

عنوان مقاله:

Origin-Destination Matrix Estimation Using Socio-Economic Information and Traffic Counts on Uncongested Networks

محل انتشار:

نشریه بین المللی مهندسی حمل و نقل، دوره 8، شماره 2 (سال: 1399)

تعداد صفحات اصل مقاله: 19

نویسندگان:

Hadi Karimi - Ph.D., Department of Industrial and Systems Engineering, Isfahan University of Technology, Isfahan, Iran

Sayed Nader Shetab Boushehri - Associate Professor, Department of Transportation Engineering, Isfahan University of Technology, Isfahan, Iran

Ramin Nasiri - MSc. Department of Industrial and System Engineering, Isfahan University of Technology, Isfahan, Iran

خلاصه مقاله:

The travel demand matrix, also known as an origin-destination matrix (OD matrix), is essential in transportation planning. Given their nature and extent of operation, direct methods of estimating the matrix often impose unusually high costs in terms of both time and human resources. Thus, over the past three decades, numerous attempts have been made to propose indirect methods of estimating and updating the OD matrix. Using traffic counts to estimate the OD matrix is one of those indirect methods. However, because there are insufficient of traffic counts, indirect methods mostly lead to multiple OD matrices. One way to overcome this drawback is to use a previously estimated matrix from available data (called the old matrix) for new matrix estimation. Since uncongested networks rarely suffer from congestion, they have not been at the center of attention by researchers and transportation planners; thus, no old OD matrix is available for these networks. This study proposes a two-stage approach for estimating the OD matrix on uncongested networks. Firstly, an initial OD matrix is built using a travel distribution model (e.g., gravity model) together with local socio-economic information and available traffic counts across the network. Secondly, by considering budget constraints and using Bayesian inference, the optimum counting sensor locations are determined and by applying the collected information and the precision of the initial OD matrix is improved. To evaluate the proposed solution, the algorithm is then applied to the Sioux Falls network. The results prove the efficiency and precision of the approach.

کلمات کلیدی:

OD matrix estimation, sensor location problem, counting sensor, Uncongested Networks, Sioux Falls network

لینک ثابت مقاله در پایگاه سیویلیکا:

<https://civilica.com/doc/1180689>



