



# Community Air Monitoring Project

## Summary Report

### Minneapolis–Harrison Neighborhood

#### Project overview

In 2013, the Minnesota Legislature funded a two-year air monitoring study to measure air quality in Minnesota communities where low income or communities of color might be disproportionately impacted by pollution from highway traffic, air traffic, and industrial sources. This legislation funds one monitor to be moved to seven locations in a two-year period.

The project began on October 1, 2013 with monitoring in the East Phillips Neighborhood of Minneapolis. After monitoring at several community neighborhoods, the monitor was then situated in the Minneapolis Harrison neighborhood. This area has mixed residential and business interlaced with moderately used roadways. Monitoring ran from October 1st, to December 31, 2014.

#### What we monitored

Air was monitored for specific chemicals that are associated with adverse public health effects (Attachment A). These chemicals are classified as fine particles (PM<sub>2.5</sub>) or air toxic pollutants (carbonyls, metals or volatile organic compounds). The data collected were examined to see if any results were above air quality standards or health benchmarks.

The data were compared with other data collected in the same time period at other monitors in Minnesota. Within each comparison group, the Minnesota Pollution Control Agency (MPCA) looked for results that were significantly different and had average daily values above air quality standards and health benchmarks.



Harrison Neighborhood  
Air Monitoring Site


#### Findings at a glance:

- All average daily PM<sub>2.5</sub> values were below the daily PM<sub>2.5</sub> standard of 35 micrograms per cubic meter (µg/m<sup>3</sup>).
- Average daily PM<sub>2.5</sub> values measured at the Harrison monitor followed similar daily behavior as other Minneapolis sites.
- Of the 72 air toxic pollutants measured for this project, the levels of 41 pollutants were so low that they were not detected by this monitor.
- Average air toxic values were all below health benchmarks.

# Summary of Results

## Fine Particles (PM<sub>2.5</sub>)

Fine particulate matter is a mixture of very small particles found in the air including dust, dirt, smoke and even small liquid droplets. Some are so small, they can only be detected with a microscope. Because of their small size, fine particles can become lodged in the lungs and cause health problems.

