"Improving Alaska's quality of transportation through technology application, training, and information exchange."

TECHNOLOGY FOR

Alaskan Transportation

Local Technical Assistance Program

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In this issue . . .

Foamed Asphalt, Alaska Style

Alaska DOT&PF Central Region needed a surfacing treatment for low-volume roads on the Kenai Peninsula that would accomplish several things: keep future maintenance costs down, make sure traffic wasn't impacted during the resurfacing process, and avoid major reconstruction costs.

Foamed asphalt seemed like a good solution, but Alaska hadn't tried it yet. A major concern was that the first foamed asphalt roadway project in Alaska was designated for a coastal area with high rainfall and steep winding grades—up to 12%. Foamed asphalt was supposed to have sensitive moisture and temperature controls, and no one at DOT&PF knew much, if anything, about it. The Kenai Peninsula is a coastal area and is known for its frequent rain, which could impact moisture sensitivity. In spite of concerns, the 1.75-mile section of West Hill Road and the

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Local Road Coordinators in Reno

by Jim Swing, Alaska Representative FHWA Local Road Coordinator Program

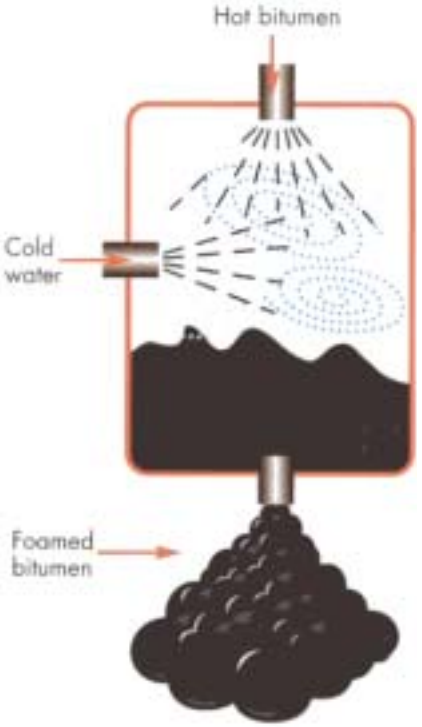
The Federal Highway Administration (FHWA) Local Road Coordinator's Program (LRC) for the 14 western states met in Reno, Nevada on November 15 & 16, 2001. Representatives from South Dakota, North Dakota, Wyoming, Montana, Idaho, Nevada, Arizona, California, Oregon, Washington, Hawaii, and Alaska attended as well as FHWA representatives.

Discussion items included future funding of the LRC Program and review of the National Association of County Engineers (NACE) document defining the LRC Program. Results of these discussions included four recommendations:

1. The need for funding support letters for the LRC Program from NACE and the National Association of Counties (NACo).
2. The need to send NACo a letter requesting they continue to support funding for the LRC Program.

continued on page 5

Foamed Asphalt cont.



Foamed asphalt is the product of hot bitumen meeting small amounts of cold water, creating thin bubbles of bitumen to bond with pulverized base materials.

2.4-mile section of East Hill Road in Homer stayed in the advertising plans for summer 2002 to be foamed.

Construction Engineer Gary Walklin, who was going to be responsible for the project during the summer construction process, talked to Research Manager Billy Connor about Central Region's concerns, particularly the potential for having to reconstruct if the foamed asphalt trial failed. Connor recommended doing the foamed roads as an Experimental Feature project, since Experimental Features are monitored over a long term and federal funds will help with any needed reconstruction.

Newt Bingham, Central Region pavement manager, obtained the experimental designation from the Federal Highway Administration. Bingham wrote the specifications and coordinated with the Construction Section. Willy Van Nostrand, design manager, initiated the first foamed asphalt work in Alaska, with his design group putting the project together.

To come up to speed with foamed asphalt application, three Central Region employees attended a two-day demonstration project in Chico, California, in March. Bingham, Paul Dougherty, and Walklin interviewed the contractor and State of California and City of Chico staff. They discussed field requirements, equipment, specifications, and inspection recommendations. The three Alaskans noted that Joe Johnson of Caltrans in Maryville was especially helpful in sharing his experiences with foamed asphalt. In fact, everyone they talked to was enthusiastic about foamed/expanded asphalt as a pavement rehabilitation, repair, and reinforcing process.

Alaska RoadBuilders, Inc., of Soldotna was the successful bidder and started on the project May 28. The contract required a technical representative on the project, and a pre-project demonstration project that used the same equipment the contractor proposed to use on the actual project.

Alaska RoadBuilders did the demonstration, or test section, on North Fork Road outside Anchor Point. Unlike the actual roads to be foamed in Homer, the test section was straight and flat with low traffic volumes. They foamed, rolled, and graded both lanes at the end of pavement back 180 feet. It was everyone's first chance to work with Eric Upperly, Wirtgen's technical representative. Upperly determined the processing and finishing. Wirtgen is the manufacturer of the reclaimer/foamer equipment. Besides the Wirtgen WR2500 reclaimer/foamer owned by Knik Construction, Alaska RoadBuilders had a pad foot roller, two steel drum rollers, a pneumatic roller, a grader, and a water truck to work the foamed roadway. They laid down a 1% cement additive down ahead of the reclaimer to increase the fines. Composite tests averaged 5.65%, with the optimum fines for foaming at 6 to 12%.

Despite a few glitches, the test section went well and the contractor started foaming West Hill on May 29, finishing on June 1. With beautiful weather, the contractor started foaming East Hill on June 2 and finished June 6.

East Hill has guardrail, curb and gutter, 21 manholes, water valves, slotted drains, and 55 centerline monuments, all which had to be lowered or removed for the foaming. With some good coordination, Alaska RoadBuilders stayed ahead of the foaming and kept the process running smoothly.

The Wirtgen reclaimer, which can do an entire lane in a single pass, did a tremendous job of finely grinding and mixing the six-inch asphalt and base coarse layer. DOT&PF and Alaska RoadBuilders made field adjustments depending on the amount of fines in the material. Having adequate fines is critical to the process. The foamed material is loose and appears dry prior to compacting, which allows for fine finish grading, but after the finish rollers complete compacting,

the surface is very hard and durable. There was no potholing or rutting during the one-week period between when the foaming was finished on West Hill and when it was paved. Alaska RoadBuilders and DOT&PF were concerned about minor pitting, but Eric Upperly of Wirtgen assured the workers that the surface was representative.

DOT&PF performed pre-foamed asphalt tests, including gradations, asphalt thickness, moisture, and falling weight deflectometer (FWD) readings. Post-construction tests will include loose foamed samples, cores, and subsequent FWD readings to monitor the foamed roadways for their long-term performance.

46 Years of Foamed Asphalt

Although new to Alaska, the foamed asphalt (now often called expanded asphalt) process has been around for quite a while, and is now growing throughout the other parts of the U.S.—particularly the northeast, south, and west coast. Canada is adding more foamed projects each year. Alaska is also considering other projects around the state, now that the Homer project is successfully (at least so far) under its belt.

A professor at Iowa State University saw the potential for using foamed asphalt as a binder to stabilize soil. Foaming the asphalt reduces its viscosity a great deal and increases its adhering properties. This makes it well suited for mixing with cold and moist aggregates. The first reported use of foamed asphalt was in 1957 on an Iowa county road. Canada and Australia had projects in the 1960s and improved on the initial methods. While the earliest processes relied on steam injection, which required additional equipment on site, the Australians opted to add cold water into a stream of hot asphalt in a low-pressure system. Internationally, successful foamed asphalt projects are completed each year.

With the right stabilizing agents, old pavement can become the foundation for a long-lasting road, according to *Better Roads FDR Supplement 2001.* The three general stabilizing categories are: bituminous, mechanical, and chemical. Foamed, aka expanded, asphalt falls into the bituminous category and is an alternative to emulsified asphalt. The foamed technique involves mixing hot asphalt with small amounts of cold water to set off a thermal reaction where tiny foam bubbles form in the asphalt. Since very little water is involved, the stabilized base material cures rapidly and has a wider construction temperature window than other stabilizers.

No chemical reaction happens; only the physical properties of the asphalt are temporarily altered. When cold water contacts the hot asphalt, it turns into steam trapped in thousands of tiny asphalt bubbles (hmm, a new reason for Don Ho to sing "Tiny Bubbles"). This process happens inside an expansion chamber in the

continued

West Hill Road, approximately 0.6 mile. Foamed/expanded asphalt processing train with flatbed holding water and preheated oil containers, Wirtgen 2500 reclaimer/foamer, and initial rolling with pad foot roller. First of three 8 ft. passes for 7.2 meter grinding width.

