

IMPACTS OF ILLEGAL DUMPING IN EAST PALO ALTO:
AN ENVIRONMENTAL JUSTICE PERSPECTIVE

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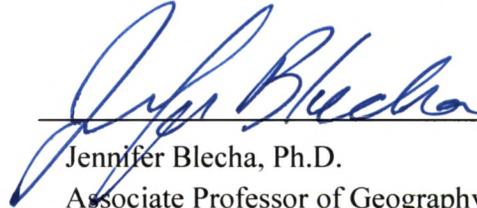
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IMPACTS OF ILLEGAL DUMPING IN EAST PALO ALTO:
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While it is well documented that illegal dumping of trash causes significant environmental impacts on land, water and air. It can also contribute to poor health in local communities where it occurs. Because illegal dumping is often concentrated in low-income communities and communities of color, it is an environmental injustice. Research on environmental justice and illegal dumping of solid waste has been widely studied separately. However, there are limited studies linking environmental justice and illegal dumping of solid waste. To explore if low-income communities and communities of color are disproportionately burdened with illegal dumping, a case study was conducted in the City of East Palo Alto. Data was collected from interviews and textual analysis of government and public documents was conducted. Results indicate that current policies to address the illegal dumping of municipal solid waste are inadequate, do not decrease incidences of illegal dumping, and persecutes the burdened community. East Palo Alto needs to strengthen community engagement, increase education about illegal dumping, and implement opportunity reduction strategies to reduce illegal dumping. Awareness gained from the case study of East Palo Alto will help other municipalities understand the complexities of mitigating illegal dumping.

I certify that the Abstract is a correct representation of the content of this thesis.



Chair, Thesis Committee

11/21/2017

Date

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A. Introduction

“I went to a meeting [in a community of color] and two young women spoke to me on the sideline and said that people are literally dumping garbage in their yard and one woman just looked so sad. The woman said ‘that’s where my kids play’.”

- Participant #5

Families want a safe and clean place to raise their children. When children go outside to play, parents should not worry about their children playing in and around garbage. Unfortunately, this type of scene is occurring in communities in the San Francisco Bay Area. Communities of color continue with their day-to-day activities as they watch their neighborhood be dumped on with garbage, creating an unsafe and unhealthy environment for residents. In communities like East Palo Alto, illegal dumping of municipal solid waste such as household garbage, furniture, motor oil, or construction debris, is prevalent. Why is illegal dumping of solid waste disproportionately impacting communities of color and low-income communities, and how can municipalities address the problem without increasing the burden on the community?

This research seeks to have a better understanding why the City of East Palo Alto, the case study for this research, continues to see an increase in the frequency of illegal dumping. Have the anti-dumping policies of the City of East Palo Alto reduced the impact of trash in low income communities and communities of color? Government and nongovernment employees participated in semi-structured interviews. To understand the

social and environmental impact of illegal dumping in East Palo Alto, I used an environmental justice framework to help explain the occurrence of illegal dumping. I first provided context of current research on illegal dumping and provided the policy background on waste management and current policies to eliminate trash from entering water bodies. Interview responses were coded and on-site field observations conducted to help understand that (1) current policies create an increased financial burden on the community, (2) the city needs to increase community engagement, and (3) illegal dumping is disproportionately impacting East Palo Alto's low-income community and community of color.

1. Illegal Dumping

In California, illegal dumping is a serious concern in urban settings with many municipalities having ordinances to deter the practice with significant consequences of fines and/or jail time (CalRecycle, 2017). In the City of East Palo Alto, California, illegal dumping is a growing concern because the frequency of illegal dumping increases year after year (City of East Palo Alto, 2014b; Human Impact Partners, 2009).

The social and environmental problem of illegally dumping municipal solid waste, such as household garbage, furniture, or construction debris, is a concern for many communities in the United States and throughout the world because of the input this has on health and well-being (Geum-Soo Kim, Young-Jae Chang, & Kelleher, 2008; Glanville & Chang, 2015; Sigman, 1998; Tasaki et al., 2007; U.S. EPA Region 5, 1998).

Illegal dumping impacts the environment and can pose serious environmental health problems if toxic waste and chemicals from dumped materials contaminate water bodies (Crofts, Morris, Wells, & Powell, 2010; Ichinose & Yamamoto, 2011). In addition to the environmental risks such as exposure to toxic substances, illegal dumping impacts the health of people in neighborhoods (Ichinose & Yamamoto, 2011; Marfe & Di Stefano, 2016; Mazza, Piscitelli, Neglia, Rosa, & Iannuzzi, 2015).

Illegal dumping, also known as “midnight dumping,” is the disposal of any waste in unpermitted areas (U.S. EPA Region 5, 1998). While the term refers broadly to any type of waste including agricultural, hazardous, or chemical, for the scope of this research, the term will generally indicate municipal solid waste, which includes household garbage, household hazardous waste (HHW), electronic waste, or construction and demolition debris illegally disposed in an urban residential area. Illegal dumping often occurs along roadways, alleys and in poorly lit areas. It often includes solid waste materials ranging from construction and demolition debris, automobile parts, household trash, and bulky household waste like furniture and appliances (City of East Palo Alto, 2014; U.S. EPA Region 5, 1998). Although there are no comprehensive studies on the reasons, illegal dumping likely occurs to avoid paying disposal fees at permitted facilities such as landfills or transfer stations, but also occurs because some materials like tires or televisions are banned from landfills (Crofts et al., 2010; U.S. EPA Region 5, 1998). Illegal dumping typically occurs at night so the likelihood of being caught and cited is low (Crofts et al., 2010; Geum-Soo Kim, Young-Jae Chang, & Kelleher, 2008b; Ichinose

& Yamamoto, 2011b; Tasaki et al., 2007; U.S. EPA Region 5, 1998). Scholars have extensively studied the topic of waste management pertaining to household waste, disposal, and the effectiveness of “Pay as you throw” programs, but illegal dumping continues to be a problem across the country.

Croft et al. (2010) addresses the issues of illegal dumping through criminal preventative measures utilizing a situational approach, focusing on techniques that increase the effort to make it harder for dumpers to dump, increasing the risks of getting caught that can lead to conviction, and reducing rewards for crime by making proper disposal cost effective for dumpers. Illegal dumping, according to Croft et al. falls under environmental criminology which views illegal dumping as an environmental harm (2010). Because illegal dumping is primarily handled by non-law enforcement agencies, illegal dumping is not perceived as an illegal activity. The authors suggest implementation of primary and secondary crime prevention techniques for mitigation. Primary techniques are focused on opportunity reduction measures of environmental design and situational crime prevention. The three characteristics of environmental design are image and milieu (unprotected and grungy open space), lack of ownership or control (who is responsible for space), and lack of natural surveillance (no community policing). Situational crime prevention includes four characteristics as seen in Table 1.

Situational Crime Prevention Characteristics	Description
Increasing the effort	Making it more difficult to commit an offense. Examples include controlling access to property and space and making time consuming to dump, deflecting offenders away from property or space, and controlling facilitators, which aid the commission of offense.
Increasing the risk whether real or perceived	Implement screening, improve lighting, CCTV for surveillance, natural surveillance from community
Reducing benefits	Increase the costs of illegal dumping, reduce expense of legal disposal
Displacement	Wider range of preventative measures to prevent displacement in another community

Table 1. Situational Crime Prevention Characteristics (Croft et al., 2010, p. 8-16).

By making access to the illegal dumping “hot spots” more difficult for would-be dumper, the lack of easy access could possibly deter people from dumping due to the limited time for dumpers to leave their waste material and be unseen. But Croft et al. (2010) were quick to point out ethical and cost risk associated with various mitigation methods. Dumpers could be deterred with improving lighting in conjunction with video surveillance that can be used as evidence when persecuting. The technique of reducing perceived benefits of illegal dumping, such as the low risk of getting caught depending on the municipal code violations in cities and state, have not been effective because of the very low penalties for the violations. The likelihood of catching an illegal dump is small because it is done in low traffic areas or during hours when no one is around; however, if dumpers learned of the associated fine and possible imprisonment, they may perceive

reduced benefits of illegally dumping waste compared with paying the cost to legally disposing their materials (Crofts et al., 2010).

For secondary techniques, the “aim is to change the people who are likely to commit offenses to using education and reform” (Croft et al., 2010, p. 17). This technique takes into account historical activity and community background. According to the authors, if the community has a large migrant population from developing countries, cultural and political experience will differ because of less environmental regulations. In addition to culture, educating the community about the environmental harm of illegal dumping and the criminal act of dumping may deter incidents from occurring. Croft et al., suggest increasing funds for education to address illegal dumping proactively rather than reactively. Education tools must correspond with spoken language and cultural diversity. (Croft et al., 2010)

Tasaki et al. (2007) focus their efforts on mitigating illegal dumping by using Geographic Information Systems (GIS) to determine illegal dumpsites and the size, amount of materials, or number of piles in Japan. Unlike Croft et al. (2010), Tasaki et al. understands that precautionary measures, such as reducing the cost to legally dump, does not prevent illegal dumping because stricter environmental regulations on what can be disposed cheaply may not include items that are illegally dumped. This is the case for items like refrigerators with Freon or cathode ray tube televisions which have lead. Fees for proper disposal of these regulated or banned materials are increasing. Using GIS,

Tasaki et al. goes further and argues for the importance of identifying the location of existing illegal dumping sites. The authors “developed a method of zoning to illustrate the illegal dumping potential of sites in order to find undiscovered illegal dumping sites, improve efficiency of surveillance, and inform and warn governmental officers of high illegal dumping potential” (Tasaki et al., 2007, p. 257). Data of existing sites in addition to geographical attributes were used for their analysis. The use of GIS in the study of illegal dumping is rather new. As more researchers utilize GIS and continue to build upon the research of Tasaki et al. with better data sources, more accurate predictions of illegal dumping sites may be provided to local municipal enforcement agencies to control and mitigate illegal dumping.

Daisuke Ichinose and Masashi Yamamoto look at the proximity to waste facility as indicators of illegal dumping frequency (Ichinose & Yamamoto, 2011). The authors believe the reason for high illegal dumping incidence is because of the lack of close means to legally discard materials (Ichinose & Yamamoto, 2011). After identifying more than 500 illegal dumpsites in Japan to determine incidents, they analyzed data using an econometric model for the cost of illegal dumping. The results of their study provided quantitative results showing that illegal dumping decreases if more intermediate waste facilities are available, with the exception of landfill sites. Additional landfill sites do not decrease the number of incidents of illegal dumping. The location and accessibility of legal disposal sites may be useful for municipalities to address the problem, especially in

communities that have other barriers to proper disposal such as poor transportation, language barriers, and culture.

