

# Extended Life Pavement in Indiana



January 9, 2008

North Central Asphalt User/Producer Group  
**NCAUPG**



# PERPETUAL PAVEMENT?

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- Structure has indefinite life  
(50 years or more)
- Surface renewed on regular basis  
(15 to 20 years)



# PERPETUAL PAVEMENT

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- Perpetual means “Long Life”
- Regular pavements crack from the bottom up
  - Require thick overlays (6 to 8 in.) or reconstruction
- Perpetual pavements crack from the top down
  - Require new surface only (2 to 3 in.)

Cracking is from  
the surface





U.S.A. - CHINA

PERPETUAL PAVEMENT  
EXPERIMENT



# PARTNERS

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- U.S.A.
  - Indiana Department of Transportation
  - Federal Highway Administration
  - National Center for Asphalt Technology
  - Heritage Research Group
- CHINA
  - Shandong Highway Bureau
  - Shandong Research Institute



150° Sea of Okhotsk  
45°  
40°  
35°  
30°  
25°  
140°  
145°  
150°

Khabarovsk RUSSIA  
Blagoveshchensk  
Birobidzhan  
Qiqihar  
Harbin  
Sapporo  
Vladivostok  
Ch'ongjin  
HONSHŪ  
JAPAN  
Tokyo  
Nagoya  
Kyōto  
Seoul  
SOUTH KOREA  
Busan  
Jeju  
Gyeongju  
P'yōngyang  
Hamhŭng  
Kimch'aek  
Dai'an  
Jinzhou  
Shenyang  
Changchun  
Jilin  
Baotou  
Datong  
Tianjin  
Tientsin  
Beijing  
Zibo  
Jinan  
Handan  
SHANXI  
Zhengzhou  
Xuzhou  
Nanjing  
Shanghai  
Ningbo  
Hangzhou  
Wuhan  
Hefei  
Wuxi  
Chongqing  
Chengdu  
SICHUAN  
HUBEI  
Changsha  
Nanchang  
Guizhou  
HUNAN  
Guangzhou  
Canton  
Fuzhou  
Xiamen  
Taichung  
Taipei  
Yunnan  
Kunming  
Guangdong  
Vietnam  
Tibet  
Qinghai  
Xining  
Lanzhou  
Yinchuan  
Datong  
Baotou  
Inner Mongolia  
Mongolia  
Gobi  
Siberia  
Chita  
Ulaanbaatar  
Ulan Bator  
Kyzyl  
Irkutsk  
Xinjiang  
Uygur  
Tibet  
India  
Kohima  
Mandalay  
Taunggyi  
Tropic of Cancer

**Shandong Province**

# Mr. Wang visits INDOT







Shandong Team Visits FHWA



# EXPERIMENT OBJECTIVE

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- Structural Design  
for Heavy Truck Load
- “How to build highways for  
200,000 lb trucks.”