West Hill Road, approximately 0.3 mile. Processing train with pad foot roller. First of three 8 ft wide passes. Traffic moving around work area as flaggers send local traffic through. Field inspectors monitor foamed material.

East Hill Road, approximately 1.1 mile. Section two-thirds complete with adjacent existing asphalt on the left. Foamed section finish graded and ready for final pneumatic rolling.

Foamed Asphalt cont.

recycling/foaming equipment, after which it's dispersed through a series of nozzles onto the aggregate. In Alaska's situation, the Wirtgen WR2500 reclaimer/foamer was the piece of equipment.

Proponents of the process claim that it saves energy and asphalt over other stabilizations. This is because injecting a small amount of water into the hot liquid asphalt causes such a significant expansion that it creates a thin film asphalt product with about ten times more coating potential than asphalt in its normal liquid state. The foamed asphalt offers a more complete coating of the reclaimed (pulverized) material. And it's done in place, which avoids the cost of milling pavement, hauling away the recycled material, and then repaving.

Alaska Asphalt Pavement Alliance Works on Paving Issues

The Alaska Asphalt Pavement Alliance met June 19 in Fairbanks to work on paving issues facing contractors and Alaska DOT&PF, including task force recommendations on smoothness, joint density, and sampling locations before final approval and implementation. Newt Bingham, Statewide Materials, briefly presented current rutting model information, and Steve Saboundjian, Statewide Research provided an update and highlights on current DOT&PF pavement-related research. Contractors addressed two-lift/two-season paving and how best to address smoothness specifications, release agents, and their need to receive timely lab results during paving operations. Lab accreditation is a topic needing further discussion. Meeting participants were from Wilder Construction, North Star Paving and Construction, Construction Machinery Inc, and DOT&PF's Northern and Central Region Construction sections, Statewide Materials, and Statewide Research. Unfortunately, no local contractors were able to attend the Fairbanks meeting.

Alaska DOT&PF recently congratulated the Alliance on its formation and desire to develop and strengthen the working relationships needed to build and maintain Alaska's roadways. DOT&PF supports the group's efforts. Chief Engineer Mike Downing went on to say, "I am glad to see that the Alliance wants to become a focal point that collects and channels new technology to improve pavement performance. . . . We will maintain a visible presence at Alliance meetings and continue to look for opportunities to partner efforts."

Included in the Alliance's statewide membership are government, contractors, suppliers, unions, and vendors. Recent additions are Construction Machinery, Inc., Operating Engineers Training Trust, Tesoro, Williams Petroleum, Chevron, Ingersoll Rand, Professional Paving Services, and Caterpillar Paving Products, Inc.

The group meets the third Wednesday of every other month, with the next meeting on August 21 in Juneau. The October meeting will in Anchorage, and will be coordinated with the national annual AASHTO meeting, where the National Asphalt Alliance and NAPA will have a booth. Contact John Lambert at Wilder Construction in Anchorage for more information: 907-267-5294, johnlamb@wilderconstruction.com or at 907-248-5633, baka@alaska.net.

LRC in Reno continued

3. The need to conduct two meetings per year for the LRC Program: one at the NACE Annual Conference and a national LRC meeting in Washington D.C. in August.
4. Need to send letters to the other three FHWA resource centers, inviting them to become more active in the LRC Program and to join the Western Resource Center States in the National LRC Program.

Other discussion items included:

1. Proposed FHWA rulemaking and Federal Register Publication
2. GASB 34
3. ROW across tribal lands
4. NPDES issues

The second day of the meeting featured talks by Glen Clinton, FHWA Western Resource Center manager and Greg Novak, FHWA Nevada Division office. Glen discussed the purpose of the Western Resource Center and in general the FHWA organization and how it works. Greg gave a presentation and handouts concerning some of FHWA's safety activities.

The members of the LRC group adopted a draft "Guidelines for the Local Road Coordinator's Program." It reads as follows:

Draft Guidelines for the Local Road Coordinator Program

Purpose

The Local Road Coordinator Program was established to:

1. Promote better understanding and dissemination of information and viewpoints between local transportation officials, State Departments of Transportation, and the Federal Highway Administration on matters pertaining to those parts of the federal-aide highway program in which local governments participate in order to facilitate coordination, understanding, and consistency.
2. Through mutual efforts, develop solutions to problems that arise in connection with FHWA programs and ensure consistent interpretation of FHWA regulations among the states.
3. Provide opportunities for the deployment of technology, new products, processes, and programs to local governments.

Players

Local Road Coordinator (LRC): local government road professional selected by the State FHWA Division Office Director to serve as the prime liaison to the

Division Office on matters associated with the local roads programs in the state.

Duties:

1. Writing and distributing information through newsletters, e-mail, or web-based bulletin boards or list service.
2. Coordinating and conducting periodic state and areawide conferences or meetings with local, states and FHWA to discuss federal highway program issues and proposed regulations affecting local governments.
3. At the conferences noted above, pursue technical sessions/workshops promoting technology deployment of new products, processes, and programs. Work with the State LTAP directors in pursuing such sessions.
4. Serving on special statewide committees.
5. Actively participating in their own state association meetings.
6. Notify FHWA Division Office director if no longer able to serve as LRC.

FHWA Division Contact (for LRC): FHWA Division Contact for the Local Road Coordinator Program selected by the FHWA division administrator to oversee all liaisons with local road professionals.

Duties:

1. Pursue periodic communications with the LRC about issues affecting local roads.
2. Coordinate and schedule singularly or with other FHWA Division LRC contacts periodic conferences, summits, or meetings with local road professionals in their respective state or in concert with other LRC in adjoining states.
3. Assist the LRC in producing or hosting newsletters, e-mails, or web-based bulletin boards/list services to road professionals in their respective states.

LRC in Reno continued

4. Recommend to the FHWA division administrator replacement LRC for their state when needed and in a timely manner.
5. Submit annual report of LRC activities to resource center.

Resource Center Technology Deployment Specialist/Engineer: Resource Center individual responsible for technology deployment to state and local professional road managers.

Duties:

1. Assist the FHWA Division Local Roads program point of contact on policy and multistate coordination activities. This would include exploring area and region-state combinations for achieving the most effective conference and meetings. Work with LRC and FHWA division contacts to implement.
2. Provide appropriate financial support and coordination including travel for the two annual LRC meetings.

FHWA Office of Professional Development: The point of contact in this headquarters office will perform the following.

Duties:

1. Provide oversight and general guidance to the LRC program.
2. Monitor the performance and effectiveness of this program.
3. Work with local government national associations (i.e. National Association of County Engineers, American Public Works Association, National Association of Towns and Townships, etc.) to promote the program.
4. Maintain a LRC program web-based bulletin board or list service.
5. Coordinate an annual Washington, D.C., meeting of LRC programs.

Actions

FHWA has requested that each state FHWA Division office provide to the FHWA Headquarters Office of Professional Development (OPD) the below. OPD will be the responsible office for LRC activities.

1. Name, address, phone number, e-mail of the selected Local Road Coordinator (LRC) for your state.
2. Name, address, phone number, email of the division office contract for liaison with the LRC.
3. Update list twice a year and notify all.

FHWA has requested that each Resource Center director establish a technology deployment specialist/engineer to champion technology deployment of new products and innovation especially with local governments and the LTAP Program directors.

FHWA division coordinators, FHWA Resource Center technology deployment specialists, and state LRC will work together to achieve the objectives in this program as outlined in the "Purpose" statement and specifically noted under the "Players" duties.

Did You Know. . . .

DOT&PF has an Alaska Highway Safety Office (AHSO) that handles safety programs and community outreach—including grants for projects that meet their mission. Find them at **www.dot.state.ak.us;** point at World of DOT, then at Programs; finally, all the way to the right, click on Highway Safety.

Their mission: "To enhance the health and well being of Alaska's people through programs aimed at saving lives and preventing injuries on Alaska's highways." They coordinate highway safety programming focused on public outreach and education, provide enforcement, promote new safety technology, integrate public health strategies, collaborate with safety and private sector organizations, and cooperate with state and local governments. AHSO administers federal funding to appropriate projects through a grant award process. AHSO staff provides technical assistance to grantees and ensures compliance with federal program regulations and guidelines. They also work with partners in communities to develop strong projects with the message of Highway Safety for all Alaskans.

Check their calendar for upcoming activities and events like car seat checks and classes in Hoonah, Angoon, and Fairbanks; Stop on Red Week; Put the Brakes on Fatalities Day; and 3D Month (look it up!).

2002 American Indian Tourism Conference

American Indian Alaska Native Tourism Conference
Preserving Our Past, Sharing Our Future

On September 28–October 1, 2002, at Juneau, Alaska, the American Indian Tourism Conference will provide participants from throughout the United States and Canada a wonderful opportunity to "talk tourism." Through networking, problem solving and relevant educational sessions, the Native American tourism industry will continue to grow and succeed. The conference also brings to the gathering invitees from federal and state government agencies, the private sector, and a number of international tour operators.

