SB

106

Subject: SB106
Date: Thu, 27 Mar 2003 16:16:56 -0900
From: Lynn Aleshire <lynn@kja.us>
To: Senator_Lyda_Green@legis.state.ak.us, Senator_Gary_Wilken@legis.state.ak.us, Senator_Con_Bunde@legis.state.ak.us, Senator_Robin_Taylor@legis.state.ak.us, Senator_Ben_Stevens@legis.state.ak.us, Senator_Lyman_Hoffman@legis.state.ak.us, Senator_Donny_Olson@legis.state.ak.us
CC: lynn@frontierk12.org

Dear Senator,

I am a consulting engineer under contract with UAA to write portions of a study of the socioeconomic effects studded tire use. This study was funded by the last legislature and I believe you have received the interim findings. As a result of what I've learned after reviewing 40+ studies and publications I am writing against SB106.

I see it's purpose to be revenue generation without doing anything to solve the problem of pavement wear and the expense of pavement repair.

The premise that studded tires are a net cost burden to the state is incorrect. Yes, road repair is expensive. But reduction in studded tire use is even more costly. Two very recent studies came to this conclusion.

- In 2002 the Japanese produced a benefit-cost analysis before and after studs were banned on Hokkaido in the mid-90's. They found no savings but added expense because road surfaces required 15 times more surface applications (sand & salt) and injury/death accidents increased 2.2 times.
- Finland predicted the same results as they considered government policies that would reduce studded tire usage without banning them. After extensive research throughout the 90's the Finns required light weight studs that allowed for the same level of safety but reduced pavement wear by one-half. Today Finland and other Nordic countries which have followed similar policies consider the problem solved.

I understand the proposal is not to ban studs but I am certain that any significant reduction in the usage of studs will add costs to highway operations. A surcharge on studs will discourage stud usage.

Thank you for your time. I hope to be able to testify at tomorrow's hearing.

Lynn Aleshire
907.248.3567

Provided by Gary Wilken

SOCIO-ECONOMIC EFFECTS OF STUDDED TIRE USE IN ALASKA

INTERIM EXECUTIVE SUMMARY – March 10, 2003

by Hannele Zubeck[1], Ph.D., P.E., Susan Harvey[2], Lynn Aleshire[3] and Stan Porhola
University of Alaska Anchorage, School of Engineering
3211 Providence Drive, Anchorage, AK 99508

INTRODUCTION

At the request of Mr. Dennis Nottingham, Senator John Cowdery introduced Senate Bill 216 (SB216) to the Alaska State Legislature on April 30, 2001 to study road design problems with the use of studded tires. Although SB216 did not pass, the Senate Finance Committee included funds in the University of Alaska FY03 Budget to investigate the socio-economic effect of studded tire use on traffic safety, air quality, and pavement wear. This study is currently underway and includes: a literature review, field study and economic analysis. This interim report briefly summarizes significant findings from the literature review and the field study; economic analysis is still underway.

REGULATORY OVERVIEW

The use of studded tires on motor vehicles is limited or restricted in many jurisdictions worldwide. Most studded tire regulations reflect a policy decision that weighs the potential safety benefits afforded by enhanced traction against the road maintenance costs and human health effects caused by studded tires.

Countries such as Japan, Germany, Holland, and Belgium prohibit the use of studded tires outright. Other countries, like the United States and Canada, regulate the use of studded tires at the state or provincial level, so that studded tire use may be banned, limited seasonally, or permitted with no restrictions in certain states or provinces. Studded tire use has not been banned in the Nordic countries, although they all restrict studded tire use to the winter months and regulate the stud type and frequency in a tire. In 1999, the city of Oslo, Norway enacted an annual tax of approximately $160 USD per vehicle using studded tires as part of an effort to reduce studded tire use.

Recent studies in Finland and Japan found that prohibiting studs produces a net increase in total costs. Pavement repair costs are greatly reduced, but costs of accidents plus the increased requirement of surface applications to improve winter traction result in an overall increased financial burden at the state level. These studies have lead to legislation that continues the use of studded tires during winter months, but allows only lightweight studs to minimize adverse effects.

ANCHORAGE STUD USAGE

As a part of this study, a total of 1,714 vehicles were surveyed on Anchorage parking lots between December 2002 and February 2003. Fifty-two percent (52%) of these vehicles had

[1] hannele.zubeck@uaa.alaska.edu
[2] sharvey@mtaonline.net
[3] lynn@kja.us

studded tires. The number of vehicles using lightweight studs represents 31% of the vehicles with studded tires and 16% of all vehicles. In previous studies, studded tire use in Alaska ranged from 35% in 1971 to a high of 80% in 1996.

PAVEMENT WEAR

It is estimated that Alaska spends $5 million annually to repair stud-related pavement damage. Vehicles that use the studs during summer are responsible for estimated $1 million annually in pavement rehabilitation costs. These figures should be reevaluated.

Finland, Sweden and Norway have conducted a tremendous amount of research on studded tire issues. Each country reports that the significant problem of studded tire related pavement wear has been solved. They attribute their success to the following factors:

- Wear resistant pavements (improve resistance by high quality aggregates, stone mastix mixtures, high quality construction);
- Strictly enforced seasonal studded tire usage;
- Less aggressive studs (reduce wear by decreasing the stud mass, frequency and protrusion);
- Traffic conditions (decrease wear by decreasing traffic volume and proportion of studded tires, decreasing winter speed limits and increasing lane widths); and,
- Weather conditions (decrease wear by keeping the road surface dry).

AIR POLLUTION IMPACT

While scientific evidence is overwhelming that studded tires do generate increased levels of road dust by "grinding" the pavement into smaller particles, the use of studded tires in Alaska does not appear to present an unacceptable respiratory health risk.

Dust generated by studded tires is only a sub-set of the overall paved road dust level, and is not currently causing violations in the National Ambient Air Quality Standards (NAAQS) for particulates. There does not appear to be any human health benefit associated with banning studded tires in urban areas of Alaska, as a reduction in roadway particulate levels due to the ban would be offset by increased dust levels due to increases in the volume of winter traction sand.

TRAFFIC SAFETY

Publications pertaining to studded tires and traffic safety were reviewed from North America, Europe and Japan. Important findings include:

- Studded tires reduce accident risk; only one study refuted this point.
- Banning stud usage increases the overall social cost despite the savings in road maintenance;
- Drivers using studded tires drive more confidently than drivers without studded tires;
- Increased tort liability greatly changes the economics of studded tire usage. If studded tire use is limited, increased surface applications are required to improve traction adding to the expense born by the state; and
- International research is more current and appropriate to Alaska's situation than earlier North American work, because it reflects improvements in studded tire and pavement design.

SENATE FINANCE
COMMITTEE
Amendment Number: #2
Bill Number: SB 106
Sponsor: Bunde Date: 4/1/03
Logged In By: Mindy

23-GS1127\I.4
Kurtz
4/1/03

AMENDMENT

OFFERED IN THE SENATE BY SENATOR BUNDE

TO: CSSB 106(TRA)

Page 1, line 1:

Delete "**studded**"

Page 1, line 7:

Delete "**Studded tire fee**"

Insert "**Tire fees**"

Delete "$10"

Insert "$2.50"

Page 1, line 8:

Delete "studded"

Page 1, lines 9 - 10:

Delete all material and insert:

"(b) In addition to the fee imposed under (a) of this section, a fee of $5 a tire is imposed on the retail sale of tires studded with metal studs or spikes weighing more than 1.1 grams each embedded in the periphery of the tire surface and protruding beyond the tread surface of the tire, or on the installation for a fee of metal studs or spikes weighing more than 1.1 grams each on a motor vehicle tire in the state."

Page 1, line 11:

Delete "fee"

Insert "fees"

Page 1, line 12:

Delete "fee" in both places

Insert "fees" in both places

Page 1, line 15:

Delete "fee"

Insert "fees"

Page 2, line 1:

Delete "fee"

Insert "fees"

Page 2, line 3:

Delete "fee"

Insert "fees"

Page 2, line 6:

Delete "fee"

Insert "fees"

Page 2, line 11:

Delete "(1)"

Delete "studded"

Page 2, line 12:

Delete ";"

Insert "."

Page 2, lines 13 - 15:

Delete all material.

Richard
Trans @ aol.com

Subject: From Dennis Nottingham re: Studded tires
Date: Fri, 7 Mar 2003 08:56:15 -0900
From: "Ingrid" <i_martin@pnd-anc.com>
To: <senator_john_cowdery@legis.state.ak.us>

UAA will get an interim report on studded tires by Monday. Based on the governor's statements we would recommend studded tire use fee to be paid at time of car licensing with a license plate sticker. This will avoid a potential problem with out-of-state tire purchases and also the mechanism of collection is already in place.

not cheap to ship.

annual fee. no way to enforce.