Geum-Soo Kim, Young-Jae Chang and David Keller studied the correlation between the new solid waste “pay-by-the-bag” system of waste disposal and the increase of illegal dumping activities in the Republic of Korea (Kim, Chang, & Kelleher, 2008). Kim et al. used datasets from publicly reported illegal dumping incidences for their statistical calculation, and were quick to point out that the datasets were incomplete because they only provided the number of incidences, and not the quantity of waste. They also discussed the likelihood that other illegal dumping incidences may not have been reported, therefore skewing the dataset (Kim et al., 2008). Their results concluded that a 1% increase in the price of the legal pay-by-the-bag disposal had an adverse increase of illegal dumping of 3% (Geum-Soo Kim et al., 2008b). Similar to Ichinose and Yamamoto (2011), Geum-Soo Kim et al. (2008) were able to quantify that illegal dumping still occurs even if residents and businesses have access to legal disposal alternatives (Geum-Soo Kim et al., 2008b).

Katherine Glanville and Hsing-Chung Chang used remote sensing to identify and map the distribution of illegal dumping in Queensland, Australia. Illegal dumping mitigation efforts can cost the government between \$670-\$1270 Australian dollar per ton, totaling as much as A\$17 million annually (Glanville & Chang, 2015). There has been very little research conducted using remote sensing in the identification of illegal

dumping. The authors reviewed various remote sensing techniques used for illegal dumping, and although, the process can be very cost effective for government agencies, the authors recommend that municipalities conduct more research before using remote sensing.

A study by Sigman (2008) that focused only on the illegal dumping of used oil, found there is a high dumping rate of oil across the United States because oil waste is prohibited from landfills and is considered a hazardous waste material. Sigman states that there are three ways to dispose of oil: legal disposal, reuse, or illegal (1998, p. 164). Depending on local or state regulation, the cost of disposal may be greater than non-oil municipal solid waste disposal (Sigman, 1998). Therefore, disposing used oil illegally might seem appealing because there is a low chance of being caught and getting convicted of illegal dumping (Sigman, 1998). The results from the collected data suggest that policies that restrict disposal of oil from normal waste disposal increased illegal dumping by 28% and suggests that “disposal restrictions are counterproductive in their effects on environmental quality” (Sigman, 1998, p. 175).

In the City of Oakland, California, specifically East and West Oakland, with demographics similar to East Palo Alto, illegal dumping is an epidemic (Rosengren, 2016). According to Rosengren (2016) the City of Oakland spent more than \$5 million on illegal dumping clean-up efforts in a one year period from October 2015 and October 2016. Residents from both neighborhood communities are fed up with the problem,

raising concerns that it could be an environmental injustice (Rosengren, 2016). With more than 20,000 calls of illegal dumping reported, Oakland decided to create a \$100 incentive program for residents to report illegal dumping; the reward is given if the responsible party is prosecuted (“East Oakland Beautification Council,” 2017; Watts, 2016). In 2014, a successful program helped reduce the incidence of illegal dumping. The East Oakland Beautification Council was established to mitigate illegal dumping and graffiti (“East Oakland Beautification Council,” 2017). The Council launched “Operation Clean Sweep” where different stakeholders like the Bay Area Rapid Transit, Oakland Public Works, and organizations cleaned up streets in Oakland. The goal of the Council was to reduce illegal dumping in Oakland by 50% by the end of 2015. Though the Council did not reach the goal, they continue to move forward with clean-ups until the Council achieves the 50% goal.

None of these studies commented on the residents experiences where dumping takes place. These studies focused primarily on the act of illegal dumping, the type of waste dumped, the location of illegal dumping, or ways to mitigate illegal dumping. The authors did not connect illegal dumping with race, ethnicity, and social class. Furthermore, research shows that illegal dumping poses a public health and safety concern to local residents because dumping in unpermitted areas produce social and environmental degradation, and impacts the health and overall quality of life of residents (City of East Palo Alto, 2014; Crofts et al., 2010; Geum-Soo Kim, Young-Jae Chang, & Kelleher, 2008; Ichinose & Yamamoto, 2011; Tasaki et al., 2007; U.S. EPA Region 5,

1998). According to Kreger et al., environmental injustice affects the health of families who live near the pollution (2011). “Neighborhood settings and other community level factors played a substantial role in shaping the health status of children with asthma in California” (Kreger et al., 2011). The message that history and the development of the community are similar to other environmental justice communities, which can be used to describe East Palo Alto. While research connecting health impacts in communities of illegal dumping is not within the scope of this project, further study of this problem can improve the future of illegal dumping management in a just and equitable manner.

2. Environmental Justice

To understand the problem of illegal dumping in East Palo Alto, we must understand the history of race in East Palo Alto and how systemic environmental injustice plays out in the city. The Environmental Protection Agency (EPA) defines environmental justice as “the fair treatment and meaningful involvement of all people regardless of race, color, national origin, or income with respect to the development, implementation, and enforcement of environmental laws, regulation and policies” (US EPA, 2016).

The environmental justice movement in the United States grew out of responses to environmental racism. In 1982, protests against the Ward Transformer Company’s plan to dump 31,000 gallons of polychlorinated biphenyl, (PCB) in a predominantly African American community in Warren County, North Carolina led to the conversation

and fight of people of color against environmental injustice (Bullard, 1990). Early research on environmental justice focused on race-based inequities of siting environmental hazards in communities of color (Bullard, 2000; Konisky, 2009; Konisky & Schario, 2010). Waste facilities and other polluting industries were disproportionately located in communities of color or low-income communities (Bullard, 2000, 2014; Konisky, 2009; Pastor, Sadd, & Hipp, 2001; Pellow, 2002, 2004). Dr. Robert Bullard's *Dumping on Dixie: Race, Class, and Environmental Quality*, provides a great example of how communities of color are disproportionately burdened and exposed, in terms of proximity to the community, of siting of waste facilities (2000). In Houston, Texas, African American communities in the northeast and southeast became the dumping ground for garbage. A new landfill was planned to be located in an African American community, but citizens organized and protested against the siting. Pastor et al. studied the phenomenon of "who came first, toxic waste or minorities" in Los Angeles County (2001). Several research studies were conducted in Los Angeles on the locations of toxic storage and disposal facilities (TSDFs) within communities of color (Boer, Pastor, Sadd, & Snyder, 1997; Boone & Modarres, 1999; Morello-Frosch, Pastor, Porras, & Sadd, 2002). The conclusion was that disproportionate siting of TSDFs occurs in minority communities and that minorities move in to communities that have TSDFs. Pastor, Sadd and Hip (2001) also conclude that communities with ongoing ethnic transition are more likely to see an increase in siting of TSDFs than established minority communities.

In David Pellow's book *Garbage Wars: The Struggle for Environmental Justice*, he traces the historical injustice of waste management in Chicago that disproportionately impacted communities of color and low-income (2002). Pellow defines environmental racism as the "unequal burden of environmental hazards on a particular social group" (Pellow, 2002). Bullard defines environmental racism as "any environmental policy, practice or directive that differentially affects or disadvantages (intended or unintended) individuals, groups or communities based on race or colour" (Bullard, 1999).

Environmental injustice is the concept that certain communities are disproportionately burdened with environmental hazards such as air pollution, toxic waste siting, and, in the study I present, illegal dumping (Bullard, 2000; City of East Palo Alto, 2014b; Parsons et al., 2015; Pellow, 2004). The environmental justice movement gained traction after the United Church of Christ report in 1987 highlighted the correlation of the location of toxic dump sites with communities of color (Heiman, 1996). The First National People of Color Environmental Leadership Summit held in 1991 developed "The Principles of Environmental Justice" comprised of seventeen goals deemed necessary for justice (Delegates to the First National People of Color Environmental Leadership Summit, 1991). This document critiques US environmentalism that excludes race from environmental concerns.

Grassroots activism to eliminate or lessen the environmental burden in communities of color started to emerge in the 1980's. During this time, US

environmentalism was fighting against hazardous waste contamination by corporations in communities. One of the first communities impacted by toxic waste was the community of Love Canal, a community in New York State that had a canal full of toxic chemicals dumped by the Hooker Chemical Company from which the community suffered serious environmental health conditions. Residents and community members fought to ensure that the federal government held the company accountable. The community prevailed when President Jimmy Carter declared a state of emergency and relocated 239 families out of the area (University of Buffalo Libraries, 2017).

Like the homeowners of Love Canal, the African American community in Warren County, North Carolina came together as a community, protested the injustice, and sued responsible parties (Heiman, 1996). However, it is important to understand the distinction between environmental racism and environmental justice. Environmental racism focuses on the targeting of hazards to communities where people of color live, while environmental justice aims to address how to mitigate and improve the problem for the impacted community (Pellow, 2002).

Relevant to the case of East Palo Alto, is David Pellow's research on the impacts of illegal dumping in Chicago, Illinois (2004). Pellow focused on the scandal known as Operation Silver Shovel where construction and demolition debris was illegally dumped in Chicago's West Side, a community of Latinos and African Americans. Chicago's communities of color have been disproportionately burdened by a significant portion of

illegal dumping, which was substantiated in the 1990's. A study conducted by the Chicago Department of Streets and Sanitation found that 60% of illegal dumping occurring in communities of Latinos or African Americans (Pellow, 2004). The dumping that occurred with Operation Silver Shovel caused health problems like coughing, difficulty breathing, and dizziness for nearby residents but local officials did not take meaningful action to mitigate the situation. In Chicago, the community burdened with the illegal dumping of construction and demolition debris, voiced their concerns to government officials without any tangible results to stop the illegal dumping. Government agencies meant to protect the health and environment did not cite the owner, John Christopher, with a fine but rather allowed him to continue to dump waste. Government officials were bribed by John Christopher to support the dumping and as a result, chose to risk the lives of the people they served. The persistence of the community paid off when the federal and state EPA finally took action in Operation Silver Shovel. Government appointees and the process of the government failed the people and only from community activism were they able to stop the illegal dumping. (Pellow, 2004)

Environmental Justice Framework

Through this Chicago research, David Pellow developed a framework that provides a holistic approach to analyze the environmental injustice of illegal dumping. The framework is comprised of four dimensions: 1) Environmental inequity as a socio-

historical process that takes into account the history of the community and how the dumping problem began. 2) The complex roles of stakeholders, and how different stakeholders can help or cause additional harm to the impacted community. 3) The effects of social inequality on stakeholders, including how institutional racism, gender and political power generally affect communities of color and low-income communities where the problem occurs. 4) The agency of the community/population confronting the problems. With all the challenges faced by communities of color impacted by illegal dumping, they can resist the status quo and demand justice. (Pellow, 2004)

Parsons et al. (2015) and Redwood et al. (2010) have used the environmental justice framework to study disparities of physical activity in proximity to parks as well as the connection of the built environment to negative health outcomes. Teixeira and Sing used the environmental justice framework to provide context and integrated history, land use, economic disinvestment and community engagement to their research on vacant lots in Pittsburgh, Pennsylvania (Teixeira & Sing, 2016).

