Comparative Measurements of Tire/Pavement Noise in Europe and the United States – NITE I

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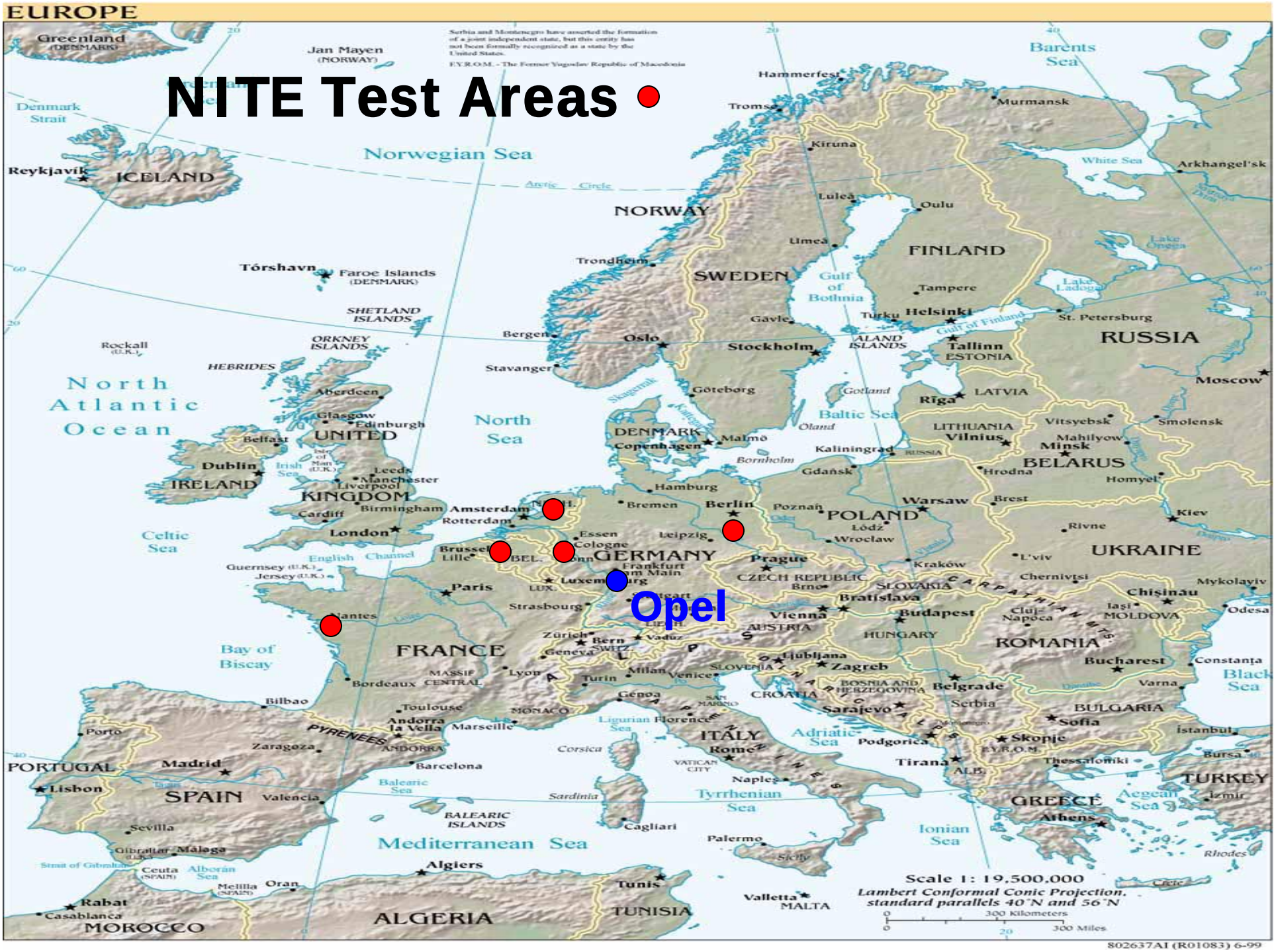
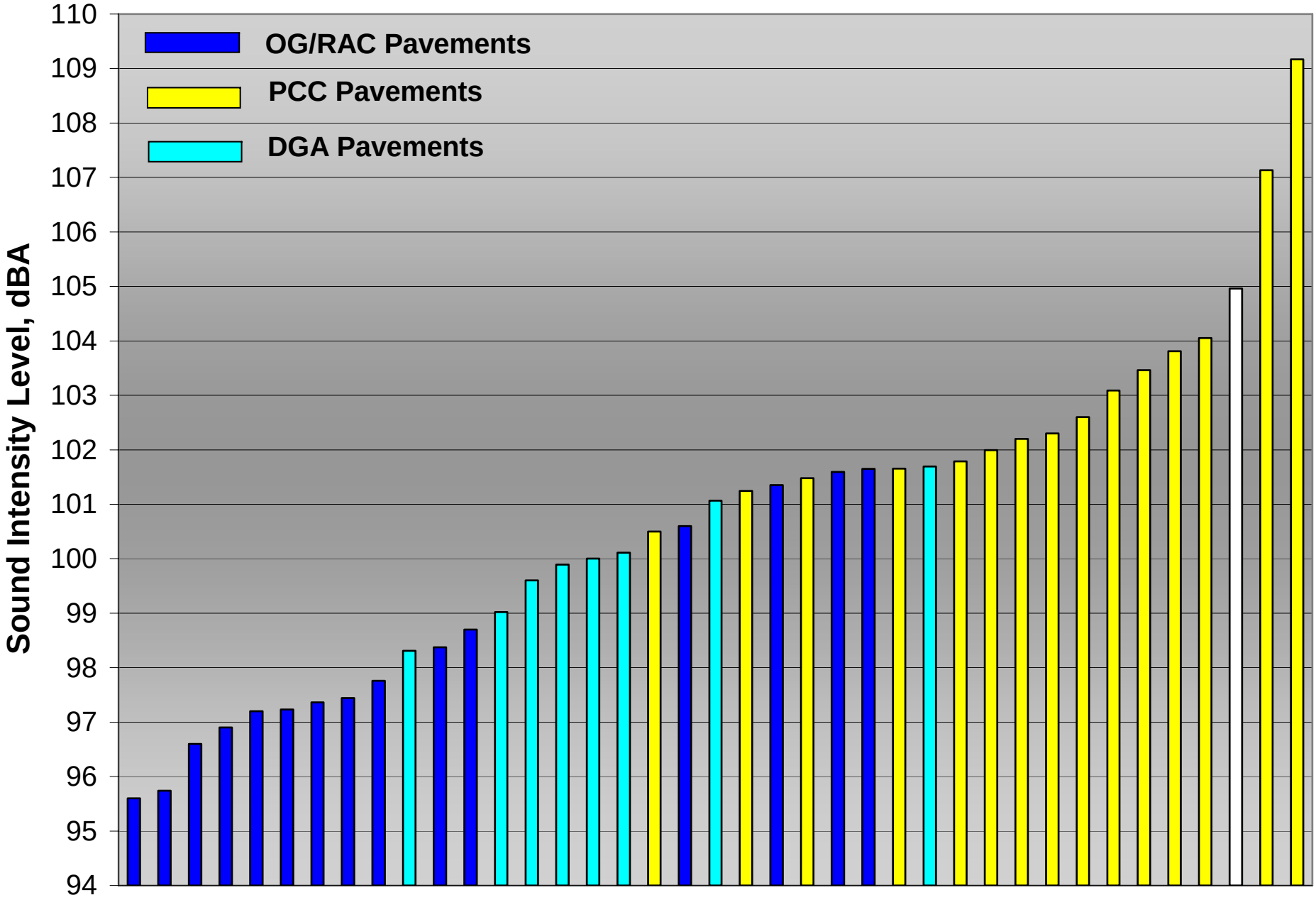
OBSI Workshop
TRB 89th Annual Meeting

