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Urban mobility in a typical day: time varying (geo)graphs

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In this work we create and analyse a set of urban mobility networks, each one corresponding to a consecutive timestamp in a same city. It was used, as case study, actual data from Sao Jose dos Campos-Brazil. This data consist of an Origin-Destination survey: a list with place (traffic zone) and time of both leave and arrival of each travel. An Origin-Destination graph was generated based on a 3-dimension matrix representation, in which each node represents a traffic zone and the edges' weight is the flow of people between these nodes. The igraph library, in language C, was applied to calculate the topological properties (degree, clustering, diameter). The Geographical Information System QuatumGIS was used to spatial visualization of both nodes and edges and their topological properties, using the framework of (geo)graphs. Our results show, for the 24-hours network, that the greatest diameter occurs at 4 a.m, and that between 6 a.m and 8 p.m the clustering is always greater than 0.62.

Complex Networks. (Geo)Graphs. Time Varying Graphs.