Similar to Pellow's assessment of Chicago's illegal dumping, his environmental justice framework can help assess the impacts of illegal dumping in East Palo Alto. As a community of color disproportionately burdened with high incidences of illegal dumping, using an environmental justice framework helps to identify the social and environmental disparities in and around the city of East Palo Alto.

Understanding the history of the East Palo Alto community and the reason Latinos and African Americans live there provides important background to the environmental inequity they experience. The political arena of the community, who are the government leaders in charge and how they serve their constituents, will provide an understanding of how decisions are made that affect stakeholders. Lastly, how the community organizes and who in the community participates and supports the community will be telling if efforts to eliminate dumping will have long lasting impacts on the community.

The City of East Palo Alto plans to “prioritize the prevention of illegal dumping, and the removal of dumping by the Department of Public Works when it does occur, to protect health, safety, environmental quality, and community aesthetics” (City of East Palo Alto, 2016, pp. 7–6). As part of the city’s general plan, East Palo Alto has set specific goals to address health and equity, which includes goals and policies addressing community health concerns on topics like access to healthful food, housing and environmental justice.

3. East Palo Alto

Geography

The City of East Palo Alto, located in San Mateo County (figure 1), is 2.51 square miles and has a population density of 11,239.5 person per square miles (U.S. Census

Bureau, 2015). The San Francisco Bay (The Bay) provides the eastern border with community access to the Bay Trail, a 500-mile scenic recreational path that provides residents the opportunity to see wildlife and wetlands (www.baytrail.org). Located on the Peninsula, East Palo Alto is a major thoroughfare for San Francisco Bay Area commuters. On the west side of East Palo Alto is Highway 101, to the northeast is Highway 84 and Willow Road (used to access the Dumbarton Bridge for East Bay commuters), and University Avenue cuts down the middle of the community. Three main creeks flow from the western hills to the San Francisco Bay. The largest, San Francisquito Creek, also acts as a border between East Palo Alto and Palo Alto. Palo Alto is a city that is part of Santa Clara County (Harris & Cespedes, 2015). While the median household income in East Palo Alto is \$52,012, two very affluent communities surround East Palo Alto: Menlo Park in the north/northwest with a \$121,816 median income and Palo Alto to the south/west at \$136,519 median income (Human Impact Partners, 2009; U.S. Census Bureau, 2015).

East Palo Alto's boundaries changed in the years prior to incorporation in 1983. According to the City of East Palo Alto Historic Resources Inventory Report (1994) (Inventory Report), the region was known as Runnymede in the early 1900's. East Palo Alto's business district is predominantly located along University Avenue. The Bayshore Freeway (Highway 101) cuts through part of the western edge of the city, which later added to economic growth as more travelers pass through the city. East Palo Alto has a

mild weather, making the site ideal for the historic agricultural practices that occurred (Inventory Report, 1994).



Figure 1. Map of East Palo Alto Boundary (City of East Palo Alto, 2016).

History and Demographics

East Palo Alto is a young city with a rich history (Harris & Cespedes, 2015). The Puichon tribe of the Ohlone Indians, were the first inhabitants in the East Palo Alto region. By the 1830's most died due to diseases brought in by Spanish settlers (Inventory Report, 1994). Spanish settlers moved in to use the land for ranching; the prospect of gold saw a surge in population by land speculators and farmers in the 1900's (Inventory Report, 1994). Suburbanization started to occur in the 1920's and 1930's as vacation homes for elites of San Francisco. Residents in the area were hard hit during the Great Depression's economic instability. This provided opportunities for Japanese and Italian flower growers to purchase fertile land to grow "chrysanthemums, violets, carnations and lilies" which was not impacted significantly by the Great Depression (Inventory Report, 1994, p. 54; Harris & Cespedes, 2015). East Palo Alto's agricultural enterprises continued to flourish from the 1950's until the 1970's.

The post-World War II boom and desegregation in the San Francisco Bay Area brought a diverse population to East Palo Alto; soon an urbanized community developed in cities around the bay (Inventory Report, 1994). Post war African Americans flocked to San Francisco and Oakland for work, living in the predominantly black neighborhoods of Bayview Hunters Point, North Oakland, East Oakland and West Oakland (Self, 2003). Like in other cities across the U.S., redlining, the practice of financial discrimination to purchase homes based on race and class, was instituted to keep blacks out of certain

neighborhoods. An effort was reportedly made by San Francisco real estate interests to segregate African Americans in low-cost housing developments in southern San Mateo County (Inventory Report, 1994, p. 70; Self, 2003). Due to cheap housing and relaxed housing covenants post war, African American migrants from Southern states made East Palo Alto their home, eventually comprising 55% of the population (Camarillo, 2007; Ruffin, 2015; Harris & Cespedes, 2015, p. 3). White neighbors attempted to push the first African American homeowner, William A. Bailey, and his family out of East Palo Alto (Inventory Report, 1994). After claims of over devalued property, and Bailey refusing to move, approximately 20% of the white neighbors put their homes on the market within a one-month period.

The white population migrated out of East Palo Alto and settled in neighboring cities such as Menlo Park, Palo Alto and San Carlos (Camarillo, 2007). This white flight saw significant changes to the community. Similar to the white flight in Oakland, California, racial housing exclusion was commonly practiced by realtors, banks and homeowner associations in the community of East Palo Alto, making it difficult for nonwhite households to purchase homes (Camarillo, 2007; Self, 2003). Known as “block-busting”, real estate agents used scare tactics of a housing collapse to ward off white residents from moving in to a city while busing in African American prospective buyers, making a profit from white and black families (Camarillo, 2007; Inventory Report, 1994; Self, 2003). The physical isolation of East Palo Alto and the segregated community became more pronounced when the Bayshore Freeway was expanded to

move the growing commuter residents up and down the peninsula (Inventory Report, 1994).

Today, East Palo Alto's population is estimated at 29,530, of which 65% are of Hispanic or Latino descent (Table 2), and 16% of African descent (U.S. Census Bureau, 2015). The increase in the Latino population in the 1990's changed the demographics and housing market of East Palo Alto (Camarillo, 2007). Camarillo, a historian of Mexican-American experiences, examines the demographic change of "minority-majority" in the California cities of Compton, East Palo Alto and Seaside in California, as an old pattern with a new twist (2007). This pattern consists of an established group (Whites) being replaced by African Americans and who are then replaced by Latinos (Camarillo, 2007). According to Harris and Cespedes (2015), "many of the new residents are immigrants and 75% of the foreign born population were not US citizens in 2013" (p. 3).

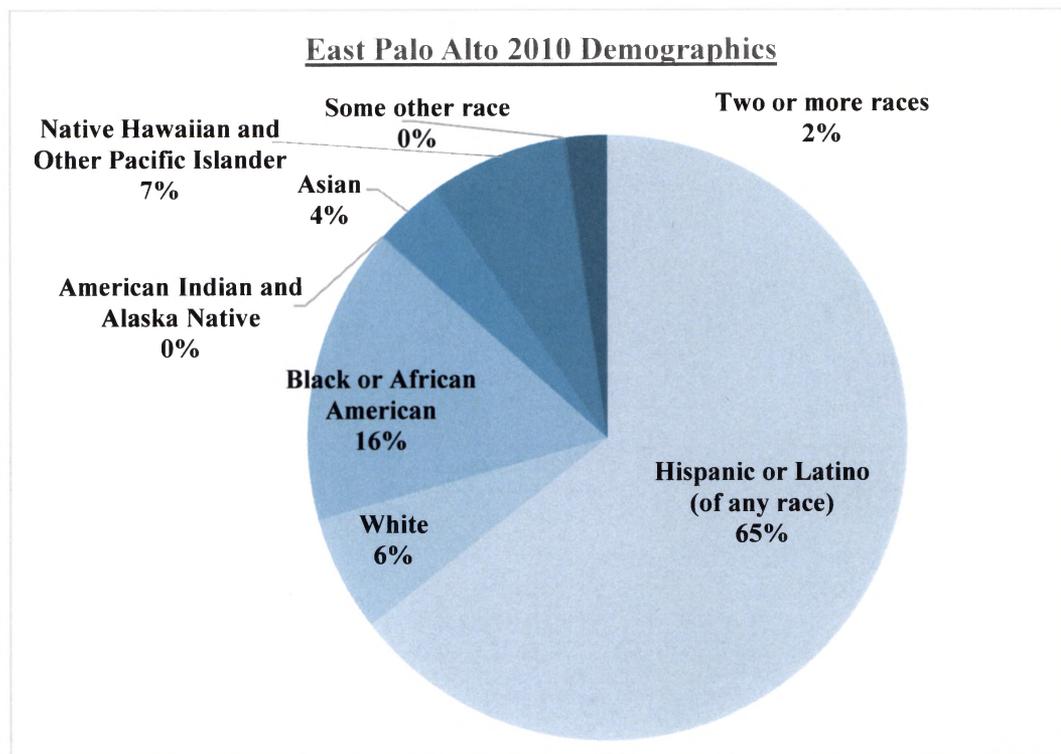


Table 2. East Palo Alto Demographics from BayAreaCensus.ca.gov.

Although African Americans represent 16% of East Palo Alto residents today, fifty years ago 60% of residents were African Americans, and twenty years ago, 40% (Anning, 1998; Miner, 1969). East Palo Alto's African American population was comprised of people "escaping from the ghettos of Oakland and Richmond flamed by the block-busting tactics of certain realtors, and increased still further by agencies that have used the area as a dumping ground for families displaced by freeways and slim clearance elsewhere" (Stegner, 1970, p. 12). The city of East Palo Alto was clearly segregated by the Bayshore Freeway because it enhanced the ghetto and perpetuated school segregation (Stegner, 1970).

The trend of African American migration to East Palo Alto changed in in late 1980's and 1990's when African Americans started to move out of East Palo Alto to get away from high crime and increasing cost of the housing market (Inventory Report, 1994). East Palo Alto was labelled the “murder capitol” of the United States in 1992 due to the city's long struggle of crime since the 1980’s (Inventory Report, 1994; Lopez, 1992).

