

Enverdeamiento for Environmental Justice

An Urban Greening Plan for Wilmington

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Project Details

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Abstract

It is well documented that climate change is placing a significant burden on communities of color across the United States. Communities of color are often surrounded by multiple sources of pollution, have most of their streets exposed to warming temperatures, have little to no greenspaces to cool neighborhoods and support ecological systems, and have been impacted by a legacy of discriminatory planning practices that left them under-resourced and with little opportunities to improve their condition.

These burdens of climate change on communities of color are Wilmington's reality, a largely low-income Latino community in the City of Los Angeles's Harbor area. Wilmington is surrounded by five oil refineries, the Port of Los Angeles, and the 110 Freeway, which, through their operations and traffic release thousands of pounds of chemicals into Wilmington's air annually. Embedded in the neighborhood are warehouses, shipping yards, railyards, and dozens of active oil wells which also pollute the community. Wilmington's tree canopy and greenspace are sparse. Ecological systems native to Wilmington have long disappeared under asphalt and concrete in this largely industrial neighborhood. Published research and resident stories document serious health disparities in the neighborhood that can be connected to Wilmington's proximity to major pollution sources and lack of recreational spaces.

This report recognizes Wilmington's condition as an environmental injustice and introduces a series of greening strategies from the field of landscape architecture to improve environmental conditions and resident health. The report begins with demographic, planning, and historical analyses of Wilmington to show the current social, economic and health condition of its residents, and how Wilmington came to be under-resourced and poorly equipped to meet the challenge of climate change. Following the analysis, the report lays out a community concept plan and design strategies that seek to address Wilmington's environmental and health disparities through a robust urban forestry project, expanding greenspace access across the neighborhood, and identifying opportunities to reintroduce ecology native to Wilmington, and apply natural remediation strategies to clean air, soil, and water.

The report concludes by connecting urban greening to critical policy change efforts that the strategies outlined in this report need to complement to truly achieve health equity in Wilmington. These include policy strategies that protect residents from green displacement and promote linked affordable housing and park projects, and support for existing efforts to permanently close oil wells in residential neighborhoods and the refineries surrounding Wilmington.



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Introduction

Wilmington is a neighborhood in the City of Los Angeles, located in the city's Harbor Region. The neighborhood spans about 4,700 acres and is bordered by the Port of Los Angeles to the South, The city of Lomita to the West, Carson to the North, and Long Beach to the East. It forms part of Los Angeles's Council District 15, a district that runs from San Pedro and the Port of Los Angeles 14 miles north towards Watts in South Los Angeles. Due to its historic role in oil production and proximity to the port, Wilmington is characterized by significant industrial activity surrounding and embedded in its residential neighborhoods. Five oil refineries surround Wilmington, and the community is dotted with hundreds of active oil wells. Two major highways—the 110 Freeway and Alameda Street—serve as the neighborhood's western and eastern borders, respectively. These highways serve as two important connections between the nation's largest port and the rest of the United States. Rail yards cut through the middle of the neighborhood, carrying shipments from the port including petrochemicals. Lomita Boulevard, Pacific Coast Highway, and Anaheim Street are the major east-west roads. Running north-south are Figueroa Street, Avalon Boulevard and Wilmington Boulevard.

The neighborhood was largely shaped by Los Angeles's oil production boom of the early 20th Century.¹ Since then, Wilmington has been dotted by hundreds of oil wells. Work in oil production and the port attracted immigrants looking for employment. The neighborhood, like all immigrant communities in Los Angeles, was further shaped by racially discriminatory planning practices that sought to restrict both the mobility of immigrants out of communities like Wilmington and investment into these communities. Racially restrictive covenants allowed Anglo homeowners to add restrictions on their deeds that prohibited the sale of homes to immigrants and Black Angelenos and effectively shut out Wilmington residents from Los Angeles's growing suburbs.

Redlining, the government practice of marking communities as "desirable" and "undesirable" for investment, created the resource desert that exists today in many immigrant and Black communities in Los Angeles. Communities like Wilmington were given a red mark, tagged too "Heterogeneous", and therefore risky for investment.² Wilmington's red grade resulted in the resource disparities we see today, such as access to park spaces, maintained streets and even tree canopy cover. As the 20th century continued, Wilmington, with its low housing costs due to the racially discriminatory planning practices described above, and its proximity to industry, became a Brown community with a large concentration of low-income immigrants from Latin America.

Even with the countless layers of social and environmental disparities that afflict Wilmington, the community has demonstrated an enormous resilience to hardship. Community members organize themselves to form garden groups, distribute food and resources, and clean the neighborhood's streets. Community based organizations mobilize Wilmington residents to speak up against environmental injustice and delegate those in power to transform policies that place oil wells and refineries directly in their backyard.

The *Enverdecimiento* for Environmental Justice plan seeks to build on the work done by its residents to make Wilmington a healthy, resilient neighborhood. This plan uses design strategies from the field of landscape architecture to protect Wilmington from pollution sources and warming temperatures, expand greenspace, and reintroduce native ecology. The strategies in this plan should not be read as the sole solutions for Wilmington's social and environmental challenges, but rather green improvements meant to complement the policy work needed to dismantle pollution sources and prepare Wilmington for the environmental challenges of the 21st Century.

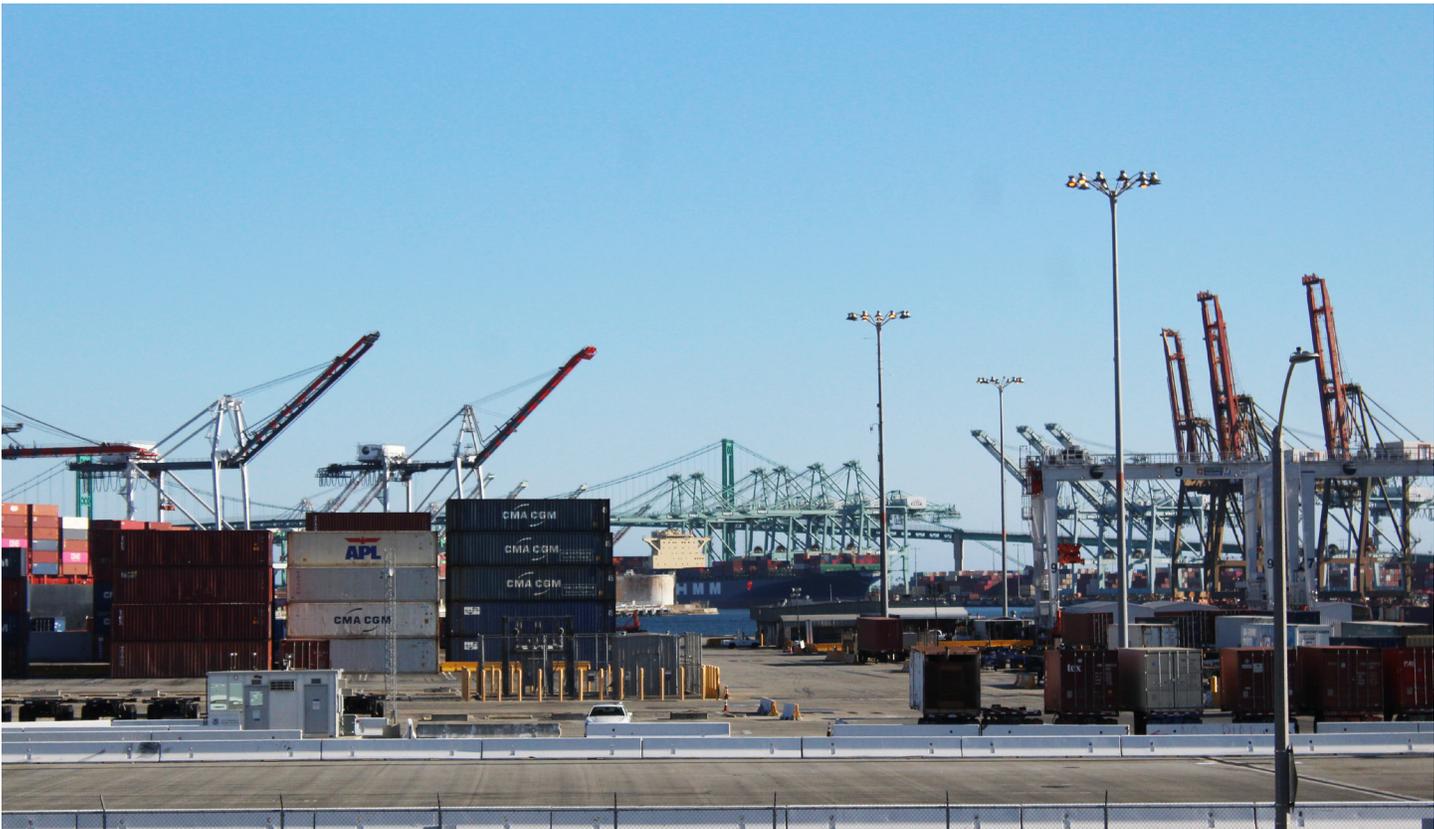


Figure 1: View of the Port of Los Angeles from Wilmington Waterfront Park. Thousands of diesel trucks travel in and out of the port daily.



Figure 2: The Wilmington Community Clinic, on Opp St. and Avalon Boulevard in Central Wilmington provides affordable health services and preventative care to residents.



Figure 3: View of Railyard from Pacific Coast Highway. Homes are adjacent to the railyard.



Figure 4: Garden leadership team elections at Wilmington Community Garden. Community gardens provide spaces for Wilmington residents to grow plants from their native Mexico and Central America.



Figure 5: Context Map for Wilmington, highlighting the surrounding neighborhoods, major highways surrounding Wilmington, and major roads within the neighborhood

Analysis

Demographics

Wilmington has a population of 57,000, with Latino's comprising 90 percent of the population.³ Wilmington has a significant number of foreign-born residents (21,000). Over 41,000 of Wilmington's residents speak more languages than English, with around 39,000 of them being fluent Spanish speakers.⁴ There are 15,000 households in Wilmington, with renters making up 64 percent of households.⁵

Significant economic disparities exist within Wilmington. According to Census data, the median household income is \$51,000, compared to 56,000 in Los Angeles County.⁶ Fifty percent of households make income below 200 percent of the Federal Poverty Line, compared to 38 percent in Los Angeles County.⁷ Most residents pay around \$1,500 in monthly housing costs.⁸ Of the 33,000 residents ages 25 and over, almost half have less than a high school diploma.⁹

These census numbers reveal that Wilmington is an economically disadvantaged community, with low opportunities for homeownership, linguistic isolation, and limited access to educational opportunities.

Schools

Wilmington has twelve schools located across the neighborhood, which include six public elementary schools, three private, two magnet, and one public high school. Public schools form part of the Los Angeles Unified School District. A majority of students in Wilmington's public schools qualify for free or reduced lunch.¹⁰ Five of Wilmington's schools sit on top of former oil well sites.¹¹

Park Access

Parks, ensured in the 20th Century for Anglo communities through policies such as the State's Quimby Act, which require developers to dedicate land or pay "impact fees" for parks to local jurisdictions, are scarce in Wilmington.¹² According to the 2016 Los Angeles County-Wide Comprehensive Parks and Recreation Needs Assessment, Wilmington offers a total of 66 acres of parkspace to residents.¹³ The Wilmington Urban Greening Plan, completed in 2017 revealed that although there are some large greenspaces, such as Banning and Wilmington Waterfront Parks, parks are thinly spread out across the neighborhood—most qualifying as small pocket parks.¹⁴ These smaller parks include East Wilmington Greenbelt Park, Wilmington Vest Park, and Wilmington Town Square. Only 1.16 acres of parkspace per 1,000 residents are available in Wilmington, compared to the County standard of 4 acres per 1,000 residents. The County Parks and Recreation Needs Assessment marks most of Wilmington west of Wilmington Boulevard as having only a moderate need of parkspace, likely due to its proximity to Harbor City's Ken Malloy Harbor Regional Park.¹⁵ This analysis does not, however, consider the significant barrier the 110 freeway provides for residents in this part of Wilmington looking to enjoy Ken Malloy Harbor Regional Park—a park with all available amenities located on its Western side, almost a mile from Wilmington's borders. Central Wilmington between Wilmington Boulevard and Avalon Boulevard, East Wilmington, and its northern area between Lomita and Avalon Boulevards are areas in high need of parks, according to the County Needs Assessment.¹⁶

A 2020 study by the Prevention Institute found that residents have higher life expectancy in census tracts which have parkspaces.¹⁷ Residents in Council District 15 have a life expectancy of 81 years, compared to 87 years in Los Angeles County's best performing community.¹⁸

Community Groups

Strength Based Community Change:

Strength Based Community Change (SBCC) is a nonprofit organization that works to empower residents to make community change. SBCC's office is in Wilmington, and they support several programs and initiatives in Wilmington, among them the I Heart Wilmington Community Garden, #CleanWilmington, a resident led initiative to organize cleanups and tree plantings across Wilmington, and I Heart Wilmington, which works with residents to lead community building projects in Wilmington.¹⁹

The Wilmington Community Garden:

The Wilmington Community Garden is located inside of the East Wilmington Greenbelt Park on East L Street between Drumm and Coil Ave. The garden was initially a food justice project led by First 5 LA, The Los Angeles Community Garden Council, the Los Angeles Neighborhood Land Trust, the Los Angeles Conservation Corp, and the County of Los Angeles to address the critical lack of healthy food options among children of color ages 0-5.²⁰ The Wilmington community garden is 0.18 acres and offers thirty-eight garden beds to primarily Latin American immigrant residents that come from a tradition of gardening and growing fresh food from their respective countries.

SBCC Community Gardens:

The I Heart Wilmington Community Garden is a project of SBCC. This spring SBCC is expected to open a second community garden on L Street between Lecouvreur Ave. and Eubank St. The first phase will have 0.59 acres of community gardening space, with an opportunity to add 0.45 more acres as the project expands into its second phase.

Wilmington Middle School Community Garden:

Wilmington Middle School has a vegetable garden located on its Southeastern corner. It is .91 acres.

Wilmington Community Clinic:

The Wilmington Community Clinic is a community-minded clinic that offers affordable healthcare to residents. They offer primary and

preventative care services and operate with an understanding that there exist significant disparities in both their patients' health and in accessing healthcare services. Their office is in the heart of commercial Wilmington, Near Anaheim street and Avalon Boulevard.²¹

Communities for A Better Environment:

Communities for a Better Environment (CBE) uses grassroots organizing and a deep understanding of environmental policy to fight for environmental justice in pollution-burdened communities across California. CBE works closely with Wilmington residents to monitor pollution sources that severely impair air quality in the neighborhood, such as flares from oil refineries.²² They also form part of the STAND LA coalition, a group working to mobilize Los Angeles residents to hold oil companies and regulatory agencies accountable for pollution in communities of color, and around the closure of oil wells in residential neighborhoods.²³

Hydrology

Wilmington once belonged to an expansive system of freshwater wetlands that expanded and contracted based on the seasons. To the East, the Dominguez channel would flow down fifteen miles from Hawthorne in the North and pass-through Eastern Wilmington and into the Los Angeles Harbor. To the West, the freshwater wetland known at the time as the Bixby Slough would extend from present-day Harbor City into Northwestern and Southwestern Wilmington.²⁴ Marshes in Los Angeles's Harbor region were historically a mix of year-round marshes, which means water exists in them throughout the year, and vernal, which dry up during the summer. Each of these types of marshes can support different types of plant and wildlife.²⁵

Prior to the construction of the 110 Freeway, which effectively divided Wilmington from Harbor City, the extension of Bixby Slough into Wilmington ensured that some areas retained the neighborhoods freshwater wetland ecology.

