CHART

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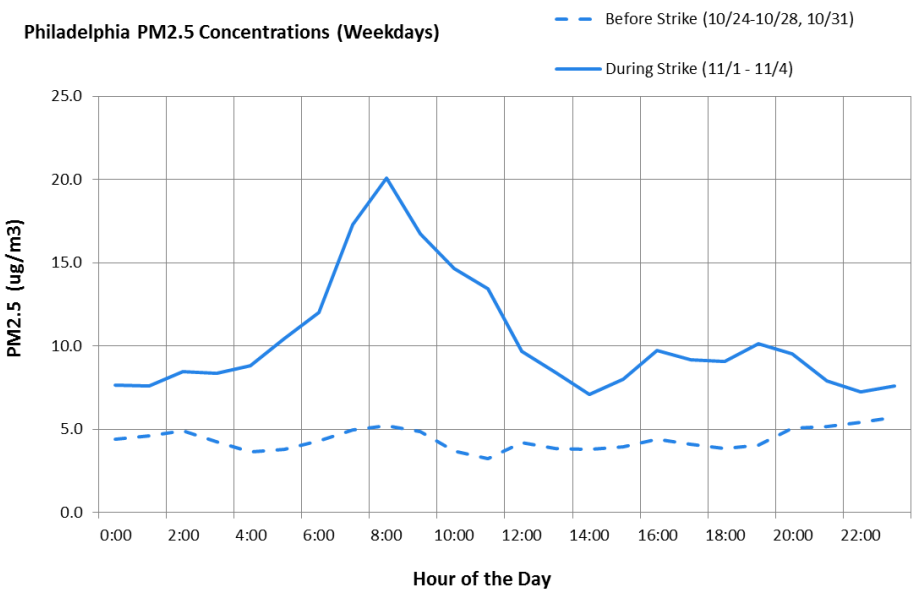
Philadelphia Department of Public Health
Thomas Farley, MD, MPH, Commissioner

Air Pollution in Philadelphia and the 2016 SEPTA Strike

Most air pollution originates from the burning of fuels. Cars and trucks that burn gasoline or diesel fuels are especially important sources of air pollution. Public transit systems are much more fuel-efficient and cleaner ways to transport large numbers of people than mass use of private vehicles. During the November 1-4, 2016 strike by workers at the Southeast Pennsylvania Transportation Authority (SEPTA) many people who ordinarily ride SEPTA vehicles to work were forced to commute by car. This provided us an opportunity to measure the effect of the public transit system on air pollution levels in Philadelphia.

The Air Management Services Division of the Department of Public Health operates air pollution monitors in 12 locations throughout Philadelphia that continuously measure key air pollutants, including fine particulate matter (or $PM_{2.5}$, commonly known as soot) and nitrogen oxides (NO_x). $PM_{2.5}$ refers to tiny particles that float in the air and can be inhaled deep into the lung. $PM_{2.5}$ pollution can have serious short- and long-term health effects, including respiratory problems, heart disease, higher risk of heart attacks, and aggravation of asthma.

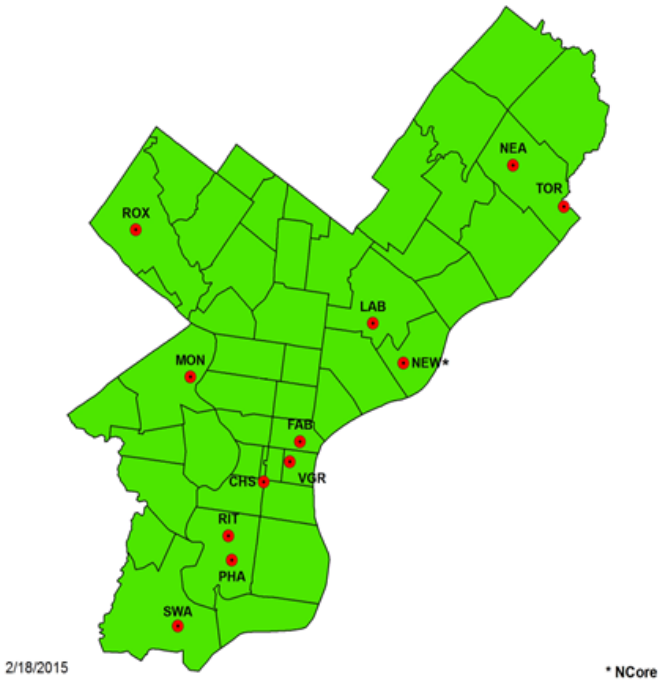
$PM_{2.5}$ Levels Spiked During the 2016 SEPTA Strike



- During the strike, the average weekdays hourly maximum emissions increased fourfold from 5 ug/m^3 to 20 ug/m^3. The annual National Ambient Air Quality Standard for $PM_{2.5}$ is 12 ug/m^3.
- While air pollution levels were unusually high throughout the day during the strike, they peaked at 8 a.m., when we expect people were driving to work or driving children to school.

