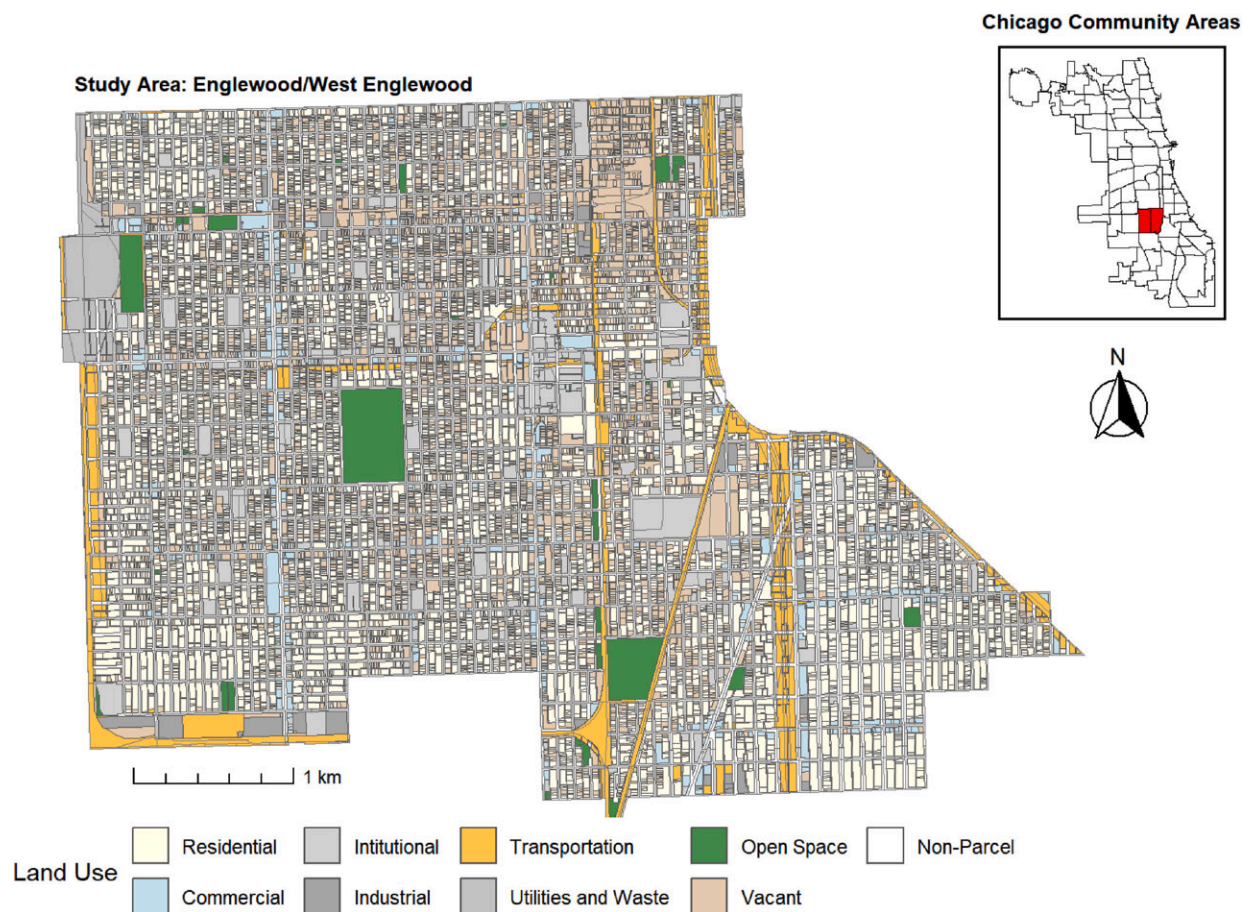


Redefining school gun violence: Acoustic sensors find frequent gunfire on school walking routes in Chicago

January 6 2025, by Jeff Grabmeier



Land use patterns in the Englewood-area of Chicago downloaded from the Chicago Metropolitan Agency for Planning (CMAP) website (<https://datahub.cmap.illinois.gov/>). Data were recoded in R using the classification scheme provided by CMAP

(

<https://cmapgis.maps.arcgis.com/home/item.html?id=9ff569e9a5f54f098c38d3b8003c7888>). The area is 43% residential (single-family housing and multi-family housing units), followed by vacant lots (24%) and green spaces (5%). Credit: *SSM—Population Health* (2024). DOI: 10.1016/j.ssmph.2024.101730

A new study used acoustic sensors that detect the sound of gunfire to show how often children in one Chicago neighborhood are exposed to gunshots while walking to and from school.