Co-hosts for this year's conference are the Tlingit and Haida Central Council of Juneau, Alaska, and the Great Lakes Inter-Tribal Council, Inc., of Lac du Flambeau, Wisconsin.

Conference Goals

- Expand Indian business opportunities in domestic and international tourism.
- Identify benefits available to tribal communities through tourism.
- Expand collective voice on Indian tourism issues.
- Implement cultural tourism initiatives of the White House Conference on Travel and Tourism.
- Promote networking among tribal communities to establish unity and understanding of the tourism industry.
- Create a network that includes Indian tribes and individual organizations as well as representatives from the United States and the international tourism industry.
- Establish recommendations for universal principles to guide Indian Tourism development and planning.
- Provide educators with information and resources concerning American Indian heritage and culture as they relate to tribal tourism and economic development.

For additional information or for sponsorship opportunities on the conference contact: Gloria Cobb, Co-Chair at gloriac@glitc.org or P.O. Box 9, Lac du Flambeau, WI 54538 Phone: 715-588-3324 Fax: 715-588-7900.

Fifth Annual National Tribal Road Conference

The Fifth Annual National Tribal Road Conference will be held at the Hyatt Albuquerque October 29–31, 2002. Call to request reduced National Tribal Roads Conference rates at 505-842-1234 or 800- 233-1234

Information about early registration will be available in July. Reduced rates will be offered for registrations received before September 25, 2002.

To receive conference announcements electronically, visit the website:

Sponsored by:

- CA and NVTTAP
- Colorado State University TIAP
- Northwest Tribal LTAP
- Michigan Technological University
- Oklahoma TTAP
- Northern Plains ITAP
- Federal Highway Administration
- Bureau of Indian Affairs

Revisions for the Roadside Design Guide

AASHTO announced in April that two technical revisions that need to be applied to the Roadside Design Guide, 3rd Edition.

Please replace the existing text on the following pages to ensure that your edition is both accurate and current:

Technical Corrections:

- Figure C.1a: The top cable height should be 770 mm instead of 970 mm.
- Figure C1b: The top cable height should be 30 inches instead of 0 inches.

AASHTO staff sincerely apologies for any inconvenience.

Grade Crossing Safety

The Railroad Safety Statistics Annual Report for 1998 is available at http://safetydata.fra.dot.gov/OfficeofSafety/Forms/Default.asp

Pedestrian Safety

The Pedestrian/Bicyclist Safety Resource set CD-ROM (FHWA-SA-00-005) contains information on how to improve pedestrian and bicyclist safety in communities across the nation. It includes information on facility design, planning, guidelines, good practices, and tools to aid in countermeasures development. This CD is intended for safety practitioners and other advocates who want to create "walkable/bikeable" communities. The Gold Camera Award-winning "Safer Journey- Interactive Pedestrian Safety Awareness" CD-ROM (FHWA-SA-00-009) is an interactive CD that takes the user through various pedestrian safety scenarios. It has been developed to improve the level of pedestrian knowledge for all road users and safety practitioners.

http://safety.fhwa.dot.gov/programs/ped_bike.htm

For more information contact Leverson Boodlal at 202-366-8044.

Red Light Running

"Synthesis and Evaluation of Red Light Running: Automated Enforcement Programs in the United States" is available at http://safety.fhwa.dot.gov/programs/srlr.htm. For more information contact Pat Hasson at (708) 283-3510.

Road Safety Audits

Road safety audits are a process wherein a team of independent experts identifies unsafe roadway conditions during project design or on existing roads.

For more information contact Fred Small at (202) 366-9212.

http://www.roadwaysafetyaudits.org

Effective Motivation of Highway Maintenance Personnel: Tools for Peak Performance

Recently completed research presented the above training course on a CD-ROM. The course is particularly suited for first and second line supervisors of state, county, and city maintenance organizations. It contains a participant workbook and an instructor's manual. The CD-ROM, which was distributed to T2 centers, is available for purchase by writing to TRB Publications Office, 2101 Constitution Avenue N.W., Washington, D.C. 20418. The cost is $15 including postage. Checks should be made payable to the Transportation Research Board or by credit card by calling 202-334-3213.

Safety Related Pamphlets

A series of safety related pamphlets are currently under development. These pamphlets are intended to help the safety community in training and implementing small projects and programs related to or resulting in improved safety on highways, bicycle and pedestrian paths, and highway-rail crossings. They are also intended to help safety partners in training and demonstrating safety improvements, identifying sources of appropriate materials, and providing core safety technology. The pamphlets can be used by Federal, state, and local agencies to train and develop safety programs for small organizations (national parks, national forests, military posts, Indian reservations, state district organizations, and local governments). The first pamphlet, *Maintenance of Signs and Sign Supports for Local Roads and Streets,* FHWA-SA-01-009, is completed and will be distributed to FHWA field offices and LTAP Centers. The PDF version of the report is posted on the "What's New" page:

Safety Performance of Rural Two-lane Highways

A report titled *Prediction of the Expected Safety Performance of Rural Two-Lane Highways* that documents the algorithm for predicting the safety performance of rural two-lane highways is now available. The algorithm estimates the effect on safety performance of roadway segment parameters, including lane width, shoulder width, shoulder type, horizontal curves, grades, driveway density, two-way left-turn lanes, passing lanes, and roadside design; and of intersection parameters including skew angle, traffic control, exclusive left- and right-turn lanes, sight distance, and driveways. The algorithm enables highway agencies to estimate the safety performance of existing or proposed highways and to compare the safety performance of geometric design alternatives.

The algorithm forms the basis for the Crash Prediction Module of the Interactive Highway Safety Design Model (IHSDM). The software for the Crash Prediction Module is currently under development. Beta testing of the software will begin in early 2002. Please contact Michael Griffith at mike.griffith@fhwa.dot.gov or 202-493-3316 to obtain a copy of the report. A PDF version of the report can be obtained at http://www.tfhrc.gov/safety/99207.htm. For general information about IHSDM, please contact Ray Krammes at ray.krammes@fhwa.dot.gov or 202-493-3312.

The World Wide Web 2002

Editors note: This newsleter is availible in PDF form and all the URLs throughout the text in new issues will be hyperlinked to their respective web site and pages. To download this newsletter go to www.dot.state.ak.us, point at World of DOT, then immediately below, point at Programs; click on Research & Technology, and finally, click on Newsletters.

FHWA Winter Maintenance Web Site

http://www.fhwa.dot.gov/winter/

FHWA hosts a web site that deals with fighting snow and ice. It contains technical briefs, listings of equipment and service providers, contacts, and a library of publications. Two of the most helpful resources may be the Winter Maintenance Exchange, where experiences are shared across state lines, and a sign-up for a snow/ice e-mail list. Included in the Exchange are sections on Communications & Public Outreach, Snow Emergency Response Centers, and RWIS & Weather Forecasting.

U.S. D.O.T. Intelligent Transportation Systems (ITS) Resources

New ITS Home Page

www.its.dot.gov Visit the U.S. Department of Transportation Intelligent Transportation Systems (ITS) program's new, improved home page. Here you'll navigate to and through the ITS world, including travel management and operations, intelligent vehicles, rural initiatives, and commercial vehicle safety.

ITS Electronic Library

www.its.dot.gov/itsweb/welcome.htm Browse through our user-friendly electronic library, a 1,800-document collection of research, technical papers, and articles written under the auspices of the U.S. Department of Transportation (USDOT). Its fast new search engine and categorical groupings will help you find what you need now. **New URL; Change your bookmark**

ITS News and Calendar

www.nawgits.com/jpo/icdn.html#news Visit the ITS Cooperative Deployment Network (ICDN), a shared Web resource of government and public interest groups at the cutting edge of ITS. Subscribe to the free monthly e-mail newsletter to receive conveniently the latest and most comprehensive news in the ITS community. The fast search engine takes you immediately to the topic areas that most interest you.

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ITS Training Guide

www.its.dot.gov/itsweb/guide.html Everything you need to know about our ITS resources in one convenient desk reference. Small enough to carry in your bag or briefcase. User-friendly. Use it interactively to find what you need on the World Wide Web, or order your free printed copy at **itspubs@fhwa.dot.gov**.

ITS Training Website

www.pcb.its.dot.gov Visit our updated Professional Capacity Building website. Learn what's available to assist transportation professionals in developing the knowledge, skills, and abilities required to deploy, operate, and manage ITS projects. 866-367-7487.

