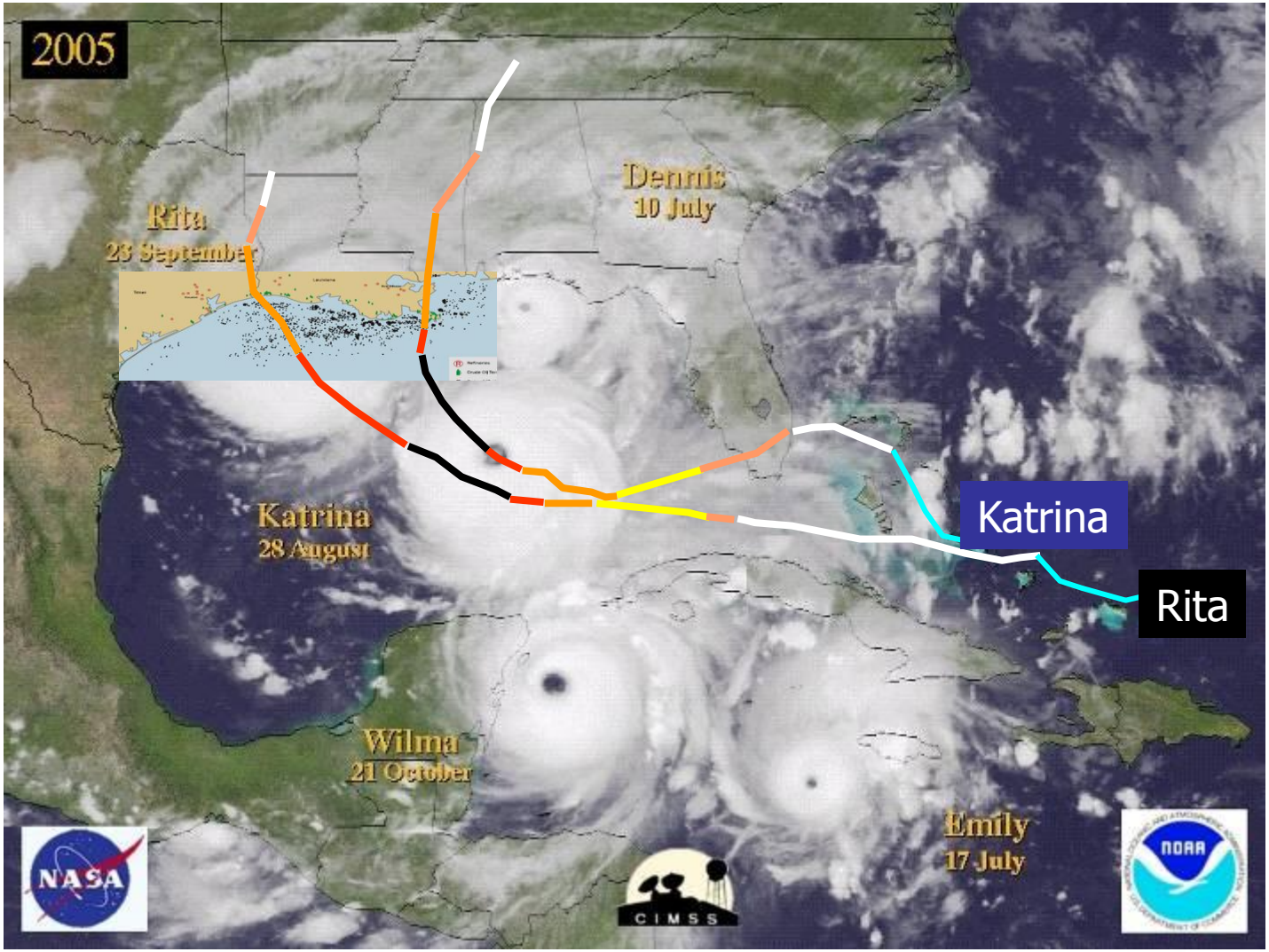
Adapting to Rising Costs of Materials

Association of Modified Asphalt Producers
8th Annual Meeting – February 12-14, 2007
Boston, MA

