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San Francisco's Street Trees
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For decades, the mature *Ficus microcarpa* trees in front of La Reyna Bakery on 24th Street in San Francisco's Mission District have provided many services residents. But the City of San Francisco has these trees slated for removal. La Reyna owner Luis Gutiérrez opposes the removal of these trees: "The trees have been living there for about 39 years. They have been life markers for me, reminding me of my past. They have become guardians of the streets." Many San Francisco residents love the trees that line their streets. Not only do the trees have sentimental value, but they also provide ecosystem services, such as shade from the sun and heat, shelter from the rain, storm-water management, habitat for wildlife, natural air conditioning, neighborhood beautification and calming, and filtering air and noise pollution. In the era of climate change, street trees also sequester carbon dioxide and can potentially transform a city from a carbon source to a carbon sink. So why would San Francisco want to take down trees that do so much good?

The answer may lie in the dollar bill. According to the U.S. Forest Service, every $1 spent on planting street trees brings about $5.82 in ecosystem services. And yet, trees are not considered a necessity, but a luxury. Cities never budget enough to be able to properly maintain street trees. A new report from The Nature Conservancy states that cities typically spend one third of one percent of the annual budget on trees. And despite the overwhelming evidence of the benefit of street trees, the number of street trees in cities across the United States is declining. Around 4 million street trees die or disappear every year in the U.S. The Nature Conservancy Report also states that to maintain our urban canopy, and expand it to the point where it creates consistent health benefits, cities would need to spend $8 per person on street tree investment.

Back in the Mission, Gutiérrez shares a story of how, earlier that day, a car lost control and swerved into the sidewalk, and instead of injuring pedestrians, the car crashed into a tree. In addition to providing shade for his bakery and customers, the trees also provide a protected buffer zone with vehicle traffic on busy roads. He explains, "The accident could have been much worse if no tree was there." Protection from vehicular collision is another public health benefit of street trees.

To date, according to San Francisco's interactive Urban Forest Map, the tree in front of La Reyna has conserved 319.2 kilowatt hours of energy per year, saved 3,624.4 gallons of storm-water per year, improved air quality by -4.7 lbs per year, removed 667.4 lbs of carbon dioxide per year, and stored 4,331.6 lbs of carbon dioxide per year.

For decades, neighborhoods where people of color reside often have often had the least tree covering. A 2013 study by UC Berkeley showed that black people were 52% more likely than white people to live in neighborhoods with sparse tree covering. 81 million Americans live in urban areas that are most at risk in extreme heat waves due to lack of tree cover, creating a heat island effect. Metropolitan areas with racial segregation are more prone to extreme heat.

Some residents in San Francisco's Mission District equate street improvements (including tree planting) with rent increases and gentrification. These residents oppose San Francisco's beautification plans for the neighborhood for fear of eviction and being pushed out. Residents like Ilaria Salvadori and Erick Arguello call for a moratorium on street improvements and tree planting until the cultural integrity and the financial stability of the neighborhood are protected and preserved.

Street trees can benefit an entire city, and ultimately help mitigate the effects of climate change. Studies conducted in Syndey and Melbourne show that a 10% increase in tree cover lowers surface temperature by as much as 1 degree Celsius. Trees not only soak up hot temperatures, but their root systems act as a sponge during heavy rains, mitigating flooding and damage to homes and business storefronts.

The effects of climate change can have a negative impact on some trees as well, and city governments are responding. Due to the extreme fluctuations in temperatures and weather patterns, some trees are less likely to survive than others. Trees that will do well in extreme weather conditions will have a strong root system, will have branches that can sustain heavy winds, can regenerate shoots after storm damage, and will have an extensive root system to prevent soil erosion. Larger trees will have a much greater impact at mitigating the effects of climate change than smaller trees.

Additionally, street trees provide habitat for unique species, some even endemic to San Francisco. The Western Tiger Swallowtail butterfly has found habitat among Market Street's London Plane trees. You can often find Hooded Orioles and our city's famous wild parrots eating their hearts' content on Canary Island Date Palms. Red Tailed Hawks and other raptors, as well as Monarch butterflies, perch on Eucalyptus. And many species of insects and migratory birds find shelter in San Francisco's Coast Live Oak. Street trees support and maintain San Francisco's rich biodiversity.

Not bad for a city that was built on sand dunes. Hundreds of years ago, one might have found some oaks, California buckeyes, and even some redwoods on these 48 hills. But, for the most part, scrub bushes, rather than trees, took naturally to the sandy environment. Many of San Francisco's street trees were originally planted in the 1950s and 1960s. And now, these trees are facing one of life's inevitable challenges: old age. Faced with the added threats of climate

change, heat waves, lack of fog, drought and development, life for these old trees is difficult. Trees like the ficus are notorious for dropping limbs as they age. Arborists believe ficus are bad for street plantings because of their stems' tendencies to split from their trunks and their root systems to tear up sidewalks. As a result, San Francisco no longer plants ficus. Sunset magazine lists the following as the best trees for new plantings in San Francisco because of their drought tolerance, sandy soil tolerance, wind/sun/heat/shade tolerance and drainage: Cork Oak, Strawberry Tree, Bailey's Acacia, Bronze Loquat, Lemon Bottlebrush, Fern Pine, Grecian Laurel, Jacaranda, Drake's Chinese Elm, Brisbane Box, Swan Hill Olive, Small Leaf Tristania, and Queen Palm. A more complete list can be found through the San Francisco Urban Forestry Council or San Francisco Public Works Department. Volunteers can help plant these trees by contacting Friends of the Urban Forest.

So back to the ficus in front of La Reyna – why would San Francisco want to remove these mature trees? The SF Department of Public Works see these older trees as an expense. Cleaning up damage like falling branches and sidewalk uprooting from an old ficus can cost anywhere from $395 to $1,776, and it costs the city $1,973 to plant a new, smaller tree. The Urban Forest Map lists it as a tree in poor condition, likely due to the lack of maintenance before 2017.

Thankfully, with the passage of Proposition E in 2016, San Francisco launched Street Tree SF, in which the City of San Francisco will be responsible for the maintenance and pruning of street trees, as well as any sidewalk damage created by roots, instead of the property owner where the tree was planted. The ballot measure set aside $19 million a year from the City's general fund to pay for the upkeep of street trees. The measure will allow for maintenance throughout a tree's lifecycle.

Because of the social, economic and environmental (including public health) benefits of an urban tree canopy, San Francisco is forging ahead with an ambition street tree planting vision. In 2014, San Francisco had one of the smallest urban tree canopies (the amount of land covered by trees when viewed from above) of any American city. Only 13.7% of San Francisco has tree coverage, compared with 21% in Los Angeles and 24% in New York. The city wants to change these numbers. In their 2014 plan, the San Francisco Planning Department called for the planting of 50,000 more trees on San Francisco's streets, expanding the tree population from 105,000 to 155,000 by 2034. But with 124,848 trees, including over 500 different species, San Francisco is on its way to fulfilling its goal of a more plentiful, bountiful and equitable urban forest.

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