

Protecting and Enhancing Natural Assets

Plan Bay Area 2040



The Bay Area's identity is largely defined by its stunning parks, open spaces, and natural landscapes—particularly the San Francisco Bay and Estuary. These natural resources are vital to the Bay Area's quality of life, robust economy, and sustainability. The produce, meats, and dairy produced locally on the region's thousands of acres of farms and ranches contribute to the economy and make the region more sustainable and resilient. Open spaces and natural areas shape our communities and provide scenic vistas, diverse habitats for native plants and animals, and recreation opportunities. Parks and trails provide space to enjoy nature, connect with neighbors, and get out and play and are cherished as part of what makes a community a great place to live.

In recognition of the fact that open space land is a limited and valuable resource that should be conserved whenever possible, every community is required to plan for how it will preserve these lands while accommodating future population growth. As of 2010, only about 18 percent of the region's approximately 4.4 million acres were developed. The remaining undeveloped area includes open space and agricultural lands



as well as water bodies (excluding the San Francisco Bay) and parks. Comparatively, 28 percent of the region is identified as protected open space.¹

Over the past decade, the Bay Area has supported a regional growth strategy that concentrates development in Priority Development Areas (PDAs) as a way to protect open space and farmland from urbanization. PDAs are areas where amenities and services can be developed to meet the day-to-day needs of residents in a pedestrian-friendly environment served by transit. Priority Conservation Areas (PCAs)—land nominated by local jurisdictions for permanent protection from development or for investment in urban greening—complement PDAs by identifying areas critical to maintaining the region's agricultural economy and ecosystem functions as well as improving human health. Along with adopted urban growth boundaries, PCAs provide the open space framework for Plan Bay Area, which focuses nearly all housing and job growth within existing communities.

Updated PCA guidelines adopted in 2014 strengthen the region's approach to conservation. Each PCA has one



of four designations—Regional Recreation, Natural Landscapes, Agricultural Lands, and Urban Greening—to reflect its specific role in the open space network. Peer-reviewed scientific research is used to determine the relative benefit each PCA provides to habitat, agricultural economy, and human health. The Urban Greening designation adds a new dimension to the PCA program by recognizing the role of existing and new natural features within cities to improve habitat, water quality, and health—helping make Bay Area communities and PDAs more complete communities. To date, local jurisdictions have adopted 165 PCAs.

Despite the Bay Area's long history of conservation, open spaces throughout the region face continuing development pressure. Local jurisdictions ultimately determine whether to permit development in open spaces or to preserve or strengthen existing preservation policies. *Plan Bay Area 2040* can also play an important role by identifying ways to achieve a growth pattern that reduces GHG emissions, invests in existing communities, and preserves farmland and open space.

¹ Association of Bay Area Governments and Metropolitan Transportation Commission, *Plan Bay Area Draft Environmental Impact Report*, July 2014, page 2.3-2.

Assessing the Scenarios

The *Plan Bay Area 2040* scenarios highlight the potential implications of different policy choices and investments on the region's agricultural economy, public open space, and ecosystem functions. The scenarios vary in terms of retention of existing urban growth boundaries, protection of PCAs, and transportation investments that support infill or greenfield development.



Main Streets

To accommodate the region's expected growth in a relatively dispersed pattern, nearly 19,000 acres of land outside the existing urban footprint² are developed in *Main Streets*, reflecting the assumption that growth boundaries are expanded faster than compared to recent trends. Much of this growth takes place on unincorporated county land, in many cases in greenfields that are currently protected but were once planned for major development projects.

Distributing housing more widely throughout the region might increase households' access to open spaces, trails, and recreational areas that are often outside or at the edges of developed areas. However, this scenario's dispersed growth pattern would likely lead to fragmented habitat corridors, loss of farmland, and potentially a reduction in the amount of land available for public recreation. With lower density housing spread over wider areas, communities may also need to incur the costs to increase the number of new parks to ensure that they are easily accessible to new households. To mitigate these negative impacts, continued funding for PCA protection from the One Bay Area Grant (OBAG) will be critical.



Connected Neighborhoods

Connected Neighborhoods assumes that all future growth occurs within existing urbanized areas. Although existing urban growth boundaries remain in place, because these boundaries do not protect all of the region's open space, some development takes place outside of existing communities in places with limited infrastructure and transportation access to job centers.

Concentrating development in communities along the major corridors near the bay can increase households' access to regional recreational and active transportation resources, such as the San Francisco Bay Trail and Water Trail. This emphasis on development in areas near the bay also means efforts to protect and improve the health of the Estuary will be particularly important, and can potentially mitigate some of the potential negative impacts of climate change and sea level rise on adjacent communities.

This scenario highlights the strengths and limitations of existing preservation policies. While most of the land developed is not critical to the functioning of the region's ecosystem and does not contain prime farmland, it would otherwise contribute to GHG reduction by sequestering carbon, retain open space for potential public use, and support habitat preservation. Funding open space protection through the OBAG program will help mitigate some of the loss of open space in this scenario while increasing funding for urban greening will provide many of the same benefits described in *Big Cities*.



Big Cities

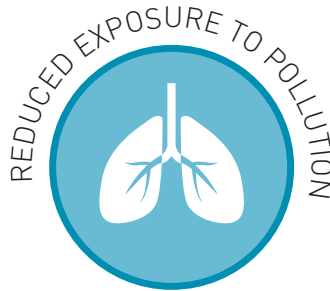
Big Cities is the most compact growth pattern with the greatest emphasis on transportation infrastructure that supports growth within the region's core, and is less likely to place additional pressure on development at the edge of the region. Similar to *Connected Neighborhoods*, existing growth boundaries remain in place. Because new homes and jobs are concentrated in the region's three largest cities and along connecting corridors, very little growth takes place on undeveloped land within the urban growth boundaries. Similar to *Connected Neighborhoods*, this limited growth on undeveloped land does carry negative, although less severe, implications for the region's ecosystem and open space network. Similar to *Connected Neighborhoods*, by focusing development in communities near the bay, this scenario can increase households' access to the San Francisco Bay Trail and Water Trail.

