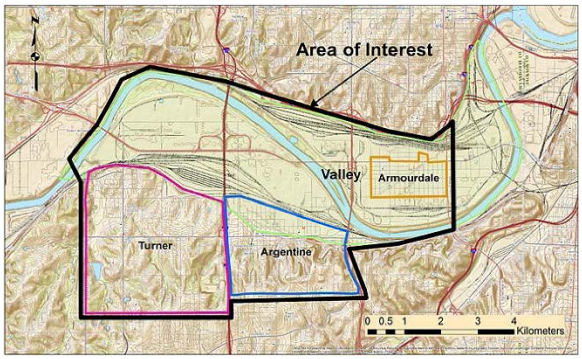
Kansas City Transportation and Local-Scale Air Quality Study (KC-TRAQS)

In fall 2017, the U.S. Environmental Protection Agency (EPA) launched the Kansas City Transportation Local-Scale Air Quality Study (KC-TRAQS) to learn more about local community air quality in three neighborhoods in Kansas City, KS, that have multiple air pollution sources from highways, railways and industry. The study will be conducted for one year and provide comprehensive air quality monitoring using three different air measurement approaches. A citizen science project is part of the study and will involve area residents and students in air measurement activities.

The principal air pollutants of interest are fine particle pollution, known as $PM_{2.5}$, and black carbon, a component of $PM_{2.5}$. Fine particle pollution is the result of the combustion of fossil fuels used in passenger motor vehicles, truck engines, train engines, industry and forest fires. Exposure to fine particles can affect both the lungs and heart.

The study area includes the neighborhoods of Turner, Argentine and Armourdale in southeast Wyandotte County, Kansas. This area is located in the Kansas river valley and has unique meteorological conditions that include inversions, which can trap pollutants close to the ground. The area is also surrounded on all sides by major highways and other roads, industry with diesel truck traffic, and two railyards, which include a rail maintenance facility and main rail track line.



Map of study area in Kansas City, KS.

Study Objectives:

The study enables EPA to provide air quality information to the community and its residents and will advance air monitoring technology for use by other states and communities. The research is designed to measure and monitor air quality and is not a health study to evaluate health effects from any observed air pollution.

Researchers will:

- Learn more about air emissions from local sources.
- Evaluate the use of multiple stationary and mobile measurement instruments to collect data in an area with multiple sources of emissions.
- Evaluate the operation and use of the AirMapper, a low-cost and portable air quality monitor for use in citizen science projects and research.

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Monitoring Approach:

There are three measurement approaches being used for the study that involve the deployment of stationary, mobile, and portable measurement technologies. Researchers will use new and cutting-edge monitors to measure the air pollutants, black carbon (BC), fine particles ($PM_{2.5}$), and carbon dioxide (CO_2), as well as weather conditions important to understanding air quality, including relative humidity, wind and temperature. The measurement instruments include:

- **Stationary Monitors.** Stationary or fixed monitors are collecting $PM_{2.5}$, black carbon and meteorological data in six locations within the study area.
- **Mobile Monitors.** An electric vehicle retrofitted with air quality monitoring instruments will be used to drive designated routes through the study area to collect data. The use of mobile monitoring provides high-time resolution (1-second) measurements and allows for increased coverage across the study area.
- **AirMappers.** A citizen science monitoring project is part of the study and enables residents to use mobile air monitors called, AirMappers, developed by EPA, to collect air quality data. These lunch box-size air monitors can be carried around the study area by local residents and students. The AirMapper includes rechargeable battery power, a global positioning system (GPS), optical particle sensor estimating $PM_1/PM_{2.5}/PM_{10}$, and carbon dioxide (CO_2) sensor.

Results:

EPA will provide the results of the study to neighborhood leaders, states and local government officials and air quality planners, as well as other stakeholders. The results will be published in the peer-reviewed scientific literature.

Be a Part of Science

Citizen Science Project

Portable monitors called AirMappers are available to residents in the study area for check out at two libraries. The monitors will come with information on how to use the monitors and provide suggestions on best places to take them to support the study. You must be 13 years of age to check out an AirMapper without a parent present. The libraries are:

Argentine South Branch Library
3104 Strong Ave., Kansas City, KS

Turner Community Library
831 South 55th, Kansas City, KS

AirMappers are available to students and groups, based on availability. For more information, contact Steven Brown at brown.steven@epa.gov.

Visit the web page at http://bit.ly/EPA-KCTRAQS

Contacts:

Public Outreach: Steven Brown, Physical Scientist, brown.steven@epa.gov

Technical Lead: Sue Kimbrough, Senior Project Engineer, Kimbrough.sue@epa.gov

Technical: Stephen Krabbe, Physical Scientist, Krabbe.stephen@epa.gov