

mapping matatus: geolocation data and public transit in Nairobi

data

using geolocation technologies in smartphones, researchers mapped networks of informal buses, called matatus, in Nairobi, Kenya

impact

Digital Matatus has provided tools to help Nairobi improve matatu routing and reduce traffic congestion

Source: Digital Matatus

Private buses known as matatus are the primary mode of motorized transport in Nairobi, with about 3.5 million regular riders.¹ In a collaborative effort called Digital Matatus, researchers from Columbia University, the Massachusetts Institute of Technology, and the University of Nairobi used GPS tracking devices and smartphone data to create a digital map of Nairobi's matatu routes, pictured above. University of Nairobi students geolocated stops along routes and recorded important information such as which stops are formally recognized by the city. This map and database is available for riders, government officials, and programmers seeking to create other transit applications.²



local civic change

The Digital Matatus project helped passengers discover more efficient routes of commuting. The new dataset will also help regulate bus stop locations; the project found that many buses stop erratically along the road to pick up passengers, with detrimental effects on traffic. The data collected by this project is also the first official record of existing routes. This information facilitates civic engagement and feedback during the transit planning process to incorporate some of the matatu routes into formal bus routes offered by the city.³

open data for tech entrepreneurship

By making the data openly available through Global Transit Feed Specification (GTFS) format, Kenyan tech start-ups have developed useful mobile applications for Nairobi's citizens. Apps that suggest optimal routes, provide warnings about unsafe areas near matatu stops, and allow users to hail matatus by requesting pick-up at a specific location are now available.⁴



The Digital Matatus project seeks to reduce the half a million dollar daily loss in productivity due to traffic jams in Nairobi. Source: McGregor and Malingha 2014. Photo: Rogiro

global ripples

The dissemination of these results sparked government planners in Nepal, Nigeria, Ghana, and other countries to approach the research team about adopting similar methods for their own public transportation systems.⁵ With the informal transport sector playing such an important role in cities of the developing world, innovations like Digital Matatus are critical for municipal efforts to improve transit efficiency.