Dennis

Dennis Nottingham, P.E., President
PERATROVICH, NOTTINGHAM & DRAGE, INC.
1506 W. 36th Avenue
Anchorage, Alaska 99503
Phone (907) 561-1011 -- Fax (907) 563-4220

Please note my new e-mail address: i_martin@pnd-anc.com

~~HB 51~~
Rail Bill

Subject: From Dennis Nottingham - tire editorials to be faxed
Date: Fri, 7 Mar 2003 08:58:32 -0900
From: "Ingrid" <i_martin@pnd-anc.com>
To: <senator_john_cowdery@legis.state.ak.us>

With regard to the Tuesday Senate Transportation hearing, we are faxing two editorials from the Voice of the Times that clearly outline studded tire wear problems and other road problems along with suggestions for improvement. Please include these in the record.

Dennis

Dennis Nottingham, P.E., President
PERATROVICH, NOTTINGHAM & DRAGE, INC.
1506 W. 36th Avenue
Anchorage, Alaska 99503
Phone (907) 561-1011 -- Fax (907) 563-4220

Please note my new e-mail address: i_martin@pnd-anc.com

SENATE COMMITTEE REPORT
First Committee of Referral

DATE: 3/6/03

FURTHER: Finance

Date of 5-Day Notice: 3/4/03
(in accordance with Uniform Rule 23)

DATE TURNED IN TO OFFICE: 3/12/03

Transportation Committee considered SENATE BILL NO. 106

SB 106 FEE FOR STUDDED TIRES

"An Act relating to a fee on studded tires; and providing for an effective date."

and recommends:

[✓] be replaced with ___ CS SB 106 (TRA)

[ ] adopt previous _____ CS _____ (_____)

[ ] attached amendment(s)

[ ] adopt Letter of Intent by _____ Committee

[ ] further referral to _____ Committee

Senate Bill:
[ ] same title
[✓] new title

House Bill:
[ ] same title
[ ] technical title
[ ] new: SCR #_____

NEW FISCAL NOTE(S):

Department	Date	Fiscal	Zero	FN#

PREVIOUS FISCAL NOTE(S):

Department	Date	Fiscal	Zero	FN#
Rev.	3/3/03	✓		1

[ ] APPROPRIATION - no fiscal note

SIGNATURES AND RECOMMENDATIONS:	DO PASS	DO NOT PASS	NO REC	AMEND
Olson			✓	
agner (Thomas H. Wagoner	✓			
wdery CHAIR: John J. Coe	✓			

Kathryn Kurtz 2029

SENATE BILL NO. 106

"An Act relating to a fee on studded tires; and providing for an effective date."

BE IT ENACTED BY THE LEGISLATURE OF THE STATE OF ALASKA:

* Section 1. AS 43.98 is amended by adding a new section to read:

Sec. 43.98.025. Studded tire fee. (a) A fee of $10 a tire is imposed on the **retail** sale or **[OTHER]** transfer for consideration of studded tires in the state.

(b) A fee of $10 a tire is imposed on the **installation of studs for a fee on a motor vehicle tire in the state** **[STORAGE OR USE OF STUDDED TIRES ACQUIRED ON OR AFTER JULY 1, 2003. THE FEE IS NOT PAYABLE IF THE FEE UNDER (a) OF THIS SECTION HAS BEEN PAID ON THE TIRES.]**

(c) A seller **of studded tires or provider of services under (b)** shall add the amount of the fee imposed by this section to the total price of the tire **or service** subject to the fee, and the fee shall be stated separately on any sales receipt, invoice, or other record of the sale or other transfer.

(d) A seller shall collect the fee from the purchaser and remit the fee collected **on a return as proscribed by [TO]** the department not later than 30 days following the last day of the month **of sale or installation[IN WHICH THE FEE WAS COLLECTED].**

(e) A seller remitting the fee collected under this section to the department within 30 days after the last day of the preceding month may retain five percent of the amount collected, not to exceed **$300 per month[1,000 A CALENDAR QUARTER],** to cover expenses associated with collecting and remitting the fee. **[IN THIS SUBSECTION,"CALENDAR QUARTER" MEANS EACH OF THE THREE-MONTH PERIODS ENDING MARCH 31, JUNE 30, SEPTEMBER 30, AND DECEMBER 31.]**

(f) **Fees imposed by this chapter shall be subject to the provisions of AS 43.05 and AS 43.10. [IN THIS SECTION, "STUDDED TIRE" MEANS A TIRE WITH METAL STUDS OR SPIKES EMBEDDED IN THE PERIPHERY OF THE TIRE SURFACE AND PROTRUDING NOT MORE THAN ONE FORTH INCH FROM THE TIRE SURFACE.]**

(g) Fees under this chapter shall not apply to tires or services sold to federal, state, or local government agencies for official use.

(h) In this section, "studded tire" means a motor vehicle tire with studs or spikes of metal or other material embedded in the periphery of the tire surface and protruding beyond the tread surface of the tire.

- Sec. 2. This Act takes effect July 1, 2003.

23-GS1127\D
Kurtz
3/11/03

CS FOR SENATE BILL NO. 106( )

IN THE LEGISLATURE OF THE STATE OF ALASKA

TWENTY-THIRD LEGISLATURE - FIRST SESSION

BY

Offered:
Referred:

Sponsor(s): SENATE RULES COMMITTEE BY REQUEST OF THE GOVERNOR

A BILL

FOR AN ACT ENTITLED

"An Act relating to studded tires; and providing for an effective date."

BE IT ENACTED BY THE LEGISLATURE OF THE STATE OF ALASKA:

* **Section 1.** AS 28.35.155 is amended by adding a new subsection to read:

(c) A person convicted of violating this section is punishable by a fine of not more than $1,000, or by imprisonment for not more than 180 days, or by both. In addition, the privilege to drive or the registration of vehicles may be suspended or revoked.

* **Sec. 2.** AS 43.98 is amended by adding a new section to read:

Sec. 43.98.025. Studded tire fee. (a) A fee of $10 a tire is imposed on the retail sale or other transfer for consideration of studded tires in the state.

(b) A fee of $10 a tire is imposed on the installation of studs for a fee on a motor vehicle tire in the state.

(c) A seller shall add the amount of the fee imposed by this section to the total price of the tire or service subject to the fee, and the fee shall be stated separately on any sales receipt, invoice, or other record of the sale or other transfer or of the

installation of studs.

(d) A seller shall collect the fee from the purchaser. A seller shall file a return on a form prescribed by the department and remit the fee collected to the department not later than 30 days following the last day of the month of the sale or installation.

(e) A seller remitting the fee collected under this section to the department within 30 days after the last day of the preceding month may retain five percent of the amount collected, not to exceed $300 a month, to cover expenses associated with collecting and remitting the fee.

(f) The provisions of AS 43.05 and AS 43.10 apply to this section.

(g) The fees imposed in this section do not apply to tires or services sold to federal, state, or local government agencies for official use.

(h) In this section,

(1) "seller" means a seller of studded tires or a person who installs studs on motor vehicle tires for a fee;

(2) "studded tire" means a tire with metal studs or spikes embedded in the periphery of the tire surface and protruding beyond the tread surface of the tire.

* **Sec. 3.** This Act takes effect July 1, 2003.

THE
FOLLOWING
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ORIGINAL
COPIES

WORK DRAFT WORK DRAFT WORK DRAFT

3879

23-GS1127\H
Kurtz
3/11/03

CS FOR SENATE BILL NO. 106( )

IN THE LEGISLATURE OF THE STATE OF ALASKA

TWENTY-THIRD LEGISLATURE - FIRST SESSION

BY

Offered:
Referred:

Sponsor(s): SENATE RULES COMMITTEE BY REQUEST OF THE GOVERNOR

A BILL

FOR AN ACT ENTITLED

"An Act relating to studded tires; and providing for an effective date."

BE IT ENACTED BY THE LEGISLATURE OF THE STATE OF ALASKA:

*** Section 1.** AS 28.35.155 is amended by adding a new subsection to read:

(c) A person convicted of violating this section is punishable by a fine of not less than $100, in addition to any other penalties imposed under AS 28.40.050.

*** Sec. 2.** AS 43.98 is amended by adding a new section to read:

Sec. 43.98.025. Studded tire fee. (a) A fee of $10 a tire is imposed on the retail sale ~~or other transfer for consideration~~ of studded tires in the state.

(b) A fee of $10 a tire is imposed on the installation of studs for a fee on a motor vehicle tire in the state.

(c) A seller shall add the amount of the fee imposed by this section to the total price of the tire or service subject to the fee, and the fee shall be stated separately on any sales receipt, invoice, or other record of the sale or other transfer or of the installation of studs.

(d) A seller shall collect the fee from the purchaser. A seller shall file a return

on a form prescribed by the department and remit the fee collected to the department not later than 30 days following the last day of the month of the sale or installation.