Need ITS technical support? You've surfed the Web, you've searched the library, and still can't find what you're looking for? Call FHWA's ITS toll-free help line at 866-367-7487.

Other websites you should know about

http://www.msha.gov = Mine Safety and Health Administration
http://www.sicop.net = Snow and Ice Pooled Fund Cooperative Program
http://walkinginfo.org = Walking Information Center
http://bicyclinginfo.org = Bicycle Information Center
http://isddc.dot.gov = U.S. Department of Transportation (One Dot Information)

Protecting Wildlife from Traffic

Originally published in World Highways *April 2002*
by Roy V Rea M.Sc., RPBio, instructor of animal physiology, University of Northern British Columbia, and with the collaboration of the Insurance Corporation of British Columbia.

Automobile collisions with wildlife are on the increase worldwide. As road surface quality, highway speeds, and the numbers of cars on the roads increase, so do the odds of encounters between motorists and wildlife.

Over 200 people are killed and thousands seriously injured every year on North American highways alone as a result of wildlife-related vehicular collisions; the loss of the wildlife resource and expenses due to material damages are staggering. In Alaska, for example, road kills are the leading cause of mortality for moose. The average cost to repair a vehicle that has collided with a moose is well over U.S. $15,000.

Researchers in the field have been scrambling for some time now to develop countermeasures that will effectively mitigate the problem of wildlife-related collisions. Unfortunately, such efforts have met with little luck. Currently, the most effective countermeasure is wildlife fencing. Fencing, unfortunately, is unsightly, costs about $50,000/km to install, and is expensive to maintain.

Several other popular countermeasures currently in use simply do not stand up against rigorous scientific scrutiny, leaving roadside managers desperate for an effective solution.

It is hoped that research will help reduce or stop this sort of tragic accident *(Photo: Christiana Wiens)*

Most researchers agree that the development of an effective countermeasure must consider the biology of the animal in question and must specifically address the behaviour drawing them to the highway right-of-way. Although wildlife may utilise corridors for a variety of reasons from travel routes and mineral (de-icing chemicals) licks to sunning areas, most experts agree that feeding on roadside forages predominates animal activities in these rights-of-way. The majority of animals killed in transportation corridors are plant-eaters, albeit carnivores are often incidentally struck while scavenging the remains of road-killed herbivores.

If the problem then is simply one of animals being attracted to rights-of-way by roadside vegetation, the solution seems clear: reduce the attractiveness of roadside forage and wildlife-related collisions will decline.

Several attempts have been made to do just this. Spraying roadside plants with noxious chemicals such as lithium chloride, for instance, appears to deter browsing. Such chemicals, however, are expensive, tend to be short-lived, and are environmentally insensitive.

Planting unpalatable species appears to be effective at deterring certain species of browsers from utilising roadside verges, but this strategy tends to be labour intensive and costly. Furthermore, what may be unattractive or unpalatable to one species may be simply irresistible to another.

Finally, reducing browse availability through repeated brush cutting is known to reduce herbivore-related collisions by as much as 60% but is extremely expensive.

More recently, research indicates that a new approach to roadside vegetation management may be a more useful tool for reducing the attractiveness of roadside browse and would negate the need to use chemicals or attempt to change the floral composition of the roadside. This research suggests that by more precisely timing roadside brush-cutting operations, managers are now capable of capitalising on built-in plant defence strategies that have allowed plants to defend themselves against herbivores for millennia.

Plants use both physical (such as rose prickles) and chemical (terpenoids, tannins, etc.) defences. A plant's ability to produce such defences in response to tissue

continued

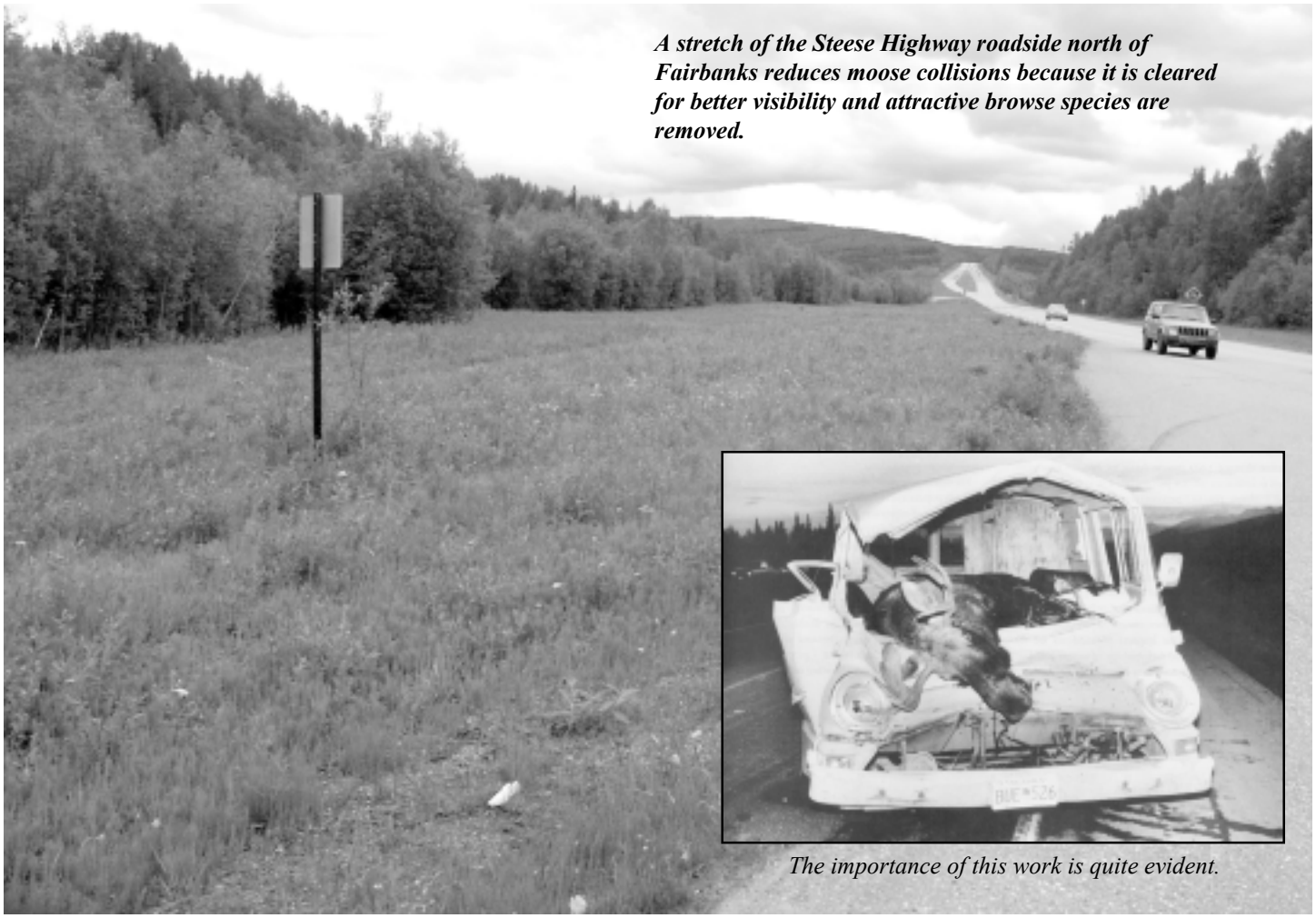
Protecting wildlife from traffic continued

removal depends, among other things, on its supply of raw building materials and energy required for the task.

This supply of materials changes as plants develop. Consequently, the ability of a plant to produce defences varies over the course of the growing season. Plants browsed or cut during early summer following costly leaf making, for instance, may have less energy for such tasks than plants damaged later in the growing season when building materials and energy reserves have started to accumulate in below-ground root structures.

Willows cut in mid-July were recently shown to produce regenerative growth for several years that had much higher nutritional quality for herbivores than willows cut at any other time of the year or uncut plants. Such findings have potentially serious implications for motorists traversing transportation corridors in which roadside vegetation is brushed, not necessarily when cutting will stimulate the production of the most unpalatable vegetation but when it is most operationally feasible for roadside tractor work.

Now equipped with these insights, rights-of-way managers in British Columbia, Canada, are trying to determine a more appropriate time of the year to cut brush that will remain operationally and financially feasible but does not result in the production of high quality, attractive browse. The University of Northern British Columbia, British Columbia Hydro, and British Columbia Rail are collaborating on the research, which will span several years. This research aims at developing a set of recommendations that can be implemented not only by rights-of-way managers in British Columbia to keep moose off of the highway, but can be adapted by managers hoping to mitigate collisions with koalas in Queensland, zebras in Zimbabwe, and free-range cattle in Kazakhstan.



