



Risk assessment on an Argentinean road with a dynamic traffic simulator

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The National Route 7 in Argentina is one of the most important corridors crossing the Andean Cordillera. It concentrates most of the traffic related to the Southern Common Market (MERCOSUR), it also connects Mendoza city (the fourth most populated in Argentina) with Santiago de Chile (the Chile capital city), and is used by tourists to access to the Aconcagua National park, Puente del Inca natural monument, skiing resorts, and to local displacements for the villages along the Mendoza valley.

The road crosses the Andes through the Mendoza river valley at an elevation between 2'000 and 3'000 m. The traffic (2500 vehicles/day) is composed of motorcycles, cars and pickup trucks, trucks without trailer, buses, and semi-trailer trucks. Debris flows developed along tributaries of the Mendoza River, and due to remobilization of talus materials, impact frequently the road, causing traffic disruptions, bridges damages, etc. Rock falls detached from highly fractured outcrops also impact frequently the road, causing sometimes casualties.

The aim of this study is to evaluate risk along sections of the National Road 7 develop along the Mendoza river, using a dynamic traffic simulator based on MATLAB[ ] routine. The dynamic traffic simulator developed for natural hazards events on roads consider different scenarios based on traffic speeds, vehicle types, interactions types, road properties and natural processes. Here we show that vehicle types and traffic variations may influence the risk estimation. The analyzed risk on several critical sections of the National Route 7 demonstrates that risk may significantly increase: 1) on sinuous sections, steep sections and because of road conditions changes (exit of tunnel, bridges, road width, etc.) because of decreasing vehicle speed, particularly with semi-trailer trucks; 2) when an event, such a debris flow, occurs and generates a vehicle tailback increasing their duration presence in the risk area.