It will be important to emphasize the protection of critical wildlife linkages and corridors in the cities where growth is concentrated. Urban greening will also be a particularly important strategy in this scenario to ensure that infill development takes place in a way that creates livable neighborhoods with access to open space and reduces the heat island effect, where the prevalence of buildings and paved surfaces leads to increased temperatures in dense urban areas.

² This is the total growth in acres of developed land outside of the urban footprint that is non-rural (i.e., urban or suburban type development) between 2010 and 2040. The existing urban footprint is defined as the existing footprint plus adopted urban growth boundaries.

Improving Air Quality

Plan
BayArea
2040



To protect public health, the U.S. EPA has established, and regularly reviews, national ambient air quality standards (NAAQS) for six principal air pollutants, also known as criteria pollutants, that are harmful to public health: ground level ozone, fine and coarse particulate matter (PM), nitrogen dioxide (NO₂), carbon monoxide (CO), sulfur dioxide (SO₂), and lead (Pb). Some of these pollutants (CO, SO₂ and lead) are emitted directly from a variety of sources such as cars and trucks, off-road mobile equipment, and industrial processes.

The Bay Area Air Quality Management District (Air District) is tasked with ensuring that the Bay Area region meets the NAAQS set by the U.S. EPA, as well as air quality standards set by the state of California (which can be more stringent than the NAAQS). In addition, the Air District is committed to achieving greenhouse gas (GHG) reductions to stabilize the climate; in 2013, the Air District's Board of Directors adopted a resolution that set a goal for the Bay Area region to reduce GHG emissions by 2050 to 80 percent below 1990 levels.

Ground level ozone (more commonly known as "smog") is not directly emitted, but is formed when nitrogen oxides (NO_x) and reactive organic gases (ROG)—which are emitted primarily through fossil fuel combustion and sometimes referred to as ozone precursors—react in the presence of sunlight.

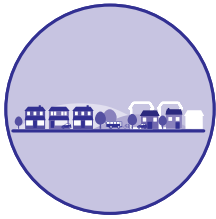
Fine PM can be either directly emitted or formed when gaseous emissions react in the atmosphere. A wide variety of sources emit criteria pollutants, ozone precursors and GHGs, including on-road motor vehicles, off-road mobile equipment, consumer products, fires, stationary source combustion, and industrial and commercial processes such as oil refining. On-road mobile sources, including cars and trucks, are the largest contributors to ground level ozone and GHGs throughout the region. Because these pollutants can disperse and remain present in the air far from where they are originally emitted, they pose regional (and in the case of GHGs, global) air quality issues.

However, ground level ozone and greenhouse gases are not the only air pollutants of concern. The Air District implements programs that are designed to identify and reduce the public's exposure to toxic air contaminants (TACs) and fine PM. TACs are air pollutants which cause or contribute to an increase in mortality, or in serious illness, or which otherwise may pose a potential hazard to human health.

Examples of TACs that are present in the Bay Area include benzene, hexavalent chromium, diesel particulate matter (DPM), asbestos, arsenic, and formaldehyde. Sources of TACs include on- and off-road mobile sources, industrial facilities, and commercial operations (such as gas stations).

Fine PM has been shown to result in a wide range of negative health effects, including respiratory conditions such as asthma, bronchitis, and impaired lung development in children, as well as serious cardiovascular effects such as heart attacks and strokes. Cars and trucks are one of the main sources of fine PM. Both TACs and fine PM are sometimes referred to as "local pollutants," because they tend to be present in higher concentrations close to where they are emitted (in other words, TACs and PM do not disperse throughout the region as readily as criteria pollutants do). Therefore, of key concern is the health of residents who live near local TAC and fine PM emissions sources, such as busy roadways, freeways, or industrial activity.

Assessing Scenarios



**Main
Streets**



**Connected
Neighborhoods**



**Big
Cities**

From an air quality standpoint, reducing vehicle miles traveled (VMT) is crucial. Reducing VMT will reduce criteria pollutants, greenhouse gases, and toxic air contaminants. Cars and trucks represent the single largest source of greenhouse gas emissions in the Bay Area; reducing these transportation-related emissions through integrated land use and transportation planning and infill development is critical to achieving GHG reduction goals to stabilize the climate.

Therefore, when evaluating the scenarios for *Plan Bay Area 2040*, the scenario which has the potential to reduce VMT to the greatest extent may be the best scenario for regional air quality and the climate, and will also help to reduce local air pollutants (including TACs and fine PM) and therefore help to reduce the exposures of people who live in close proximity to freeways and busy roadways.

However, some scenarios may plan for more residents in locations with elevated levels of existing TACs and fine PM than other scenarios, which may lead to an increase in overall population exposure to local air pollution unless steps are taken to minimize exposure. To assist local governments in addressing and minimizing potential air quality issues, the Air District is releasing a guidance document entitled *Planning Healthy Places*, which provides recommended best practices that can be implemented to reduce exposure to, and emissions of, local air pollutants. Local governments are encouraged to partner with the Air District to implement these air quality solutions.

Precise data on anticipated changes in VMT and potential locations for future housing will be necessary to evaluate each scenario from an air quality standpoint. This information will be provided throughout the scenario planning process.