

TTI heat map shows relationship between traffic-related air pollution and childhood asthma

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Cities with Most Childhood Asthma Cases Due to TRAP in 2010 (Modeled Estimates)				
City	State	Total Population	Total Children	Modeled Cases of Childhood Asthma Due to TRAP
New York	New York	8,175,133	1,768,111	6,756
Los Angeles	California	3,792,621	874,525	3,390
Chicago	Illinois	2,695,598	621,630	2,506
Phoenix	Arizona	1,445,632	408,341	1,278
Houston	Texas	2,099,451	543,024	1,240
Philadelphia	Pennsylvania	1,526,006	343,837	1,159
San Diego	California	1,307,402	279,368	821
Dallas	Texas	1,197,816	317,128	779
San Jose	California	945,942	234,678	622
San Antonio	Texas	1,327,407	356,000	592

This table shows the modeled estimation of the ten cities with the most childhood asthma cases due to traffic-related air pollution in 2010. Credit: Texas A&M Transportation Institute

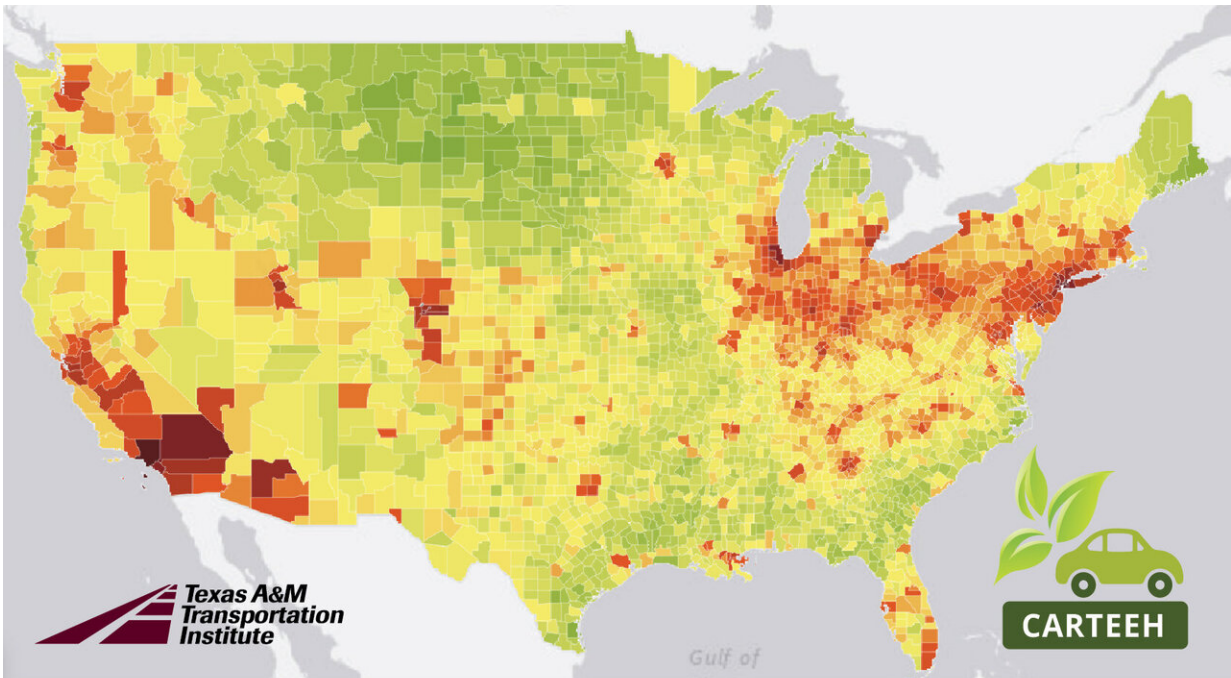
A team of air quality and health researchers led by the Texas A&M Transportation Institute (TTI) have created a first-of-its-kind, county-by-county interactive heat map and city-by-city table detailing the distribution of childhood asthma due to traffic-related air pollution

across the United States. One of the principal findings is that asthma cases attributable to traffic-related air pollution dramatically decreased over a 10-year period.

A [research paper](#), "[Traffic Related Air Pollution and the Burden of Childhood Asthma in the Contiguous United States in 2000 and 2010.](#)" detailing the findings has been accepted for publication in the peer-reviewed journal *Environment International*.

"This is the first time a study has estimated the national [childhood asthma](#) incidents attributable to different ambient air pollutants," states Principal Investigator Haneen Khreis, assistant research scientist with TTI's [Center for Advancing Research in Transportation Emissions, Energy and Health \(CARTEEH\)](#). "Based on our modeling estimates, childhood asthma cases attributable to traffic-related air [pollution](#) (nitrogen dioxide, or NO₂) decreased, on average, by 33 percent between 2000 and 2010. This is a win for public health."

Khreis and her team created an interactive heat map showing the impact NO₂ had on childhood asthma across the country during the years 2000 and 2010. Every U.S. county is represented, and users can hover over a county to see the findings for that county. Also, a table of the largest 498 cities across the country with detailed information for each year is presented. | [Access the Heat Map and Table](#)



TTI HEAT MAP SHOWS

Asthma cases attributable to traffic-related air pollution dramatically decreased between 2000 and 2010

Around 6 million children in the United States are affected by asthma, making the condition the most common chronic lung disease in children. These interactive visualizations illustrate the impact of traffic related air pollution on the burden of incident childhood asthma in the contiguous United States in 2000 and 2010. Credit: Texas A&M Transportation Institute

For example, for Harris County (home to Houston, Texas), the map details the population of children in the county, the number and percentage of childhood asthma cases attributable to NO₂, and the average NO₂ concentration for the year. In 2000, there were 2,682 asthma cases attributable to traffic-related pollution, representing 25 percent of all asthma cases in the county. In 2010, there were four hundred fewer air pollution-related cases, representing 18 percent of all asthma cases in the county for that year and a 23.7 percent decrease from 2000. (In Texas, Houston and Dallas rank in the top 10 cities with traffic-related air pollution [TRAP] asthma cases.)

"The decline in NO₂-related asthma cases is due to multiple factors, including more fuel-efficient vehicles," says TTI's Raed Alotaibi, a graduate assistant researcher and a medical doctor with CARTEEH. "Whatever the reason(s) for the decline, this is good news because asthma is one of the leading chronic airway diseases among children."

TTI estimates there were more than 140,000 asthma cases due to TRAP in the United States in 2010. More than 80 percent of children with TRAP-induced asthma live in urban areas. Low income households are especially vulnerable.

The heat map can help better inform air quality policy makers, transportation agencies, medical associations and anyone else interested in learning more about the burden of childhood asthma due to air pollution. The research team is currently refining this analysis by using state-specific health data from surveys by the Centers for Disease Control and Prevention.

"This study highlights the issue of TRAP-related asthma and pinpoints those cities where air quality and asthma continue to be a major problem," Khreis points out. "Despite the encouraging decrease in air pollution-related [asthma](#) cases, of those cases that remain, many could

and should be prevented."

More information: Raed Alotaibi et al, Traffic related air pollution and the burden of childhood asthma in the contiguous United States in 2000 and 2010, *Environment International* (2019). [DOI: 10.1016/j.envint.2019.03.041](https://doi.org/10.1016/j.envint.2019.03.041)

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