

AGU Fall Meeting 2009

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Carbon footprint analysis of the Bus Rapid Transit (BRT) system: a case study of Xiamen City, China

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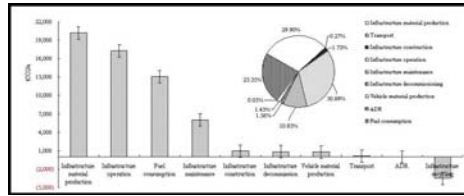
Transport sector is responsible for a large and growing share of global emissions affecting climate change. Bus Rapid Transit (BRT) systems have been identified as an efficient public transportation option, but its total emissions across entire operation chain has not been quantified. This paper proposed a carbon footprint model of the BRT system based on the Life Cycle Assessment (LCA) approach, which including three components: infrastructure, fuels and vehicles. A case study of Xiamen City was carried out to offer a broader perspective on the greenhouse gas (GHG) impact. Results showed that the total carbon footprint of Xiamen's BRT system was 55,927 t CO₂e per year. As the main emission phases, infrastructure operation, vehicle fuel consumption and infrastructure material production respectively accounted for 31%, 30% and 23%. The direct emission from fuel consumption was 13,059 t CO₂e per year, accounting for 23% of the total carbon footprint. If only considering the direct emissions, BRT system could reduce approximately 25,255 t CO₂e per year than no-build option. It is demonstrated that the carbon footprint model is effective in identifying and measuring the GHG emission from each activity of the life cycle.

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Carbon footprints of the BRT system in Xiamen City

Category	GHG emissions (tCO ₂ e per year)
Infrastructure material production	20,200.17
Transport	149.89
Infrastructure construction	967.13
Infrastructure operation	17,273.74
Infrastructure maintenance	6,055.29
Infrastructure decommissioning	870.42
Infrastructure recycling	-3,479.21
Aggregate1	42,037.43
Vehicle material production	801.25
Assembling-Disposal-Recycling	29.18
Fuel consumption	13,059.21
Aggregate2	13,889.64



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