(e) A seller remitting the fee collected under this section to the department within 30 days after the last day of the preceding month may retain five percent of the amount collected, not to exceed $300 a month, to cover expenses associated with collecting and remitting the fee.

(f) The provisions of AS 43.05 and AS 43.10 apply to this section.

(g) The fees imposed in this section do not apply to tires or services sold to federal, state, or local government agencies for official use.

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* Sec. 3. This Act takes effect July 1, 2003.

ALASKA MUNICIPAL LEAGUE
Alaska Conference of Mayors

217 Second Street, Suite 200 • Juneau, Alaska 99801
Tel (907) 586-1325 • Fax (907) 463-5480 • www.akml.org

March 11, 2003

Senator John Cowdery
Senate Transportation Committee
State Capitol
Juneau, AK 99801

Re: **S.B. 103 – Motor Vehicle Registration Fees**
S.B. 112 – Increase Motor Vehicle Fuel Tax

Dear Senator Cowdery,

As noted in the Alaska Municipal League (AML) policy statement, the AML supports an increase in motor vehicle registration fees and motor vehicle fuel taxes so long as:

(1) fuel tax and vehicle registration fees are "used to fund state and municipal highway road operation, maintenance, and improvements;" and

(2) the motor vehicle fuel tax and vehicle registration fees are "shared on an equitable basis between local and state government based on the proportion of local vs. state maintained roads."

Thank you for the opportunity to express our views on this important legislation.

Sincerely,

Sarah A. Gilbertson

Sarah A. Gilbertson
Policy and Program Coordinator

Cc: Representative Jim Holm
Representative Beverly Masek

SOCIO-ECONOMIC EFFECTS OF STUDDED TIRE USE IN ALASKA

INTERIM EXECUTIVE SUMMARY – March 10, 2003

by Hannele Zubeck[1], Ph.D., P.E., Susan Harvey[2], Lynn Aleshire[3] and Stan Porhola
University of Alaska Anchorage, School of Engineering
3211 Providence Drive, Anchorage, AK 99508

INTRODUCTION

At the request of Mr. Dennis Nottingham, Senator John Cowdery introduced Senate Bill 216 (SB216) to the Alaska State Legislature on April 30, 2001 to study road design problems with the use of studded tires. Although SB216 did not pass, the Senate Finance Committee included funds in the University of Alaska FY03 Budget to investigate the socio-economic effect of studded tire use on traffic safety, air quality, and pavement wear. This study is currently underway and includes: a literature review, field study and economic analysis. This interim report briefly summarizes significant findings from the literature review and the field study; economic analysis is still underway.

REGULATORY OVERVIEW

The use of studded tires on motor vehicles is limited or restricted in many jurisdictions worldwide. Most studded tire regulations reflect a policy decision that weighs the potential safety benefits afforded by enhanced traction against the road maintenance costs and human health effects caused by studded tires.

Countries such as Japan, Germany, Holland, and Belgium prohibit the use of studded tires outright. Other countries, like the United States and Canada, regulate the use of studded tires at the state or provincial level, so that studded tire use may be banned, limited seasonally, or permitted with no restrictions in certain states or provinces. Studded tire use has not been banned in the Nordic countries, although they all restrict studded tire use to the winter months and regulate the stud type and frequency in a tire. In 1999, the city of Oslo, Norway enacted an annual tax of approximately $160 USD per vehicle using studded tires as part of an effort to reduce studded tire use.

Recent studies in Finland and Japan found that prohibiting studs produces a net increase in total costs. Pavement repair costs are greatly reduced, but costs of accidents plus the increased requirement of surface applications to improve winter traction result in an overall increased financial burden at the state level. These studies have lead to legislation that continues the use of studded tires during winter months, but allows only lightweight studs to minimize adverse effects.

ANCHORAGE STUD USAGE

As a part of this study, a total of 1,714 vehicles were surveyed on Anchorage parking lots between December 2002 and February 2003. Fifty-two percent (52%) of these vehicles had

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studded tires. The number of vehicles using lightweight studs represents 31% of the vehicles with studded tires and 16% of all vehicles. In previous studies, studded tire use in Alaska ranged from 35% in 1971 to a high of 80% in 1996.

PAVEMENT WEAR

It is estimated that Alaska spends $5 million annually to repair stud-related pavement damage. Vehicles that use the studs during summer are responsible for estimated $1 million annually in pavement rehabilitation costs. These figures should be reevaluated.

Finland, Sweden and Norway have conducted a tremendous amount of research on studded tire issues. Each country reports that the significant problem of studded tire related pavement wear has been solved. They attribute their success to the following factors:

- Wear resistant pavements (improve resistance by high quality aggregates, stone mastix mixtures, high quality construction);
- Strictly enforced seasonal studded tire usage;
- Less aggressive studs (reduce wear by decreasing the stud mass, frequency and protrusion);
- Traffic conditions (decrease wear by decreasing traffic volume and proportion of studded tires, decreasing winter speed limits and increasing lane widths); and,
- Weather conditions (decrease wear by keeping the road surface dry).

AIR POLLUTION IMPACT

While scientific evidence is overwhelming that studded tires do generate increased levels of road dust by "grinding" the pavement into smaller particles, the use of studded tires in Alaska does not appear to present an unacceptable respiratory health risk.

Dust generated by studded tires is only a sub-set of the overall paved road dust level, and is not currently causing violations in the National Ambient Air Quality Standards (NAAQS) for particulates. There does not appear to be any human health benefit associated with banning studded tires in urban areas of Alaska, as a reduction in roadway particulate levels due to the ban would be offset by increased dust levels due to increases in the volume of winter traction sand.

TRAFFIC SAFETY

Publications pertaining to studded tires and traffic safety were reviewed from North America, Europe and Japan. Important findings include:

- Studded tires reduce accident risk; only one study refuted this point.
- Banning stud usage increases the overall social cost despite the savings in road maintenance;
- Drivers using studded tires drive more confidently than drivers without studded tires;
- Increased tort liability greatly changes the economics of studded tire usage. If studded tire use is limited, increased surface applications are required to improve traction adding to the expense born by the state; and
- International research is more current and appropriate to Alaska's situation than earlier North American work, because it reflects improvements in studded tire and pavement design.

Subject: FYI SB 112 Fuel tax
Date: Tue, 11 Mar 2003 12:08:54 -0900
From: "Ronald Jordan" <akrljordan@hotmail.com>
To: Richard_Schmitz@legis.state.ak.us, Senator_John_Cowdery@legis.state.ak.us

I support SB 112 "Fuel tax increase" I think that some kind of fuel tax increase of .12 cents a gal is needed I would suggest splitting the increase over three years. But their is a draw back to this tax increase.

I would like to remind the Senate and the Governor that Rep. Don Young of Alaska proposed a .33 cents a gal fuel tax in his transportation committee about two months ago. I do not know the HB number at this time.

Also that State of Washington had a ballot vote for a fuel tax increase last year of .09 cents a gallon. It lost by 63%. I believe that the State of Washington now pays a .22 cent a gallon state tax on fuel.

Any major price increases in the cost of fuel would hurt as the cost of fuel is going up as much as .10cents a week here in Anchorage and higher in other parts of the State of Alaska.

Thank you
Ronald Jordan
8170 Woodgreen Cr.
Anchorage, AK.
907-345-2755

Senate Transportation Committee

Hearing on Studded Tires

March 11, 2003

Testimony of:
Dennis Nottingham, P.E.
1506 W. 36th Ave.
Anchorage, AK 99503

My entire youth and adult life has been spent in northern environs with 41 years in Alaska as a civil engineer. I have used about every tire type available and have observed roads progressively experiencing greater wear and rutting as time progresses.

Tire technology has progressed in two ways including better tungsten carbide studs and better rubber and tread combinations. In addition, vehicle design has improved with all-wheel drive and front-wheel drive.

According to a preliminary UAA study, about one-half of Anchorage drivers have adapted to new technology and do not use studded tires in winter. The other half use tires with studs during the winter and some use them all year. These people combine to damage roads estimated at $200 per year per vehicle more or less.

Studs can give people unwarranted confidence because after a few thousand miles studded tires wear to the point that they are no safer than a typical tire.

New softer rubber compounds and better tread design give performance similar to studs and better performance after studs are used.

Economic studies addressing safety of studs are possibly flawed because stud-wear related accidents, such as hydroplaning and loss of control, are not well documented and thus cost impacts are not included in studies. Economic costs of repair impacts are also a factor including delays and detour safety.

There is no question that studs wear road surfaces and that some users truly believe they are necessary and they may well be in some cases.

Meanwhile 50% of the drivers are paying for those who cause road damage.

The best solution considering all circumstances is to let users decide upon tire style best suited to their desires provided they pay for any damage caused by their choice.