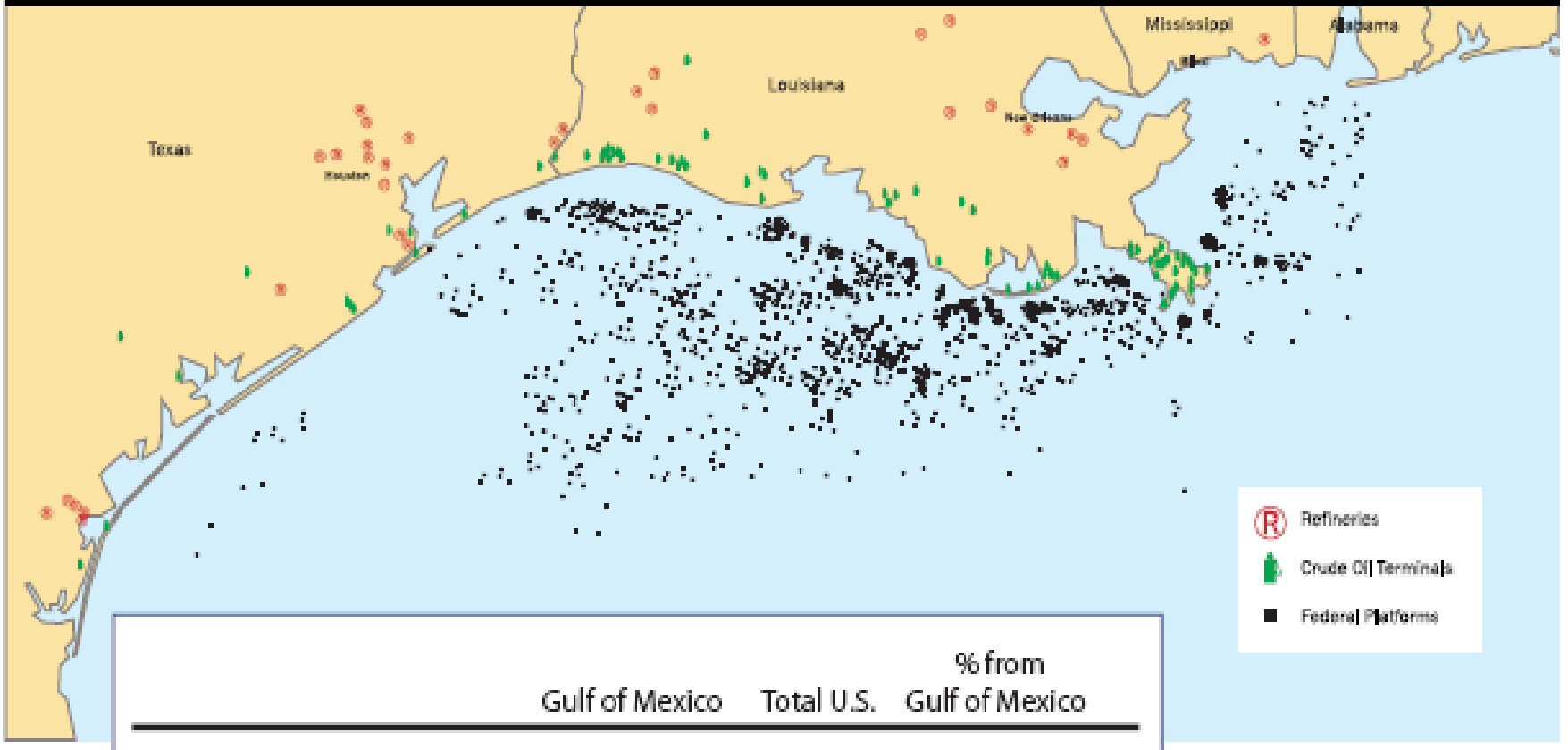
Peter T. Grass, P.E.

President, Asphalt Institute

2005 Tropical Cyclones



Gulf Coast Oil and Natural Gas Operations



	Gulf of Mexico	Total U.S.	% from Gulf of Mexico
Oil production (million b/d)	1.5	5.5	27%
Natural Gas production (bcf/d)	10.6	52	20%
Refinery Capacity (million b/d)	8.1	17	48%
of which in LA and MS	*3.1*	*17*	*18%*
Crude Oil Imports (million b/d)	6.5	10.8	60%
of which into LA and MS ports	*2.5*	*10.8*	*23%*

Source: U.S. Energy Information Administration

Katrina's Impact on Oil & Gas Operations

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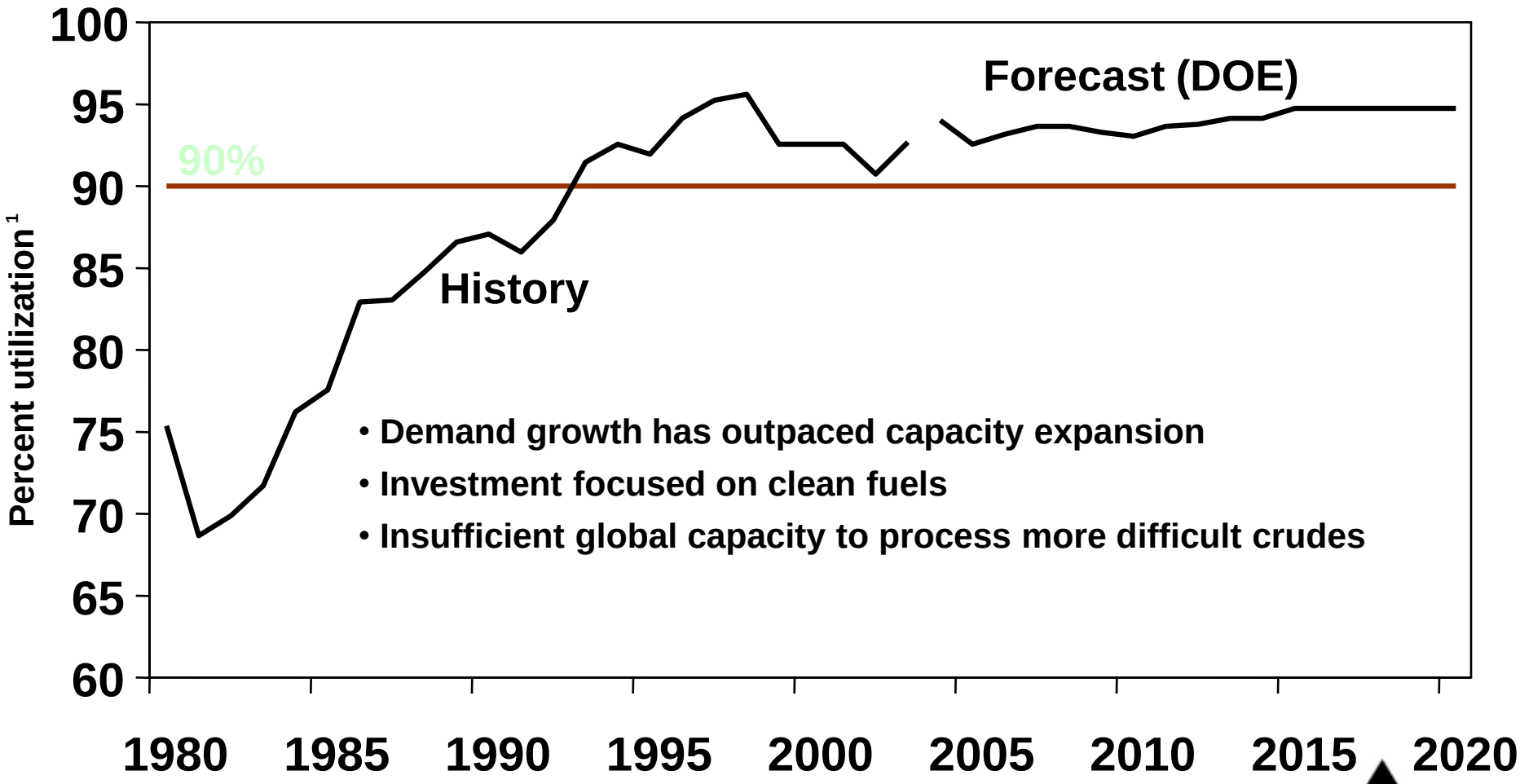
August 29th