# HEAVY LOADS IN CHINA



# NEWLY OPENED HIGHWAY

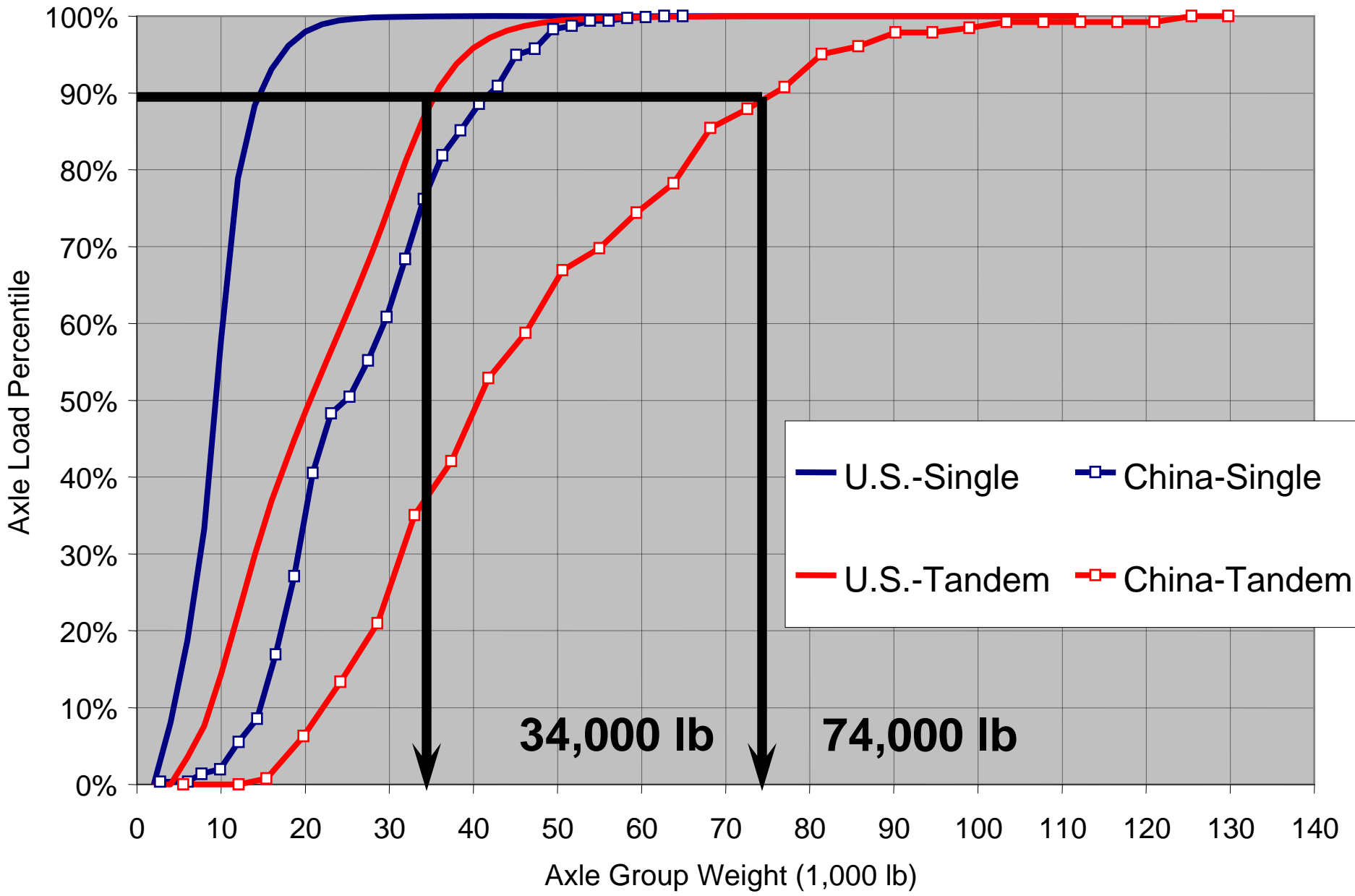


*Long Life Pavement in Indiana*

# SIX YEAR OLD HIGHWAY



# Axle Weight Distribution Comparison



