



**CAPHE PHAP-RM
6.15 WESTSIDE DETROIT
2016**

This work is made possible by National Institute of Health and Environmental Sciences, RO1ES022616, and the Fred A. and Barbara M. Erb Family Foundation. Additional support was provided by the Michigan Center on Lifestage Environmental Exposures and Disease (M-LEEaD), #P30ES017885.

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6.14 Westside Detroit

Residents of Detroit’s Westside live near several air pollution sources that affect pollution exposures, and also experience exposures in the social environment that may increase their risk of and vulnerability to adverse health effects of pollutant exposures. Approximately 350,000 people live on Detroit’s Westside. (See [Section 6.15.3](#) below and [Table 6-1](#)).

Air quality monitoring in Westside Detroit is described in Section 4. Below we describe pollutant sources of exposure for Westside Detroit residents, along with a description of population and community characteristics that may influence vulnerability to adverse effects of exposures.

6.14.1 Point sources

[Table 6-8](#) shows that one facility with point sources of pollutants (listed in MAERS) is located within the boundaries of Detroit’s Westside (see [Table 6-8](#)). Its **Rank** indicates the rank order of this site in relation to others reporting to the Michigan Air Emissions Reporting System (MAERS), with the number “1” indicating the greatest number of pounds of emissions based on the five year average tons of emissions. **Five-year average emissions** (2010-2014) are also shown, filtered to exclude some variations (see text in [Section 4.3](#) for a more detailed description), as well as the **rate of change** over that same 5 year period (see text, [Section 4.3](#)).

Rank	Facility	NOx			SO2			PM2.5			PM10			VOC			CO		
		5 Year Filtered Average	Note	Annual Change (%/yr)	5 Year Filtered Average	Note	Annual Change (%/yr)	5 Year Filtered Average	Note	Annual Change (%/yr)	5 Year Filtered Average	Note	Annual Change (%/yr)	5 Year Filtered Average	Note	Annual Change (%/yr)	5 Year Filtered Average	Note	Annual Change (%/yr)
71	Detroit Diesel Corporation	55	(1)	-31	7		-9	2		-10	3		-8	13.6			32		-8

[Table 6-8](#): Point source emissions of conventional pollutants (tons/yr) in Westside Detroit.

Shows 5-year average emissions (filtered to exclude some variations, see text in section 1.3), and rate of change over 5 year period (see text). Excerpted from full [Table 5-4](#).

Health Effects: Health effects associated with exposure to pollutants in [Table 3-1](#), include increased risk of respiratory problems (e.g., asthma exacerbations and hospitalizations, COPD, cardiovascular effects). See Health Effects [Table 3-1](#) for a complete listing. [Section 5.5.3](#) provides quantitative estimates of health impacts from the two largest of these point sources for three pollutants: PM_{2.5}, NO_x, and SO₂.

