
Emissions from the transport sector represent the fastest growing source of greenhouse gas emissions in the United States, increasing at an average rate of three percent per year. This thesis research evaluates the relationship between passenger transportation emissions, land use development, and household travel choice in order to address the appropriate planning and policy solutions to mitigate the impact of U.S. transportation on the environment. It uses spatial mapping and a statistical analysis of on-road transport sector emissions data for all counties within the conterminous U.S. The analysis shows that urban and suburban counties in the U.S. produce more than 98 percent of on-road transport sector emissions, where roughly 80 percent of those emissions are produced by gasoline combustion from passenger travel. This research also establishes that increasing local travel to work for 3 million Americans will reduce U.S. passenger travel CO2 emissions by roughly 7 MT. If those 3 million people were to move into denser counties, net passenger travel emissions would be reduced by an estimated 270 MT, and if they moved into vacant housing units, passenger travel emissions would fall by roughly 8 MT. Finally, if those 3 million Americans were to switch to alternative modes of travel such as public transportation, then U.S. passenger travel emissions would decrease by roughly 90 MT. Land use policies aimed at increasing urban density and creating better job-housing mixes therefore will reduce transport sector emissions under existing vehicular travel and technology. Policies aimed at expanding and improving upon existing public transit and that promote alternative travel modes also will reduce the impact of passenger transportation on the environment.