Reviewer's report

Title: Compliance Potential Mapping: A Tool to Assess Potential Contributions of Walking Towards Physical Activity Guidelines

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Reviewer: Ugo Lachapelle

Reviewer's report:

The idea of a compliance potential map is sounds, and provides policy relevance to research on walkability. The title and abstracts are good, and the objectives are clearly stated. Yet the manuscript suffers from a number of problems in description of methods, data and properly referenced framework and methods. I believe most of the revisions required are minor although some involve rerunning the models and further documenting the effort. Is this a novel method or has this been applied somewhere else?

With the information provided, I would have a difficult time reproducing the methodology, and would have difficulty in selling this type of maps over more traditional ones showing a similar effect: that denser central areas tend to generate more walking.

Minor Essential Revisions

Avoid the use of the term “popular” when only one reference is cited. (line 83).

Is table 1 a joint discrete continuous model? If so state in Estimates (p.3) as you present your approach equations. Statements at the beginning of p.4 are unclear. Join discrete continuous models have no reference, the discrete choice model (I am sure that it is not used here) is not clearly linked to your topic or approach, and the ordered probit model (which I am assuming you are using with the frequency variable) is also not tied to your own modeling effort. How is this joint discrete continuous model better than an individual model of walking? Why are transit and car trips modeled but not used afterwards? Reading the equations, I am unclear as to what the hat refers to in this case, and tpi (trips) is not defined.

Eq.3, for the sake of simplicity, please reorder the equation so that it follows the logic on figure 1 (prob*trip*length).

Before seeing figure 1, I was sure that the unit of analysis would be individuals. The grid shapes on the maps rather suggest areas. It is unclearly stated how you move from the individuals to areas. Are individual respondents aggregated to a raster map? If so, a travel survey contains only a limited amount of older adults and many older adults will do very little walking if any. While there may be more of these walkers in central and denser areas, in many areas of a city, densities preclude any walking. If areas on this map are composed of aggregated data on walkers, how many (max, min mean) were available for each area? Did you use
a threshold to determine unsuitably low number of observations? On the figure, the 3+ trips are presented as 3. While few people likely walked more, this bundling feature seems to reduce the total distance that would have resulted if a person actually walked 4 or 5 trips.

Line 105. State the guideline to link to weekly minutes. Reference 14 is improperly cited and likely not the best source for this information. CESP does not set the guidelines. I did not check reference 18, but this may be better. Furthermore, used respondents are aged 55-64. The guidelines refer to them as adults. Seniors are 65+. Even thought the guidelines are roughly the same, please reformulate to be coherent with guideline language.

Finally, the maps show that in very few areas, near the CBD, senior are likely to reach more than 30% of guidelines by walking. Having a table or graph that shows the quartile distribution of these values or some descriptive would help understand the magnitude of people affected. There are few red areas, but how high above 30% are they. And since these are in denser central areas, what proportion of seniors do they represent.

Line 176, 211-214: This information should come much earlier, in the intro and methods.

Line 159-160 : Is it not a quadratic function of distance from home to CDB?

Typos on line 84, 142,147, 150, 164 (mobility tools?)

Major Compulsory Revisions

Since travel surveys are conducted at the metropolitan level, why is only the city of Montreal used?

Please clarify the first model used in table 1. And include why you chose this model in the method section. It is only briefly mentioned and unreferenced on line 84. Furthermore, you do not make use of the estimates for car and transit trips. I was also puzzled to see that table 1 contains 31,000 observations and table 2, 13,000. Are they respectively trips and people?

Job density is discussed on line 151, but not presented in methods. Same for square footage to building ratio. In line 151 to 156, it seems that many variables may be correlated and should not be placed jointly in a model.

Using profiles of men and women with completely different values for other variables seems illogical, as one would not be able to determine if the effect is due to gender, or car ownership and income. Since gender is not reported as being significant in both walking models (Note that non significant variables are not treated the same way in model 1 and 2. In the latter they are not reported), I suggest that the profiles stick to one gender and have other variables influence the profile.

Discretionary Revisions
Because you need to make the assumption that people walk the same number of trips every day, it may be best to produce you % compliance with only one day for which you have real data. 30 minutes a day, 5 days a week is, I believe the way guidelines formulate it.

Level of interest: An article of importance in its field

Quality of written English: Acceptable

Statistical review: Yes, and I have assessed the statistics in my report.

Declaration of competing interests:

I declare that I have no competing interests.