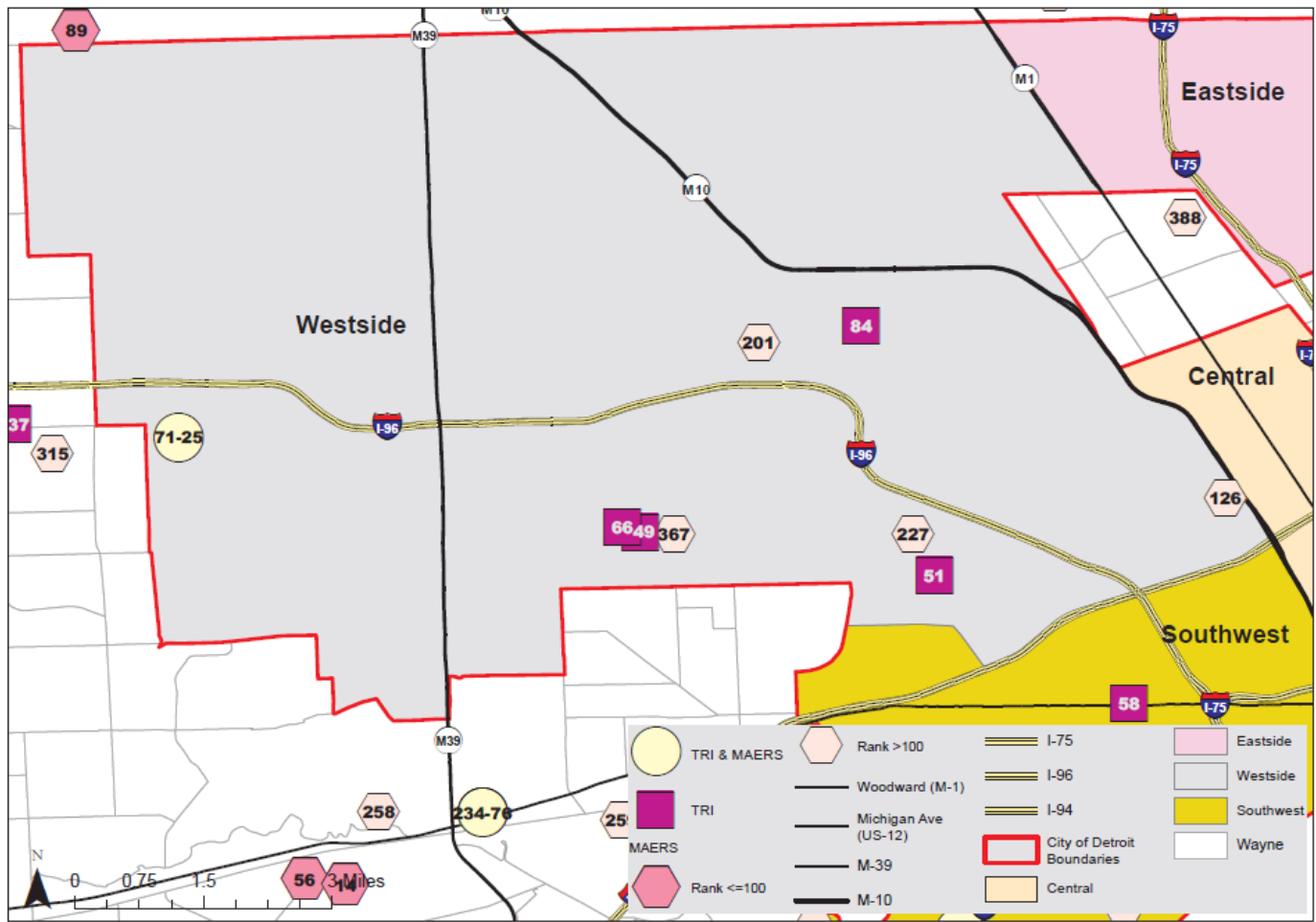
Rank	Facility	Acids	VOC	Metals and Metal Compounds	Nitrogen Compounds	Sulfur Compounds	Other
25	Detroit Diesel Corp, Redford Facility	0	384	0	0	0	12630
49	Houghton International Inc	0	0	0	0	0	1073
51	Park Metallurgical Corp	0	0	24	533	0	0
66	PVS Nolwood Chemicals Inc	163	8	10	8	0	29
84	DCI Aerotech	0	0	0	7	0	0

Table 6-9: Emissions of toxic pollutants (pounds/year) by facility in Westside Detroit by pollutant type. Average 2010-2014. In approximate rank by total TRI emissions.

Table 6-9 shows emissions of toxic air pollutants by facility located in Westside Detroit, as reported in the Toxic Release Inventory (TRI). For each facility, pounds per year of toxics reported are shown. This table shows the rank order for each facility located in Westside Detroit, with the number “1” indicating the highest emissions. The full table is shown in **Section 5.2.3**.

Figure 6-17 maps locations of facilities that are point sources of air pollutants located in or immediately adjacent to Westside Detroit. Symbols indicate facilities that emit conventional air pollutants reported in the Michigan Air Emissions Reporting System (MAERS) and air toxics reported in the Toxic Release Inventory (TRI), as described in the legend. Numbers indicated for each facility reflect its ranking in the listing of MAERS emissions (**Table 5-6**) and the listing of toxic emissions (**Table 5-7**).

Air Pollutant Point Sources in the City of Detroit - Westside Region



NOTE: TRI & MAERS Source Rank: First number indicate MAERS rank, second number indicate TRI rank.

Figure 6-17: Air pollutant point sources in Westside Detroit.

Many other point sources located outside Westside Detroit affect air quality in this area. Impacts of these sources are shown in Section 5.5, and Section 5.5.2 quantifies the health impacts of SO_2 , $\text{PM}_{2.5}$, and NO_x in Detroit.

6.14.2 Mobile sources

Mobile sources emit NO_x , $\text{PM}_{2.5}$, VOCs, CO, diesel exhaust and other pollutants, which significantly increase the exposure of Westside Detroit residents to air pollutants. Emissions result when a vehicle is idling and on the road, and also when refueling. Importantly, a large truck produces considerably more emissions than a car, and trucks are responsible for a large share of both $\text{PM}_{2.5}$ and NO_x emissions. The area also contains extensive off-road sources; these are quantified in Section 5.4.

