

Pollution Exposure in Chicago: Key Findings

How is the way that land is used in neighborhoods related to pollution in Chicago?
 What is the relationship between pollution exposure and zoning?

All Chicagoans are exposed to air pollution at high levels, which contributes to serious health issues. Latinx Chicagoans are most impacted by air pollution, while Latinx and Black Chicagoans are most likely to live in neighborhoods zoned for more manufacturing generally. They are also more likely to live in areas with heavier manufacturing and land uses that emit pollution, like transportation and waste.

Key data takeaways from our research

➤ **All Chicagoans breathe unhealthy air**
 Chicagoans are exposed to small particulate air pollution, called PM2.5, at higher levels all across the city than recommended by 2024 US EPA public health standards for long-term exposure. Estimated levels across Chicago range between about 9 and 12 $\mu\text{g}/\text{m}^3$, while the standard is 9 $\mu\text{g}/\text{m}^3$.

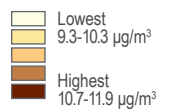
➤ **Latinx Chicagoans suffer the most from pollution exposure**
 Though Latinx populations make up 30% of the citywide population, they make up 37% of the population living in the areas with the highest overall pollution. These Latinx populations are also exposed to more air pollution specifically, as 50% of the population in the highest air pollution census tracts are Latinx.

➤ **Latinx and Black Chicagoans experience more of their neighborhood zoned for heavy manufacturing, and manufacturing overall, compared to other groups**
 23% of land was zoned for manufacturing in areas where most Black Chicagoans live, while 29% of land was zoned for manufacturing in areas where most Latinx Chicagoans live. This compares to only 5% and 8% of land zoned this way in areas where most white and Asian Chicagoans live, respectively. In areas where most Black and Latinx Chicagoans live, the manufacturing zoning is much more likely to be heavy industry zoning (M3 zoning).

➤ **Latinx and Black Chicagoans are more likely to encounter pollution-emitting land uses**
 Latinx and Black Chicagoans are more likely than white and Asian residents to be exposed to land uses categorized by transportation and communications or utilities and waste within manufacturing districts in their neighborhoods.

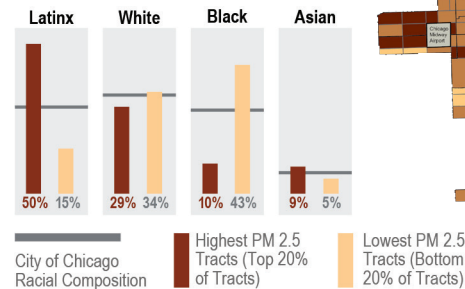
Small particulate air pollution exposure citywide

Satellite-Derived PM 2.5



Data source: U. of Illinois HeRoP Lab
 Years: Data collected between 2014-2018

Racial composition in highest and lowest PM 2.5 tracts



		Chicagoans				
		Latinx	Black	Asian	White	
Types of manufacturing for each demographic	Share of all manufacturing land zoned M1	9%	14%	21%	22%	
	Share of all manufacturing land zoned M2	12%	8%	28%	15%	
	Share of all manufacturing land zoned M3	19%	30%	11%	8%	
	Share of all manufacturing land zoned PMD	60%	47%	40%	55%	
	Share of all land zoned for manufacturing	29%	23%	9%	6%	
Top land uses within manufacturing districts	Type of land use		Chicagoans			
			Latinx	Black	Asian	White
	Industrial	38%	26%	60%	66%	
	Transportation & Communications	35%	38%	3%	10%	
	Utilities & Waste	8%	14%	2%	2%	
	Vacant or Under Construction	9%	13%	12%	6%	
Commercial	3%	3%	11%	8%		
Share of land zoned for manufacturing		29%	23%	9%	6%	