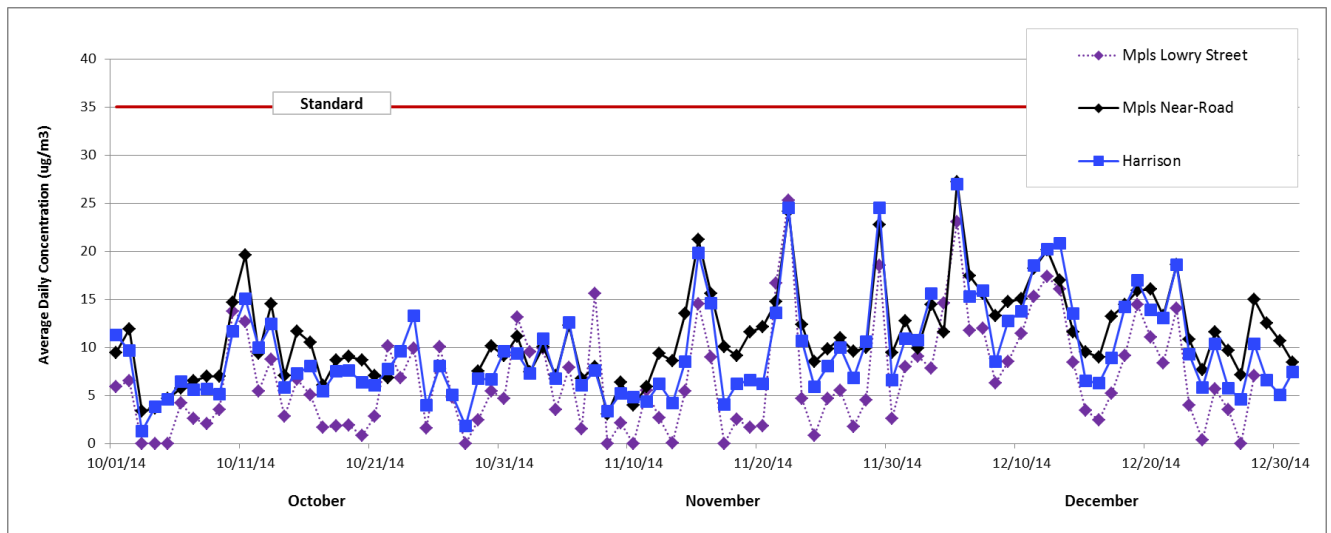


U.S. Environmental Protection Agency (EPA) regulations state that a monitored site meets daily PM<sub>2.5</sub> regulatory requirements if the 98<sup>th</sup> percentile of the 24-hour PM<sub>2.5</sub> concentrations in a year, averaged over 3 years, is less than or equal to 35 µg/m<sup>3</sup>. For more information: [http://www.epa.gov/ttn/naaqs/standards/pm/s\\_pm\\_index.html](http://www.epa.gov/ttn/naaqs/standards/pm/s_pm_index.html)

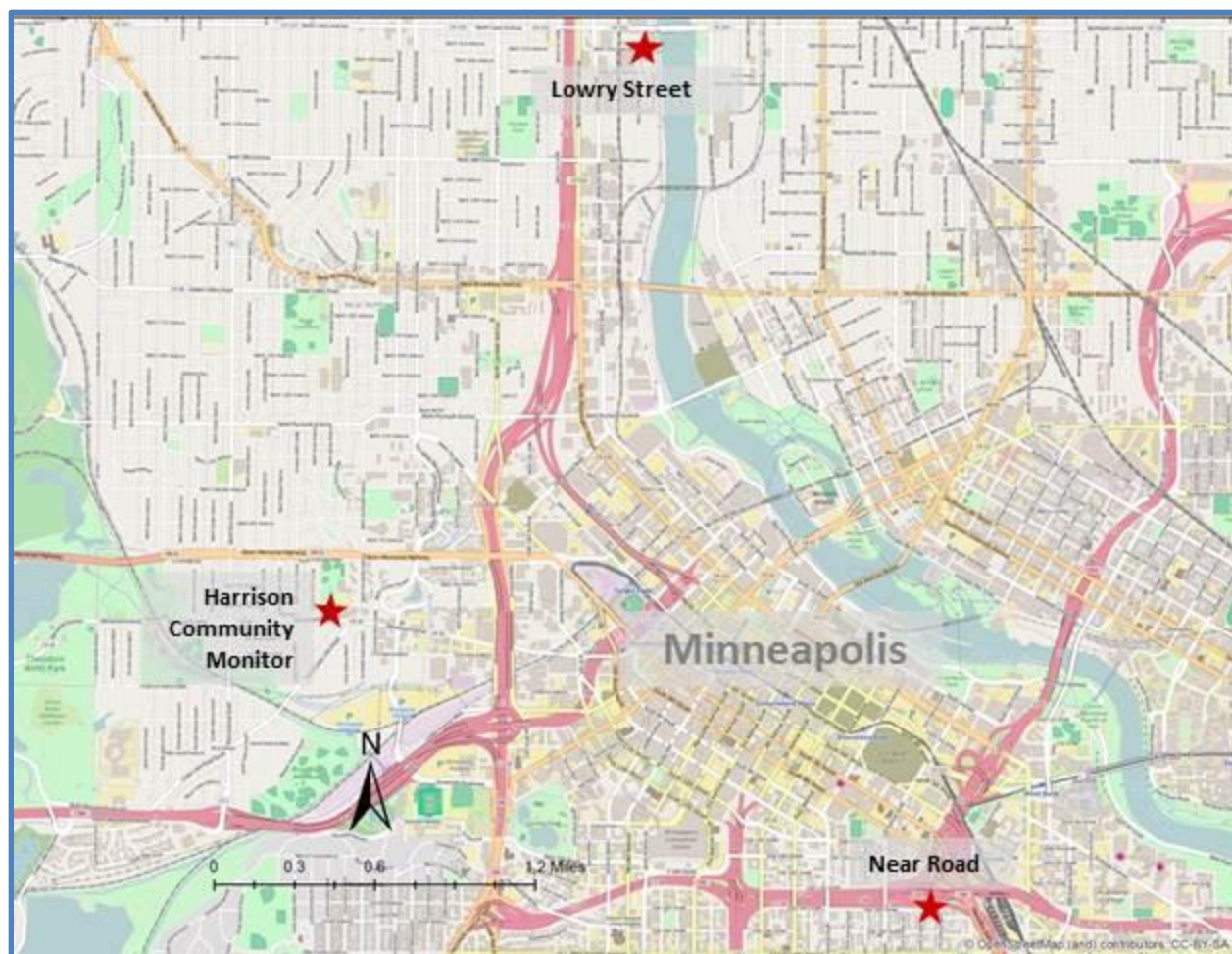
Regulatory standards exist for fine particle measurements, but these standards require a monitoring period of three years or greater. The monitoring period for this project is too short to consider regulatory compliance for safe PM<sub>2.5</sub> levels. However, as an informal comparison, for all days, the average daily PM<sub>2.5</sub> values were below the daily regulatory PM<sub>2.5</sub> standard of 35 µg/m<sup>3</sup>.

