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Comment on acp-2021-281

Anonymous Referee #2

Referee comment on "High-resolution mapping of regional traffic emissions using land-use machine learning models" by Xiaomeng Wu et al., Atmos. Chem. Phys. Discuss., https://doi.org/10.5194/acp-2021-281-RC2, 2021

Wu et. developed a new approach by using machine learning models to map vehicle emissions in high resolution styles. The method has significant improvements in computational accuracy and efficiency compared with conventional methods, such as simple spatial allocation or transport demand modeling. More importantly, the required land-use data is highly available through traffic road maps or other open-accessed sources. I see a high potential of this method to be applied in many regional and city-level occasions, which can improve the policy design and implementation of traffic emission controls. Overall, this manuscript is well organized with contributions in both methodology and policy implications.

A few minor comments are listed below for improving the manuscript.

1. This study established a high-resolution traffic flow database by machine learning methods, but the development of emission factor is not adequately reported. For example, the original EMBEV model was developed for the fleet in Beijing. Please illustrate how to localize the emission factors for the entire fleets in the greater Beijing region.

2. This paper compared the performance of two machine learning models, LURF and GPR, on traffic flow simulation. The author should explain why these two models are selected.

3. Currently, the emission inventory covers a portion of the entire traffic network (highways outside urban areas). Whether the method is applicable to urban roads needs further discussion.

4. Figure 5(F), The title should probably be changed to NO^X instead of CO.