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Caring for the People

BRT Station Design using a Macroscopic Spatial-Parameters (SP) Model

L.F.L. Hermant *Ph.D, Pr.Eng, CMEngNZ*

Tonkin+Taylor, P.O. Box 5271, Victoria Street West, Auckland, 1142
Tel: +6493523000; email: lhermant@tonkintaylor.co.nz

The implementation of Bus Rapid Transit (BRT) is receiving increasing global popularity in terms of introducing the mode as a fast, affordable and reliable public transport offering. Over the last decade, many academic and practical contributions towards quantitative guidance regarding the internal design and spatial arrangements have been made both within BRT stations; as well as outside stations in terms of bus operational requirements.

Microsimulation software has afforded improved techniques to assess such facilities and the author has applied resultant theories from such associated research work towards assessing BRT station designs throughout South Africa using a bespoke excel-based macroscopic Spatial Parameters (SP) model.

The original SP-models were initially developed by the author to assess the performance of proposed BRT station designs from a passenger spatial perspective only. At the time, little consideration was given to the operational performance of the buses docking at these stations in relation to the performance of the internal station.

The SP-model was then restructured late in 2019 to include the interface performance between supply (i.e. bus provision) and demand (passenger) metrics, which permitted proposed BRT station typologies and the bus service provision to be assessed holistically.

During the course of the Cape Town Phase 2A BRT Network project planning, predicted passenger demand profiles and bus operations varied considerably to the extent that repeated station-by-station microscopic assessment would have been an expensive exercise. The SP-model provided the much-required flexibility in this regard and was ultimately used to undertake final due-diligence checks on the proposed Cape Town Phase 2A BRT Network station typologies.

The paper presents an SP-model that provides assessment metrics for major components of a BRT station and identifies supply-demand mismatches, which can assist with high-level planning and decision making on BRT corridor designs.

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