An annual license fee of $200 per vehicle for use of studs would be fair to all, coupled with a $1,000 ticket for violation of the seasonal use restriction. A license plate sticker could be issued to identify stud users as part of the established state licensing system with no significant cost impact.

23-GS1127\A.2
Kurtz
3/11/03

AMENDMENT

OFFERED IN THE SENATE BY SENATOR COWDERY

TO: SB 106

Page 1, line 1:

Delete "**a fee on**"

Page 1, following line 2:

Insert a new bill section to read:

"* **Section 1.** AS 28.35.155 is amended by adding a new subsection to read:

(c) A person convicted of violating this section is punishable by a fine of not less than $100, in addition to any other penalties imposed under AS 28.40.050."

Page 1, line 3:

Delete "**Section 1**"

Insert "**Sec. 2**"

Renumber the following bill section accordingly.

oice of the Times
A CONSERVATIVE VOICE FOR ALASKANS

WILLIAM J. TOBIN
Senior editor

Solutions to fixing our rutted roads

By JOSEPH L. PERKINS

I'd like to thank Dennis Nottingham for his Voice of the Times article, "Tired of Alaska's lousy roads?"

Dennis correctly identified two of our biggest challenges with building and maintaining roads in Alaska — ruts and pavement failure. As Dennis points out, studded tires are the biggest cause for pavement rutting, particularly in heavy traffic areas like Anchorage.

We spend millions of dollars each summer to replace pavements which are not worn out, but are severely rutted. Our recent work on the Glenn Highway is a good example.

The Department of Transportation and Public Facilities has proposed legislation to ban the sale of heavyweight studs in Alaska but it wasn't passed by the Legislature. Studies have shown that lightweight studs, which have the same tungsten carbide tips as heavyweight studs, produce about half of the pavement wear while providing nearly identical stopping ability.

Some tire companies are now installing lightweight studs, but we still have a considerable number of heavyweight studs on our roads.

A major contributor to the rutting problem is also caused by drivers who do not remove their studded tires in the summer. Studs can cause more damage to our pavements in the summer than in the winter.

Several states, including Minnesota, Michigan, Illinois, Maryland and the Canadian provinces of the Northwest Territories, Ontario and Alberta, as well as British Columbia, have outlawed studded tires altogether. Residents of these states and territories have given up their studs and use new studless snow tire technology to preserve their roads.

As the person responsible for highway maintenance in Alaska, I would like to see Alaska, as a minimum, pass legislation that bans heavyweight studs and increases the penalty for summer stud use from the current "fix it" ticket to a penalty that would get more attention from violators.

"Hey, Ed — let's switch our golf game from Thursday to Wednesday."

The department is trying to reduce the severity of the rutting problem. On our high traffic roads, we are using the latest asphalt mix design technologies, called Superpave and Stone Mastic Asphalt.

We are finding that these asphalt mixes in combination with hard rock can produce a more rut-resistant pavement. By placing these types of asphalt we aim to slow stud wear and delay rutting. We are seeing success using these techniques.

For a first-hand view, look at Fifth and Sixth avenues in downtown Anchorage, the Egan Expressway in Juneau and the North Tongass Highway in Ketchikan.

Temperature extremes and water are two causes of pavement failure on our roads. Due to the short construction season in Alaska, we often find ourselves paving in weather conditions that are far from optimum, especially during the late fall.

We have implemented a policy requiring that most asphalt pavements be constructed with at least two layers of asphalt. The first layer is placed in the late summer and used as the temporary driving surface over the winter. The final driving surface, the second layer, is placed early the following summer when weather conditions are much more conducive to obtaining a high quality pavement. By using this approach we are improving the quality and extending pavement life.

Water in our road structures is one of our biggest enemies, and the closer it is to the pavement, the more problems it causes. For years we have placed approximately four inches of crushed rock (D-1) under our pavements.

As Dennis explained, water can collect in this material, freeze and thaw and then cause pavement failure. We recently issued a directive to waterproof the D-1 on all of our high volume roads by treating it with asphalt or cement. This material will not allow water to collect directly under the pavement.

I think this change will pay big dividends in extending pavement life. Pavement performance is something the department and I take very seriously.

I hold an asphalt summit every year with personnel from the department, contractors, private sector engineers, material suppliers and asphalt producers to discuss problems and develop solutions. The exchange of ideas during these summits has been valuable.

In addition, we are working with industry in a newly formed organization called the "Asphalt Pavement Alliance" which will be coming up with some innovative ideas. My goal is to develop pavements strong enough to withstand spring thaw conditions without seasonal reductions in truck weight limits.

The department and the engineering and construction industry certainly haven't solved all of Alaska's pavement problems but we are working together to make Alaska's roads better.

Joseph L. Perkins is commissioner of the Alaska Department of Transportation and Public Facilities, based in Juneau.

oice of the Times
A CONSERVATIVE VOICE FOR ALASKANS

WILLIAM J. TOBIN
Senior editor

Tired of Alaska's lousy roads?

By DENNIS NOTTINGHAM

Have you noticed the grooves worn in Anchorage intersection pavements placed just last year? Have you noticed "alligator" (failure) cracks on new highways such as the Seward Highway, at Dutch Harbor and other locations? Have you had difficulty controlling your vehicle in water-filled ruts? Do you despise traffic delays during seemingly endless road resurfacing work?

If you answered "yes" to the preceding questions, wouldn't you like to know the real cause of these costly inconveniences?

If so, just ask anyone and you will get an assortment of reasons. Politicians duck the questions, tire dealers will support their product with all kinds of pointed logic, the Department of Transportation and Public Facilities will describe new, better, but expensive, road designs, others blame trucks, oldtimers will tell you how good the oil used to be in the "good old days," consultants will tell you what you want to hear and then send you the bill, attorneys resemble consultants, and then there's the socially dysfunctional individual who will tell you the straight scoop — and that would be me.

The reason I know some of the answers is that I'm old and have seen a lot, read a lot, have tested tires and traction, and actually got my hands dirty investigating road problems.

Did you know that winter tires were originally recaps with sawdust or walnut shells mixed in with the rubber for traction? These worked well but unfortunately, after 35 mph, you had a good chance of peeling off the outer layer. Soft steel studs later came out and road ruts started showing up. Modern tungsten carbide studs followed and, with high speeds, stopping, starting or wheel spinning, are most efficient grinding and chipping devices.

About 1 million passes of a studded tire will wear pavement 1 inch. This explains the rapid road wear caused by the 40 percent more or less of drivers who use studs. For a busy road with traffic centered in its lane, one inch of wear could occur in only one year. What do the rest of us drivers get who use modern stud-free tires and vehicles? We get the bill for the damage. About $6 million a year is spent in Anchorage alone repairing pavement. About $20,000 per lane mile is spent for minimal repair and $80,000 per lane mile for the full treatment. For those of you who have not heard of the new studless tire technology, rest assured it exists and it works.

Other states and provinces such as Minnesota and British Columbia disallow the use of studs and claim benefits are far outweighed by negative aspects.

So, if you're tired of excuses and paying the bill for others, call your legislator or ask one of the political candidates what they will do. Their answer will tell you if your support is deserved.

You say I forgot the alligatoring and cracking and failing road surfaces. I didn't forget, I just don't want to talk about the 30 years more or less I've fruitlessly spent trying to explain winter road frost-induced failure problems to the Transportation department.

Oh, what the heck — one last time. In winter, roads freeze from the top down. This action draws moisture to the freezing front from below in certain soils, creating an ice lens. Upon thawing from the top down in spring, soils with ice become weak for a short time, thus providing the conditions for road surface failure under loads and "alligatoring." The solution to this problem is to prevent ice lens formation by using the correct materials, particularly in the upper eight inches or more of the highway. Thicker pavements or stabilized bases under paving will solve the problem.

Road stud wear and road surface failure problems have been swept under the rug for too long by responsible parties. Such a history of this has been created that some smart plaintiff lawyer will figure it out and the next "loss of control" highway injury could result in treble damages against the government and those responsible.

My company's new parking lot expansion is designed the way Alaska's roads and streets should be. So if you're interested, stop by for a lesson in Arctic engineering.

Dennis Nottingham is president of Anchorage-based Pentrovich, Nottingham & Drage Inc., engineering consultants. PN&D recently completed an extensive renovation and expansion of its Spenard property at 1506 W. 36th Avenue, which includes an enlarged and newly paved parking lot.

The Anchorage Times

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Studded Tires

Studded tires have not been permitted in Ontario since 1971.

In 1999 and in early 2000, the Ministry of Transportation conducted an extensive review of studded tire use around the world. MTO's findings supported a continued ban on studded tires because, despite advances in technology, the disadvantages of studded tires continue to outweigh their advantages.

