Thank you for your valuable comments and grammar corrections. I appreciate your thorough reading of the manuscript. Attached are point by point replies to the comments. The pointed out spelling/grammar errors will be corrected in the revised manuscript.

This is a nice paper and it serves as a valuable complement to the newly released, freely available source code for the RoadSurf model. The different components of the model are well described. The evaluation part shows that the model is capable of computing the surface temperature well. However, the central theme of the paper is not the model's forecasting capabilities for road surface temperature. Rather it is, like Crevier & Delage (2001), a description of a sophisticated road weather model. As such, the paper should focus its discussion on the model and how it differs from other similar models.

-Thank you for your suggestion. Comparison to other road weather models would indeed be interesting. However, I think that including comparison to other road weather models would broaden the scope too much for this paper and would require an additional paper. There are multitude of road weather models which share the same basic physical principles and thus meaningful comparison would require going to too much detail for a discussion chapter. One possibility is focusing comparison only to the METRo model that is the only other open-source road weather model. However, as Crevier's and Delage's paper is already over a decade old and as the model code is contributed by many parties, some of the details might have changed over time. This would make the comparison difficult. In addition, comparing details like the number of ground layers or how the boundary layer conductance is calculated would not be meaningful for many readers without showing how they affect the model results. This would require running both models and comparing the results, which would broaden the paper too much.

Below, you'll find a few comments and requests for clarification:
The paper would benefit from having a Discussion section.
-May I kindly request some clarification regarding your comment? Given that a comparison with other road weather models might significantly broaden the scope of our manuscript, could you please suggest what type of discussion would be appropriate to include?

Abstract: "well suited for forecasting road surface temperature."
The model has a sophisticated storage module that takes asphalt porosity as well as ice, black ice and snow into account. This, among other things, sets it apart from the METRo model. If well implemented, the RoadSurf model should also be well-suited for calculating road conditions, potentially more accurately than METRo. This could be interesting to address in a Discussion section.
-Both METRo and RoadSurf predict storage terms, but it is true that while METRo has only two storages: water and combined storage for ice and snow, RoadSurf have four different storages: water, snow, ice and black ice. However, determining the accuracy of these predictions is difficult without reliable observations. The optical instruments at the road weather stations measure the thicknesses of water, ice and snow layers, but are not reliable enough for accurate measurements. In addition, these amounts depend greatly on the spot on the road they are measured. Thus, it is difficult to assess which one of the models is more accurate. We would not like to speculate in discussion which of the models is better without actual verification results.

Page 4 row 17: "The upward radiation". Explain how the upward radiation from the surroundings affects the road surface.

-An more detailed explanation will be added to the revised manuscript “Smaller sky view factor decreases the amount of long wave radiation from the sky, but increases the long wave radiation from surroundings. As approximation of the radiation from the surroundings, the model uses upward radiation from an NWP model. As the radiation output from an NWP model represents the whole grid cell, the upward long wave radiation can be assumed to present the road surroundings rather than the road that covers only small part of the grid. Although upward radiation is not same as radiation towards the road point, it can be used as rough approximation. It is calculated as the difference between the net long wave radiation and incoming long wave radiation:”

Page 10 row 23: Explain which items in table 1 refer to which storage term/wear factor x. Is ice2=black ice? How is deposit different from black ice?
-Simple explanation will be added below the wear factors. Deposit and secondary ice storage are explained earlier, so they are not elaborated further. (Page 9 row 26: “Deposit means black ice that has formed on the road surface via deposition.” Page 9 row 28: “There are two separate storages for ice that are otherwise similar but the secondary ice storage is reduced faster by traffic. “)

Page 11 row 8: What is the disadvantage of allowing water to freeze immediately without affecting the temperature?
-In the real world, water gradually freezes and freezing releases heat. Thus, letting the water freeze immediately may cause too cold surface temperature and too fast ice formation. However, the phenomena’s accurate simulation is difficult as it would require increasing surface temperature when freezing, which would cause temperature to rise above the freezing limit. This minght cause surface temperature to bounce above and below freezing limit when water is freezing.

Page 12 row 33-34: If the air is dry, can the dew point reach -50 in the north of Finland? "lower than -50 ◦C were removed from the air temperature, surface temperature and dew point temperature"
-It can, but it is rare, so it probably does not affect much to the results

Page 12 row 46: Why not simply remove those forecasts? They would be of poorer quality than when the system is functioning as expected.
-This is a good suggestion; we will remove those forecasts and recalculate the results for the revised manuscript

Page 16 row 1: "there was". Otherwise one might misinterpret it as though there is always a decreasing temperature trend in October and January (why not November and December?) in Finland, but the data only supports this for the specific winter season. "there is a general decreasing trend in temperature during those months."
-This will be corrected to the revised manuscript

Page 16 row 8-9: This seems counterintuitive. Please explain why! "The 00, 06 and 18 UTC forecast seem to have smaller RMSE values when the actual forecast time is around 12 UTC"
-The reason for this will be investigated more closely and if explanation is found it will be added to the revised manuscript