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# Economic Valuation of Emissions from Mobile Sources in the Urban Environment of Bogotá

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**Abstract :** Road transportation is a significant source of externalities, notably in terms of environmental degradation and the emission of pollutants. These emissions adversely affect public health, attributable to criteria pollutants like particulate matter (PM2.5 and PM10) and carbon monoxide (CO), and also contribute to climate change through the release of greenhouse gases, such as carbon dioxide (CO2). It is, therefore, crucial to quantify the emissions from mobile sources and develop a methodological framework for their economic valuation, aiding in the assessment of associated costs and informing policy decisions. The forthcoming congress will shed light on the externalities of transportation in Bogotá, showcasing methodologies and findings from the construction of emission inventories and their spatial analysis within the city. This research focuses on the economic valuation of emissions from mobile sources in Bogotá, employing methods like hedonic pricing and contingent valuation. Conducted within the urban confines of Bogotá, the study leverages demographic, transportation, and emission data sourced from the Mobility Survey, official emission inventories, and tailored estimates and measurements. The use of hedonic pricing and contingent valuation methodologies facilitates the estimation of the influence of transportation emissions on real estate values and gauges the willingness of Bogotá's residents to invest in reducing these emissions. The findings are anticipated to be instrumental in the formulation and execution of public policies aimed at emission reduction and air quality enhancement. In compiling the emission inventory, innovative data sources were identified to determine activity factors, including information from automotive diagnostic centers and used vehicle sales websites. The COPERT model was utilized to ascertain emission factors, requiring diverse inputs such as data from the national transit registry (RUNT), OpenStreetMap road network details, climatological data from the IDEAM portal, and Google API for speed analysis. Spatial disaggregation employed GIS tools and publicly available official spatial data. The development of the valuation methodology involved an exhaustive systematic review, utilizing platforms like the EVRI (Environmental Valuation Reference Inventory) portal and other relevant sources. The contingent valuation method was implemented via surveys in various public settings across the city, using a referendum-style approach for a sample of 400 residents. For the hedonic price valuation, an extensive database was developed, integrating data from several official sources and basing analyses on the per-square meter property values in each city block. The upcoming conference anticipates the presentation and publication of these results, embodying a multidisciplinary knowledge integration and culminating in a master's thesis.

**Keywords :** economic valuation, transport economics, pollutant emissions, urban transportation, sustainable mobility
**Conference Title :** ICEITE 2024 : International Conference on Environmental, Infrastructure and Transportation Engineering
**Conference Location :** Chengdu, China
**Conference Dates :** April 11-12, 2024