NITE Test Areas



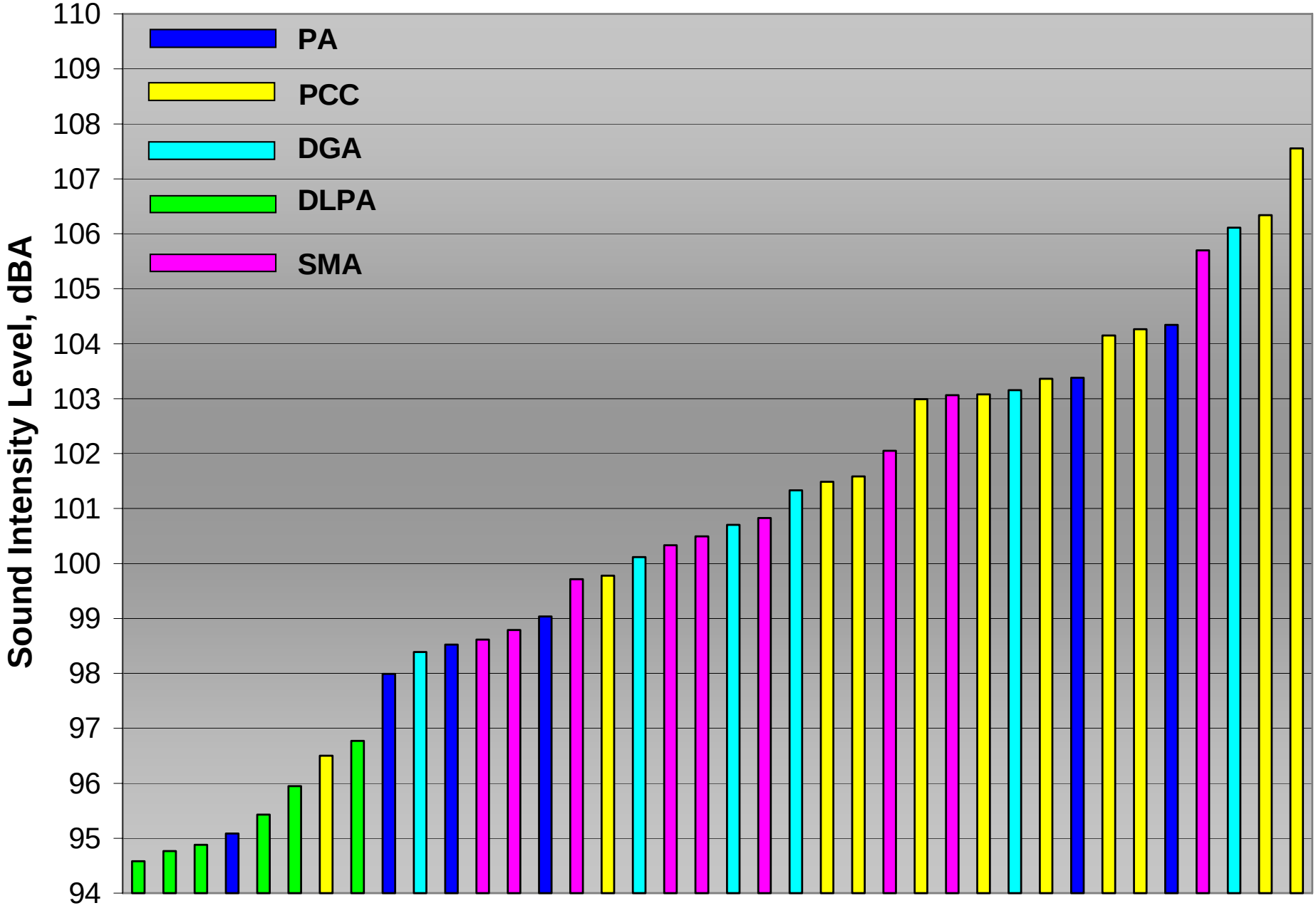
Caltrans Data Base - California & Arizona