- Oil & Gas Production
  - 27% of U.S. oil
  - 20% of U.S. gas
- Refineries
  - 11% shutdown
  - 14% reduced runs
- Pipelines
  - No electricity to major crude and product pipelines feeding Northeast and Midwest

September 6th

- Oil & Gas Production
  - 9% of U.S. gas
  - 19% of U.S. oil
- Refineries
  - 7% shutdown
  - 5% reduced runs
- Pipelines
  - Colonial 100% up
  - Plantation 100%
  - Capline 88%

Total U.S. Capacity Utilization



Source: U.S. Department of Energy

[1] Percent utilization defined as: gross input to refineries /operable capacity.

Producing more gasoline with fewer refineries

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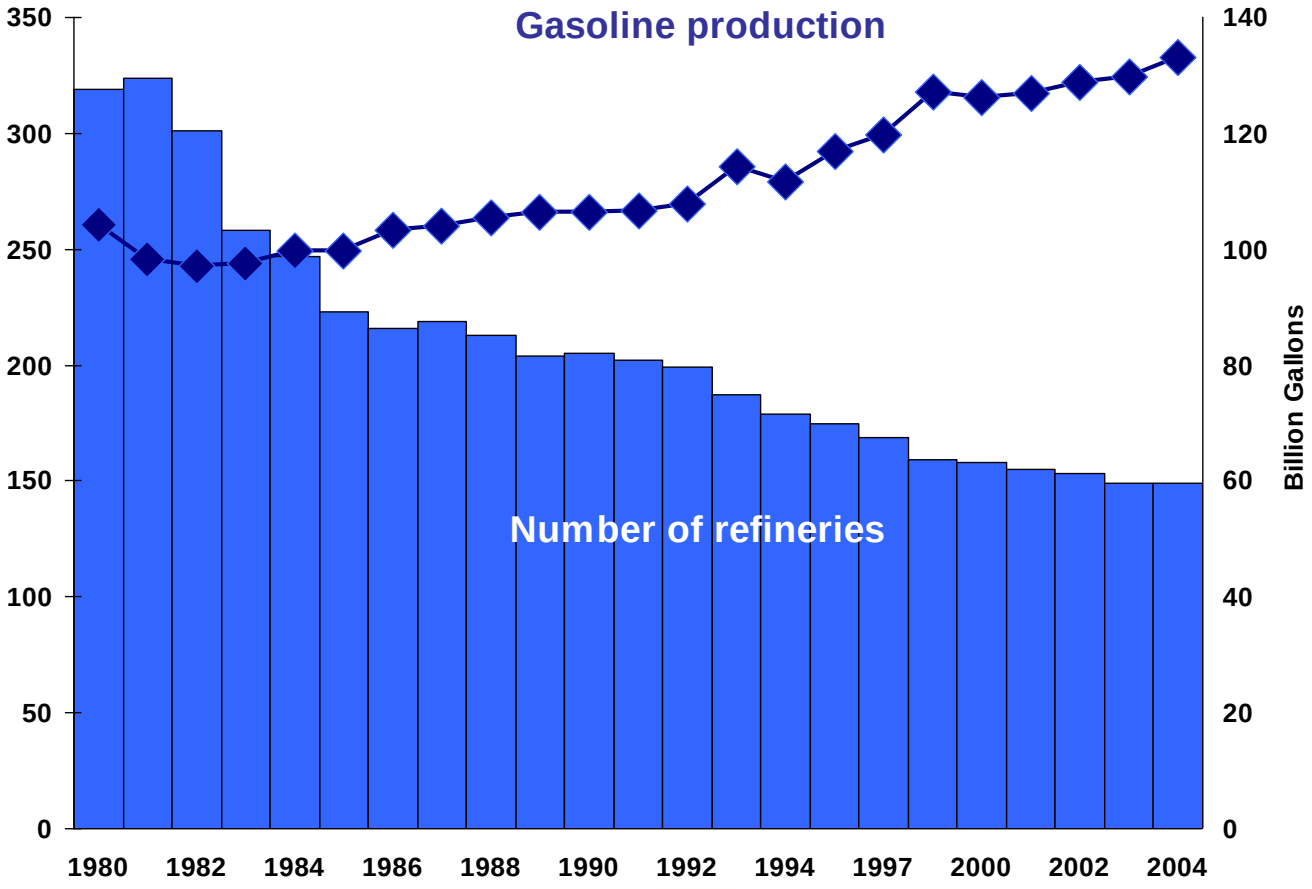

Biofuels aren't the answer...

