

Spatial Analysis of Traffic Crashes Using GIS

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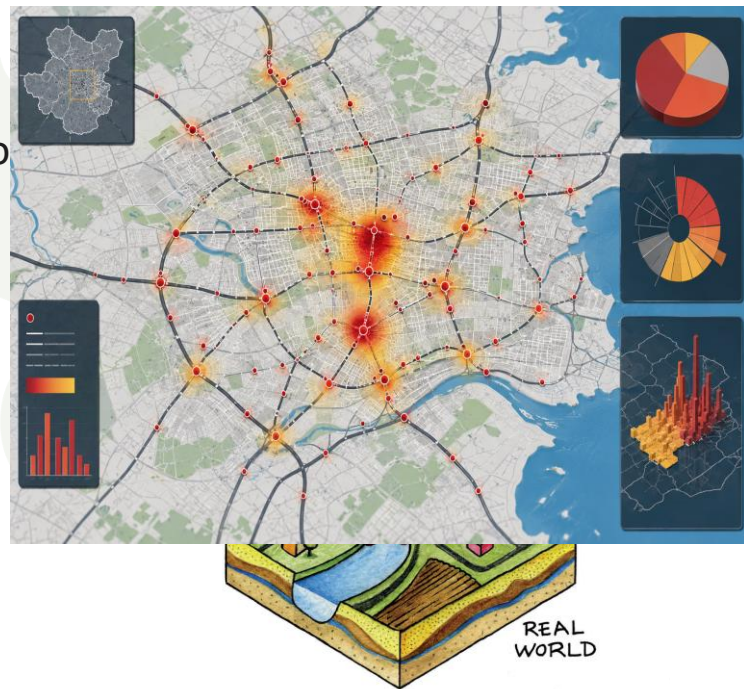
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Spatial Analysis of Traffic Crashes Using GIS

Spatial analysis of traffic crashes enables crashes to be observed not only as individual events, but as phenomena with a clear spatial pattern. GIS allows crash data to be linked with the road network, traffic volume, infrastructure and the surrounding environment.



Data Required for Analysis

- ❑ High-quality analysis requires data on crash location, time of occurrence, crash type, consequences, participants, road category, speed limit, AADT and infrastructure characteristics. The accuracy, completeness and spatial precision of data directly affect the reliability of results.



Geocoding of Traffic Crashes

Geocoding is the process of placing traffic crashes on a map using coordinates or address data. Each crash is represented as a point in space. Precise geocoding is a basic requirement for reliable risk mapping and identification of locations with an increased number of crashes.



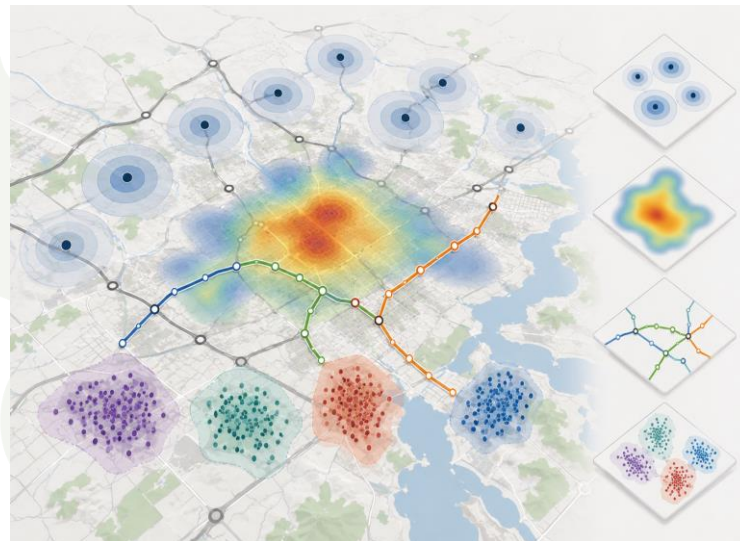
Linking Crashes with the Road Network

An important step in GIS analysis is linking crash points with the corresponding road sections. This makes it possible to calculate crashes per section, fatalities and injuries, crash density, crash rate and other risk indicators on the road network.



Methods of Spatial Analysis

Different GIS methods are used in traffic crash analysis: spatial join, density analysis, buffer analysis, proximity analysis, cluster analysis and network analysis. The choice of method depends on the research objective, level of detail and type of available data.



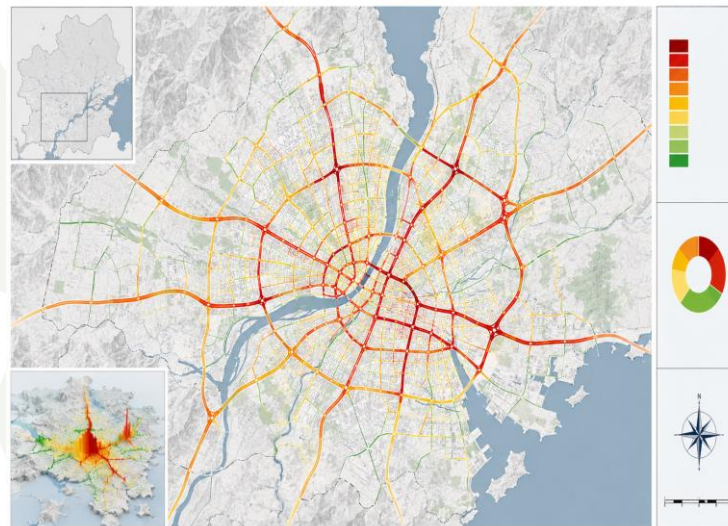
Identification of Hazardous Locations

GIS enables the identification of hazardous locations, meaning locations with an increased number of crashes or more severe consequences. These may include intersections, curves, pedestrian crossings, high-speed sections or road parts with unfavourable geometric and traffic characteristics.



Traffic Risk Maps

Traffic risk maps show the spatial distribution of safety problems on the road network. They can display the number of crashes, severity of consequences, crash density, crash rate or a combined risk index. Such maps are important for planning measures and setting priorities.



Examples of Measures After Analysis

After identifying high-risk locations, different measures can be proposed: improving traffic signs and markings, traffic calming, improving pedestrian crossings, better lighting, installing safety barriers, reconstructing intersections and improved speed management.



THANK YOU!