(Source: Air Management Services, PDPH)

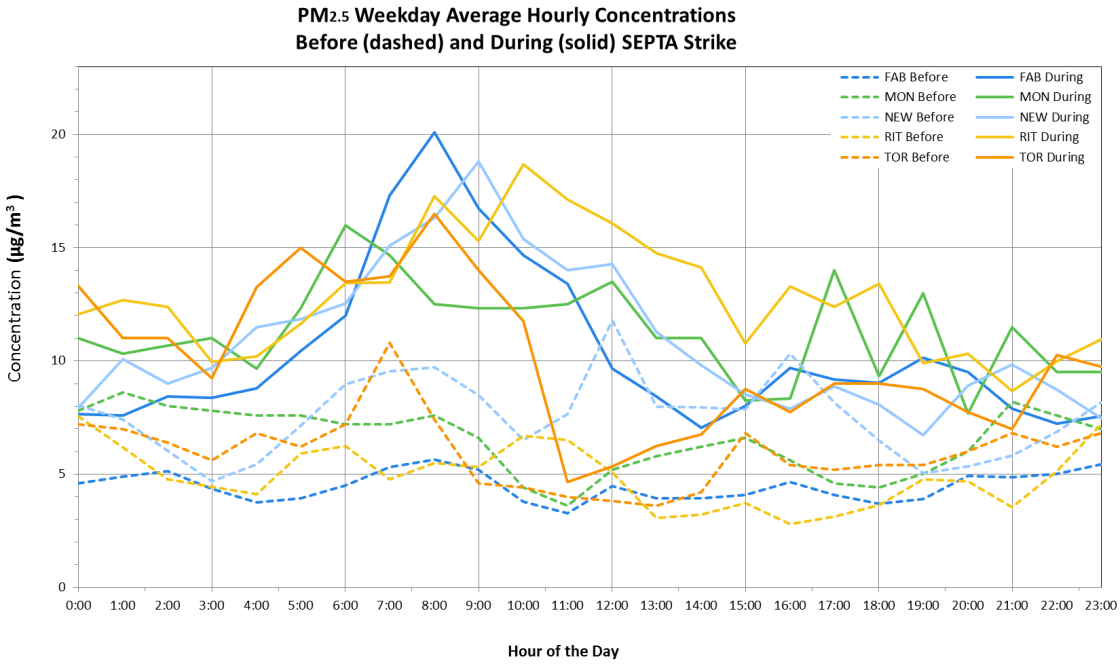
Philadelphia Air Monitoring Locations



The map above shows the locations of the PDPH Air Management Services Division air pollution monitors.

(Source: Air Management Services, PDPH)

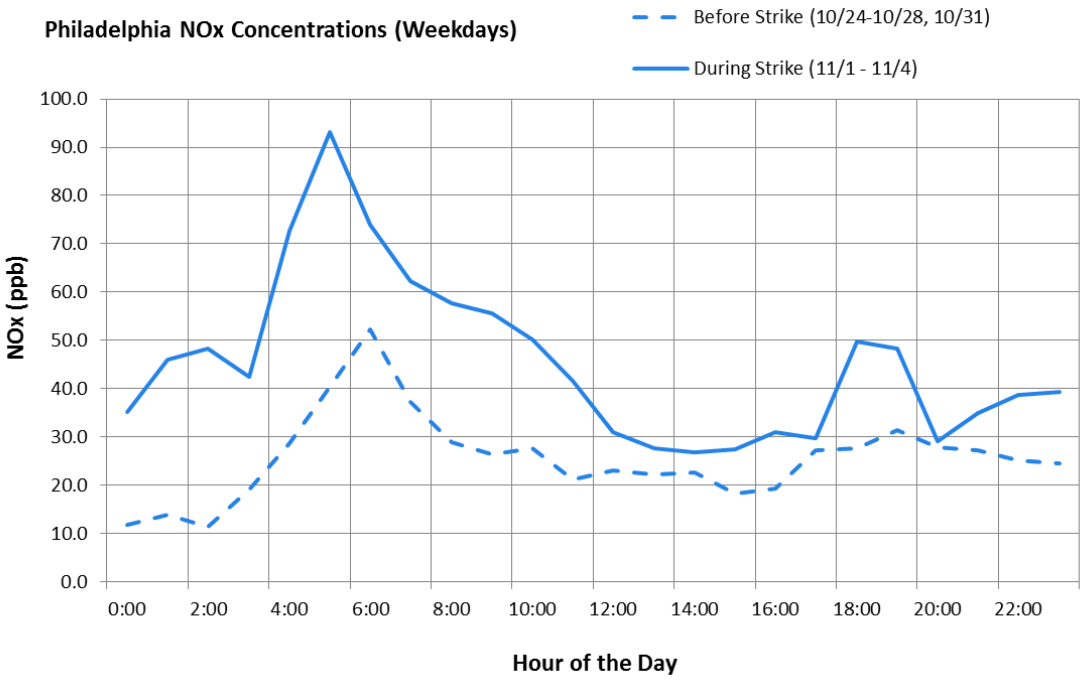
$PM_{2.5}$ Levels Most Pronounced at Monitoring Locations Close to Highways



$PM_{2.5}$ levels were much higher during the strike at each of five selected monitoring sites. The most pronounced differences between pre-strike and strike $PM_{2.5}$ levels were found at the FAB and RIT sites, which are both close to highways.

