Review Number: ****CEUS-D-23-01112****

# Editor

I have now received 2 reviews of your manuscript, “Modeling the impacts of replacing car trips with combined public transport and cycling: Reproducible methods, results and actionable evidence from biclaR," which you submitted to Computers, Environment and Urban Systems (CEUS). As you will see in the comments appended below, the reviewers noted that the manuscript is interesting and addresses an important topic. I believe that your research has the potential to make a good contribution to the literature.  
At the same time, the reviewers raised some concerns and proposed that the manuscript need to be improved regarding the following aspects:  
  
- Spatially explicit analysis and representations  
- Spatial variations and generalizability  
- Policy implications and insights into design interventions  
- The sophisticated rationale and deeper analysis for trip transitions between car driving and public transport & cycling  
- Additional spatial analysis on these trip transitions  
  
In consideration of the Special Issue's focus, we encourage authors to incorporate perspectives on 'socially sustainable' and 'equitable' mobility into their study. This is particularly relevant given the emphasis of the special issue on both environmentally and socially sustainable mobility. Authors have the option to integrate these perspectives directly into their analyses, which is the preferred approach, or at least address them comprehensively in the discussions. As an illustrative example, we suggest that authors provide estimates of geographically varied benefits, moving beyond a single value for the entire region.

Additionally, it would be valuable to associate these estimates with various socioeconomic contexts of different neighborhoods.

Furthermore, we note the increasing prevalence of using open data and open-source software. While these methods are becoming more common, we recommend focusing on articulating the hypotheses, conducting thorough analyses, presenting newly obtained insights, and engaging in in-depth discussions regarding the (policy) implications. This is because this study is not about introducing substantial development or updates in the open data and tool themselves, but the study uses a tool for a specific application research.  
  
Based on the reviewers’ feedback and my own evaluation, I would like to give you the opportunity to submit a revised manuscript, if you believe you can adequately address the issues raised in this review.

# Reviewer #1

This paper estimates the social and environmental impacts of replacing car trips with cycling and public transport options for the Lisbon Metropolitan area. Overall, the paper addresses an important concern in transportation planning and the findings are of practical relevance for the large-scale decarbonization of urban transportation systems. I am in support of the publication of this manuscript but have some minor suggestions for the authors to consider:  
  
1)Making the switch from car trips to public transportation is a highly context-based decision. I think there are opportunities to make the findings more spatially explicit. While Figure 4 goes some way to show bike routes with the highest potential, it would be useful to examine this at a finer spatial resolution. Currently it is hard to pinpoint which areas should be prioritised by planners. This would be helpful especially for planners operating in resource scarce environments.  
  
2) The aesthetics of Figure 2 can be improved. It is currently hard to make out any details from the plot and in my opinion does not provide additional value add over the text. Suggest adding some colour coding and line width (or the consideration of faceting to reduce visual clutter and improve the representation of desire lines.  
  
3) The authors claim that the analysis can be applied to other metropolitan areas but the analysis is only applied to a single metropolitan area. It would be helpful to discuss potential challenges for generalisability and extending this concept to other cities/metropolitan areas. Some concerns might be data availability in different regions, the applicable spatial scale and extent of the analysis, and assumptions about travel patterns in different climatic conditions.  
  
4) There is further opportunity to expand on the conclusion section to discuss some recommendations for design intervention. For example, I think the results and findings could offer interesting insight about the can it offer further the scale and type of design interventions that planners should be considered.

# Reviewer #2

The paper provides a clear summary, methodology, data, objectives, and contributions.

However, there's a need for improvement in the logic and explanation of the transition from car trips to a combination of public transport (PT) and cycling. Particularly, the rationale and explanation regarding which trips transition from car to PT + cycling are lacking and require significant enhancement.  
  
Additionally, the Results section requires further enhancement. It currently interprets the findings too simplistically, lacking in policy implications or a thorough discussion of the results.

There is also a need for the inclusion of a spatial analysis regarding the transition trips

This feedback emphasizes the necessity of a deeper analytical approach and the importance of discussing the broader implications of the study's findings, suggesting that a more comprehensive examination could significantly enrich the research's contribution to policy and planning discussions.

### Major Comments

1. In Section 2.3, "Modeling intermodality," assumptions are made for the first and last legs with a combined length of up to 5 km and up to 25 minutes on bike travel time. The basis for these specific distances and times appears to be unsubstantiated by survey or statistical data, raising questions about their appropriateness.

2. Tables 1 and 2 lack sufficient explanation. There is a need to clarify what is meant by the "Target" column, what the "national strategy targets" refer to, and the definitions of routing values such as "safe" and "direct". Additionally, the units for Total trips and other columns like Baseline, Potential Cycling + PT—whether they're trips per month or year—require further clarification.

3. Following up, there is inadequate explanation about which scenarios lead to car trips transitioning to PT + Cycling. It is unclear whether all car trips are assumed to transition under the assumptions mentioned in Section 2.3 or only those satisfying specific criteria. While there is sufficient detail on routing, the O-D jitter tool, and the emission model, there is a notable absence of discussion on the Mode Choice Model and transition rates, necessitating further elaboration.

4. The criteria for trips transitioning to Cycle + PT is crucial to the study's outcomes and appears to need additional clarification. It seems not only car trips but also existing PT trips might transition to Cycle + PT. There is a need for a more comprehensive explanation (including tables, statistical values, diagrams, etc.) on how the transition volumes were calculated.

5. If the assumptions were solely based on a maximum of 5 km by bike, up to 2 hours, and no possible transfers between PT, this might oversimplify the complex transportation mode choice behaviors of users. In this case, a justification for these assumptions or a sensitivity analysis across various scenarios would be beneficial.

6. In my view, there could be specific O-D pairs or zones where the transition from car to PT + Cycle is notably high. However, there appears to be no inclusion of spatial analysis or detailed results regarding these transitions in the Results section. Incorporating spatial analysis to identify these areas could significantly enhance the understanding of where and why certain transitions are more prevalent, providing valuable insights for targeted interventions and infrastructure development. The inclusion of such analysis would not only enrich the findings but also support more nuanced policy-making and planning efforts.

### Minor Comments

7. The acronym HEAT mentioned in the Abstract seems to be unexplained. The use of acronyms should be minimized in the Abstract, suggesting a need for revision in the wording.

8. Figure 4 lacks descriptions for color and thickness.