Percentage of Public School Students in Wilmington That Qualify for Free or Reduced Lunch:

Wilmington Park: 95%

Broad Ave: 83%

Fries Ave: 97%

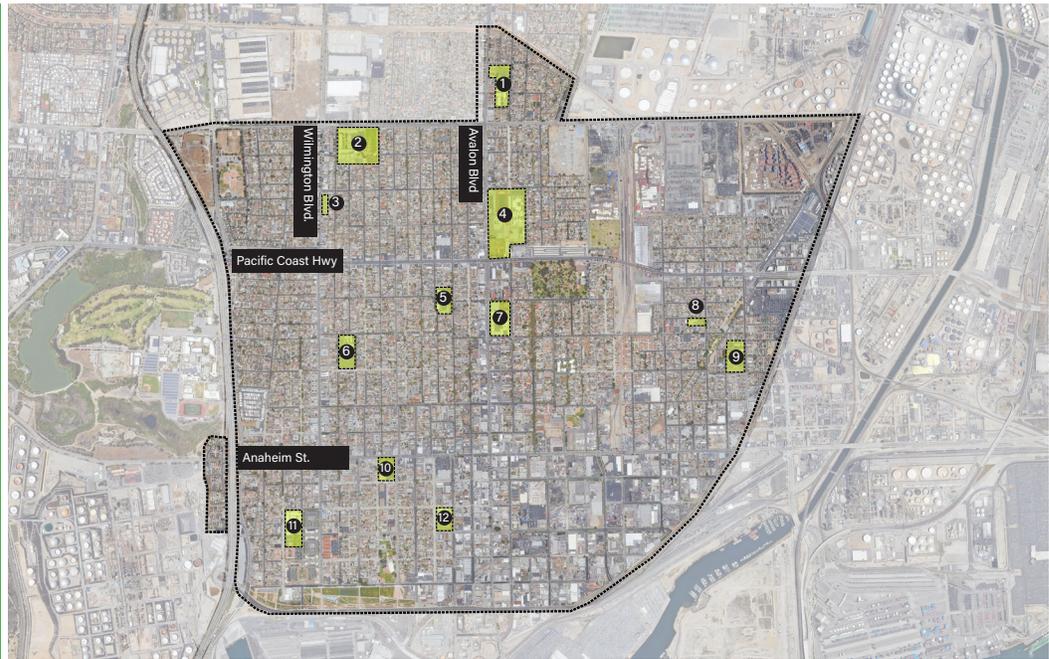
Gulf Ave: 92%

Harry Bridges Spanish School: 89%

George de la Torre: 96%

Phineas Banning HS: 93%

Hawaiian Ave: 97 %



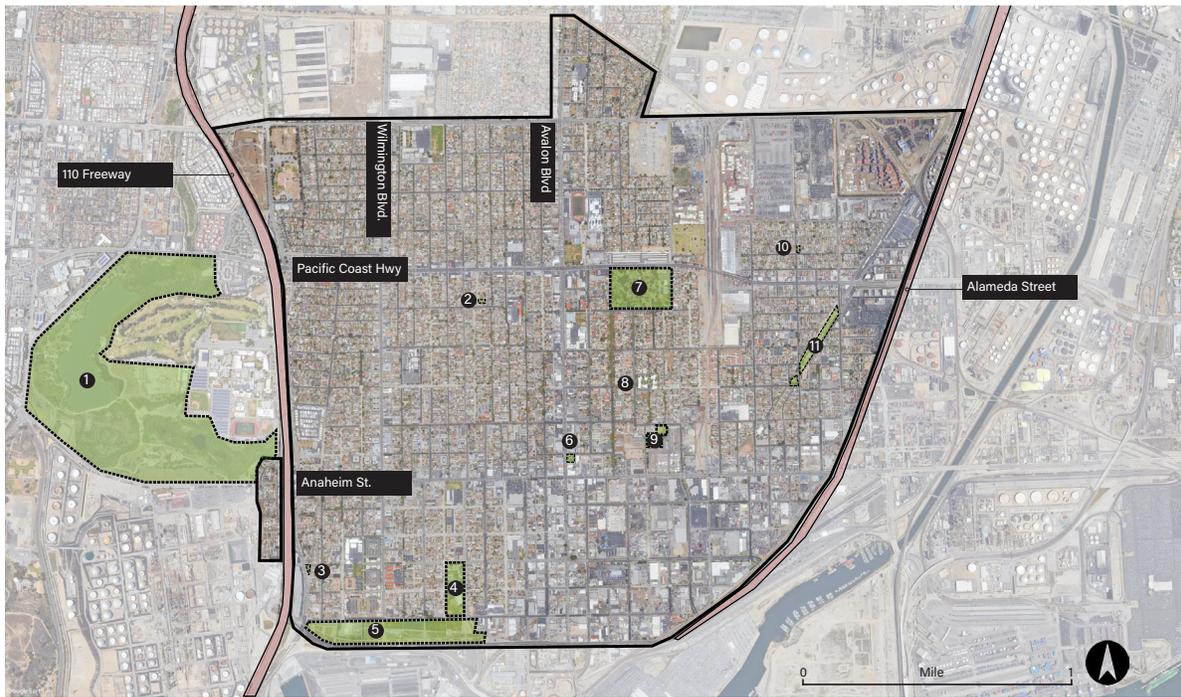
Schools

- | | | | |
|----------------------------------|---------------------------------|------------------------------------|---|
| 1. Broad Ave. Elementary | 5. Fries Ave. Elementary* | 9. Wilmington Park Elementary | * = plugged Oil Well Based on CALGEM Data |
| 2. Wilmington Middle school | 6. Gulf Ave. Elementary* | 10. St. Peter & Paul School* | |
| 3. Pacific Ave. Christian School | 7. Harry Bridges Spanish School | 11. Hawaiian Ave. Magnet | |
| 4. Phineas Banning High* | 8. Holy Family Grammar School | 12. George de la Torre Elementary* | |

Figure 6: Map of schools in Wilmington. Schools located on former oil wells are marked with asterisks.

Wilmington is in the Dominguez Watershed, which covers an area of about 133 square miles.²⁶ Water is directed by storm drains into the Dominguez Channel, which, when passing Wilmington is surrounded by oil refineries and other industrial sites. According to the 2004 Dominguez Watershed Management Master Plan, 93% of the land in the watershed is developed, and, at 63% hardscape, is the most impervious watershed in Los Angeles County.²⁷

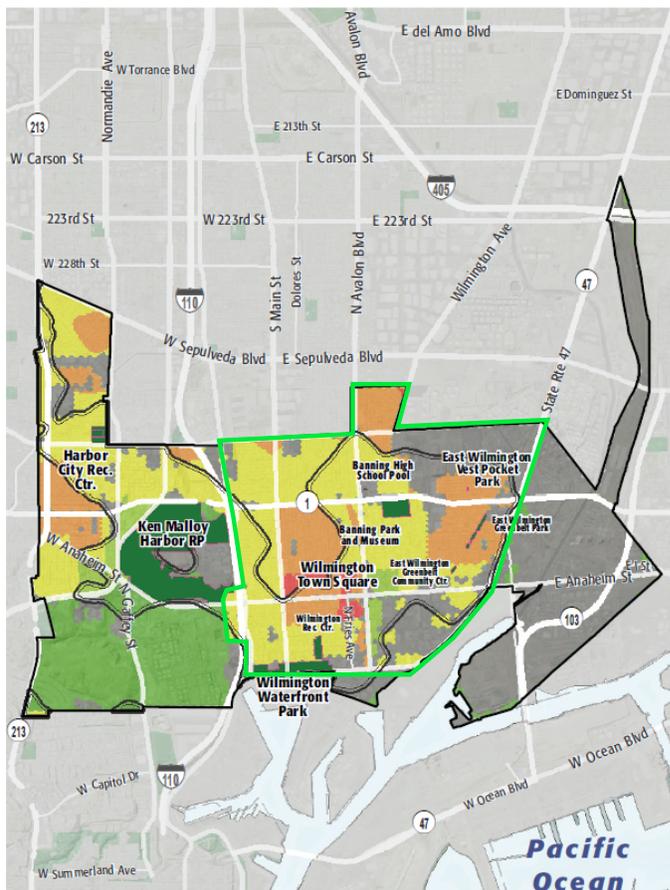
The Dominguez Channel is considered an impaired water body. Chromium, copper, lead, petroleum-based contaminants have been found in the channel.²⁸ To the West of Wilmington Machado Lake and the Wilmington Drain are the remnants of the once expansive freshwater wetland ecosystem. These bodies of water sit just outside of the neighborhood west of the 110 Freeway. Both serve as important habitat for local and migrating wildlife and for stormwater capture.



Greenspaces

- | | | | |
|--|---------------------------------|------------------------------|------------------------------------|
| 1. Ken Malloy Harbor Regional Park (Outside of Wilmington) | 4. Wilmington Recreation Center | 7. Banning Park | 10. East Wilmington Vest Park |
| 2. I Heart Watts Community Garden | 5. Wilmington Waterfront Park | 8. Drum Barracks Park | 11. East Wilmington Greenbelt Park |
| 3. Dog Park | 6. Wilmington Town Square | 9. John Mendez Baseball Park | |

Figure 7: Map of Greenspaces in Wilmington.



PARK NEED CATEGORY

- Very High
- High
- Moderate
- Low
- Very Low
- No Population
- Area within 1/2 mile walk of a park

HOW MANY PEOPLE NEED PARKS?



Figure 8: Parks Needs Assessment map illustrating Wilmington and Harbor City's Park Needs.

Source: https://lacountyparkneeds.org/FinalReportAppendixA/StudyArea_121.pdf



Figure 9: Routes, distance and time it takes to get from Wilmington to recreational areas in Ken Malloy Harbor Regional Park.

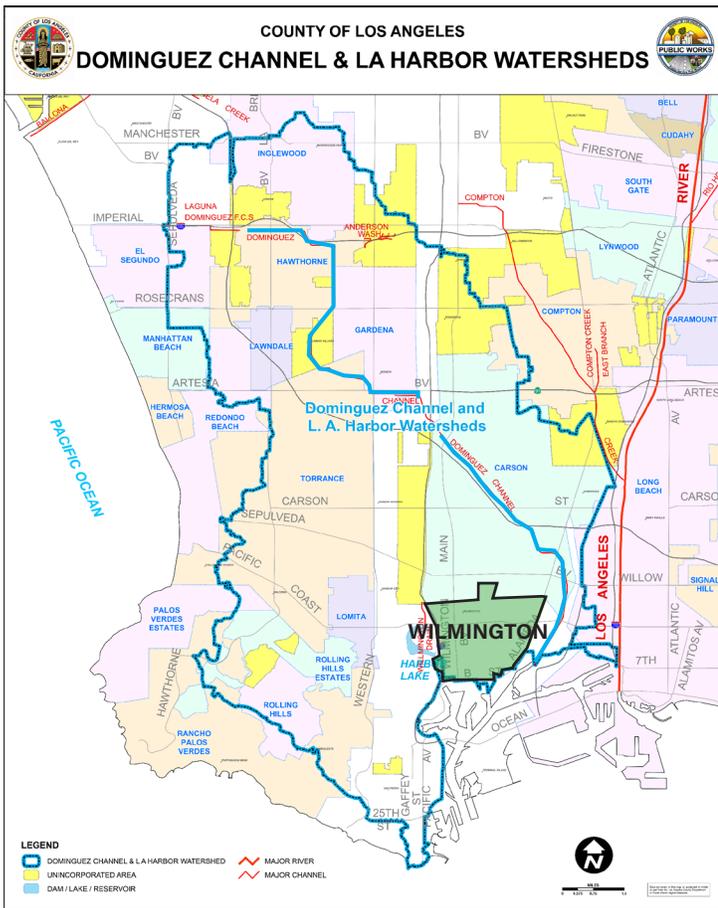


Figure 10: The Dominguez Watershed. Wilmington sits at the end of the Dominguez Channel.



Figure 11: East Wilmington Greenbelt Park.



Figure 12: Wilmington Waterfront Park.

Year-Round Wetland: In these environments, clay soil keeps water above surface. groundwater supply is often high enough to keep surface soils constantly moist. Plants and trees with deep taproots have their roots in constant contact with water.

Vernal Wetlands: vernal wetlands dry up during the summer months, though retain small pools of water that serves as habitat for many wetland species. low groundwater levels can also affect how much surface water exists in these environments.

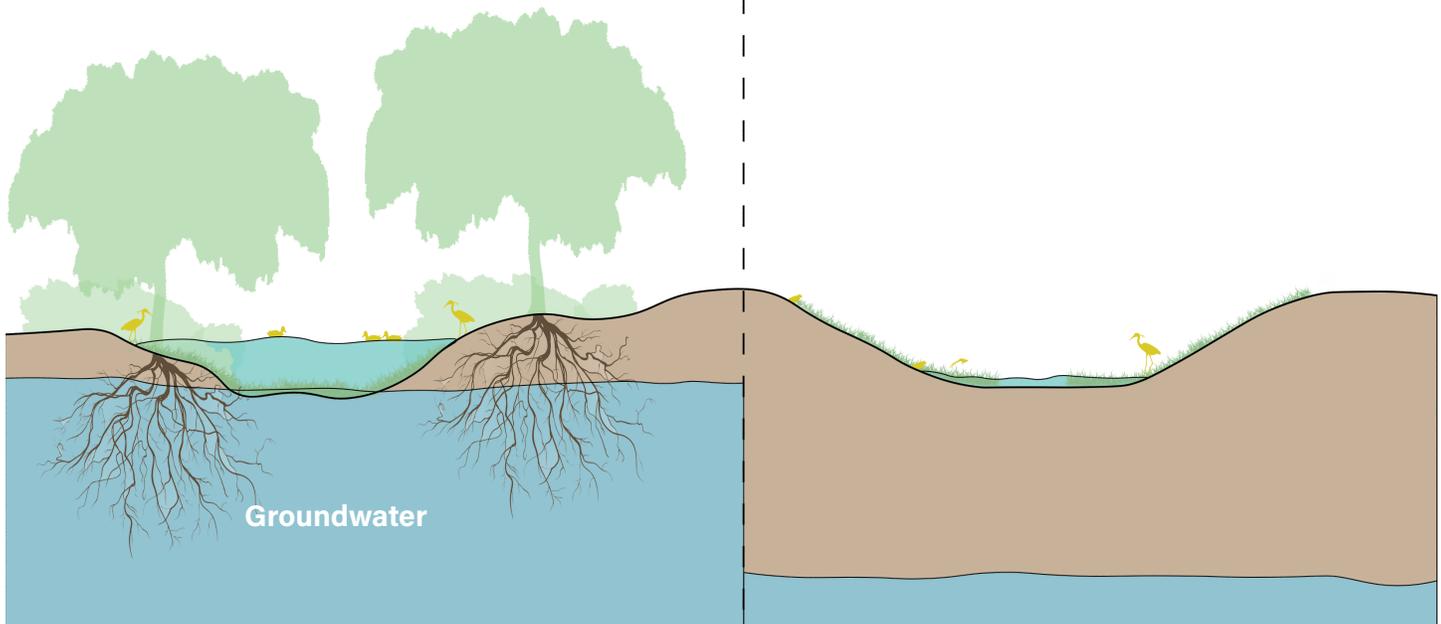


Figure 13: Year-Round and Vernal Marshes.

Flora

Wilmington’s historic vegetation belongs to the freshwater wetland and coastal sage scrub community that characterized Los Angeles’s Harbor. This ecology included shrubs such as Toyon (*Heteromeles arbutifolia*) and Lemonade Berry (*Rhus integrifolia*), various types of sages (*Salvias*), cottonwoods (*Populus*), sycamores (*Platanus*), willow trees (*Salix*) and other plants that thrive in both wet environments and the drought conditions common in the Los Angeles region.

Tree Cover

Wilmington is a tree-poor community, a condition that can be traced back to the practice of redlining. Redlining in the 1930s ensured resources, such as parks and street trees, for communities graded in green, while restricting resources for neighborhoods graded as undesirable, such as Wilmington was.²⁹ A 2020 study found that immigrant neighborhoods that received a negative grading in the 1930s,

today record temperatures up to five degrees F warmer than their non-redlined counterparts.³⁰ This disparity in tree cover can be analyzed by using tools such as ITree from the USDA Forest Service, which map tree coverage in American communities. When comparing neighborhoods such as Palos Verdes Estates to Wilmington, we can see the present-day disparities in tree canopy cover. Palos Verdes Estates has 24% of its surface covered by trees, while Wilmington has only 5%.³¹ Wilmington, largely built out and filled with hardscapes, is dangerously exposed to the sun and warmer temperatures.

Oil Refineries and the Port

Wilmington is surrounded by five oil refineries which include the Phillip 66, Phillips 66/ Marathon, Marathon, Tesoro, and Valero refineries. The South Coast Air Quality Management District (SCAQMD) is tasked with regulating flares and emissions from these refineries and requires them to provide quarterly reports of their emissions

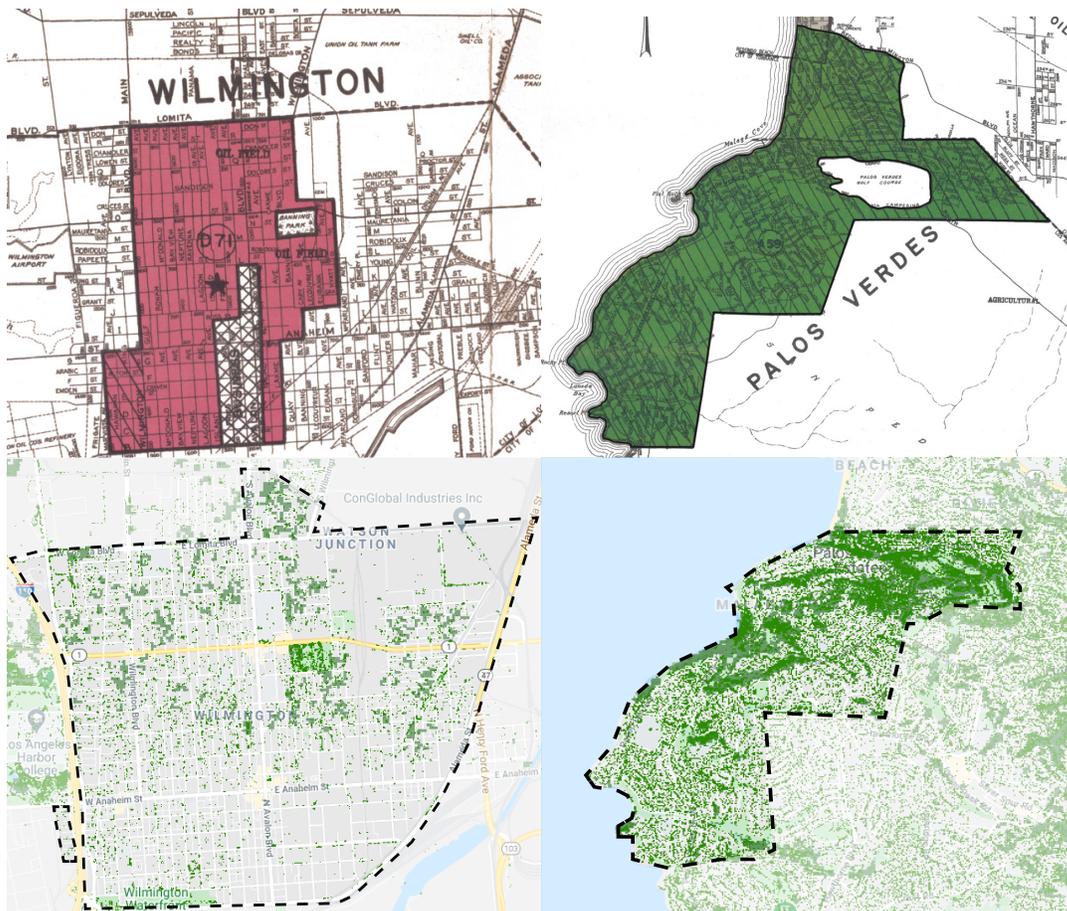


Figure 14: Redlining (top) and tree cover (bottom) maps of Wilmington and neighboring Palos Verdes Estates. Redlining Wilmington resulted in less tree canopy cover than non-redlined communities like Palos Verdes Estates.