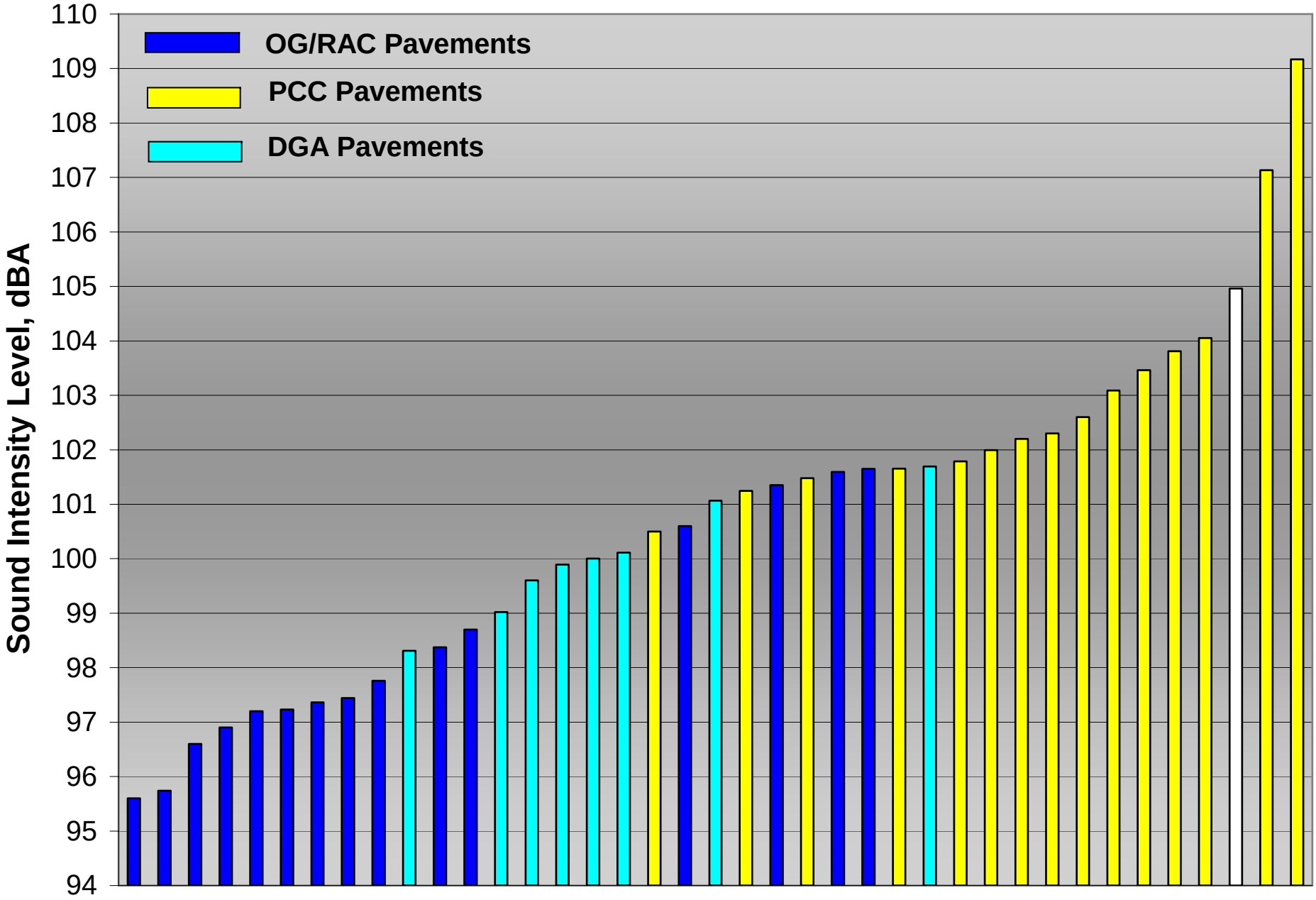
NITE Project - Measurements

- Germany, France, Belgium & the Netherlands
- Test speeds
  - 97 km/h (60 mph) primary speed - 62 pavements
  - 56 km/h (35 mph) secondary speed - 33 pavements
- Test tires
  - Caltrans standard tire – Goodyear Aquatred 3
  - Alternate tire – Uniroyal Tiger Paw AWP