A stretch of the Steese Highway roadside north of Fairbanks reduces moose collisions because it is cleared for better visibility and attractive browse species are removed.

The importance of this work is quite evident.

Is That "More Secure" Mailbox Really Safe?

With mailbox vandalism and identity theft from stolen mail on the rise, many homeowners opt for the newer, heavier mailbox designs that promise security. However, little is known about how these heavier mailboxes could impact drivers and passengers in car crashes.

The Federal Highway Administration (FHWA) Office of Safety Design and the American Association of State Highway and Transportation Officials' (AASHTO) Task Force for Roadside Safety are concerned that these new heavyweight mailbox designs could contribute to serious motorist injury. To study the effects of mailbox impacts, they have turned to the FHWA/NHTSA National Crash Analysis Center (NCAC) and the Federal Outdoor Impact Lab (FOIL). The FOIL crew will conduct a series of pendulum tests on the windshields of passenger automobiles.

Prior to each pendulum test, a grid of white tape is placed over the curved windshield and the FOIL team scans it with a digitizing arm to measure the initial location of each nodal point. A pendulum test device swings a heavy steel ball into the windshield. An accelerometer mounted on the steel ball measures the actual impact force and the loading time history. After the test, the team measures the displaced positions of each node with a digitizing arm.

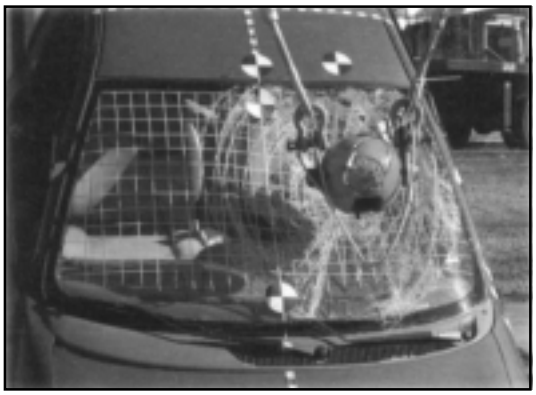
The FOIL team will run a series of pendulum tests at different speeds and impact locations on the windshield. A few full-scale tests with the secure mailboxes will also be used in the validation process. To date, four pendulum tests were conducted, and as weather permits, the remainder of the tests will be run over the next few months.

NCAC will use the pendulum test data to develop a finite element model of a windshield, which they will use to evaluate the potential for windshield cracking and penetration under various impact scenarios. To do this, they must develop a material model that accurately represents the material properties of laminated glass.

Upon completion of the study, FHWA will make the results available to the AASHTO Task Force for Roadside Safety in order to develop secure mailbox accommodation guidelines. For additional information, contact:

Charlie McDevitt, 202-493-3313
charlie.mcdevitt@fhwa.dot.gov

Windshield after pendulum test with steel ball shows crack patterns and deformations. The test data will be used to make a windshield model for finite element analysis.



The cracks on the windshield radiating outward from the point of impact and the deflection of the nodes on the grid will be scanned into a computer.

Children at Play Signs: Seldom Effective, and Usually Unnecessary and Confusing

Warning signs call attention to unexpected conditions on or adjacent to a road. Conditions might require speed reduction or other actions in the interest of safety. Therefore, sign messages must be clear. The Manual on Uniform Traffic Control Devices (MUTCD), the standard for placing traffic signs, ensures clear messages. It also emphasizes that drivers must respect traffic signs. This article will focus on Children at Play signs, which are often unclear and drivers tend to disrespect them.

Citizens often demand that Children at Play signs be installed on their street. They argue that the signs will reduce the risk of potentially tragic accidents. There is some merit to their concern. In a NCHRP study of pedestrian accidents, researchers found that over 40 percent of the accidents involved children. Almost two-thirds of those accidents occurred in residential areas other than intersections. The Children at Play sign, however, is rarely an effective solution.

The MUTCD requires that use of warning signs be based on an engineering study or on engineering judgment. Such a study could draw the following conclusions.

1. The Children at Play sign has little effect on driver behavior, which is seldom the cause of accidents. The NCHRP study reported that nearly 80 percent of the collisions involving children resulted from an unsafe or illegal act by the child. From that study, an ITE *Traffic Control Devices Handbook* author concluded that no traffic control device could be expected to protect a child.
2. Signs give parents and children a false sense of security. By relying on the sign, parents might monitor their children less closely. Children might interpret the sign to mean they can play in the street. Thus, a Children at Plan sign can contribute to the very accidents parents seek to avoid.
3. One Children at Play sign can lead to many such signs throughout a town. Nearly every block has children living on it. As stated in the MUTCD, "The use of warning signs should be kept to a minimum as the unnecessary use of warning signs tends to breed disrespect for all signs."
4. Installing a Children at Play sign in response to a citizen's request is based on political reasons rather than on sound engineering judgment.
5. Signs need to be maintained. They are expensive to purchase, install, and inspect.
6. Because they are confusing and fail to meet any recognized criteria for good signing, placing Children at Play signs can open a municipality to tort liability claims.

There are situations where road managers should consider signs to protect children. The MUTCD describes signs for school zones, pedestrian crossings, and playgrounds. It also contains signs for children with disabilities. The MUTCD signing for such areas conveys a clear message to drivers.

Children at Play signs, on the other hand, are usually ineffective, unnecessary, and confusing. For the reasons given above, they should not be used.

Sources

"Children at Play" Signs Can Cause Confusion. Mass *Interchange,* Fall 2001.

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Nassi, Richard B. 2001 "Pedestrians," pp. 429–486 in *Traffic Control Devices Handbook.* Washington DC: Institute of Traffic Engineers.

NCHRP. National Cooperative Highway Research Program Synthesis 139. Pedestrian and Traffic Control Measures.

Perpetual Pavement

By Ali A. Selim, Ph.D., P.E., Director, South Dakota LTAP

1. Better Roads, pp. 30–32, February 2002.
2. Asphalt Pavement Alliance. CD-ROM, November 2001.

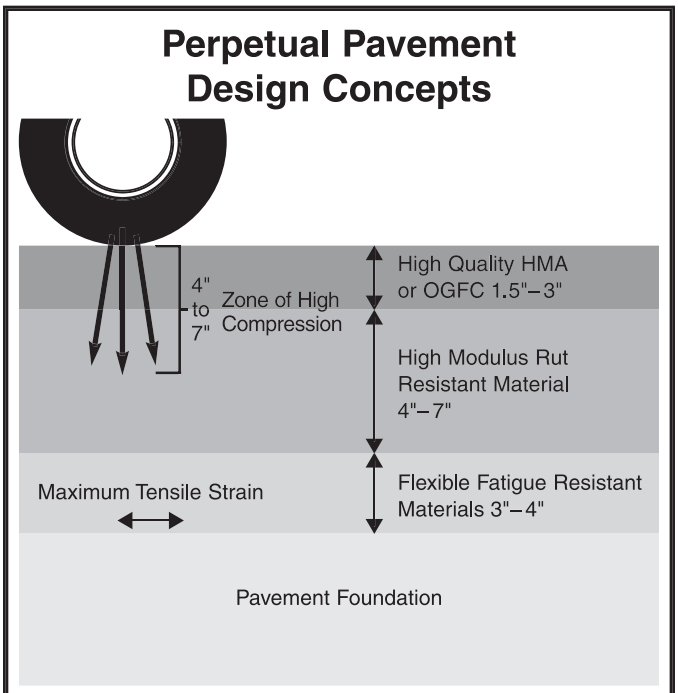
Ever since highways became a viable means of transporting people and goods, pavement engineers have striven to build long-lasting pavement to serve motorists. Their attempts unfortunately often failed since pavements, once built, often need frequent maintenance—be it preventive, reactive, or even major rehabilitation. While this is usually the case, there are a few exceptions such as the New Jersey turnpike that won the Asphalt Pavement Alliance (APA) award in 2001. The APA chairman was quoted saying, "Even though 50 years of heavy use have punished that pavement, motorists are still traveling on the original pavement structure. Only surface treatments have been used to maintain the pavement."

Even some low-volume roads come close to the perpetual pavement concept. A road surface called blotter (aggregate base with light application of surface treatments) has been observed in South Dakota serving the farm-to-market traffic remarkably well without any major rehabilitation. Close examination of a road of that type (Highway 13-0 in Hand County) revealed a sound and thick base, good drainage, good gravel with proper gradation and plasticity, and good construction. This road has performed extremely well for 37 years. Field inspection of the road revealed no major distress.

Building roads that last a very long time can and has been done. Instead of hoping for the exception as in the above two examples, pavement engineers have come up with an approach to build asphalt pavement that can last a very long time. This is called perpetual pavement, which is designed as a three-layer hot-mix asphalt pavement that is intended to provide optimum rideability. The layers are constructed with different asphalt designs. They are topped with a sacrificial friction course intended to be cold-milled and overlaid with asphalt at 15 to 20 year intervals to restore drivability.