Three main reasons why studded tires are banned in Ontario:

- The limited potential benefits of studded tires under icy road conditions do not compensate for the significant adverse effects they create under other conditions.
- Studded tires create considerable health and road safety problems.
- Studded tire use is declining in many countries and banned in many jurisdictions outside Canada.

Why are the benefits of studded tires so limited?

- Studded tires do not offer safety advantages in comparison to modern radial winter tires in road conditions which are either wet or dry for most of the time.
- Studded tires are only superior to conventional tires on glare ice near freezing temperatures; these road conditions occur in Ontario less than 1% of the time.
- Any safety advantage is lost by even a small increase in speed.
- New lightweight studded tires cause only marginally less damage to the road surface than traditional studs and are less effective.

How do studded tires cause health and road safety problems?

- Nuisance and health concerns.
  - Increased noise levels.
  - Create dust – impact on asthma and respiratory health.
- Give drivers a dangerous false sense of security.
  - Studies have found that motorists with studded tires often drive faster under adverse conditions because of this overconfidence, which can create a greater accident potential.
- Cause road damage which contributes to serious safety hazards in all conditions
  - Create ruts which fill with ice and water creating spray and hydroplaning.
  - New light studs polish pavements, which reduces traction and creates a more slippery driving surface.

    - Removes pavement markings.
- Cost of extra road maintenance resulting from pavement damage caused by studded tire use.
    - In Oregon: Cost estimated at US$70 million a year based on 1994 study.
    - Washington State DOT: spends US $10.5 million a year.
    - In Ontario: cost estimated at CD$39 million a year.

What other jurisdictions ban studded tires?

- Minnesota, Wisconsin, Illinois, Maryland, Holland, Belgium, Germany, and Japan.

Where is studded tire use declining?

- Norway and Sweden.

Ontario will continue to consider new technologies and research regarding studded tires, as it becomes available. Review of studies done to date supports a continued ban on the use of studded tires.

Winter driving is a challenge for motorists due to snow and unpredictable weather. It's important to prepare your vehicle mechanically. Check weather and road conditions before leaving. Allow yourself extra travel time. Carry an emergency travel kit. Adjust your driving to weather and road conditions. Keep a safe distance between you and the vehicle in front of you and stay a safe distance back from snowploughs. Remember the three key elements to driving safely in winter - stay alert, slow down and stay in control.

Last Modified: November 5, 2001

Peratrovich, Nottingham & Drage, Inc.

Engineering Consultants

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Sen. John Cowdery
Alaska State Capitol
Room 101
Juneau, AK 99801-1182

February 26, 2003

Dear Sen. Cowdery:

I visited Juneau last week on business and my son William skated in the Treadwell Ice Arena grand opening. Juneau is beautiful on a clear day.

Of note in Juneau was the bridge paving on the Douglas Bridge which has deep stud wear grooves similar to Anchorage. We will have a horrendous road breakup this spring due to stud wear coupled with inappropriate design. I doubt $10 million per year will cover maintenance costs.

Something has to be done and the stud legislation would certainly help. Let those who wish, use studs, but have them pay.

Sincerely,

PERATROVICH, NOTTINGHAM & DRAGE, INC.

Dennis Nottingham, P.E.
President

NORTHERN DESIGN COURSE OUTLINE

pp 21-26

Dennis Nottingham, P.E.

Selected excerpts on the subject of studded tires and pavement wear:

Water is the great natural destroyer of roads in northern regions ... . If pavement surfaces are kept intact and relatively impervious, then theoretically there should not be problems. However this is not the real world. Asphalt surface permeability, thermal cracking, wear and a host of other variables allow water to penetrate from the surface, which coupled with capillary and vapor from below are combined to create problems.

A major problem resulting from modern technology has been the development of tire studs for better traction. Attempts to provide better traction have evolved from sawdust/walnut shell recaps to steel studs to tungsten carbide studs in use currently.

Present studs are many times harder than pavement aggregate, thus act as a chipping/grinding mechanism enhanced by speed and wheel spinning. The result of this is to wear pavement and create ruts which allow water to pond thus creating a multitude of problems.

Significant research has been done on the effect of studded tires ... . Some excerpts from a Minnesota Department of Highways study help illustrate the issue:

- "Wear rate for conventional asphalt pavements ranged from between 0.75 and 0.91 inches per million studded tire passes.
- "For conventional concrete pavements the wear rate was 0.30 to 0.47 inches per million studded tire passes."

Stopping distances for various tire configurations (20°F, 20mph):

■ All regular tread	glare ice	143 feet
■ Regular tread front, studded tires rear	glare ice	116 feet
■ All regular tread	dry pavement	18 feet
■ All studded tires	glare ice	89 feet
■ All worn studded tires (5,000 miles)	all conditions	125 feet +

Reports of the following effects related to pavement and stud wear:

- Premature loss of paint striping to delineate pavement lane lines and center lines.
- Loss of pavement grooving where provided for skid prevention.
- Loss of skid resistance in pavement wheel-track ruts
- Reduction of driving visibility due to splash and spray from water accumulating in worn pavement wheel troughs.
- Adverse vehicle handling behavior caused by wheel troughs during lane-changing or passing maneuvers.
- Increased noise produced both inside and outside the vehicle from tires riding on roughened pavement.
- Danger from loosened stones and flying studs.

Minnesota banned use of studded tires with the following reasoning:

> "Overall, the few advantages studded tires present on ice and compacted snow are greatly overshadowed by the detrimental effects they inflict on asphalt and concrete road surfaces throughout the year."

Pavement stud wear also allows water to penetrate through thin spots and ruts. Untreated base suffers from this as potholes rapidly form. Surface pavement alligatoring or cracking is a visual indicator of impending failure.

Repair of stud-worn pavement costs over $1 per square foot plus annual striping costs, resulting in a cost of approximately $200 per vehicle per year.

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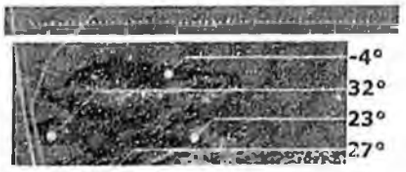

What's happening? Click on dates for events! Friday, March 7, 2003

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Web posted Monday, October 22, 2001

State cringes at wear, drivers can't wait to get their tires studded

By James MacPherson
Journal Reporter

Just as tire stores are gearing up for the rush to install studded snow tires, road crews are racing to repair damage done by studs as the early snowfalls arrive.

It's an annual ritual in Alaska, where the subject of winter driving on studded tires is cause for much heated debate.

State Department of Transportation and Public Facilities officials estimate that studded tires cause $6 million in damage each year to Alaska roads. And for the past decade, the department has unsuccessfully supported legislation either to ban them completely, or to mandate the use of less abrasive studs.

Many Alaskans, however, say you can't put a price on the increased safety the studs provide.

There is little argument that studs wear down road surfaces at a higher rate than regular tires. But advances in asphalt and tire technology over the years have lessened the effect of road ruts, DOT&PF officials say.

Tire studs act like tiny ice picks, chewing away at the asphalt, said Mike Tooley, a DOT&PF highway construction engineer.

"It's not rocket science," Tooley said.

Heavily traveled roads in Alaska can have ruts nearly 2 inches deep, and they can act like water troughs, causing automobiles to hydroplane, sometimes out of control.

The state has been sued by drivers who have said the rutted roads caused them to crash, Tooley said.

State attorneys, however, would not disclose any details of the lawsuits to the Journal.

"Ruts can cause you to lose control," Tooley said. "It really gives you a scare."

For the past few years, the state has used a "stone mastic asphalt mix" on Alaska roads which has reduced pavement wear by as much as 40 percent, state officials say. The mix, which was patented in Germany and is used extensively in Scandinavian countries, contains a high percentage of coarse aggregate.

Prior to 1995, state highways were paved with aggregate that contained about 70 percent fine aggregate and the rest a coarse rock. Now the ratio is reversed, and a special cellulose and asphalt oil mix is used.

"It may extend the life 40 percent, but it costs 10 percent more," said Tom Moses, DOT&PF regional construction engineer. Although

Kenai Peninsula Online

the wear and tear is lessened, the improved stone mastic asphalt mix is still no match for studded tires, Moses said.

"When you mix rocks with studs, the studs are still going to win," Moses said.

A heavily traveled road may last about five to seven years before the ruts become too deep and need to be filled, state officials say.

The state has laid test sections on the Glenn Highway and on Muldoon Road this summer using rock from Cantwell, a harder aggregate than found from the state's normal source in Palmer.

Although the harder aggregate in the pavement mix probably will resist studded tire wear better than aggregates found in Palmer, it's going to be much pricier since it has to be shipped by rail an extra 200 miles or so, state officials say.

Legislation failed in 1993 to ban studs completely, said Dennis Poshard, a DOT&PF special assistant to the commissioner. Several legislative attempts that would require lighter weight, less damaging studs have failed over the years.

