Abstract

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Bus transit is the most common mode of public transit given its distinctive flexibility, accessibility, and mobility. Inefficient planning and operation of bus transit may ruin all its good features. This paper presents a methodology for improving bus transit planning using spatial multi-criteria decision-making and Geographic Information Systems (GIS). The developed methodology generates more efficient, profitable, and sustainable bus routes that maximize land use support and minimize travel distance along the route in an attempt to improve passengers' perception of the service and increase ridership. The new developed methodology introduces a Transit Suitability Map (TSM), a Transit Suitability Tool (TST), and a new routing technique. The TSM indicates the most transit-supportive areas. Each cell in the TSM carries a number that reflects the need for transit in that particular locality. The TST was developed using spatial multi-criteria along with ArcGIS geo-processing capabilities to produce TSM according to the Selected criteria and its weights. The routing technique is based on a generalized travel cost that combines both travel distance and land use support. The case study shows improvements in the suggested bus routes as a result of using the new methodology.