With perpetual paving, there are typically three asphalt layers as shown in the illustration:

- A durable, fatigue-resistant base layer.
- A rut-resistant and durable intermediate layer.
- A rut-resistant, impermeable, and wear-resistant surface layer.



Perpetual Pavement concepts call for enough stiffness in the upper layers to preclude rutting, and enough total pavement thickness and flexibility in the lowest layer to avoid fatigue cracking from bottom of pavement structure.

Adapted from a paper by Huddleston, Buncher, and Newcomb — Asphalt Pavement Alliance.

The base layer is designed to resist the tendency to crack at the bottom from bending under traffic loads. This asphalt mix is characterized by having higher asphalt binder and lower air voids. This combination will reduce stiffness, thus reducing fatigue cracks. If the pavement is thick enough, its structural stiffness can reduce tensile strain at the bottom of the asphalt layers to insignificant levels.

The intermediate layer must possess stability and durability. This can be achieved by stone-on-stone contact in the coarse aggregate and using a binder with an appropriate high temperature grading. A Superpave mix will meet this criterion. The design of the wearing

continued

Perpetual Pavement continued

surface or friction course depends on local requirements and economics. In some cases the need for rut resistance, durability, impermeability, and wear resistance may dictate the use of stone matrix asphalt (SMA). In other cases where the overall traffic is not as high, or when moisture is not a problem, a well-designed, well-graded Superpave mix may be adequate.

The material in each layer is specifically selected to resist specific pavement distresses. The outcome is a thinner overall section than those using a conventional long-life design.

The pavement design community in the USA and in Europe is seriously considering perpetual pavement as the new standard. California, Ohio, Washington, and Illinois are either constructing or designing perpetual pavements. Pavement engineers in England are also conducting research on this type of design. In Ohio, a side-by-side study of asphalt and concrete pavement concluded that flexible pavement not only costs less to build, but also costs less in maintenance during the service life of the pavement.

In the state of Washington, a 300-mile stretch of I-90 was closely examined. The pavement thickness for the western half of I-90 varied between 14 and 19 inches with a service life of 23 to 29 years, while in the eastern part, the pavement thickness varied between 6 and 14 inches with a service life of 6 to 35 years. Overlays placed on various sections of I-90 were lasting 12 to 18 years. The conclusion of the study on I-90 was that deep strength pavement yields less rutting. The Illinois experience with perpetual pavement will be applied in 2003 when part of I-70 is scheduled for rehabilitation. Another study in Illinois showed concrete pavement costs three times as much as asphalt pavement to construct and four times as much in terms of interruption to traffic.

Britain's Transportation Research Laboratory (TRL) reports that deep strength asphalt (DSA) has been an excellent performer in British roads with longer life and less maintenance. Repairs and maintenance for DSA have been confined to the top layer only.

For more information on the subject, please access the following web site: www.asphaltalliance.com or e-mail: publications@asphaltalliance.com

National 2002 AASHTO Annual Meeting in Anchorage

Alaska Department of Transportation and Public Facilities (DOT&PF) is hosting the 2002 annual national American Association of State Highway Transportation Officials (AASHTO) meeting. Held October 10–15 at Anchorage's Egan Convention Center, the annual meeting should draw about 1,500 people from Alaska and the other 49 states; people from other countries may also choose to attend. The draw includes key decision-makers from AASHTO's member departments: chief administrators of state highway and transportation agencies, Federal Highway Administration, Federal Transit Administration, and various other U.S. Department of Transportation representatives. Invited speakers are Norman Mineta, U.S. DOT Secretary, and Don Young, chair, U.S. House of Representatives Committee on Transportation and Infrastructure. The featured speaker is Jim Morris, the baseball player on whom the recent award-winning movie *The Rookie* is based.

In addition to technical sessions, there are technical tours, a trade fair, and scenic tours and activities. Host hotels include the Hotel Captain Cook, Hilton Hotel, and the Marriott. For more information, go to www.dot.state.ak.us and click on the AASHTO 2002 link. Contacts are AASHTO: Hannah Whitney, 202-624-8489, hwhitney@aashto.org; or Alaska DOT&PF: Mike Downing, 907-465-2960, aashto@dot.state.ak.us

Ice Forces on Stream Bank Protection

History

Every spring, roads, bridges, and airports in Alaska suffer the effects of spring breakup—including damage caused by ice jams, raft ice impact damage and pushup on the shore, moving rocks, and stream ice cover causing longitudinal tractive forces.

Using riprap is the most common means to protect stream banks in the vicinity of these roads, bridges, and airports. Alaska DOT&PF designers and hydrologists commonly use FHWA's HEC-11, "Design of Riprap Revetment," which forms the design procedure for riprap under ice conditions. While the method described in HEC-11 assumes that riprap stability factor for floating debris will be suitable for ice forces, there is little guidance or criteria to give a design engineer confidence that this assumption is valid under Alaska conditions. The publication concedes that "quantitative criteria for evaluating the impact of ice has on channel protection schemes are unavailable." Its only consolation is that "observation of New England rivers indicate that riprap sized to resist design flow events will also resist ice forces."

Alaska DOT&PF engineers have found that this rudimentary consideration of ice forces does not work for Alaska streams. The designer currently bases the ice correction factor solely on experience. In some cases, this results in different designers selecting riprap that varies widely in size and quantity.

Five scenarios can describe ice forces on stream banks:

- Anchor ice (ice encased on streambed) often moves rock as it begins to raft (float).
- Raft ice (floating ice) impacts the riprap, causing damage.
- Raft ice may be pushed up on shore, also causing damage.

continued

Red River of the North spring flood 1997. U.S. Army Corps of Engineers Flood Recon Team photograph.

Riprap installed to protect the Parks Highway/Chena River Bridge in Fairbanks

Ice Forces continued

- Ice jams increase the water velocities beyond normal design.
- The ice cover itself exerts tractive forces on the stream bank.

Complicating matters, the importance of each scenario depends on the characteristics of each individual stream.

The Research Project

To work toward resolving the design issue, DOT&PF developed a research project. The objective is to develop a consistent procedure for how to adjust the HEC-11 stability factor to account for ice forces on stream bank protection. The goal is to specify the riprap size with a greater degree of confidence. The study is limited to expanding on the HEC-11 procedure to allow for the presence of river ice.

University of Alaska Fairbanks, the successful responder to the request for proposals, has a near-final draft report. Expect the final report, *Impact of Ice Forces on Stream Bank Protection, Report No. FHWA-AK-RD-01-16*, to be published by early October. But don't expect exact precise cookbook answers and concrete formulas. The conceptual development presented here offers a best judgment of what the current technical literature reveals about the problem of ice effects on riprap bank protection, along with example formulas. The hydraulic engineer or designer will still need to develop the flow, channel, and ice information.

Results

UAF researchers quantitatively assessed the effects of the five ice-related scenarios on riprap stability. HEC-11 suggests a stability factor of 1.6–2.0 for ice impact, but otherwise neglects ice influence on design.

Researchers applied stability factors for three of these scenarios in terms of the original HEC-11 stability factor, and expressed two independently of the conditions considered in HEC-11. Generally, researchers discovered that ice influence is highly site specific and thus is the limiting design variable for riprap revetment in northern rivers. Brief, semitechnical descriptions of their solutions follow.

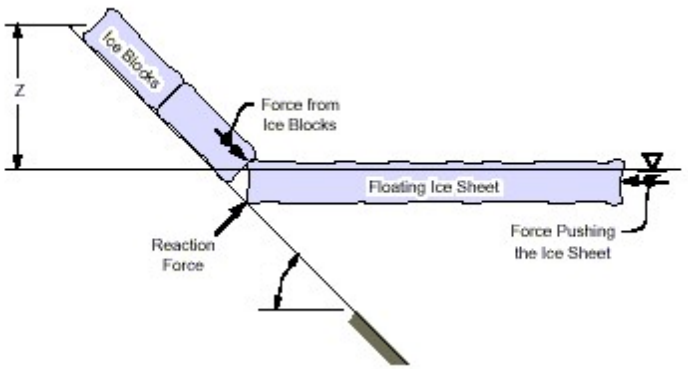
Scenario 1: Anchor ice rafting and moving rocks/ rock encasement by ice with reduced specific gravity

The technique applied to this scenario comes from basic geotechnical engineering concepts and can easily be adapted to include partial saturation. For full saturation, any volume increase due to water expansion during freezing is ignored due to the assumption of infinite permeability of the riprap matrix.