in pounds.³² chemicals in oil refinery emissions are associated with high levels of asthma, skin irritation, adverse birth outcomes, cancer, among other health issues in impacted communities.³³

The Port of Los Angeles also contributes to the poor air quality around Wilmington, releasing tens of thousands of pounds of nitrogen and sulfur oxides, particulate matter, and carbon dioxide into the air.³⁴ Diesel emitting trucks coming in and out of the port and through Alameda Street, Pacific Coast Highway, Anaheim Street, and the 110 Freeway contribute high levels of particulate matter 2.5 (PM 2.5) to Wilmington’s air, which is of particular concern to respiratory health. PM 2.5 embeds itself into the lungs and bloodstream impairing respiratory health and causing premature death. Due to their proximity to these pollution sources, most census tracts within Wilmington score among the most pollution burdened in California based on the state’s CALenviroscreen tool.³⁵ A 2019 study on air quality and asthma among black and brown communities

in Los Angeles marked Wilmington as part of an asthma emergency visit hot spot that stretches from the port up to South Los Angeles.³⁶

Oil Wells

The City of Los Angeles is home to a little over 1,000 active and idle oil wells—almost half of which are in Wilmington.³⁷ Active and idle oil wells are scattered across residential sections of Wilmington, many of which located near locales where biologically sensitive populations frequent, such as schools, and the Wilmington’s Boys and Girls club. Oil extraction from these sites is known to impair human health by contaminating the soil, air, and water. As easy to access oil is depleted, oil companies resort to more aggressive extractive methods to reach deeper into the earth. Companies inject steam and water into oil wells to pump oil up into the surface. Surface flow back through this method carries numerous harmful chemicals used in oil extraction, including xylene, toluene, formaldehyde, and benzene—the latter

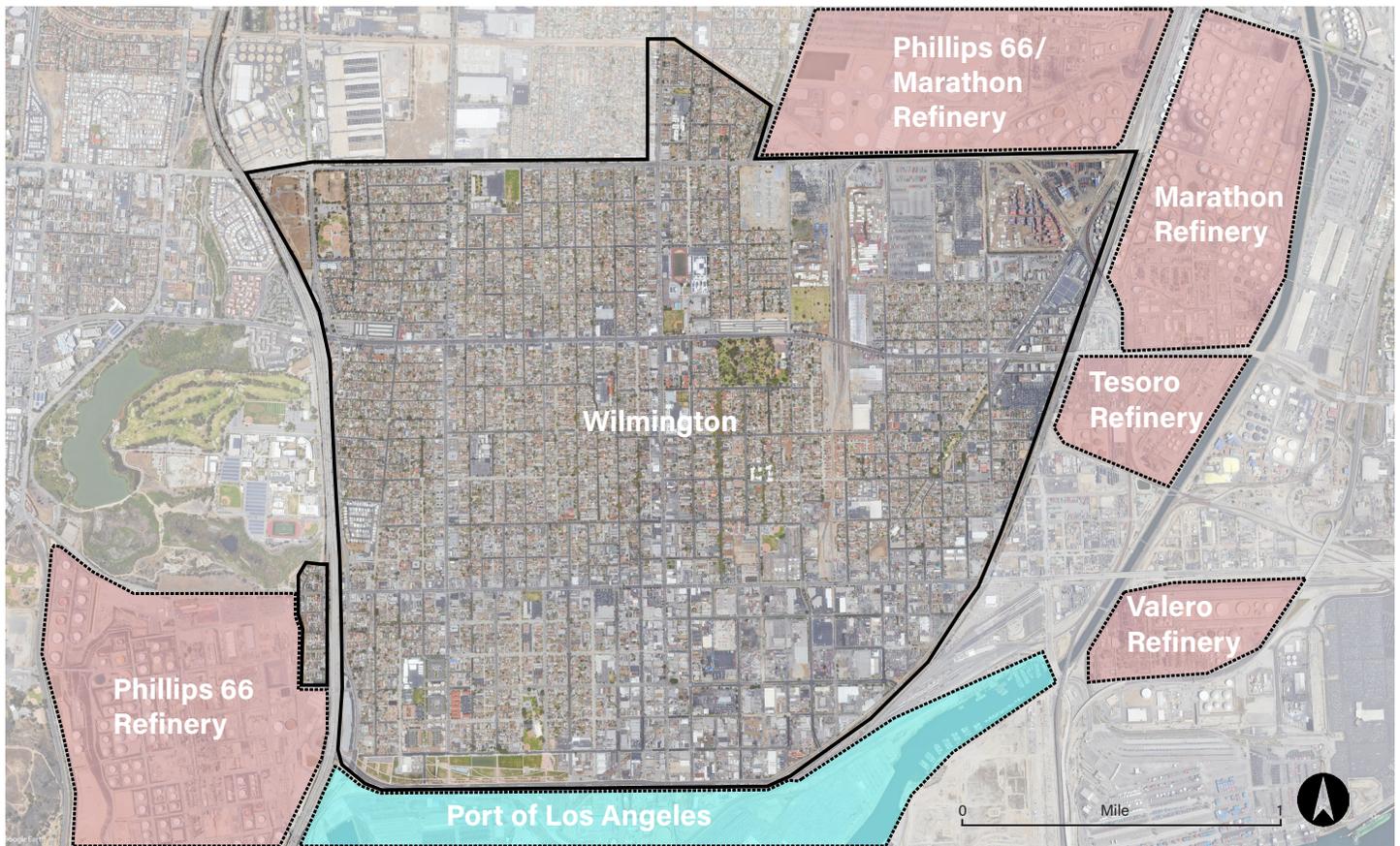


Figure 15: Oil Refineries Surrounding Wilmington. Wilmington is surrounded by five oil refineries.

two are known carcinogens.³⁸ The contaminated water is further used to pump more oil out of wells or shipped out by truck to Sump fields outside of Los Angeles, basins where the water is deposited.³⁹ Storage tanks have in the past been known to leak and contaminate soil. Using acids to burn through the earth as an oil drilling method has the capacity to burn through aquifers. If petrochemicals get into the aquifers, groundwater supply is effectively contaminated.⁴⁰

Oil wells also emit chemicals into the air produced through the extraction process, such as benzene, hydrogen sulfide, and methane. It is documented that people exposed to these chemicals experience throat and sinus irritation, low birth weights in newborns, and strong headaches as far as 8,000 ft. from oil extraction sites.⁴¹ Noise from oil well extraction sites is known to disturb sleep in residential neighborhoods. Lack of sleep leads to additional health impairments including high blood pressure and lower school performance in children.⁴²

The City of Los Angeles does not have a current setback distance between oil production sites and residential areas. Advocacy groups such as STAND-LA and Communities for a Better Environment champion a setback distance of 2,500ft.⁴³ Most oil wells in Wilmington are embedded in residential parts of the community, with some homes within ten feet of an oil well.

Health Disparities

In recent years, the Los Angeles County Department of Public Health has taken a more holistic approach to identifying and addressing poor health outcomes in County communities. For one, the County Department of Public Health acknowledges that there are racial and class-based inequities in how health and preventative resources are distributed. Non-Anglo, low-income communities of color report the highest health disparities in the county. A person's lack of adequate income, educational attainment, access to parks, housing stability, and proximity to pollution sources can severely impair human

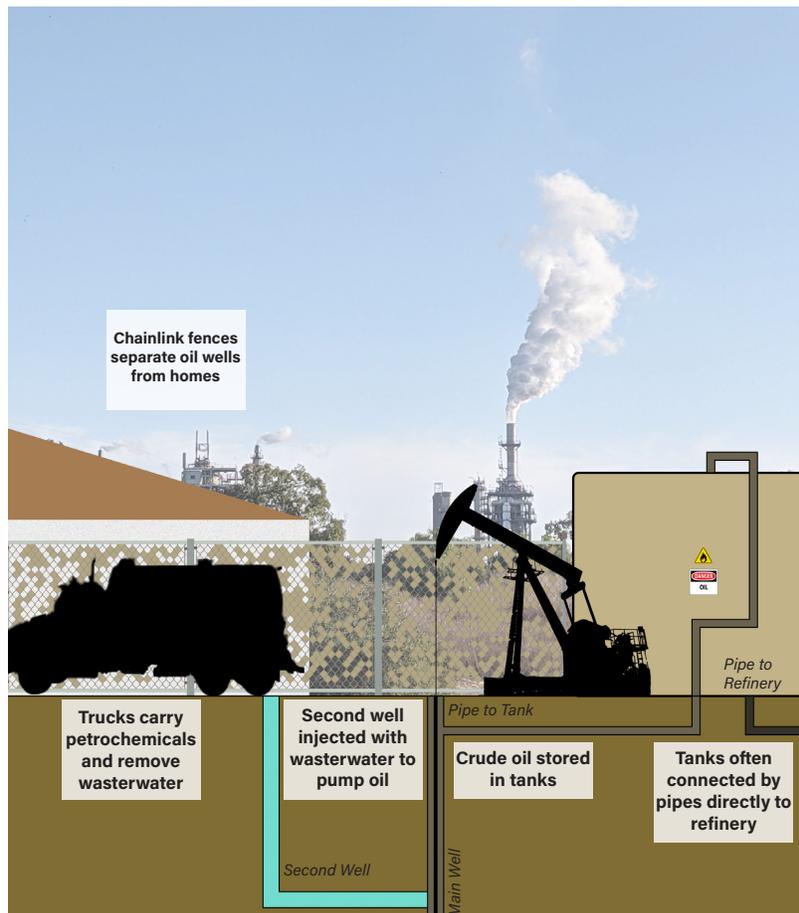


Figure 16: Mode of the oil extraction process. water is injected into ground to pump oil to the surface through second well.

health.⁴⁴ Wilmington, with its proximity to major pollution sources, lack of park space, housing access relative to the population size, and income disparities place residents' health in a precarious situation. Wilmington registers over 1,000 cancer diagnosis per 1 million residents, an enormous disparity when compared to the National Clean Air Act Goal of 1 cancer diagnosis per 1 million residents.⁴⁵

According to the Wilmington Urban greening plan a third of Wilmington residents suffer from obesity—a condition known to exacerbate asthma.⁴⁶ Cases of chronic obstructive pulmonary disease in Council District 15, which Wilmington belongs to, are 26 per 100,000 residents, compared to 13 per 100,000 in the County's best performing community.⁴⁷ Impaired lung function resulting from compromised air quality will only worsen as the COVID-19

pandemic continues to impact Los Angeles County. Initial reports from the Los Angeles County Department of Public Health find that Latino residents were the most severely impacted by COVID-19 in the first few months of the pandemic, registering higher COVID-19 testing requests, positive results, and deaths.⁴⁸

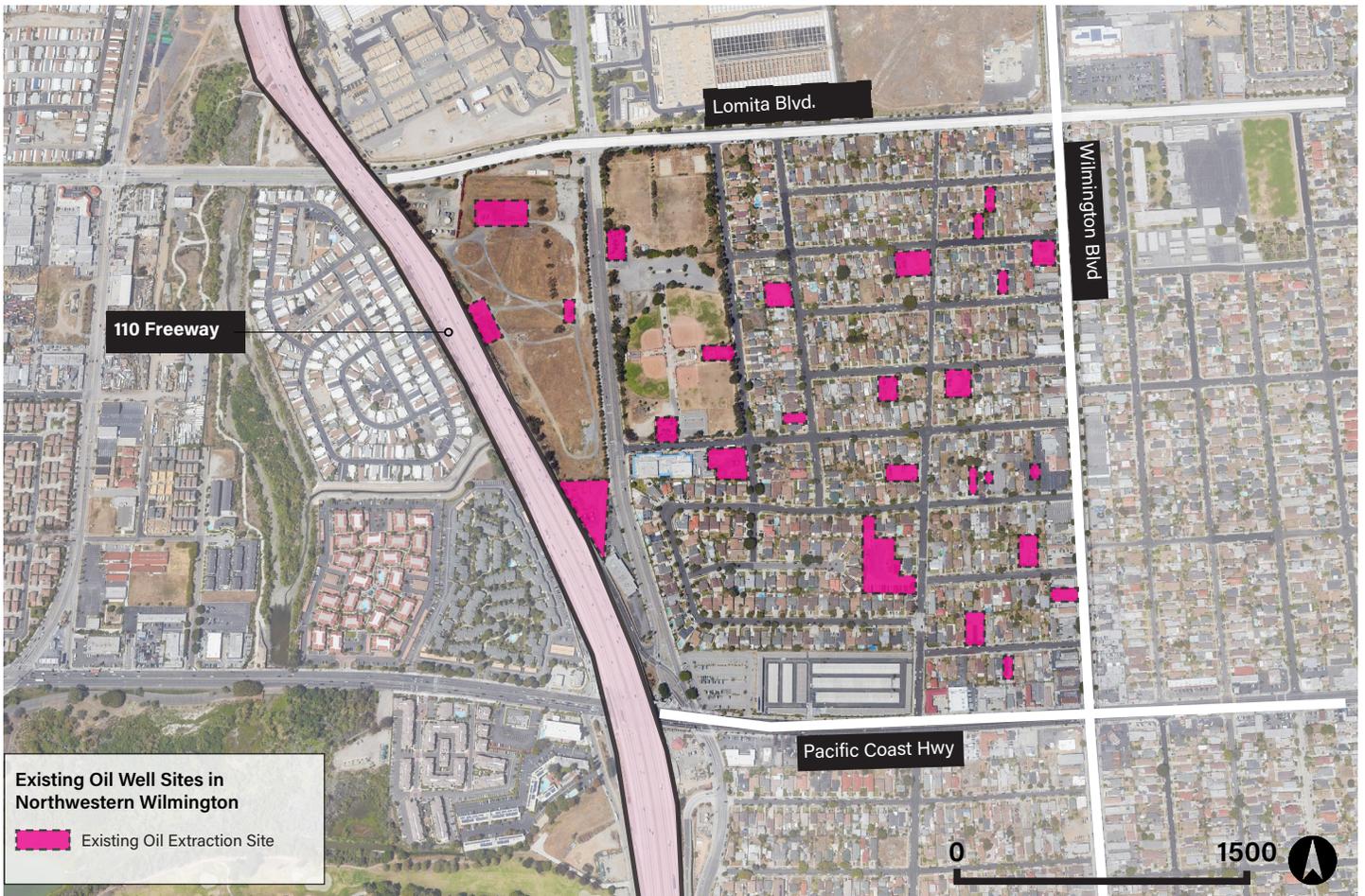


Figure 17: Oil extraction sites in the northwestern corner of Wilmington. There are over two dozen oil extraction sites in this Wilmington neighborhood.



Figure 18: Oil Production and Industry are part of Wilmington's identity. Photo: Mural at El Mercado Grocery on L Street and Watson Avenue.

Summary

Wilmington is a community located in Los Angeles's harbor. Early in the 20th Century, oil extraction, the Port of Los Angeles, and other industries transformed Wilmington's once expansive freshwater wetlands and coastal sage scrub ecosystems into the industry and hardscape heavy community it is today. For decades, these industries have attracted immigrants to Wilmington looking for employment. As Anglo communities in the greater Los Angeles basked in the Postwar employment, housing, and community boom subsidized by the government, racial and ethnically discriminatory planning practices effectively barred Wilmington from enjoying the benefits of the postwar economy. These policies not only barred Wilmington from the postwar boom, but even created an imposing physical separation between thriving Anglo Los Angeles and Wilmington with the construction of the 110 Freeway. In the latter half of the 20th Century, the effects of these discriminatory planning practices barred communities like Wilmington from good employment, divested

resources from the neighborhood and allowed the proliferation of pollution sources. Their effects became visible in both the built environment and the health of Wilmington residents. Five oil refineries exist within Wilmington, which, coupled with the Port of Los Angeles emit thousands of pounds of chemicals into Wilmington's air. Decades of oil extraction has left Wilmington with an alarming amount of active oil wells, many of which are located within feet of people's homes. Park access and tree canopy cover, ensured by the State for Anglo communities through policies such as the Quimby Act, are scarce resources in Wilmington. The result of all these economic and environmental disparities has been exposed streets, impaired resident health, housing insecurity, damaged ecological systems and a Wilmington unprepared to meet the coming environmental burdens placed on the region by climate change.



Figure 19: Section of Wilmington Waterfront Park, Wilmington's Southernmost park. Wilmington Waterfront Park was designed to serve as a buffer between the noise and air pollution that comes from the Port of Los Angeles.

Project Goals & Objectives

The *Enverdecimiento* for Environmental Justice Plan proposes landscape design strategies to improve the environment, resident health, and ecology in Wilmington. To address the health and environmental disparities in Wilmington, this plan outlines four goals along with a series of objectives under each goal.

I. The first goal proposes a neighborhood-wide urban forestry project. Urban forests have benefits that go beyond aesthetics—a fact often quoted by public agencies in Southern California.⁴⁹ In practice these agencies continue to prioritize trees for their appearance and low-maintenance costs rather than functions that can advance health equity in communities like Wilmington. The plan outlines specific trees to maximize the capture of air pollutants and stormwater, and provide shade. Expanding tree cover and understory planting could also provide habitat for local wildlife.

II. The second goal addresses greenspace access in Wilmington through the creation of new parks, community gardens, and school greening projects. Wilmington has a major need for parks.

III. The third goal proposes the conversion of former oil well and extraction sites into natural recreational spaces that showcase the native ecology of the region. Proximity to heavy industry and a century of oil extraction has completely impaired natural processes in Wilmington. Utilizing phytoremediation strategies, these sites could also serve as local examples of the remediation and repurposing of land contaminated by petroleum extraction.

IV. The *Enverdecimiento* for Environmental Justice Plan acknowledges that in order to achieve environmental justice and health equity in Wilmington, greening efforts need to accompany policy change. The fourth goal focuses on the policy change work that greening should complement to truly bring environmental justice to Wilmington and improve community health.



