

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

Background

The San Bernardino and 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 and 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 and Muscoy community, as an area to focus emission reduction efforts.

Table 5-1. Public Charter Schools in the San Bernardino and 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

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To address community concerns about the health impacts of air pollution, the 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 and 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.

¹ The California Healthy Places Index, Tree Canopy, 2019, <https://healthyplacesindex.org/policy-actions/tree-canopy/>, Accessed June 13, 2019.

² Polidori, A., et al. “Pilot Study of High-Performance Air Filtration for Classroom Applications.” *Indoor Air*, vol. 23, no. 3, 2012, pp. 185–195., doi:10.1111/ina.12013

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.

Kids Making Sense Program⁵

Low-cost sensor technology allows the South Coast AQMD to implement a new program for high school teachers and students in environmental justice communities by combining science, technology, engineering, and math education with air quality coursework.

U.S. EPA STAR Grant Program⁶

The South Coast AQMD Air Quality Sensor Performance Evaluation Center (AQ-SPEC) has engaged a number of schools in the San Bernardino and 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.

³ South Coast AQMD, Environmental Justice Community Partnership, <http://www.aqmd.gov/ejcp>, Accessed June 6, 2019.

⁴ South Coast AQMD, Environmental Justice Community Partnership Advisory Council, June 2019, <http://www.aqmd.gov/docs/default-source/Agendas/Environmental-Justice/2019-ejcp-agenda-june-5.pdf>, Accessed June 6, 2019.

⁵ Sonoma Technology, Kids Making Sense, 2017, <https://kidsmakingsense.org/>, Accessed June 6, 2019.

⁶ South Coast AQMD, Air Quality Sensor Performance Evaluation Center, <http://www.aqmd.gov/aq-spec/research-projects>, Accessed June 14, 2019.

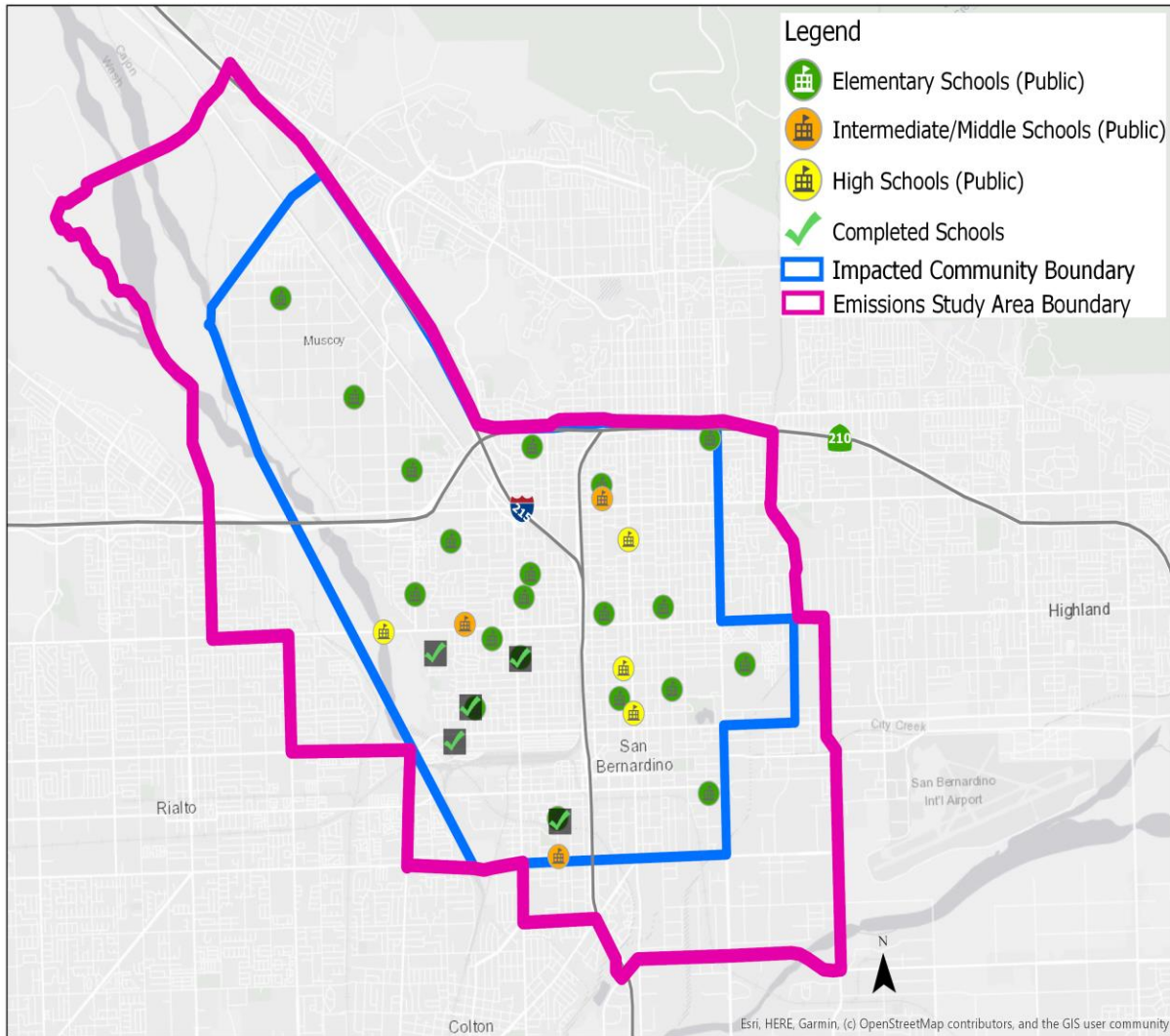


Figure 5-1. Map of schools and community centers in San Bernardino and Muscoy with air filtration systems installed through the South Coast AQMD program