- Ethanol?
  - 10% replacement of US gasoline needs in 2020
  - Plant all of Ohio, Illinois, Indiana – using 1/6th of total US crop land just to grow corn for ethanol
  - Not an energy efficient nor economic alternative currently

Refiners are making progress…

- US Refiners invested $50B over the last 2 decades to greatly improve environmental production aspects
- 1.4 b/d of new refining capacity planned
- An 8% increase from today

US Energy Policy Lacking

- Still living in the past
- New reality
  - Oil is a truly global resource
  - Market driven buyers of crude
  - Huge strategic importance
- Domestic production options exist
- US oil drilling at a 20 year peak in 2006
- 9% increase from the same period in 2005

U. S. Asphalt Refining Capacity

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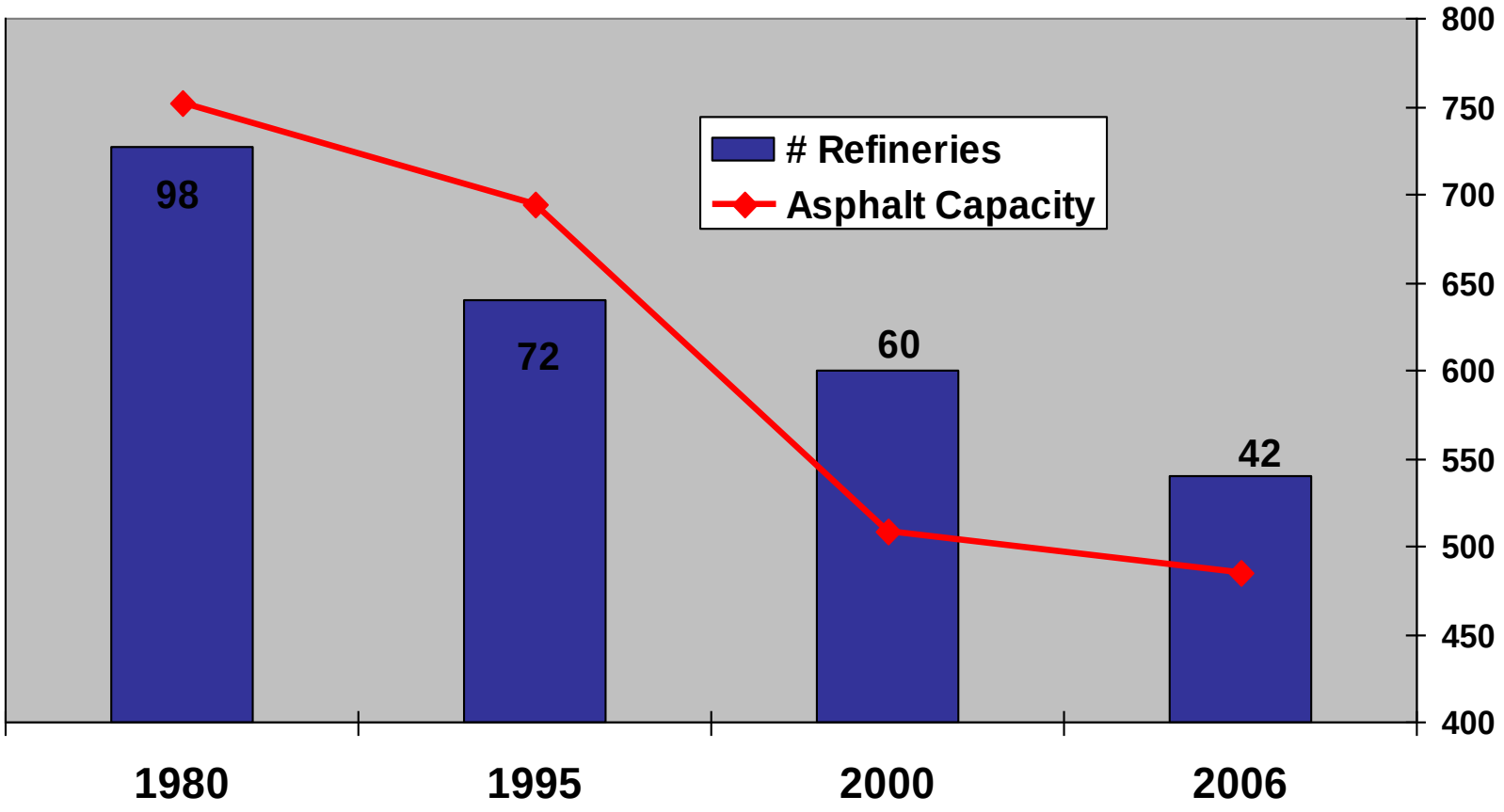

