Modeling the Impact of Public Transportation Service Quality and Clean Vehicles Availability on Auto Ownership and Use in Lebanon, Vehicular Emissions, Fuel Consumption, and Heat Island Effect

PI: Maya Abou Zeid

Co-PI: Dr. Isam Kaysi

Department of Civil and Environmental Engineering

Faculty of Engineering and Architecture, AUB

Abstract

This research project aims to quantify the extent to which auto ownership and use in Lebanon can be reduced through the provision of improved public transportation services and cleaner passenger cars, and the associated emissions, fuel consumption, and heat generation impacts. The current auto ownership rate of 1 vehicle for every 3 persons and the 80% share of trips in Greater Beirut made by the private auto have resulted in an unsustainable situation characterized by gridlock, pollutant concentrations in the air exceeding safe limits, excessive fuel consumption, and lower overall well-being of Lebanese citizens. The proposed methodology is to develop econometric models of auto ownership and use decisions based on survey data that explicitly link these decisions to the quality of public transportation services and types/prices of clean vehicles available to households or individuals. Once estimated, these models would allow the quantification of the decrease in auto ownership (number of autos owned) and use (kilometers traveled) and their impacts. The models will be used to test scenarios of improved bus frequency, route coverage, and speed as well as availability of clean vehicles. The research is expected to advance the state of the knowledge in auto ownership and use modeling in Lebanon which has not been studied before from a modeling perspective. It will also provide a tool for policy makers to test the traffic, vehicular emissions, fuel consumption, and heat generation reduction impacts of public transport, clean vehicles, and land use strategies. The proposal theme is aligned with the "Alternative Energy and Energy Efficiency" focus area of the Masri Institute research.