Table 5-2. List of schools and community centers in San Bernardino and 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	

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Opportunities for Action

CSC members also 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 systems, 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.

Action 1: Reduce Exposure to Harmful Air Pollutants through Public Outreach	
Course of Action(s):	<ul style="list-style-type: none"> • Provide air quality related programs to schools, including the Clean Air Ranger Education (CARE) program (which includes air quality flags), and Kids Making Sense program • Partner with the <i>[insert collaborating agency here]</i> on providing 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) or <i>[insert other collaborating organization(s) here]</i> to share information or provide outreach to schools for asthma related programs • 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
Goal(s):	<ul style="list-style-type: none"> • Participate in <i>[fill in number]</i> public outreach events (e.g., health fairs, Earth week event) at schools or childcare centers on information relating to air quality and reducing exposure • Provide <i>[fill in number]</i> childcare centers with information relating to air quality effects on young children and reducing exposure, prioritizing centers based on CSC input • Implement CARE and Kids Making Sense programs at <i>[fill in number]</i> schools

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<ul style="list-style-type: none"> 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"> Fourth quarter of 2019, begin working with Department of Public Health on developing outreach materials Early 2020, begin outreach efforts with community based organizations 	
Implementing Agency, Organization, Business or Other Entity:	
Name:	Responsibility:
South Coast AQMD	<ul style="list-style-type: none"> Implement the CARE program and Kids Making Sense program to schools Partner with community-based organizations and Department of Public Health 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 Work with appropriate entities to negotiate access to conduct school-based air monitoring
<i>[insert Collaborating Agency here]</i>	Partner with South Coast AQMD on notifications to schools for air quality advisories
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
References:	
[insert information on collaborating agencies or organization(s) here]	

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

Course of Action(s):

- Work with *[insert Collaborating Agency here]* to implement installation of high efficiency air filtration systems by working with the community to prioritize schools,

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<p>childcare centers, and community centers near truck routes, railyards, and concrete batch plants⁷</p> <ul style="list-style-type: none"> • Work with appropriate agencies toward replacing filters at schools with air filtration systems and installation at schools without these systems 	
<p>Strategy:</p> <ul style="list-style-type: none"> • Exposure Reduction 	
<p>Goal:</p> <ul style="list-style-type: none"> • Installation of air filtration systems in <i>[insert number of filtration systems to be discussed by CSC members]</i> schools⁸, childcare centers, and community centers with priority given to <i>[insert prioritizing criteria or schools, to be discussed by CSC members]</i> 	
<p>Estimated Timeline:</p> <ul style="list-style-type: none"> • Mid-2020, begin deployment of <i>[specify number]</i> of school air filtration systems 	
<p>Implementing Agency, Organization, Business or Other Entity:</p>	
<p>Name:</p> <p>South Coast AQMD</p>	<p>Responsibility:</p> <p>Implement air filtration systems at schools, childcare centers, and community centers</p>
<p><i>[insert Collaborating District here]</i></p>	<p>Partner with South Coast AQMD on the installation of air filtration systems at schools, childcare centers, and community centers</p>
<p>References:</p> <p>For more information on air filtration systems in schools: https://www.aqmd.gov/docs/default-source/ceqa/handbook/aqmdpilotstudyfinalreport.pdf</p>	

Action 3: Reduce Exposure to Harmful Air Pollutants at Homes⁹

Course of Action(s):

- Identify new or existing technologies, programs, and funding sources that can provide the most effective air filtration systems in homes

⁷ Public schools, including charter schools, childcare centers, and public community centers, are eligible for the South Coast AQMD program.

⁸ Some schools or community centers have had air filtration systems previously installed; however, filter replacements may be needed. The CSC will need to prioritize the air filtration systems at schools.

⁹ 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 PM2.5 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 PM2.5 and ultrafine PM.

<ul style="list-style-type: none"> 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 	
Goal(s):	
<ul style="list-style-type: none"> Partner with other entities [<i>insert collaborating entities</i>] to determine new or existing programs that can provide home filtration systems 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 new or existing home air filtration programs 	
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
References:	

Action 4: Increase Green Space in Areas Where People Spend Time

Course of Action(s):	
<ul style="list-style-type: none"> Identify new or existing sources or programs that can provide funding for tree planting 	
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 	

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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 members, when opportunities are available
References:	

Action 5: Replace Older School Buses	
Course of Action(s):	
<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 with CSC members and appropriate stakeholders to identify any existing funding sources for 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 Conduct outreach and share information with CSC members, when opportunities are available
References:	