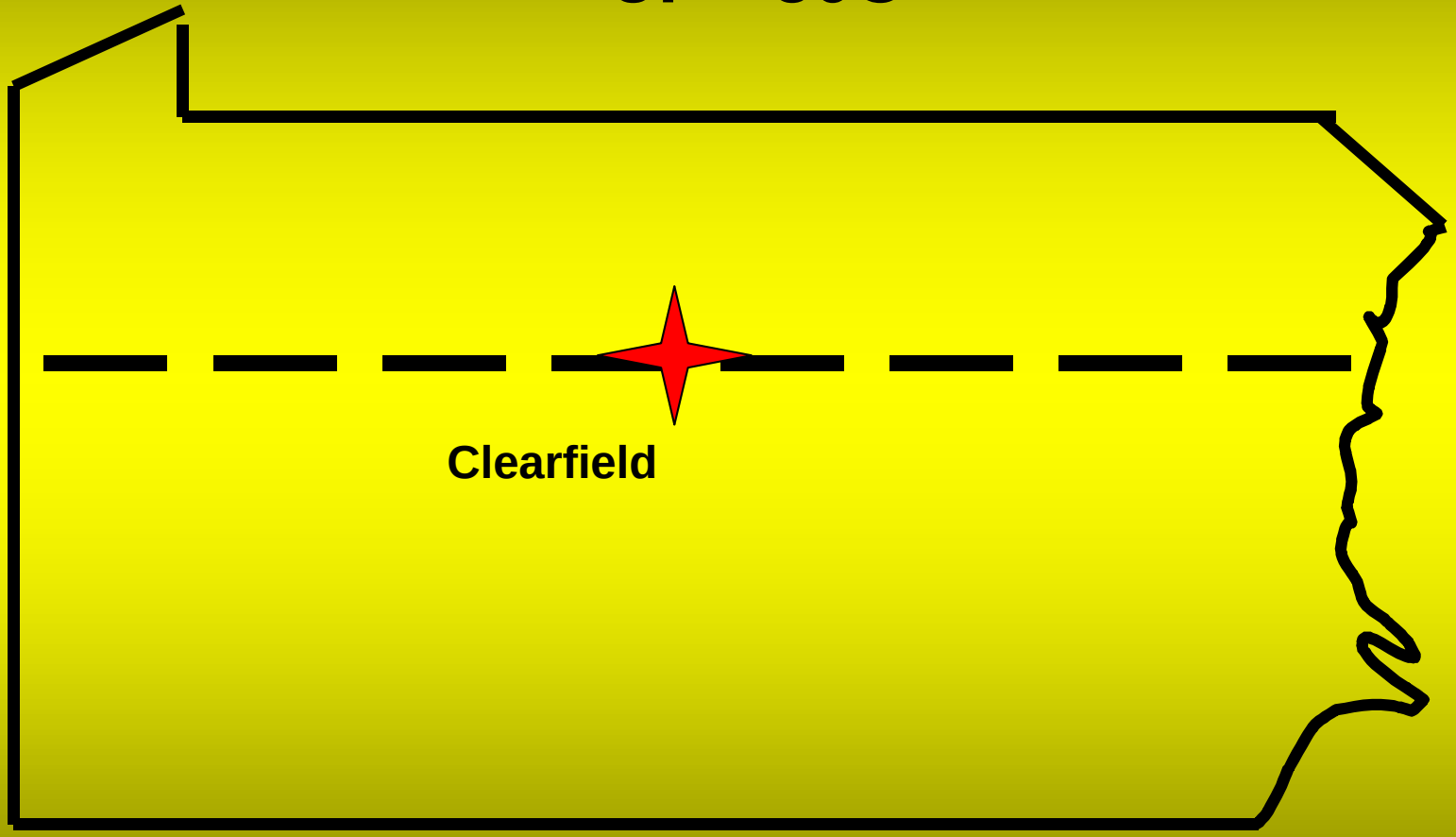
**Premature Rutting had been Increasing in recent years (Mid 1980's) due to:**

**Increased Traffic Loads**
**Increased Truck Tire Pressures**
**Duration & Frequency of High Temps.**
**Inadequate Mix Properties**

# OBJECTIVE

**To evaluate the effectiveness of various polymer modifiers or other types of bituminous modifiers to reduce rutting and deformation**

