Abstract

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Demand-Sensitive Candidate Route Generation Algorithm (DSCRGA).

Demand satisfaction is a key component that reflects the quality of public transit from passengers’ perspective. On the other hand, cost minimization is considered a main objective of transit agencies. This trade-off between quality and cost turns transit network design into a multi-objective problem where passengers’ and operator’s interests 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 generating a set of potential routes using a candidate route generation algorithm. Existing route generation algorithms find the shortest path between route’s origin and destination where demand is aggregated, without giving proper attention to the pattern and distribution of demand along the generated route. Given that demand is actually 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 (DSCRGA) that is capable to address passengers’ and operator’s needs in a simple objective function aiming to realize the maximum route-level ridership. The proposed approach is well suited for small and rural communities and specialized transit services (e.g. flex-route and demand responsive services) where transit demand is dispersed.