Alaska is not alone in its studded snow tire dilemma. In Oregon, for example, legislation has been introduced that would require a $100 annual permit to use studs there. A penalty for not having the permit while using studs would be $300. Money collected from the permits and fines would go toward offsetting damage caused by studded tires, according to the bill before the Oregon Legislature.

No such legislation has been talked about in Juneau. And no other bills concerning studs are slated for the Legislature's upcoming session, Poshard said, adding that legislating studs in Alaska is a hard sell.

"People are really sold on their studded tires," Poshard said.

State officials say at least 50 percent of Anchorage drivers use studded snow tires, based on surveys where tires were counted in

shopping mall parking lots during the winter months.

"I like studs because they help people control their rigs better," said Bob Neitz, owner of Alaska Mobile Tire in Anchorage.

Neitz said when the first snow hits, he's automatically backlogged two weeks, a trend that lasts sometimes for several months.

"There is good money in it, and covers my slow months when I have to starve just to keep the lights on," Neitz said of selling and mounting studded tires. "But it's more than money, call it safety, traction, whatever, they're just a good insurance policy."

Neitz said studded tires earn him up to $1,500 a day at the height of the season, usually after the first big snow.

Neitz also re-studs and de-studs tires, a service many larger tire companies don't do in Anchorage.

Rick Gilmore, operations manager of Johnson's Tire Service, said there is little debate that studded tires are much safer than regular snow tires.

"We want people to be safe," Gilmore said. "Regular tires work well until you have to slam on your brakes."

The Anchorage-based tire company has six stores, three in Anchorage, and one each in Eagle River, Wasilla and Soldotna.

The company sells only lightweight studded tires which it calls "environmentally friendly tires." Instead of steel, the studs use an aluminum casing, but still utilize a tungsten tip.

Johnson's Tire Service has sold some 350,000 tires with the lightweight studs since they were first introduced in the mid-1990s, Gilmore said.

But even among studded snow tire advocates, there is disagreement over which studs are best, as more than 300 different types of studs

are produced for tire manufacturers.

"If you want to drive aggressively or defensively and not have them wear out in three months, use good old steel studs," said Neitz of Alaska Mobile Tire.

A state report done in 1996 by DOT&PF said that lightweight studs such as those sold by Johnson's Tire Service provide the same stopping power as older, heavier studs and reduce pavement wear by as much as 50 percent. And they last just as long, according to the report, done in large part by Tony Barter of DOT&PF.

Barter has researched road wear related to studded tire use in the state and around the world. He's considered by some to be the studded snow tire expert in the state.

So does he use studded snow tires?

"I don't, but my wife does," Barter said.

Sen. John J. Cowdery, Chair
Senate Transportation Committee
Call: 465-4921 Fax: 465-2069

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Sen. Pres. THERRIAULT
Sen. WAGONER
Sen. LINCOLN
Sen. OLSON

FROM:

STATE OF OREGON / RISK MANAGEMENT DIVISION

Last Updated 01/28/03
by: Barbara.E.Hamilton@state.or.us
URL: http://risk.das.state.or.us/vippdriv.htm

Studded Tires

"To stud or not to stud, that is the question." Shakespeare in Love? No, actually it's Oregon in Winter. The question: Is there a consensus on the use of studded tires?

The use of studded tires began in 1967 with approval by the Oregon Legislature. Studded tires are acceptable "traction devices" for crossing the Cascade passes. In 1971, the Legislature changed the studded tire season to November 1st through April 30th. It is not against the law to use studded tires. The only official recommendation is that if they are used, they must be placed on all four wheels.

To Stud

Studded tires are convenient. They are already on the vehicle. No floundering with chains. No wallowing in wet, dirty slush. They help you go in icy and packed snow conditions. Studs indent the surface to decrease the stopping distance on glare ice or packed snow. They provide some benefits in steering in these conditions as well, if used on all four wheels. Sounds inviting if you drive in those conditions frequently.

Or Not to Stud

The Oregon Department of Transportation discourages the use of studded tires. Studs do serious damage to the road surface. They cause pavement wear and rutting in the wheel path. Rutting causes a whole host of problems. Ruts catch rainwater. This can cause hydroplaning. Snow and ice tend to accumulate in the rutted areas. Snowplows can't remove it. Drivers try to avoid the ruts. Driving out of the designated lane may increase the risk of running off the road or running into other vehicles traveling in other lanes. The most serious problem with studded tires is that stopping distance is increased on wet or dry pavement. Sounds expensive and dangerous.

What was that question?

The question is really, "To go or not to go?" Studded tires help you "to go." But they don't help you "not to go" (read that as "stop.") ... In the rain ... studded tires are not as safe as all season tires. Wet conditions increase stopping distance. Studs increase it further. Do studs really increase your safety or are you actually at higher risk? Is the damage done to roads worth it? That damage takes tax dollars to fix.

FINNISH ROAD ADMINISTRATION

THE FINAL RESULTS OF THE ROAD TRAFFIC IN WINTER PROJECT

The Sosio-economic Effects of Winter Maintenance and Studded Tires

Project Manager: Ms Anne Leppänen, M.Sc. (Civ.Eng.) Finnish Road Administration P.O Box 33, FIN-00521 Helsinki Tel. int.+358 (0)204 22 2411, Fax int.+358 (0)204 44 2395

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ABSTRACT

Finland is a sparsely populated country where the road network provides access even to the most remote areas of the country. All public roads maintained by the Finnish National Road Administration (Finnra), are kept in good condition day and night, throughout the year.

Sodium chloride (NaCl) is the main substance used for chemical de-icing. Sanding is used only on roads with little traffic.

In Finland the use of studded tires began in the early 1960's. Finland has been and still is the leading country in the use of studded tires. In wintertime 95 % of passenger cars have studded tires.

The simultaneous use of salt and studded tires causes problems. To solve these problems a large research program called Road Traffic in Winter was launched by Finnish National Road Administration. The main object of the whole program was to evaluate new alternative winter maintenance scenarios for improving social benefits.

The overall project included over 40 subprojects. The duration of the project was three years (1992-1995) and the total costs of the project amounted to ca. 3.5 million US $. The final report was published in May 1995.

The Road Traffic in Winter Project had nine different future scenarios, representing permutations of three different usage of studded tires and three different salting alternatives. The alternative salting regimes were: full salting (120,000 tons p.a.), 50 % reduced salting and 80 % reduced salting. The alternative usage of studded tires were the baseline usage, i.e. 95 % passenger cars fitted with studded tires, 50 % usage and less than 20 % usage.

None of the examined scenarios was more favorable than the baseline situation. When searching for the socio-economic optimum, the accident costs become the most important factor. The accident costs strongly support retention of the baseline situation. i.e. the use of salt and studded tires should be continued at current levels in spite of their drawbacks.

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1. BACKGROUND

Sodium chloride (NaCl) is the main substance used for chemical de-icing in Finland. Sanding is used only on roads with little traffic. Increasingly widespread use of salt began in the 1960s. Salting reached its peak at the end of the 1980s. Finnish National Road Administration (Finnra) is currently trying to reduce the use of salt through further development of methods and equipment.

In Finland the use of studded tires began in the early 1960's. Finland has been and still is the leading country in the use of studded tires. In wintertime 95 % of passenger cars have studded tires. All tires must be studded if studded tires are used. Extensive pavement research work has been carried out to reduce the wear of pavements. Development has also produced studs which cause less pavement wear.

The simultaneous use of salt and studded tires causes problems. Studded tires wear the pavement and also increase harmful dust effects. In Finland, the best aquifers are situated in ridge areas from which salty water has easy access to the groundwater. Since these aquifers are not very large, even small amounts of salt may be enough to increase the salt content of the area. The possible salting of aquifers has been regarded as a serious problem. Therefore a significant reduction in road salting has been demanded, and even its complete discontinuation.

To solve these problems a large research program called Road Traffic in Winter was launched by Finnish National Road Administration. The main object of whole program was to evaluate new alternative winter maintenance scenarios for improving social benefits. The study viewpoint in project was simplified to three use levels of studded tires and three winter maintenance strategies, which together combined nine future scenarios. The ultimate scenario included both giving up studded tires and decreasing essentially the use of salt.

The Road Traffic in Winter project was divided into three main areas of research: A) Studies concerning traffic flow and traffic safety, B) Assessment of the state of the environment and C) Maintenance studies. The overall project included over 40 subprojects. The duration of the project was three years (1992-1995) and the total costs of the project amounted to ca. 3.5 million US $. The final report was published in May 1995.