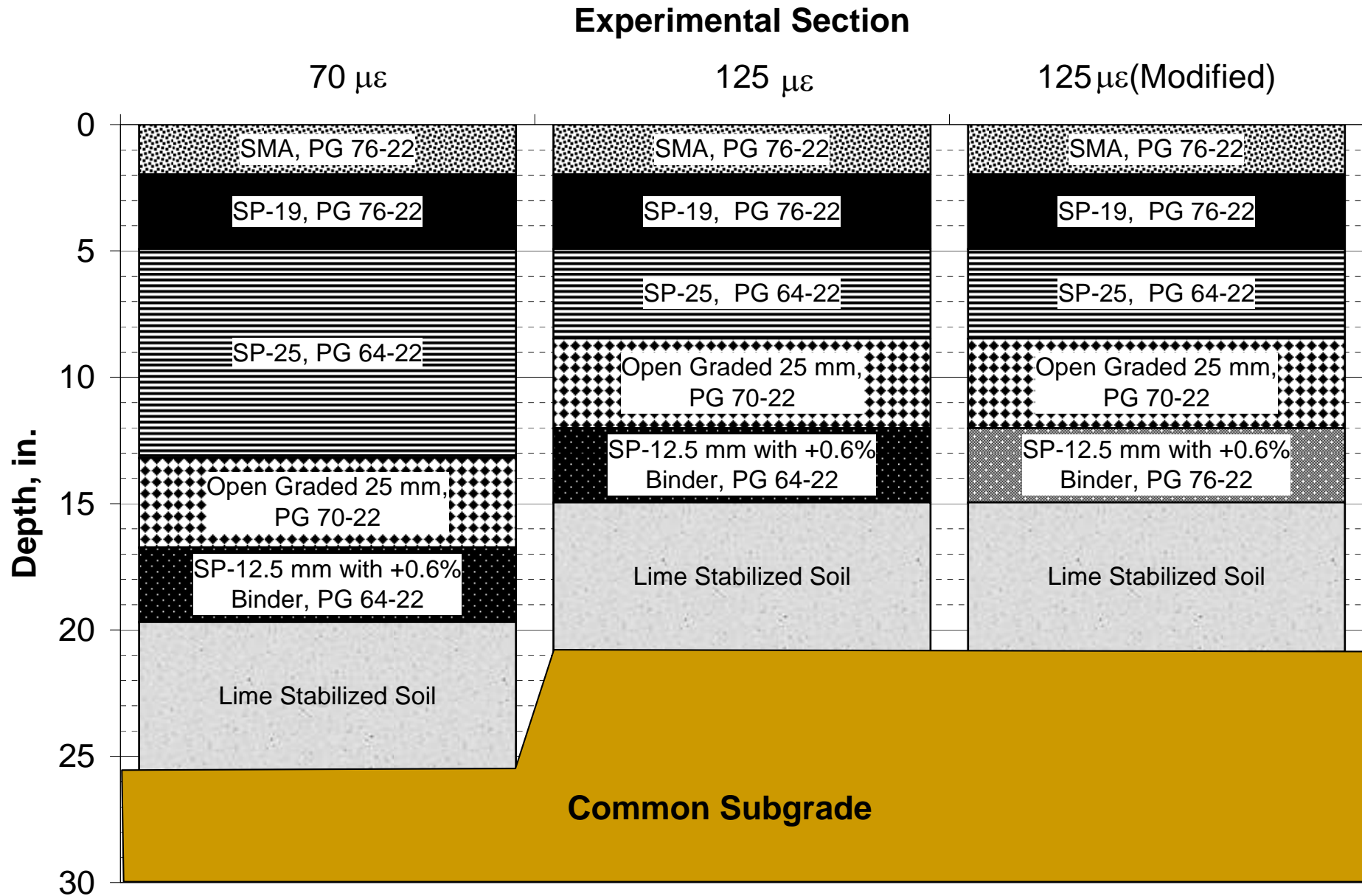
Legend:

- U.S.-Single (Blue line)
- China-Single (Blue line with square markers)
- U.S.-Tandem (Red line)
- China-Tandem (Red line with square markers)