East Palo Alto’s housing data is different from neighboring cities with higher renter-occupied tenure (65% versus roughly 45% in Menlo Park and Palo Alto), lower household income, and nearly 30% of rentals having more than one occupant per room compared to approximately 96% single room occupant in neighboring communities (US Census, 2015). According to the US Census Bureau, housing characteristics in East Palo Alto is comprised of detached single units at approximately 52.2%, 3.8% attached single units, and 44% with two or more units as seen in Table 3. 20% of multi-unit housing have twenty or more units. Approximately 65% or 4,589 of occupied housing units (from a total of 7,065 total housing units) are rental units. Nearly 60% of renting households earn less than \$50,000 a year, with an average of \$43,527 annual household income represented in Table 4.

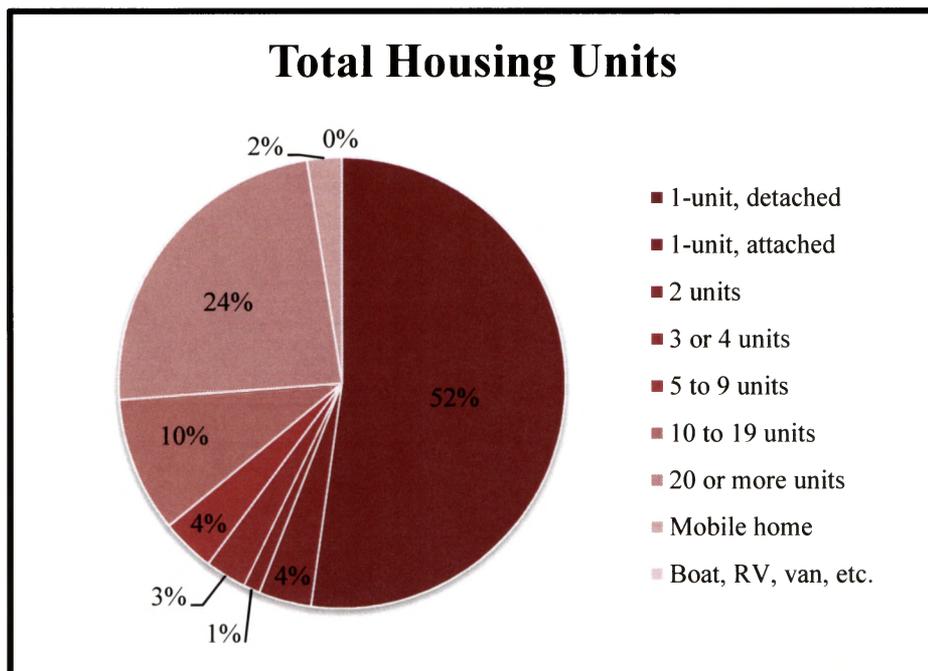


Table 3. East Palo Alto Housing Unit Structure from US Census.

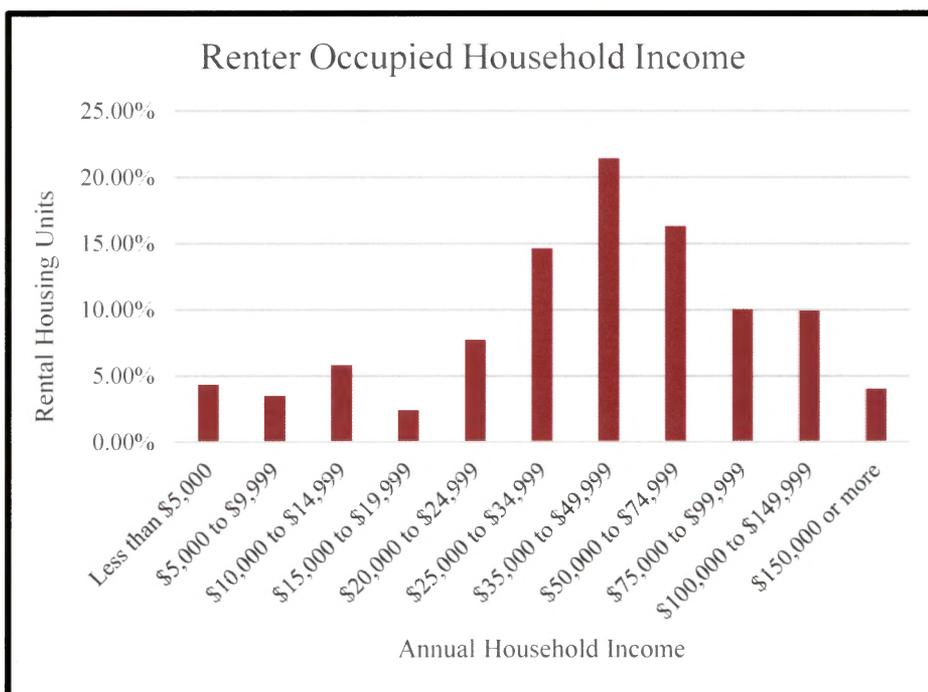


Table 4. East Palo Alto Renter Household Income from US Census.

4. Illegal Dumping and Public Policy

Governments at local, state, and federal levels have all attempted to decrease illegal dumping through policy. This section briefly introduces two federal policies that address illegal dumping, a California state agency that seeks to implement these policies, and the local/regional plan to help East Palo Alto meet the federal and state requirements.

Two federal policies that can help address illegal dumping are the Resource Conservation and Recovery Act and the National Pollutants Discharge Elimination Systems (NPDES) of the Clean Water Act. In East Palo Alto, low-income communities and communities of color are disproportionately burdened with illegally dumped waste compared to neighboring cities that are predominantly white (“Bay Area Census -- City of Menlo Park,” n.d., “Bay Area Census -- City of Palo Alto,” n.d., U.S. Census Bureau, 2015). The San Francisco Bay Regional Water Quality Control Board’s NPDES regulation, specifically the Trash Load Reduction Long Range Plan (Trash Plan), was adopted in 2009 to help reduce waste, such as illegally dumped materials, from entering water bodies. However, rather than see a decrease of waste under the Trash Plan, East Palo Alto has seen an increase (City of East Palo Alto, 2014b).

Federal Policy: Resource Conservation and Recovery Act, Subtitle D

According to the Environmental Protection Agency, solid waste is regulated under the 1976 Resource Conservation and Recovery Act (RCRA) with the intent to

protect human health, conserve natural resources, reduce the amount of waste generated, and ensure that waste is managed correctly (*RCRA Orientation Manual*, 2014). Solid wastes are considered any garbage or refuse, sludge from treatment plants, and discarded material from all commercial sectors, as well as waste produced by a community. Waste under RCRA includes all solid, liquid and gas and materials deemed discarded by being abandoned, recycled, or deemed inherently waste-like. A subset of solid waste is municipal solid waste, which includes durable goods, nondurable goods, organic waste, and containers/packaging (Table 5). In the case of East Palo Alto, durable goods like mattresses, furniture and televisions are illegally dumped.

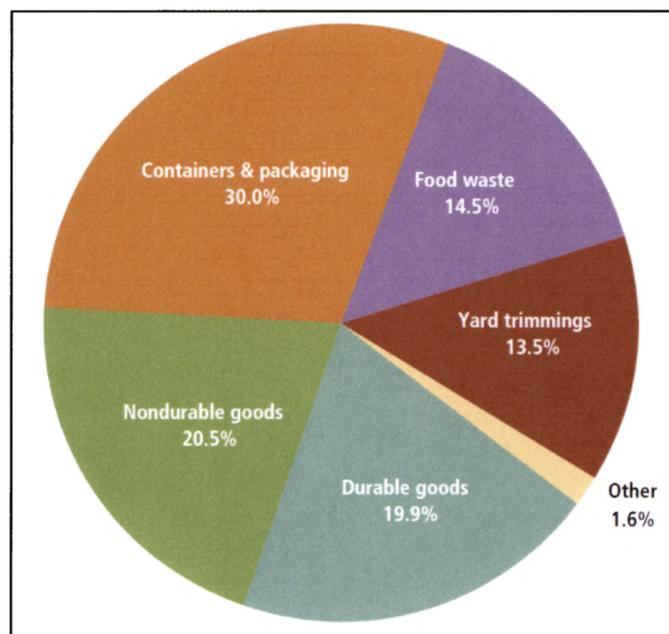


Table 5. 2012 Data on total municipal solid waste (MSW) generation before recycling (Environmental Protection Agency, 2012).

There are ten titles in RCRA, of which, Subtitle D addresses the planning, regulating and implementation of solid waste management conducted by state and local governments. The Federal Environmental Protection Agency, provides guidance to state and local agencies in the decision making process of environmentally safe disposal of waste. "Integrated waste management" is the recommended system of the Environmental Protection Agency, which comprises of source reduction, recycling, composting, waste to energy, and/or landfill. Source reduction and recycling hold higher priorities as they conserve natural resource and generate by-products from recycled content.

Federal Policy: Clean Water Act - NPDES

The Clean Water Act, passed in 1972, regulates pollutants that are discharged into receiving waters throughout the United States and created a quality standard for surface water (Bullard, 2000; Konisky, 2009; Konisky & Schario, 2010) EPA – Laws and Regulations, 2014). Stormwater runoff is a leading contributor to water quality degradation in the United States and throughout the world. In 1987, Section 402, the National Pollutant Discharge Elimination System (NPDES), was added to regulate point source pollutants. Pollutants fall under two categories: point source pollution and nonpoint source pollution (NOAA, 2008).

Point source pollution, according to the National Oceanic and Atmospheric Administration (NOAA), is “any single identifiable source of pollution from which pollutants are discharged, such as pipe, ditch, ship or factory smokestack” (2008). Point

source pollutants include solid waste, sewage, chemical, biological and radioactive materials, agriculture waste, and soil. Nonpoint source pollution comes from land runoff, precipitation, drainage, and typically is not from one specific source (EPA – Pollution Runoff, 2012). Nonpoint source pollutants include litter, illegal dumping, automotive chemicals, and heavy metals. Dumping municipal solid waste into the environment is prohibited under the NPDES.

Prior to the adoption of the NPDES phase I permit in 2009, trash load reduction was not mandated. The focus of the NPDES pre 2009 was discharge rates and hydromodification management standards and control. Many public policies for hazardous waste raise the costs of legal disposal. Concerned about illegal disposal of hazardous waste, economists have instead recommended policies that reward desirable waste management alternatives (Sigman, 1998). Sigman studied the empirical determinants of illegal disposal as reported to the U.S. Emergency Response Notification System (ERNS). Sigman analyzed the frequency of used oil dumping using count-data models. The results suggest that dumping is sensitive to the cost of legal waste management options, including disposal and reuse, and to the threat of enforcement (Sigman, 1998). In particular, state policies that restrict legal disposal cause substantial substitution of illegal dumping (California Regional Water Quality Control Board San Francisco, 2007). Acknowledging the issues of nonpoint source pollution like illegally dumped waste, cities in the San Francisco Regional Water Quality Board with green

vision plans wanted to tackle the issues of nonpoint source pollution. The adoption of the new permit was complementary to many efforts occurring at the city level.

