



How Bad Air in Somerville Can Shorten Your Life

Somerville is in Boston's most intense commuter corridor. Every day, Somerville residents breathe the pollution from 250,000 vehicles on I-93, Mystic Avenue (38) and McGrath Highway (28) that cut

through the city. We also breathe the fumes from 200 diesel commuter and freight trains that cut through the city. These cars, trucks and trains produce ultrafine and fine particles that are now known to cause lung cancer and heart attacks. Somerville's death rate due to lung cancer and heart attacks is much higher than the state average, even though the rate of smoking is lower!

Somerville residents have already been dumped on too much!

What can we do?

- Demand that any new development in the city that will bring traffic assess its impact on Somerville residents and find ways to reduce congestion and harm.
- Continue advocating for the good planning of the two Green Line extensions and their completion by the end of 2014 as well as advocate for the construction of two head houses (entrances/exits for the new Orange Line station at Assembly Square as these major transit improvements will contribute significantly to reducing mobile pollution in Somerville. *
- Demand that any new development in the city that will bring traffic assess its impact on Somerville residents and find ways to reduce it.
- Insist that the proposed Green Line* extensions through Somerville be built soon and that a stop be added to the Orange Line* at Assembly Square to service the new development there.

* MBTA subways and light rail are powered by electricity and therefore add little to our local air pollution

More info on the harm caused by traffic congestion...



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Ultrafine particles

Fresh *ultrafine particles* from transportation sources are a major human health concern because they exist in very high numbers near highways. Once inhaled, they are retained in the lungs and other areas of the body (rather than exhaled) and they easily penetrate cells system. Ultrafine particles are measured in nanometers (billionths of a meter) and their concentrations drop off steeply within 1000 feet of a highway. Most ultrafine particles enter the body through the lungs. However, small amounts of the particles can travel along nerves from the nose directly into the brain. Regardless of passageway, ultrafine particles find their way into many organs, cells, and even sub-cellular structures like mitochondria. We have very few defenses against them. Together with associated toxins, ultrafine particles cause inflammation and other damage, with the arteries and lungs serving as primary targets.

Fine particles are measured in *microns* (millionths of a meter) and are produced both from the growth of fresh ultrafine particles and by regional atmospheric conditions. Between 1993 and 2002, environmental health research showed a linear relationship between fine particle concentrations in the air and excess lung cancer and heart attack deaths in regions and cities. Based upon this research, the EPA revised its air quality standards in 1997 and will do so again later this year. EPA's current health effects document shows that roughly half of the man-made fine particle concentration in Middlesex, Suffolk and Norfolk counties is responsible for roughly 600 excess regional deaths per year from lung cancer and other cardiopulmonary diseases.

In the last several years, public health researchers have studied disease and death rates at residential sites located next to highways and heavy diesel rail. They have demonstrated that ultrafine particle concentrations are highest close to the highways or train lines; the concentrations drop quickly further away. Residents who live closest are subject to 20 to 30 times as much dangerous air pollution as residents living further away from the high concentration. The worst health problems are found in the residents who lived the closest.

Public health researchers and epidemiologists have gathered data to support the following conclusions. People who live in the most transportation-polluted 10% of a large urban region may have:

- 20% higher overall mortality rates;
- 50% higher lung cancer and heart attack mortalities.

Additionally, people who live within 333 feet of a highway may have:

- Up to a 50% increase in Chronic Obstructive Pulmonary Disease (COPD) in women;
- Up to a 100% increase in childhood asthma incidence;
- Up to a 200% increase in childhood cancers – by birth address – for children born and spending their first years of life at these locations;
- Up to a 400% increase in children who never develop 80% of normal adult lung capacity, assuming they reside within 300 feet of a highway from age 10 through age 18.

Other research on cardiovascular disease and mortality reports that:

- Post-menopausal women in US cities has found cardiovascular and cerebrovascular (stroke) mortality to have much higher association with local than with regional fine particulate levels (Miller 2007).
- In the Miller study, the increased mortality between cities per 10 $\mu\text{g}/\text{m}^3$ increment was roughly 60% while within cities the same pollution increment was associated with over 100% increase in cardiovascular and cerebrovascular mortality.

What does this all mean for residents of Somerville?

Somerville has been the densest city in Massachusetts for over a century, with roughly 20,000 people per square mile now. Our community

contributes very little to regional air pollution on a per capita basis but breathes in more commuter-generated emissions per capita than any other city in the state. We are the only community in Massachusetts with over 200,000 vehicle miles traveled per day per square mile and we are the only community with 15,000 diesel trains per year per square mile. The major commuting corridor through Somerville, with an interstate highway and two busy arterials, carries 250,000 vehicles per day to and from Boston.

From 1996 through 2000, Somerville had more heart attack and lung cancer deaths, in excess of the Massachusetts age-adjusted mortality rates, than any of Massachusetts' other 350 municipalities. This means we had 145 such excess deaths in just 4 square miles over those 5 years. Our age-adjusted mortality rates for heart attack and lung cancer exceeded the State's by 36%. From 1989 through 2003 we had 291 excess heart attack and lung cancer deaths.

In Somerville, we will be able to apply the environmental health requirements of the recently passed state Transportation Reform legislation that will require that every large development project fully disclose the environmental and health issues associated with the location of the project and the project's impacts upon its neighbors and future residents. This legislation will require project proponents to show all the roadway vehicular volumes and diesel train volumes within 1000 meters of the project site and along major routes to and from the project. Sources need to be detailed and then run through local dispersion models. The environmental health analysis should require assessing population exposure levels over the short and long term and must be calculated as well as communicated clearly to all concerned residents. We have lived with this slow silent slaughter for over a generation. We must do something to protect the next generation. It is time for us to say, "Enough is enough."