The average daily trends (**Figure 1**) over the three month period were similar between the Harrison community monitor and other Minneapolis monitors (sites shown in **Figure 2**). All average daily PM<sub>2.5</sub> values were below the daily PM<sub>2.5</sub> standard of 35 µg/m<sup>3</sup> (**Table 1**).

**Figure 1.** Average daily PM<sub>2.5</sub> values at St. Paul-Minneapolis sites from October 1 to December 31, 2014.



**Figure 2.** Location of the Harrison community air monitor in relation to other PM<sub>2.5</sub> air monitors in Minneapolis. For more information about the individual sites, please visit the MPCA Air Monitoring Network Plan website ([www.pca.state.mn.us/pyrifa3](http://www.pca.state.mn.us/pyrifa3)).



**Table 1.** Summary information describing average daily PM<sub>2.5</sub> values found at MPCA monitors during the monitoring period of October 1, 2014 to December 31, 2014.

Site	Min µg/m <sup>3</sup>	Max µg/m <sup>3</sup>	Mean <sup>1</sup> µg/m <sup>3</sup>	Median <sup>2</sup> µg/m <sup>3</sup>	Standard Deviation <sup>3</sup> µg/m <sup>3</sup>	Number of days that average daily values at the community monitor were		Total Number of Monitoring Days*
						higher	lower	
Harrison Community Monitor	1.3	27.0	9.6	8.0	5.2			91
Mpls NearRoad	3.1	27.2	11.3	10.1	4.7	22	63	85
Mpls Lowry Street	0.0	25.3	6.6	5.5	5.6	79	9	88
St. Paul-Harding H.S.	0.6	25.3	7.4	6.3	4.8	85	6	91
Anoka Airport	1.2	25.3	7.8	6.2	4.7	86	5	91
Apple Valley	0.4	22.7	7.2	6.7	4.1	78	7	85
Virginia	2.7	19.0	7.0	6.3	3.4	68	23	91
Rochester	1.2	24.0	7.6	6.6	4.5	63	22	85
Talahi School	0.1	23.8	6.4	5.0	4.5	77	6	83
St Michael	1.4	25.5	6.8	5.4	4.6	80	3	83
Detroit Lakes	2.3	23.5	7.7	6.7	3.8	68	23	91
Marshall	0.0	21.3	5.6	4.9	3.8	75	9	84
Duluth-Laura McA School	1.0	18.3	6.2	5.1	3.9	77	9	86
Ely	2.7	16.0	5.7	5.2	2.5	78	6	84
Brainerd Airport	3.3	23.5	8.1	7.0	3.8	62	29	91
Winona	3.5	30.9	9.5	8.1	4.8	49	38	87

