

Improving road safety to tackle crime

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Improving road safety in cities could result in a lower rate of violent crime, according to research from UCL.

Experts analyzing [crime](#) and car accident data in Mexico City found a surprisingly high level of synchronicity between the two on a weekly

cycle, suggesting that applying more resources to prevent road [accidents](#) would improve [crime rates](#) by enabling more efficient policing.

For the paper, published today in *Cities as Complex Systems* special issue in *PLOS ONE*, experts plotted the time and locations of nearly one million car accidents and 200,000 [violent crimes](#) from January 2016 to March 2020 in Mexico City, creating a 'heartbeat' - so-called because of its resemblance to an electrocardiogram—of the [city](#).

The pattern of crash and crime occurrences were similar day by day, repeating on the weekly cycle, the concept of which had previously been unexplored. Experts observed 'valleys' during the night and peaks in the evening, where at a city level, crime peaked at 7.5 times more than in the depth of valleys, and [car accidents](#) peaked at 12.3 times.

Lead author Dr. Rafael Prieto Curiel (UCL CASA) explained: "Distinct parts of the city have different heartbeats in terms of crime and of crashes. A neighborhood with bars and restaurants has a different heartbeat than a residential neighborhood or one with offices or schools. The land-use of the region can help us explain why we observe distinct heartbeats and make projections and forecasts".

Crime and road accidents have been observed and analyzed together before, but not in terms of cyclic behavior. The team analyzed both by capturing weekly occurrences of crime and accidents, using geotagged data capturing time and location. This created the heartbeat of the city.

This heartbeat was then analyzed for a more specific location, relating to distance from the Mexico City Metro and other public transport stations, to create 'tiles' of the city. Nearby tiles were found to have similar heartbeats, in that they saw peaks and valleys in crime and crashes at similar times during the week. These peaks and valleys related to economic activities, such as residents commuting to work.

The team further observed that crimes and crashes reach their respective intensity peak on Friday night and valley on Tuesday morning. The mathematical method the team used can be applied to other cities.

Using the weekly cycle makes it easier to predict peaks and valleys in the near future, with potential implications on city policing. Whereas most cities have resources—albeit of differing levels—in place to tackle and prevent crime, [road safety](#) has had comparatively less resource attributed to it.

Dr. Prieto Curiel added: "Focusing more on preventing road accidents would improve crime prevention in urban areas and give more resource to police tackling crime. Serious road accidents usually require the presence of police officers to divert traffic and secure the area.

"Unfortunately, due to the temporal synchronization between crashes and crime, the times when more officers are engaged with road accidents is also when they are most needed due to the high levels of crime. Therefore, road accidents reduce the presence of police officers and could increase response time to other emergencies."

Road accidents kill more than 1.35 million people around the world each year and 50 million people suffer non-fatal injuries in a crash. Three times more people are killed by cars than all types of crime and violence combined.

Additionally, crime and [road accidents](#) are becoming a more relevant urban problem. In Mexico, some of its cities suffer nearly twice the number of crimes per capita than the national level, so most of the urban population fears crime, In the US, for example, 54% of road accident deaths in 2018 occurred in [urban areas](#), up from less than 40% in 2000.

Provided by University College London

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