TRANSPORTATION SYSTEMS AND LAND USE INFLUENCE DECISIONS REGARDING MODE OF TRANSPORTATION AND THE FLOW OF TRAFFIC. THE ASSOCIATED HEALTH IMPACTS ARE IMPRESSIVE: ROAD TRAUMA IS THE PRIMARY CAUSE OF DEATH AMONG 15-29 YEAR OLDS, AMBIENT AIR POLLUTANTS AND NOISE FROM ROAD TRANSPORTATION HAVE BEEN ASSOCIATED WITH MORBIDITY AND MORTALITY DUE TO CARDIORESPIRATORY PROBLEMS, AND AMBIENT AIR POLLUTANTS ARE RESPONSIBLE FOR ~3% OF THE GLOBAL BURDEN OF DISEASE. DENSE RESIDENTIAL DEVELOPMENTS FAVOUR ACTIVE TRANSPORTATION AND THE DEVELOPMENT OF PUBLIC TRANSIT, REDUCING BOTH PHYSICAL INACTIVITY AND CO2 EMISSIONS. HOWEVER, METHODS FOR ESTIMATING THE HEALTH IMPACTS OF DIFFERENT TRANSPORTATION SCENARIOS REMAIN LARGELY UNDEVELOPED.

OBJECTIVES
- Develop hypothetical transportation and land-use scenarios for the Montréal Census Metropolitan Area (CMA) for 2061.
- Estimate the number of trips made according to mode of transportation and the distance (km) travelled by vehicle and by active transportation for the 2061 scenarios at an aggregate spatial scale.
- Estimate NO2 and noise levels for the 2061 scenarios at an aggregate spatial scale.
- Estimate CO2 emissions of municipalities in the Montréal CMA based on scenarios for 2031 and 2061.
- Calculate and compare the health impacts associated with the 2061 scenarios.

METHODOLOGY
- Create nine 2061 scenarios involving different population distributions (with or without densification of suburban areas) and uses of modes of transportation. In each of these scenarios, fleets of vehicles with different characteristics are used to estimate air pollutant levels.
- Estimate the following health impacts: road trauma, incidence of childhood asthma, death from cardiovascular disease, incidence of cardiovascular disease, diabetes (physical activity) and breast and colon cancers.
- Calculate the health burdens and benefits for each scenario and compare the scenarios.

EXPECTED RESULTS
The project aims to quantify the health benefits and impacts of transportation systems and urban land use in the greater Montréal region at present and under a range of future transportation and development scenarios. The tool integrates models for predicting transportation mode choice and for estimating traffic flow, pollution and noise levels as well as risk functions to quantify the burden of disease linked to transportation systems and land use.