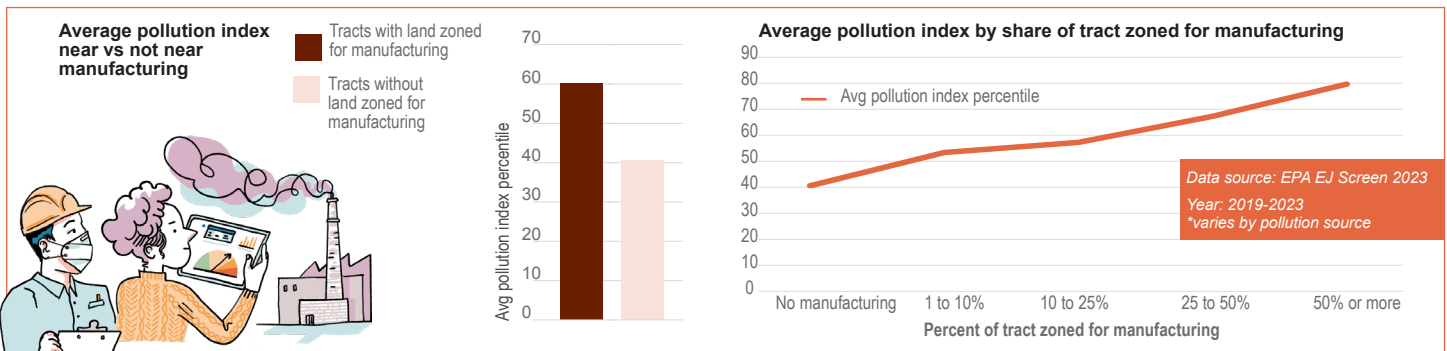
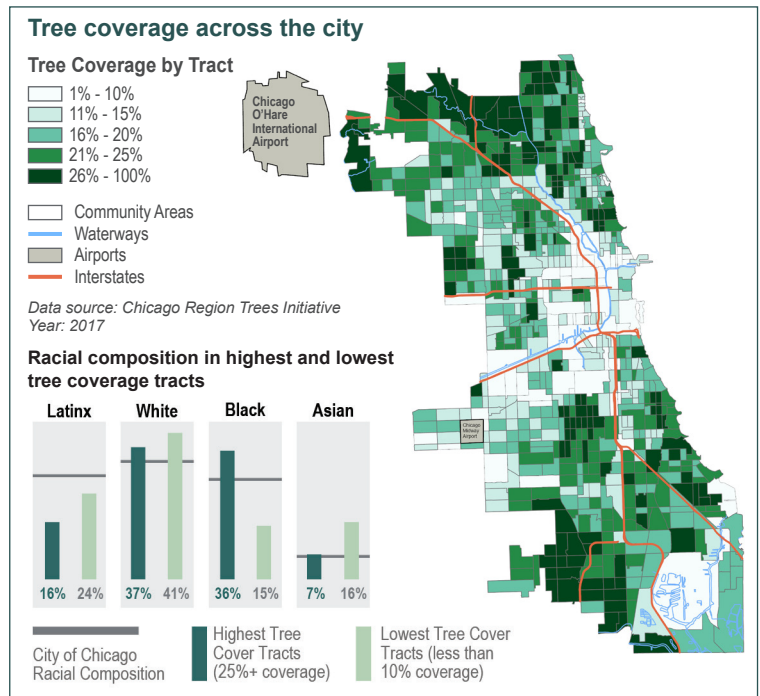
Note: This looks at the top 30% most populous tracts for each demographic (roughly 75 to 85 percent of the citywide population for each demographic).

➤ **Tree coverage is sparse in Latinx neighborhoods, which is where pollution concentrates**

The parts of the city with higher pollution levels—near downtown, along expressways, and along major industrial corridors—also tend to have low levels of tree coverage. In the areas with the most tree coverage, only 16% of the population is Latinx.

➤ **Areas with manufacturing have higher pollution, on average**

Pollution and manufacturing are correlated. The share of land that is zoned for manufacturing is a statistically significant predictor of higher levels of pollution exposure. Greater shares of zoning for manufacturing within a neighborhood results in greater exposure to pollution overall in that neighborhood. Census tracts with manufacturing have a higher pollution index on average. The index increases as the share of the tract zoned for manufacturing increases.



Why does this data matter? Why should I care about these findings?

Through breathing and living, we are all exposed to pollution—costing us health and wealth

Pollution is waste that contaminates our air, land, and water, and it is an urgent public and environmental health threat in Chicago. The impacts of pollution are felt by everyone, regardless of which neighborhood they call home. As residents, we all move around the city to recreate, work, visit friends, see a show, go shopping, etc. Pollution, particularly air pollution, is not stationary, but travels. For example, truck deliveries from warehouses to homes create ground level air pollution, including the release of small particulate matter—PM2.5. This pollution moves throughout all the neighborhoods that the truck does. **Just because you don't live right next door to a factory doesn't mean you don't encounter pollution.**

The burden of pollution is also placed on certain communities more than others, particularly those living, working, and spending time in areas with manufacturing districts—primarily Latinx and Black Chicagoans. This inequity results in Latinx and Black residents suffering from higher rates of chronic illnesses resulting from their increased exposure. Pollution can cause lung cancer, heart disease, and asthma—particularly in children. According to City of Chicago's 2020 Air Quality and Health report, **an estimated 5% of all premature deaths in Chicago can be attributed to exposure to PM2.5 air pollution.** Chronic diseases account for most illness, disability, and death in the United States and are the leading drivers of health care costs. These chronic diseases take an economic toll, as well, costing our health care system billions per year as well as lost productivity and lost economic activity. **No neighborhood, community, or resident should experience pollution at the unsafe levels we have in Chicago.**

Zoning and Land Use Assessment initiative and research

This research is part of a collaborative initiative led by Metropolitan Planning Council (MPC) and the Urban Institute that evaluates Chicago's zoning and land use to understand whether they contribute to equitable, sustainable, and healthy outcomes for communities and residents. The goal is to understand zoning's impact to collectively make changes to create a vibrant and thriving Chicago.

For more information about this project and additional information about this research visit metroplanning.org/projects/zoning-land-use-assessment