Spatial segmentation of mode choice behavior: a latent class approach based on accessibility and the built environment

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Background

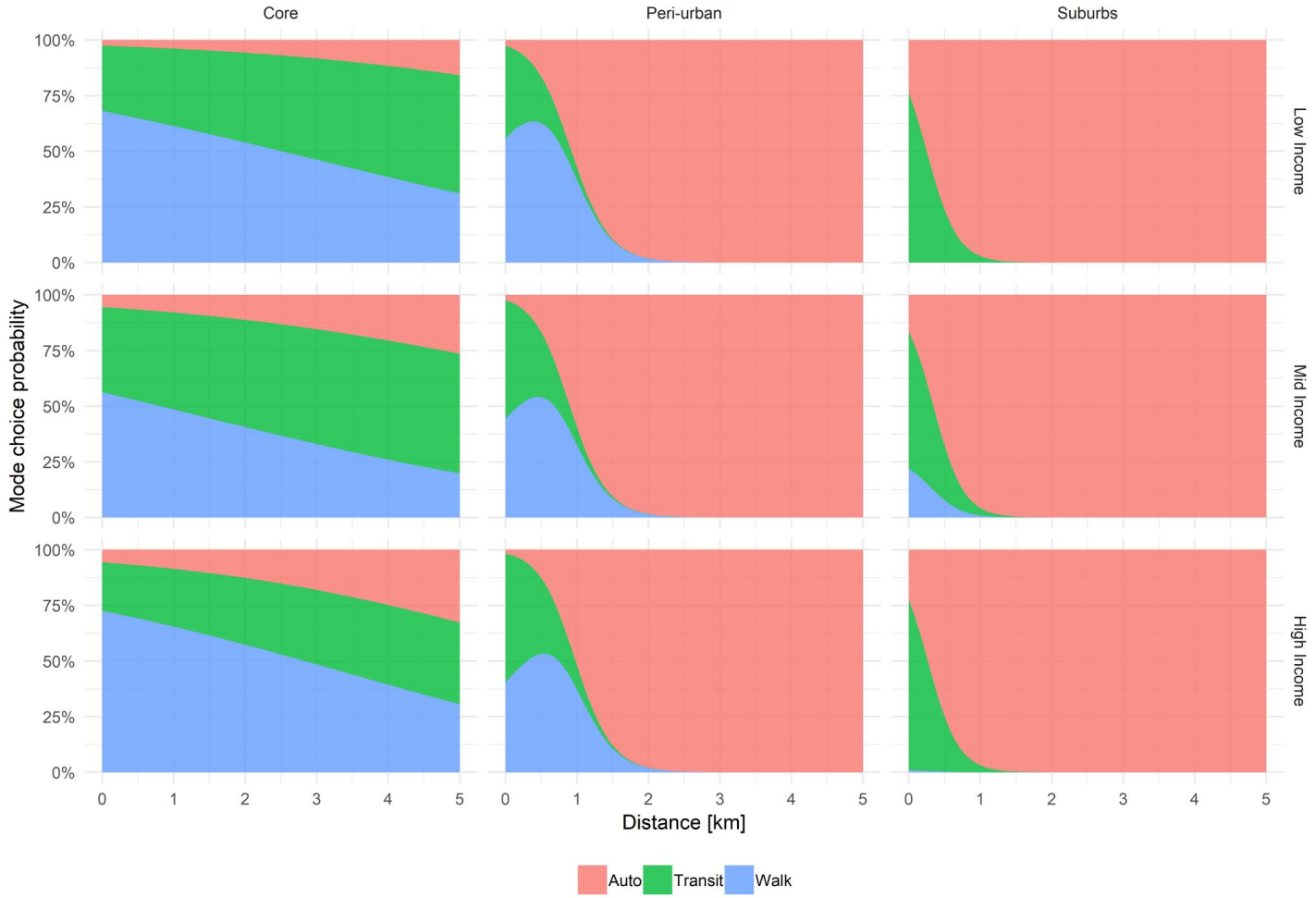
- Transportation planning goals > reduce VMT and increase use transit, bike and walking
- Literature states limited potential in built environment and accessibility changes to reduce VMT and increase the use sustainable modes (Ewing & Cervero, 2010, Stevens, 2017, Giles & Duranton, 2018)
- Often these studies have represented travel behavior linearly across the urban space.
- If the analysis incorporates that behavior changes depending in the urban location. Could the association between the built environment and accessibility with more use of sustainable modes be larger?

Application

- The notion is that the location attributes generate a specific response
- For example, people that walk, may do it because they are in a walkable area. Facing the same trip in a different location may be associated with another mode choice.
- Two level modeling: Locations are associated different classes of behavioral models. Each zone has a probability of being in each class. This is done using latent class choice modeling.
- Three classes: **Core**, **peri-urban**, and **suburbs**
- Applied to Portland, Oregon in a grid cell spatial framework (80 by 80 meters)

Most probable class in each grid cell

Mode choice probability



Discussion

- Spatially segmenting travel behavior models is a better method to identify the association between the urban environmental features and travel choices
- Location accessibility can have a large association with sustainable travel choices
- In the **core** class the majority of travel choices are sustainable, in the **suburb** class almost everyone drives, and **Peri-urban** works as a transition that tends to behave more like a suburb
- Could we set standards of urban development and transportation planning to move the **peri-urban** areas look more like the **core**?