

TREES SUBCOMMITTEE MEASURES

BACKGROUND

Vegetative barriers, also known as windbreaks, are composed of one or more rows of trees or shrubs that may be planted in specific areas of concern in order to improve air quality in the immediate area by intercepting airborne particles, dust, chemicals, and odors. Pollutants directly emitted from cars, trucks, and other motor vehicles are found in higher concentrations near major roads. In addition, stationary sources such as industrial facilities, factories, and other industrial processes can also contribute air pollutants to their surrounding areas. While various emission control techniques and programs exist to reduce these pollutants from mobile and stationary sources, vegetative barriers have been shown to be an additional measure to potentially reduce a population's exposure to air pollution through the interception of airborne particles and the uptake of gaseous pollutants. Examples of vegetative barriers include trees, bushes, shrubs, or a mix of these. Generally, a higher and thicker vegetative barrier with full coverage will result in greater reductions in downwind pollutant concentrations. In addition to air quality benefits, vegetative barriers can improve aesthetics, increase property values, reduce heat, control surface water runoff, and reduce noise pollution.¹

Characteristics of a vegetative barrier that should be considered include the porosity/density of the vegetative barrier, the characteristics of the vegetation during different seasons, leaf surface characteristics, vegetation air emissions (e.g. biogenic VOCs), and the resistance of the vegetative barrier to air pollution. Other considerations include: soil characteristics, availability of water, control of water runoff, maintenance of the vegetative barrier, use of native and non-invasive species, and roadway safety. Vegetative barriers may also be used with solid barriers to increase mitigation. Research is ongoing as to the effectiveness of vegetative barriers in reducing exposure to pollutants, but a recent study has found that vegetative barrier installations may reduce downwind exposure to carbon monoxide and fine particulate matter by at least 23%.²

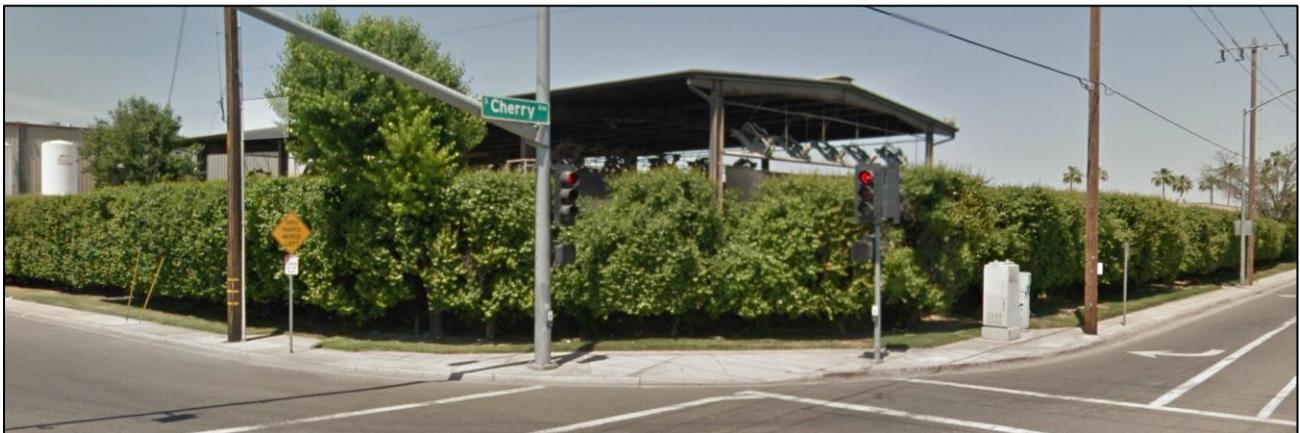
The US EPA has produced a fact sheet with further information on vegetative barriers, available here: https://19january2017snapshot.epa.gov/sites/production/files/2016-08/documents/recommendations_for_constructing_roadside_vegetation_barriers_to_improve_near-road_air_quality.pdf

¹ Baldauf, R. (2016). Recommendations for Constructing Roadside Vegetation Barriers to Improve Near-Road Air Quality. *National Risk Management Laboratory Office of Research and Development, Air Pollution Prevention and Control Division: Washington, DC, USA.*

² Lin, M. Y., Hagler, G., Baldauf, R., Isakov, V., Lin, H. Y., & Khlystov, A. (2016). The effects of vegetation barriers on near-road ultrafine particle number and carbon monoxide concentrations. *Science of the Total Environment*, 553, 372-379.