Results showed that nearly two-thirds of schools in the Englewood neighborhood of Chicago had at least one gun incident within 400 meters (about one-quarter mile) of where children were walking home during the 2021–22 school year.

These findings suggest a need to redefine federal definitions of school gun [violence](#) to include indirect forms of violence that take place near schools, not only on school grounds, in order to more appropriately capture the burden on [communities of color](#), said Gia Barboza-Salerno, lead author of the study and assistant professor of public health and social work at The Ohio State University.

"Not all the violence children are exposed to is direct violence or happens on school grounds," Barboza-Salerno said.

"But that doesn't mean it doesn't have an impact. Hearing gunshots on the way to and from school is terrifying and will affect how kids perform in school."

The study was published recently in the journal [SSM-Population Health](#).

The findings are important because research shows that exposure to gun

violence in schools is linked to poor outcomes for students, including diminished performance on standardized assessments in mathematics and English, elevated rates of absenteeism, decreased [student enrollment](#), and lower graduation rates.

In this new study, the researchers found that 4.5 times more gunshots were detected using the acoustic sensors compared to what police recorded in investigative reports.

This sensor data shows how staggering the amount of indirect violence is for children in Englewood, and potentially other areas, said study co-author Sharefa Duhaney, a graduate student in public health at Ohio State.

"You can't just put metal detectors in schools to deal with violence," Duhaney said. "Children are exposed to violence on the way to and from school, and we need to recognize that."

Englewood, a community on the south side of Chicago, is one of the most violent in the United States. In 2022, the Englewood area accounted for about 10% of all gun violence that occurred in Chicago. The community is 94% Black and one of the most socioeconomically vulnerable neighborhoods in the city.

The researchers used computational spatial network methods to analyze data on gunshots detected by [acoustic sensors](#) operated along Safe Passage Routes for each school in the Englewood School District. These routes are designated routes created to ensure safer travel for students walking to and from school.

The study analyzed gunshots detected during the morning (6–9 a.m.) and afternoon (3–6 p.m.) commutes of children during the 2021–22 school year.

Acoustic detectors showed 610 gunshots fired in Englewood on days when schools were in session during the school year. Of, those 52% occurred during afternoon commutes and 12% during the morning commutes.

Results showed that 40% of Englewood schools had at least one [gunshot](#) fired within 400 meters of the routes to school during the morning commute, and 62% had at least one during the afternoon commute.

"Hearing gunshots during school has not typically been considered 'school gun violence,' but it should be, Barboza-Salerno said. "Imagine what that is like for children to hear gunshots while walking to school and how scared they must be."

Analysis of the data showed that shooting incidents cluster along city streets, including safe passage routes, near schools. The configurations of streets that support walking for students also attract other types of foot traffic, and increase the likelihood of violent incidents, Duhaney said.

"Youth in violence-prone areas are not safe along Safe Passage Program Routes," she said.

One issue in Englewood is that almost half of residents live in households without access to vehicles, meaning that residents are heavily dependent on public transit and walking. Other studies have shown that students feel safer going to school via car rather than walking, but that is not an option for many in the community.

The researchers noted that the U.S. Department of Education is directed to collect and report on data on school safety, including violence. But they said the definition of gun violence doesn't currently include witnessing and hearing gun violence.

In addition, the focus on student safety should go beyond what happens on school grounds and beyond direct violence: Hardening schools and using [metal detectors](#) and [police officers](#) there won't solve the problem, the researchers said. They emphasized the need for policymakers to focus on violence prevention in the communities at large.

"We are failing to address the underlying issues in the community that lead to violence," Barboza-Salerno said. "We need to focus on the root causes."

Hexin Yang, a graduate student in [social work](#) and public health at Ohio State, was also a co-author of the study.

More information: Gia Barboza-Salerno et al, Spatial accessibility to gun violence exposure on walkable routes to and from school, *SSM - Population Health* (2024). [DOI: 10.1016/j.ssmph.2024.101730](https://doi.org/10.1016/j.ssmph.2024.101730)

Provided by The Ohio State University

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