

Asthma and Air Pollution in Baltimore City



ABELL
FOUNDATION

DECEMBER 2017

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Pollution from Road Traffic

Although the NATA analysis is not comprehensive and is limited to respiratory risks from air toxics, it is likely that on-road vehicles are the largest contributor to the air pollution that people breathe in Baltimore. This is because there is significant traffic congestion in the area and because vehicle tailpipes, which are relatively close to ground-level, do not disperse pollution as widely as taller smokestacks.

We were able to map road traffic emissions using a tool made available by the University of North Carolina and the U.S. EPA called the Community LINE Source Model ("C-

⁷⁰ The respiratory risk map and legend were created by the EPA's EJSCREEN mapping tool, after selecting for environmental indicators and NATA Respiratory HI. EIP removed the areas outside of the City boundary.

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Source: Environmental Integrity Project. Asthma and Air Pollution in Baltimore City. December 18, 2017. <https://www.environmentalintegrity.org/reports/baltimore-asthma/>

EPA does not provide a tool that allows users to model the dispersion of emissions from power plants and other large facilities.⁷⁵ The map of respiratory risks from air toxics (Figure 6) in the “Respiratory Risk from Toxic Air Pollution” section includes pollution from these facilities, but, as previously discussed, only health risks from toxic air pollutants (not criteria pollutants) are modeled. In order to provide a rough visualization of the location of large facility sources of criteria pollutants, we mapped the zip codes in which facilities that produce these emissions are located (Figures 13-15) using data from the National Emissions Inventory, an EPA dataset⁷⁶ that is described in more detail in the Methodology and Data Caveats section of this report. This is an extremely imprecise measure of air pollution from these plants, which can disperse differently depending on factors like stack height and wind direction.

In addition, we limited this presentation to emissions from facilities located within Baltimore City’s borders. There are large sources of air pollution located just outside of the city. These include the Fort Smallwood coal plant complex, which is discussed in more detail in the section of this report on trends over time and is located in Anne Arundel County portion of the 21226 zip code. We did not include emissions from sources located outside of Baltimore City in the maps below because some large sources in the area, like the Charles P. Crane coal plant in Baltimore County, are in zip codes that are not even partly in Baltimore City. It would have been too difficult to present data for these sources as part of a map of Baltimore City.

In general, there is not a significant association between city zip codes with the highest emissions of criteria pollutants from stationary facilities and the zip codes with the highest asthma rates. The zip codes with the highest emissions from facilities in 2011 were 21230 (Westport/Morrell Park), which houses the Wheelabrator/Baltimore Refuse Energy Systems Company (“BRESCO”) trash incinerator, and 21226 (Curtis Bay), which includes two industrial areas that house multiple pollution sources and are served by mobile pollution sources like trucks and trains. In 2011, the 21226 zip code ranked 14th in the city out of 31 zip codes with data in terms of highest asthma hospitalization rates and had an asthma hospitalization rate of 35.66 per 10,000 people. The 21230 zip code ranked 19th in the city with an asthma hospitalization rate of 27.76 per 10,000 people. However, it should be noted that the asthma hospitalization rates in both zip codes are still much higher than the state average rate in 2011 of 17.17 per 10,000 people.

“In general, there is not a significant association between city zip codes with the highest emissions of criteria pollutants from stationary facilities and the zip codes with the highest asthma rates.”

Source: Environmental Integrity Project. *Asthma and Air Pollution in Baltimore City*. December 18, 2017.

<https://www.environmentalintegrity.org/reports/baltimore-asthma/>

⁷⁵ While the C-PORT mapping tool allows the user to manually add point sources emissions information to baseline data for port pollution sources, we did not use it to map pollution from point sources like incinerators and power plants because the tool was primarily created to visualize pollution from within ports/terminals. We would have had to manually add very detailed stack data – including exit temperature, exit velocity, inner stack diameter at top, and height – for each point source in order to include facility emissions in the model.
⁷⁶ We used the 2011 asthma map for the comparison because the National Emissions Inventory (“NEI”) dataset is from 2011. NEI is assembled every three years, and a dataset is available for 2014. However, we do not have asthma data for any year more recent than 2013.



