

# Particulate Matter (PM)

## Community Action to Promote Healthy Environments (CAPHE)

### PROJECT PARTNERS:

Community Action Against Asthma

Community Member-at-Large, Theresa Landrum

Detroit Community-Academic Urban Research Center

Detroit Health Department

Detroit Hispanic Development Corporation

Detroiters Working for Environmental Justice

Green Door Initiative

Healthy Environments Partnership

Michigan Department of Environment, Great Lakes, and Energy (EGLE)

Sierra Club

Southwest Detroit Community Benefits Coalition

Southwest Detroit Environmental Vision

University of Michigan School of Public Health, Michigan Medicine, & Taubman College of Architecture and Urban Planning

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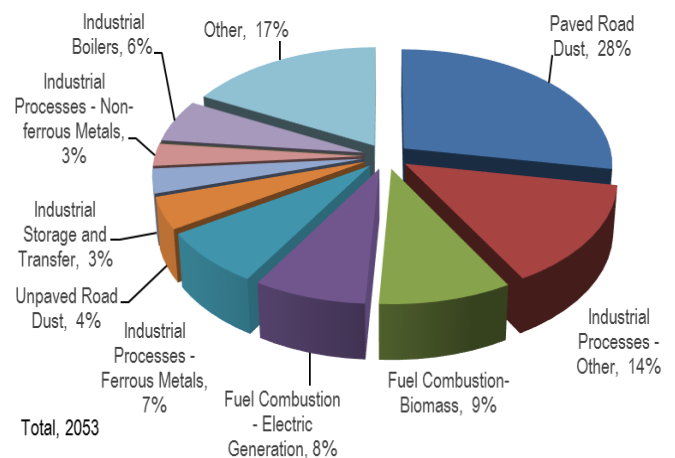
### WHAT IS PARTICULATE MATTER?

Airborne particulate matter, also known as PM or particle pollution, is a mixture of extremely small particles and liquid droplets that can include acids, organic chemicals, metals, soil and dust particles, and biological matter such as fungal spores. Smaller particles pose a health concern because they can be inhaled into and accumulate in the lungs. Particles less than 2.5 micrometers in diameter, called PM<sub>2.5</sub> or "fine" particulate matter, pose the greatest health risks. Because of their small size (about 1/30th the width of a human hair), these tiny particles penetrate deeply into the lungs.<sup>1,2</sup>

### WHERE DOES PARTICULATE MATTER COME FROM?

PM comes from many sources and is often too small to see directly with the human eye. Sometimes you can see a "haze" in the atmosphere that results from PM (and not humidity). Outdoors, important sources include cars, trucks, trains, construction equipment, power plants, incinerators, fireplaces, burning leaves and brush, and some industrial processes. "Coarse fraction" particulate matter, with a diameter between 2.5 and 10 micrometers, is due to crushing and grinding operations, as well as windblown dust from roads and fields.<sup>1</sup> PM also results from chemical reactions involving combustion gases, organic vapors, ammonia and ozone. Indoors, PM can come from cigarette smoking and cooking (especially frying), woodstoves, candles, or from outdoor air that comes into houses or buildings.<sup>2</sup>

**Top 10 Sources in Wayne County for PM<sub>2.5</sub> Emissions (tons/year)<sup>6</sup>**



### HOW DOES PARTICULATE MATTER AFFECT YOUR HEALTH?

Exposure to PM, particularly PM<sub>2.5</sub>, can cause or worsen a number of diseases and can cause death. PM<sub>2.5</sub> can increase your risk of the following:<sup>3, 4, 5</sup>

- Lung irritation, coughing, and difficulty breathing
- Asthma attacks and hospitalizations— especially children
- Adverse birth outcomes, including premature births and low birth weight babies
- Decreased lung function and impaired lung growth in children and teenagers
- Increased blood pressure
- Heart attacks and irregular heartbeat
- Cancer
- Death

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## IS DETROIT'S AIR HEALTHY?