Figure 20: Mural of Jose Maria Morelos, hero of the Mexican Independence Movement. Located at *El Mercadito* on L. Street and Hyatt Avenue. Wilmington is home to a large population of Mexican immigrants.

Project Goals & Objectives

1. Improve Air Quality and Mitigate the Impact of Climate Change

- A. Expand Wilmington's urban forests to sequester air pollutants, capture stormwater, and reverse urban heat islands.
- B. Expand tree canopy cover on major and minor streets across Wilmington.
- C. Create a "green buffer" between major pollution sources such as railyards, industrial yards, and refineries. Extend "green buffer" along major highways such as the 110 Freeway, Harry Bridges Boulevard, Alameda Street, and Lomita Boulevard.

2. Improve Community Health by Expanding Access to Greenspace

- A. Improve Wilmington residents' quality of life and life expectancy by expanding greenspace acreage to meet county standards
- B. Promote nature-based design at Broad Avenue, Gulf Avenue, Fries Avenue, Wilmington Park Elementary Schools and Wilmington Middle School.
- C. Expand open space by introducing pedestrian features to informal gathering areas at the Metro Park & Ride on Pacific Coast Highway and the Figueroa and Grant Street Freeway underpass.
- D. Support SBCC's Harbor Farm Project, expand Wilmington Middle School's Community Garden Program and construct a new community garden on R Street and Banning Blvd.
- E. Expand existing greenspace at John Mendez Baseball Field and Community Dog Park on E Street and Figueroa

3. Reintroduce Ecology Native to Wilmington

- A. Convert oil well sites in Northwestern Wilmington into natural recreational spaces. Utilize phytoremediation strategies to clean contaminated lots
- B. Convert retention basin on Eubank Avenue into a freshwater wetland habitat and educational site.

4. Support Policies That Advance Health Equity in Wilmington

- A. Promote anti-displacement strategies that combat "green gentrification"
- B. Support a moratorium on residential oil wells and drilling sites.
- C. Support community efforts that seek to limit emissions from local refineries.

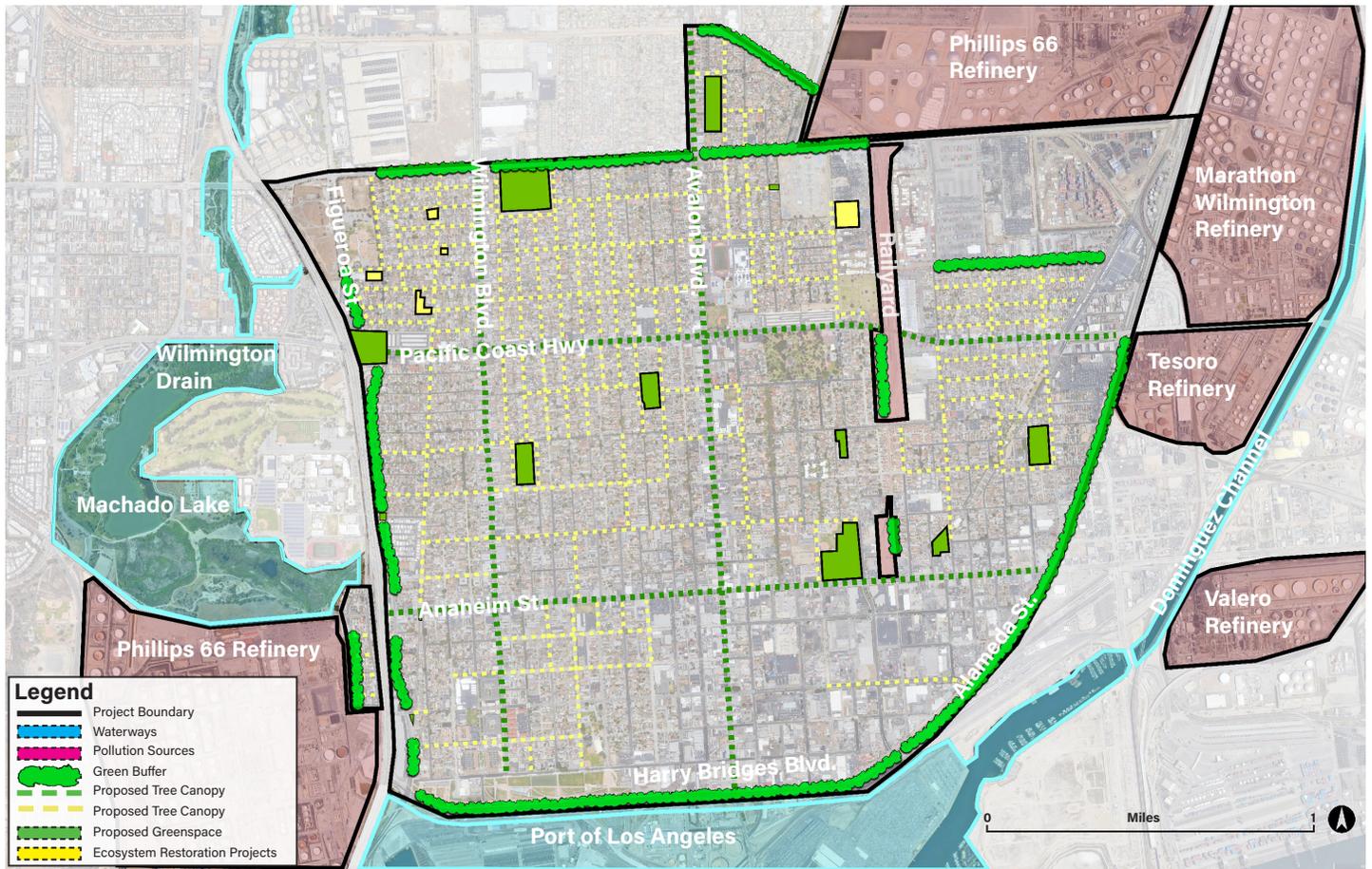


Figure 21: The full community concept plan lays out proposed projects and streets for designing green buffers, expand tree canopy cover and greenspaces and vacant land to transform into natural spaces in Wilmington. Included are the surrounding refineries and waterways for reference.

Goal I: Improve Air Quality and Mitigate The Impact of Climate Change

Wilmington's air quality is severely impaired by its proximity to major pollution sources, such as the Port of Los Angeles and the five oil refineries that surround the neighborhood. Additionally, residential sections of Wilmington are often adjacent to other sources of air pollution, such as the railyard that serves as the separation between west and eastern Wilmington, and the shipping yards just north of East Wilmington. Additionally, Wilmington has a serious need for street trees, as most of the surfaces in Wilmington are exposed to the sun. Goal I focuses on expanding Wilmington's urban forest to insulate Wilmington from toxic air pollutants and shade streets.

Air Pollution

There are two processes to take into account when planning tree planting projects for air pollution capture: deposition and dispersion. With deposition, air pollutants deposit onto trees, which trees then either hold the particles in place or absorb into their systems. Dispersion refers to the way in which trees can control the circulation of pollutants in the air, potentially moving them around and away from the pedestrian level.⁵⁰

The Urban Heat Island Effect

Environments like Wilmington that are mostly hardscape absorb the sun's heat and retain it at the street level throughout the day. This means that Wilmington is artificially heated by hardscape, exposing residents to heat-related illnesses. Having an ample tree canopy cover shades and protects communities. Without a significant intervention in terms of tree cover, Wilmington—like many working communities of color that lack the green infrastructure needed for climate adaptation—will continue to be one of the first and worst impacted by hotter temperatures resulting from climate change.

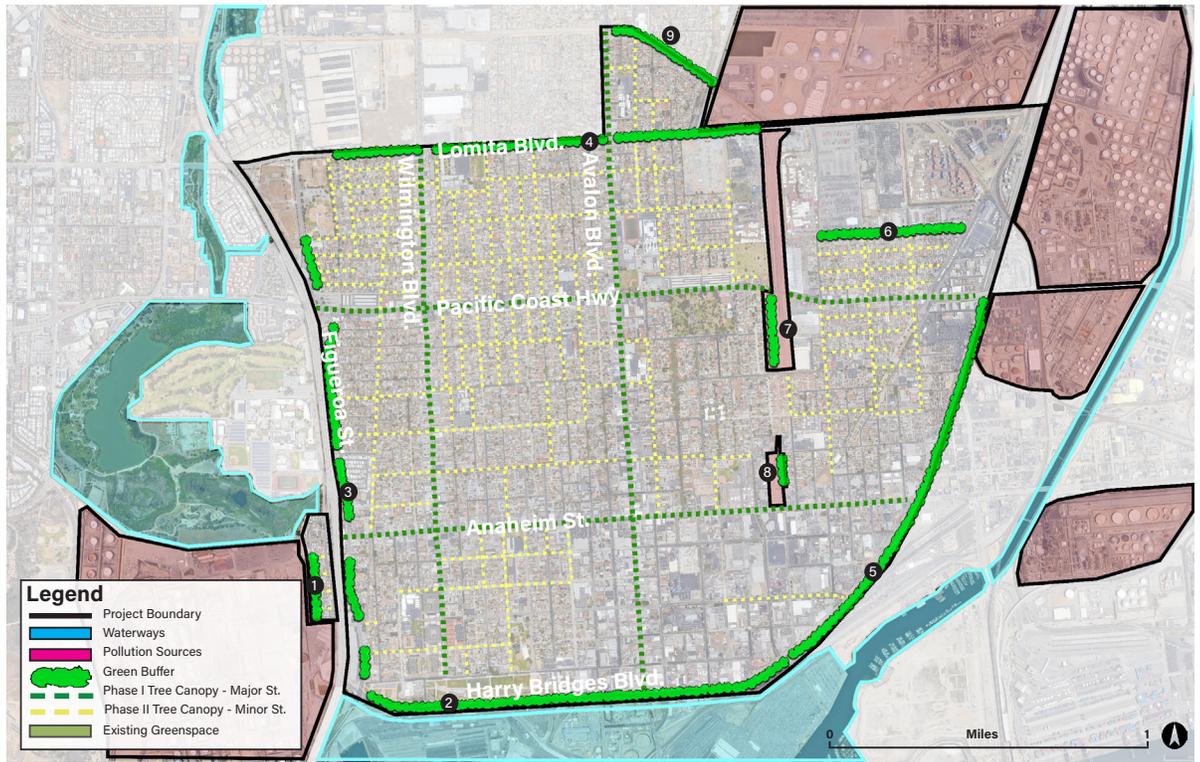
The Purpose of a Green Buffer

Wilmington is surrounded by major pollution sources—some of which are embedded within residential areas in Wilmington. The *Enverdecimiento* Plan proposes to install a vegetative buffer that surrounds Wilmington at important locations where pollution sources meet residential neighborhoods. The buffer would utilize trees such as Canary Island Pines (*Pinus canariensis*) and Mondell Pines (*Pinus eldarica*). Conifers are known for maximizing particle deposition and in controlling dispersion of highway air pollutants up and away from residential communities.⁵¹ Specific attention would be paid to tree spacing, height and width, leaf surface, understory cover, and in the case of the 110 freeway, combination with existing solid barriers. Green buffers would be located along Harry Bridges Boulevard in the south, sections of Alameda Street near residential portions of East Wilmington, and Lomita Boulevard. The buffer would also be extended to the Los Angeles County Flood Control District Lots in Southwestern Wilmington, West of the 110 next to the Phillips 66 Refinery, and along the rail yards that begin on Avalon Blvd and move east and down into Wilmington, cutting between homes.

Phase I Tree Planting: Major Roads

Phase I tree planting would focus on expanding tree canopy cover along Wilmington's major roads: Wilmington Boulevard, Anaheim Street, Pacific Coast Highway, and Avalon Boulevard. This phase would require significant re-engineering of Wilmington's major streets, to accommodate trees with a wider canopy spread and extensive root systems. Re-engineering streets would focus on expanding parkway widths, placing utility lines underground, and creating physical infrastructure for cyclists.

"Air is fresher and purer when it's close to plants."
- Wilmington resident



Goal I Green Buffer Locations and Corresponding Pollution Source

- | | |
|---|--|
| 1. Figueroa Place/Phillips 66 Refinery | 6. Sandison Street/Industrial Yards |
| 2. Harry Bridges Blvd/Port of Los Angeles | 7. Pacific Coast Highway/Railroad |
| 3. Figueroa Street/110 Freeway | 8. Anaheim Street/Railroad |
| 4. Lomita Boulevard/Phillips 66 Refinery | 9. Avalon Boulevard-Wilmington Avenue/Railroad |
| 5. Alameda Street | |

Figure 22 : Goal I projects. Areas not selected for cover under the Enverdecimiento Plan either have an existing tree canopy, or recently received trees as part of existing greening efforts in Wilmington.

Phase II Tree Planting: Minor Streets

Phase II tree planting would focus on all the minor streets in Wilmington identified in the community concept plan. The plan considers existing Safe Routes to School recommendations to plant trees in streets with frequent student foot traffic.⁵²The plan also considers recommendations from the Wilmington Urban Greening Plan, which identifies specific streets across Wilmington to install a tree canopy along with other green infrastructure features for stormwater management and ecology.⁵³ Connecting the *Enverdecimiento* plan to the existing Wilmington Urban Greening Plan would build on existing research on urban forestry in the neighborhood—research which can be connected to potential funding opportunities. The goal of each of these tree canopy project phases would be to capture air pollutants and shade as many exposed surfaces in Wilmington as possible.



Figure 23: Existing conditions of trees along Pacific Coast Highway. Pacific Coast Highway is a seven lane road with 15 foot sidewalks.



Figure 24: destroyed pine tree along Harry Bridges Boulevard. The Enverdecimiento plan proposes a more personalized maintenance approach to properly cover Wilmington from warmer temperatures and poor air quality.

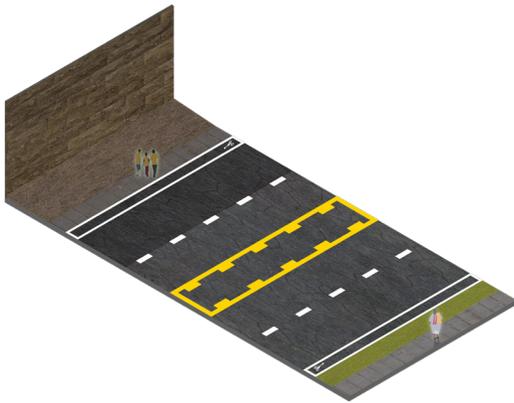


Figure 25: Existing tree-less conditions along the 110 Freeway. The Green Buffer would go along the 110 Freeway.

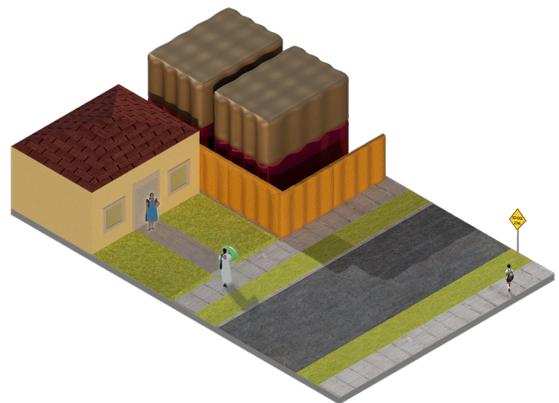


Figure 26: Port-related industry exists next to homes. The Green buffer would extend along homes adjacent to industry.



Figure 27: Existing conditions along Avalon Blvd. Phase I Tree Planting would introduce trees with a wide canopy for air pollution capture and shade.



Figure 28: Existing conditions along minor streets. Phase II tree planting would install trees in minor streets.

Goal II: Improve Community Health by Expanding Access to Greenspace

The *Enverdecimiento* plan would expand greenspace access to Wilmington residents in parts of the neighborhood where parks and open space are nonexistent. The Los Angeles County Parks and Recreation Needs Assessment found that most of the area from northern Wilmington down through the center of the neighborhood has little to no park spaces available for residents. One third of Wilmington residents suffer from obesity.⁵⁴ Obesity worsens asthma and is often coupled with other conditions such as hypertension, which can lead to stroke.⁵⁵ Most of these chronic diseases are preventable and having access to park space and other recreational amenities can both prevent and manage these conditions. The *Enverdecimiento* Plan would add 2718 acres of greenspace to the existing 66.26 acres of parkspace. This would mean increasing the acreage of greenspace per 1,000 residents from 1.17 to 1.64 acres. In August of 2020 the Port of Los Angeles announced it would invest 52 million dollars to construct the Wilmington Waterfront Promenade, a ten acre expansion of Wilmington Waterfront Park, which would connect Wilmington for the first time in decades to the waterfront, along with providing a natural buffer between port pollution and the neighborhood.⁵⁶ Although the number is under the County goal of 4 acres per 1,000, significant, innovative work to expand greenspace needs to continue in Wilmington to meet County metrics.

Proposed School Greening Projects

Wilmington's public schools offer opportunities to expand greenspace access to residents. All of Wilmington's public schools fit the traditional Southern California school design—large asphalt covered schoolyards with little greenspace, with most recreational features exposed to the sun. The plan would look at greening five school yards in Wilmington and convert thousands of square feet of asphalt in each school into vegetated planters, nature-based play areas for kids, stormwater capture

bioswales, expanded grass and tree shaded areas. To ensure access to residents, the plan also promotes joint use opportunities between LAUSD and the Department of Recreation and Parks along with other partners that offer recreational opportunities. Promoting green schoolyards and joint use agreements would greatly support the health of Wilmington residents. Pursuing joint use agreements would open existing recreational infrastructure for residents who often have a long walk to their nearest recreational facility.

•*Wilmington Middle School*: The school has an existing vegetable garden, which could be expanded to provide more residents opportunities to grow fresh fruits and vegetables.

•*Broad Avenue Elementary School*: Broad Avenue could serve as Wilmington's northernmost recreational facility.

