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Update on VDOT's Asphalt Research Activities

Jose Gomez
Director of Research

Virginia Asphalt Association Fall Meeting
October 8, 2013

NCHRP Project 9-51

"Material Properties of Cold In-Place Recycled and Full-Depth Reclamation Asphalt Concrete for Pavement Design"

- Current work:
  - Receiving cored samples from agencies in Canada and the US for dynamic modulus (stiffness) and repeated-load permanent deformation (rutting) testing.
  - Work is expected to continue through 2014 with cores from an anticipated 25 projects

Alternate Uses of RAP

VCTIR asked to explore alternate uses of RAP beyond HMA/WMA blends

- Meeting of Elko, VCTIR, and District folks
- Proposed Unbound applications:
  - Blends for unbound aggregate base for pavements
  - Use for unpaved road stabilization/shoulders
  - Use as embankment fill

Alternate Uses of RAP

RAP in unbound aggregate pavement base

- Establish a research project to evaluate impacts on:
  - Compaction
  - Drainage
  - Stability
- Determine acceptance criteria

Alternate Uses of RAP

Unpaved Road and shoulder stabilization

- Trial maintenance applications to be performed using either in-house or contract forces.
- Monitor impacts on compaction and stabilization.
- Assess whether any environmental concerns exist.

Alternate Uses of RAP

RAP as embankment fill

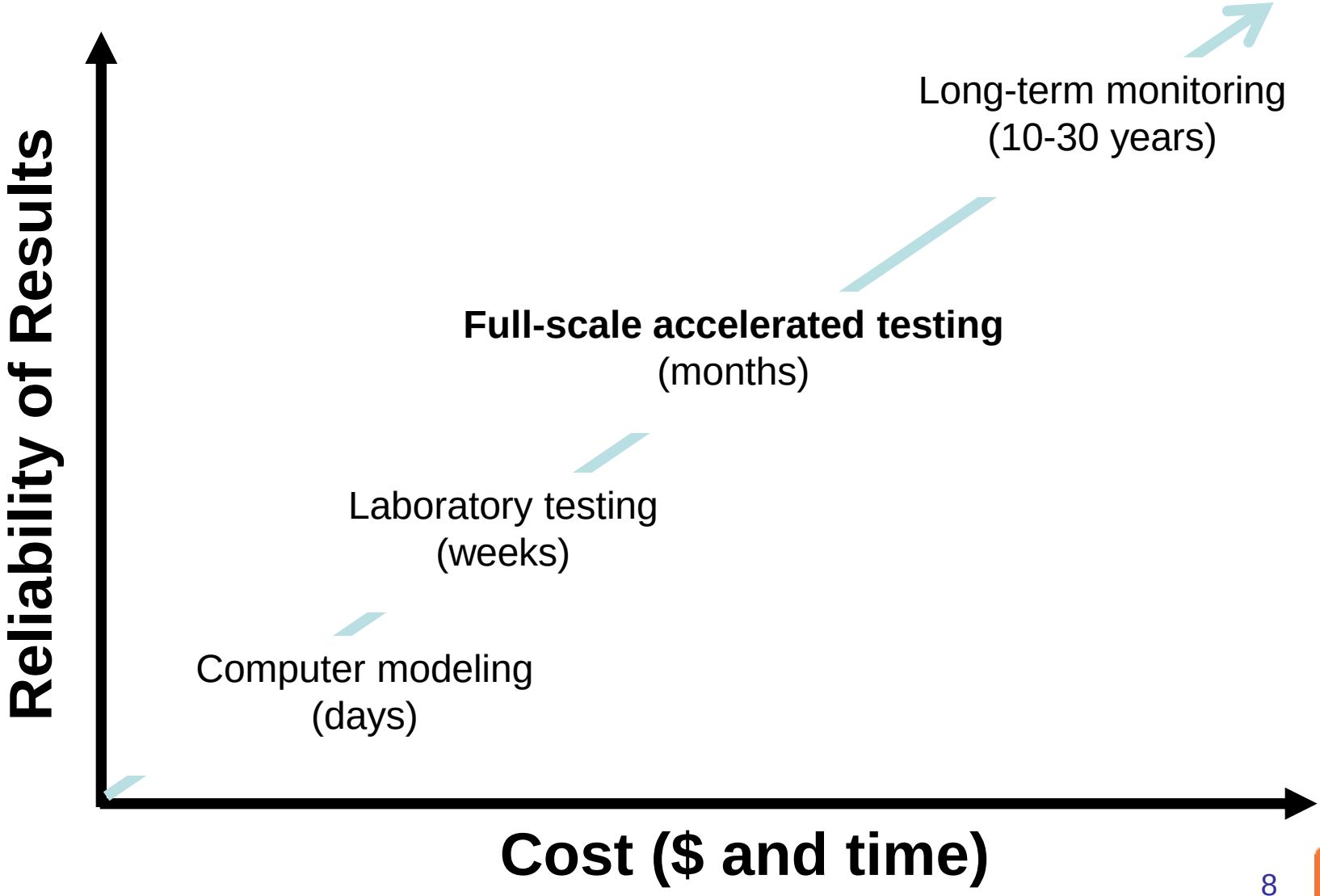
- Conduct field trials and monitor
  - Compaction
  - Necessary cover
  - maximum heights (stability)
  - Waterflow and environmental influence
  - Viscoelastic (creep) settlement

Full-Scale Accelerated Pavement Testing

- A means to study pavement performance
  - under more controlled conditions
  - more rapidly
  - with less risk to the traveling public / agency

- Heavy Vehicle Simulator (HVS)
  - Dynatest
  - 5 units operating in the US
  - $3 million

Tradeoffs in Pavement Testing



CalTrans / UC Davis

CalTrans / UC Davis

VDOT APT Program

- Address strategic issues
  - Materials & designs, rehabilitation alternatives, vehicle characteristics, etc.
  - Better quantify results by testing under controlled conditions
  - Educate future agency pavement staff

- Costs
  - Significant cost to startup and operate
    - However, a small % of VDOT's total pavement maintenance budget (~ $500 million per year)

Pavement Research Scientist

Benjamin F. Bowers

- Ph.D., Civil Engineering / Geotechnical and Materials Engineering
  University of Tennessee, Knoxville
  - Dissertation: Investigation of Blending Efficiency and Some Special Problems in Asphalt Paving Mixtures Utilizing Analytical Chemistry Techniques
  - Advisor: Dr. Baoshan Huang
- M.S., Civil Engineering / Geotechnical Engineering (2010)
  University of North Carolina at Charlotte
  - Thesis: Effect of Calcium Chloride on Cement Stabilization of Soils
  - Advisor: Dr. John L. Daniels
- B.S., Civil and Environmental Engineering (2009)
  University of North Carolina at Charlotte

Pavement Research Scientist

Benjamin F. Bowers

FUNDED RESEARCH EXPERIENCE

- NCDOT - research on cold weather cement stabilization of soils. Featured cement, lime, sodium chloride and calcium chloride additives in laboratory and field applications.
- National Natural Science Foundation of China (NSFC) - research on the erosion characteristics of fly ash treated with organo-silane solutions while abroad in Xuzhou, Jiangsu, China.
- TennDOT - field collection and lab testing of asphalt pavement with low to high Reclaimed Asphalt Pavement (RAP) contents.
- TennDOT - field collection and lab testing of Warm Mix Asphalt (WMA) pavements using foaming and chemical additives.

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For more information:

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