A PSO based transportation network design optimization of the mega city Dhaka

Abstract
Transportation network is a key issue for a city area and is required to update to fulfill the growing demand of existing roads and the construction of new roads considering various constraints. In general, transportation network design problem (TNDP) concerns the optimal selection of several projects from various alternative prepared projects with restricted available resources and associated constraints to ensure benefit versus cost. Various approaches have been investigated to solve TNDP in last several decades. Recently, periodic swarm optimization (PSO) based method is chosen to perform other methods. However, most of the existing methods, including PSO, tested on the real case of Dhaka. Therefore, the aim of this study is to clarify the effectiveness of the PSO based method for a mega city having large number nodes and arcs. The nodes considered in this study are Dhaka, the capital of Bangladesh. The experiment has been conducted on a roughly estimated data for online network as well as proposed projects. Experiments results for reveal that the method able to select projects for optimal (near optimal) utilization of a given budget amount. The selected projects are seen to be effective in increase traffic flow while observe on the schematic diagram of the road network.