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## **New Modifications to Bus Network Design**

### **ABSTRACT**

This article provides new methodology for solving the bus network design problem, covering both network design and frequency setting. Two new bus network design models are created which build upon the methodology proposed by Baaj and Mahmassani (1995). One modification includes the consideration that commercial speeds of buses vary depending on the aggregated frequency of buses on each street or corridor. A further modification is the updating of route frequencies during the route generation process. The models were applied to the street network of Barcelona. Outputs were compared and it was found that the new models produce bus networks with faster average travel speeds, smaller fleet size, less route kilometer, and fewer buses per link than prior methodologies. These results demonstrate that taking the variability of bus speeds and required route frequencies into consideration when performing route generation and frequency setting can significantly improve the performance of the bus network produced.