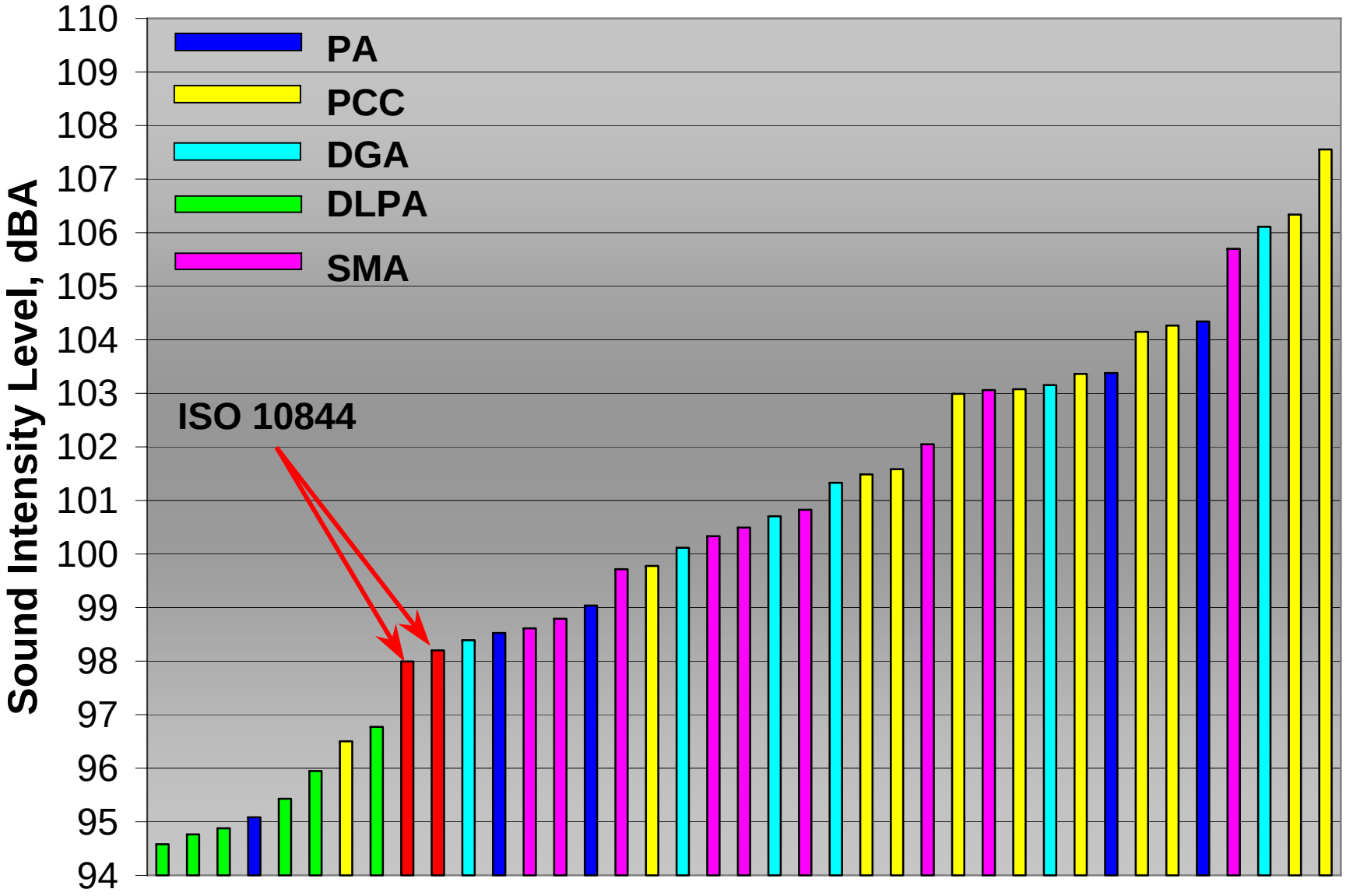
European Pavements at 97 km/h



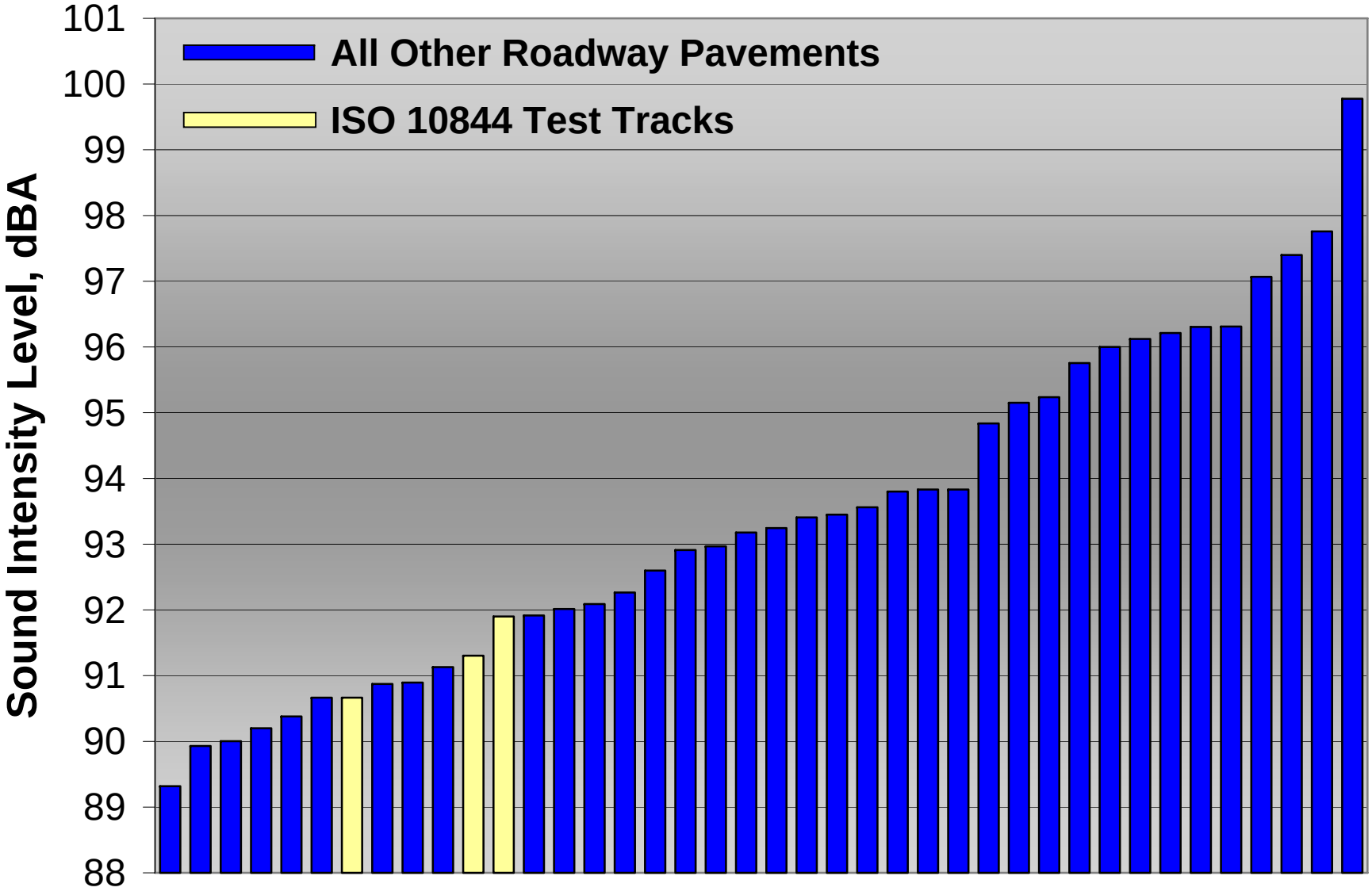
Caltrans Data Base - California & Arizona