PPES-MRPS-2019
DNR Publication No. 12-091619-167

PPRP

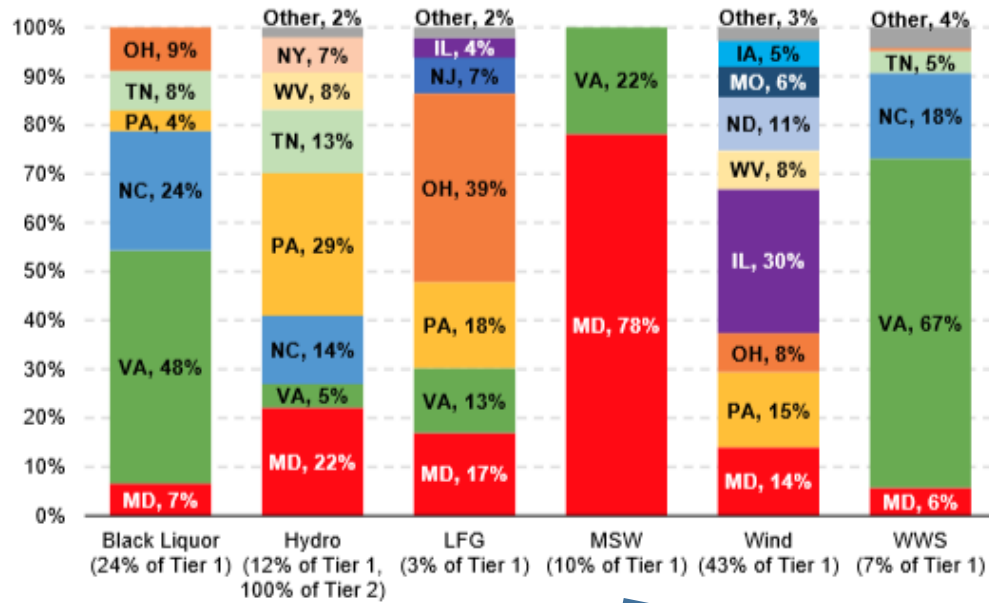
FINAL REPORT CONCERNING THE
MARYLAND RENEWABLE PORTFOLIO
STANDARD AS REQUIRED BY CHAPTER
393 OF THE ACTS OF THE MARYLAND
GENERAL ASSEMBLY OF 2017

December 2019

**MARYLAND POWER PLANT
RESEARCH PROGRAM**

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78% of MSW RECs are generated in Maryland for compliance with the Maryland RPS.

Source: Maryland Department of Natural Resources. Final Report Concerning the Maryland Renewable Portfolio Standard as Required by Chapter 393 of the Acts of the Maryland General Assembly of 2017. December 2019.

<https://dnr.maryland.gov/pprp/Documents/FinalRPSReportDecember2019.pdf>

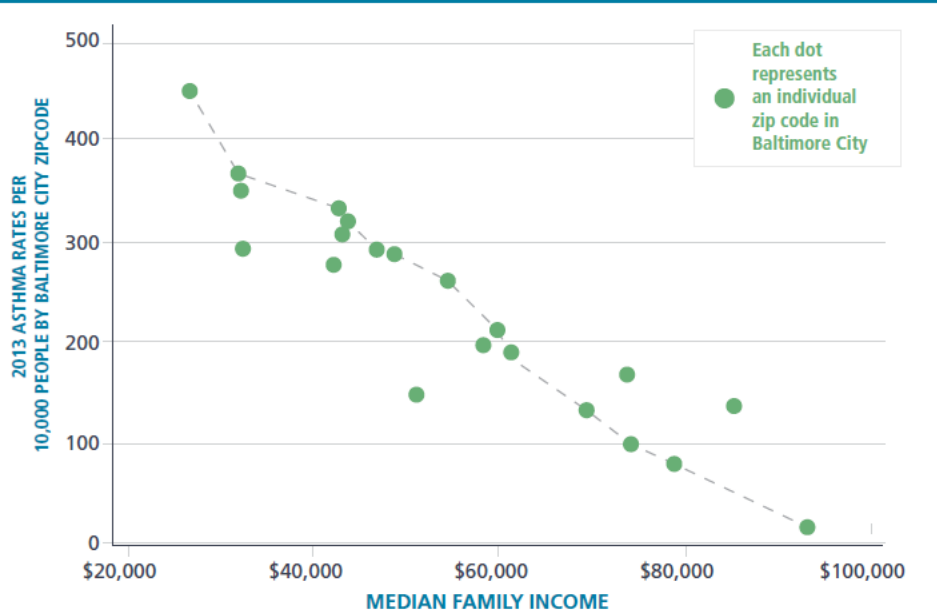
Figure ES-11. Percentage of RECs Generated in Each State Used for Compliance with the Maryland RPS, by Fuel Source (2017)