•*Gulf Avenue Elementary School*: Gulf Avenue Elementary could serve the center-west part of Wilmington, which currently does not have any parkspaces or recreational features.

•*Fries Avenue Elementary School*: Fries Avenue has a large blacktop that once greening features are incorporated could serve the central Wilmington population.

•*Wilmington Park Elementary*: Wilmington Park Elementary could add much needed greenspace to East Wilmington and complement the existing recreational features at East Wilmington Greenbelt Park.

Informal Gathering Areas

The plan would focus on converting informal gathering areas into formal public spaces. The plan would introduces amenities such as benches, shade structures, planters, and trees to two projects sites used by street vendors on weekends, such as the Metro Park and Ride on

Pacific Coast Highway and Figueroa Street, and the freeway underpass on Grant and Figueroa Streets.

Community Gardens

To advance food security and prevent diet-related illnesses, The *Enverdecimiento* Plan would create and expand community gardening opportunities in parts of Wilmington where there currently are no gardens and complement the three existing community gardens: the Wilmington Community Garden in East Wilmington (0.18 acres), the I Heart Wilmington Community Garden near the Neighborhood's center (0.12 Acres), and the Vegetable garden at Wilmington Middle School (0.91 Acres).

Heart of the Harbor Community Farms: This plan would support existing efforts by SBCC to open the Heart of the Harbor Community Farms on L Street between Eubank and Lecouvreur Avenues. A preliminary design has been created for the first part of the project, which would convert 25,000 sq. ft. into a raised bed garden. The second half of the project could offer an additional 25,000 sq. ft. for community opportunities. (1.15 Acres)

Vacant Lot on Banning Boulevard and L Street: This lot forms part of the undeveloped end of L Street. There are no community gardening options in this portion of Wilmington. This project would add 7,600 square feet (0.17 acres) of gardening opportunities

Vacant Lots

John Mendez Recreational Space Expansion: The second lot currently serves as a large oil extraction site and is located next to the Mendez Baseball Park. The closure of this oil extraction site would open an opportunity to expand recreational space offered by the Mendez Baseball Park.

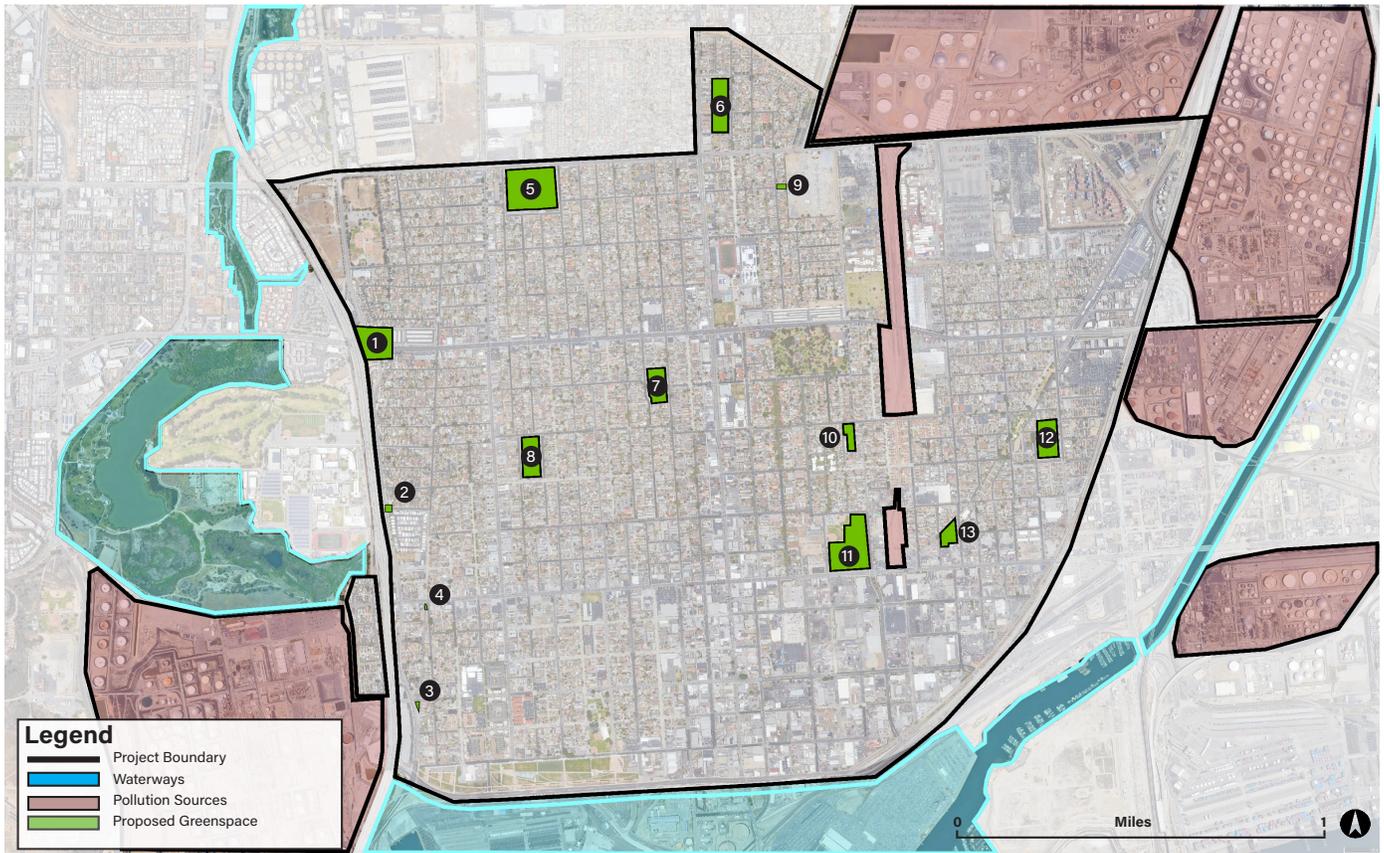
Dominguez Avenue Housing and Park: To meet Wilmington's housing and recreational needs, this plan proposes the conversion of the vacant

Expand Existing Greenspace

lot on Dominguez Avenue into a linked affordable housing project and parkspace.

Dog Park on E. Street and Figueroa: The Wilmington Greening Plan identified this space for a potential expansion with stormwater features.

Mar Vista Avenue Pocket Park: There currently exists a small garden on the corner of Mar Vista Avenue and Anaheim Street designed by the Clean Wilmington group. The garden has many decorative flowers, succulents and grasses. Under the *Enverdecimiento* plan and in potential partnership with Clean Wilmington, this project proposes to incorporate seating, shade canopies and street trees to the existing garden to convert the space into a small pocket park.



Goal II Projects

- | | | |
|--|---|---|
| 1. Metro Park and Ride Parklet | 6. Broad Avenue Elementary Green Schoolyard | 11. John Mendez Park Expansion |
| 2. Grant Avenue Parklet | 7. Fries Avenue Elementary Green Schoolyard | 12. Wilmington Park Elementary Green Schoolyard |
| 3. Expanded Figueroa St. Dog Park | 8. Gulf Avenue Elementary Green Schoolyard | 13. Dominguez Avenue Housing and Park |
| 4. Mar Vista Avenue Pocket Park | 9. Banning Blvd./R Street Community Garden | |
| 5. Wilmington Middle School Green Schoolyard | 10 Harbor Farms (In Progress) | |

Figure 29: Concept plan outlining Goal II projects.



Figure 30: Garden designed by #CleanWilmington on Mar Vista Avenue and Anaheim Street.



Figure 31: Wilmington residents visiting food vendors that set up on Grant Avenue and Figueroa Street.

Goal III: Reintroduce Ecology Native to Wilmington

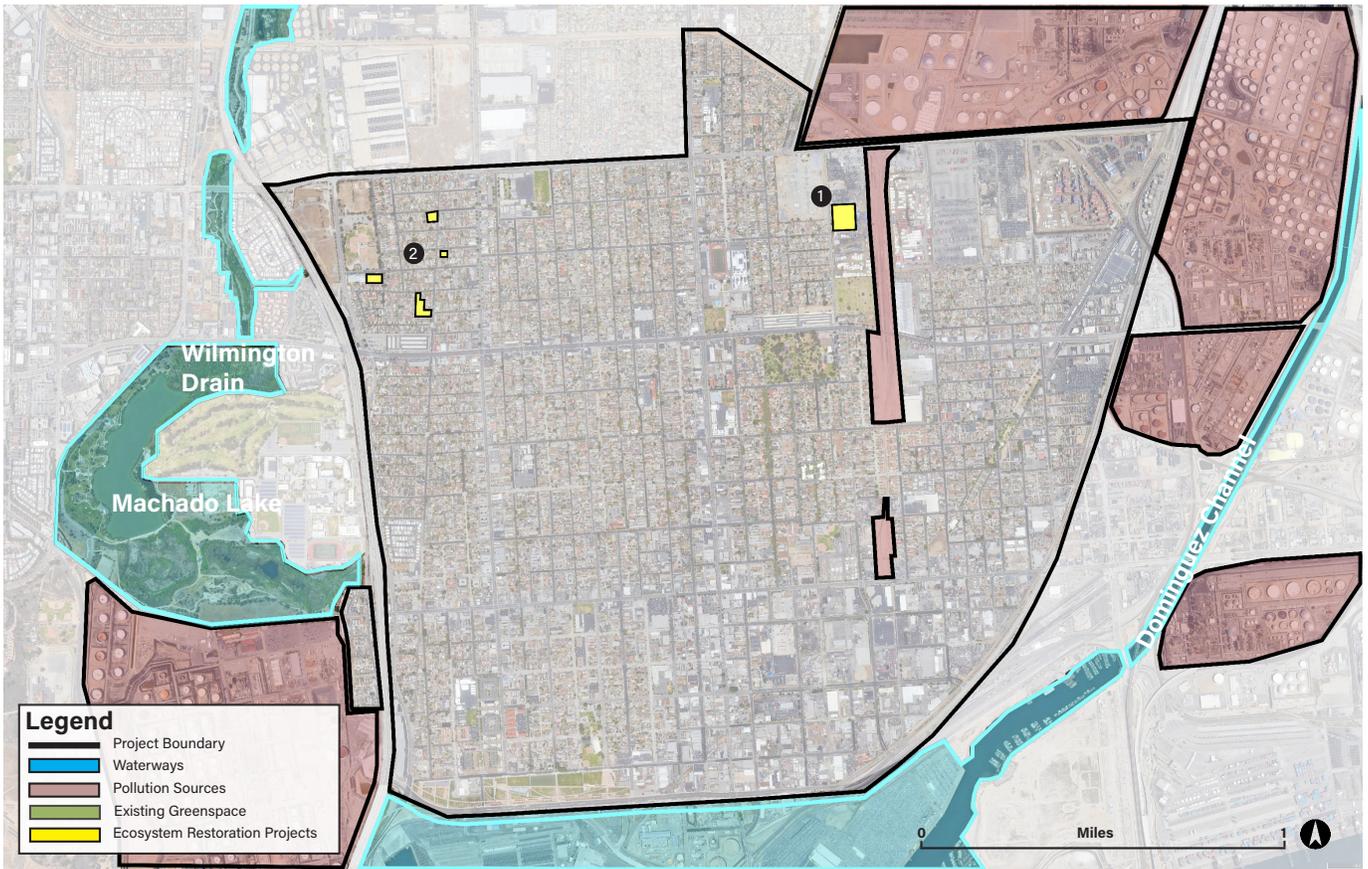
Goal III seeks to reintroduce the ecology native to Wilmington to the neighborhood. Wilmington, like most of the Dominguez Watershed is largely built out and impervious. Local traces of the area's once expansive freshwater wetland and coastal sage scrub ecosystems can be found just outside of Wilmington, at the Wilmington Drain and Ken Malloy Harbor Regional Park. Hardly any traces of these ecosystems can be found in Wilmington proper. Reintroducing these ecosystems would help create habitat for local wildlife, remove hardscapes in favor of greenspace, provide opportunities to clean contaminated soil and water, and provide recreational and educational opportunities for Wilmington residents.

Converting Oil Wells into Greenspaces

This project supports the closure of all residential oil well sites in Wilmington. Their closure would leave numerous vacant sites, which can be reclaimed for ecological and recreational opportunities. Decades of oil extraction have exposed many of these lots to different levels of soil and water contamination. This project proposes to create four natural recreational areas that exemplify different phytoremediation techniques. Recent studies on natural approaches to remediating soil and water have found that techniques have been most effective when dealing with petroleum-based contamination.⁵⁷ This project would use this research to introduce phytoremediation techniques for former oil well sites in Wilmington.

Creating a Freshwater Wetland

The *Enverdecimiento* Plan would convert an existing retention basin operated by LA Sanitation into a freshwater wetland. The wetland would serve as habitat for local wildlife and an educational space for Wilmington residents to learn about the local ecosystem.



Goal III Projects

1. Eubank Ave. Wetland Project
2. Ecosystem Restoration Projects

Figure 32: Concept plan outlining goal III projects.



Figure 33: Eubank Avenue retention basin used by LA Sanitation to capture stormwater.

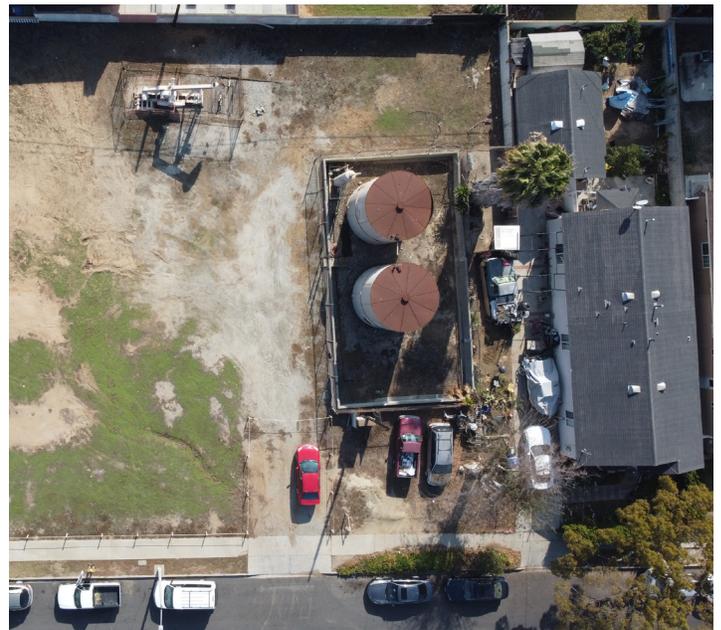


Figure 34: Over twenty oil well sites exist in the residential part of Northwest Wilmington.

Goal IV: Support Policies That Advance Health Equity in Wilmington

Goal IV focuses on supporting policy change efforts that support housing affordability and seek increased oversight and closure of pollution sources. Urban greening is part of a solution to environmental injustices in communities like Wilmington. Significant improvements in resident and ecological health cannot happen unless the problem of existing pollution sources is dealt with through policy change.

Anti-Displacement Policies

The *Enverdecimiento* plan promotes the creation of linked affordable housing and parks projects, to alleviate both park inequities and housing insecurity. Along with linked projects, the plan supports existing housing stabilization practices such as affordable housing development, rent control, and density bonuses.

Residential Oil Wells

This Plan also support efforts led by the STAND-LA Coalition in the City of Los Angeles to close residential oil wells. In December 2020, the coalition had a big victory at City Hall, as the Environment, Climate Change, and Environmental Justice Committee voted to start the process of working towards the amortization of residential oil wells across the City of Los Angeles. In April 2020, their proposal passed unanimously through the city's Planning and Land Use Committee.

Oil Refineries and the Port of Los Angeles

The Plan supports stricter regulation of oil refinery flares in the Wilmington area, as laid out by Communities for a Better Environment (CBE). CBE advocates for more air quality monitors across the community and periodic inspections of the refineries by the South Coast Air Quality Management District (SCAQMD), the regulatory agency tasked with overseeing air quality in the region.⁵⁸

As the state government works towards transitioning California away from fossil fuels, the Plan also supports the eventual phasing out of Wilmington oil refineries. This step would also phase out the use of heavy duty diesel trucks coming out of refineries and the Port of Los Angeles. Diesel trucks are major pollution source for Wilmington, which sees thousands of them daily on the neighborhood's major streets, on Alameda Street, and the 110 Freeway.

Summary

The *Enverdecimiento* Plan looks at four goals for improving resident health and environment in Wilmington. The first focuses on the ability of certain trees to capture air pollutants along major roadways and pollution sources and shade streets.

The second goal focuses on expanding greenspace access to all Wilmington residents. Greenspace is essential for human health, and in Wilmington, it could mean improving resident chances to live longer, healthier lives.

The third goal focuses on reintroducing ecological systems native to Wilmington. Wilmington—like the watershed it belongs to—is largely impervious, and traces of its freshwater wetland and coastal sage scrub ecology no longer exist.

The fourth goal focuses on promoting policies that advance health equity in Wilmington. This plan promotes community stabilization techniques to ensure that greening projects are enjoyed by the people they are meant for. The plan also supports efforts to close major sources of pollution such as residential oil wells and oil refineries. Urban greening should complement policy change and not detract from the primary goals of closing pollution sources.

Design Proposals

Introduction

The following section introduces a series of design proposals that seek to address each of the project goals laid out in the *Enverdecimiento* Plan. To introduce design concepts applicable across Wilmington, this section focuses on Northwestern Wilmington as it exhibits many of the issues that impair environmental and human health in Wilmington; Oil wells embedded in residential neighborhoods, absence of public recreational spaces, sparse tree cover, and proximity to pollution sources such as the 110 Freeway and the Marathon Refinery.

