

## ***Interactive comment on “Brief Communication: On direct impact probability of landslides on vehicles” by P. Nicolet et al.***

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This brief communication addresses an important issue in risk analyses for gravitational processes like landslides, avalanches, rock falls or debris flows. The authors provide an overview on various approaches in the literature for calculating the probability that objects such as cars or trains are directly hit by an event. This is denoted as “spatial-temporal probability”. They categorize these approaches in three categories, which are presented and compared by a simple, virtual example. The article is well written and allows comprehending the differences of the approaches. This contribution fits into the scope of NHESS and I recommend publication after a minor revision.

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In particular, some issues should be clarified to make the paper better understandable:

- p. 7312, line 24 to p. 7313, line 1: please provide references for the ‘usual use’ of the term ‘spatio-temporal probability’ and to ‘some methods’.
- p. 7313, line 12: tipos analyses and line 20 rock-fall
- p. 7316, line 16: land-use planning
- p. 7316, line 11ff: Here, the meaning of  $W_E$  in eq. (4) and (6) is clear; however, its use is less clear or perhaps wrong in the following equations. In equation (8),  $W_E$  would be the diameter of a rock in case of a rock-fall and in case of a slide it would correspond to the (effective) width of the slide. However, in the cited EconoMe-Tool, the length of endangered section is added to the length of the vehicle ( $g_j + l(B)$ ) on page 11 in the cited document Bründl et al.). Therefore, the equation should be corrected to:  $p_{ST} = \frac{f_v \times (L_H + L_V)}{v_V}$  since  $W_E \neq g_j$  according to your terminology. Please comment on this and clarify.
- p. 7318, line 14: I suggest to replace ‘last inspection’ with ‘last clearance’
- p. 7318, eq. (9): I cannot find this equation in Borter (1999). Number of affected people is used in Borter (1999) in terms of damage susceptibility on p. 66.
- p. 7320, lines 1 - 4: Here, it should be mentioned or discussed that all people of a train could be affected if the front part of a train (e.g., first or second waggon) is hit and the train derails. Potential damage in case of derailment depends also on topographic conditions, meaning that in case of steep terrain a high number of passengers could be affected.
- p. 7320, line 5: around
- p. 7320, line 2: “. . . of the neglected . . . taken into account.” The ‘the one’ is unclear.

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- line 25: 'consequence' instead of 'consequences'
- p. 7321, lines 5 - 10: Check the (long) sentence for clarity and consider rewriting; check also lines 17 - 22, where the sentence could be shortened.
- Table 1: What is  $V$  [-]?
- Figure 3: please indicate  $L_H$  here.

I'm looking forward to see the revised paper published.

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