PM levels across Detroit have declined in recent years and now meet the US Environmental Protection Agency standards.<sup>3</sup> However, even at their current levels, there are effects of PM on health, including blood pressure, asthma, and birth outcomes. In addition, some areas of Detroit have higher PM levels, including areas near major highways and large industrial emitters.

The top industrial emitters of PM<sub>2.5</sub> in Wayne County include a large coal-fired power plant, two steel mills, an oil refinery, and a large cement producer.<sup>6</sup> Portions of Detroit downwind from such sources may experience higher PM levels.<sup>7</sup>

### WHO IS MOST LIKELY TO BE AFFECTED?

About one out of every three people in the USA is at risk of experiencing PM<sub>2.5</sub> related health effects. Some people are more likely to be exposed to unhealthy levels of PM, and to suffer negative health effects.<sup>2</sup> People at risk of higher exposure levels include those who work or are active outdoors and those who live near major sources, including large industry and major roadways.<sup>3</sup>

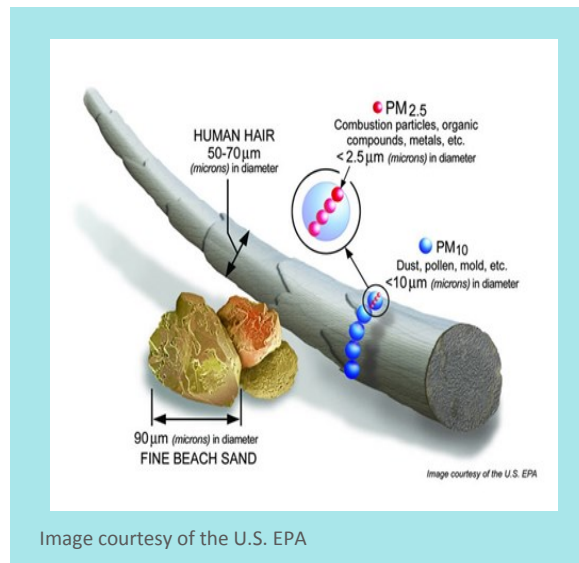
Some populations are more likely to have adverse health effects of PM. Individuals at risk include: infants, children-especially if very active during high pollution periods, people over 65 years of age, people with lung diseases such as asthma, chronic obstructive pulmonary disease (COPD), chronic bronchitis and emphysema, people with heart disease or diabetes, and those with lower incomes.<sup>3</sup>

### HOW TO REDUCE AND AVOID EXPOSURE TO PARTICULATE MATTER

- Avoid smoking and avoid breathing second-hand smoke.
- Minimize open fires, the use of fireplaces, and replace wood-burning stoves with gas-powered versions.
- Install particulate filters to reduce PM levels in your home, office, or school.<sup>8</sup>
- Support regulations that require installation of the best available technology at local steel mills and other PM-producing industries to help keep PM and many other harmful pollutants out of our air.
- Reduce the number of polluting vehicles, by upgrading the diesel truck, bus and rail fleet, or retrofitting vehicles with diesel particulate traps.
- Assure that industries and transport stations are not located near schools and residential areas.
- Enforce diesel truck idling ordinances to reduce PM levels on roads and parking areas.<sup>9</sup>

### REFERENCES

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### ABOUT COMMUNITY ACTION TO PROMOTE HEALTHY ENVIRONMENTS

CAPHE uses a community-based participatory research approach in which partners are involved in all phases of the work. This includes defining the research problem, designing and implementing the study, interpreting and distributing the results, deciding how results will be applied and applying the results to create a public health action plan to improve health in Detroit. CAPHE builds on 20 years of community-academic research partnerships. Representatives from each of these organizations comprise the CAPHE Steering Committee. This structure promotes collaboration and shared decision making at all levels of the CAPHE project, to assure that Detroit residents and leadership have a significant voice in identifying and creating solutions to promote clean air for Detroit's residents.