# Research Project
# 87 – 50C



# Interstate 80

## TRAFFIC DATA

8,284 ADT (36% Trucks) 1989
12,885 ADT (49% Trucks) 2006

## TEST SECTIONS

3% Grade
½-mile long
Traffic lane

# PLACEMENT DATES

**Eastbound April 1989**

**Westbound August 1989**

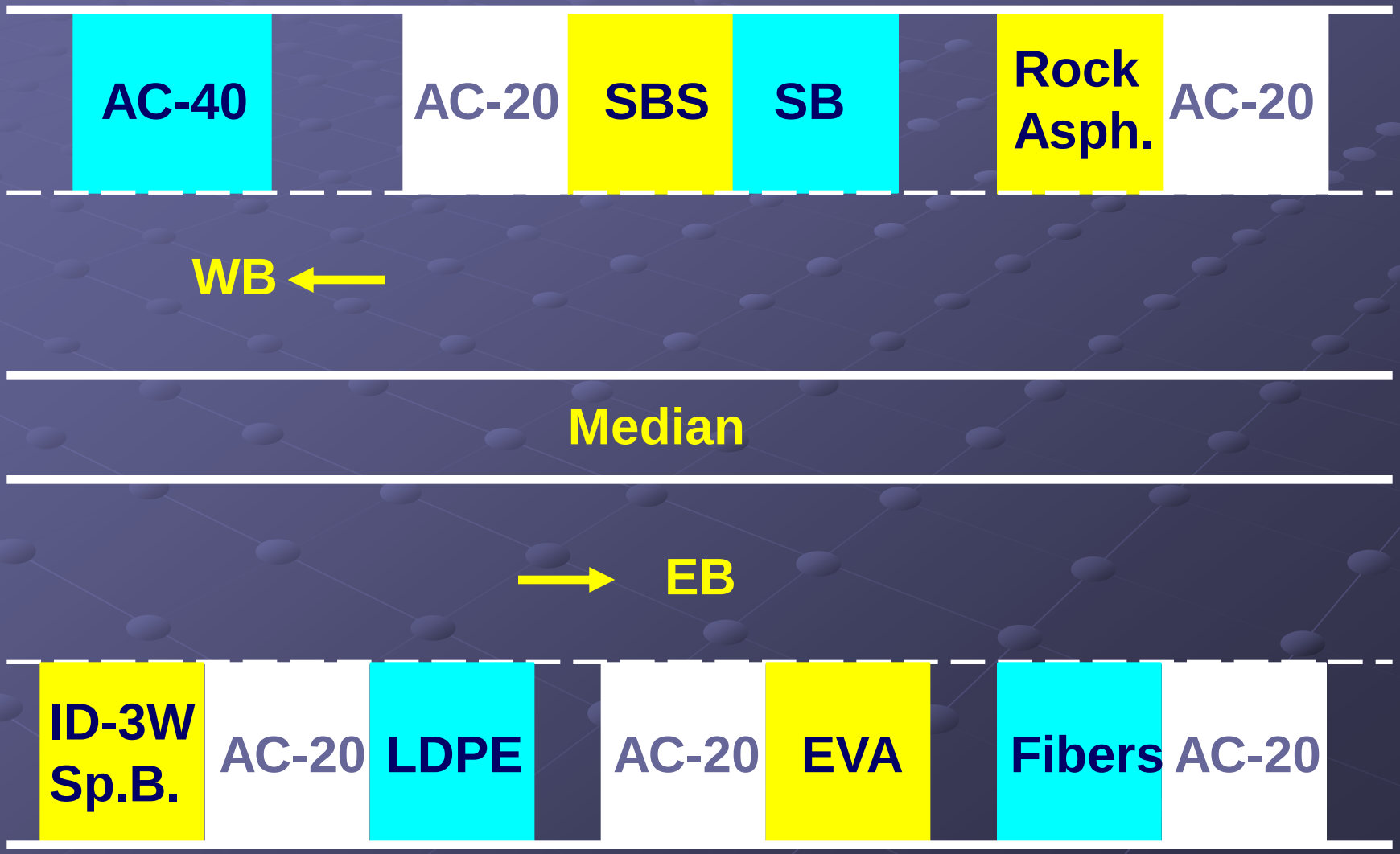
**Completed Project**
**September 1989**

