

TOPIC: C

Toward a sustainable city: identifying link between urban environment and people choice of low energy transportation in Bangkok using GIS

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Abstract:

Transportation is the sector that consumes the most energy in a city like Bangkok, capital city of Thailand. One way to decrease use of energy in the city is then to encourage alternative means of low to zero energy transportation. Cycling as a choice of transportation has been identified among the best transportation that use the least energy (calculated and compared to others means by Vale using ecological footprint). With recent gas price going up and down rapidly, how Bangkok Metropolitan Administration and Bangkokian prepare themselves for a change in an expensive fossil fuel future? Do we know what kind of urban environment needed to encourage change toward sustainable city lifestyle in term of transportation? How do we decide if the policy or project being implemented will help improve the situation?

Geographic Information Systems (GIS) can be used to objectively measure features of the built environment that may influence choices of transportation, which is an important factor of energy used in a city. In this paper, the author describes how a previously developed index of bikability was operationalised in Bangkok context, using available spatial data. Cycling behavior of sampled respondents who commute regularly by bicycle in the area and objective parcel-level GIS measures of land use and infrastructure conditions was analyzed. Secondary data on public needs and opinion on using bicycle as an alternative means of transportation in the city has also been used as a reality check and a confirmation of recognized bike-friendly urban design/plan features.

Among previously researched correlates of cycling, it appears that proximity of home to destinations and the presence of parks are the objective environmental variables that contribute to non-fossil fuel choices of transportation such as cycling. However, limitations of the study was that our existing GIS variables measured was restricted. Few respondents' mentioned variables such as the presence of bicycle lanes, trees or shading, traffic speed and volume was not readily available thus has not been included in the analysis.

This study demonstrated that GIS data have the potential to be used to construct measures of environmental attributes and to develop indices of bikability for regions, cities or local communities. In other studies, GIS has also been used at a simulation level to model neighborhood pedestrian/cycling network connectivity. Modeling neighborhoods prior to development show promise for conceptualizing the urban environment relative to target behaviors. In the case of Bangkok, benefit from the tools will be more obvious if further attention is made on collecting and distributing qualitative and detail quantitative transportation data.