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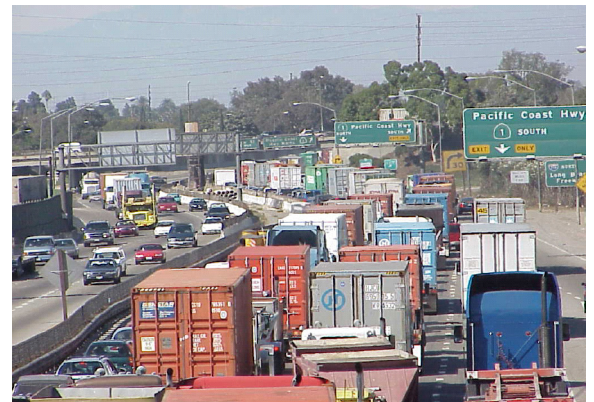


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ISSUE

The San Pedro Bay Port (SPBP) of Los Angeles and Long Beach is the largest container port in the U.S. Although the benefits of handling and hauling freight are enjoyed by the nation as a whole, the traffic congestion and air pollution created by the port falls mostly on the people who live and work nearby and along connecting freight corridors. These corridors include two busy freeways, the I-710 and the I-110, and an active rail link, the Alameda corridor.

This research studied the environmental and health impacts of freight operations between the SPBP and downtown Los Angeles, some 22 miles to the north. In our analysis of health impacts, we focused on nitrogen oxide (NO_x), a contributor to the formation of photo-chemical smog, and fine-grain particulates (PM_{10}), which can lodge in peoples' lungs with repeated exposure. We combined estimates of air pollutants from the I-710 and I-110 freeways, line-haul rail lines, and rail yards and looked at them for summer and winter.



Four models were linked together to assess impacts: a microscopic traffic simulation model (TransModeler), which describes vehicle behavior; an emissions model (EMFAC 2007), which estimates the impacts of congestion on air pollution; a pollutant dispersion model (CALPUFF), which calculates how emissions move in a region's atmosphere; and a health impact model (BenMAP), which calculates various pollutants' effects on health using the incidence of various pollution-related illnesses.

The San Pedro Bay Port, located 22 miles from the City of Los Angeles, is the busiest in the U.S. Freight moves in and out of it by two major freeways and a rail line, the Alameda corridor.

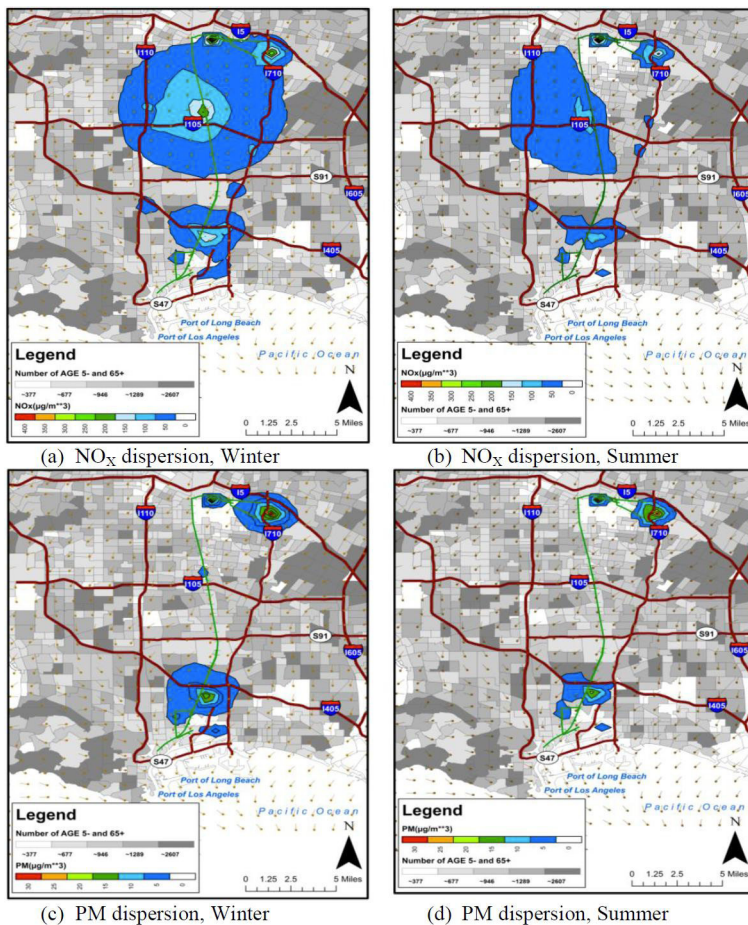
RESEARCH FINDINGS

Our study found that living or working near freight corridors that tie into SPBP threatens public health. NO_x and PM_{10} were the highest in neighborhoods abutting the freeways, rail yards, and rail lines. We also found that the impact zone—the area affected by NO_x and PM_{10} —was much larger in the winter than in the summer. We estimate

that the annual cost of health impacts from exposure to NO_x and PM_{10} in the study area—measured by increased incidences of asthma and other upper respiratory illnesses as well as premature deaths—could reach \$900 million.

RECOMMENDATIONS

A number of strategies could reduce emissions along active freight corridors like the SPBP. These include: intelligent transportation systems (ITS), advanced traffic operations and control measures, shifting freight from trucks to trains, and increased use of clean-diesel trucks. The health impacts of such strategies should be closely studied in coming years. Our analysis is being expanded to measure health impacts of trucks not only on freeways that feed directly into the port, but also on nearby local streets and other freeways in the corridor.



The maps in the left column show dispersion of NO_x and fine particulates (PM_{10}) during the winter. Those in the right column show the dispersion over the same areas in the summer. The winter dispersion area for each pollutant is much larger, as are the health impacts. The maps also show that the concentration of pollutants is highest in areas close to freeways, rail yards, and the rail lines.