Production Range: 600 B/D to 60,000 B/D

Source: Oil & Gas Journal

Historical Asphalt Supply/Demand

Millions Tons - Liquid

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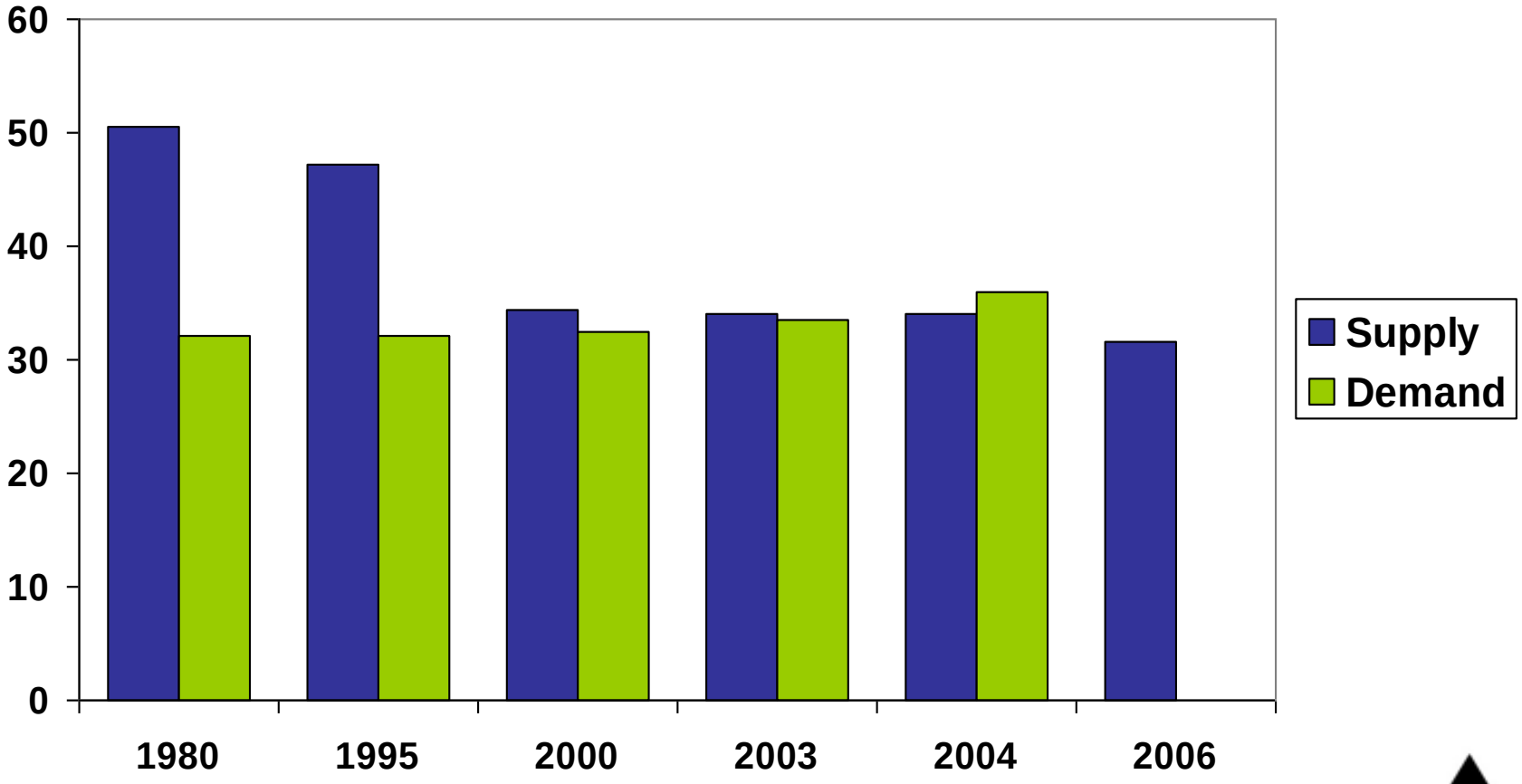

