

Schools, Childcare Centers, Community Centers, and Homes – Exposure Reduction

Background

The San Bernardino, Muscoy communities identified children’s exposure to harmful air pollutants while at school as a priority with a focus on children in schools, childcare centers, community spaces such as parks and community centers, and homes. A major pollutant of concern in this community is diesel particulate matter (PM), generated by truck traffic, warehouses, and the railyards. The CSC also expressed concern about emissions from concrete batch, asphalt, and aggregate plants and the Omnitrans bus yard. Like many environmental justice communities, the San Bernardino, Muscoy community may experience a disproportionately high level of exposure to harmful pollutants. Children, seniors, and people with certain medical conditions are especially sensitive to the impacts of air pollution. However, proactive steps such as installing high performance air filtration systems in schools and notifying the public when air quality is unhealthy can reduce a child’s exposure to harmful air pollutants.

Community Air Quality Priority – Reducing Exposures at Schools, Childcare Centers, Community Centers, and Homes

CSC members identified schools, including charter schools, and other places where children spend a lot of time (e.g., childcare centers, parks and community centers) as places where the South Coast AQMD should focus on reducing exposure to harmful air pollutants. The CSC provided examples of air pollution sources, such as the idling of diesel trucks, and dust from cement and asphalt batch plants, that are near schools, parks, and community centers where residents are exposed to harmful air pollutants found in diesel exhaust. The CSC members also shared instances where students and other sensitive populations near sources of air pollution experienced health problems. Table 5-1 is a list of public charter schools that are in the San Bernardino, Muscoy community, as an area to focus emission reduction efforts.

Table 5g-1. Public Charter Schools in the San Bernardino, Muscoy Community

Name of School	
Ballington Academy	PAL Charter
Hardy Brown College Prep	PAL Charter Academy
Options for Youth-I	SOAR Charter Academy
	Woodward Leadership Academy

To address community concerns about the health impacts of air pollution, CSC members prioritized installing school air filtration systems, implementing electric school buses, modifying routes for trucks to avoid schools, childcare centers, and community centers, and community outreach and engagement as ways to reduce exposure to harmful air pollutants. This includes providing information, including proactive steps that can be taken to reduce exposure, to schools, childcare centers, and community centers, when outdoor air pollution levels are unhealthy. The CSC expressed support for implementing an air quality flag program in schools. Other input includes increasing the amount of green space, such as planting trees around the community, specifically around warehouse centers and railyards.

The CSC identified investing in green spaces as a strategy to improve health outcomes. Green spaces may be beneficial to addressing cumulative health impacts within vulnerable communities. They can provide shade, reduce stress, encourage physical activity, and promote overall positive health outcomes.¹

The CSC asked for the Community Emission Reduction Plan to focus installation of school and residential air filtration systems at locations close to major sources of diesel PM and dust. Specific locations mentioned as priorities included schools near the Omnitrans bus yard, railyards (including BNSF), concrete and asphalt batch plants, and surface quarries. Arroyo Valley High School was cited as one example of a school that experienced fugitive dust problems from a nearby concrete batch plant facility, and air filtration systems were installed in 2012.

Ongoing Efforts

School Air Filtration Program

The installation of air filtration systems in schools can reduce exposure to air pollution inside school buildings. There are certain types of air filtration systems (“high efficiency air filters”) that are effective in filtering very small particles from diesel engines and other sources. Small particles can be inhaled deep into the lungs and cause health problems. These filtration systems may be beneficial to schools located near freeways, truck routes, rail yards, concrete and asphalt batch plants and other sources² of diesel emissions.

South Coast AQMD has helped to install air filtration systems at schools in the San Bernardino Unified School District since 2012. To date, South Coast AQMD has installed these systems at four schools and one community center within the San Bernardino, Muscoy community. Figure 5-1 shows a map of the schools and community centers that have air filtration systems completed within this community, and Table 5-2 provides a list of these schools and community center.

Environmental Justice Community Partnership (EJCP)³ Clean Air Ranger Education (CARE)⁴

The EJCP is designed to build relationships with community members and organizations to achieve clean air and healthy, sustainable communities. The Clean Air Ranger Education (CARE) Pilot Program is a program designed for elementary school education and includes topics on air pollution and health, air quality flags, and zero-emission technologies.

Why Air Quality Matters (WHAM) High School Education Program

The South Coast AQMD is implementing Why Air Quality Matters (WHAM), a Science, Technology, Engineering, and Math (STEM) and experiential learning based curriculum, in high schools located within environmental justice communities. WHAM will increase teacher and student awareness on air quality issues in their communities and beyond through activities and experiments, including measuring PM using low-cost hand-held sensors.

