Combating Road Traffic Congestion with Big Data: A Bibliometric Review and Analysis of Scientific Research

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Abstract: Road traffic congestion is one of the challenging problems confronting city dwellers globally. It is majorly caused by either one or a combination of recurrent congestion, nonrecurrent congestion, and precongestion conditions in urban road networks. This chapter performs a bibliometric analysis and reviews the volume of literature linking big data with combating road traffic congestion between 2011 and 2020. The review employs a quantitative analysis of bibliometric science mapping tool to highlight features that affect knowledge accumulation. The chapter also reviews the intellectual structure of knowledge based on total publications and citations. The key scholars, documents, affiliations, regions, data, and algorithms that influenced the development of this research area are analyzed. The results of documents co-citation evaluation show that the key research clusters are salient elements linked with the development and deployment of connected and autonomous vehicles (CAVs) technology. These research clusters are traffic flow prediction, congestion and accidents alert systems, security and privacy mitigation, vehicle emission profiles, travel time estimation, optimization of vehicular routing, journey planning and congestion prediction, and travel and parking guidance. Finally, the chapter presents the way forward and future research direction for sustainable road traffic management in the context of smart city initiatives leveraging on big data.