Source: Oil & Gas Journal

Average Monthly Variation in Asphalt Production

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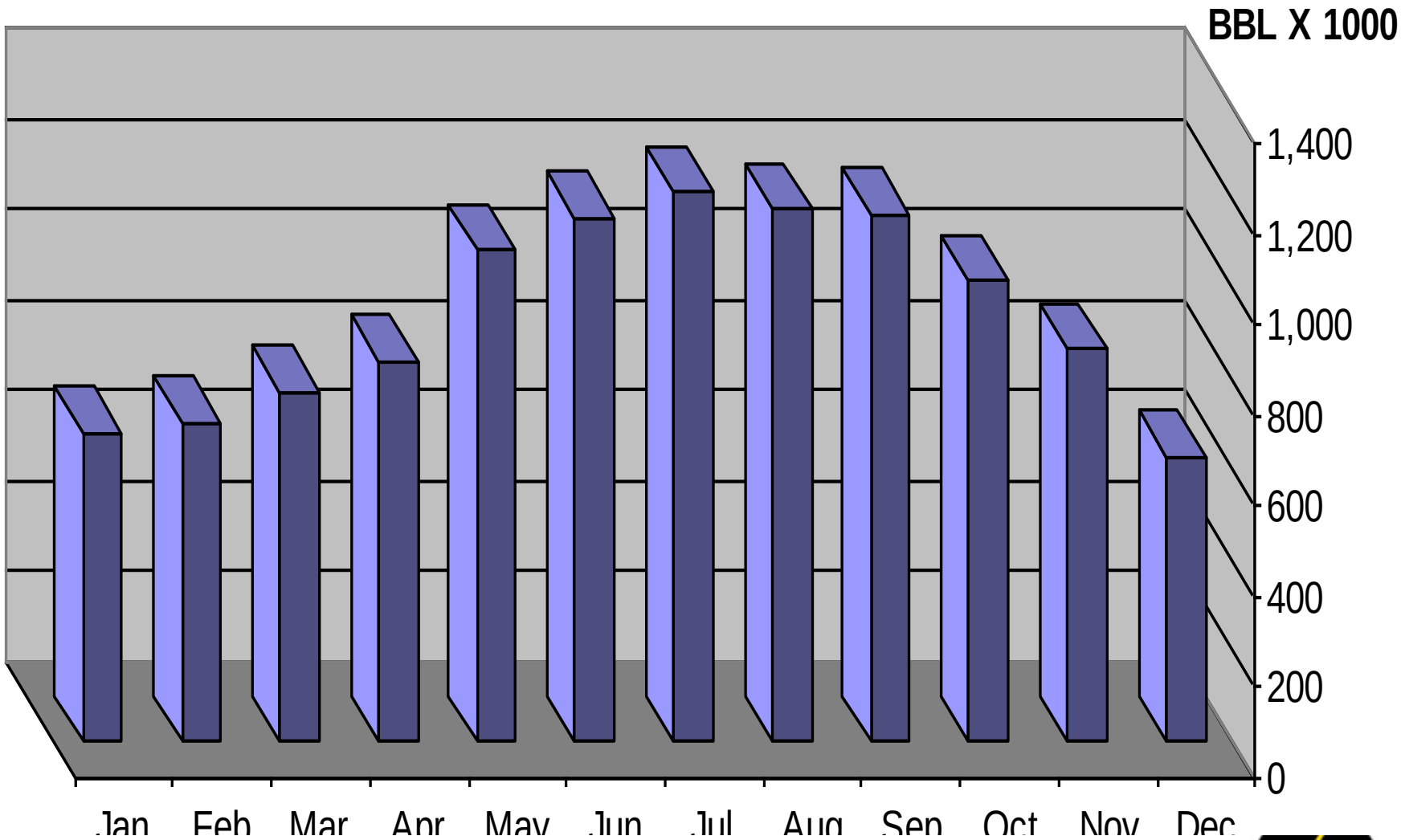

Factors that may affect asphalt binder supplies

- Logistics into and out of refineries
  - Crude availability
  - Things that are critical to refinery operations
    - Power, nitrogen, gas
- Market
  - Asphalt versus other petroleum products
  - Seasons, weather
- Imports
  - Not a significant source in the past, but what about the future?