# Modifiers and Additives Used

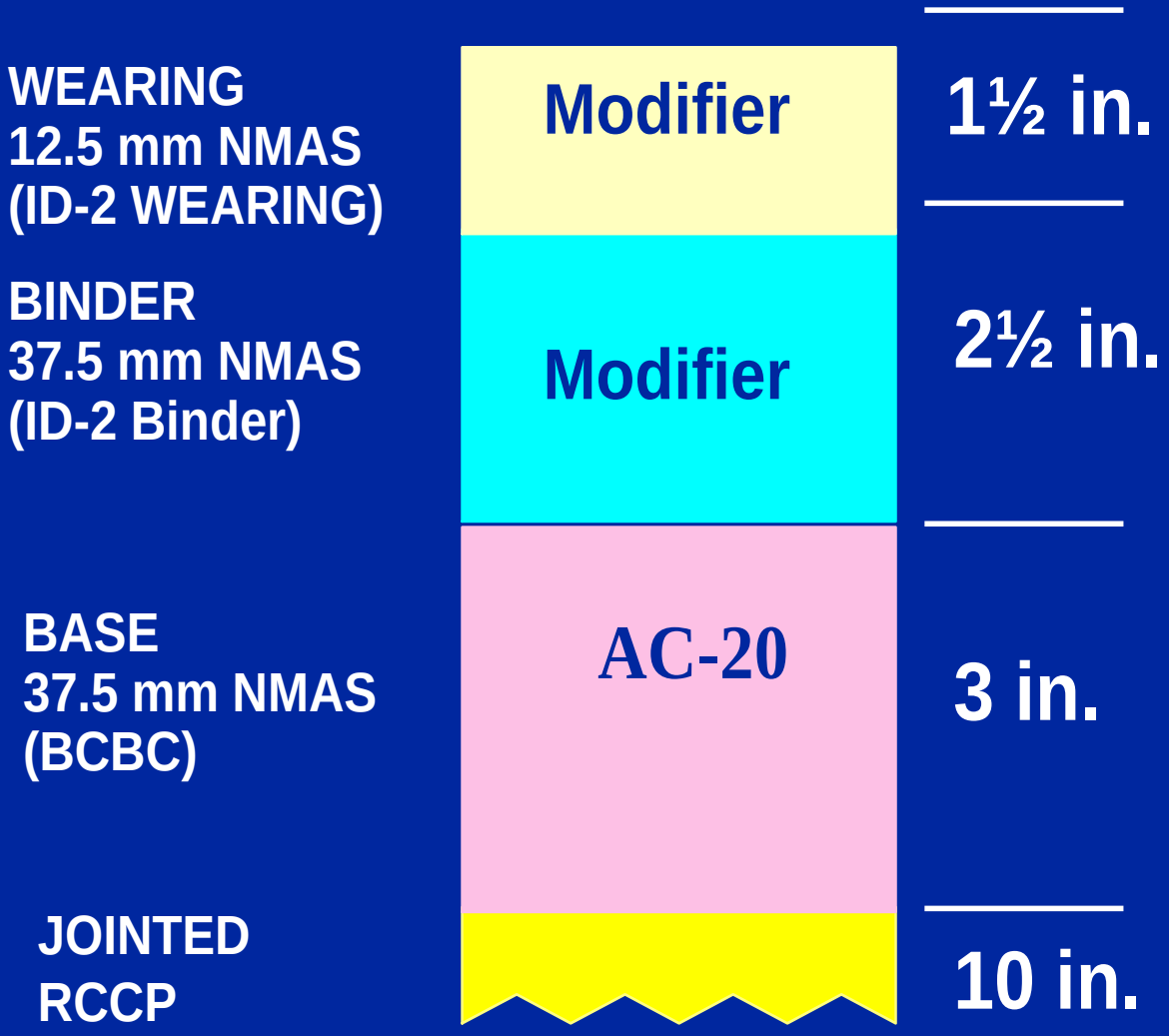
TYPE

AC-20 (Control)
LDPE
EVA
SB
SBS
AC-40 (Stiff Neat)
Powdered Rock Asphalt
Polyester Fibers
ID-3W & Special Binder
(Large Stone Mix)