Issues in Northwestern Wilmington

25 Active Wells
5 Idle Wells



No Recreational Spaces



Sparse Tree Cover



Proximity to Pollution Sources

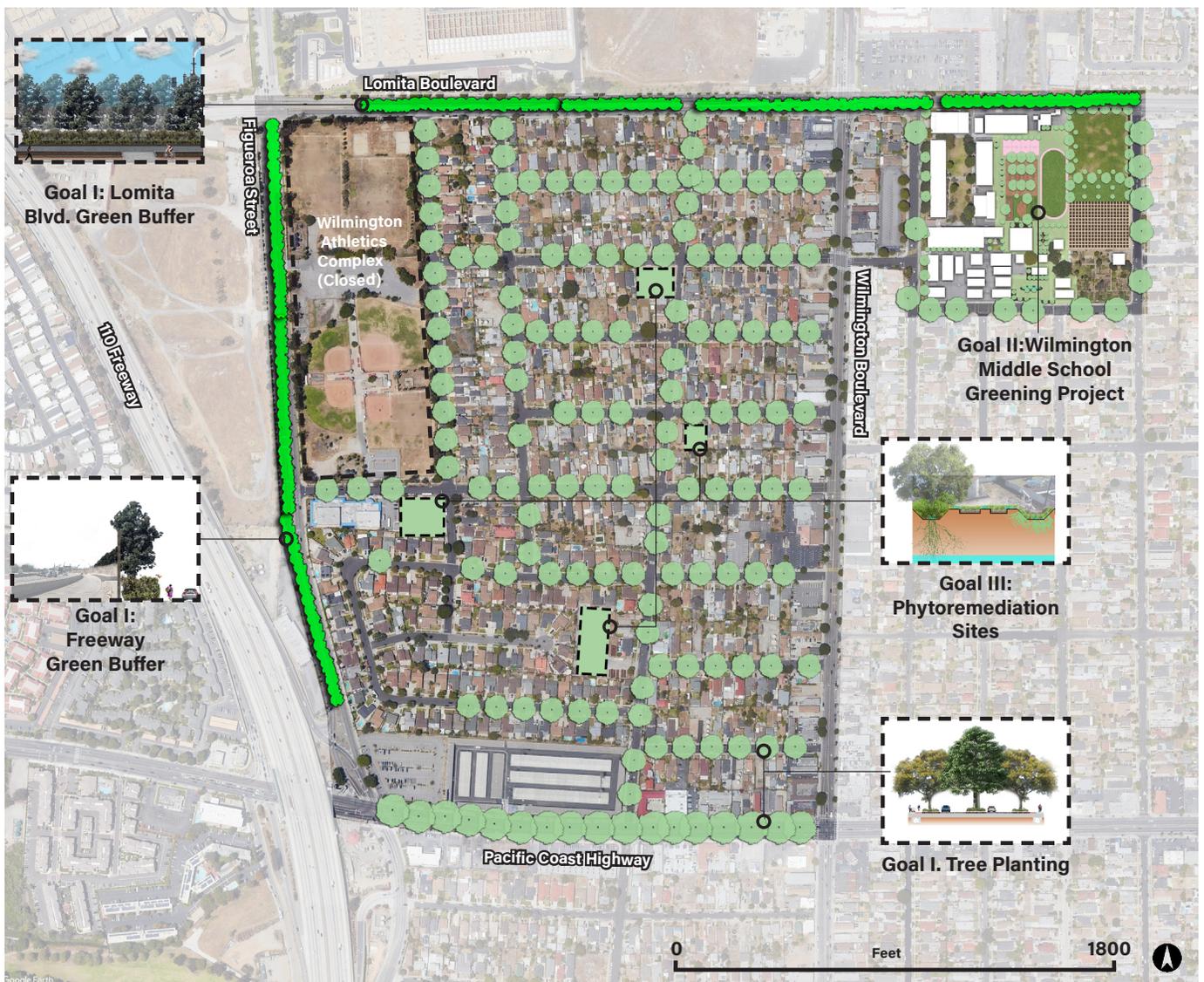


Figure 35: Map of Northwestern Wilmington with highlighted projects.

Goal #1: Expand Wilmington's urban forest to capture air pollutants and mitigate warming temperatures

Green Buffers

The *Enverdecimiento* plan proposes a green buffer that wraps around Wilmington at locations where the neighborhood's residential communities meet pollution sources. Emissions from the Port of Los Angeles and the five refineries around Wilmington release tens of thousands of pounds of nitrogen oxides (NOX), sulfur oxides (SOX), and particulates (PM) into the neighborhood's air. These chemicals are known to impair lung health. The purpose of a green buffer is to both capture these pollutants and recirculate them away from Wilmington by using dense trees and shrubs as both filters and walls. This report section will focus on the green buffers proposed for Figueroa Street along the 110 Freeway and the proposed median on Lomita Boulevard, which is adjacent to the Marathon Refinery.

Considerations:

Tree height: Pollutants will both attach themselves to tree surfaces and impact and go over the green buffer. Pollutants that go over the green buffer can travel over the community for a long distance, avoiding street level. Height of trees will depend on the height of pollution source. Research shows that 16' of height is appropriate for a buffer meant to capture emissions from cars, which are emitted at lower heights. Taller green buffer trees would be considered when looking to protect the community from refinery stack emissions.

Biogenic Emissions: All trees release natural emissions—some more than others. Trees selected for a green buffer should have low biogenic emissions, to ensure they do not negatively contribute to already impaired air quality.

Tree Surface: Research recommends pine trees for green buffer projects. The leaf density on pine trees provide an almost filter like quality that allows for pollution capture.

Tree spacing: Trees must be spaced closely, to leave as little space possible for pollutants to travel through the buffer and into the neighborhood. Pollutants that make it through a buffer spaced too far apart are slowed by the trees, which then leads to pollution stagnation in the neighborhood behind the buffer.

Evergreen: Trees selected for green buffers should not be fully deciduous. Seasonally deciduous trees leave large gaps for air pollutants to travel through a buffer and into neighborhoods.

Environmental Considerations: Trees should be climate appropriate. For Wilmington, this means incorporating trees that have a tolerance for coastal environments and are drought tolerant. This project proposes Mondell Pines (*Pinus eldarica*), Monterey Pines (*Pinus radiata*), and Canary Island Pines (*Pinus canariensis*) for Wilmington's green buffer.

Coverage from top to bottom: shrubs that can tolerate shade and pollution should be placed as understory planting in green buffers. A green buffer is most effective when there is coverage from the top to its bottom. This project proposes Lemonade Berry (*Rhus integrifolia*) and Toyon (*Heteromeles arbutifolia*) for understory shrubs, due to their leaf density, drought tolerance, habitat value, tolerance for partial shade, and use as understory shrubs in other local greening projects for air pollution capture.⁵⁹

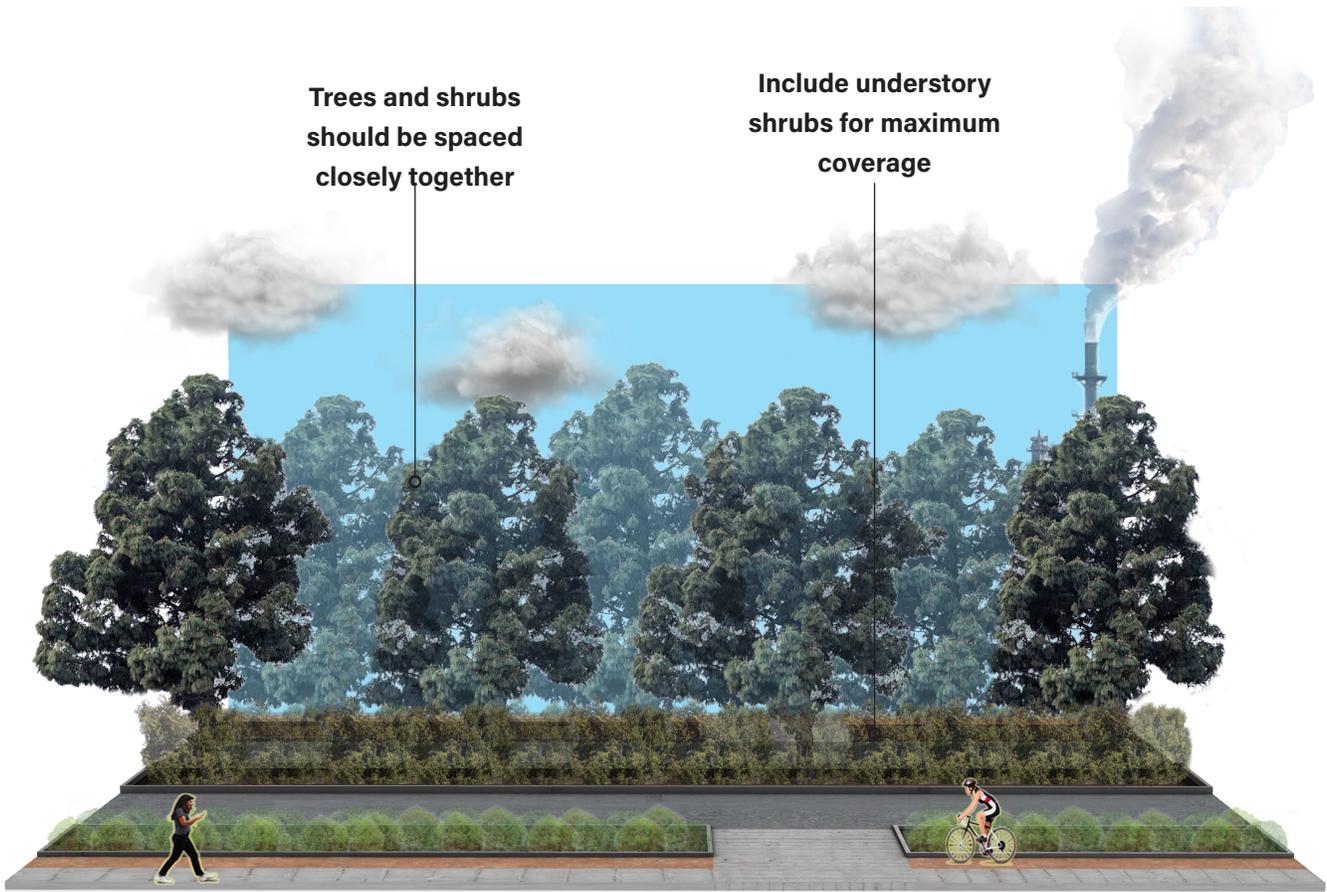


Figure 36: Section of Lomita Blvd. Green Buffer. Pine trees and Toyon are closely spaced together to form a dense, pollution capturing wall.

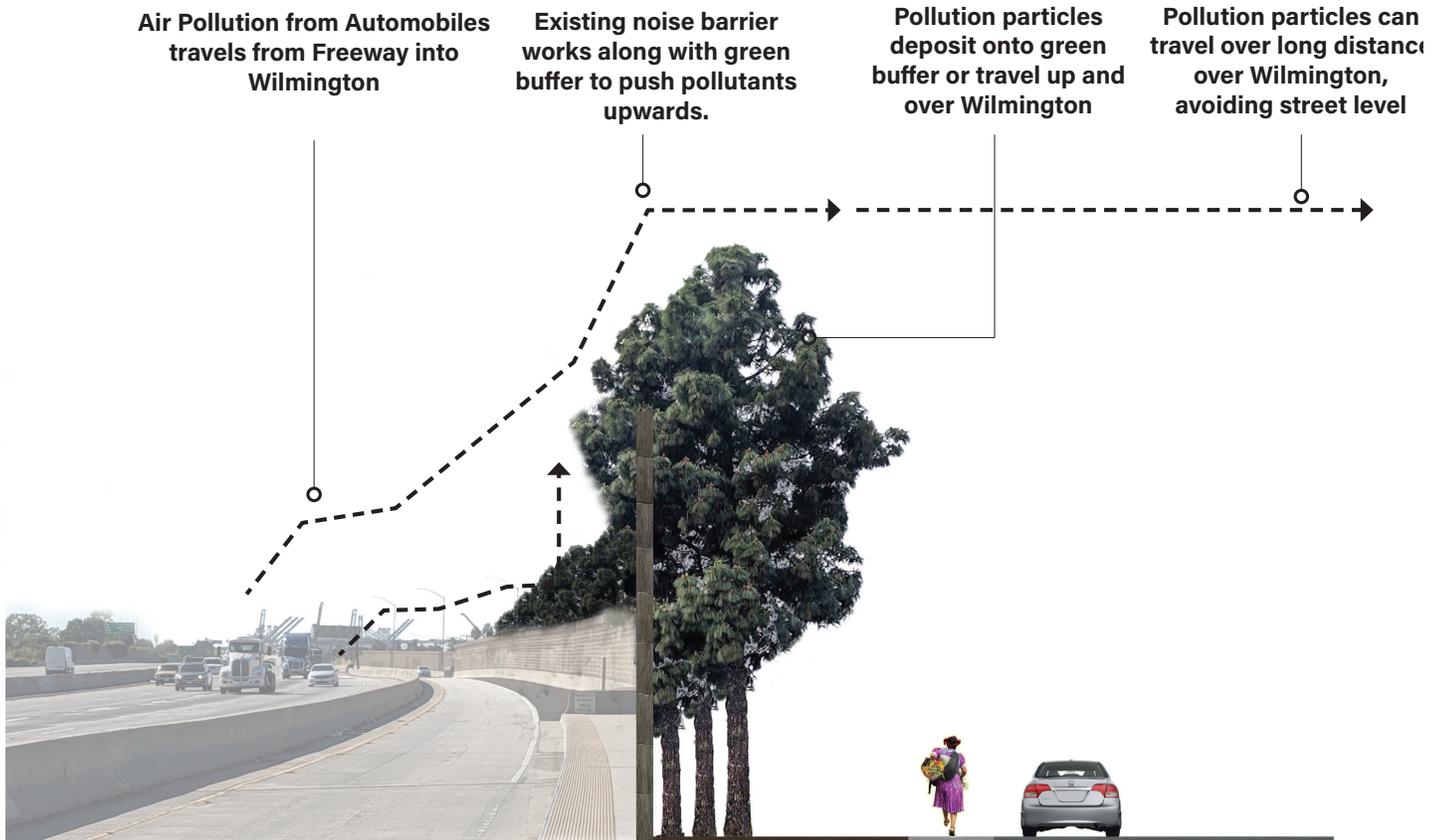


Figure 37: Section of green buffer along the 110 Freeway. Graphic models how pollution interacts with green buffer.

Tree Canopy Cover

Poor air quality and warming temperatures threaten the health of Wilmington residents. Wilmington has only sparse tree cover to cool streets and capture air pollutants. Many of the trees in the existing inventory selected for Wilmington streets by the city of Los Angeles cannot meet the environmental demands placed on the neighborhood by rising temperatures from climate change and poor air quality. They were selected for aesthetic reasons and for low maintenance requirements. Selection criteria focus on mitigating root and power line damage in streets where the minimum width of parkways is often about four feet.⁶⁰ Major streets receive the same treatment and trees even though their sidewalk and parkway widths can be as wide as ten feet. Many of the existing street trees are known to release high amounts of biogenic emissions. When planted at a large scale, these trees could cancel out any intended air quality benefits with their own emissions.⁶¹ Wilmington was also the historical target of disinvestment, through practices such as redlining and, as Anglo residents fled into the suburbs, reductions in local taxes that supported services such as parks and urban forestry.

The *Enverdecimiento* Plan proposes an equity-based street tree planting plan—one that recognizes Wilmington’s unique and precarious social and environmental situation. This means avoiding traditional tree planting lists in favor of trees selected for their ample canopy spread, lower biogenic emissions, being native to Wilmington, and ability to improve ecology. An equity-based tree planting plan would also invest in significant re-engineering of Wilmington streets to accommodate trees that meet the criteria described above.

Pacific Coast Highway

Using Pacific Coast Highway as an example, this plan proposes significant re-engineering of major streets to accommodate trees with larger canopy spread for shading

streets. This would include a wider parkway and planter widening, traffic lane removals, creation of median planters, and, where possible, placing power lines underground. Three criteria were used for selecting which streets to focus on for this project:

- Streets that form part of the Safe Routes to School Program at Wilmington schools.
- Streets identified in the Wilmington Urban Greening Plan as part of its urban forestry goal.
- Connectivity potential between existing greenspaces and proposed projects under the *Enverdecimiento* plan.

Currently, Pacific Coast Highway has a road width of 76 feet and accommodates seven lanes. Sidewalks are 15 feet wide and have planters that are about 4 feet wide, significantly spaced from each other by 20+ feet. Bronze Loquats (*Eriobotrya deflexa*) and Crape Myrtles (*lagnostroemca indica*) are common on Pacific Coast Highway—trees which average a canopy spread of about 20 feet, insufficient to cover the street’s 80+ feet of exposed surfaces.⁶²

This project proposes the creation of wide sidewalk planters on Pacific Coast Highway, road width reduction, creation of a median planter, and incorporation of a physical bike path. The *Enverdecimiento* plan removes Pacific Coast Highway’s sidewalk-adjacent traffic lanes to create expanded, 14-foot planters that accommodate larger trees. The trees selected for the sidewalk planters include Madrone (*Arbutus menziensis*), Tipu Tree (*Tipuana tipu*), and Deodar Cedar (*Cedrus deodara*). Each of these trees has a mature canopy spread of over 40 feet, and require planters that are at minimum widths of 6 feet (Madrone, Tipu Trees), and 8 feet (Deodar Cedar).⁶³ A 14-foot planter would provide ample space for the trees to thrive, along with an opportunity to include understory shrubs for habitat value. Understory plants for the sidewalk planters include Yarrow (*Achillea*

millefolium) and *Salvia* 'Bee's Bliss', selected for their ability to thrive under shade and for being in the Wilmington Urban Greening Plan.⁶⁴ At 16 feet, the median planters could accommodate Oak trees, with a potential average canopy spread of 90 feet, enough to cover a significant amount of exposed surfaces on Pacific Coast Highway. Oaks selected include Southern Live Oak (*Quercus virginiana*), and Engelmann Oak (*Quercus engelmannii*)—selected for having a high canopy that, with proper maintenance, can accommodate the 14 feet maximum height of freight trucks.⁶⁵ The goal is to provide an uninterrupted, laced canopy over major streets. Hummingbird sage (*Salvia spathacea*) is selected for the median, for its ability to thrive under oak trees.