U.S. EPA STAR Grant Program⁵

The South Coast AQMD Air Quality Sensor Performance Evaluation Center (AQ-SPEC) has engaged a number of schools in the San Bernardino, Muscoy area under the U.S. EPA STAR Grant: “Engage, Educate and Empower California Communities on the Use and Application of ‘Low Cost’ Air Monitoring Sensors”. Under this grant, AQ-SPEC has installed sensors for measuring particulate matter (PM_{2.5}), nitrogen oxides (NO₂) and ozone at two schools within this community: San Bernardino High School and Arroyo Valley High School.

Figure 5g-1: Map of schools and community centers in San Bernardino, Muscoy with air filtration systems installed through the South Coast AQMD program

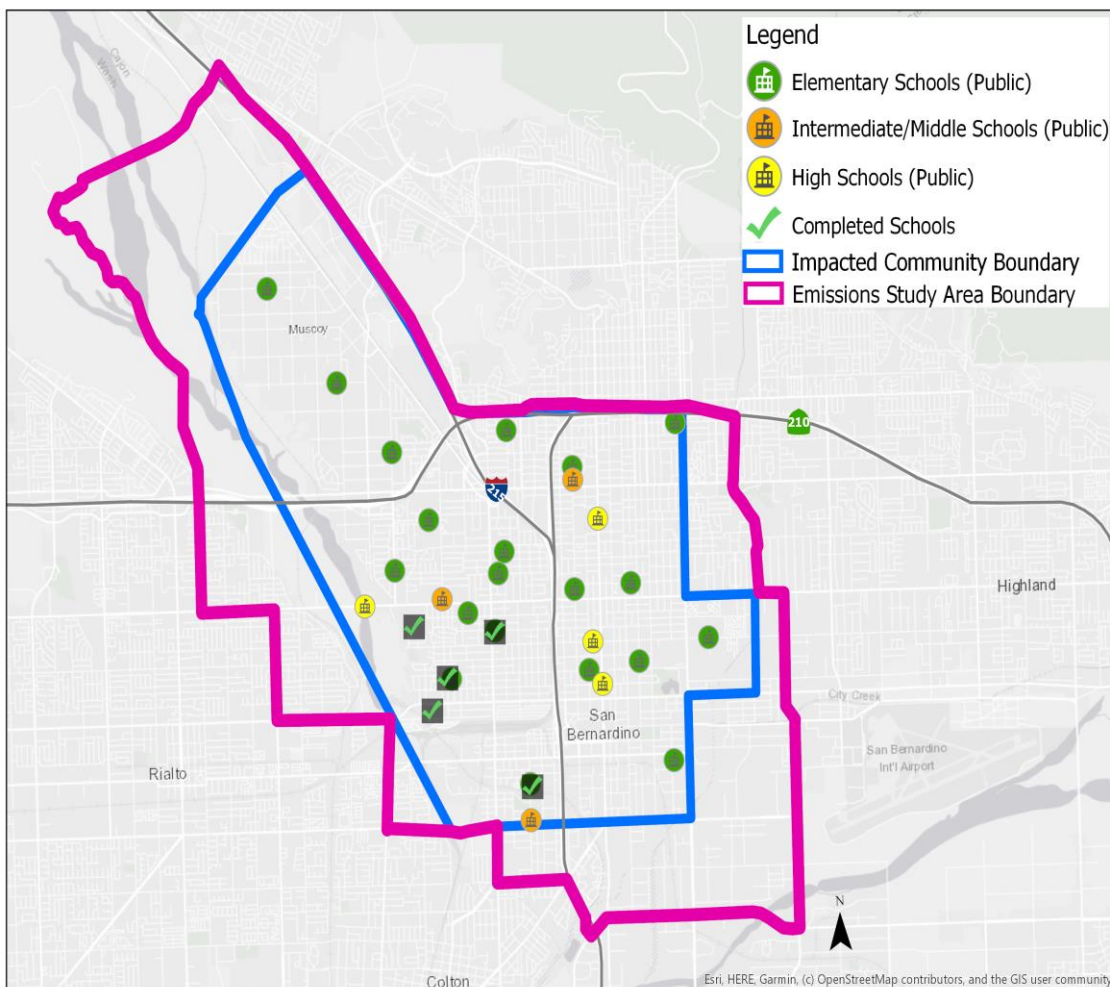


Table 5g-2: List of schools and community centers in San Bernardino, Muscoy with air filtration systems installed through the South Coast AQMD program

Name of School or Community Center	
Arroyo Valley High School	Mt. Vernon Elementary School
Lytle Creek Elementary School	Ramona Alessandro Elementary School
Ruben Campos Community Center	

