Geoscientific

Model Development

Discussions

[GMDD]

Interactive

comment

Interactive comment on "Computing Climate-Smart Urban Land Use with the Integrated Urban Complexity Model (IUCm 1.0)" *by* Roger Cremades and Philipp Sommer

Anonymous Referee #2

Received and published: 5 October 2018

The manuscript proposes an integrated urban complexity model to assess climate friendly urban forms based on a cellular automata approach. The purpose and content of the paper is presented clear and traceable and deals with the very relevant planning challenge to steer urban regions to a more sustainable development. Some comments: you are motivation your work with the objective to minimize global carbon emissions. Focus of your model is the energy consumption per inhabitant. I am not sure about the correlation of these two variables in terms of mobility as the kind of energy (electric, direct combustion) strongly depends on the used mode of transport. For example using public transport will definitely have other impacts on CO_2 emissions than driving by car. In terms of urban CO_2 emissions I would find vehicle miles travelled by car a more

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[Discussion paper]

meaningful destination variable. You could change that or rewrite your introduction towards energy consumption. You should at least clearly describe how this variable energy (it is coming from the UITP database, right?) was calculated. Are active modes included in this assessment and which values were taken for which mode of transport/ mode of drive?

In general: think about your input variables. I would assume that you can achieve better results for the regression if you would include mode sensitive accessibility measures instead of simple average distance between citizens. Also the spatial entropy could be exended towards land-use mix.

Working trips represent the majority of executed trips in urban areas. Therefore the locations of jobs are equally important for the number and length of trips per person as residential locations. Please discuss how this can be incorporated in the planning process/included in the model.

I would drop the section about absence of existing infrastructure (page 19, 6-13). The optimization you are performing is based on relations between energy consumption and an existing supply of mobility infrastructure and public transport (le nechet). That means the optimal urban form you found is only valid if this kind of supply exists.

Extend the section about transferability. Why is it difficult to transfer? Which data is missing? What could you do to overcome tranferability issues? As i understood you only need city boundaries, population density and some kind of basic land use.. I would say that the main problem is different mobility behavoir/ mobility options.

Nevertheless, good work!

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