Toronto

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93.1 Study Area

The GTHA (Greater Toronto and Hamilton Area) is located northwest of Lake Ontario, in the province of Ontario, forming Canada's largest urban region. The GTHA's current population is over 6.5 million, with projected growth to approximately 8.6 million by 2031.

93.2 Population, Demand Generation and Activity Locations

The TTS (Transportation Tomorrow Survey) was the basis for travel demand used for the multi-modal assignment simulation. TTS was a retrospective telephone survey, conducted in the GTHA every five years. The TTS sampled just over 5 % of GTHA households; the survey collected household socioeconomic and geographical data, characteristics of each household member and a full 24 hours travel diary for each household member. Current MATSim models use the TTS travel diary records to generate the plans file. Integration of the TASHA activity based model, developed for the glsgtha, was also investigated. Irrespective of the demand data source, both sources provided the traffic zone location for all activities. The Toronto implementation then randomly distributed activities around the traffic zone, which resulted in unique x-y coordinates for each activity. Within the current MATSim implementation in Toronto, no MATSim facilities development has been attempted.

93.3 Network Development and Simulated Modes

The GTHA MATSim implementation used a pre-existing planning level network for static user equilibrium assignment,employing the EMME traffic assignment software. This network was converted to a MATSim network, using a conversion tool found in the MATSim Toronto playground.

More recently, this network was merged with GTFS data for five of the eight major regional transit agencies to allow for multimodal demand assignment.

93.4   Calibration, Validation, Results

The Toronto MATSim implementation was compared to more conventional, large-scale assignment models with varying success. The work of Gao et al. (2010) found that travel time, travel distance, link flows and speeds were reasonably comparable, in fact more plausible, than those achieved through the EMME assignment. Conversely, work on transit assignment, first done by Kucirek (2012) and then by Weiss et al. (2014), found limitations associated with predicting line boarding figures; these were based on different transit technologies and agencies and utilized different fare structures, suggesting that further work to calibrate the multimodal assignment model is required. These issues are exacerbated by the current implementation's inability to distinguish between in-vehicle dwell times and out-of-vehicle wait times; these should ideally be weighted differently, particularly given the climate and predominance of outdoor bus stops in the region.