<sup>1</sup>Mean value is the arithmetic average value of all of the average daily PM<sub>2.5</sub> measurements

<sup>2</sup>Median value is the middle value of the set of average daily PM<sub>2.5</sub> measurements

<sup>3</sup>Standard Deviation of the average daily PM<sub>2.5</sub> measurements

\*Total number cannot exceed 91 (number of community monitoring days). Lower numbers reflect missed measurement days at the respective fixed monitor site.

## Summary of results (cont'd)

### Air toxics

Toxic air pollutants are those chemicals known or suspected to cause serious human health effects or adverse environmental effects. Example pollutants include *methylene chloride*, used as a solvent and paint stripper, *perchloroethylene*, emitted by some dry cleaning facilities and *benzene*, which is found in gasoline. Some toxic air pollutants are metals such as *cadmium*, *chromium*, or *lead* compounds.

### Air toxics health benchmarks

Existing air quality standards and health benchmarks come from a variety of sources. However, these are not available for all chemicals. For air toxics, the MPCA uses available published health benchmarks. Specific information about standards and health benchmarks can be found at: <http://www.pca.state.mn.us/bkzq4b0>.

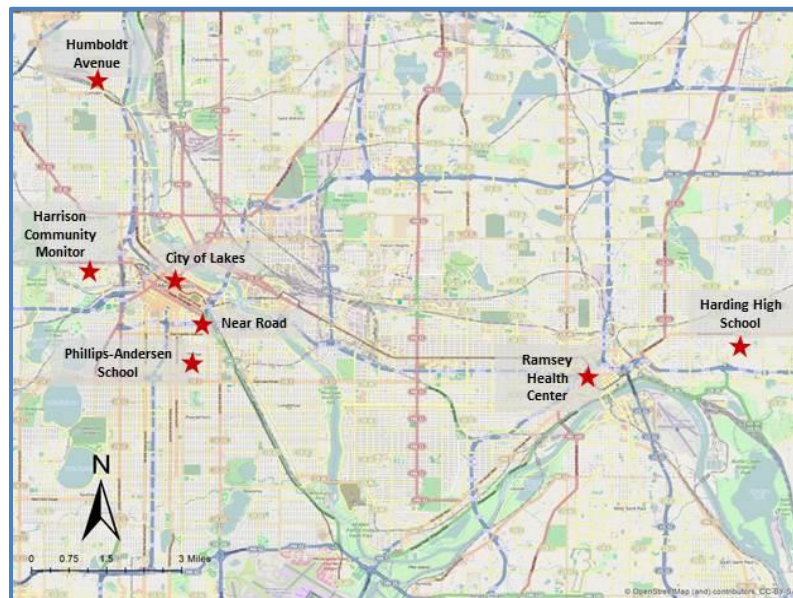
Of the 72 air toxic pollutants measured (**Attachment A**), there were 31 pollutants detected at the Harrison community monitor.

Compared to values at other fixed monitoring sites around the state and in the Twin Cities metropolitan area (**Figure 3**), the majority of these chemicals did not significantly\* differ in measured values (**Figure 4**).

All average values were at or below established health benchmark values.