The NPDES, under the Clean Water Act, established a two-phase plan to regulate stormwater runoff. The first phase required permits for Municipal Separate Stormwater Sewers Systems (MS4s) that serve 100,000 or more people, and commercial and industrial sites greater than five acres (San Francisco Stormwater Design Guidelines, 2010). Many municipalities throughout the San Francisco Bay Region are considered part of the regional MS4 permittee. The second phase permit holders require MS4s with less than 100,000 people (San Francisco Stormwater Design Guidelines, 2010). NPDES permits are required for any industrial and municipal systems to reduce or mitigate pollution from entering water bodies, but the law does not require individual homes or septic system users to comply with NPDES (EPA- Laws and Regulations, 2014). Individual homes fall under municipal systems if within the boundary. Because of NPDES, water released from wastewater treatment plants are tested for safety of the environment and health, and provides improved water quality throughout the nation. However, NPDES is not effective in reducing pollutants from nonpoint source. This leaves a significant gap in regulating pollutants from entering receiving water bodies from nonpoint sources. Stricter regulations from government agencies regarding nonpoint source pollutants needs to be addressed, but passing new regulations and funding is a barrier.

California - State Water Resources Control Board

California's State Water Resources Control Board is a state government agency that is responsible of overseeing statewide implementation of the federal policies. In addition to overseeing federal policies, the California Water Board develops regulations to address nonpoint source pollution under the NPDES. Under WRCB, California is divided into 9 regions, of which the San Francisco Bay Regional Water Quality Board is one (Region 2).

San Francisco Bay Regional Water Quality Control Board (Region 2)

The San Francisco Bay Regional Water Quality Control Board (Region 2) consists of municipalities and local agencies from Alameda, Contra Costa, San Mateo, and Santa Clara counties, and the cities of Fairfield, Suisun City, and Vallejo. Region 2 adopted Order R2-2009-0074 or municipalities and local agencies to comply with the Clean Water Act's NPDES regulation. Order R2-2009-0074 required provisions to be met to control an array of activities causing pollutant discharge such as C.3 New Development and Redevelopment, C.4 Industrial and Commercial Site Controls, C.6 Construction Site Control, C.9 Pesticides Toxicity Control, C.10 Trash Load Reduction, or C.13 Copper Controls (San Francisco Bay Regional Water Quality Control Board, 2009).

C.10 Permittee: East Palo Alto

Within the NPDES Order R2-2009-0074, Section C.10, “Trash Load Reduction,” is the section that suggests how MS4 municipalities can reduce trash in receiving water bodies through various mitigation strategies and actions. C.10 permittees, such as East Palo Alto, must reduce trash below the 2009 levels by 60% by July 2016, 80% by 2019 and 100% by 2022 (San Francisco Bay Regional Water Quality Control Board, 2015). Permittees are required to submit two Trash Reduction Plans to the San Francisco Regional Bay Regional Water Quality Control Board: a Short-Term and a Long-Term Plan.

Due in February 2012, the Short-Term Plan needed to address best management practices, ordinances, and how they were going to achieve a 40% trash reduction by 2014. It also required implementing mandatory Full Trash Capture devices (used to trap particles) in sub-drainage areas and cleaning up designated Hot Spot regions. Hot Spots are sections of creeks or water bodies with significant trash impacts (San Francisco Bay Regional Water Quality Control Board, 2015). Hot Spot clean-up must be addressed throughout the entire permit time range. The number of Hot Spots for a municipality was based on the city's total population. For every 30,000 residents, a trash Hot Spot is required which consist of 100 yards of a creek or 200 yards of shoreline length. Trash source hot spots are typically associated with “parks, schools or poorly kept commercial facilities, near creek channels” (San Francisco Bay Regional Water Quality Control

Board, 2009, p. App I-72). After the clean-up of hot spots, permittees are required to report on the findings in the annual report.

The next step of the NPDES permit was submitting a Long-Term Plan for the total reduction of 70% to the Water Board by February 2014. Similar to the Short Term Plan, the new plan required updates on the goal status in the municipality's annual report. The Long-Term Plan was a collaborative effort, guided by the Bay Area Stormwater Management Agencies Association (BASMAA), to create a regional outline for the report provided to the Water Board.

Permittees complying with Section C.10 must track reduction of trash entering water bodies for each of the following quantifiable control measures:

1. Full and Partial Capture Devices
2. Stormwater Conveyance System Maintenance
3. Street Sweeping
4. Creek/Channel/Shoreline Cleanups (Volunteer and/or Municipal)
5. Product Bans and Prohibitions
6. Public Education and Outreach Programs
7. On-land Litter Pickup/Removal
8. Additional Fees at Landfills for Unsecured Loads
9. Anti-Littering and Illegal Dumping Enforcement Activities
10. Free Trash Pickup/Drop Off Days (e.g. Bulky Days)
11. Improved Municipal Trash Bin/Container Management
12. Solid Waste Recycling and Diversion Programs
13. Litter Fees on Businesses
14. Storm Drain Signage/Inlet Marking

(San Francisco Bay Regional Water Quality Control Board, 2009)

Several of these control measures were in place prior to the NPDES, including goals 3, 6, 7, and 12.

San Francisco Bay Regional Trash and Long Range Plans

The goal of implementing the Trash Load Reduction of the NPDES permit section C.10 is that trash will be eliminated. However, implementing the programs to eliminate 100% of the trash is unrealistic.

Municipal Long Range Plans are significantly flawed. According to the nonprofit organization, SF Baykeeper, the model used to calculate trash generation rates rely on “assumptions, conceptual models and arbitrary credits, which do little to identify and mitigate trash hot spots or propose practical, on-the-ground effort to cleanup shorelines and urban creeks currently clogged with trash” (Wren & Blodgett, 2012, p. 1). The nonprofit organization Save the Bay is critical of grandfathering existing control measures like plastic bag and polystyrene bans as not enough to reduce trash generation (Lewis, 2012). SF Baykeeper criticizes being compliant with C.10 because of the amount of paperwork submitted to the state that shows the “efforts” to mitigate trash, rather than the true amount of trash removed (Wren & Blodgett, 2012). Conducting annual cleanups or designating Hot Spots does not address the cleanup of non-designated hot spots. According to SF Baykeeper’s public comment letter on the Trash Load Reduction Report, an example of arbitrary credit is “implementing a plastic bag ban and providing a 10% load reduction credit but contradicts the agency’s study stating bans provide a 7-8%

reduction” (Wren & Blodgett, 2012). Current policies do not adequately prevent or mitigate trash or illegal dumping from affecting the urban and natural environment. Regional and local government agencies will need to develop plans to reduce dumping in order to comply with the trash load reduction requirements of the NPDES.

B. Methods

Methods used by scholars to study environmental justice include surveys (Mansyur et al., 2016), archival analysis (Pellow, 2002), participation observation and interviews (Pellow, 2002, Mansyur et al., 2016, and Teixeira & Sing, 2016), and community-based participatory research (Teixeira & Sing, 2016). The best method to study the impacts of illegal dumping in East Palo Alto was to do textual analysis of archived documents, field observations, and conduct semi-structured interviews with government and non-government participants. Textual analysis included a detailed reading and synthesis of materials including: government documents, scientific and professional literature, and newspaper articles. On-site field observations in East Palo Alto included driving throughout the city in order to understand the physical environment and to see firsthand the instances of illegal dumping. Personal interviews with government staff and non-government organizations provided input on previous illegal dumping mitigation activities conducted in the City of East Palo Alto or communities of color.

The inequitable siting of pollution and landfill has been well documented within environmental justice literature, (Heiman, 1996; Konisky & Schario, 2010; Mohai & Saha, 2015). Significant research has also been conducted on the impacts of trash and marine debris/trash load on the environment (Avio, Gorbi, & Regoli, 2017; Khairunnisa, Fauziah, & Agamuthu, 2012; Leous & Parry, 2005; Owens, Zhang, & Mihelcic, 2011). However, there is currently little research that addresses illegal dumping as an environmental justice concern. Thus this research on illegal dumping in East Palo Alto contributes to the conversation on the environmental injustice of illegal dumping as well as environmental justice activism. This project may also provide better opportunities for municipalities, through community engagement, to address illegal dumping in communities that face a disproportionately high dumping rate, and are predominantly people of color and low-income neighborhoods.

Textual Analysis

Government Documents. Maps, presentations and public comments from the City of East Palo Alto, CalRecycle, California Regional Water Quality Control Board, and CalEPA were analyzed to provide background information on previous and current policies related to illegal dumping and solid waste management. Analysis was conducted on documents related to state regulations, bills and local municipal codes regarding solid waste, pollution prevention, environmental justice, illegal dumping and community participation to examine pollution and civic engagement.

Newspaper articles were a valuable resource of information on historical and chronological snapshots of community concerns, particularly as they relate to illegal dumping. The contentious racial history of East Palo Alto was well documented in a local newspaper provided data on the community sentiment of the time. Newspaper articles also provided examples of illegal dumping problems from other communities in the San Francisco Bay Area.

On-site Field Observation

To better learn about my study area, I drove through the areas with high illegal dumping incidences based on the City of East Palo Alto's illegal dumping map. I conducted four visits to make observation and take pictures of illegal dumping. I observed multiple locations that were frequent illegal dumping hot spot within the city including the end of Cypress Street, Weeks Street and Beech Street. A digital camera and iPhone camera were used to capture examples of illegally dumped materials and illegal dumping signs throughout the city of East Palo Alto. No individuals were captured in the photography to ensure privacy.

Semi-Structured Interviews

Purposive sampling was used in the selection of the participant pool. Purposive sampling is a useful technique for researchers to discover information-rich informants on the subject matter (Hay, 2010). To achieve this, I contacted government and non-

government professionals with experience in illegal dumping of solid waste, community cleanups, environmental justice policies and activism, environmental policies, and community engagement to address illegal dumping. Government and non-government employees¹ were interviewed about their professional knowledge and experience with illegal dumping and the community. Snowball sampling was applied in order to find additional eligible participants and stakeholders who were knowledgeable about East Palo Alto or illegal dumping concerns (Hay, 2010).