Source: Maryland PSC 2018 Renewable Energy Portfolio Standard Report.

Note: The percentages under each fuel category reflect each fuel type's share of Maryland RPS compliance for 2017.

A strong relationship exists between Baltimore City asthma rates and social determinants of health.

Baltimore City asthma rates vs. median income



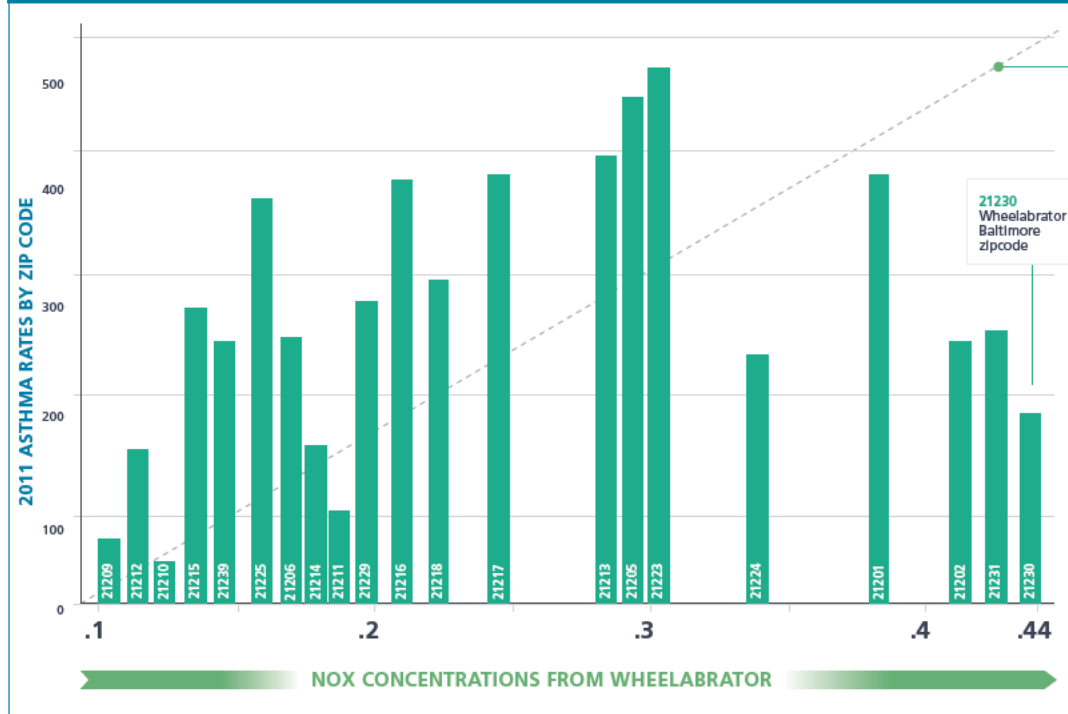
**STRONG STATISTICAL RELATIONSHIP
ASTHMA RATES VS. MEDIAN INCOME**

The Baltimore City Health Disparities Report Card stated that "it has been well documented that level of income directly affects overall health and mortality. "Within this report, disparities among the lowest income earners (household median income < \$15,000 per year) and the highest income earners (household median income ≥ \$75,000 per year) are persistent in childhood asthma (ratio 2.76:1)... If we were to consider how many premature deaths could be avoided if all Baltimore residents had equal opportunity to good health by using income as a sole determinant of mortality, 50.1% of deaths citywide could potentially be averted."

