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Discussions

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Interactive comment on "Stability assessment of roadbed affected by ground subsidence adjacent to urban railways" *by* Ki-Young Eum et al.

Anonymous Referee #2

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General comments This paper proposes an assessment on the stability and risk of the roadbed adjacent to urban railways by using a three-dimensional model. This topic could be interesting to NHESS readers, if some issues are more clearly addressed, in particular literatures review, research method, model's verification and discussions. For this reason, major revision of this paper is necessary before it can be considered for publication.

Specific comments P.1, 1 Introduction, please provide more literatures related to the assessment methods used in this topic, in particular the numerical models. P.2, 2 Case studies of ground subsidence, what kind of the cases are the simulated target in this paper? P.3, 3 Numerical analysis, please add a section to briefly introduce this three-dimensional numerical model such as theory base, essential parameters,

input/output, boundary conditions, initial conditions, etc. P.3, 3 Numerical analysis, please add a section of model's verification by historical events to properly demonstrate the reliability of the model's performance. P.3, 3.1 Conditions for numerical analysis, Ln.103-104, how to decide the scenario such as diameter 4-10 m, distance 15-25 m and various groundwater levels? Based on any field cases? In additions, please add a table to list total computational runs. P.3, Figure 4, what is the meaning of the roller attached on the left side and two sides of bottom? P.3, Figure 5, the legend texts are too small and unclear. Is it possible to merge this figure with Figure 4 as a single figure? P.4, 3.1.2 Physical properties of rail, rail pad, and prestressed concrete (PC) sleeper, too many tables in this section, I suggest to reorganize these tables to reduce table numbers. P.5, Figure 7 - The legend texts are too small and unclear. - Please use the same color interval of vertical displacement value of (a) and (b) in order to clearly to show "ground settlement increases as the diameter of the cavity increases". - Please keep the same geometric scale and view angle of the model display. P.6, 4.1.1 Regression analysis of roadbed settlement, too short descriptions. What's the meaning of the regression analysis? Why the groundwater level is absent in the regression? The better description for R-squared=0.72 probably is "medium to high correlation" instead of "high correlation". P.7, Figure 9, a linear equation in legend, editing error? P.7, Figure 10 - The legend texts are too small and unclear. - Why the vertical displacement is symmetry along the centerline of roadbed since only cavity on one side. P.9, It's difficult to understand the risk level through Table 5 – Table 7 since the risk level is based on the combination of cavity diameter, distance and groundwater level. I suggest to reorganize these table to perform more systematical outcome. P.10, 5 Conclusions, conclusions should include vital or quantitative findings of this paper.