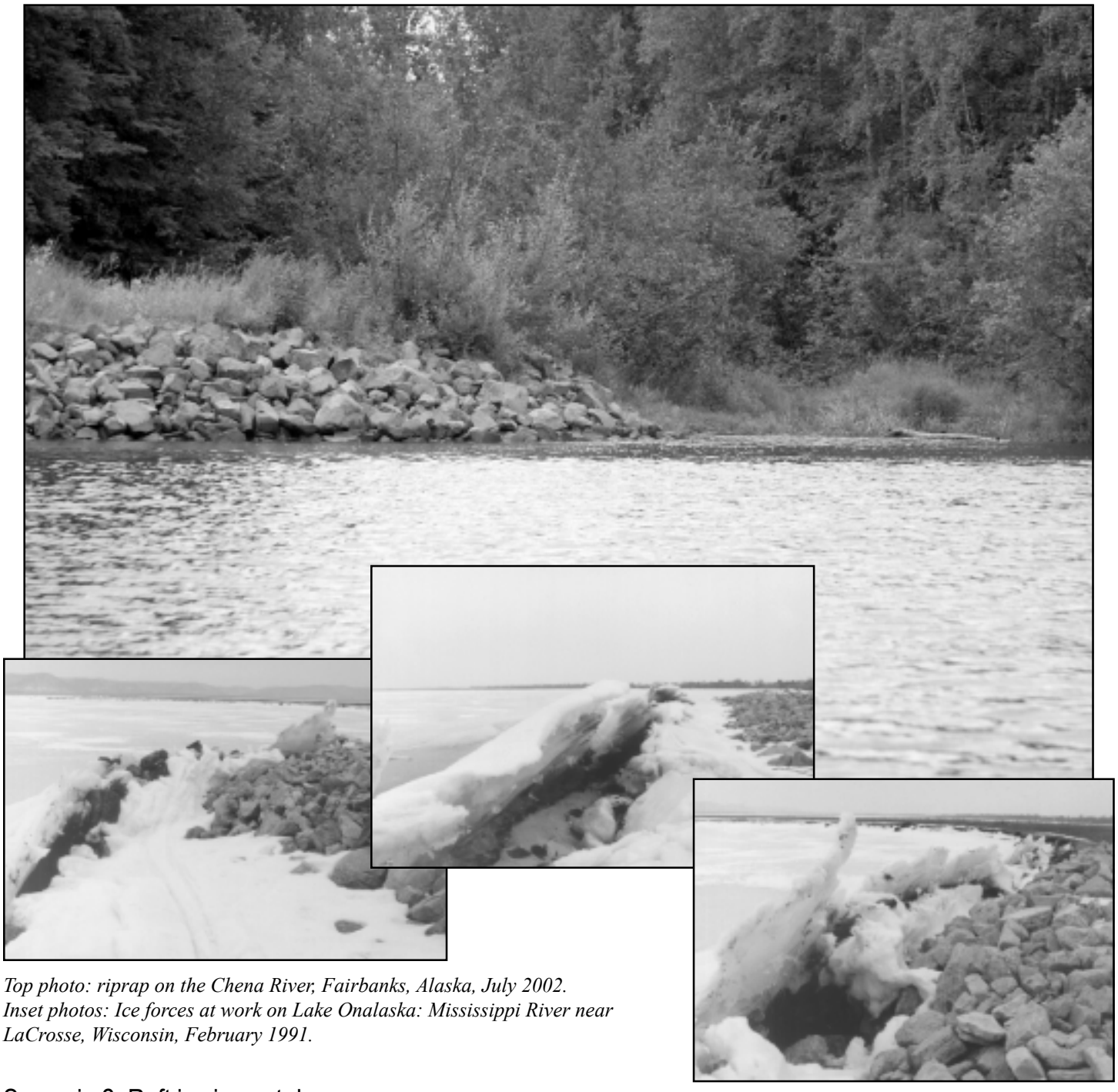
"Plucking," a failure independent of tractive considerations, occurs if the riprap/ice matrix density is less than that of water. This effect will be more prevalent during break-up periods in shallow, low-flow rivers that allow for ice to develop throughout the riprap or in shallow, turbulent waters that permit supercooled water to reach the river bottom. Plucking will most likely occur in quickly rising rivers where the riprap may maintain a maximum amount of anchor ice while being subjected to buoyant forces.

The physical process: The water penetrates the riprap matrix and freezes. The ice encasement can extend downward as the water level drops throughout the winter season. If a complete freeze occurs, ice above the riprap matrix may also become affixed. Once the water level rises, the rock/ice matrix may move by rafting or "floating."

The computational focus: If the engineer estimates the void ratio of the riprap matrix and knows the height of ice above the riprap, s/he can calculate a new rock-ice specific weight and insert it into HEC-11 Equation 2.7 and calculate an adjusted S^*_F.



Sketch of forces acting during ice interaction with a sloping surface, where q is the slope angle from the horizontal and z is the height of the pushed-up ice blocks.



Top photo: riprap on the Chena River, Fairbanks, Alaska, July 2002. Inset photos: Ice forces at work on Lake Onalaska: Mississippi River near LaCrosse, Wisconsin, February 1991.

Scenario 2: Raft ice impact damage

Researchers modeled the impact of ice using the failure stress of the model ice; i.e., individual stream conditions may not create high enough ice impact stresses to cause failure. This approach ignores several negligible effects: (1) effects of water drag as, when compared to the ice forces, water effects are relatively minor; (2) tractive shear from water flow around the riprap resulted in a variation in predicted stress of less than 0.1%, and (3) water-based tractive shear, because determining ice forces is relatively imprecise. Also, this solution assumes uniform, simultaneous failure across the contact surface, a simplification unlikely to occur in nature but which is useful for modeling purposes. Generally, this technique is overly conservative;

continued

Ice Forces continued

however, the current state of the art does not allow for a direct relationship between floe velocity and impact force.

The physical process: A moving ice raft impinges on the riprap protection and loosens or dislodges the particles. Because the net force is the result of raft deceleration, it turns out that the cushioning effect of the ice crushing together with the velocity and angle of the impact make the magnitude of this effect very difficult to predict.

The computational focus: The process does not lend itself well to the tractive force concept of HEC-11, but some literature is available on the impact of ice forces on bridge piers. The calculated stress, s_U, caused by the impact can be resolved into two orthogonal components: transverse shear stress along the plane of the bank and vertical stress perpendicular to the plane of the bank. The imposed transverse stress would act similarly to the imposed water shear stress, t_O, but the removal mechanism would differ. While it is possible to compute the maximum stress imposed at ice failure, failure may not occur in every situation.

Scenario 3: Raft ice pushup onto shore

Ice pushup depends heavily on determining the critical stress of the ice. Due to the relatively slow strain rate associated with passive shoving, buckling is a viable failure mode that engineers should consider. Bending, while possible, would likely be confined by the presence of ice above the point of contact, increasing the stress required for bending failure.

The physical process: Raft ice pushup onto the shore can result from long-term ice pressure through the winter and during spring breakup. It differs from the ice raft impact by strain duration and orientation. The relationship to the HEC-11 imposed tractive stress method again is somewhat tenuous. While a fair amount of literature is available on this subject, it is primarily for applications to ocean coast problems.

The computational focus: Because the maximum stress exerted on the bank occurs prior to ice build-up, engineers can apply an approach similar to that used in the previous model. The calculated stress, s_U, caused by the raft ice push can be resolved into two orthogonal components: transverse shear stress along the plane of the bank and normal stress perpendicular to the bank. The imposed transverse stress would act in a manner of the imposed water shear stress, t_O.

Scenario 4: Ice jams causing velocity increase

Provided the water velocity beneath the ice jam, the HEC-11 velocity-based procedure for determining riprap stability is not appropriate due to the difference in roughness between the ice and bank material. Due to the absence of an effective hydraulic radius under ice-covered conditions, this research provides a more suitable solution for the bank shear. Determination of the velocity under the jam would require field measurements or the use of a calculation package.

HEC-RAS, a hydrology modeling program created by the U.S. Army Corps of Engineers, employs an ice jam modeling package known as ICEJAM. At the toe of the ice jam, ICEJAM uses an "erosion velocity" approach that limits the water velocity under the toe of the ice jam to the maximum velocity before the jam erodes at the toe. At some point, dissolution of the jam will occur and the approach will cease to be valid, but, for stable jams, it adequately describes the maximum condition. For design purposes, designers should include a safety factor to account for the additional velocity possible during dissolution.

The physical process: Ice jams on river channels can cause a temporary dam to form and instigate high-velocity water under the jam. The high velocity may cause a boundary shear stress; the conditions that produce the jam and the subsequent velocity would be site-dependent.