My San Francisco State University email account was the primary tool used to contact participants. Each participant was given and signed an informed consent letter based on the San Francisco State University Institutional Review Board protocol. I ensured participant anonymity by assigning pseudonyms known only to my thesis committee and myself. I sent emails to thirteen potential participants. I recruited two participants through snowball sampling and one agreed to participate in the study. One participant asked to invite other individuals knowledgeable on the topic, which eventually grew into a group interview with four participants. Three potential participants declined because they did not think they were knowledgeable about illegal dumping, environmental justice or East Palo Alto. Five participants did not respond to the email requests to join the research. Files collected during the research were saved on the University's Box account under my faculty advisors password protected account.

¹ The government and non-government organization are not listed for the protection and privacy of participants.

To gain information from different perspective on the issues of illegal dumping, interviews with government and non-government participants were conducted. These interviews provided me with specific information about illegal dumping and the experiences of the city. Semi-structured interviews provided a mean to gain in-depth knowledge from key participants. Although the interviews consisted of similar questions, the interview was flexible to include participant's interest. Interviews provided the opportunity to focus on what participants felt was most relevant. Thus, the developed interview guide comprised of 7-9 primary questions and 5-6 secondary questions all related to illegal dumping, environmental justice and community engagement.

Nine individuals participated in interviews. I interviewed five participants individually while four participants joined a group interview. The group interview provided valuable insight but created an environment where some participants spoke more than others. For example, Participant #8 did not respond or provided insight into many of the themes; this likely happened because other members in the group answered them.

Interviews were audio recorded for accurate record-keeping. Audio recording provided for a more "natural conversational interview style because the interviewer is not preoccupied with taking notes" and able to become a more "attentive listener" (Hay, 2010, p. 119). I took hand-written notes at each meeting. Note-taking supplemented the audio recording to help keep track of additional questions I wanted to ask as well as to

note nonverbal cues not picked up by the recorder, such as facial expressions. This process provided the opportunity to allow the interviewee to answer the question without interruptions while I remembered the follow-up questions.

The primary audio recorder used for all semi-structured interviews was a digital Tascam DR-05 and a secondary recorder was an iPhone app Voice Recorder by TapMedia Ltd. All recordings were transcribed for analysis. Transcripts of the six semi-structured interviews were coded for data analysis. All transcripts were initially read, followed by highlighting themes and patterns in the interview. The number of times themes were mentioned was tallied in a table 2. Nine themes emerged from the semi-structured interview. Results of the analysis will be discussed in the section below.

Limitations

Because dumping waste outside a designated area is against many state and city laws, illegal dumping mostly occurs in the late evening or early morning. Data on the number of incidences may not reflect the true volume and amount of illegal dumping in East Palo Alto. There is there for no standard measure for counting dumped waste. For example, the number of dumps may be higher if multiple garbage dumped by multiple people occurred in the same location but are reported as one incident. The type of waste illegally dumped may not be accurate or tracked, making it difficult to analyze the quality, type, and size of waste found in East Palo Alto.

C. Results

Results of my textual analysis of archival documents, field observations, and semi-structured interviews revealed nine major topics of concern including, community engagement, enforcement and environmental justice. All participants agreed that illegal dumping is an environmental concern especially for communities of color. But the concept of environmental justice and the connection to impacts of illegal dumping in the community was disconnected. 78% of participants want increased enforcement measures to address illegal dumping and increased community engagement from residents to take ownership and pride of their city. The Major themes are displayed in Table 6 and analysis of the themes is discussed below.

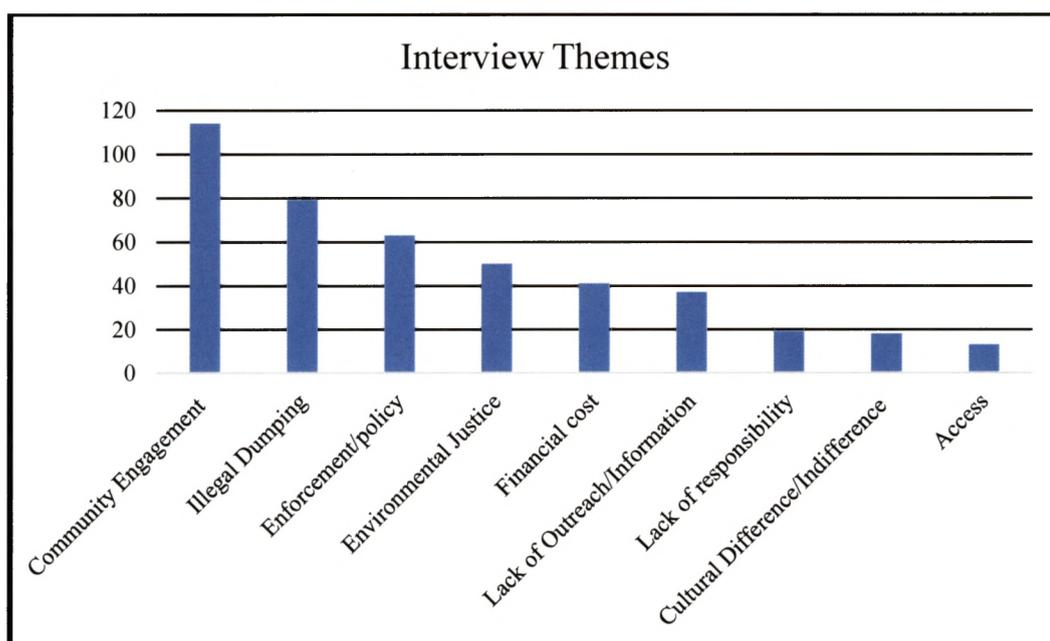


Table 6. Nine major themes addressed in the interviews.

1. Community Engagement

Of the nine major themes brought up by participants, the theme of community/civic engagement was the most prevalent in the interviews. Eight of the nine participants discussed community engagement themes (Table 7). Community engagement discussion included: community involvement, residents and community organizational led trash cleanups, community priorities, community beautification, school involvement, community meetings, community-based solutions, and local advocates.

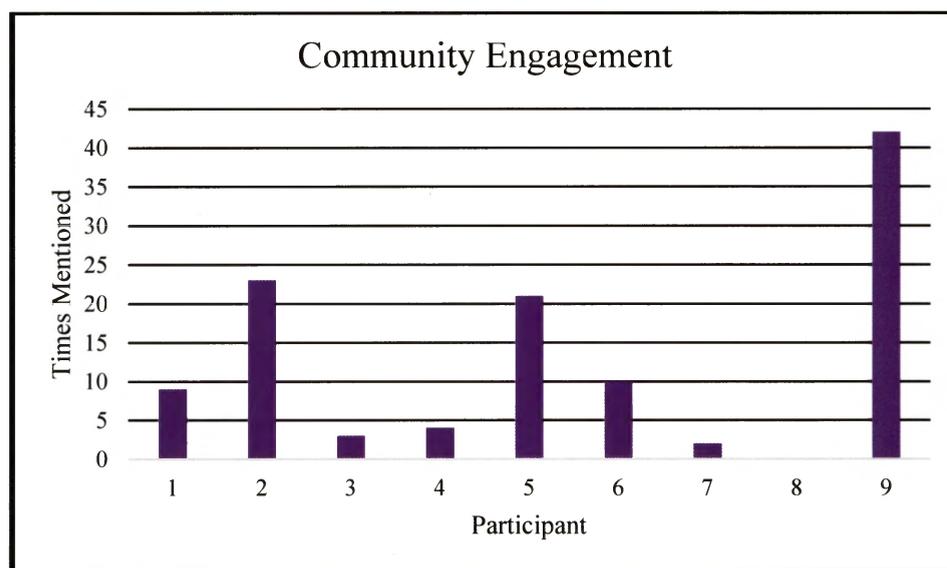


Table 7. Concerns of Community Engagement.

Collectively, participants see active civic and community engagement as a key component to ensuring disadvantaged communities such as East Palo Alto are empowered to voice their concerns to their representatives and pushing government to do

their part in mitigating illegal dumping. Participants would like to get more involvement in city beautification from the community.

It's engaging folks to help them have a voice in decision-making and ultimate action. – Participant #9

Participant #4 connected the decrease of illegal dumping with neighborhood pride and ownership. But this is not the case if the residents are renters, compared with homeowners living in the community. Renters are more disconnected to the community because they do not have the financial investment or having security like owning the home.

If a neighborhood or community decides to make that a priority and keep it clean, it tends to discourage the overall dumping. I think homeownership rates are also tied to that. – Participant #4

Research participants voiced that to address illegal dumping in the community, solutions must come from the community itself and not outside organizations. Community engagement is closely tied to providing information about disposal options to the community, which was another theme brought up by participants. Community members who want to participate in the decision making process must be able to understand the information provided. In referring to a public meeting by government organizations on discussion of impacts and mitigation of illegal dumping, Participant #5 commented on the lack of participation from the most affected communities.

We have all sorts of people at our public meetings once a month but there's not one representative for those communities or disadvantaged communities... so I would like to see more representation, so that's one of our key objectives is to get people to be involved in the decision-making process. – Participant #5

But participant #7 points out that environmental injustice are occurring because the community does not have legal authority or representation to fight on their behalf.

I would just add that a lot of these environmental justice communities, I mean the reason environmental dumping and other horrible pollution may occur in them is because those community members don't necessarily have any legal authority or representation looking out for them. - Participant #7

Participants addressed concerns on multi-lingual communication of information on illegal dumping, meetings and community outreach methods. For example in East Palo Alto there is a sign created by students in Samoan, a prevalent languages spoken in the community.



Figure 2. Signs made by students in English and Samoan.

To have an effective community engagement, communication to residents and community members must be relevant in regards to language and gauging the level of understanding of residents. Providing interpreters ensures that information is explained accurately is important as suggested by Participant #9 and #5.

I have bilingual staff that assisted them [impacted community]. Making sure that meetings are accessible, that the right people are there to explain things simply to people in the language that they need are keys to success and then us partnering with those locals [residents]. – Participant #9

One participant explained the importance of reading and comprehension level.

We tried to keep it at a fifth grade level to educate communities about everything that we do that faces outward. – Participant #5

One participant addressed engaging the homeless population. The homeless community is often left out of discussion about community engagement. In East Palo Alto, the homeless populations continues to grow but are not represented in decisions. Participant #6 suggests leveraging the homeless community by giving them the opportunity to contribute to cleaning East Palo Alto. The Participant gave an example of a community that paid the homeless to clean up. This provided a means of earning income for the homeless community and engaged all people, regardless of housing or income.

They're paying mostly the homeless with volunteers. They actually pay them. They're going to be in charge of the clean-up and we're finding that a lot of homes at – people there are willing to accept responsibility if we have some way of paying them. – Participant #6

Participant #1 addressed the lack of manpower to educate the community. One solution is to hire temporary aides to reach a wider population. Incorporating Participant #6's suggestion of hiring or incentivizing the homeless community can work in the City of East Palo Alto.