Main Sources: Major freeways, including I-96, M-39 (Southfield Freeway), and M-10 (John C Lodge Freeway), US-24 (Telegraph Road), and M-5 (Grand River Avenue) run through Westside Detroit. Sections of highway are heavily trafficked. According to Michigan Department of Transportation (MDOT) data, I-96, M-39 and M-10 all

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experience daily vehicle volumes of over 90,000 cars per day.¹ There is also heavy truck traffic on some sections of highways in the Westside area. Both I-96 and M-39 in the Westside section have average daily commercial volumes of 4,000-5,000 trucks per day.² Emissions from commercial traffic, which can include diesel exhaust and PM_{2.5}, can be particularly harmful to human health and are of particular concern. These large vehicles produce most of the on-road mobile source emissions of PM_{2.5}. (see [Section 5.3](#)).

Highway	2013 Average Daily Vehicle Traffic (cars/day) ³	2013 Average Daily Truck Volume (trucks/day) ⁴
I-96	99,600 - 157,200	5,400 - 5,600
M-39 (Southfield Fwy)	91,800 - 151,800	4,400 - 5,000
M-10 (John C Lodge Fwy)	93,000 - 134,100	1,600 - 2,200
US-24 (Telegraph Rd)	58,300 - 83,500	710 - 1,800
M-5 (Grand River Ave)	7,700 - 23,100	380 - 410

Table 6-10: Average Daily Vehicle Traffic and Average Daily Truck Volume, Westside Detroit

Health Effects: Substantial health effects have been demonstrated for people who live, work, or go to school near major freeways. In particular, those who live within about 150 meters (about 500 feet) of roadways with high volumes of traffic, and in particular, diesel truck traffic, experience increased risk of respiratory and cardiovascular health effects. Health impacts from on-road traffic is quantified in Section 5.5.4. See Health Effects [Table 3-1](#) for greater detail. Approximately 69,000 (about 10%) of Detroit’s population lives within 150 meters of such heavily trafficked roadways.

Vehicles and the related infrastructure (e.g., fuel distribution facilities) are among the largest emitters of NO_x and VOCs in the urban area. In summer, the NO_x emitted by vehicles and other sources combines with VOC emissions from vehicles and other sources to produce ground-level ozone (O₃), another pollutant which is harmful to health. Currently, O₃ levels in Detroit are very close to the new (2015) National Ambient Air Quality Standard for O₃. [Section 4.3](#) provides further information on O₃ trends in Detroit.

¹ MDOT (Michigan Department of Transportation). 2014. MDOT Traffic Volumes. Available: <http://mdot.maps.arcgis.com/apps/Viewer/index.html?appid=18a4b2f2ba3b4e079e935f8835862c73> [Accessed 17 March 15].

² MDOT (Michigan Department of Transportation). 2014. MDOT Traffic Volumes. Available: <http://mdot.maps.arcgis.com/apps/Viewer/index.html?appid=18a4b2f2ba3b4e079e935f8835862c73> [Accessed 17 March 15].

³ MDOT (Michigan Department of Transportation). 2014. MDOT Traffic Volumes. Available: <http://mdot.maps.arcgis.com/apps/Viewer/index.html?appid=18a4b2f2ba3b4e079e935f8835862c73> [Accessed 17 March 15].

⁴ MDOT (Michigan Department of Transportation). 2014. MDOT Traffic Volumes. Available: <http://mdot.maps.arcgis.com/apps/Viewer/index.html?appid=18a4b2f2ba3b4e079e935f8835862c73> [Accessed 17 March 15].

City of Detroit - Westside Region (150 meters buffers from freeway)