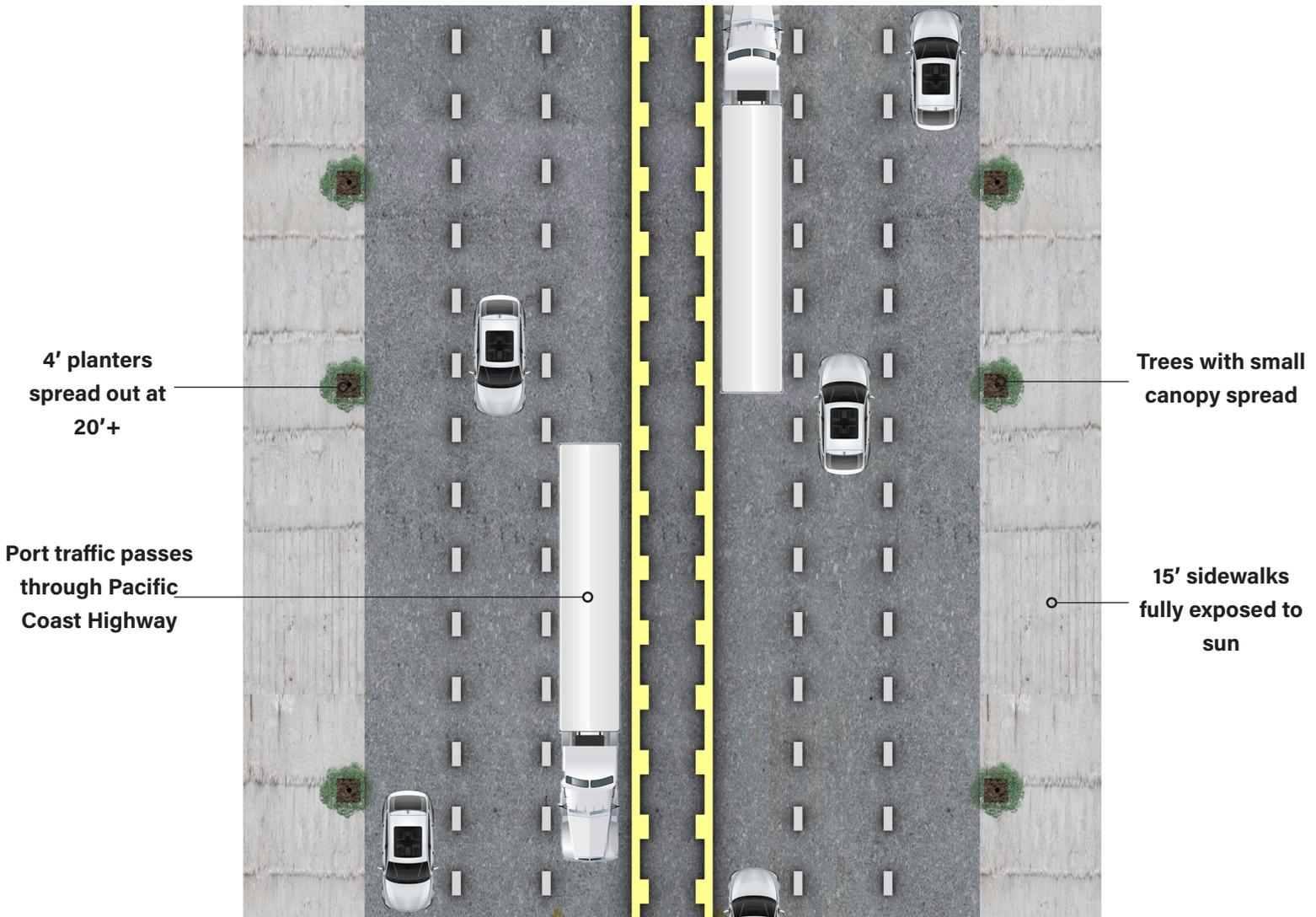


Figure 38: Existing conditions on Pacific Coast Highway.



Figure 39: proposed redesign of Pacific Coast Highway (Section).

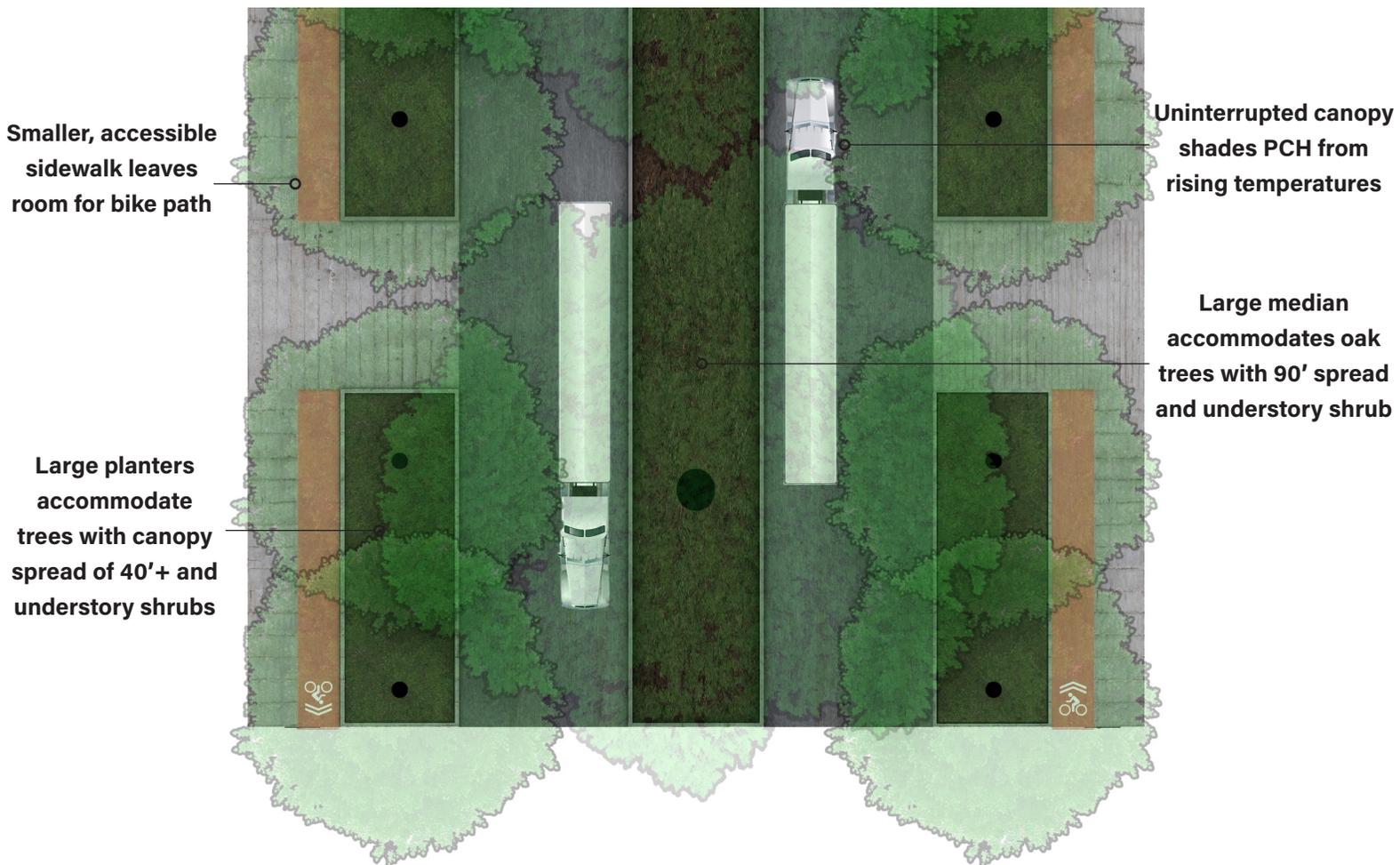


Figure 40: Proposed redesign of Pacific Coast Highway (Plan).

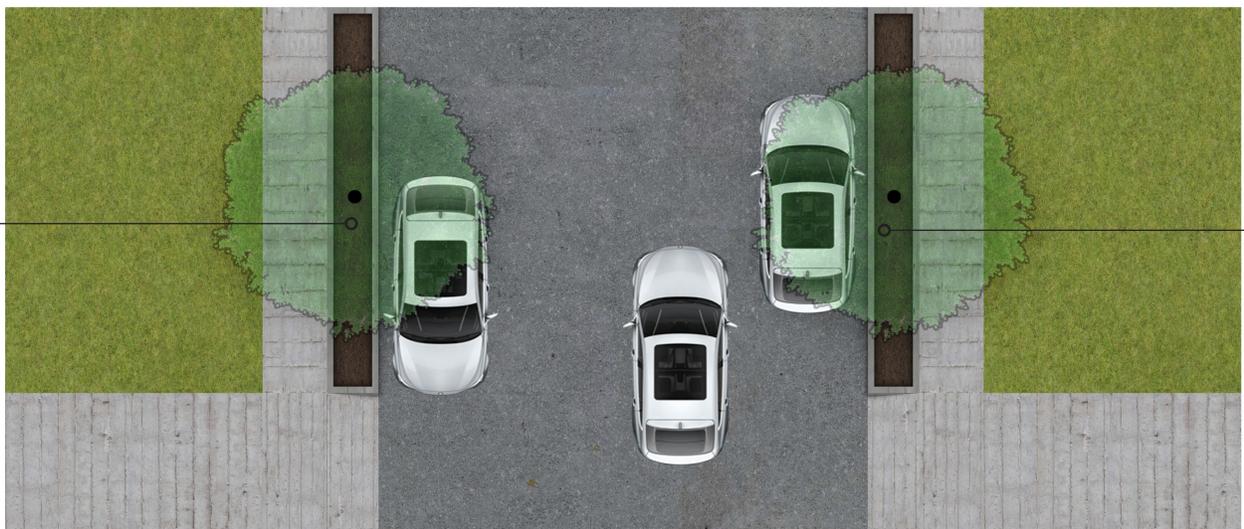
Minor Streets

Minor streets in Northwest Wilmington have a road width of about 38 feet. Parkway are 4 feet wide—one reason why small trees such as Australian Willow (*Geijera parviflora*) and Weeping Bottlebrush (*Callistemon viminalis*) are selected for minor streets. These trees offer a small canopy spread. Weeping Bottlebrush is known to have high biogenic emissions.⁶⁶

This project proposes a 2 foot road reduction and 1 foot parkway expansion on minor streets to 5 feet. An added foot for parkways can accommodate trees with wider canopy spread and ecological benefits. Trees selected for minor streets include Marine Arbutus (*Arbutus marina*), Holly Oak (*Quercus ilex*) and—with proper maintenance—Madrone (*Arbutus menziensii*). These trees can offer a canopy spread of 25+ feet. Understory plants selected for minor streets include Yarrow (*Achillea millefolium*), and Catalina Currant (*Ribes viburnifolium*), which are included in the Wilmington Urban Greening Plan and are native to Wilmington.⁶⁷

Swales for stormwater capture can also be incorporated into parkways, and certain streets in Northwest Wilmington are identified in the Wilmington Urban Greening Plan as potential

stormwater management opportunity sites.⁶⁸ Plants selected in the *Enverdeamiento* plan for swales include Common Rush (*Juncus patens*), and Golden Currant (*Ribes aureum*).



Insufficient shade from small canopy

Parkways are under 4' width

Figure 41: Existing conditions on minor streets in Northwest Wilmington.

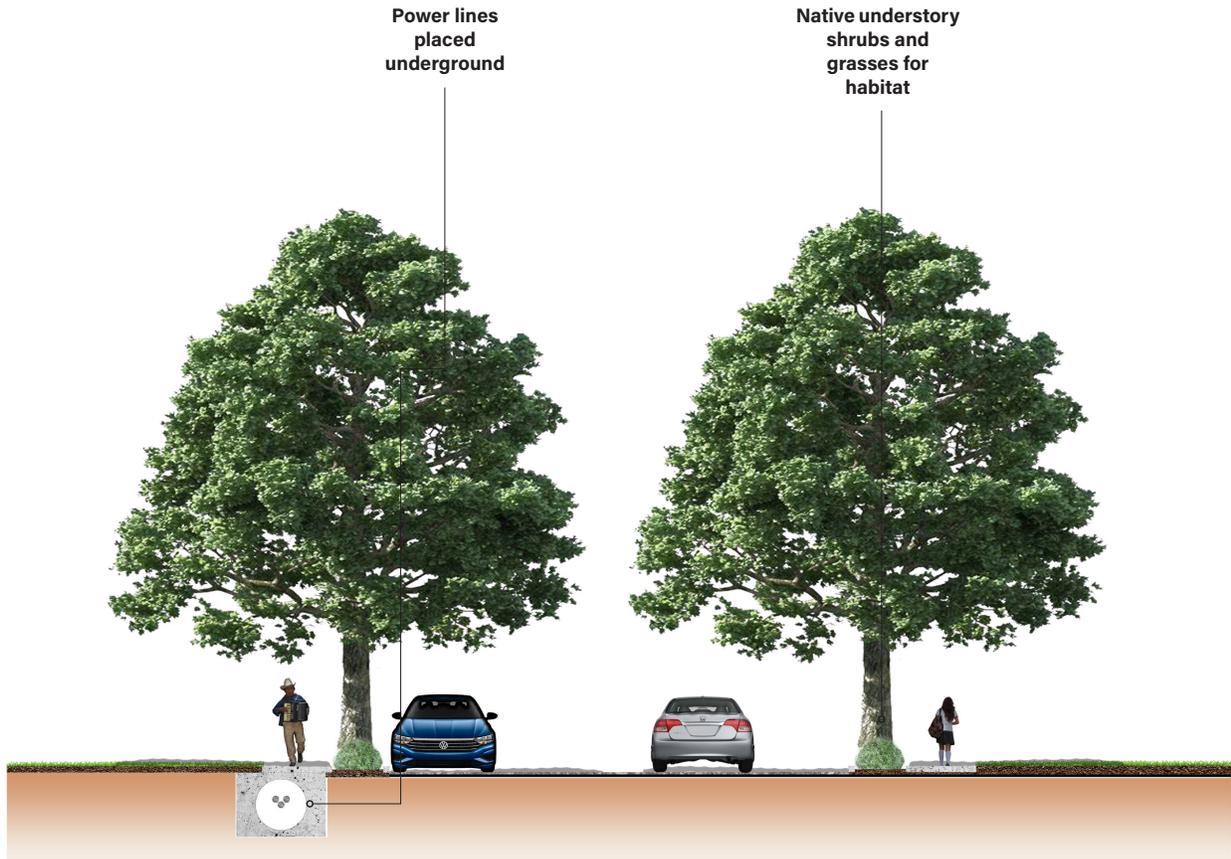


Figure 42: Section of Proposed Redesign of minor streets in Northwest Wilmington.

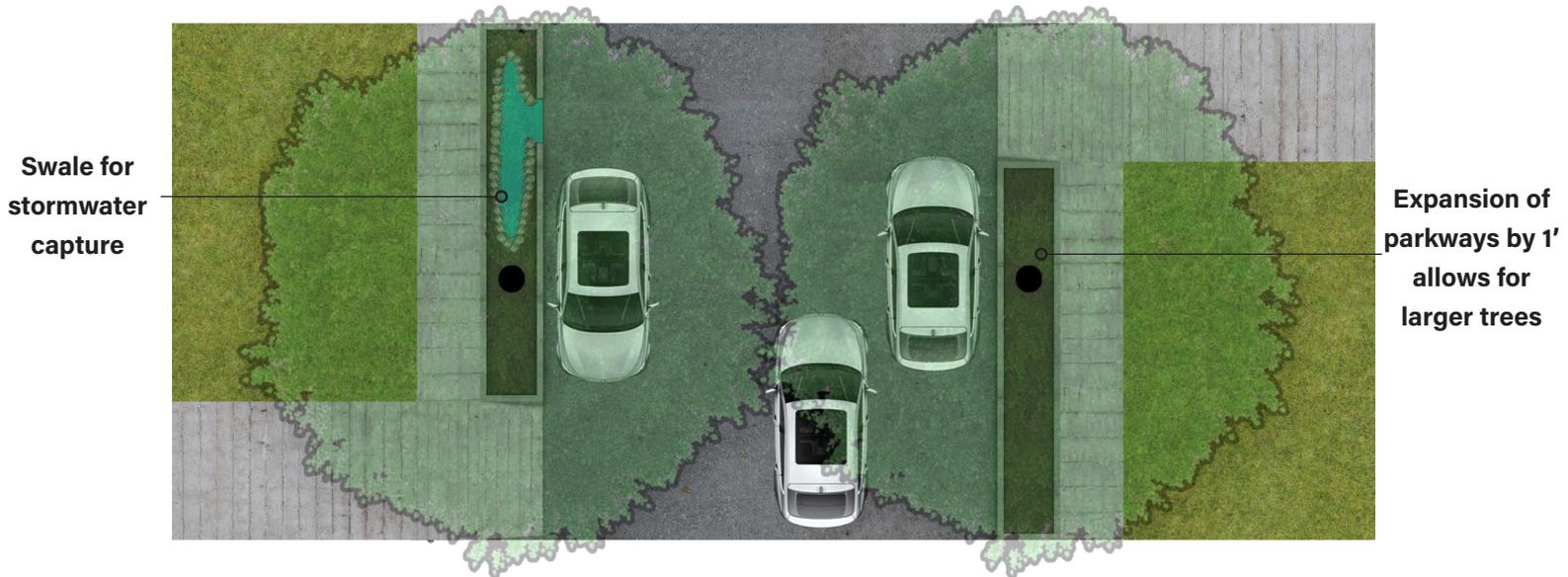


Figure 43: Proposed Redesign of minor streets in Northwest Wilmington.