We're talking about hiring a couple of community service aides. Their job is solely going to be to educate people on the topic of disposal of their materials. Participant #1

Solutions to address environmental injustice are successful only if the community is informed, are organized and have the means to take action. Developed organizations in East Palo Alto like the Church of Saint Francis of Assisi and school leadership clubs provide an existing base to help engage residents and take ownership of their community.

2. Illegal Dumping

Participants were asked if they believe illegal dumping was a concern. All participants agreed that illegal dumping is a concern that affects the environment and the community. Participants addressed littering, inadequate waste receptacles, dumping from residents, dumping from commercial sector, and illegal waste hauler dumping as culprits to the issues of illegal dumping. A mention of the concern of illegal dumping was second to community engagement.

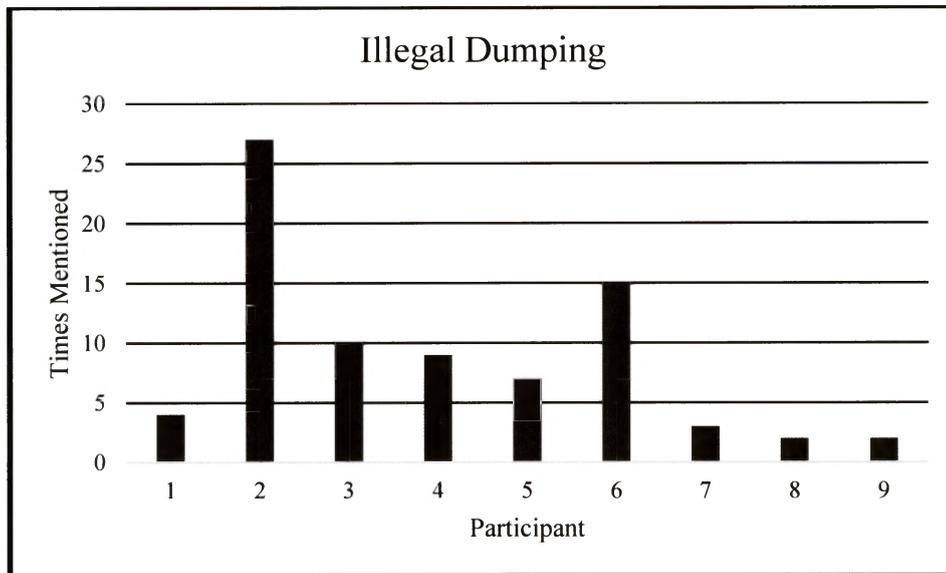


Table 8. Concerns of Illegal Dumping Results.

All participants were asked “how significant are the impacts of illegal dumping?” Participants responded that illegal dumping is a concern significantly impacting communities and the environment. Two participants related the impact of illegal dumping to the quality of life in the community.

The quality of life impacts are pretty substantial because it’s the broken window syndrome where we have all these messes all over the place and people feel like they can disregard health and safety issues generally and disregard taking pride in their community. – Participant #1

I think that impacts of illegal dumping can be quite significant. It can affect both the physical environment, and say in regards to stormwater or animals, but it also has an impact on the quality of life for the people in the area and on crime rate. – Participant #4



Figure 3. Illegal dumping at the entrance to the footpath of the Bay Trail.



Figure 4. Illegal dumping on the dead end 1200 block of Weeks Street.



Figure 5. Illegal dumping on the dead end 1200 block of Weeks Street.

Figures 3, 4 and 5 show the location and type of waste illegally dumped in East Palo Alto. Illegal dumpers frequent the 1200 block of Weeks Street, a residential street that ends to the foot-path entrance to the Ravenswood Open Space Preserve. There are no homes at end of the block with poor lighting making it ideal to quickly dump waste without being easily seen. People living in their cars and recreational vehicles often park on the block leaving behind waste. The City of East Palo Alto designated the block as a “very high” trash generation area (figure 6) under the Trash Load Reduction Plan.

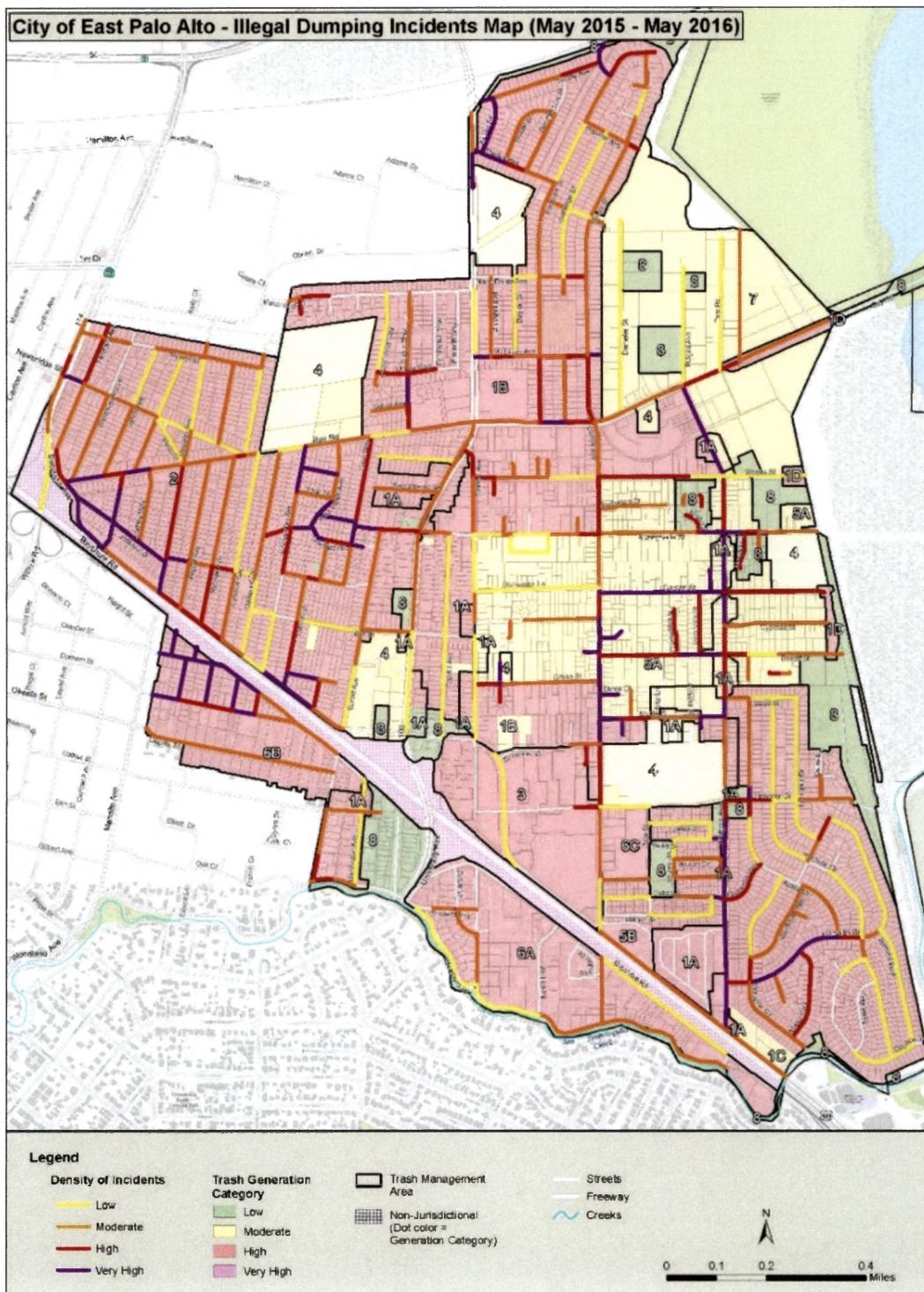


Figure 6. Illegal Dumping Incidence Map (City of East Palo Alto, 2017).

One participant stated that the impact of illegal dumping is a financial constraint for residents. East Palo Alto residential customers pay the same rate for garbage service regardless of whether the garbage cart is the smallest or largest.

It impacts the residents here that are already for the most part strained enough as it gets [incorporated] to our [property] taxes. – Participant #3

Garbage service is rolled into the residential property taxes. As such, more research on the financial impact to residential customers is needed. Financial mechanism of the rate structure of the Franchise Agreement with the Waste Hauler Recology San Mateo County should be studied and examine alternatives that provides options for customers.

The term illegal dumping was not explicitly mentioned as many times by participants' responses to the questions in the interview because the study was all about illegal dumping.

3. Enforcement

The third most discussed theme from participants was on enforcement and policy. Concern was raised about prosecution, solid waste management policy not adequately addressing illegal dumping, surveillance, dedicated staff, and organization authority over enforcement.

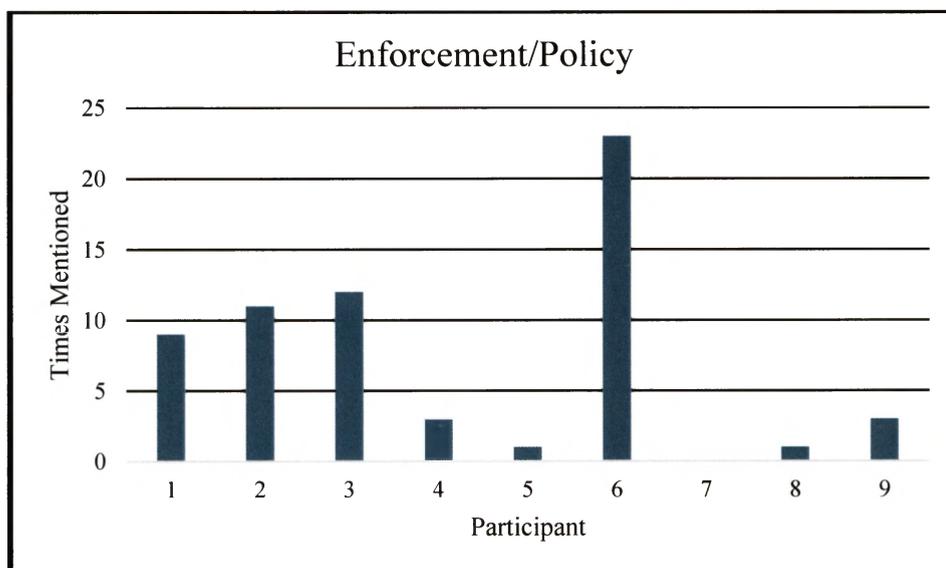


Table 9. Enforcement/Policy

Some participants want to see a better mechanism for catching and prosecuting illegal dumpers. It is costly and difficult to catch and prosecute illegal dumpers. There are illegal dumping signs (Figure 7) throughout the city but people still dump because there are not enough staff to enforce and police the neighborhood. The city needs staff to investigate and persecute dumpers. Participant #6 is concerned that it will be a paper chase that continues to grow.