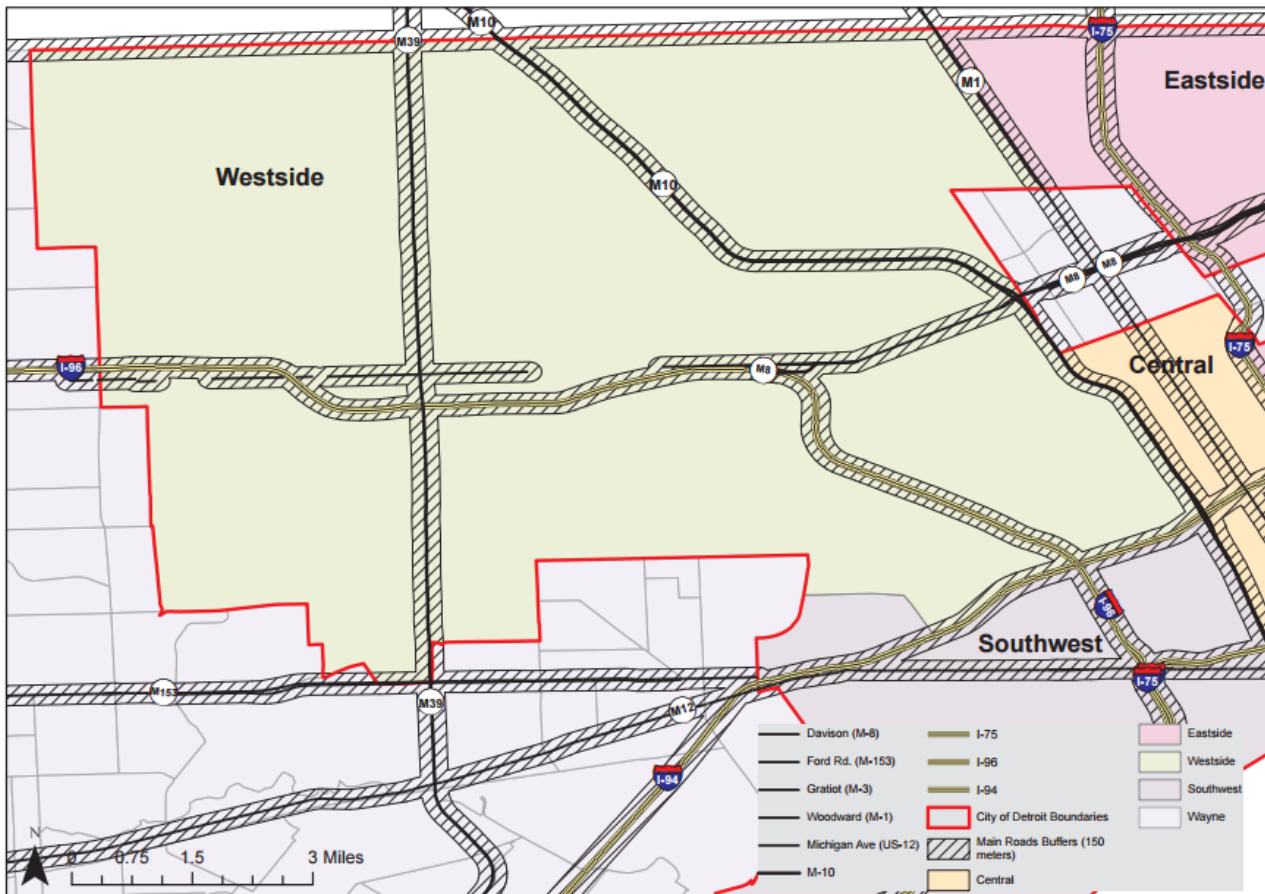


Figure 6-18: 150 meter roadway buffers in Westside Detroit.

6.14.3 Vulnerability

As described in Section 6, some communities or individuals may be more vulnerable to the adverse effects of exposure to air pollutants because they are exposed to higher levels, or because they are more adversely affected by exposure than others. Low income communities and communities of color are disproportionately likely to be exposed to high levels of air pollutants. Existing health conditions, low levels of some nutrients in the diet, young age, older age, and poor housing condition can increase the severity of health effects from exposure to air pollutants. As shown in Table 6-1, residents of Westside Detroit have exposures to Diesel PM, respiratory and cancer mortality risk that are comparable to those for the city as a whole, although higher than for the surrounding Tri-County area.

The proportion of young children (6.8%) and adults over age 60 (18.5%) in Westside Detroit is comparable to the City as a whole (6.8% and 17.5%, respectively). A greater proportion of Westside Detroit residents have completed high school, compared to the city as a whole, median household income is slightly higher, and the proportion of renters is slightly lower compared to other areas of the city. About 91% of residents of Detroit's

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Westside are non-Hispanic Black. See Figures 6-5 and 6-10 for maps showing the Cumulative Vulnerability Index for census tracts in the Tri-County Area and Detroit, respectively.