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2.TRAFFIC SAFETY

Tyre research studies

The condition of the tyres does not affect the speeds in winter time. The drivers who thought their tyres were inferior did not drive slower than others. The drivers' knowledge about the condition of their tyres was poor and their knowledge about the condition of their studs was even worse.The grip of the new light studs is quite similar to that of the older steel studs, but the wear of pavements is only about a half. The serviceable life of the light studs varies considerably between different makes. Studded tyres as a whole are better than studless winter tyres, so called friction tyres. A car equipped with ABS brakes and friction tyres is a good combination if driving under icy conditions can be avoided. The differences between studs are huge. /6/

Driver behaviour

The change to friction tyres did not affect the amount or time of driving. Drivers with friction tyres drove slower than those with studded tyres in built-up areas and at sharp curves. They also maintained a longer safety margin to the car in front. The changes were not, however, sufficient to keep the risk at the same level as with the drivers with studded tyres. In good road conditions the increase in speed of the friction tyre users can have a negative effect on traffic safety.

As age and driving experience increase the risk of less accidents decreases, but particularly the risk of severe accidents is at its greatest for young and old drivers.

Drivers are not aware of the road conditions. The road conditions are usually evaluated as less slippery than they really are. On the other hand the condition of the tyres is overestimated. Under slippery conditions, more than half of the drivers (56%) estimated the conditions non-slippery or semi-slippery. Very slippery road conditions were deemed by 13% as non-slippery and only by half of the drivers as slippery or quite slippery. /1/

Although the road conditions are considered as slippery, people do not slow down sufficiently and the risk increases. In snowy conditions speeds decrease by 4-5 kmph and in slippery conditions by 3-7 kmph. Drivers seem to take the winter speed limits as a "recommended speed" regardless of how slippery the road surface is. /2/

Drivers in queues do not keep adequate safety margins. This is a problem especially in the capital region. In winter conditions one in every four keep too small safety margins (under 1.5 sec). /3/

Studded tyres of good condition increase safety. When studying accidents resulting in loss of life, 30% of the tyres were classified as being of bad condition (in normal traffic the percentage is 3%). /4/, /5/

Reduced salting experiments

During the reduced salting experiments in Kuopio (situated in the middle of Finland) the amount of sanding tripled. As small amounts of salt are used in the sand to enhance adhesion, the total amount of salt was reduced by 80%.

On the experimental roads, friction levels below 0.3 were twice as common as on

control roads. Less than 3% of the time the friction levels were below 0.2 with no difference between experimental and control roads. /7/

During the first winter there were 27 accidents leading to injuries or death on the test roads and 25 during the second winter. These numbers correspond to the mean of the last five years (26.8). Taking into account the fact that accidents decreased simultaneously on the comparison roads, the experiment has increased the personal injury accidents by 5 %. On the roads in maintenance class I, comprising over 80 % of the test roads, the personal injury accidents increased by about 20 %. /8/
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3. ENVIRONMENTAL EFFECTS

Ground water /10/

The salt pollution of the ground water is a problem in southern Finland, where the most heavily trafficked roads are built on an esker. Roads built on top and following an esker are adverse.

In general, salt pollution develops slower in larger aquifers. When the esker material is coarser the groundwater flow velocity increases => water circulation increases => salt pollution is slower. Dense layers situated unfavourably can direct the salt pollution of groundwater.

At the coastal areas excessive intake of water can result in salty seawater pushing into the place of fresh water. In the old sea water reserves of the coastal areas the salt concentration can be high.

According to the modelling studies, the salt amount of 5 t/km/a which corresponds well to the current usage does not usually raise the salt concentration in groundwater. In some cases the salt concentration can even decrease a bit. /11/

Salt deposits at the bottom of aquifers has been dreaded. This didn't happen in the modelling studies. The sinking of salty water would seem possible only with extreme salt concentrations or very small flow velocities. Continued salting with great amounts of salt (10-20 t/km/a) will eventually lead to excessive increase of the salt concentration at small aquifers.

The environmental risks of salting can be controlled by protection of the most risky areas and keeping the salt amount as small as technically possible.

Vegetation

The study indicated that even modest use of road salt in the road region of Savo-Karjala resulted in accumulation of salt in the pine needles. However, the salt concentrations were not high enough to cause any visible injuries. According to the study the reduced use of road salt has proved to be good for the roadside vegetation.

Dust

Dust can cause breathing symptoms to people with allergies. The quartz dust from the road and sanding materials can be hazardous to health but the amounts of quartz dust remain so small that they can not form a risk factor according to the current knowledge.

Dusting and formation of wet, dirty fog can be controlled by traditional maintenance i.e. by opening up slush drains, moving snowbanks, well-timed peeling of ice from the embankments and by auxiliary measures (draining melt water, washing and brushing) as the need arises. Constructional road improvments can also be used to decrease dusting and/or assist in the maintenance needed to decrease dust and dusting.

Alternatives to road salt

CMA (calsiummagnesiumacetate) is in general similar to NaCl (sodium chloride) in anti-icing: Both can be applied using the same equipment and for similar circumstances. The dosage of CMA has to be 1.3 times the weight of NaCl. As the volume weight of CMA is about 63% from that of NaCl, one load on CMA is sufficient for about half the road length of NaCl. The effect of CMA decreases significantly at temperatures below —5 C. CMA melts slower than NaCl and it is not effective enough for packed snow or ice.

In Finland the oxygen content in aquifers is quite low. That's why CMA is not so suitable for us. CMA causes much less corrosion than NaCl.
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4. WINTER MAINTENANCE /9/

In the studies of the logistic effects of winter maintenance the number and recurrence of late arrivals was considered more important than the time of lateness of a single transport.

Reducing the amount of salt increased the transport hours by 1-5% and studless winter tyres by 2%. Using less salt increases the annual transport costs by 0.05-0.5% and using studless winter tyres by 0.1-0.3%.

Using less salt increases the standard deviation of the transport speed increasing also the risk of delay during winter road conditions by 5-10% and the total risk of delay by 0.5-1%. The increased transport time would have significance only when the logistics activities have developed to the level where small delays wouldn't be covered by elasticity in the logistics chain.

Discontinuing the salting almost totally increased the costs of winter maintenance of a busy road (6 000 vehicles/day) even by 50%. The costs of winter maintenance were increased also on roads with less traffic but the effects were smaller than on the busy roads.

Wet, including salty, road conditions existed for 46-49% of the winter period in

coastal area and central Finland. The percentage of frost and icy road conditions in winter time was 11-13% except in northern Finland where the percentage was about 20%.

Hard packed snow wore twice as fast in the studded tyre tracks than in the control tracks as measured from the cross section areas. Softer packed snow wore at the same speed both in studded tyre and control tracks.

Two locked brakings of trucks on a road surface covered with packed snow collapsed the deceleration values. On the side of studless winter tyres deceleration values decreased by 53% and on the side of studded tyres by 36%.

The introduction of light studs would decrease rutting to 40-50% and the forbiddance of studs to 20-30% of the current rutting level.

The effect of alternative stud wears on maintenance costs was studied using the pavement management system (PMS). The long term target level of maintenance costs is 102 million US$/a based on the current rutting levels. The introduction of light studs and friction tyres would decrease the maintenance costs by 17 million US$/a. The banning of studded tyres would decrease the costs by a further 8 million US$/a. As the current situation will anyway change towards the light stud alternative on account of the current stud regulations, the ultimate effect of a stud ban would be only about 8 million US$/a.

In bridge maintenance the additional annual costs caused by winter salting are about 6 million US$ and the additional costs of corrosion damage prevention in the construction of new bridges are about 2 million US$/a bringing the total up to 8 million US$/a.

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5. VEHICULAR COSTS

The fuel consumption of a car on a slippery, snowy and uneven road increases by 15 % compared to the consumption on a dry, bare and even road. The changes in consumption depending on road geometry are greater than those depending on road conditions. The fuel consumption with studded tyres is 1,2% greater than with studless winter tyres.

The annual corrosion costs were calculated as 160 US$ per car. With the current passenger car base the total corrosion costs are about 300 milj.US$/a, half of it is caused by salt. The amount of salt used has a distinct effect on the corrosion costs and regional variations are great. In the calculations of total social costs the corrosion costs of cars were instead based on the protection costs and the costs were about a half of the former.

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6. ROAD USER EXPERIENCES

In other countries, forexample in Japan, the greatest disadvantage of studded tyre use was perceived to be the particle dust caused by the studs. Thus far the experiences from the winter traffic in Japan show no "alarming" signs after the move to studless winter tyres.

In Finland in spite of rains, slipperiness and packed snow the drivers of heavy vehicles estimated the road conditions rather as fair than as bad. 63% of the bus drivers and 83% of the lorry drivers did not think that reduced salting impeded staying on schedule. Only 1% thought that reduced salting had hindered them quite often.

The small amount of road salt experiment in the Province of Kuopio was welcomed by the public. The experiment increased the number of people opposed to the use of salt. The use of road salt was most often opposed due to the environmental inconveniences. As expected, the representatives of the heavy traffic had a more positive attitude towards the use of road salt than the drivers of private cars. They motivated this with the increased traffic safety. The road users did not feel that the decrease in the use of road salt caused any great inconvenience. On the contrary, the attitudes of driver responsibility and driving comfort were usually increased.

