

Los Angeles County Near-Freeway Particulate Pollution

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Growing bodies of research indicate the health hazards due to inhalation of ultrafine particulates (7-220 nm in diameter). These particulates—mostly created by motor vehicle processes—increase risk of various respiratory problems and are also increasingly linked to degenerative brain diseases such as Alzheimer's.

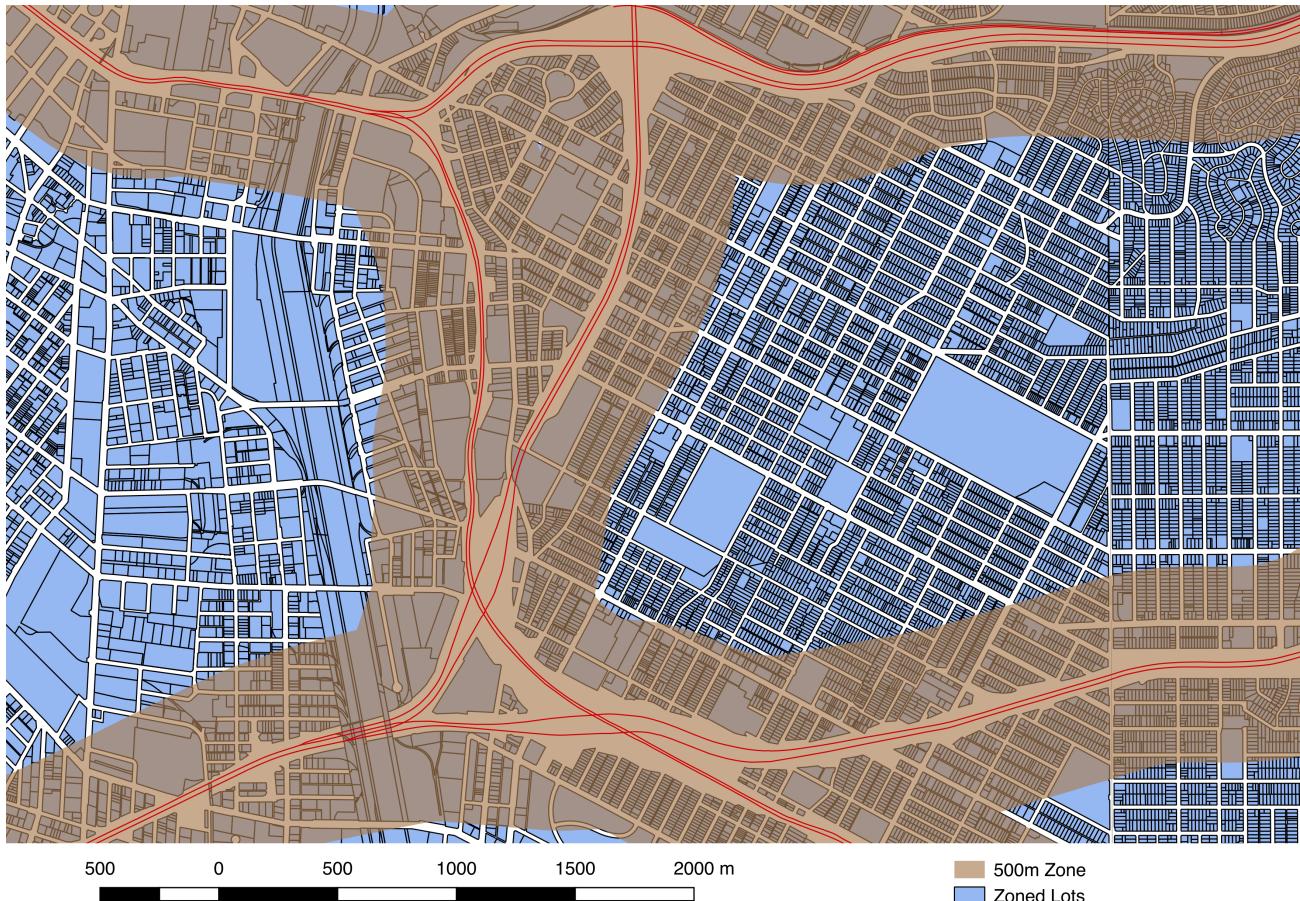
As a city straddled by high-volume freeways, Los Angeles must take leading action on this public health issue. Recent reporting by the Los Angeles Times has helped illustrate the problems, but the city's housing crisis combats the impulse to restrict residential construction and zoning near freeways.

I built 500m buffer zones around freeways on top of a zoning layer in QGIS to better understand what types of neighborhoods would be most affected by their proximity to these airborne pollutants.