Figure 4-3 Vegetative Barrier w/ Solid Barrier on Highway 198, Visalia, CA

Latest Google Map Information

Figure 4-4 Vegetative Barrier around Foster Farms, Fresno, CA

Latest Google Map Information

COMMUNITY CONCERNS AND COMMENTS

The Stockton Steering Committee has identified Vegetative Barriers as a priority for air pollutant mitigation. The committee has expressed the need for the installation of vegetative barriers (and sound walls) around and near sources of concern such as schools, along truck routes, near the Port of Stockton, Charter Way, Boggs Tract and El Dorado with an additional priority along Interstate 5. The committee has expressed the need to enforce existing mitigation plans associated with specific industries.

CURRENT PROGRAMS

The Valley Air District, the City of Stockton, the California Department of Transportation (Caltrans), and other local partners have promoted the use of vegetative barriers for reducing exposure to air pollutants, mitigating the urban heat island effect, and improving aesthetics. The District's Fast Track Action Plan includes the strategic use of tree and vegetation planting as a potential measure to improve air quality.

STRATEGIES DEVELOPED FOR IMPLEMENTATION IN COMMUNITY

Based on community interest in vegetative barriers, the following measure was developed for implementation as a part of the Stockton CERP.

VB.1: INCENTIVE PROGRAM FOR THE INSTALLATION OF VEGETATIVE BARRIERS AROUND/NEAR SOURCES OF CONCERN

Overview: The purpose of this strategy is to provide incentives for the installation and maintenance of vegetative barriers around sources of concern to reduce particulate matter, odor, and other emissions, as feasible. Based on community interest in vegetative barriers, the District will also look to partner with other agencies to identify additional grant funding to support the installation of vegetative barriers at/near industrial facilities and along major transportation and goods movement corridors.

It should be noted that the SJVAPCD has no authority over how agencies allow land under their jurisdiction to be used. These land-use decisions, such as whether to allow or require vegetative barriers in specific locations, are historically the responsibility, under state law, of cities and counties, or, in some cases, state and federal agencies responsible for transportation corridors, state and federal parks, and other properties. AB 617 does not provide the District with new land-use regulatory authority, so land-use authority remains with cities, counties, and state and federal land-use agencies, as discussed in CARB's Blueprint (see "Who Has the Authority to Implement Actions?", page 26 of the Blueprint), the District is committed to working with these agencies and the CSC to see this measure implemented this measure.

Implementing Agency: SJVAPCD, CDOT, City, County, Port of Stockton, other local partners