NITE Data Base at 60 mph



NITE & CA/AZ Data Base at 35 mph

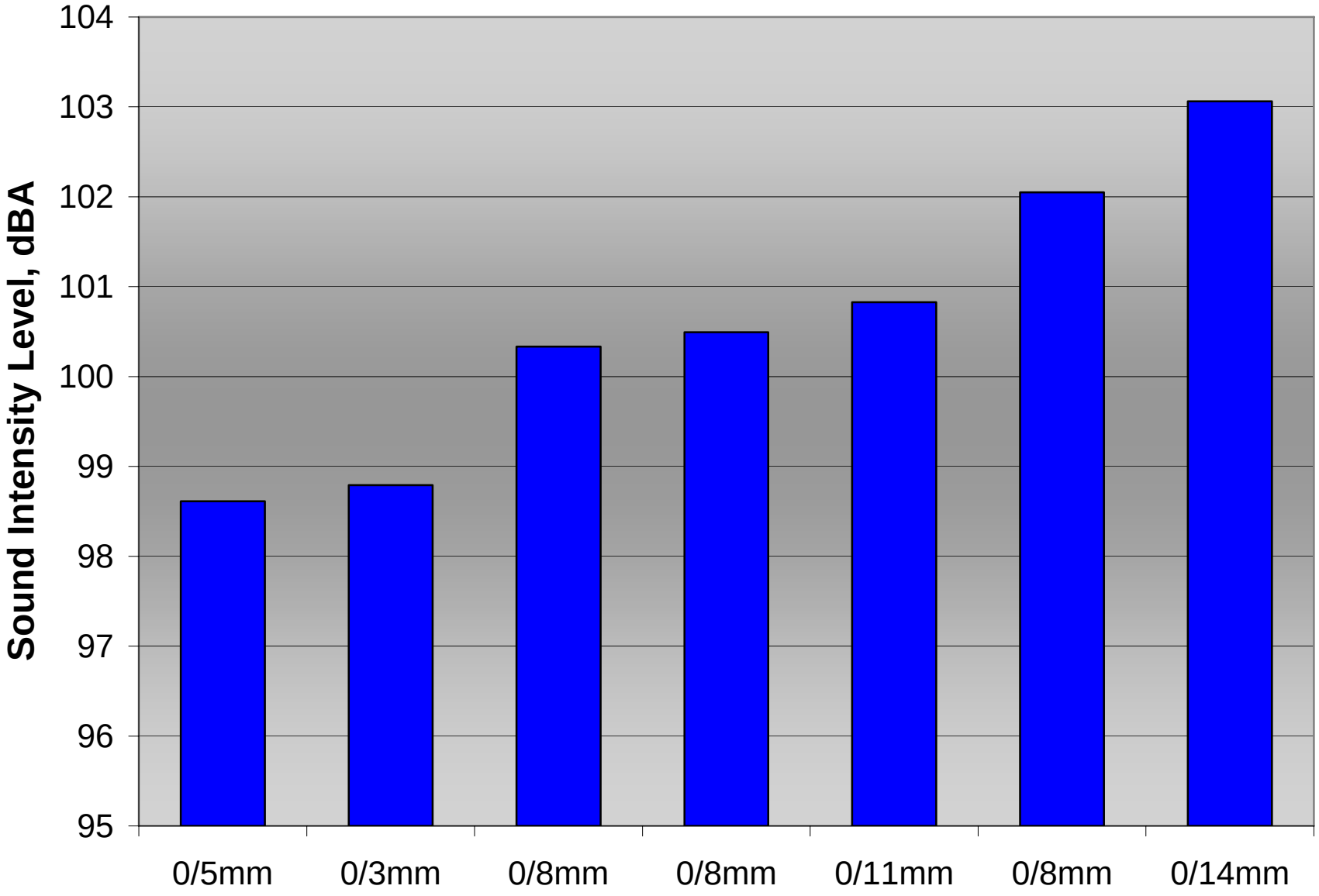


Coarse & Fine SMA Surfaces

8/10mm – 105.7 dBA

0.8/1.5mm – 99.7 dBA

Stone Mastic Asphalt Surfaces of Varying Aggregate Size

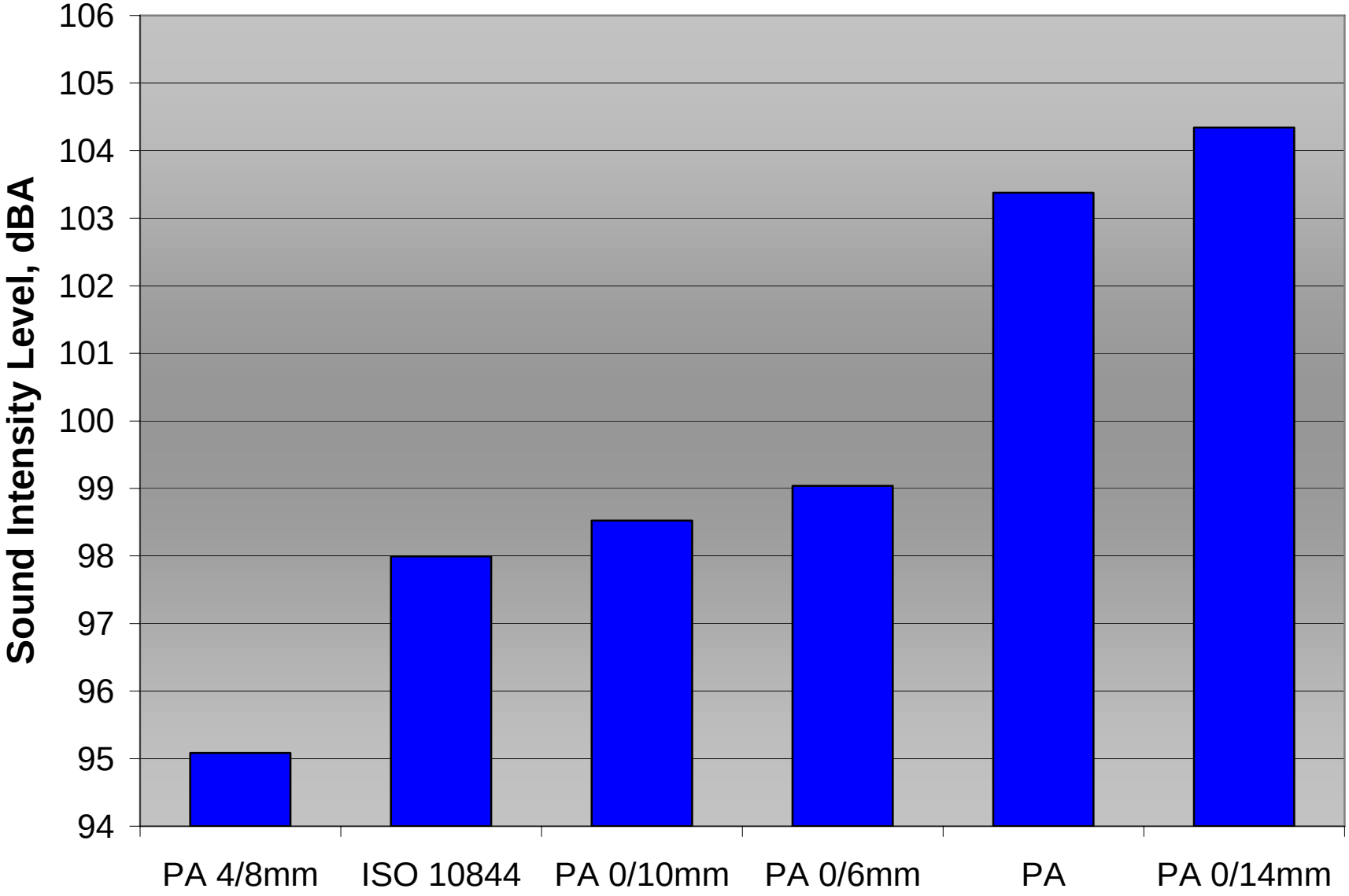


Coarse & Fine DGA Surfaces

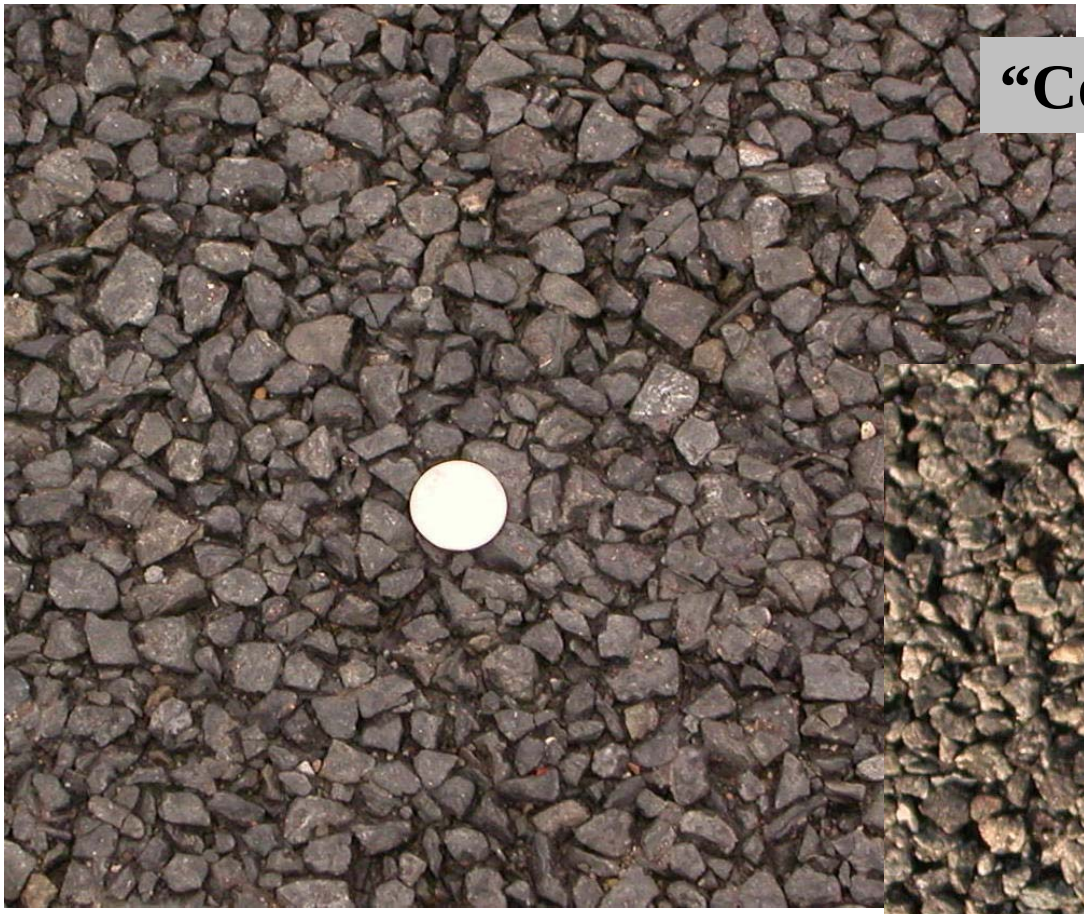
0/10mm – 101.3 dBA

