

## Center for Safety Equity in Transportation

*If you have a right to get there, you have a right to get there safely.*

May 2020

### CSET Research Showcase

#### Operational Safety of Gravel Roads in Rural and Tribal Communities

There are over 2.1 million miles (almost 54% of all roads including federal and state highways) of unpaved roads in the United States. Unpaved or gravel roads in the Pacific Northwest are being used as main transportation corridors in various locations. In many cases, these unpaved roads are the only means of transporting agricultural products, of transferring logs from forestry or of accessing a remote area. Limited maintenance of unpaved roads can lead to structural failures and geo hazards. Similar to paved roads, the main factors affecting the performance of unpaved roads are: materials, construction activities, traffic characteristics, and environmental and drainage conditions. The major differences are that gravel roads need greater maintenance frequency and have a greater susceptibility to moisture damage than paved roads. Most often excessive snowfall in winter causes hazardous issues for the unpaved roads in the Pacific Northwest and Alaska. These highways are a critical component of the infrastructure system, especially for the communities which do not have alternative access in or out. Therefore, ensuring safe access year-round is a necessity for those communities.

This CSET study by Ahmed Ibrahim at the University of Idaho focused on identifying gravel road safety issues currently affecting the operational characteristics of people and goods in rural communities. Much of this initial evaluation relied on information readily available in the Idaho highway database (ITD). The research team contacted the Latah County in the state of Idaho, and well-established maps were provided for all accessible gravel roads. The goal of the study was to identify communities impacted by unpaved road closures and report the reasons for such closures.

The project is considered a pilot study to identify unpaved, and gravel roads which have experienced road closures in the state of Idaho. The project results included a comprehensive literature review of unpaved roads, field visits, and a questionnaire sent to all local highway jurisdictions in the state of Idaho. The survey investigated whether or not a rural community experienced unpaved road closures, the location of the community, and the reason(s) for closure. 37 responses were received by the research team. Five rural

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### Announcements

CSET has positions open for post-doctoral researchers, graduate and undergraduate students interested in RITI transportation equity and safety research. Please contact us at [cset.utc@alaska.edu](mailto:cset.utc@alaska.edu).



Typical street in rural Alaska. (Ruby, Alaska).

A grader evens the wearing surface of the Dalton Highway, Alaska during spring melt.



CSET has been funded through the 2016 University Transportation Center Program by the US Department of Transportation as part of the FAST Act at approximately \$1.4 million through 2022.

Maintenance and dust management on Dalton Highway is particularly challenging due to the very high volume of tractor trailer trucks hauling freight between Fairbanks and Prudhoe Bay, Alaska.



Although nationally the percentage of fatalities and serious injuries from crashes on gravel roads is low, in some states these roadways account for up to 20% of total fatalities.

30% of people who are involved in a crash on gravel roads are not using seatbelts, twice as many as unbelted victims on other roads.

Of crashes occurring on gravel roads, 36% are single car crashes many of which involve rollovers.

Drivers age 14 to 19 are overrepresented, accounting for 30 percent of the crashes on gravel roads.

## Gravel Roads (continued from page 1)

communities responded that they experienced closures and isolation. The reasons for the closure of the unpaved roads were the lack of funding for snow removal, excessive dirt, unstable gravel roads, tornados, and heavy rains. The locations of the communities are spread across the state of Idaho with corresponding populations ranges from 25 to 8,500 people. The researchers developed a simple guideline for unpaved/gravel roads assessment for local highway jurisdictions to use, which will aid in reporting various types of damage or potential hazards. The positive impact of simplifying assessment of road quality is improved allocation of infrastructure funding. Finally, based on the information provided by ITD, most of Idaho's unpaved roads were reported as improved and in acceptable condition.

## UAF Come study with us!

The University of Alaska Fairbanks is actively seeking graduate students interested in research related to rural, isolated, tribal and indigenous transportation safety. Civil engineering is preferred, but also looking for interdisciplinary and Alaskan Native students. For more information contact Nathan Belz at [npbelz@alaska.edu](mailto:npbelz@alaska.edu).

## Gravel Road Safety

According to the Federal Highway Administration (FHWA), in 2012 there were 1,357,430 miles of unpaved road in the United States, accounting for almost 35 percent of the more than 4 million miles of roadway in the Nation. Gravel roads present unique safety issues, the most considerable of which is traction. Driving on loose gravel is harder than driving on pavement because your tires do not have sufficient traction to maintain stable control. Traction issues are exacerbated at high rates of speed.

Basic safety tips to reduce your risk of being involved in a crash while driving on gravel include:

- 1) Slowing down
- 2) Avoiding sudden changes in direction
- 3) Accelerating and braking slowly
- 5) Increasing the distance with which you follow the vehicle ahead of you.
- 6) Not driving while under the influence of alcohol or drugs.
- 7) Using safety equipment appropriate for the vehicle being driven (e.g., seatbelt, helmet, etc.)



Taylor Highway near Eagle, Alaska. The Taylor Highway is closed during the winter months.



Large cracks form on the Dalton Highway as a result of a process known as shoulder rotation which is caused by degradation of permafrost at the toe of the road embankment.