Optimizing Pavement Function (Wearing Course Design/Selection)

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Topic Introduction

Role of wearing course:

- Comfort and safety of user
- Environment impact
- Service life of underlying structure

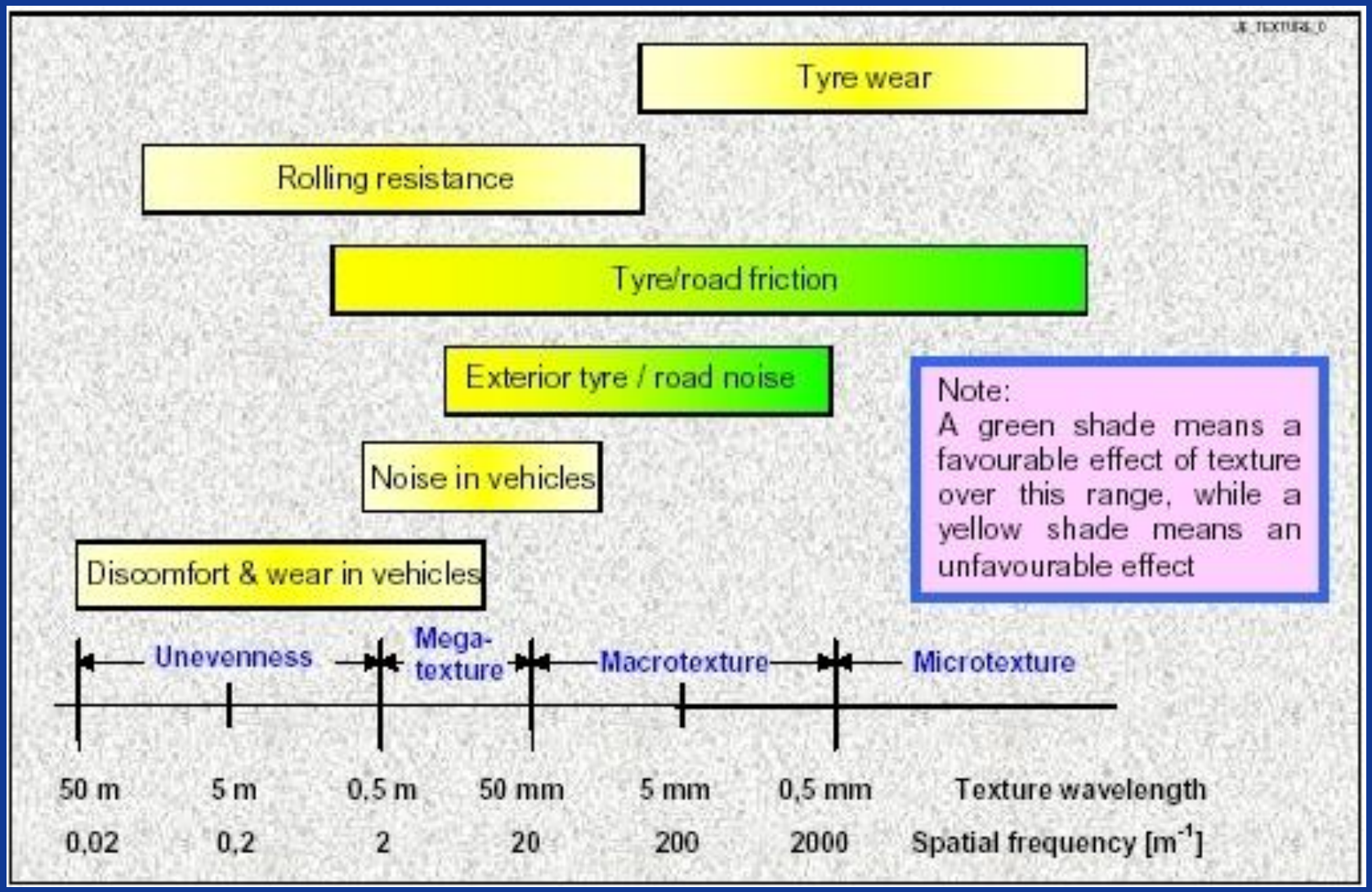
Special surfaces/materials:

- Open-graded & porous mixes($$)
- Ultra-thin bonded wearing courses($$)
- HFS – high PSV aggs./epoxy resins ($$$)
- Fine dense-graded mixes?($)

Topic Relevance

- In free-market societies, Value…Marketability…Sustainability of anything depends on its ability to supply something for which there is demand.
- The point where pavements meet the demands of the traveling public is at the wearing surface

What We Know


Tyre wear
Rolling resistance
Tyre/road friction
Exterior tyre / road noise
Noise in vehicles
Disoomfort & wear in vehicles
Note:
A green shade means a favourable effect of texture over this range, while a yellow shade means an unfavourable effect
Unevenness
Mega-texture
Macrotexture
Microtexture
50 m
5 m
0,5 m
50 mm
5 mm
0,5 mm
Texture wavelength
0,02
0,2
2
20
200
2000
Spatial frequency [m-1]

Gaps?

- Trade-offs between functional characteristics and service life
- High Texture:
  - Good splash/spray & skid resistance
  - Poor noise, rolling resistance, & durability
- Low Texture:
  - Poor splash/spray and wet-night visibility
  - Lower noise and rolling resistance
- Good combination → high costs

Research Questions

- Incorporate functional requirements in Design
  - Proactive/rational method for determining functional expectations/needs?
- Performance requirements that address user
  - Addressing with “mix” of special surfaces?
  - Justify additional costs?
- Performance measures that address non-traditional contracting scenarios (e.g., DBM, M-O, etc.)
  - safe, comfortable, financially viable, and environmentally sustainable facilities?

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Questions & Comments