“Fine” – 98.4 dBA

Single Porous Layer Asphalt Surfaces of Varying Aggregate Size



Coarse & Fine Porous AC Surfaces



“Coarse” – 103.4 dBA

0/10mm – 98.5 dBA

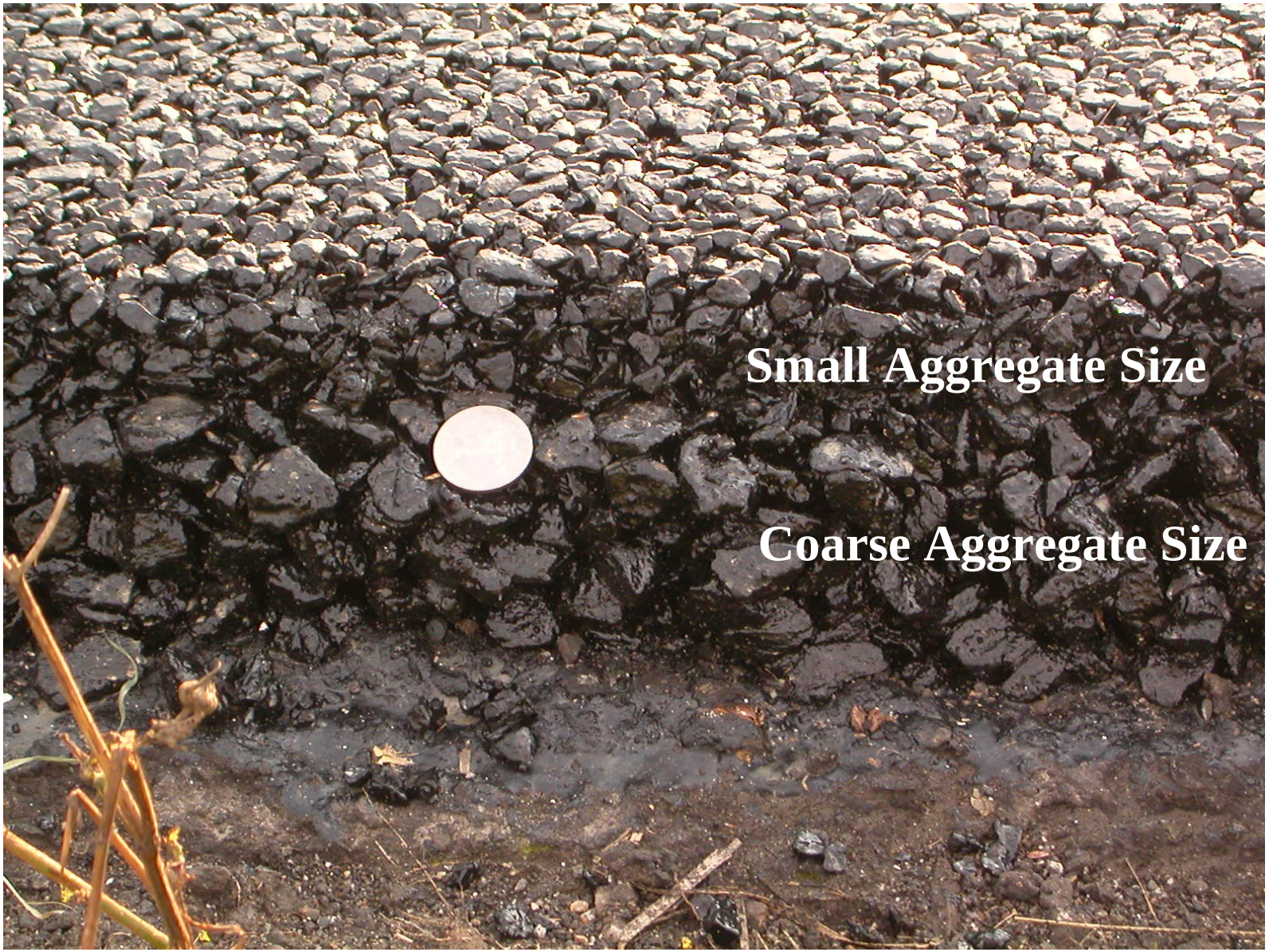
Examples of “Porous” AC Surfaces

4/8mm – 95.1 dBA

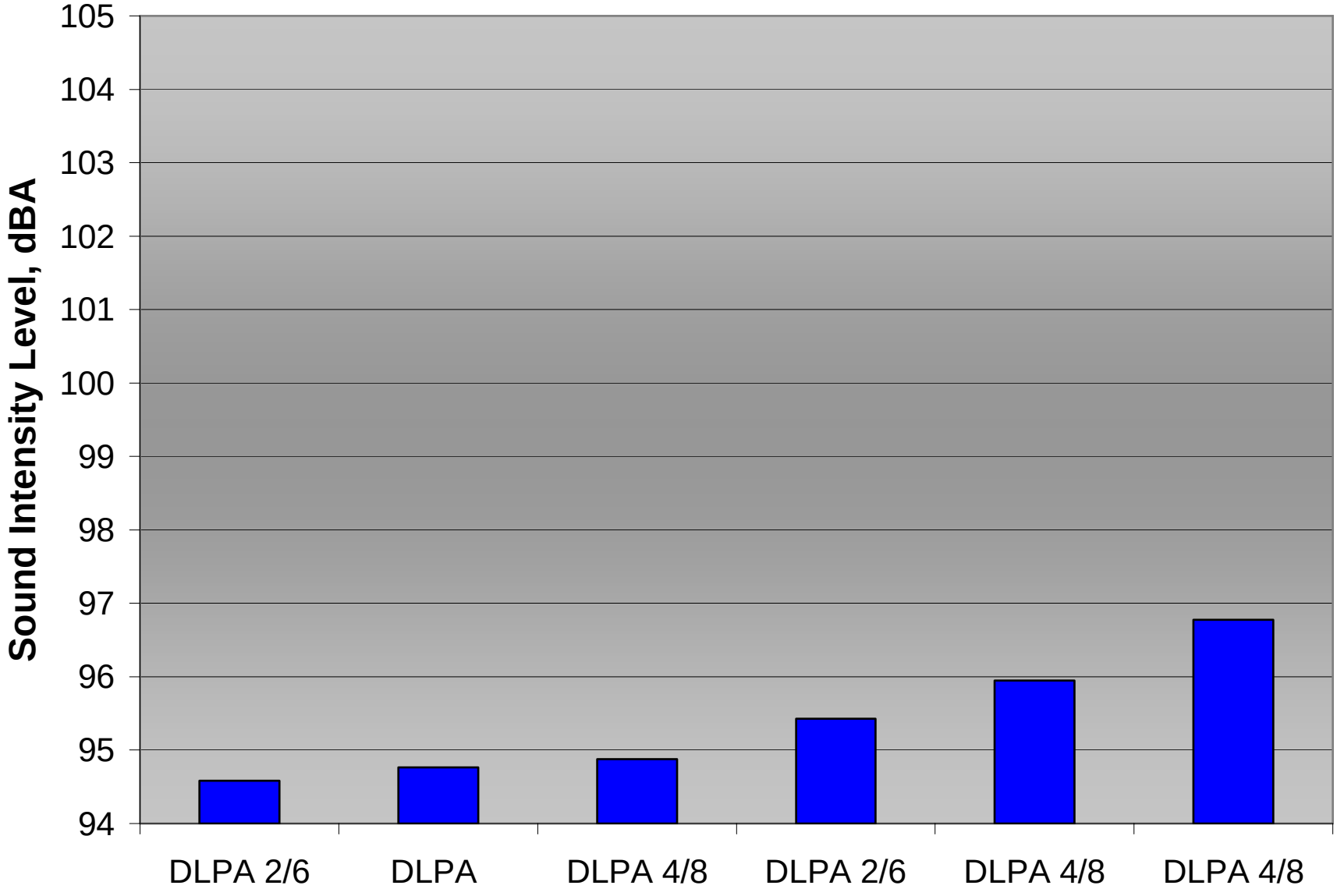
ISO – 98.0 dBA

Typical 2-Layer Porous Asphalt

the Netherlands