Opportunities for Action

CSC members expressed a desire to have residential air filtration systems for homes located near major sources of pollution, such as the BNSF railyard. While the South Coast AQMD does not currently have an active program to provide residential filtration systemsⁱ, staff will work with its partners to identify potential opportunities for residential filtration systems and share this information with the CSC. In addition to air filtration systems, the CSC prioritized education and outreach as a way to reduce exposure to harmful air pollutants. In addition, in Chapter 5b: Neighborhood Truck Traffic, Action 3, describes actions to provide data on truck traffic and potential emissions near schools and residences, which may be useful to support decision-making for truck routing. CSC members also would like to replace existing school buses with near zero- or zero-emission school buses. Some existing funds for school buses may be limited to replacing buses with public entities. Regardless, South Coast AQMD will continue to partner with entities to identify new or existing programs of funding to replace existing school buses with near zero- or zero-emission school buses, as seen below in Action #5.

Action 1: Reduce Exposure to Harmful Air Pollutants through Public Outreach

Course of Action:

- Provide air quality related programs to schools, including the Clean Air Ranger Education (CARE) program (which includes air quality flags), and Why Air Quality Matters (WHAM) program
- Partner with the San Bernardino County Department of Public Health to provide information on how to receive air quality advisories, and how to reduce exposure to air pollution, particularly for sensitive populations
- Partner with community-based organizations such as Center for Community Action and Environmental Justice (CCA EJ) and/or Arrowhead Regional Medical Center (ARMC) to share information or provide outreach to schools for asthma related programs

ⁱ The South Coast AQMD will work with CARB’s Indoor Air Quality program and its contractor to identify effectiveness and opportunities for residential filtration and share this information with the CSC.

<ul style="list-style-type: none"> • Partner with Safe Routes to School to provide information on programs such as walkability and active transportation • Work with appropriate parties to negotiate access to conduct school-based air monitoring 	
Strategies:	
<ul style="list-style-type: none"> • Public Information and Outreach • Collaboration • Monitoring 	
Goals:	
<ul style="list-style-type: none"> • Participate in six public outreach events (e.g., health fairs, community events) during the implementation period of this CERP and provide air quality related information to reduce exposure • Provide 11 childcare centers during the implementation period of this CERP with information relating to air quality effects on young children and reducing exposure, prioritizing centers based on CSC input • Present CARE and WHAM programs in at least two schools during the implantation period of this CERP • Collaborate with community-based organization (e.g., CCAEJ) and co-host outreach meetings • Work with appropriate entities to negotiate access to conduct school-based air monitoring 	
Estimated Timeline:	
<ul style="list-style-type: none"> • During the 2019-2020 school year, begin working on providing air quality related programs to schools (e.g., CARE and WHAM program) • Fourth quarter of 2019, begin working with Department of Public Health on developing outreach materials • Early 2020, begin outreach efforts with community-based organizations • Fourth quarter of 2019, begin partnering with Safe Routes Partnership to provide information on programs • Late 2019, begin to conduct school-based air monitoring at or near schools 	
Implementing Agency, Organization, Business or Other Entity:	
Name:	Responsibility:
South Coast AQMD	<ul style="list-style-type: none"> • Implement the CARE program and WHAM program to schools • Partner with community-based organizations and/or local entities on asthma-based programs and air quality notifications that inform the community about proactive steps to reduce exposure to harmful air pollutants • Collaborate with organizations to implement outreach events

	<ul style="list-style-type: none"> • Work with appropriate entities to negotiate access to conduct school-based air monitoring
San Bernardino County Department of Public Health	Partner with South Coast AQMD on notifications to schools for air quality advisories
Arrowhead Regional Medical Center (ARMC) and other community-based organizations (with asthma related programs)	Partner with South Coast AQMD to share information and/or provide outreach to schools for asthma-related programs
Additional Information:	
<ul style="list-style-type: none"> • Arrowhead Regional Medical Center (ARMC)'s BreathMobile program: https://www.arrowheadmedcenter.org/srvOutBreathMobile.aspx 	

Action 2: Reduce Exposure to Harmful Air Pollutants at Schools, Childcare Centers, and Community Centers

Course of Action:

- Work with appropriate entities to implement the installation of high efficiency air filtration systems by working with the community to prioritize schools, childcare centers, and community centers near truck routes, railyards, and concrete batch plantsⁱⁱ
- Work with appropriate agencies toward replacing filters at schools with air filtration systems and installation at schools without these systems

Strategy:

- Exposure Reduction

Goal:

- Installation of air filtration systems in schoolsⁱⁱⁱ, childcare centers, and community centers with priority given to schools located in areas with high diesel PM levels and in close proximity to facilities identified as a priority by the CSC

ⁱⁱ Public schools, including charter schools, childcare centers, and public community centers, are eligible for the South Coast AQMD program.

