

Using Open Source Data and GIS Techniques to Overcome Data Deficiency and Accuracy Issues in the Construction and Validation of Transportation Network: Case of Kinshasa City

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Abstract : An accurate representation of the transportation system serving the region is one of the important aspects of transportation modeling. Such representation often requires developing an abstract model of the system elements, which also requires important amount of data, surveys and time. However, in some cases such as in developing countries, data deficiencies, time and budget constraints do not always allow such accurate representation, leaving opportunities to assumptions that may negatively affect the quality of the analysis. With the emergence of Internet open source data especially in the mapping technologies as well as the advances in Geography Information System, opportunities to tackle these issues have raised. Therefore, the objective of this paper is to demonstrate such application through a practical case of the development of the transportation network for the city of Kinshasa. The GIS geo-referencing was used to construct the digitized map of Transportation Analysis Zones using available scanned images. Centroids were then dynamically placed at the center of activities using an activities density map. Next, the road network with its characteristics was built using OpenStreet data and other official road inventory data by intersecting their layers and cleaning up unnecessary links such as residential streets. The accuracy of the final network was then checked, comparing it with satellite images from Google and Bing. For the validation, the final network was exported into Emme3 to check for potential network coding issues. Results show a high accuracy between the built network and satellite images, which can mostly be attributed to the use of open source data.

Keywords : geographic information system (GIS), network construction, transportation database, open source data

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