Double Porous Layer Asphalt Surfaces of Varying Aggregate Size

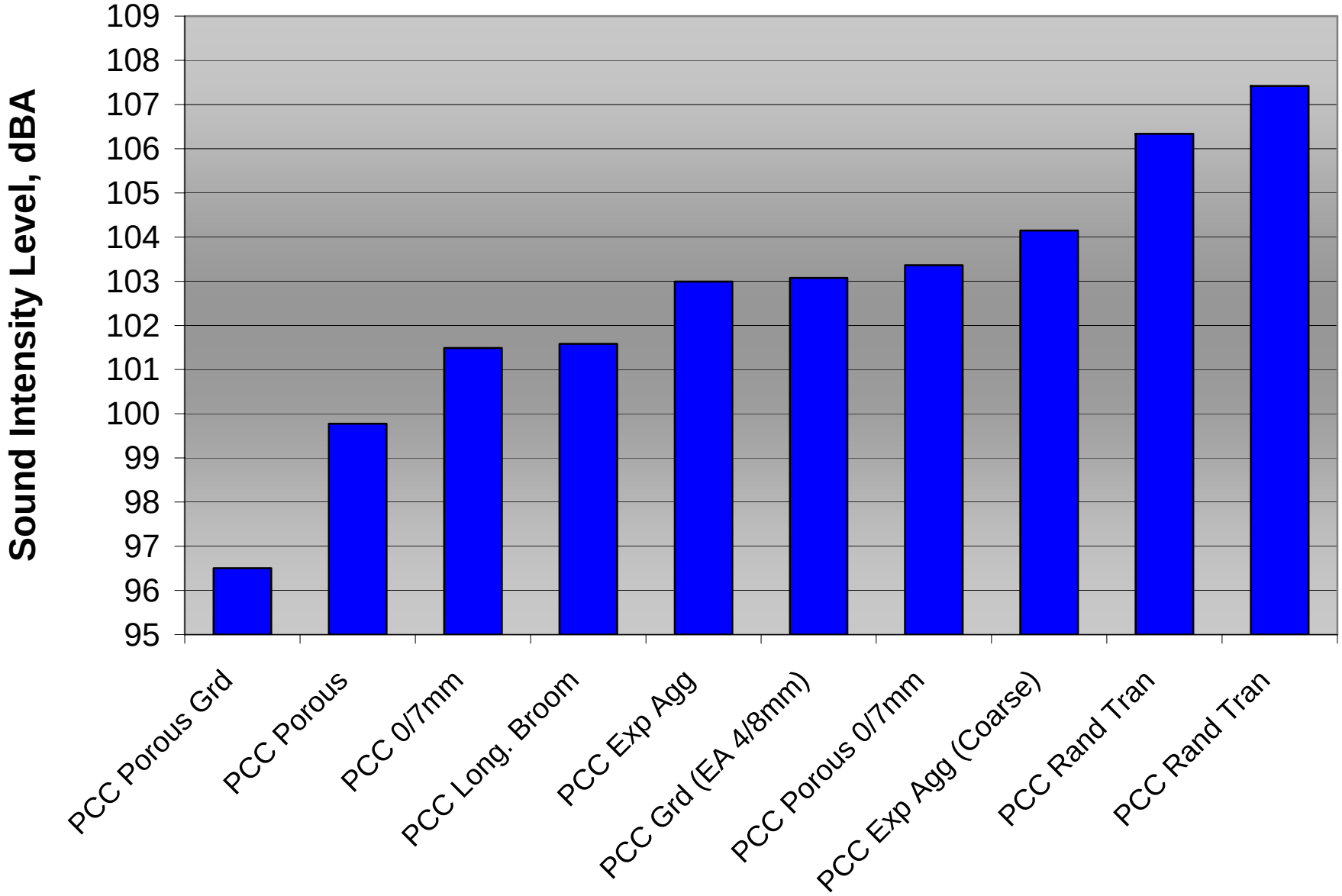


Coarse & Fine Top Surfaces for Double Layer Porous AC

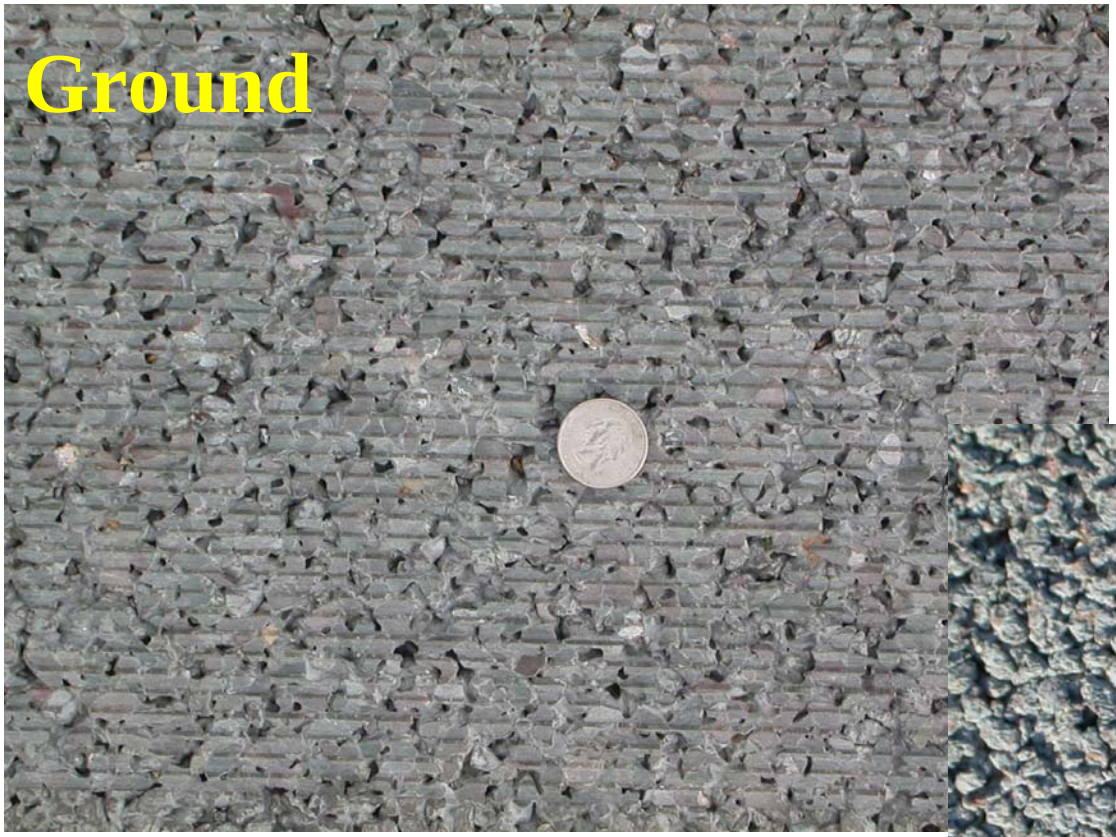
4/8mm – 96.6 dBA

2/6mm – 94.5 dBA

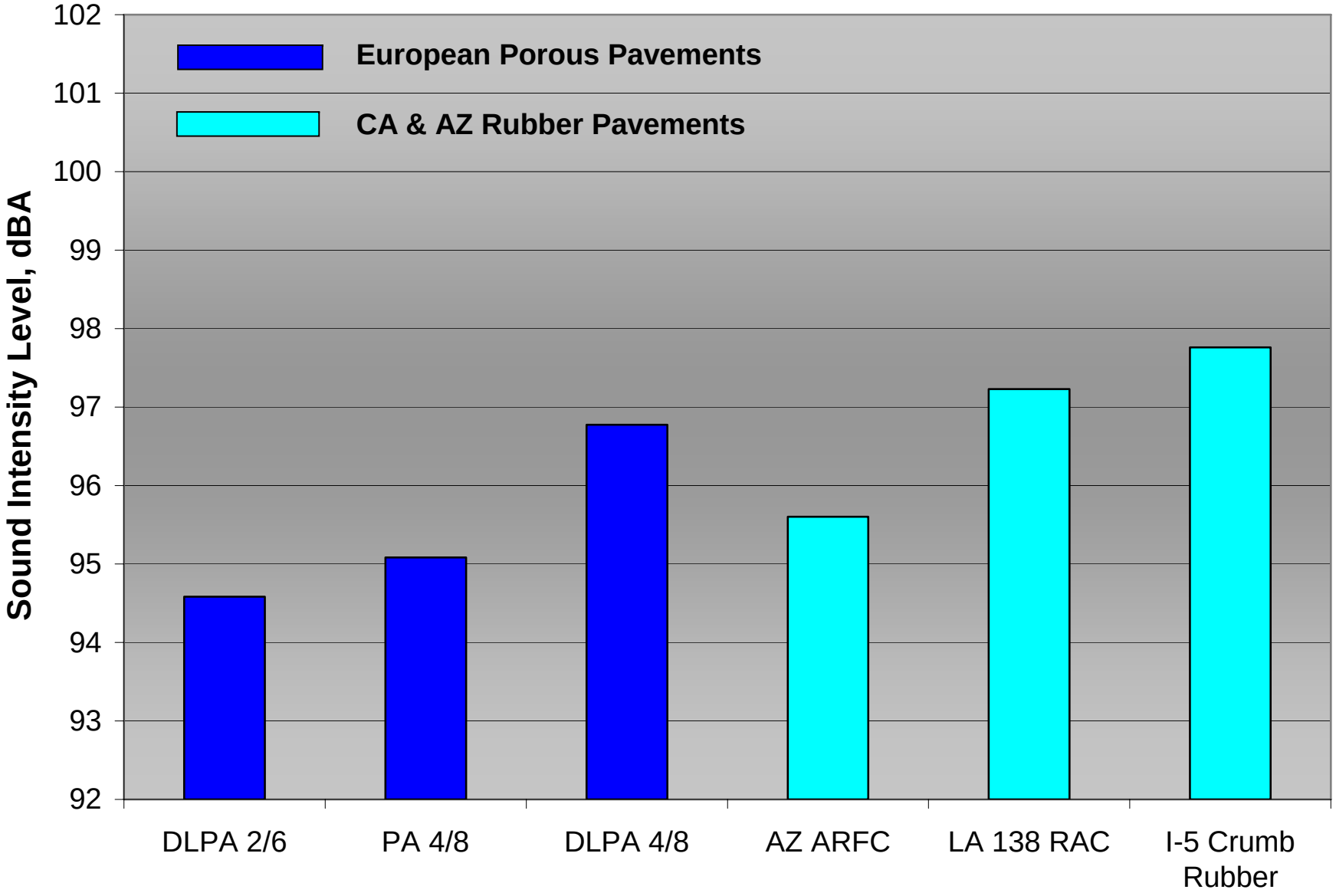
PCC Surfaces



Quiet Porous PCC Surfaces



Comparison of Highly Porous and Rubber Content Pavements



NITE I Findings

- Pavements in Europe & US generally similar
- SMA surfaces similar to DGA with noise determined largely by aggregate size
- Exposed aggregate PCC's not found to be “quiet”
- More novel quieter pavements
  - Highly porous, 2-layer AC constructions
  - Ground porous PCC
- ISO 10844 test surface is on the quieter side of in use pavements