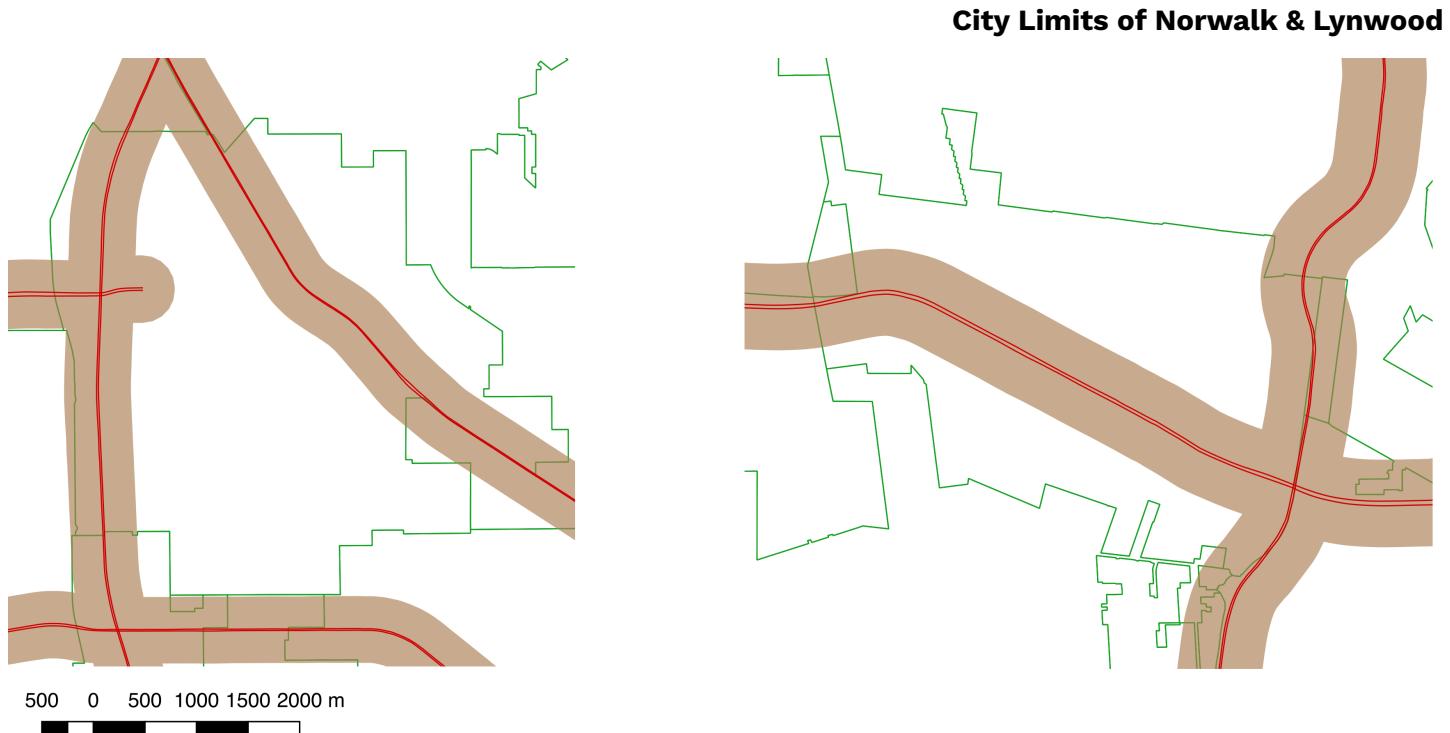
While EPA research shows that particulate density peaks extremely close to the freeways (100m or less), a Los Angeles Freeway Adjacency Advisory Notice encourages 1000ft (about 300m) of distance between freeways and residential use. EPA research indicates that pollutant levels return to baseline about 200m from the freeway. Thus, I chose 500m as a cautious radius for in-danger areas.

Seen below, East Los Angeles is an at-risk area for this issue.

Profile of Downtown & East Los Angeles



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Some incorporated areas within Los Angeles county are at higher risk than others. I calculated the percentage of an incorporated city's area within a 500m buffer of freeways to get a sense of this.

Topping the list are small cities which wrap around freeways. Lynwood, Cerritos, and Norwalk are “Gateway Cities” defined by proximity to the 110 and other freeways, whereas Lawndale is a “South Bay” city near the 405, Commerce sits at the intersection of the 5 and 710, and Hawthorne at the 405 and 105.

As freeways often serve as community boundaries, inter-community governments such as SCAG and GCOG are crucial in coordination efforts to build physical and legislative protection from air pollutants.

Multi-scale strategies will be necessary to combat damage by respiratory and brain disease, including barrier walls, “green walls” of vegetation, re-zoning to promote industrial use near freeways, programs to promote effective filtration in HVAC systems for residential and industrial zones within freeways, and potential large-scale urban design interventions to manipulate wind directions.

Affluent, residential cities like Cerritos have the power to act on health measures more immediately than their less privileged Gateway Cities, and should spearhead county-wide or cross-municipality ordinances.

Lynwood	40%
Lawndale	37%
Commerce	35%
Cerritos	35%
Norwalk	34%
Hawthorne	30%

References and Information:

For L.A. Times on “The Pollution Zone,” The California Air Resources Board strategies to reduce air pollution, EPA reports on ultrafine particle spread, Mother Jones on the link between pollution and Alzheimer’s, and sources for research on air flows in urban environments, please see this repository:

<https://www.are.na/lukas-wp/la-air-health>