



Pavement Preservation

Reducing Costs—Extending Life Cycles

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Research Program Title:

Pavement Design and Preservation

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Study Timeline

Multiple projects, 2007-2013

Report References

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Alaska DOT&PF
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Project Partners

Alaska DOT&PF
California Pavement Preservation
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Summary

This research provides Alaska DOT&PF with tools to extend pavement life-cycle and reduce maintenance costs.

Problem/Objective

Alaska's pavement faces challenges to its life-cycle unlike those found in any other state. Permafrost and frozen ground cause costly pavement damage, leaving Alaska DOT&PF with annual surface maintenance costs up to \$140 million. Alaska's limited construction season, extreme climates, and remote locations add to existing pavement preservation challenges by driving up costs, energy and material use, and labor needs.



Outcomes and Products

- Tested and deployed composite wicking fabric to reinforce asphalt pavements in Alaska.
- Identified cost-savings measure to improve current crack sealing methods.
- Provided more accurate characterizations of hot mix asphalt properties.
- Provided safe, cost-effective aggregate testing.
- Enabled more cost-effective designs by including a life-cycle cost analysis in the Alaska Flexible Pavement Design Software.
- Developed and tested protocols to determine concrete curing strength during the construction.
- Enabled safe and quick warm mix asphalt performance under very cold conditions.
- Developed pavement preservation guidelines to save costs and decrease energy emissions.
- Identified the three most cost-effective pavement preservation treatments for Alaska surfaces.
- Field tested a locally-manufactured fast-set Magnesium Phosphate Cement overlay with 8,000-12,000 psi compressive strength.

Implementation

Studies show that implementing a statewide pavement preservation program can save more than 50% in costs over a pavement system's 20-year life-cycle. Toward this goal, our research has seen multiple implemented benefits from this broad program of research:

- Improved usage of asphalt treated base course material.
- Improved pavement designs and lowered costs by using locally available materials.
- Improved hot mix asphalt quality assurance specifications.
- Improved flexible pavement design methods.
- Reduced energy costs by spreading hot mix asphalt at lower temperatures.