

Review of “Roads at risk – traffic detours from debris flows in southern Norway”, NHESS.

General comments

I think this paper is very well written, and provides the literature with new insights on landslide impact on road networks. It provides a good explanation of the methods, so that they can be applied by other investigators/developers. The sections of the paper are generally well proportionate and well structured, and the tables and figures have a good appearance and readability.

Section 2 could be more detailed in places, for example: (i) few details are given on how the type event landslide inventories were generated (field inventory, photo-interpretation, etc.); (ii) a short definition of “trigger frequencies” should be provided; (iii) explain the rationale and the justification for aggregating the data at the catchment scale (provide also a range of the size of the catchments).

Section 3.2 is clear, but missing adequate references to the literature, at least regarding the general definition of risk. For example, the authors could refer to:

- *Varnes, D.J. and the IAEG Commission on Landslides and other Mass-Movements, 1984. Landslide hazard zonation: a review of principles and practice. The UNESCO Press, Paris, Paris, 63 pp.*
- *Jones, D.K.C., 1995. Landslide hazard assessment. In Landslide Hazard mitigation. The Royal Academy of Engineering, London, 96-113.*
- *Lee E.M., Jones D.K.C., 2004. Landslide risk assessment. Thomas Telford Publishing, London. ISBN: 0 7277 3171 8*

In Section 4.1, it would be useful to provide some example of costs for Scenario 2, to be compared to figures provided in Scenario 1 (data could be also provided in a new table, or integrating table 2).

In Section 5, it should be more extensively discussed the reason why the results do not match the “four years of detailed data coverage”.

Specific comments

Figure 2d seems out of place here. Maybe it would work better (alone) as Figure 5, since it is also presented after Figure 4 in the main text.

Figure 4 is not easy to understand. Please add arrows where missing, this should improve the overall readability of the flowchart. Furthermore, the “operation” ovals could be differentiated by all the other boxes by different colors.

In Figure 5b the range and the unit of measure presented for the total additional traffic load per road closure do not correspond with the text. Please correct the wrong one.

In Figure 6, I think it would better to add the names of the regions mentioned in the text (same as in Figure 1).

In the legend of Figure 7, the thickness of the link failure line (black line) is different from the one in the figures 7a and 7b.

In the caption of Table2, please specify that the distances are measured in km.