**34,000 lb**

**74,000 lb**

# Test Sections



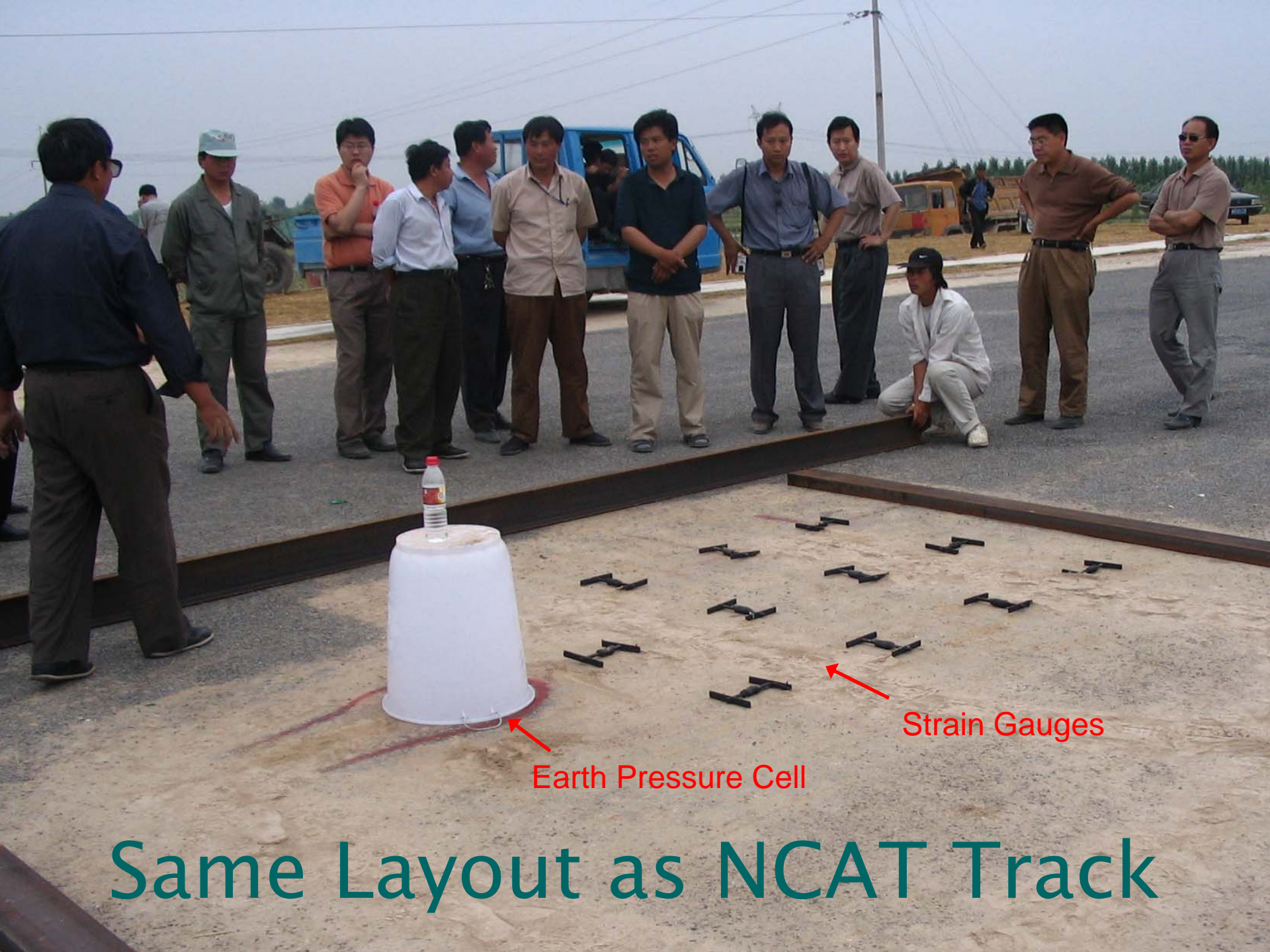
# Construction Site



November 2004

May 2005





Earth Pressure Cell

Strain Gauges

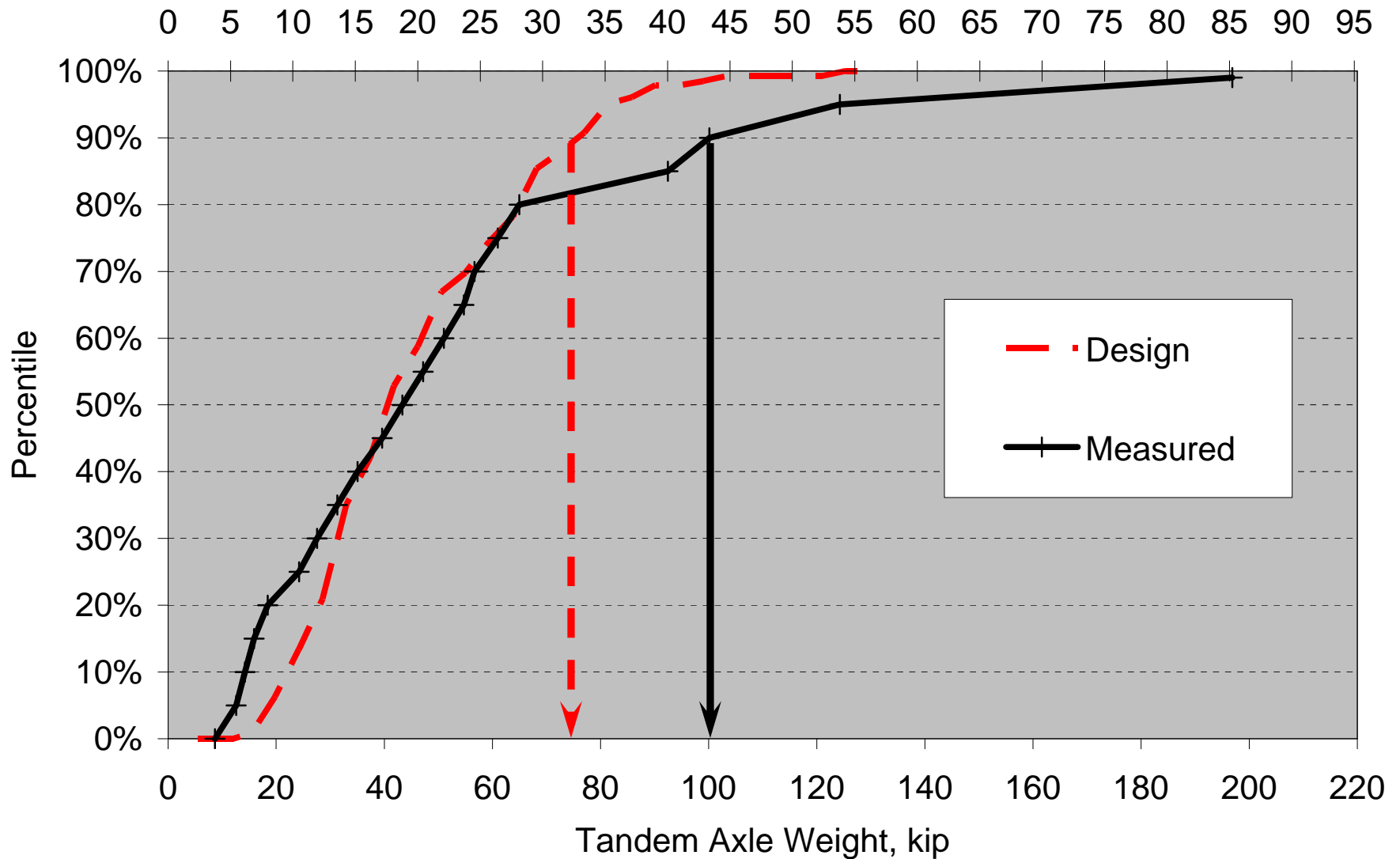
Same Layout as NCAT Track



Completed  
Pavement

# Measured Axle Weight

Tandem Axle Weight, Metric Tons





Current Condition (Dec 2007)







# Preliminary Results

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- 20-inch pavement is perpetual
- 15-inch pavements are perpetual
- 13-inch pavement on soil cement is perpetual
- 6-inch pavement on soil cement is not



U.S. Highways





# Design Data

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- AADT=126,180
- % Trucks=10
- No. Lanes=8

# Applying ME Design

