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Warehouses As an Environmental Justice Issue

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When we think of locally undesirable land uses, we often think of large power plants, puffing single plumes of pollution. But many plumes of pollution from trucks traveling to and from warehouses can have equally large impacts on health. [40% of US imports](http://www.latimes.com/local/lanow/la-me-ports-clean-air-20170719-story.html) enter through the ports of Los Angeles and Long Beach. Trucks travel frequently to deliver the goods to warehouses, and further move the goods from those facilities to more customers. In the era of e-commerce, high demand for express deliveries further contributes to the massive expansion of the warehousing industry.

As an Angeleno commuter, I am deeply impressed that a large number of giant warehousing facilities emerge in the suburbs along the Interstate 10 when I drive to work. But what do these facilities bring to our communities besides consumer goods?

The significant expansion of the warehousing industry

Over the last decade or so, the warehousing industry has expanded substantially, especially compared to the other industry sectors. In the Los Angeles Metropolitan Area, the number of warehouses and storage facilities increased by 21% between 2003 and 2015 (see Figure 1). However, during the same period, the construction sector got a 9% increase, wholesale and retail generally remained the same, and the manufacturing sector experienced a 23% plunge. While these traditional sectors in the economy stagnate, the warehousing industry becomes a star that is experiencing continued prosperity in the recent decade.

Expansion of the logistics industry isn’t limited to Los Angeles. Among the largest eight metropolitan areas in the US, the number of warehousing establishments increased by at least 20% in six of them: Los Angeles, Chicago, Dallas, Houston, Philadelphia and Miami (see Figure 2). The growth rate in Houston reached as high as 40%. The spatial expansion of warehouses is especially dramatic in metropolitan areas with abundant cheap suburban land. Warehousing developers favor this type of land as it offers many conveniences for warehousing development: low rent, large parcels, *weak regulations*, and good regional connections.

What impacts can warehouses have on communities?

The increased number of warehousing facilities not only consume large tracts of land, but also bring about substantial environmental externalities. **Freight trucks generate air pollutants, noise, pavement damage, and traffic safety threats while moving into and out of warehouses.**

According to studies in public health and traffic engineering, a truck creates significantly higher environmental impacts than a passenger vehicle. **The exposure of local residents, especially children and elderly people, to truck related emissions like**[**NOX**](https://www.sciencedirect.com/science/article/pii/S1352231009001629)**and**[**particulate matter**](https://www.ncbi.nlm.nih.gov/pmc/articles/PMC1241027/)**would cause health outcomes including**[**asthma and respiratory allergies**](https://www.ncbi.nlm.nih.gov/pubmed/15184208)**.**

Roads filled with semi-trucks are a familiar sight in areas and neighborhoods with warehouses. It suggests the great impacts that frequent truck movement could have on the local communities. More and more residents are becoming aware of these externalities associated with warehousing activities. Some of them have organized to fight against the siting of new warehousing projects. For instance, the World Logistics Center, a major warehousing project under review in the City of Moreno Valley, is [opposed by local resident groups](http://www.pe.com/2016/08/19/all-you-need-to-know-about-the-world-logistics-center/), environmental advocates, and public agencies including the South Coast Air Quality Management District. This huge project, with floor space totaling around 40 million square feet, rouses concerns about the environmental risks associated with substantial truck movement.

Do some neighborhoods receive more warehousing facilities than others?

Given that warehousing facilities are regarded as locally undesirable, an important question arises: are they disproportionately distributed? Unfortunately, the answer is yes. [My recent analysis](https://www.fhwa.dot.gov/planning/freight_planning/talking_freight/november_2015/) of warehousing location in Los Angeles revealed that low-income and medium-income minority neighborhoods contain a vast majority of warehouses and distribution centers (see Figure 3). Apart from traditional industrial clusters in the East LA and Gateway cities, suburban neighborhoods in the Inland Empire are rising hotspots for warehousing development. Econometric model results confirm the spatial patterns that minority neighborhoods receive significantly more warehouses than white neighborhoods, after controlling for household income, land rent and many other variables. The empirical evidence implies a classic environmental justice problem.

But why? Warehousing developers search for locations with low land rent, low-wage labor pool, weak political power, and favorable public policies. Economic, sociopolitical and institutional factors are equally important in the dynamics. When local authorities are indifferent about warehousing development, minority residents may not be able to resist this spatial inequity, or unequal spatial distribution of warehouses.

This environmental justice problem is drawing the attention of the public, academia, and policy makers. Land use regulations, environmental standards, vehicle fleet upgrades, and techniques (such as using plants as buffers) are all potential options for alleviating the problem. As warehouse development continues to increase, let’s take seriously this environmental justice issue, and come up with feasible solutions that stop burdening our minority communities with air pollution.

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