Type of Action: Partnership, Incentives

Implementation: 2021-2025

Budgeted Amount: \$1,000,000

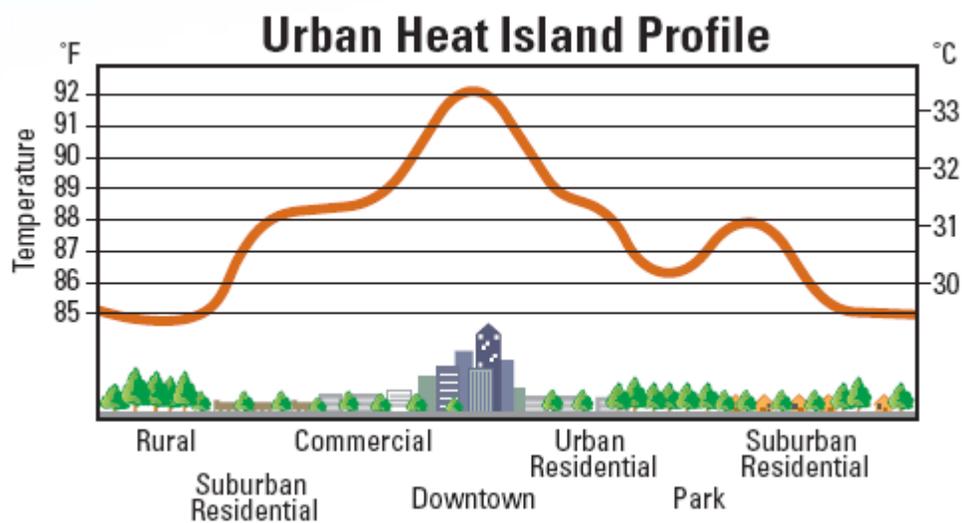
Quantifiable emission reduction: Estimated 5-year emissions reductions associated with this measure includes up to 0.11 tons of PM2.5 and NO2 per year

URBAN GREENING

URBAN GREENING SOURCES IN STOCKTON

Urban greening is one way to help improve air quality and public health in addition to enhancing the overall beautification of the community with drought resistant low maintenance greenery. Trees and vegetation help reduce the impacts of heat islands by increasing the amount of shade and cooling the air by evapotranspiration.³ Careful placement and choice of vegetation will maximize its cooling benefits. Shade provided by trees and other vegetation prevents sunlight from reaching heat-absorbing surfaces such as sidewalks and parking lots, cooling the area by 2 to 9 degrees Fahrenheit. Air quality also benefits from a decrease in energy usage. The less energy used, the fewer power plants running and emitting ozone precursors.⁴ The total net savings when considering energy, ozone, and PM reduced from vegetation were valued at \$210/tree.

Figure 4-5 Urban Heat Island Effect Illustrated (Source: EPA, 1992)



COMMUNITY CONCERNS AND COMMENTS

The steering committees expressed an interest in opportunities for increased urban greening and forestry in the community of Stockton specifically at Charter Way, Boggs Tract, and El Dorado as a strategy to reduce exposure from emissions that occur along local transportation corridors while keeping in mind water and maintenance issues.

CURRENT PROGRAMS

The District Fast Track Action Plan identified Heat Island Mitigation as a measure to be implemented with the goal to increase urban forest canopy shading and increase the albedo of structures and pavement. This guidance includes a model resolution and

³ EPA (1994) *Using Trees and Vegetation to Reduce Heat Islands*. Retrieved 1/21/21 from <https://www.epa.gov/heatislands/using-trees-and-vegetation-reduce-heat-islands>

⁴ EPA (2008) *Heat Island Compendium*. Retrieved 1/21/21 from <https://www.epa.gov/heatislands/heat-island-compendium>

policy statement for use by businesses, government, and organizations who desire to commit to heat island mitigation strategies.

Due to the benefits of urban greening, there are several programs available to support urban greening in communities. Below are the ongoing efforts to promote Urban Greening by other agencies, as well as programs committed to be implemented in future State and/or Valley-wide programs.