6.14.4 Cumulative risk

Figure 6-19 shows the cumulative risk scores for residents of Westside Detroit, along with point and mobile pollutant sources. The cumulative risk score is the sum of three indices assessing proximity of population to hazardous land uses (e.g., railyards, freeways), exposure to air pollutants and associated health risks (e.g., Diesel PM, respiratory risk, cancer risk), and vulnerabilities (e.g., percent below poverty, percent children under age 5). Briefly, these are calculated by rank ordering census tracts in the Tri-County area by each indicator, and constructing quintiles with 1=low and 5=high exposure or vulnerability. The sum of the risk and vulnerability scores creates a cumulative risk score ranging from 3 (lowest cumulative risk) to 15 (highest cumulative risk).⁵ Note that all census tracts in Westside Detroit fall into the mid- to upper ranges of risk (oranges and reds) when ranked against all census tracts in the Tri County Area (Figure 6-6).

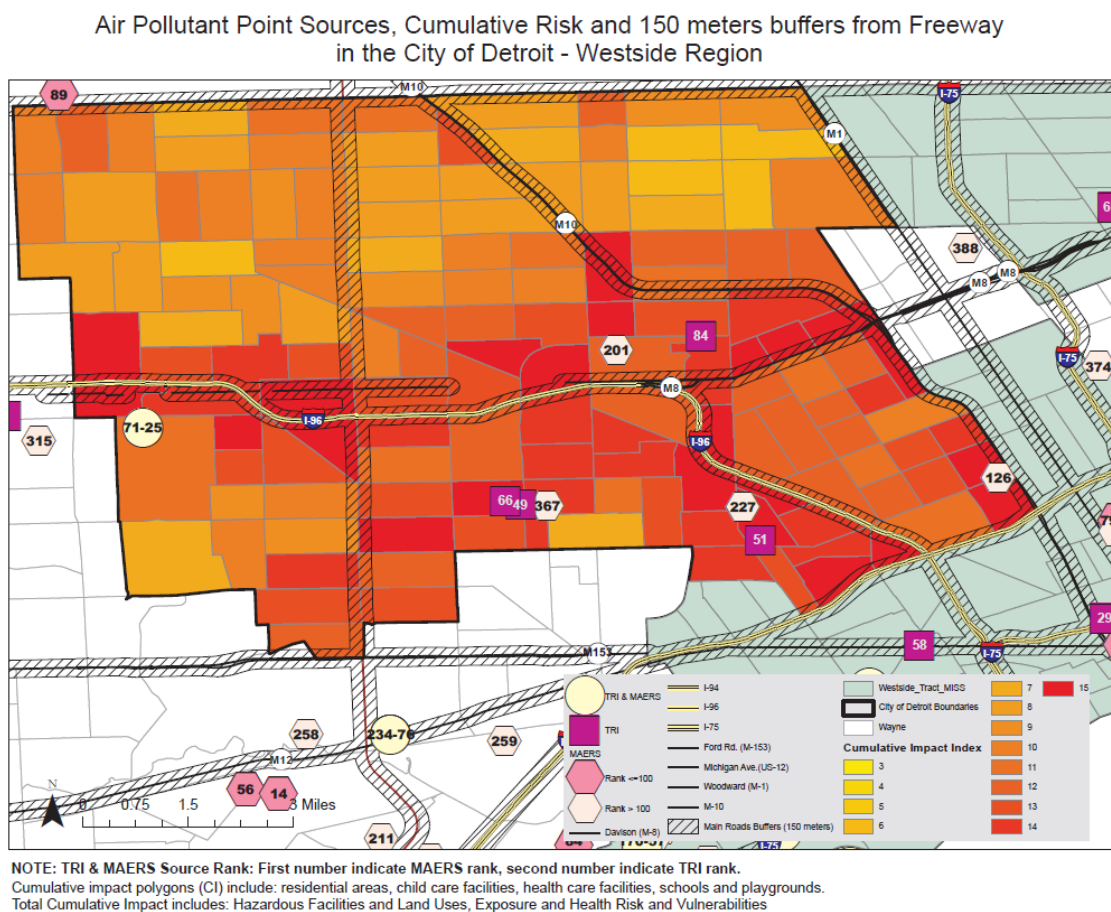


Figure 6-19: Cumulative risk index, 150 meter roadway buffers, and point sources of pollutants in Westside Detroit.

⁵ Schulz, A.J., Mentz, G.B., Sampson, N, Ward, M., Anderson, R., deMajo, R., Israel, B.A., Lewis, T.C., Wilkins, D. 2016. RACE AND THE DISTRIBUTION OF SOCIAL AND PHYSICAL ENVIRONMENTAL RISK: A Case Example from the Detroit Metropolitan Area. *DuBois Review. In Press.*

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