Abstract

Ahmed O. Idris


This research aims to investigate the impacts of various transportation and land use planning policies on changing travel behaviour, and subsequently GHG emissions reduction. A novel trip-based urban transport GHG emissions model is presented. The developed model integrates two main components: a discrete mode shift model and an emissions forecasting model. Given personal, modal, and land use information, the mode shift model calculates the proportion of trips made by different travel options (e.g. car, bus, walk, etc.). The total Vehicle Kilometres Travelled (VKT) by each mode is then calculated by multiplying the proportion of trips made by each mode by respective average VKT. Finally, total GHG emissions are calculated by multiplying the total VKT by each mode by respective average emissions factor. The City of Kelowna, BC, Canada is Selected as a case study. The model validation shows a difference of only -0.3% between the forecasted GHG emissions and the 2010 historical data. The developed model is intended to assist municipalities evaluate alternative policy scenarios and eventually Select the one(s) that help them meet their future GHG emission targets.