The computational focus: Given the calculation of the water velocity under the ice jam from the site conditions, the calculated boundary stress would replace gRS in the HEC-11 equation.

Scenario 5: Increased longitudinal effective tractive force imposed by stream ice cover

There are two types of increased shear due to ice cover: weight-based and traction-based. The weight-based shear is calculated assuming adhesion to both banks and no submersion as it represents the maximum static load supported by each individual bank. Alternately, tractive shear is calculated assuming full surface ice cover, but adhesion to only one bank. These two worst-case scenarios cannot occur simulta-

neously, but alternate dominance. Engineers should integrate this scenario with Scenario 1 to determine an appropriate safety factor due to an anchor-ice effect from the ice cover. This scenario does not consider form drag relating to inconsistencies in the profile of the ice cover, as determination is highly site-dependent. It also does not consider wind-based tractive shear, which may be a significant factor, depending upon location.

The tractive shear will be greatest for low ice depths on wide rivers, since the water's traction is a function of width, and the stress at the ice/riprap interface is a function of ice thickness. Ultimately, however, the shear transferred via the ice is limited by the shear strength of the ice.

The physical process: As an ice cover forms on the channel water surface, it remains in place because of the resistive shear of the interlock with the bank. The two forces causing the opposing force are the weight of the ice cover along the downstream slope, S, and the shear force on the water-ice interface.

The computational focus: The sum of the calculated shear stresses, t_w, t_F, and $g_w R_I S$, would replace the tractive shear stress, gRS, in the HEC-11 calculation. Designers must pay attention to the fact that the ice cover increases the wetted perimeter by two times and therefore decreases the hydraulic radius by one-half. Also, because of the additional shear surface, the water level might raise a significant amount.

Suggested Research

UAF suggests further research is in order to validate the theories and conceptual formulas discussed in this report:

- Examine the relationship between ice strain rate and ice velocity to aid in determining the maximum stress a bank would actually encounter during ice impact as opposed to the maximum possible stress; reduced riprap could be used in areas not subject to failure velocities. In lieu of such a relationship, a more defined relationship between the modulus of elasticity and strain rate of ice would allow for more accurate predictions of riprap failure mode criteria.
- Perform experiments involving collisions with structures wider than the impact width, which would benefit riprap design. Except for some focus on high aspect ratio situations, the current work on indenters neglects the type of collision typical of riprap. Particularly applicable, work on fracture mechanics for unconfined collisions and limited penetration indenters could allow for much more accurate modeling of actual events.
- Determine peak velocities under ice jams, which could enhance design for scour resistance. Current ice jam software packages implicitly determine the scour velocity for conditions that do not apply during dynamic jam activity (formation and breakup). A project to examine ice-caused riprap failure in Alaska might provide useful information; a site-specific stability factor could be determined and general correlation established.

Contact: Clint Adler, research engineer, 907-451-5321, clint_adler@dot.state.ak.us.

Training Calendar 2002

August

NHI 142005A: NEPA and Transportation Decision Making
Anchorage: August 13–15
Contact Simon Howell, 907-451-5482

October

AASHTO Annual Meeting
Anchorage: October 11–15
http://www.asce.org/conferences/coldregions2002/index.cfm
Not Sponsored by T2

Infrastructure Asset Managment: Best Practice
Anchorage: October 8 & 9; contact Dave Waldo.

Accounting for GASB 34 Activities
Anchorage: October 7, 1 p.m.–5 p.m.; contact Dave Waldo.

Effective Use of Chemicals & Abrasives for Winter Road Maintenance
Sponsored by APWA. October 29 via audio-web conference. Contact Simon Howell.

December

Writing Skills Workshop
Anchorage: December 3-4; Fairbanks, December 9-10. Contact Simon Howell.

Risk Management & Tort Liability on the Roadways: What You Need to Know to Protect Your Agency! Sponsored by APWA. December 5 via audio-web conference. Contact Simon Howell.

Postponed

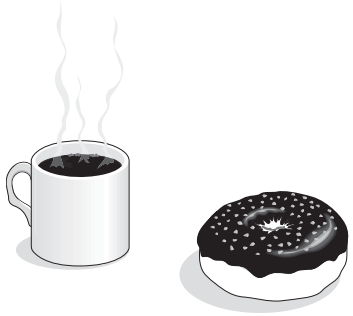
Postponed to second half of the year:
Contact Simon Howell 907-451-5482
NHI 152068: ITS Deployment Analysis System, Anchorage
NHI 131026: Pavement Subsurface Drainage Design, Anchorage
NHI 151029: Application of GIS-T, Anchorage

Canceled

NHI 152068: ITS Deployment Analysis System
NHI 380060: Work Zone Traffic Control for Maintenance Operations on Rural Highways, Anchorage
NHI 131054A: Pavement Preservation: The Preventive Maintenance Concept, Anchorage

For information about T2-sponsored training, contact Dave Waldo at 907-451-5323, david_waldo@dot.state.ak.us, or Simon Howell at 907-451-5482, simon_howell@dot.state.ak.us, or go to www.dot.state.ak.us, go to "World of DOT & PF," then click on "Training Opportunities."

Meetings & Events 2002



Meetings Around Alaska

Society	Chapter	Meeting Days	Location & Contact	
ASCE	Anchorage	Monthly, 3rd Tues., noon	Northern Lights Inn	
	Fairbanks	Monthly, 3rd Wed., noon	Captain Bartlett Inn	
	Juneau	Monthly, 2nd Wed., noon*	Westmark Hotel	* except June–Aug.
ASPE	Anchorage	Monthly, 2nd Thurs., noon	West Coast International Inn	
	Fairbanks	Monthly, 1st Fri., noon	Captain Bartlett Inn	
	Juneau	Monthly, 2nd Wed., noon*	Westmark Hotel	* except June–Aug.
ASPLS	Anchorage	Monthly, 3rd Tues., noon	Executive Cafeteria, Federal Building	
	Fairbanks	Monthly, 4th Tues., noon	Ah Sa Wan Restaurant	
	Mat-Su Valley	Monthly, last Wed., noon	Windbreak Cafe	George Strother, 745-9810
AWRA	Northern Region	Monthly, 3rd Wed., noon	Rm 531 Duckering Bldg., University of Alaska Fairbanks	Larry Hinzman, 474-7331
ICBO	Northern Chapter	Monthly, 1st Wed., noon	Zach's Sophie Station	Jeff Russell, 451-5495
ITE	Anchorage	Monthly, 4th Tues., noon**	Sourdough Mining Co.	Alex Prosak, 562-3252 ** except July & Dec.
IRWA	Sourdough Ch. 49	Monthly, 3rd Thurs., noon**	West Coast International Inn	
	Arctic Trails Ch. 71	Monthly, 2nd Thurs., noon**	Oriental House	
	Totem Ch. 59	Monthly, 1st Wed., noon	Mike's Place, Douglas	** except July & Dec.
Asphalt Pavement Alliance	Alaska	3rd Wednesday of every other month	varies	John Lambert 267-5294
PE in Government	Anchorage	Monthly, last Fri., 7 a.m.	Elmer's Restaurant	
Society of Women Engineers	Anchorage	Monthly, 1st Wed. 6:30 p.m. except July and August	varies	Karen Helgeson, 522-6513

Dave Waldo replaces Sharon McLeod-Everette

Sharon McLeod-Everette retired on June 21 from DOT&PF after 33 years, having spent the last 13 years in RTAP / LTAP. She began as a Clerk Typist I in the Glennallen road maintenance office, working summers to pay for school at the University of Alaska Fairbanks. She also worked in Personnel, Right of Way, and Planning. The National Highway Institute developed its first Relocation classes based on the unique right-of-way project work that Sharon and and her fellow worker, Helen Spotts, did in Fairbanks, not long after the Uniform Relocation Assistance and Real Properties Acquisition Act was enacted and while rules were still being written.

Dave Waldo, Sharon's replacement, is originally from Wisconsin but moved to Delta Junction, Alaska, in 1968. He comes to DOT&PF from Tanana Chiefs Conference, where he managed training that parallels the coordination and outreach activity involved in LTAP. Dave graduated from University of Alaska Fairbanks in 1990 with a BA in English, and is currently enrolled in graduate school at the UAF School of Education. Dave's background is in institutional development and administering training and higher education programs. As an avid outdoorsman, he spends his off time hunting, fly-fishing, snow machining, biking, and cross-country skiing.

TECHNOLOGY TRANSFER

Local Technical Assistance Program
Department of Transportation and Public Facilities
2301 Peger Road M/S 2550
Fairbanks, AK 99709-5399

Return Service Requested

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- rest the cursor on "World of DOT&PF"
- rest the cursor on "Programs"
- double-click on "Research & Technology"

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