

Safe Routes to School Framework and Active Transport to School across Urbanization Settings in Otago, New Zealand

Mohammad Lutfur Rahman, PhD Candidate, School of Surveying, University of Otago

Supervisors:

Associate Professor Antoni Moore, School of Surveying, University of Otago

Professor Sandra Mandic, School of Sport and Recreation, Auckland University of Technology



Active transport to or from school (ATS) presents an opportunity for adolescents to engage in daily physical activity. Multiple factors influence whether adolescents actively travel to/from school. Creating safe walking and cycling routes to school is a promising strategy to increase rates of active transport. This study presents:

- a) A comprehensive conceptual framework for modelling safe walking and cycling routes to high schools. The framework has been derived from several existing relevant frameworks and identifies built environment features (land use mix, pedestrian/cycling infrastructure, neighbourhood aesthetics, and accessibility to local facilities) and traffic safety factors (traffic volume and speed, safe road crossings, and quality of path surface) to be considered when modelling safe walking/cycling routes to high schools.
- b) Analysis of school-level ATS rates among adolescents, Geographical Information Systems (GIS)-based objectively measured school neighbourhood BE features, and adolescents' perceptions of the school route across different urbanisation settings. Adolescents ($n = 1260$; 15.2 ± 1.4 years; 43.6% male) were recruited from 23 high schools located in large, medium, and small urban areas, and rural settings in Otago, New Zealand. Adolescents completed an online survey and School neighbourhood BE features were analysed using GIS. School neighbourhood intersection density, residential density and walkability index were higher in large urban areas compared to other urbanisation settings. School-level ATS rates were significantly and negatively correlated with school neighbourhood intersection density, residential density, and walkability index. School-level ATS rates were also significantly and negatively associated with adolescents' perceived safety concerns for walking and cycling to school, high traffic volume, and presence of dangerous intersections. Future initiatives to encourage ATS should therefore focus on school neighbourhood BE features and minimise adolescents' traffic safety related concerns.