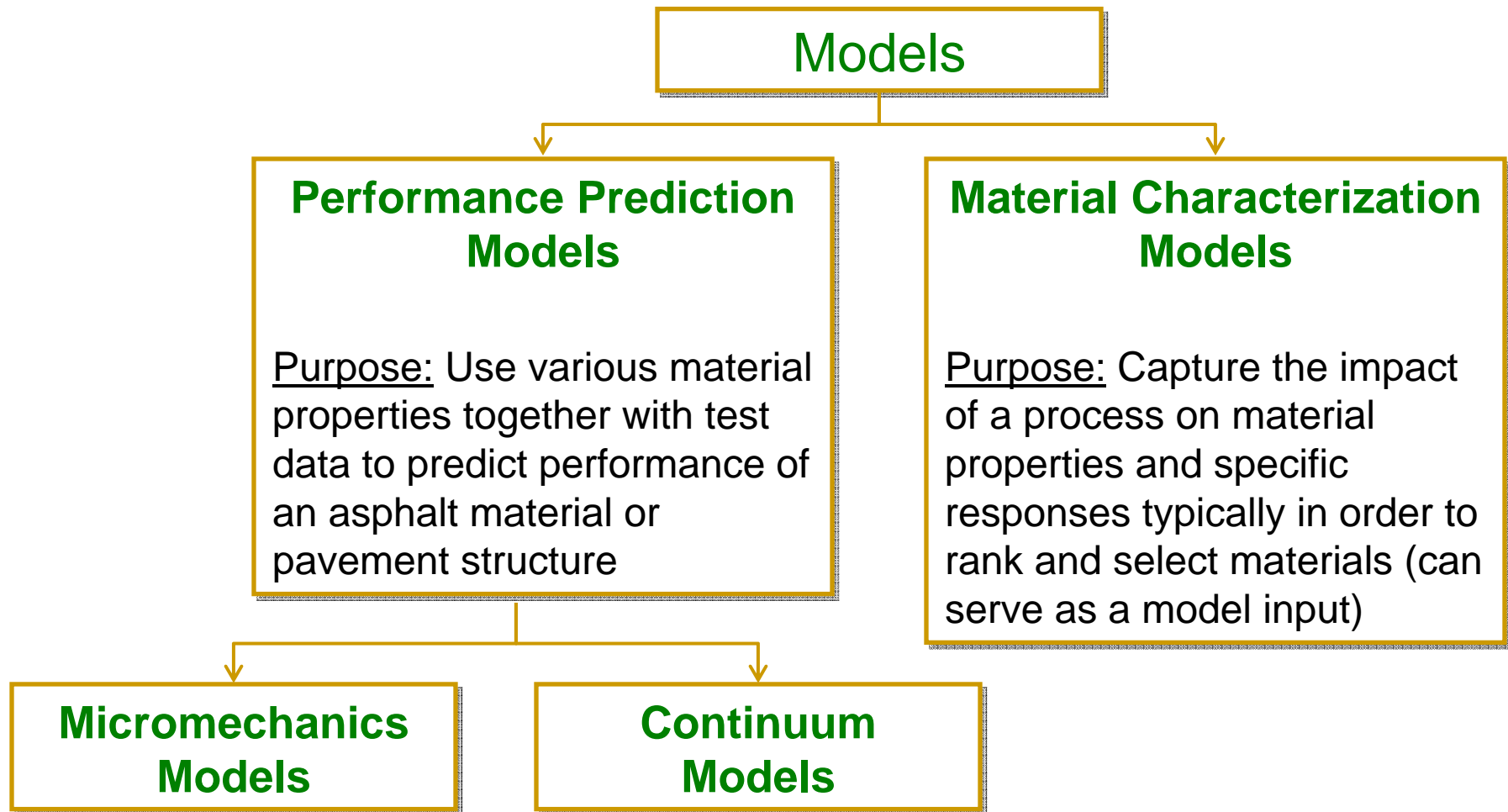

Asphalt Research Consortium

Comparing Modeling Approaches

Models ETG – Chicago, June 2008

Background



Background

- There may be more than one approach in each category to accomplish a similar objective
 - In most cases, this redundancy is either apparent or exists by design
 - Following is a summary of this is addressed in each one of three modeling categories
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Micromechanics Models

Criteria for selecting the most appropriate micromechanics model will be based on its ability to:

- generate input that will help development of the continuum model,
 - predict laboratory performance of mixtures,
 - predict performance of mixtures used in various test sections
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Continuum Models

Criteria for selecting the most appropriate continuum damage model will be based on its ability to:

- accommodate inputs from other models such as the micromechanics models, and
 - predict performance of various pavement test sections
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Materials Characterization Models

- In most cases the models have very clear and distinct objectives, e.g. models for healing, oxygen diffusion, moisture diffusion etc.
- In some cases, it may be apparent that more than one model is being used to achieve the same objective

Crack growth index

Characterizes fatigue damage based on fracture mechanics and evaluates the relationship between fundamental material properties and crack growth

Continuum damage model

Characterizes cumulative effect of crack growth on the bulk material

Accuracy of both models depends on the accurate determination of visco-elastic properties to determine pseudo stresses and strains based on Schapery's approach