

Pavement Serviceability

- The ability of a pavement section to serve high-speed, high-volume, mixed traffic in its existing condition.
 - PSR, PSI
 - PCI, PDI, etc.
- PSR~2.9 = 50th percentile of acceptability
- PSR~2.5 = 50th percentile of unacceptability
- PSI developed to utilize object measures to predict subjective PSR quality rating
- PSI=fn {roughness, cracking, patching, rutting}

Roughness Measurement

- Class I – Direct measurement via rod & level or dipstick
- Class II – Direct measurement using profilometers
- Class III – Indirect measurement using response-type devices such as the Mays ridemeter
- IRI, PI, RN

Surface Friction

- Minimize wet weather accidents related to loss of control
- Potential problem if one or more conditions present:
 - Bleeding
 - Polished Aggregate (Smooth Microtexture)
 - Smooth Macrotecture
 - Surface Rutting
 - Poor Surface Drainage

Measurements

- Skid Number
 - Locked-wheel trailers
 - Yaw-mode trailers
 - Locked wheel stopping distance
- Surface Macro-Texture
 - Sand patch
 - ROSAN

Control of Skid Resistance

- Minimum requirements based on traffic speed (T9.6)
- Surface Properties
 - Aggregates: angularity, particle size, wearing characteristics
 - Mixtures: gradation, binder content, mortar balance, surface finish
- Noise vs Friction ?

Deflection Data Analysis

- NDT Devices
 - Benkleman Beam
 - Dynaflect
 - Road Rater
 - Falling Weight Deflectometer (FWD)
 - Rolling Wheel Deflectometer (RWD, RDD)

Factors Affecting Deflections

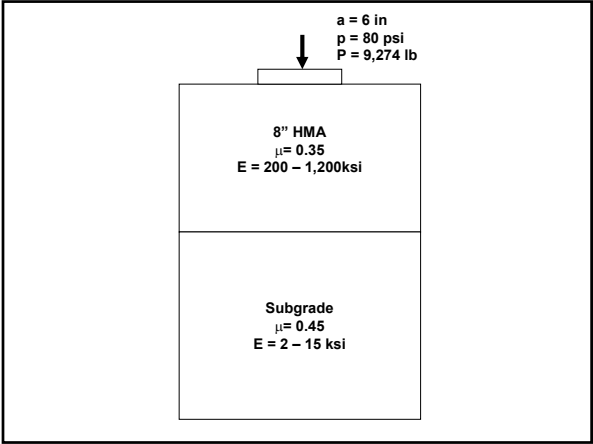
- Loading
 - Size of loaded area
 - Magnitude of load
- Climate
 - Temperature
 - Moisture
- Pavement Conditions

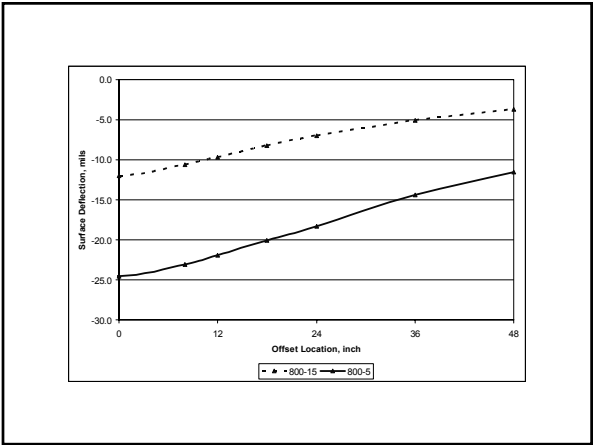
Backcalculation of Moduli

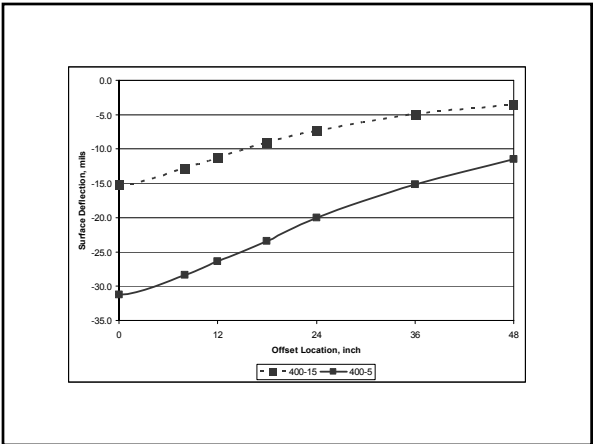
- Individual sensor analysis
 - Manual matching
 - Automated programs
- Combined sensor analysis
 - Deflection basin AREA
 - Surface Curvature Index (SCI)
 - Area Under Pavement Profile (AUPP)

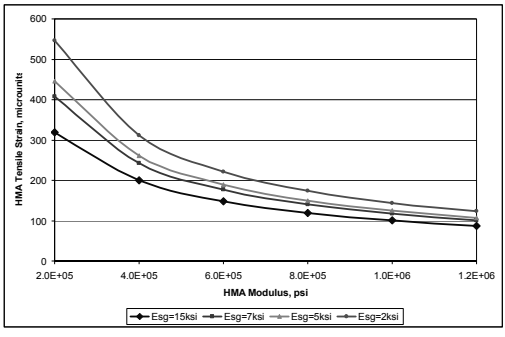
Forward Analysis

- Model pavement structure
 - Layer thickness, modulus, Poisson's ratio
- Model applied load
 - Radius, pressure
- Compute surface deflections
- Develop meaningful trends









$\epsilon_{ac} = fn \{AUPP\}$