ⁱⁱⁱ Some schools or community centers have had air filtration systems previously installed; however, filter replacements may be needed. Replacement filters will continued to be provided to schools that have had air filtration systems installed. The CSC will need to prioritize the air filtration systems at schools and work with local school districts to establish Memorandums of Understanding (MOUs) with the South Coast AQMD.

Estimated Timeline:	
<ul style="list-style-type: none"> Mid-2020, work with appropriate agencies to install high efficiency air filtration systems, replacing filters at schools with air filtration systems and installation at schools without these systems during the implementation period of this CERP 	
Implementing Agency, Organization, Business or Other Entity:	
Name:	Responsibility:
South Coast AQMD	Implement air filtration systems and replacement filters at schools, childcare centers, and community centers
Additional Information:	
<ul style="list-style-type: none"> Air filtration systems in schools: https://www.aqmd.gov/docs/default-source/ceqa/handbook/aqmdpilotstudyfinalreport.pdf 	

Action 3: Reduce Exposure to Harmful Air Pollutants at Homes^{iv,v}	
Course of Actions:	
<ul style="list-style-type: none"> Identify new or existing technologies, programs, and funding sources that can provide the most effective air filtration systems in homes Seek potential partners or funding opportunities to improve weatherization in the homes to help improve the efficiency of the air filters 	
Strategies:	
<ul style="list-style-type: none"> Exposure Reduction Incentives Public Information and Outreach 	
Goals:	
<ul style="list-style-type: none"> Partner with appropriate entities to determine new or existing programs that can provide home filtration systems If funding or programs become available, share information with CSC 	
Estimated Timeline:	
<ul style="list-style-type: none"> Mid-2020, consult with CSC members and appropriate stakeholders to identify any new or existing home air filtration programs 	

^{iv} Air filtration systems will generally be less effective in older, pre-2006 homes due to lower energy efficiency typically found in Environmental Justice or disadvantaged communities. Limited research on the efficiency of high performance air filtration systems in older homes suggests a 25% - 30% lower efficiency for PM_{2.5} and ultrafine PM is expected, which is comparable to having open doors and windows. Most data collected on efficiency of high performance air filtration systems has been on 2006 and new homes, showing an average removal efficiency of 90% for PM_{2.5} and ultrafine PM.

^v Residential air filtration systems have not been approved by CARB. The South Coast AQMD plans to continue to work with them to establish a protocol where residential air filtration systems can be installed.

<ul style="list-style-type: none"> If opportunities are identified for residential filtration systems, provide updates to the CSC 	
Implementing Agency, Organization, Business or Other Entity:	
Name:	Responsibility:
South Coast AQMD	<ul style="list-style-type: none"> Identify new or existing sources or programs that can provide home air filtration resources or home weatherization resources Conduct outreach and share information with CSC members, if this becomes available
Additional Information:	

Action 4: Increase Green Space in Areas Where People Spend Time	
Course of Action:	
<ul style="list-style-type: none"> Identify new or existing sources or programs that can provide funding for tree planting. If funding or programs become available, share information with CSC members 	
Strategies:	
<ul style="list-style-type: none"> Public Information and Outreach Collaboration 	
Goals:	
<ul style="list-style-type: none"> Partner with other entities to determine new or existing sources or programs that can provide funding to coordinate tree planting. If funding or programs become available, share information with CSC members 	
Estimated Timeline:	
<ul style="list-style-type: none"> Mid-2020, consult with CSC members and appropriate stakeholders to identify any existing funding sources for tree planting or increasing green space 	
Implementing Agency, Organization, Business or Other Entity:	
Name:	Responsibility:
South Coast AQMD	<ul style="list-style-type: none"> Identify new or existing sources or programs that can provide funding for tree planting Conduct outreach and share information with CSC , when opportunities are available
Additional Information:	

Action 5: Replace Older School Buses	
Course of Action:	
<ul style="list-style-type: none"> Identify new or existing sources or programs that can provide funding for alternative-fueled school buses 	
Strategies:	
<ul style="list-style-type: none"> Public Information and Outreach 	
Goals:	
<ul style="list-style-type: none"> Partner with other entities to determine new or existing sources or programs that can provide funding for near zero or zero-emission school buses 	
Estimated Timeline:	
<ul style="list-style-type: none"> Mid-2020, consult and work with appropriate stakeholders to identify any existing funding sources or programs for replacing school buses with near-zero or zero-emission school buses 	
Implementing Agency, Organization, Business or Other Entity:	
Name:	Responsibility:
South Coast AQMD	<ul style="list-style-type: none"> Identify new or existing sources or programs that can provide funding alternative-fueled school buses Work with appropriate entities to replace existing school buses with near zero or zero-emission school buses Provide updates to CSC, when new or existing sources that can provide funding for alternative-fueled school buses (e.g., electric buses) are available
Additional Information:	

References

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