Exploring Influence Range of Tainan City Using Electronic Toll Collection Big Data

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Abstract : Big Data has been attracted a lot of attentions in many fields for analyzing research issues based on a large number of maternal data. Electronic Toll Collection (ETC) is one of Intelligent Transportation System (ITS) applications in Taiwan, used to record starting point, end point, distance and travel time of vehicle on the national freeway. This study, taking advantage of ETC big data, combined with urban planning theory, attempts to explore various phenomena of inter-city transportation activities. ETC, one of government's open data, is numerous, complete and quick-update. One may recall that living area has been delimited with location, population, area and subjective consciousness. However, these factors cannot appropriately reflect what people’s movement path is in daily life. In this study, the concept of "Living Area" is replaced by "Influence Range" to show dynamic and variation with time and purposes of activities. This study uses data mining with Python and Excel, and visualizes the number of trips with GIS to explore influence range of Tainan city and the purpose of trips, and discuss living area delimited in current. It dialogues between the concepts of "Central Place Theory" and "Living Area", presents the new point of view, integrates the application of big data, urban planning and transportation. The finding will be valuable for resource allocation and land apportionment of spatial planning.
Keywords : Big Data, ITS, influence range, living area, central place theory, visualization
Conference Title : ICUPRD 2017 : International Conference on Urban Planning and Regional Development
Conference Location : Tokyo, Japan
Conference Dates : March 27-28, 2017