# Project Layout



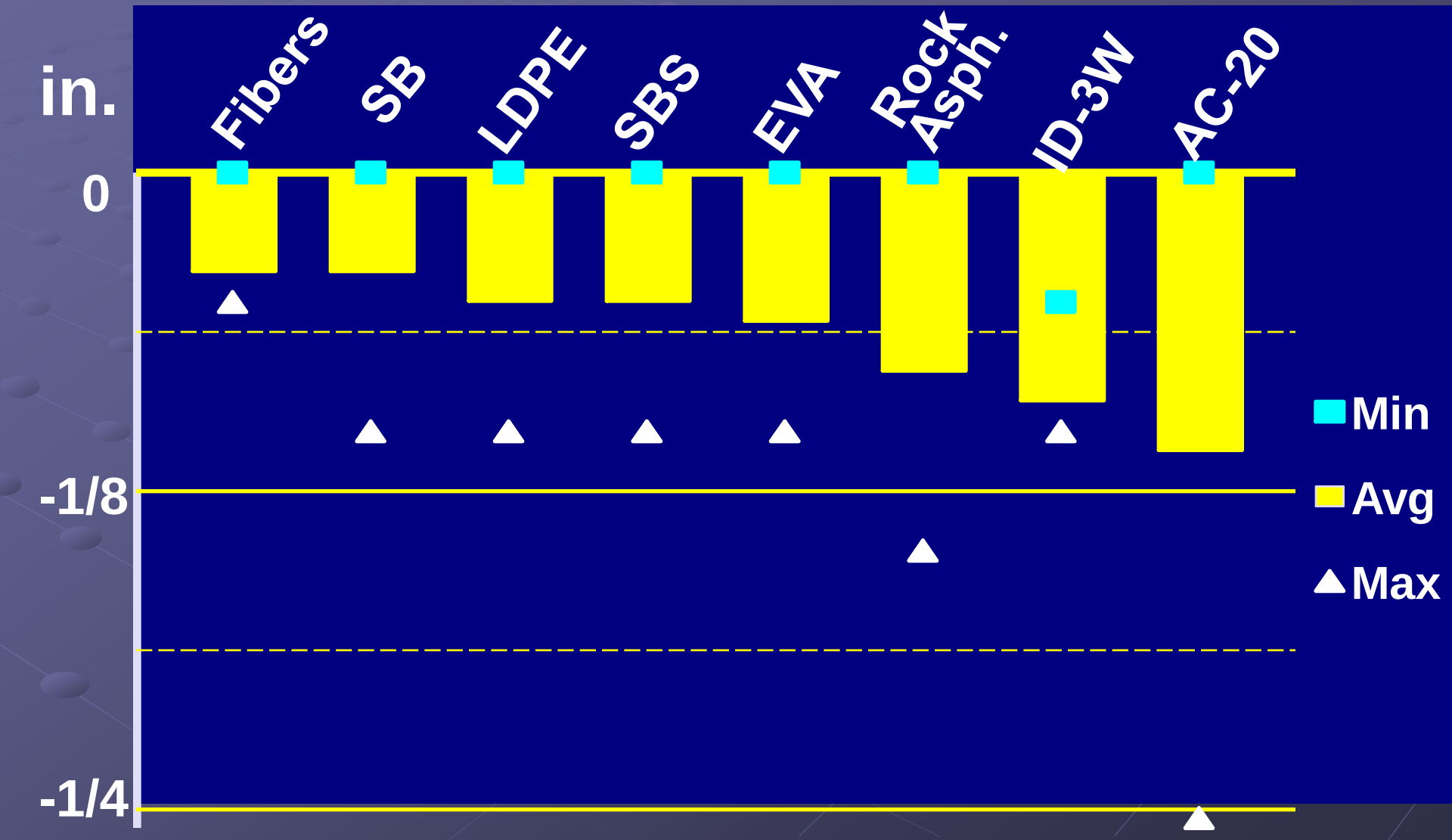
# Typical Pavement Cross-Section



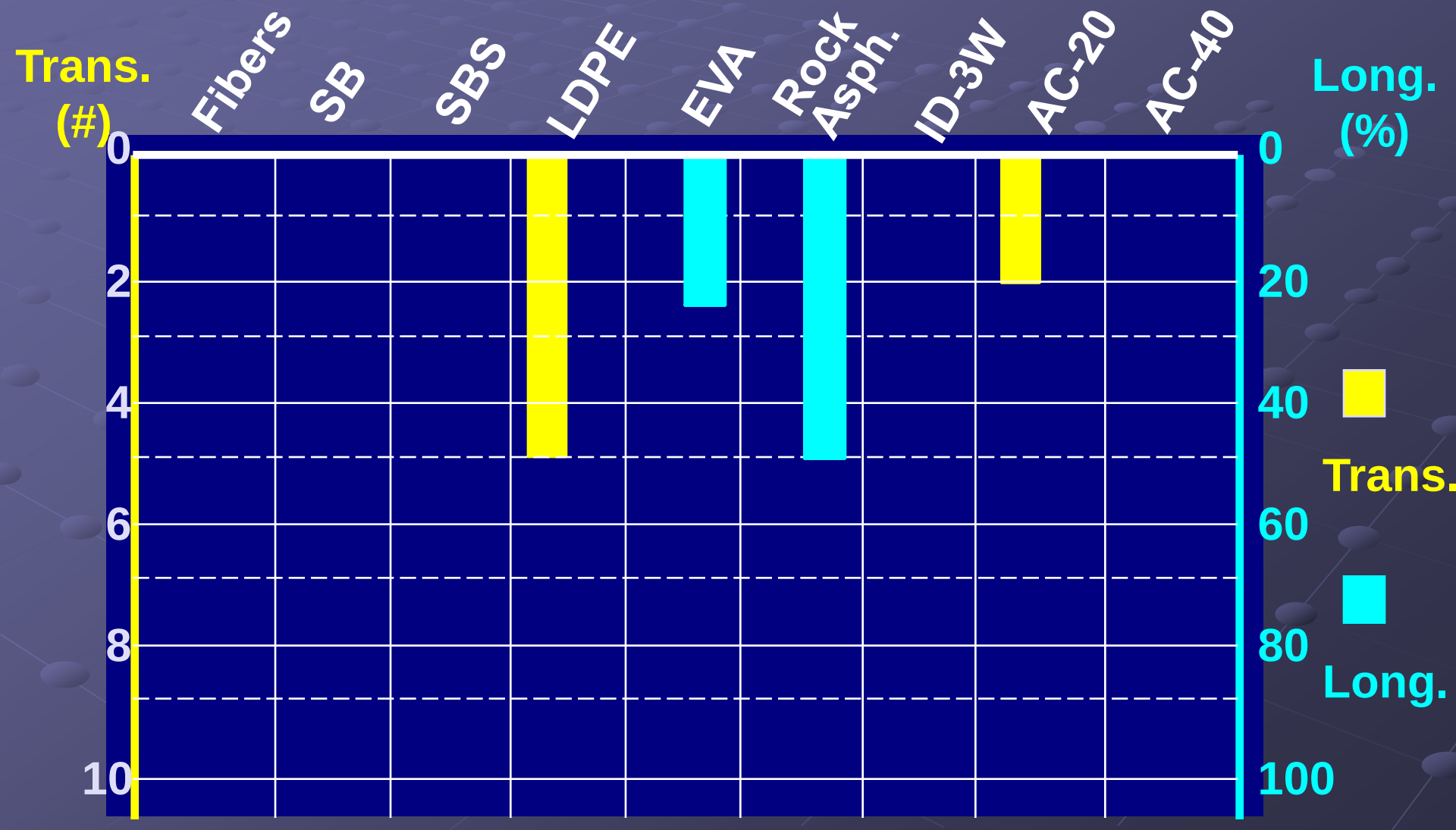
# Other Pavement Cross-Sections

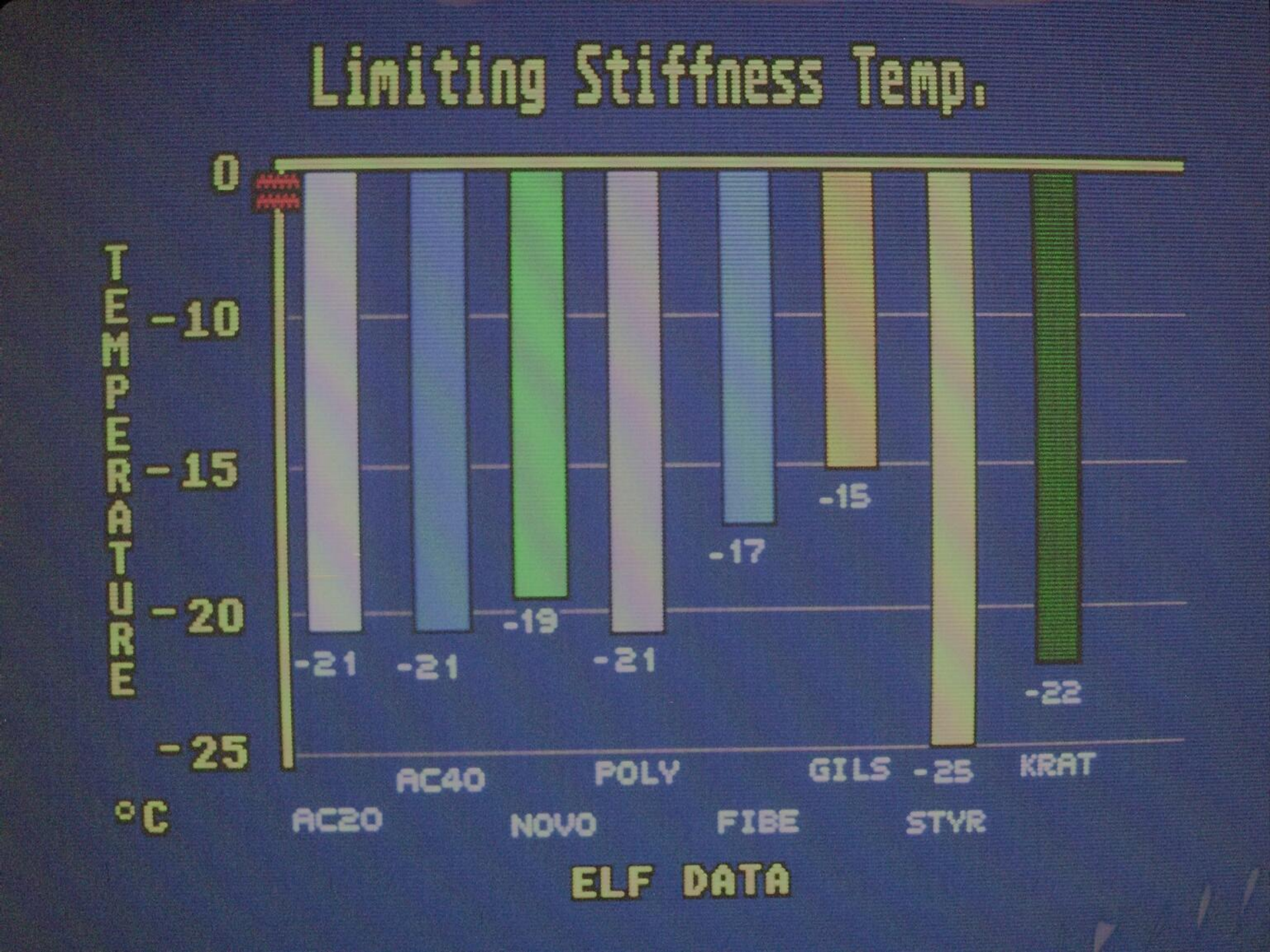

98 7 17

# Rut Depths After 5 Years



# Cracking After 5 Years




Limiting Stiffness Temp.
TEMPERATURE
0
-10
-15
-20
-25
°C
-21
-21
-19
-21
-17
-15
-25
-22
AC20
AC40
NOVO
POLY
FIBE
GILS
STYR
KRAT
ELF DATA