\* Kaplan-Meier non-parametric non-detects data analysis

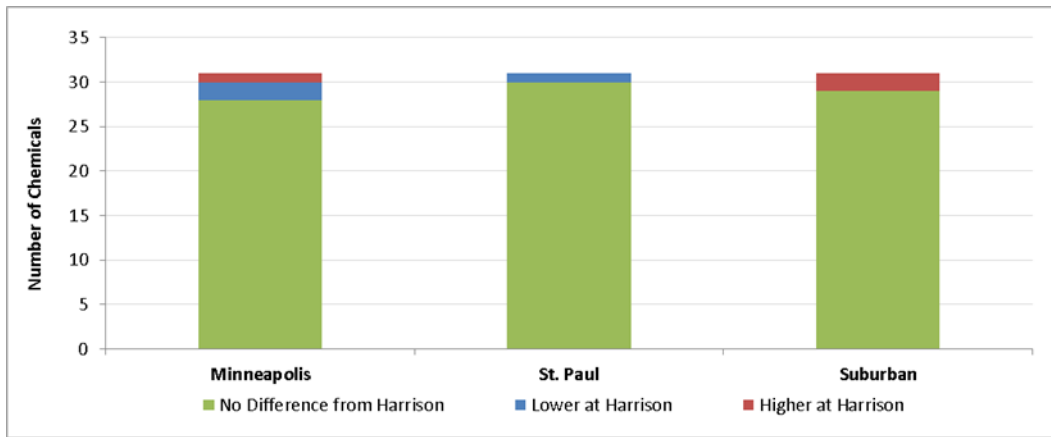
**Figure 3.** Location of the Harrison air monitor in relation to other fixed site air toxics monitors in the St. Paul-Minneapolis metro area.



Minnesota  
Public Health Data  
can be found at  
<https://apps.health.state.mn.us/mndata/home>

This data can be  
searched by county to  
help you find public  
health information  
relevant to your local  
area.

**Figure 4.** The number of air toxic pollutants that had a statistically\* different average value than was seen at other monitors around the Twin Cities.



\*Kaplan-Meier non-parametric non-detects data analysis

## What you can do to reduce your exposure to air pollutants

To reduce your risk of developing bad health from exposures to air pollution:

- Avoid exposure to tobacco smoke, wood smoke, vehicle exhaust, and other sources of airborne particles.
- Avoid prolonged outdoor exertion near high-traffic areas.
- Stay informed about air pollution alerts and advisories in your area by visiting the MPCA Air Quality Index website ([www.pca.state.mn.us/d8dcwpp](http://www.pca.state.mn.us/d8dcwpp)), calling the AQI Information Line (651-297-1630) or subscribing to the MPCA Air Quality Forecast Alert system (<http://mn.enviroflash.info>).
- If you experience respiratory or cardiovascular symptoms (e.g., persistent cough, burning eyes, wheezing, shortness of breath, tightness of chest, or chest pain) on air quality alert days, consult with a health care professional, as needed. Pay particular attention if you are an athlete, or if you or your children have a respiratory or cardiovascular condition.
- Work together with others in your community to improve air quality (see website links below for more information).

## Links to other information

For tips on how to reduce air pollution, please visit [http://epa.gov/oaqps001/peg\\_caa/reduce.html](http://epa.gov/oaqps001/peg_caa/reduce.html).

For more information about commonly found air pollutants and their sources, please visit [http://epa.gov/airquality/peg\\_caa/cleanup.html](http://epa.gov/airquality/peg_caa/cleanup.html).

For more information on the air monitoring results from the Community Air Monitoring Project or other air quality monitoring studies, please call 651-296-6300 or 1-800-657-3864 and ask for air data analysis staff. For more information and to view updates about the Community Air Monitoring Project, please visit [www.pca.state.mn.us/9xc4ahc](http://www.pca.state.mn.us/9xc4ahc).

More information about the MPCA's air monitoring program is available on the web at <http://www.pca.state.mn.us/ruu6fhw>.