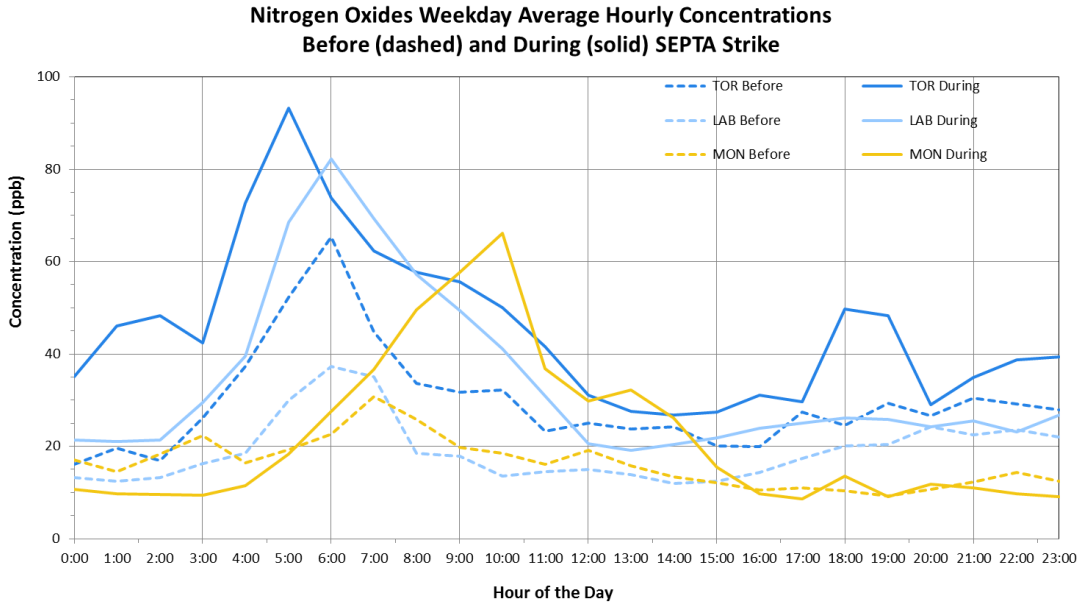
(Source: Air Management Services, PDPH)

NO_x Levels Also Increased Sharply During the 2016 SEPTA Strike



(Source: Air Management Services, PDPH)

- In large cities, the amount of NO_x emitted from vehicles can be significant. During hot and sunny weather NO_x can form another harmful air pollutant, ozone (O_3, sometimes referred to as smog). NO_x can cause inflammatory conditions in airways and decrease lung function. Ozone can cause similar health effects and can aggravate lung diseases, such as asthma.
- NO_x levels are typically highest during the morning and evening rush hours. During the strike, the maximum average weekday hourly emissions increased from 50 parts per billion (ppb) to 93.3 ppb. The annual National Ambient Air Quality Standard for NO_x is 53 ppb.
- The increase in NO_x was seen at all three air monitoring locations that measure NO_x emissions.



(Source: Air Management Services, PDPH)

What Can We Do to Reduce Air Pollution

The City is:

- Monitoring air quality.
- Issuing air quality alerts via Twitter when air pollution levels are particularly high, to help people take protective measures. More information about air quality alerts can be found here. (http://bit.ly/PhillyAQI)
- Developing a more extensive air sampling project (Philadelphia Air Quality Survey) to better understand the air quality issues citywide.
- Working with major sources of air pollution to reduce emissions. Air Management Services negotiates with facilities to:
  - Switch from high-polluting fuels to lower-polluting fuels (such as natural gas) or renewable energy sources (such as solar and wind),
  - Change processes to use raw materials that produce fewer toxic chemicals and less pollution, and/or
  - Install emission control devices.

Organizations can:

- Reduce fuel combustion and energy use.
- Switch to cleaner heating fuels. Residual-oil fuels (designated as No. 4 and No. 6) are particularly heavy emitters of $PM_{2.5}$. Switching to cleaner fuel oils (designated as No. 2) or natural gas will greatly reduce $PM_{2.5}$ emissions.

People can:

- Choose a cleaner commute, for example use public transportation, car pool, walk, ride a bicycle ,or use an electric vehicle.
- Combine errands and reduce trips.
- Avoid prolonged idling and jackrabbit starts.
- Reduce the use of wood-burning fireplaces and wood stoves.
- Reduce utility consumption and conserve electricity; set air conditioners at a higher temperature during summer.

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