# Overall Best Performance Modified Asphalt Systems

**SB**

**SBS**

**Polyester – Fibers**
**( MIX )**

# Some of the Modified Asphalts Appear To have Contributed to Accelerated Cracking (Fatigue or Reflective )

**POWDERED ROCK ASPHALT**

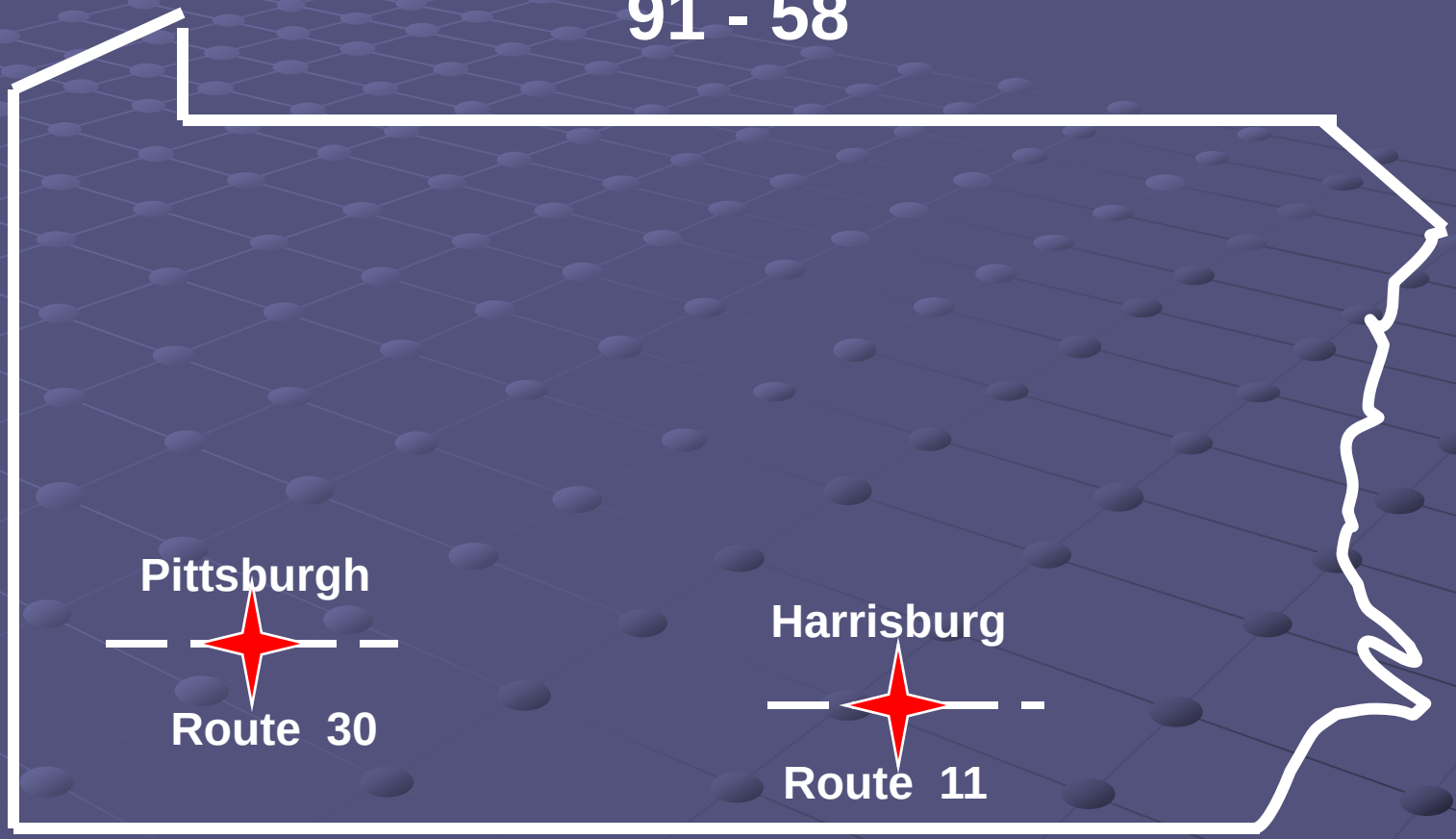
**EVA**

**LDPE**

# RESEARCH PROJECT No. 91-58

## ANTI-RUTTING MATERIALS for INTERSECTIONS

# Research Project
# 91 - 58



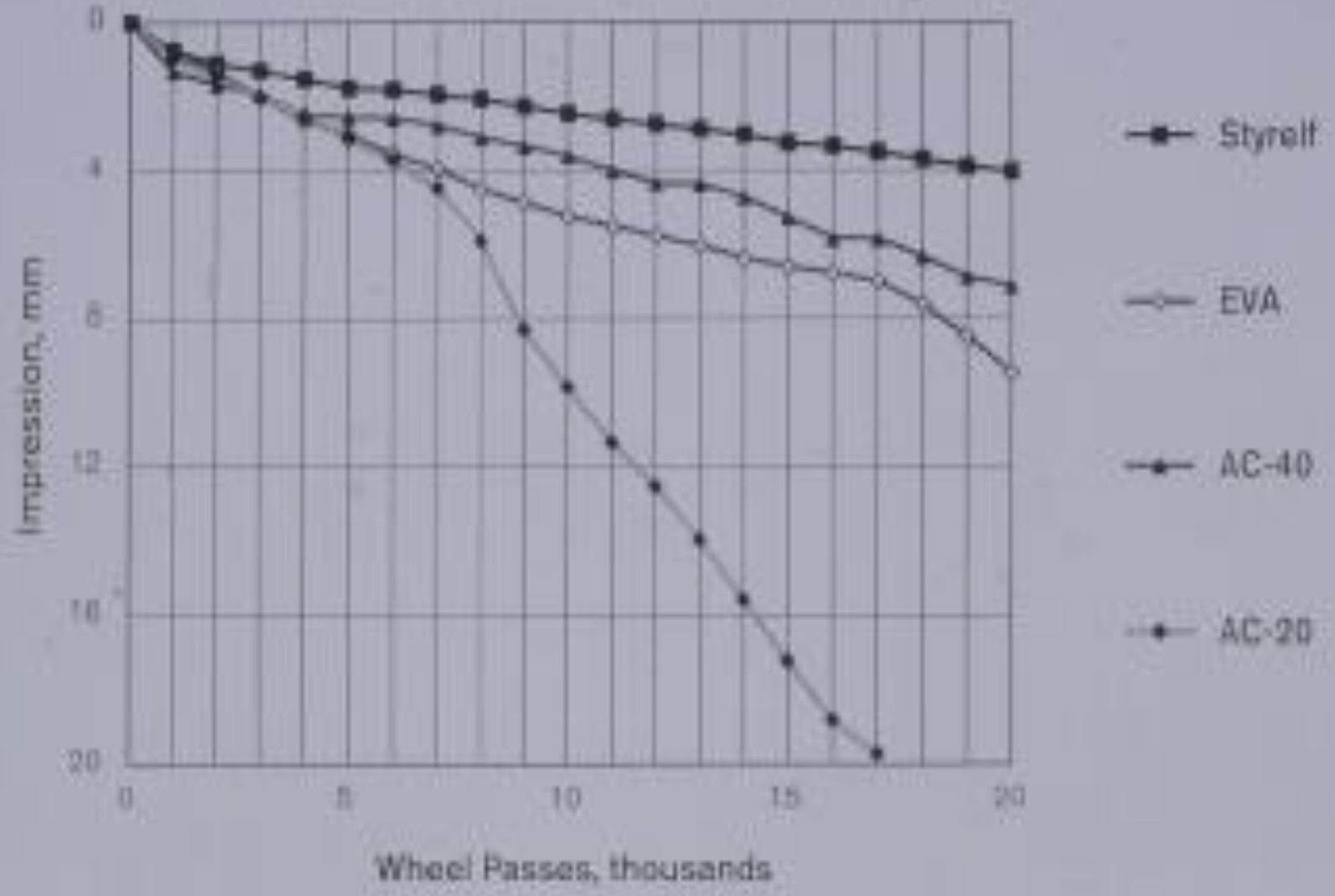

Route 11
Mechanicsburg, PA


Route 11
Mechanicsburg, PA

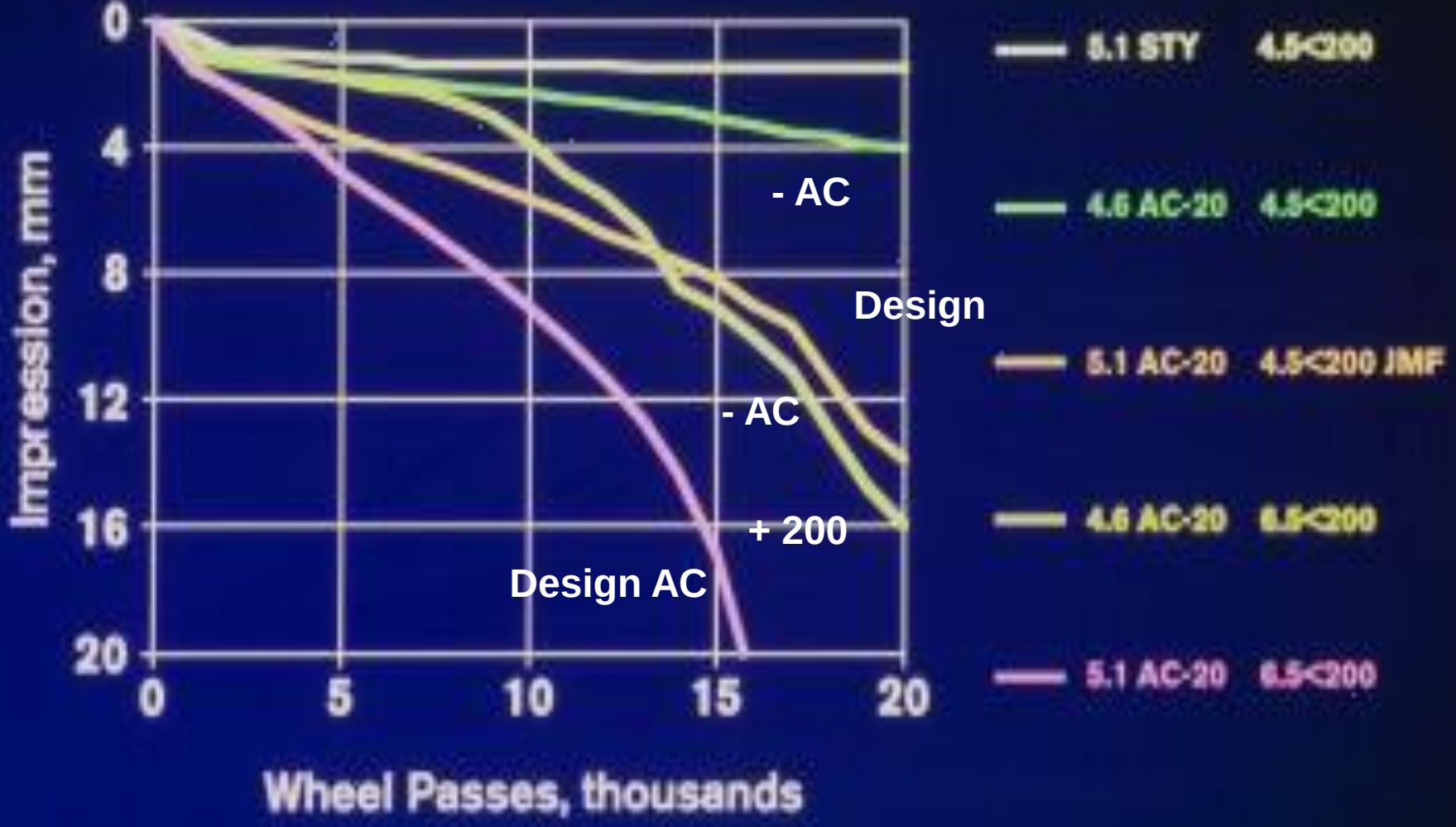

EVA
ID-3
AC-40
AC-20
SBS
ID-3


EVA
SBS

# Wheel Tracking Results Penn Rt 11 (ID-2 BC)



# Wheel Tracking Results Pa Rt 11 ID-3-WC




Route 30