Additional Proposals: Targeted Interventions

An equity-based urban forestry plan cannot thrive without significant investments in maintenance and in creating infrastructure that can accommodate higher quality trees. This factor is of utmost importance and is what will separate current urban forestry plans from future ones. The *Enverdecimiento* Plan proposes what the Prevention Institute calls “targeted interventions,” meaning that infrastructure and greenspace maintenance funding be allocated specifically for meeting health equity needs in disadvantaged communities like Wilmington.⁶⁹ Fortunately, Los Angeles County recently passed Measures A and W. Measure A provides \$94 million annually for greenspace development and maintenance funding. Tree planting and maintenance projects can also receive funding under Measure A.⁷⁰ Measure W provides \$300 million in annual funding for stormwater infrastructure improvement and heat reduction projects, which can include projects focused on greenspace development. As

an infrastructure measure, Measure W funds can be allocated to make the re-engineering of streets needed in Wilmington to accommodate larger trees.⁷¹ Funding from both Measures could also be used to support regular, quality maintenance of trees planted under the *Enverdecimiento* Plan. Partnerships with groups like the Los Angeles Conservation Corp and Clean Wilmington can ensure tailored, local maintenance of Wilmington’s urban forest and provide local jobs.

Goal #2: Improve community health by expanding access to greenspace

Wilmington Middle School

Wilmington has a significant need for parks and recreational spaces. Northwestern Wilmington has no publicly accessible recreational areas. Access to parks and recreational facilities improves community health. Research shows that having a park within your census tract improves median life expectancy in residents, reduces the prevalence



Figure 44: Aerial of Wilmington Middle School showing existing conditions.

Wilmington Middle School Green Schoolyard: Proposed Design

Legend

- 1. Reflective Asphalt Coating
- 2. Tree Planters with Swales
- 3. Shaded Seating Area
- 4. Outdoor Theater with Seating
- 5. Native Garden
- 6. Riparian Area
- 7. Expanded Vegetable Garden With 200 beds
- 8. Passive Recreation Field
- 9. Race Track with Grassy Field
- 10. Sport Field With New Trees
- 11. Basketball Courts with Reflective Asphalt Coating



Figure 45: Proposed School Greening Concept Plan for Wilmington Middle School.

of diabetes, cardiovascular issues, and obesity.⁷² Like most of Los Angeles, Wilmington does not have easily accessible land that can accommodate large public spaces. The *Enverdecimiento* Plan proposes the development of green schoolyards, such as in Wilmington Middle School. The plan proposes to convert 65,000 square feet of asphalt schoolyard in Wilmington Middle School into softscape, such as areas with grass, decomposed granite and mulch. 117 trees would be incorporated into the school to provide shade and stormwater capture opportunities. Amenities include a shaded lunch seating area, passive recreation field, amphitheater, track with a grassy center, native garden, and riparian habitat area. A survey conducted as part of outreach for the *Enverdecimiento* Plan found that residents identified community gardening opportunities as a priority greenspace for Wilmington. The Green Schoolyard project at Wilmington Middle School

would expand the existing vegetable garden to include 200 new 10'x10' beds for residents to grow food.

Additional Proposals: Support for Joint Use Policies

To make room for additional publicly accessible recreational spaces such as in an upgraded Wilmington Middle School, this plan promotes the development of joint use agreements between the Los Angeles Unified School District, the Los Angeles Department of Recreation and Parks, and organizations that provide recreational services to Wilmington residents. Residents should be able to access expanded gardening opportunities at Wilmington Middle School, and the added amenities proposed under the *Enverdecimiento* Plan.

Goal #3: Restore native ecology in Wilmington

Addressing oil extraction sites in Northwest Wilmington

This plan supports the closure of all oil wells in residential parts of Wilmington. This closure would leave more than two dozen vacant fields in Northwestern Wilmington, all with potentially varying levels of contamination. With context-appropriate remediation strategies, these lots can be repurposed to become both recreational spaces and habitat for native wildlife. The *Enverdecimiento* plan proposes the use of phytoremediation strategies to clean up the petroleum-based contamination that likely exists in these sites, and focuses on the four largest lots within Northwestern Wilmington. Phytoremediation refers to the use of plants and their natural processes to clean up contamination of soils, water, and air. Testing will need to happen to determine the level of contamination of each site. This project illustrates a selection of proven phytoremediation strategies to tackle contamination at different depths and different chemical makeups. Specific techniques used at specific sites will be used based on test results.

Research on phytoremediation shows that applied strategies are most successful at cleaning petroleum-based contaminants. Oil extraction contaminates groundwater and the land where wells and other extraction facilities are located. The most successful phytoremediation work happens within the first two feet of depth in contamination sites, as the plants selected to remediate soil often have most of their fibrous root zones within that depth. Practitioners can overcome this limitation by various means: trenches can be dug, and plants placed at the bottom to reach the contaminants located at deeper levels. Practitioners can also use phreatophytes, or plants that seek groundwater through long roots to capture pollutants at greater depths. Phreatophytes require regular

contact with water. This project recommends supplemental irrigation to support plants. A potential partnership for reclaimed water could be established with the Los Angeles Department of Sanitation, which has a treatment plant a few blocks from the oil wells in Northwestern Wilmington. Some contaminants are difficult to extract. Plants with fibrous root zones can be used to stabilize the pollutants in place, effectively keeping pollution from migrating to other parts of the site.⁷³ The graphic on page 40 illustrates the different phytoremediation strategies outlined above. Additionally, a list of potential plants appropriate for both phytoremediation and reintroduction of natives is included below.

Recommended Plant List for Phytoremediation Projects

- Willows (*Salix nigra, viminalis*): Phreatophytes, produce large amount of biomass which creates more chemical processes that breakdown pollutants in the soil.
- Mulefat (*Baccharis salicifolia*): phreatophyte, native to Wilmington.
- Common Rush (*Juncus patens*): riparian grass
- Valley Sedge (*Carex barbarae*): Grasses commonly used in phytoremediation work.
- Coast Live Oak (*Quercus agrifolia*): native to Wilmington, phreatophyte.
- California Sycamore (*Platanus racemosa*): native to Wilmington, phreatophyte.

Phytohydraulics: Plants with deep roots extract and destroy or evapotranspire groundwater contaminants.

Rhizodegradation: microbial activity in fibrous root destroy contaminants.

Phytovolatilization: Plants takes up contaminant and removes it by using it in growth process.

Phytostabilization: Plant roots hold difficult to extract contaminants in place. trench created to reach contaminants deep in earth.

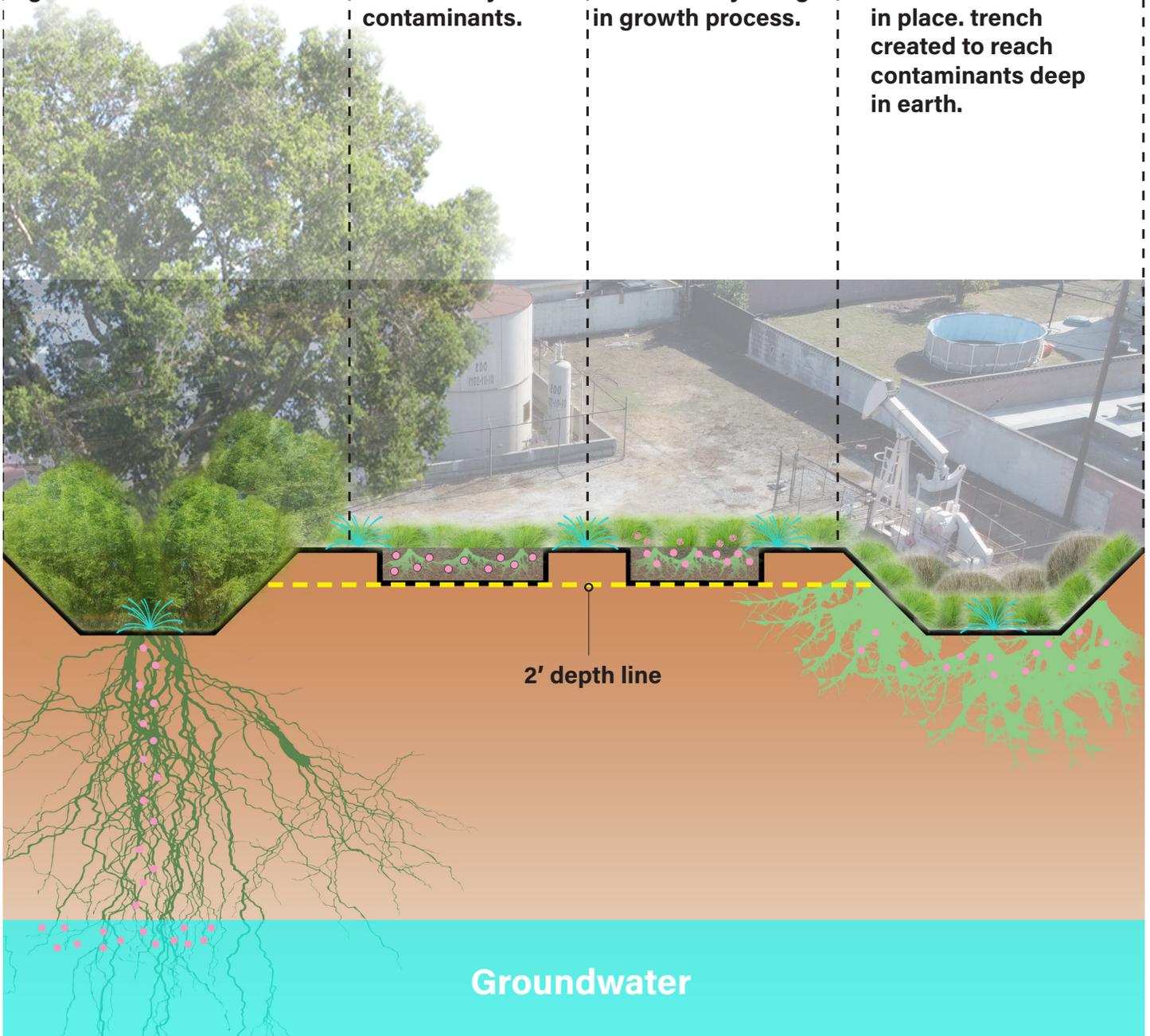


Figure 46: Section and model illustrating different strategies for phytoremediation of sites contaminated by petroleum extraction. The pink dots represent petroleum-based contaminants.



Figure 47: Islas Housing Project in South Los Angeles (Credit: Lorcan O’Herlihy Architects)
 Source: <https://cbhousing.org/communities/isla-intersections/>.

Goal #4: Support Policies That Advance Health Equity in Wilmington

The Los Angeles County Department of Public Health defines work of health equity as advancing opportunities so that “everyone has the community conditions needed for optimal health and well-being.” These community conditions, from a public health standpoint include access to resources such as “good schools”, A “thriving and inclusive economy”, and “sustainable, healthy environments.”⁷⁴ The *Enverdecimiento* Plan recognizes that advancing health equity requires more than just urban greening strategies: Policy work needs to happen in tandem with green infrastructure improvements. This plan supports the development of affordable housing, and dismantling pollution sources such as oil refineries and residential oil wells.

Greening without Gentrification

In recent years, housing and park advocates have raised concern over the potential for greenspace projects to displace low-income

residents. Wealthier residents move into lower income communities with newly constructed or renovated parks and displace the original residents, who in the end do not enjoy the benefits of new greenspaces. Having access to affordable housing contributes to the health and well-being of residents. Residents who are not housing burdened worry less about being able to provide food for the family. The mental health costs of worrying about housing burden eventually impacts physical health, which is already impaired in communities like Wilmington.⁷⁵ The challenges of park equity—making sure every resident regardless of their background has access to parks—and affordable housing should be dealt with simultaneously. In recent years housing and parks advocates have accomplished significant policy work that supports the merging of the two fields. In 2016, Through organizing efforts of the Los Angeles Neighborhood Land Trust and other park advocates, the Los Angeles City Council voted to reform the city’s Quimby ordinance. The city’s ordinance had not been updated since the 1970s, which means that for decades the amount

of fees collected did not keep up with the costs of constructing a park.⁷⁶ Simultaneously, park advocates organized the passage of Measure A, the County of Los Angeles's own park funding measure. Measure A's equity-based funding programs and lack of sunset clause will ensure that annually the County will collect 94 million dollars for parks in neighborhoods that are severely park-poor, like Wilmington.⁷⁷ Additionally, in 2016 the City of Los Angeles passed Measure HHH, to support the creation of affordable housing in the city, and in 2017 the County of Los Angeles passed Measure H, its own policy to tackle the unhoused resident crisis.⁷⁸

This plan proposes the development of linked affordable housing and greenspace opportunities in Wilmington. Since 2016, coalitions between affordable housing and parks advocates have championed the creation of sites that offer both crucial community assets. For example, Clifford Beers Housing is currently constructing the Isla Intersections Housing in South Los Angeles, an affordable housing complex located at the intersection of the 105 and 110 Freeway. The housing project includes a series of innovative green infrastructure features to capture and filter freeway pollutants that form part of a 'shared street,' which will be a public space that repurposes a busy street. The Islas project leveraged Measure HHH funding and is expected to open in May 2021.⁷⁹

The Enverdecimiento Plan identifies four lots within Northwestern Wilmington as potential sites for linked parks and affordable housing projects. Three lots are owned by the Los Angeles Department of Water and Power. Urban land trusts such as the Los Angeles Neighborhood Land Trust often pursue publicly owned lots first before seeking private property for greenspace projects as the process towards transferring ownership of property is easier under public property.⁸⁰ As publicly owned lots, the process towards converting these lots into linked

housing and parks could be facilitated through close collaboration between city officials, the Department of Water and Power, and affordable housing and park advocates. In total, these three sites could offer up to 37,000 square feet of space for affordable housing and greenspace. The fourth lot is currently a 13,000 square foot active oil well site off Wilmington Blvd. To convert this lot the city would need to first enact policy that closes oil production sites in residential neighborhoods. Analysis of site conditions, funding search, and treatment of the site for potential pollutants through strategies such as those laid out in goal three of the *Enverdecimiento* Plan would then follow.



Figure 48: The Enverdecimiento Plan identifies the four sites above as potential linked affordable housing and greenspace opportunities, due to their size in square feet and being publicly owned land (in the case of the LADWP lots).

Closing Pollution Sources

Along with linked affordable housing and greenspace development, this plan supports the use of proven anti-displacement policies for Wilmington. These policies include rent control to support existing Wilmington residents, higher density housing, and tenant protection programs as advocated for by the Prevention Institute in their brief "Healthy Development without Displacement."⁸¹

Oil wells

Successful implementation of this plan's objectives in goal three is contingent on the closure of existing oil well sites in residential areas of Wilmington. Oil wells near residential areas impair the health of community members through their emissions and flowback of

chemicals used to extract oil. Community based organizations such as Communities for a Better Environment, and groups such as the STAND-LA Coalition are actively advocating for the closure of residential oil wells in communities like Wilmington. In December 2020, the Los Angeles City Council voted to begin the process of working towards the phase out of residential oil wells in the city. On April 20th, 2020, the Planning and Land Use Committee voted unanimously toward a moratorium on oil wells in residential communities. The motion will pass through two more committees before going to the full City Council.⁸²

Refineries

Green buffers are a physical, landscape-based strategy towards protecting Wilmington from the pollution that stems from oil refineries.

The most comprehensive way to protect residents from refinery pollution is the phasing out of oil refining practices in Wilmington. This plan supports the research conducted by Communities for a Better Environment which lays out a plan for transition oil refining out of California by 2050. According to CBE, oil refineries are an essential cog in the global oil production machine. Phasing out refineries from California would not only support the health of residents, but support in meeting the states climate goals by 2050. Their research suggests that beginning a 5-7 percent annual decrease in refining today is critical to both meeting the states climate goals and ensure sustainable transitions for California residents and municipalities dependent on oil extraction for their livelihoods to alternative sources of income and social safety nets.⁸³

Summary

The *Enverdecimiento* for Environmental Justice Plan lays out four goals that utilize greening strategies to improve both health and the environment in Wilmington. This section of the plan focuses on northwestern Wilmington to demonstrate different strategies laid out in the project goals in action.

Goal I focuses on urban forestry as a strategy for capturing air pollutants and mitigating warmer temperatures as a result of climate change. The plan proposes a green buffer that offers Wilmington protection from pollution sources. Lomita Boulevard and the 110 Freeway green buffer are highlighted in this section, to illustrate the processes and design considerations that make an effective green buffer. Goal I also proposes the introduction of street trees with larger heights and canopy spread to shade exposed streets. Pacific Coast Highway and minor streets are highlighted to demonstrate the significant change this updated list of trees would make in shading Wilmington, along with the re-engineering of streets necessary to accommodate larger trees. An improved maintenance regime will essential for the trees proposed under this plan.

Potential maintenance funding and partnerships are briefly outlined in this report.

Access to greenspace is essential for human health. Goal II focuses on expanding greenspace access to Wilmington residents. This section highlights Wilmington Middle School as a site which could cover multiple recreational needs in Wilmington. A green schoolyard for Wilmington could both provide a natural setting for students to thrive, and, with a joint use agreement, much-needed recreational opportunities to residents in general.

Significant political momentum currently exists in the City of Los Angeles to permanently close oil extraction sites. Goal III attempts to answer the question of how these empty lots could be repurposed to support the reintroduction of native ecosystems, remediate land contaminated by petroleum products, and provide recreational spaces for residents. This report section illustrates different strategies for naturally remediating the largest oil extraction sites in Northwestern Wilmington, to make them publicly accessible recreational spaces for residents.

Any greening efforts in Wilmington should accompany policy changes that improve health in Wilmington. Goal IV provides opportunities in which greening strategies can accompany policy efforts to protect residents from green displacement, and support existing efforts to close pollution sources such as residential oil wells and refineries.

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