- **Transformative Climate Communities (TCC) Program:** The (TCC) Program funds development and infrastructure projects that achieve major environmental, health, and economic benefits in California's most disadvantaged communities. TCC is one of many California Climate Investments programs
- **Fathers & Families of San Joaquin:** Fathers & Families of San Joaquin's Health Justice Tree Planting/ReLeaf program plants trees in disadvantaged communities, trading gray concrete spaces into vibrant green spaces to promote a canopy of healthy environments and reduce greenhouse gases.
- **PUENTES:** PUENTES empowers at risk urban families by providing opportunities to enhance their environment with trees and stewardship for natural resources, foster local food chain viability, employment and entrepreneurship, and reinforce the sense of community involvement and physical wellbeing through volunteer participation in farming and forestry.
- **California ReLeaf Grants:** California ReLeaf seeks and provides pass-through grants to ReLeaf Network Members and other community groups interested in planting and caring for trees in California and offers grant programs through the Social Equity Grant Program and California Arbor Week Grant.
- **California Natural Resources Agency Urban Greening Grant Program:** Consistent with AB 32, the Urban Greening Program will fund projects that reduce greenhouse gases. This program includes urban heat island mitigation projects and energy conservation efforts related to shade tree projects.
- **Cal Fire:** Through the California Climate Investments (CCI) Urban & Community Forestry Grant Program, CALFIRE works to optimize the benefits of trees and related vegetation through multiple-objective projects as specified in the California Urban Forestry Act of 1978.
- **Active Transportation Program (ATP): California Department of Transportation (CALTRANS):** Urban forestry, such as trees and other vegetation, are significant components of several eligible projects under the ATP, including parks, trails, and safe-routes-to-schools.
- **California Urban Forests Council (CAUFC):** As a coalition, CAUFC is dedicated to the expansion and perpetuation of sustainable urban and community forests to enhance the quality of life for all Californians.

Non-profit organizations such as One Tree Planted, River Partners, the San Joaquin River Conservancy, and others provide the public the ability to donate to support tree

planting and also advocate for the allocation of state and federal funding towards tree planting or replanting in forest, river, and/or urban areas in California.

STRATEGIES DEVELOPED FOR IMPLEMENTATION IN COMMUNITY

Due to the community's interest in increased urban greening, the District will be working with other agency partners to bring increased funding for urban greening to the AB 617 selected communities, as further described in the following measure.

UG.1 URBAN GREENING AND FORESTRY

Overview: The purpose of this strategy is to identify and support efforts to increase urban greening/forestry to improve air quality for residents in the Stockton community. The focus areas will include, Charter Way, Boggs Tract, and El Dorado. This measure is supported by scientific studies that have shown urban trees and forestry can help with the removal of air pollutants and reduced emissions of volatile organic compounds (VOC's). The effects of urban trees on fine particulate matter (PM2.5) was modeled for ten U.S. cities, with total annual PM2.5 removal varying from 5.2 tons in Syracuse to 71.1 tons in Atlanta. Overall air quality improvements attributed to urban trees ranged between 0.05% in San Francisco to 0.24% in Atlanta (Nowak, Hirabayashi, Bodine, Hoehn, 2013). Based on a study to assess the effects of urban trees on air quality have found that urban vegetation can attribute to temperature reduction, removal of air pollutants, reduced emission of VOCs, and building energy conservation (United States Department of Agriculture Forest Service, 2002). The measure would also include an on-going maintenance program with the city.

The District has long been supportive of the public benefits provided from planting of trees and vegetation. The District's Fast Track Action Plan, adopted by the Governing Board to reduce ozone pollution in the Valley, identified strategic use of tree and vegetation planting as a potential measure to reduce ozone. There has also been significant efforts at the federal, state, and local levels to promote and increase urban greening and forestry through funding opportunities, programs, and projects.

It should be noted that, while the District has no direct authority over how agencies allow land, under their jurisdiction, to be used. These land-use decisions on whether to allow or require urban greening in specific locations, are the responsibility, under state law, of cities and counties, or, in some cases, state and federal agencies responsible for transportation corridors, state and federal parks, and other properties. While AB 617 does not provide the District with new land-use regulatory authority, so land-use authority continues to remain with cities, counties, and state and federal land-use agencies, as discussed in CARB's Blueprint (see "Who Has the Authority to Implement Actions?", page 26 of the Blueprint), the District is committed to working with these agencies and the CSC to see this measure implemented this measure.

Implementing Agency: SJVAPCD, CDOT, City, County, Port of Stockton, other local partners

Type of Action: Partnership, Incentives

Budgeted Amount: \$1,000,000

Quantifiable emission reduction: Utilize CARB-established methodology available through the Urban & Community Forestry Program