The acceptance of the future scenarios specified in the Road Traffic in Winter -programme was tested using the weighting from a conjoint study. Normal road users saw that the primary alternative was very limited salt use combined with the current studded tyres and the current level of winter speed limits. As the use of salt would be decreased from the present, the environmental influences and car depreciation would be on a lower level. The top management of the Finnra preferred 50% salting from the beginning, the current policy of tyres and changing speed limits. Traffic safety and environmental issues would be emphasised, but the salt content of ground water could increase within the recommended levels and car depreciation could continue at the current level. Environmental and traffic safety experts saw reduced salting and current studded tyres as the primary alternative. They also hoped for lower winter speed limits and increased traffic safety.
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7. SUMMARY OF THE ROAD TRAFFIC IN WINTER PROJECT /13/

The Road Traffic in Winter Project had nine different future scenarios, representing permutations of three different usage of studded tires and three different salting alternatives. The alternative salting regimes were: full salting (120,000 tons p.a.), 50 % reduced salting and 80 % reduced salting. The alternative usage of studded tires were the baseline usage, i.e. 95 % passenger cars fitted with studded tires, 50 % usage and less than 20 % usage.

The baseline situation, i.e. 120,000 tons p.a. salting and 95 % of passenger cars fitted with studded tires, was representative of the actual practice at the commencement of the project in 1992. Since then, the salting of roads has been reduced (to 80,000 tons p.a.) and light-weight studs that are less abrasive to pavements are now used in new winter tires. In the socio-economic calculations it is assumed that all studded tires

are fitted with light-weight studs (1,1 g).

In the socio-economic calculations, efforts were made to take account of the effects as broadly and comprehensively as possible. The calculations include the costs of road authority, the motorist, society as a whole and the environment. Cost assessments are based on the costs of preventing harmful effects, the established practice (e.g. accident costs) or, in the absence of these, the best estimates of relevant experts. /12/

The changes of socio-economic costs compared to baseline situation are presented in figure 1.

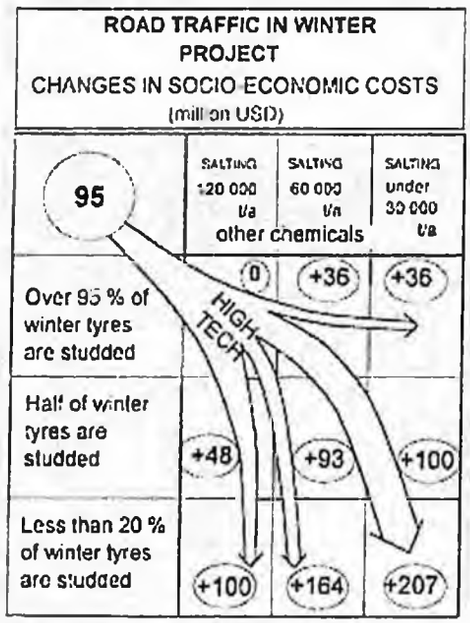

Figure 1. Summary of the socio-economic costs (mill. US$) of various scenarios examined in the Road Traffic in Winter Project.

None of the examined scenarios was more favorable than the baseline situation. When searching for the socio-economic optimum, the accident costs become the most important factor. The accident costs strongly support retention of baseline situation. i.e. the use of salt and studded tires should be continued in spite of their drawbacks. Studded tires provide added safety, especially for uncertain drivers in variable road conditions. Similarly, salting evens out variations in road conditions and provides an opportunity to travel safely and smoothly even in the winter (more information in TRB preprint number 960876/session 96, Kallberg V-P & al: Estimation of the Effects of Reduced Salting and Decreased Use of Studded Tires on Road Accidents in Winter).

The method of calculation used in this study has provided simplified answers to complex questions. All of the values were difficult to express in monetary terms. Those intending to utilize these findings should also familiarize themselves with more detailed studies, which will provide a more comprehensive view of the complexities of the field.

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The main reports of the project Road Traffic in Winter. Reports are in Finnish with English abstracts:

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/3/ Roine, Matti. **Driver behavior in sharp curves and queues on main roads.** Helsinki 1993. Finnra 87/1993, ISBN 951-47-877-4, ISSN 0788-322. TIEL 3200212.

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STATE OF ALASKA
OFFICE OF THE GOVERNOR
JUNEAU

March 5, 2003

The Honorable Gene Therriault
President of the Senate
Alaska State Legislature
State Capitol, Room 107
Juneau, AK 99801-1182

Dear President Therriault:

Under the authority of art. III, sec 18, of the Alaska Constitution, I am transmitting a bill that would impose a fee on the purchase and use of studded tires in Alaska.

According to a 1996 report by the Alaska Department of Transportation and Public Facilities, the use of studded tires in Alaska causes approximately $5 million damage to our roads per year. Most of this damage occurs in our high traffic urban centers in the form of rutting. It is a particular problem in our urban centers where rutting is often severe and causes unsafe driving conditions.

The worst of this damage is repaired by the department. Due to limited maintenance funding, much of it is added to the State's deferred maintenance backlog. This bill would impose a fee of $10 for each studded tire sold, resulting in $2 million in increased revenues. This proposal represents a modest, user-pays approach to paying for studded tire damage.

New tire technology has been developed in the last ten years to create studless winter tires. These tires use softer rubber compounds and specific tread patterns to improve their performance in snow and ice conditions. This technology has continued to improve and is widely available as an alternative to studded winter tires.

I urge your prompt and favorable action on this measure.

Sincerely,

Frank H. Murkowski
Governor

TRANSMITTAL LETTER

FISCAL NOTE

STATE OF ALASKA
2003 LEGISLATIVE SESSION

Fiscal Note Number: 1
Bill Version: SB 106
(S) Publish Date: 3/6/03

Revision Date/Time (Note if correction):
Dept. Affected: Revenue
Title: Studded tire surcharge
BRU: Revenue Operations
Component: Tax Division
Sponsor: Rules Committee
Requester: Governor
Component No.: 2476

Expenditures/Revenues (Thousands of Dollars)

Note: Amounts do not include inflation unless otherwise noted below.

OPERATING EXPENDITURES	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009
Personal Services	43.9	43.9	43.9	43.9	43.9	43.9
Travel	5.0	2.0	2.0	2.0	2.0	2.0
Contractual	8.0	3.0	3.0	3.0	3.0	3.0
Supplies	2.0	1.0	1.0	1.0	1.0	1.0
Equipment	2.5					
Land & Structures						
Grants & Claims						
Miscellaneous						
TOTAL OPERATING	61.4	49.9	49.9	49.9	49.9	49.9
CAPITAL EXPENDITURES						
CHANGE IN REVENUES ( )	1,950.0	1,950.0	1,950.0	1,950.0	1,950.0	1,950.0

FUND SOURCE (Thousands of Dollars)

1002 Federal Receipts						
1003 GF Match						
1004 GF	61.4	49.9	49.9	49.9	49.9	49.9
1005 GF/Program Receipts						
1037 GF/Mental Health						
Other (Specify Type–Do not abbreviate)						
TOTAL	61.4	49.9	49.9	49.9	49.9	49.9

Estimate of any current year (FY2003) cost: 0.0
Mark this box (X) if funding for this bill is included in the Governor's FY 2004 budget proposal:

POSITIONS

Full-time	1	1	1	1	1	1
Part-time						
Temporary						

ANALYSIS: *(Attach a separate page if necessary)*

This legislation would impose a $10 per tire surcharge on all studded tires sold in Alaska, effective July 1, 2003. Businesses would be required to file monthly reports and remit payments to the Department of Revenue. The surcharge would be collected by the seller of the studded tire, such as tire dealers, service stations, garages, etc. Businesses would be allowed to retain 5% of the amount collected, not to exceed $1,000 in any calendar quarter, to cover expenses in collecting and remitting the surcharge.

Based on projections from the Department of Transportation and Public Facilities, the surcharge would raise an estimated $2 million a year -- minus the 5% commission. This is based on the assumption that about 40% of all passenger vehicles and pickup trucks in the state use studded tires on all four wheels, and that vehicle owners replace their studded tires every five years.

The operations cost includes one Tax Technician II (Range 12) to administer and collect the surcharge. The Department expects several hundred businesses statewide will be included in this new program.

Prepared by: Larry Persily, Deputy Commissioner
Phone 465-5469
Division: Department of Revenue
Date/Time 3/3/03 4:03 PM
Approved by: Larry Persily, Deputy Commissioner
Date 3/3/2003
Agency: Department of Revenue

(Revised 9/2002 OMB)

FISCAL NOTE

COMMITTEE COPY