

State Planning and Research Program Quarterly Report

PROJECT TITLE: Understanding the Chemical and Mechanical Performance of Snow and Ice Control Agents on Porous or Permeable Pavements

OBJECTIVES: The objectives of this research are to identify the primary chemical and mechanical interactions that occur when deicers are applied to textured or porous pavements before, during and after a winter storm to determine optimal winter maintenance strategies and application rates for treating these types of pavements

PERIOD COVERED: July 1, 2014 – September 30, 2014

PARTICIPATING AGENCIES:

Western Transportation Institute, Montana State University – Bozeman

PROJECT MANAGER:

Tom Peters and Ashley Duran

SP&R PROJECT NO:

TPF-5(218)
MnDOT Contract No.99006

PROJECT IS:

Planning
 Research & Development

LEAD AGENCY:

Minnesota Department of Transportation

PRINCIPAL INVESTIGATOR:

Michelle Akin

PROJECT BUDGET:

\$185,000

PROJECT EXPENDITURES TO DATE:

\$115,029.22

WORK COMPLETED:

Task 0 – Project Management

- Teleconference on July 2, 2014: discussed lab testing components and matrix of tests

Task 1 – Literature Search - COMPLETE

Task 2 – List and Categorize Pavement and Overlay Types - COMPLETE

Task 3 – Interviews - COMPLETE

Task 4 – Lab Testing

- Conducted baseline (no deicer) testing on dense pavements and ultrathin friction course pavements. In general the snow bonded more strongly to the permeable pavements than the dense pavements. However, after plowing the snow, the friction was generally greater even though snow remained packed in the voids and gave the appearance of low friction.
- Determined particle size and application rate for testing solid salt. Target application rate is 250 lb/LM using sieved salt that passes No. 8 and is retained on No. 10 sieve. 152 salt particles are placed in a grid with 1 inch spacing.
- Conducted CT scans to determine appropriate settings for viewing pavement structure.

Task 5 – Analyze Chemical and Mechanical Interactions – no progress during this period

Task 6 – Synthesize Best Maintenance Practices – no progress during this period

Task 7 – Recommend a Plan of Study – no progress during this period

Task 8 – Reporting

- Submitted Quarterly Report #6

SUMMARY OF ACTIVITIES EXPECTED TO BE PERFORMED NEXT QUARTER:**Task 0 – Project Management**

- Teleconference to discuss preliminary lab testing results

Task 1 – Literature Search – *completed***Task 2 – List and Categorize Pavement and Overlay Types - *completed*****Task 3 – Interviews - *completed*****Task 4 – Lab Testing**

- Conduct CT scans to determine appropriate settings for analyzing presence of deicer, snow, air and pavement
- Procure additional pavement samples (cores from in-service pavements and new OGFC pavement slabs)
- Continue conducting experiments

Task 5 – Analyze Chemical and Mechanical Interactions

- Begin analyzing data for trends and statistically significant differences between dense and porous/permeable pavements

Task 6 – Synthesize Best Maintenance Practices – no progress anticipated during this period**Task 7 – Recommend a Plan of Study – no progress anticipated during this period****Task 8 – Reporting**

- Write Quarterly Report 8

STATUS:

The project is currently on budget for a revised schedule:

Task	Start Date	Completion Date	Status
0 – Project Management	2/1/2013	9/30/2015	On-Going
1 – Literature Search	2/1/2013	5/31/2013	Completed
2 – List & Categorize Pavement & Overlay Types	6/1/2013	6/30/2013	Completed
3 – Interviews	6/1/2013	1/31/2014	Completed
4 – Lab Testing	3/1/2014	12/31/2015	On-Going
5 – Analyze Chemical & Mechanical Interactions	12/2/2014	2/28/2015	Not Started
6 – Synthesize Best Management Practices	3/1/2015	4/30/2015	Not Started
7 – Recommend a Plan of Study	5/1/2015	5/31/2015	Not Started
8 – Reporting	5/1/2013	9/30/2015	On-Going