Pittsburgh, PA


Route 30
Pittsburgh, PA


VESTOPLAST

# OTHER EXPERIMENTS

## EARLY SUPERPAVE IMPLEMENTATION

**Allentown**
**PA**
**6th & Linden**

**Pa's. 1st**
**Superpave**

**19mm PG 76-22**

# Superpave
# Rt. 15

## Amity Hall, PA

**19mm PG 76-22**


**Flying “J” Left Turn Lane**
**Carlisle, PA**

# SUPERPAVE BINDERS - NEW SPECIFICATION ( 1998 )

- PG 76-22 + ( E. R. / SB/SBS )
- SBR BATCH PERMITTED

# MORE EXPERIMENTS
# NEW MODIFIERS

## OTHER ISSUES
## (COMPATIBILITY / SEPARATION)


All PG 76-22
SB / OXIDIZED / TERPOLYMER / POLYESTER FIBERS
( 2000 )
Route 11
Chambersburg, PA.

# Both Lab Testing & Field Verification Suggest:

**Elastomeric Modified Asphalts Can Contribute to Improved Rut Resistance Without Compromising Cracking Resistance ( Fatigue & Low Temp. Related)**

# CURRENT PENNDOT SPEC ( PG + )

- SB or SBS POLYMERS
- R & B SEPARATION (2C MAX.)
- ELASTIC RECOVERY - ASTM (60% MIN.)
- INTERMEDIATE TEMP. (25C)
- PLAN on REPLACING E.R. w/ M.S.C.R.
  - * Published by AASHTO
  - * Purchase new D.S.R.s

# PLANNED FUTURE EVALUATIONS

- P.P.A. ( PG 64-28 )
  - * Neat Control
- Rubberized Asphalt Seal Coat (RASC)
  - * PG Binders w/ CRM
- S.M.A. w/ CRM
  - * 12.5mm (2003)
  - * 4.75mm (2006)

# THANK YOU !
# QUESTIONS ?