Abstract

Ahmed O. Idris

Demand-Sensitive Candidate Route Generation Algorithm (DSCRGA).

Demand satisfaction is a key component that reflects the quality of public transit from the passenger’s perspective, whereas cost minimization is considered a main objective of transit agencies. This trade-off between quality and cost turns transit network design into a multiobjective problem in which the interests of passengers and operators conflict. Transit network design involves the determination of various design elements, such as route alignments and stop locations, which are essential to serve transit demand within a particular area. The design of a transit network typically starts with the generation of a set of potential routes through the use of a candidate route generation algorithm. Existing route generation algorithms find the shortest path between a route’s origin and destination. Demand is aggregated without proper attention given to its pattern and distribution along the generated route. Given that demand actually is scattered along the transit route, the aggregate demand assumption is considered a major drawback of existing route generation algorithms. In an attempt to fill the highlighted gap in current practice, this paper presents a novel demand-sensitive candidate route generation algorithm that can address passenger and operator needs in a simple, objective function that aims to maximize route-level ridership. The proposed approach is well suited to small and rural communities and specialized transit services (e.g., flex route, demand responsive service) in which transit demand is dispersed.