Research Fact Sheet

Research project:

How Mobility and Accessibility Affect Crime Rates: Insights from Mobile Device Location Data

What's the issue?

Predicting crime is critical for effective strategies to combat it. Using mobile device data, this project discovered a novel way to investigate correlations between mobility, accessibility and crime.

What did the research discover?

Researchers first processed and analyzed the mobile device dataset to get measures of mobility and accessibity. They combined anonymized location traces from mobile devices with police arrest records and built statistical and machine learning tools to model crime rates at the census tract level, using the calculated mobility and accessibility measures and land use and socioeconomic-related variables as the covariates. The results indicated that using the mobility and accessibility measures can help improve crime prediction. Researchers used the crime of burglary as a response variable and found that West Baltimore has a significantly higher burglary crime rate, which was consistent with common sense, since it is a high crime area. Transit did not significantly correlate with burglary, but non-motorized traffic – someone on foot or on a bike – did. There was an even higher relationship between non-motorized travel and burglary in the more affluent neighborhoods of north and northeast Baltimore, where most residents drive. Non-residents walking through a neighborhood may not be a good indicator. Transit, which reduces transportation costs and provides access to jobs, potentially will lead to less poverty, and since poverty is correlated with crime, that might improve the region's quality of life.

How can I implement this?

The measures used in this research differed from the traditional measures in that they were obtained based on the empirically observed location data. This project provides those involved in predicting crime with a new method for doing so.

Learn more:

The full report is available on our website at
https://www.morgan.edu/school_of_engineering/research_centers/urban_mobility_and_equity_center/research/completed_research/crime_rates.html