FHWA Materials Cost Indices, Embankments and Surfaces

U.S. Department of Transportation
Federal Highway Administration

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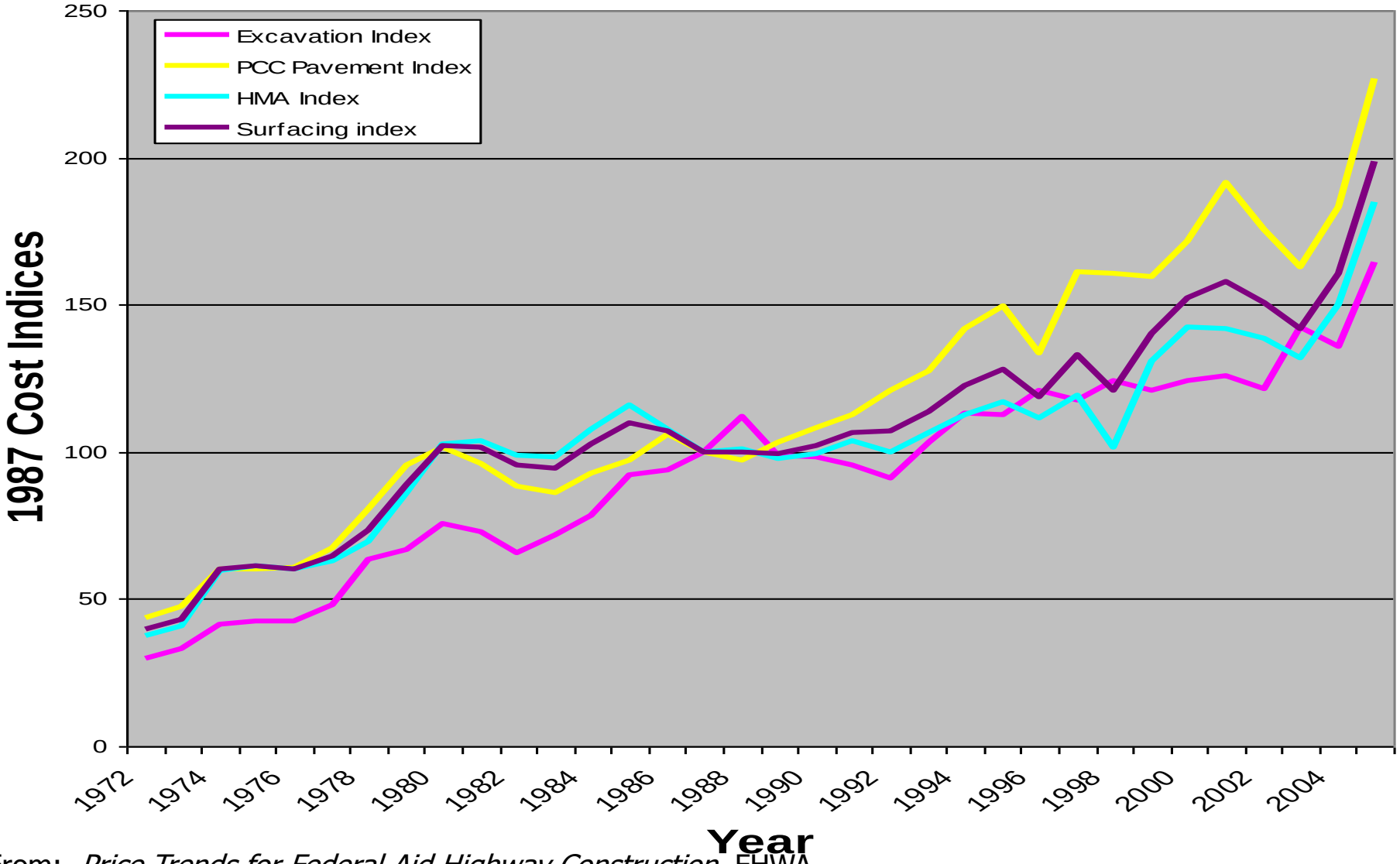
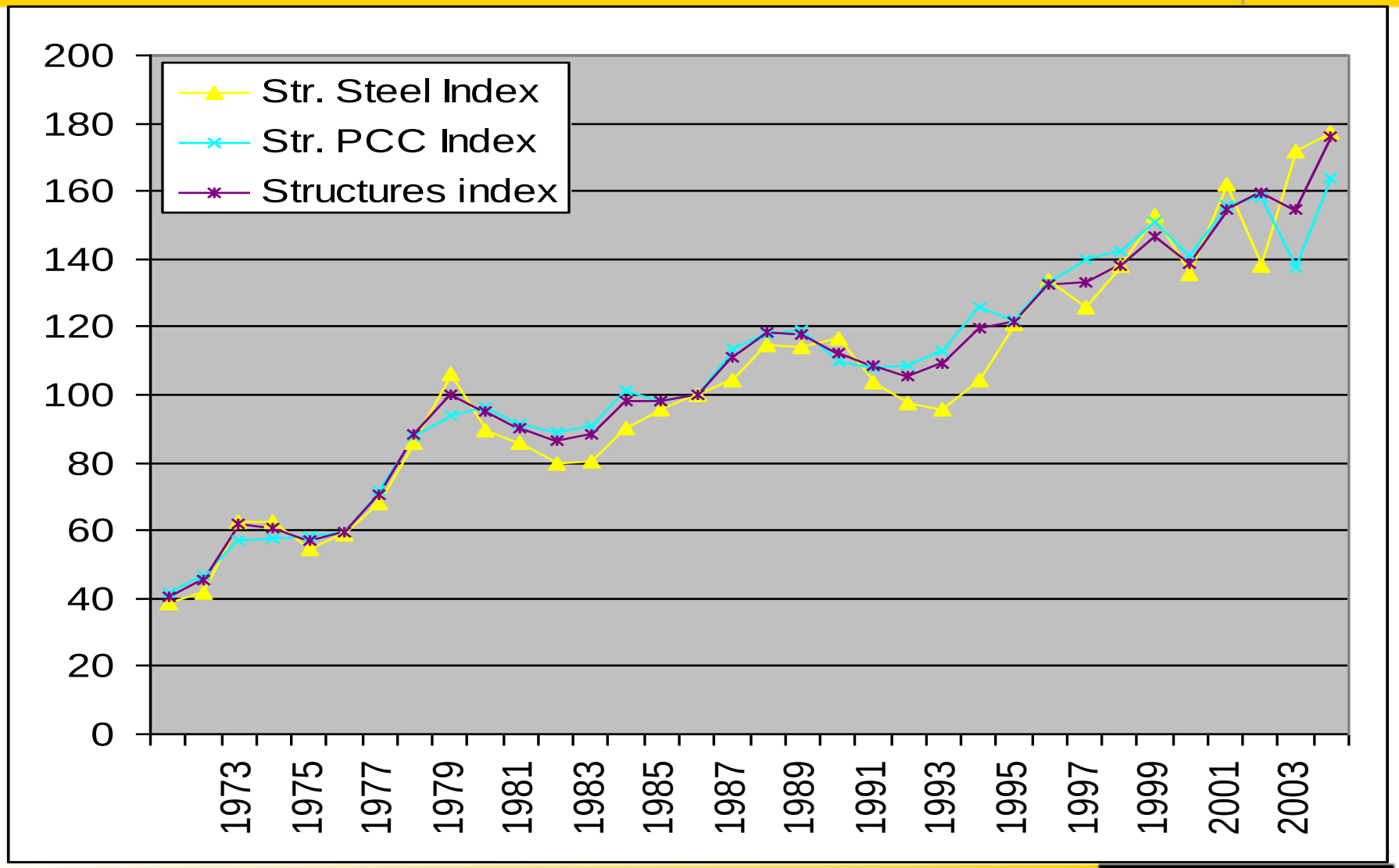


From: *Price Trends for Federal-Aid Highway Construction,* FHWA

Structural Items-FHWA Data



AASHTO Survey - 2006

- AASHTO Standing Committee on Highways - 44 states
- Average cost increases:
  - HMA 18%
  - PCC 22%
  - Steel 26%

Observations

- Volatility in cost and supply exists for major construction materials
- Equipment cost and availability, and the available construction labor force are emerging issues
- Funding hasn't increased to take any of this into account

How can an agency respond to these issues while maintaining or improving their network condition level?