**Attachment A. Community Air Monitoring Project - Monitored Air Quality Pollutants**

**Carbonyls**

Acetaldehyde  
 Benzaldehyde  
 Butyraldehyde  
 Formaldehyde<sup>T,U</sup>  
 Propionaldehyde  
 Trans-Crotonaldehyde

**Metals**

Antimony<sup>2</sup>  
 Arsenic<sup>2</sup>  
 Barium  
 Beryllium<sup>1</sup>  
 Cadmium<sup>1</sup>  
 Chromium<sup>2</sup>  
 Cobalt<sup>1</sup>  
 Iron  
 Lead  
 Manganese  
 Nickel<sup>2</sup>  
 Selenium<sup>1</sup>  
 Zinc<sup>U</sup>

**PM2.5 Continuous**

PM2.5 Concentration

**Volatile Organic Compounds**

1,1,2,2-Tetrachloroethane<sup>1</sup>  
 1,1,2-Trichloroethane<sup>1</sup>  
 1,1-Dichloroethane<sup>1</sup>  
 1,1-Dichloroethylene<sup>1</sup>  
 1,2,4-Trichlorobenzene  
 1,2,4-Trimethylbenzene<sup>B</sup>  
 1,2-Dichlorobenzene<sup>1</sup>  
 1,2-Dichloropropane<sup>1</sup>  
 1,3,5-Trimethylbenzene<sup>1</sup>  
 1,3-Butadiene  
 1,3-Dichlorobenzene<sup>1</sup>  
 1,4-Dichlorobenzene<sup>1</sup>  
 Benzene  
 Benzene, 1-Ethenyl-4-Methyl<sup>1</sup>  
 Benzyl Chloride  
 Bromodichloromethane<sup>1</sup>  
 Bromoform<sup>1</sup>  
 Bromomethane<sup>1</sup>  
 Carbon Tetrachloride  
 Chlorobenzene<sup>1</sup>  
 Chloroethane<sup>1</sup>  
 Chloroform<sup>1</sup>  
 Chloromethane  
 Cis-1,2-Dichloroethene<sup>1</sup>  
 Cis-1,3-Dichloropropene<sup>1</sup>  
 Cyclohexane  
 Dibromochloromethane<sup>1</sup>

Dichlorodifluoromethane<sup>2</sup>  
 Dichloromethane  
 Ethylbenzene  
 Ethylene Dibromide<sup>1</sup>  
 Ethylene Dichloride<sup>1</sup>  
 Freon 113  
 Freon 114<sup>1</sup>  
 Furan, Tetrahydro-  
 Hexachlorobutadiene<sup>1</sup>  
 M/P Xylene<sup>C</sup>  
 Methyl Butyl Ketone  
 Methyl Chloroform<sup>1</sup>  
 Methyl Ethyl Ketone<sup>2</sup>  
 Methyl Tert-Butyl Ether<sup>1</sup>  
 N-Heptane  
 N-Hexane  
 O-Xylene  
 Propylene  
 Styrene<sup>2</sup>  
 Tetrachloroethylene<sup>1</sup>  
 Toluene<sup>C</sup>  
 Trans-1,2-Dichloroethylene<sup>1</sup>  
 Trans-1,3-Dichloropropene<sup>1</sup>  
 Trichloroethylene<sup>1</sup>  
 Trichlorofluoromethane  
 Vinyl Chloride<sup>1</sup>

<sup>1</sup>Indicates chemicals that were below detection limits at all monitors in Minnesota, including the Harrison community monitor, for this three month monitoring time.

<sup>2</sup>Indicates chemicals that were below the detection limit at the Harrison community monitor, but were detected at one or more monitoring sites in Minnesota.

<sup>B</sup>Indicates chemicals that were higher\* at the Harrison monitor than at Minneapolis fixed monitors.  
 (1 chemical higher: 1 VOC)

<sup>C</sup>Indicates chemicals that were higher\* at the Harrison monitor than at Suburban Twin Cities fixed monitors.  
 (2 chemicals higher: 2 VOCs)

<sup>T</sup>Indicates chemicals that were lower\* at the Harrison monitor than at St. Paul fixed monitors.  
 (1 chemical lower: 1 carbonyl)

<sup>U</sup>Indicates chemicals that were lower\* at the Harrison monitor than at Minneapolis fixed monitors.  
 (2 chemicals lower: 1 metal, 1 carbonyl)

\*Kaplan-Meier non-parametric NADA averaged values