

SUMMARY OF REPORT

SOCIO-ECONOMIC EFFECTS OF STUDED TIRE USE IN ALASKA – ZUBECK 2004

Abstract: “The use of studded tires seems to have a positive impact on the overall Alaskan economy. The savings from avoided crashes are the most substantial impacts and benefit the broadest range of groups including the state government, vehicle owners, passengers, and insurance companies (and their policy holders”

“Test results show studded tires provide on average better traction on ice than non-studded friction tires. On snow or wet pavement there are no significant differences. Alternative to winter tires, chains and special equipment are currently not practical for Alaska”

Regulatory Overview: “Six states (Colorado, Kentucky, New Hampshire, New Mexico, Vermont and Wyoming) allow virtually unrestricted use of studded tires on state roads and highways. 36 states all studded tires but restrict their use seasonally, geographically or through equipment specifications. 7 states prohibit use of studded tires (though only one receives snow/ice).

“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 increase requirement of surface applications to improve surface traction (e.g. sand, salt, gravel) result in an overall increased financial burden at the state level”
- These studies have led to legislation that continues the use of studded tires, but limits that use to lightweight studs to minimize adverse effects.

Air Pollution: Road dust particles produced by studs are unhealthy, leading Japan to ban them after a study was performed addressing health costs. No adverse effects to human health if studded tires are banned. Any reduction in particulates would be offset by an increase in the volume of dust from surface applications (sand, salt)

Traffic Safety: Banning stud usage increases the overall cost despite savings in road maintenance. The relationship between rutted pavement and hydroplane accidents still needs to be evaluated. Studded tires reduce accidents by 5%.

Pavement Wear: Studded tires wear pavement surface and cause rutting. Rutting is also caused by plastic deformation due to heavy vehicles, though studded tires do the most damage.

-Nordic Countries report that they have significantly reduced the costs related to pavement wear caused by studded tires. They did this by implementing wear resistant pavements, less aggressive studs and strict enforcement of seasonal usage.

Recommendations:

Apply wear resistant asphalt mixtures

Mandate the use of lightweight studs

Reduce speed limits during the winter on high traffic roads

1.2 Problem Statement Summary

Studded tires are proven to wear pavement surfacing, causing ruts which cause accidents. Rutted pavement needs to be rehabilitated. Studded tires may also cause health risks to community in the dust they produce, which can be inhaled and bring about respiratory problems in sensitive population groups (elderly, children, sick)

3.3.3 Japan

Economic evaluation of Japan's studded tire ban, done 10 years after the ban went into effect, found that regulation was successful in reducing road dust and in limiting noise pollution.

It also found that the reduction in studded tire use led to an increase in cost of approximately \$137 million (Asano 2002).

- This can be attributed to increase in traffic accidents, however road users incurred the majority of these costs.
- The recommendations made was not to remove the studded tire ban, but improve road surface maintenance and transportation policies.

3.4 Studded Tire Policy Decisions

- In a study on studded tire pavement effects in Oregon, they found that a combined approach of lightweight studs, a reduction in the time permitted for stud use, and a user fee structure to recoup pavement damage costs would provide a balanced and effective studded tire policy.

4.3 Contribution of Studded Tires to Roadway Dust

- Alaska DOT estimates highway damage from studded tire use in Alaska to be \$5 million annually. Calculated for inflation, this would cost **\$8,097,402.16** in 2017.

- Dust in Alaska does not reach unacceptable levels.

4.7.1 Wear-resistant Asphalt

- General agreement that the installation of wear-resistant pavement substantially reduces the amount of road dust and road damage caused by studded tires.

5.6 Conclusions and Recommendations

All studded tires sold should only be lightweight studs.

5.7 Executive Summary

Pavement repair costs resulting from pavement wear caused by studded tires is a significant problem to the state of Alaska.

Although pavement repair costs are significant, accident costs are the overwhelming factor in economic analyses of studded tire effects.

Motivating factors for restrictions on studded tires were pavement wear and air pollution.

Drivers using studded tires behave differently than drivers without.

Few published studies available that address a relationship between rutted pavement and hydroplaning accidents.

8.4 Avoided Crash Costs

According to a compilation “meta” study, studded tires reduce accident rates by 1 – 10%.

Insurance companies benefit the most from studded tires, followed by the state and federal government because of cost savings from accidents needing expensive emergency services.