Some things to consider…

- Pavement preservation
  - More cost-effective now to keep pavements in good condition than before!
- Efficient use of available resources
  - Reuse existing materials to their full extent
    - HMA recycling
    - Full-depth reclamation of flexible and semi-rigid pavements
- Emphasize quality materials and workmanship

Paving Industry Challenges…

- Significant run up in all material costs
- Reducing costs of in place construction
  - Efficient burners, modern plants
  - Stockpile management (paving under, slope management etc)
  - Low temperature mixes
  - Thinner overlays
  - RAP management and use (% inc, sorting)
- What is the in-place cost reality?

RAP Use Increasing

- NCHRP Report No. 452 – Recommended Use of Reclaimed Asphalt Pavement in the Superpave Mix Design Method: Technician's Manual; Becky McDaniel (North Central Superpave Center) and R. Michael Anderson (AI)

Paving Industry Challenges…

- MEPDG local calibration
  - Few DG sections included PMA
  - Few section for Superpave mix designs or SMA
  - Few constructed using modern equipment technology

- National calibration grossly conservative for asphalt (not so for PCC)
- Need a national-local process to work within the guide to improve the calibration methodology

New APA Brochures

New site: *PaveGreen.com*

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AI Publications Development Update

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- MS-23 Thickness Design:
  Asphalt Pavements for Heavy Wheel Loads – now available

- MS-24 Moisture Sensitivity

- MS-19 The Basic Asphalt Emulsion Handbook

MS-25 Asphalt Binder Testing

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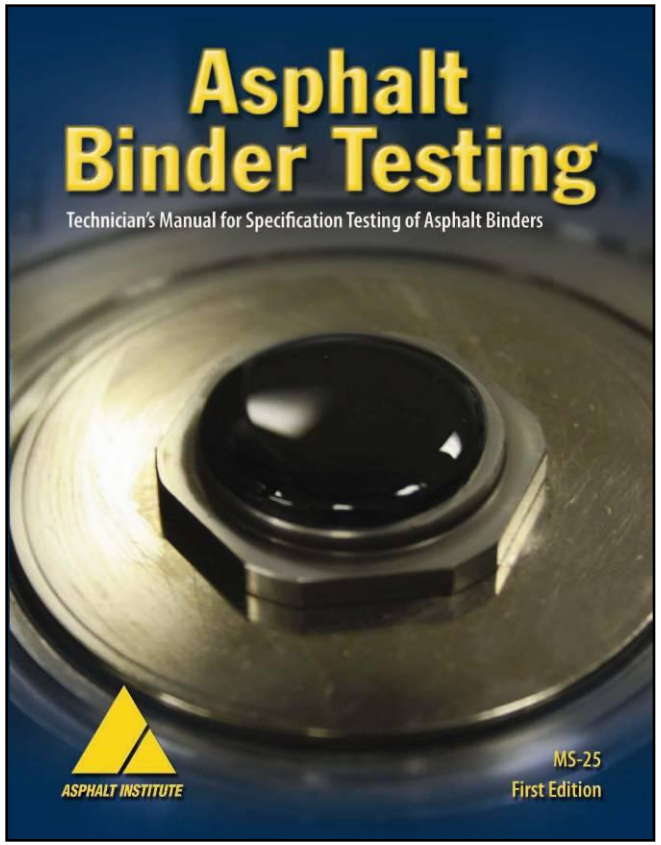
- ***Asphalt Binder Testing***: *Technician's Manual for Specification Testing of Asphalt Binders*
- New manual
- Available now
- *Principle author:*

Dr. Dave Anderson



MS-4 The Asphalt Handbook (7th Ed.)

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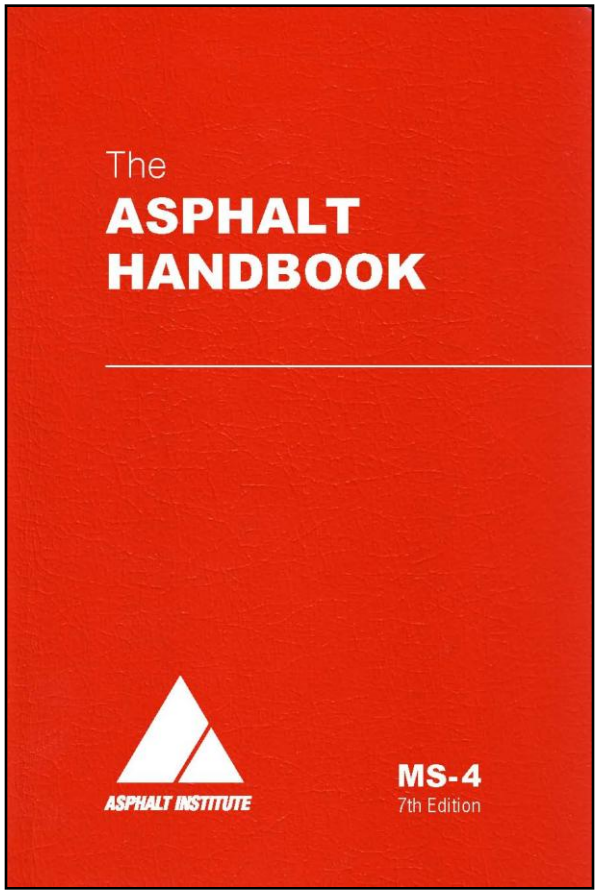
- New edition; completely revised.
- Delivery Date: September 07
- Sampler unveiled at NPE
- Also at WOA in Atlanta



A Professional Reading List

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Oil: Anatomy of an Industry
Matthew Yeomans

Blood and Oil
Michael T. Klare

Crude Awakening
Steve A. Yetiv

Twilight in the Desert
The Coming Saudi Oil Shock and the World Economy
Matthew R. Simmons