

SOLUTIONS



RESEARCH PROGRAMS WINTER 2007

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PROJECT HIGHLIGHTS

MONTANA AIR SERVICE:

OPPORTUNITIES AND CHALLENGES

http://www.mdt.mt.gov/research/projects/aer/air_challenges.shtml

MDT, in conjunction with the Montana Department of Commerce, initiated a research project in late 2004 to report on the status of air service in Montana and to make recommendations on how the state can improve and expand its air service. A team consisting of Wilbur Smith Associates, Morrison Maierle, and the Louis Berger Group conducted the study. The goal of the research was to provide a historical framework from which to understand changes in air service. With the framework established, an analysis of national and state trends was conducted to set the stage for determining the opportunities and challenges in improving air service in Montana.

Airport infrastructure needs, intermodal concerns, and long-range transportation policy issues were considered as they relate to development of a strategy for air service enhancements. The project also established work plans to achieve the goal of improved and expanded air service. The study found that Montana is one of the lowest-ranking states in the continental U.S. for passenger activity. It also has some of the highest airfares in the country. When ranked by outbound domestic passengers, Montana ranked 39th in the continental U.S. in 2005. When ranked by average one-way fares, Montana was 45th, the fourth highest. The average one-way fare paid by domestic passengers originating in Montana was \$168.14 in 2005—\$24 more than the average one-way fare paid by other U.S. domestic passengers. The research recommendations include: 1) continue to support the Essential Air Service, a federal program to guarantee scheduled air service to small communities; 2) establish a statewide air service committee; and 3) create an air-service development program and initiate a statewide marketing campaign.

For more information, contact Craig Abernathy at 406-444-6269 or cabernathy@mt.gov.



COMPARATIVE ANALYSIS OF COARSE SURFACING AGGREGATE USING THE MICRO-DEVAL, L.A. ABRASION, AND SULFATE SOUNDNESS TESTS

http://www.mdt.mt.gov/research/projects/mat/coarse_aggregate.shtml

The Montana Department of Transportation (MDT) currently uses the Sodium Sulfate Soundness test and the Los Angeles Abrasion and Impact test (L.A. Abrasion test) to determine aggregate quality. The objective of this study was to investigate whether the Micro-Deval test will provide better, timelier, and more repeatable information about the quality of Montana aggregates than the Sodium Sulfate Soundness test.

Results from the suite of laboratory tests were normalized to facilitate direct comparisons between the three test methods. Normalized test results were obtained by taking the average percent loss for a particular soil and dividing it by the pass-fail standard for that test. Plots were generated to make direct comparisons between the Micro-Deval and Sodium Sulfate tests. Data points within these plots fell within one of two regions: 1) regions where the test results agreed (i.e., pass-pass and fail-fail regions) or 2) regions where the test results disagreed (i.e., pass-fail and fail-pass regions). Linear regression of the data points and the corresponding confidence intervals were examined to aid in qualitatively assessing the degree of positive correlation between test methods.

Based on these results, the Micro-Deval, L.A. Abrasion, and Sodium Sulfate tests appear to correlate well for aggregates that have a relatively low percent loss value. Discontinuities between the three tests begin to appear with materials that have percent losses near the cutoff values. Because of the scarcity of borderline and failing tests, the statistical significance of this observation could not be quantified.

The following observations are presented based on a qualitative review of the results and the 95% confidence bands that were created through a statistical evaluation of the data:

- The largest scatter of data occurred in the comparison between the L.A. Abrasion and Sodium Sulfate tests.
- Of the three tests, the Sodium Sulfate appears to be the most difficult and time-consuming test to perform. This test also has the poorest record for repeatability and the poorest correlation to field durability.
- The Micro-Deval test tended to provide more “conservative” results than the L.A. Abrasion and Sodium Sulfate tests.
- Aggregates that pass the Micro-Deval test will likely also pass the L.A. Abrasion and Sodium Sulfate tests.
- Based on the 95% statistical confidence bands, the authors suggest that the greatest likelihood of pass-fail conflicts will occur when the percent loss of a sample is slightly greater than the Micro-Deval cutoff criteria.

The researchers conclude that the Micro-Deval test is a suitable replacement for the Sodium Sulfate test as the primary test for evaluating aggregate durability. However, because there were some inconsistent durability determinations between test methodologies, the researchers recommend that the Micro-Deval test results be further supported by a second aggregate durability test when the Micro-Deval test result for an aggregate is between 18 and 24 percent loss. Suggested alternative tests include recognized methods such as the Sodium (or Magnesium) Sulfate Soundness test or the L.A. Abrasion test.



MDT is in the process of developing an implementation strategy to transition from the Sulfate Soundness test to the Micro-Deval for aggregate source approval. The new specification will essentially follow the researchers' recommendations. MDT is working to develop the necessary specifications and procedures, which will be presented to the contractors and consultants for comment prior to implementation. MDT anticipates implementing the new specification in all contracts beginning in May 2007. A transition period of one year is expected.

For more information, contact Sue Sillick at ssillick@mt.gov or 406-444-7693.