- City Health Department Office of Epidemiologic Services April 2014

As median family income increases, asthma rates decrease.

Baltimore City asthma rates vs. Nox's contribution to ambient air quality from Wheelabrator Baltimore



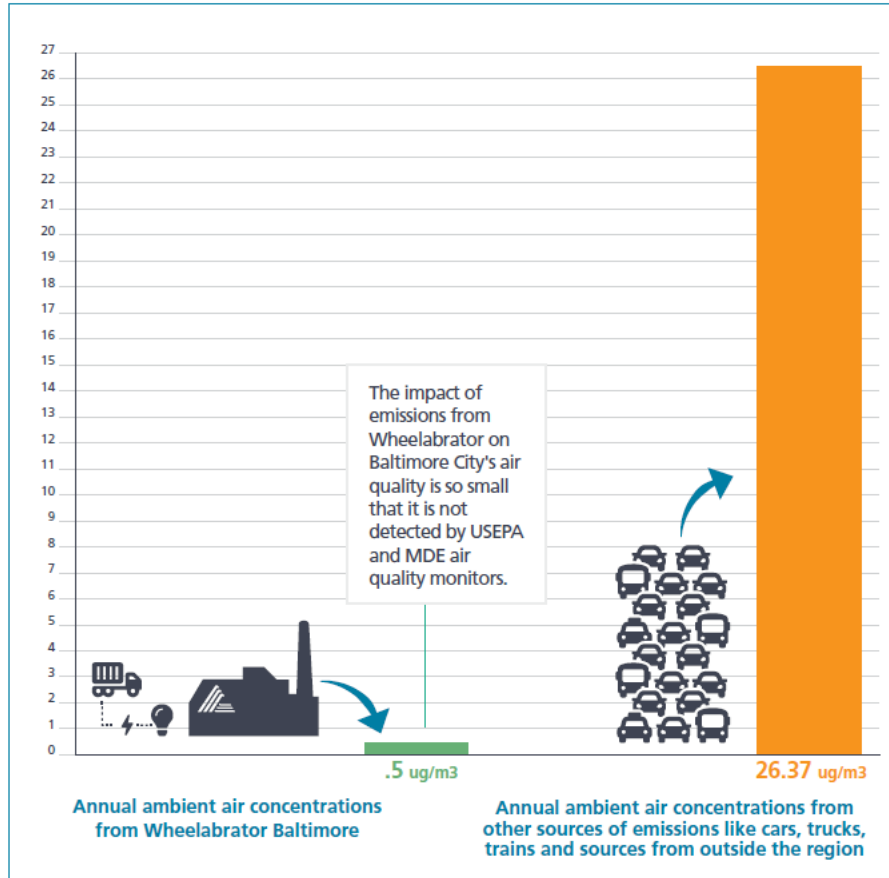
There is not a statistical relationship between NOx concentrations from Wheelabrator Baltimore and City asthma rates because asthma rates do not increase steadily by zip code with increasing NOx concentrations.

"In general, there is not a significant association between city zip codes with the highest emissions of criteria pollutants from stationary facilities and the zip codes with the highest asthma rates."

- Environmental Integrity Project (EIP). 2017. Asthma and Air Pollution in Baltimore City.

**NO STATISTICAL RELATIONSHIP
ASTHMA RATES VS WHEELABRATOR BALTIMORE**

Annual average air quality impacts from Wheelabrator Baltimore are negligible compared to other sources



The important difference between emissions and air quality

When considering the impacts of facility emissions on air quality, it is important to understand that the same amount of emissions from different sources (for example, from a vehicle at ground level vs. from a stack) have very different impacts on air quality. To understand the impact of any emissions on regional air quality, it is necessary to evaluate various factors like characteristics of the emission source itself, weather patterns and more

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