LIBRARY CORNER

DIGITAL RESOURCES IN LIBRARIES

- Digital resources available through libraries are in the limelight lately. A workshop is available for exploring [digital resources](#) in state government libraries, and is held on recurring dates at Montana State Library. Topics include using databases and journals, government publications, the Natural Resource Information System, DOT library resources, the Natural Heritage Program, and GIS resources.
 - On a national level, Transportation Research Board's 86th Annual Meeting: Compendium of Papers CD-ROM is available in the library, and covers 1,800 papers from the January 21-25 2007 Conference. For those not able to attend, all [electronic sessions](#) are available for viewing.
 - Many Transportation Research Board Electronic Circulars have been added to the library catalog recently. You may view all [e-circulars](#); narrow search by topic selector.
 - One of the biggest resources, however, has been the creation of a [custom search engine](#) of all 50 departments of transportation by a transportation librarian. This is in a beta phase to determine the efficiency of searches and works by combing the DOT websites using the searcher's keywords.
 - In addition, search engines have been created for [metropolitan planning organizations](#), [public transit](#), [university transportation centers](#), and [local technical assistance programs](#). Since December 2006, there have been over fifty thousand queries.
- Contact Lisa Autio, 406-444-6125 or lautio@mt.gov for more information.



[DID YOU KNOW?](#)

NATIONAL TRANSPORTATION PRODUCT EVALUATION PROGRAM (NTPEP)

NTPEP is a nationally recognized program administered by the American Association of State Highway and Transportation Officials (AASHTO). NTPEP conducts ongoing coordinated evaluation of proprietary, engineered highway products, materials, and devices. NTPEP was founded in 1994 and its mission remains unchanged since its inception. The basic goal of the program is to reduce duplication of effort by State DOTs and participating industry, for purposes of product prequalification. The program focuses physical testing resources and expert knowledge to better understand and utilize proprietary, engineered products; and to provide quality and responsive engineering for the testing and evaluation of products, materials, and devices that are commonly used by the AASHTO member departments of transportation.

NTPEP research may be in any of the following areas:

- Basic Research
- Operational Research
- Forensic Analysis
- Standards Development
- New Product Development
- Software Development

The NTPEP program is designed to conduct physical lab testing and field performance evaluation on the most commonly used transportation products. In practice, whenever AASHTO, ASTM, or other national test methods exist, NTPEP will refer to those specifications.

AASHTO member departments volunteer to host NTPEP evaluations. For their actual work, NTPEP testing service fees which are assessed and collected are used to reimburse the host agency. AASHTO/NTPEP prefers to utilize member departments to host NTPEP evaluation. In the event that testing is highly complex, or outside of the available resources of State DOTs, AASHTO/NTPEP will contract with private testing agencies. First, universities will be given opportunity to contract with AASHTO; secondly, private testing labs will be sought by AASHTO, if their use fulfills the mission and business development of NTPEP. This program has been successfully implemented across the nation and NTPEP staff can help you implement results in your agency.

To read more about this program, visit the NTPEP website at: <http://www.ntpep.org/index.asp>, or contact Craig Abernathy at 406-444-6269 or cabernathy@mt.gov.



CALENDAR OF EVENTS

March

AASHTO SCOR Meets to Select New NCHRP Projects
MDT RRC Meeting – New Research Projects Chosen
NCHRP Funds Obligation Due
Schedule and Guidance for TRB Annual State Visits Distributed
TCRP Synthesis of Practice Topics Due
TRB Core Program Contributions Due for States Contributing under Pooled Fund Program Option

April

ACRP Problem Statements Due
MDT RRC Meeting
NCHRP Panel Nominations Solicitation
Preliminary NCHRP Program Announced

May

AASHTO Spring Meeting
MDT RRC Meeting
NCHRP Panel Member Nominations Due
NCHRP Synthesis of Practice Topics Selected
TCRP Synthesis of Practice Topics Selected

TIG Request for Topics
TRB Annual Visits Begin (conducted through summer)
TRB Mailing Verification Forms Sent

June

MDT RRC Meeting
State CEO Ballot on NCHRP Program Due
TCRP Problem Statements Due
TRB Call for papers for 2008 Annual Meeting
TRB Sponsor Funds Due

July

MDT RRC Meeting
NCHRP Funding Due
NCHRP Problem Statements Solicited

August

AASHTO Research Advisory Committee National Meeting
LTAP National Meeting
MDT RRC Meeting
TIG Topics Due
TRB Annual Meeting Abstracts Due 8/1

NEW RESEARCH REPORTS

[Comparative Analysis of Coarse Surfacing Aggregate Using the Micro-Deval, L.A. Abrasion, and Sulfate Soundness Tests](#)

[Habitat Connectivity and Rural Context Sensitive Design: A Synthesis of Practice](#)

[Montana Air Service: Opportunities and Challenges](#)

A listing of all past and current projects can be found at www.mdt.mt.gov/research/projects/sub_listing.shtml.



NEW RESEARCH PROJECTS

[Disparity/Availability Study](#)

[Extending the Season for Concrete Construction and Repair, Phase III](#)

[Highway Project Cost Estimating and Management](#)

[Montana Summer Transportation Institute](#)

[Subsurface Drainage for Landslide and Slope Stabilization](#)

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www.mdt.mt.gov/research/projects/sub_listing.shtml.

REMINDER

Information on research services and products, such as research and experimental project processes and reports, and technology transfer services, including our library catalog can be found on the Research web site at www.mdt.mt.gov/research.

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