That works pretty well provided that you have an agreement on prosecution because if it's just going to be a paper chase, it's not good. I don't know how well that would work in big cities. It's very difficult but what's one of the things you look at is what enforcement do you have. - Participant #6

Another concern addressed by Participant #3 is that law enforcement prioritizes more severe crimes like domestic violence and shooting over illegal dumping. Even with

video evidence of the perpetrator, law enforcement in East Palo Alto does not have the manpower to investigate the incident.

We do the surveillance; we give [law enforcement] as much information as we can. Sometimes we have even gone [through] the garbage because people's [information is] in there and we get the address. - Participant #3

There's a camera at the back of the dikes where they dump as well but in a city that's already impacted by not having adequate police, it's at the bottom of the totem pole. - Participant # 3

Having stricter fines for illegal dumping under the municipal code was also suggested.

The current fine for illegal dumping in East Palo Alto is \$1000. Increasing the fines may or may not deter individuals from dumping. Driving through the streets of East Palo Alto, I only found three "No Dumping" signs. The signs on Figure 7 and 8 were located in a high trash generation zone and were clearly visible. The sign on Figure 9 was located in an alley between apartment complexes on the western side of East Palo Alto and covered with graffiti. It was difficult to spot the sign and is not effective at deterring illegal dumping if it occurs at night.



Figure 7. Illegal dumping sign on the corner of Pulgas Avenue and Weeks Street.



Figure 8. Illegal dumping and warning signs at a donation center.



Figure 9. Illegal dumping sign in an alley street between Euclid Avenue and Manhattan Avenue.

An ironic finding with regards to stricter enforcement is that it would add an additional burden to the community the enforcement is trying to help. Some participants stated that many of the individuals dumping are residents of the community and they either cannot afford the cost to legally dispose of the waste or do not have the right information.

If it is on private property, you can go after that property owner and say you either clean that or we will have it cleaned and lien the property. - Participant #6

Culprits have been video recorded or the names and addresses found in the waste.

However, targeting the residents dumping, who might themselves be low-income, with more fines is part of the injustice occurring in the community. Municipalities like East Palo Alto should empower the community and give them the tools and information for

proper disposal including affordable convenient legal dumping sites. Instead, cities are looking towards enforcement rather than behavioral change as suggested by Participant #1. But, as participant #6 states, you can implement enforcement mechanisms, but without law enforcement or city attorneys to prosecute, enforcement mechanism will not be successful.

[Cities] should put less emphasis on community based programs and put more emphasis on actually doing infrastructure improvements that are just going to be without a thought. The city just has to maintain a structure and the community doesn't have to do any work to get it to be in compliance because there is such an increase in distribution of illegal dumping. - Participant #1

"They want to put cameras and stuff and I said before you spend the money on it, meet with your district attorney and find out if he's willing to prosecute. If they are, that's fine. – Participant #6

There was maybe only one staff person in the city that was dedicated to looking at the problem. - Participant #4

This adds to the issues of the cycle of environmental justice that disproportionately impacts communities of color such as East Palo Alto. One participant had implemented cameras on their property and was sending footage to law enforcement with little, to no, prosecution of the offenders.



Figure 10. Illegal dumping outside donation center



Figure 11. Illegal dumping next to parking lot



Figure 12. Signs made by local East Palo Alto K-12 students promoting city beautification.

4. Environmental Justice

The fourth most discussed theme from participants was environmental justice. Not all participants understood the concept of environmental justice but many responses were similar or addressed environmental justice. All participants were asked if they thought illegal dumping was an environmental justice concern. Two participants were very knowledgeable on the topic and addressed the concerns in depth. One participant wanted to clearly point out that environmental justice *is* closely related to race and class.

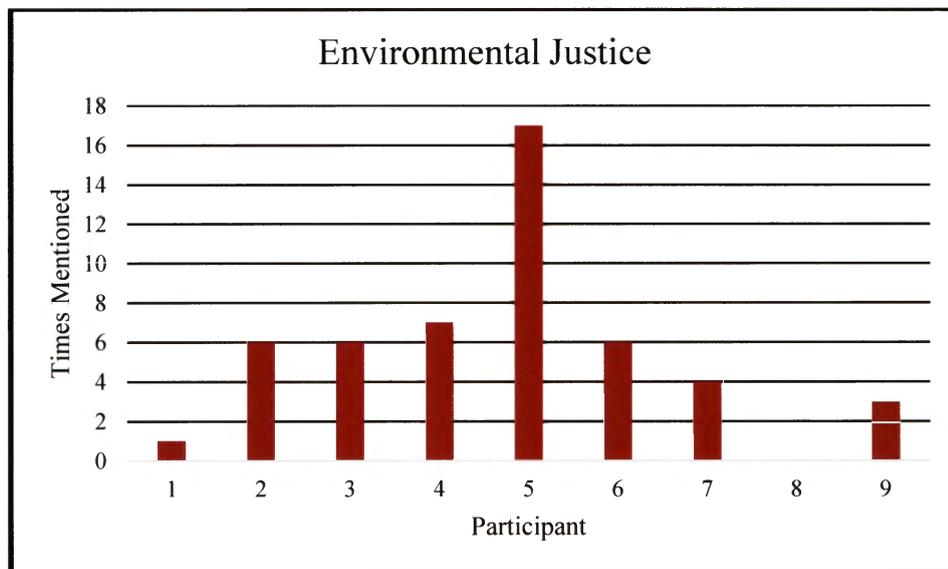


Table 10. Mentions of Environmental Justice

All participants were asked if they believed East Palo Alto or similar communities are disproportionately burdened with illegal dumping. Although the question is similar to the question of “do you believe illegal dumping is an environmental justice concern,” this particular question does not use the term environmental justice. Asking participants about the disproportionate burden rather than environmental justice was easier to comprehend. Eight out of nine, responded that communities like East Palo Alto are disproportionately receiving more illegally dumped materials. Participant #8 did not provide a response because other participants in the group provided lengthy responses to the question. One participant acknowledged the disproportionate burden, but contradicted the response by stating, “*I think we are doing it to ourselves but we definitely have a higher incidence of it.*” But, outsiders may have little understanding of

the complexity of environmental justice. The consequences of not understanding environmental justice is harmful to the community that is burdened. Blaming the residents for the illegal dumping in their neighborhood perpetuates the injustice and may make it harder to decrease the environmental burden. Based on the statement from the participant, outsiders could perceive that residents and community members do not care about their wellbeing and the environment if they are tolerating illegal dumping in the community. It reverses the work and goal of environmental justice.

Not all participants connected environmental justice with illegal dumping and some participants understood the concept to be closely tied with the environment rather than with the impact of environmental pollutants on humans.

They would dump stuff out there and it impacts the nature, the habitat...I went and took my kids on a walk to the dikes and just seeing all the garbage and trash that's in the marsh is a disaster. It's bad, it forms health issues, problems with just the natural habitat... - Participant #3

Participant #3 was passionate about the impact illegal dumping has on the environment. She briefly referenced health concerns but the response was about how it makes the environment dirty with Figure 13 as an example.



Figure 13. Illegal dumping of demolition debris next to the National Wildlife Refuge.

Referencing the impact illegal dumping has on her children, the participant states that sensitive community members like children are impacted by illegal dumping, because it occur along paths where children play, posing a public safety concern of possibly injury from tripping. Illegal dumping may force children to walk on the street to avoid the garbage as seen in the Figure 14 below.



Figure 14. Illegal dumping blocking sidewalk.

It may be difficult to connect the human injustice component to the environmental inequity even though residents see and experience the issue regularly.

Participant #5 was very knowledgeable about environmental justice and the impacts of illegal dumping. The participant clearly connected that illegal dumping occurs in communities predominantly of color.

What's most concerning is that a lot of the time with all pollution, as we know, not only in California but the United States and the world, the people that are most impacted are people of color and minorities. - Participant #5

Participant #5 was the only individual throughout the research who addressed race as a key component in the environmental injustice. Stakeholders involved with

addressing illegal dumping cannot ignore impacts of racism on illegal dumping. Issues of racism and classism are relevant in this research. According to Participant # 1, removal of dumped material in front of an East Palo Alto residence is not immediately reported to responsible agency. If dumping was to occur in the affluent community of Atherton, the response time will be quicker because Atherton has more financial resource than East Palo Alto.

Racism isn't the only issue. But I want to bring it up because so many times people don't and I think it's important to bring it up. That it is a real thing and we're seeing with our current administration that stuff is coming out of the woodwork.

One of the concerns I hear from community members is like people just feel that they can dump here because our community is not well-off or what have you. But I think some of it actually does have to do with racism. – Participant #5

Concerns about the homeless community were discussed. As previously mentioned in the community engagement section, the homeless community is usually not discussed or considered part of the established residents. The City of East Palo Alto is seeing an increase in homelessness, which brings in the stigma of what Bourgois and Schonberg (2009) refers to as “invisible people” or Hill's (1992) “human waste of a disposable society”. Although these women, men, and children may be homeless, society needs to address them and see them as human beings rather than the “invisible” community.

But I think it is important to talk about how are these [homeless] communities being perceived. They're the throwaway community. Homeless people, it's not only a race thing but it's also a class thing... But the concern from Bayview was like, well, a lot of the times, this is homeless people's housing and if you're coming up and picking up the "garbage," then you're coming up and picking up their home. - Participant #5



Figure 15. Abandoned waste from a homeless community.

There were other participants who connected illegal dumping to environmental injustice. In addition, the participant was able to discuss the ripple effect on the whole community, including current and future businesses that impacts the economy of the community.

I think that the physical environment, just the way your neighborhood looks can definitely impact your happiness and quality of life and when there's more dumping there tends to be more graffiti, higher rates of crime. It's all interconnected. It can sort of have a ripple effect. From something that seems pretty small. To go hand in hand with that, that is

going to affect jobs, businesses might not want to come into the area to do business, and so there could be more vacancies and less jobs.

- Participant #4

Los Angeles has many areas that have trash as one of the pollutants. I think demographically, I think they are impacting many low income and disadvantaged communities, for sure. – Participant #9

5. Financial Cost

Disposal of waste costs money and the price depends on the type of waste.

Residential customers pay a flat rate of \$40.77 regardless of whether your garbage container size is a 32 gallon or 96 gallon can.

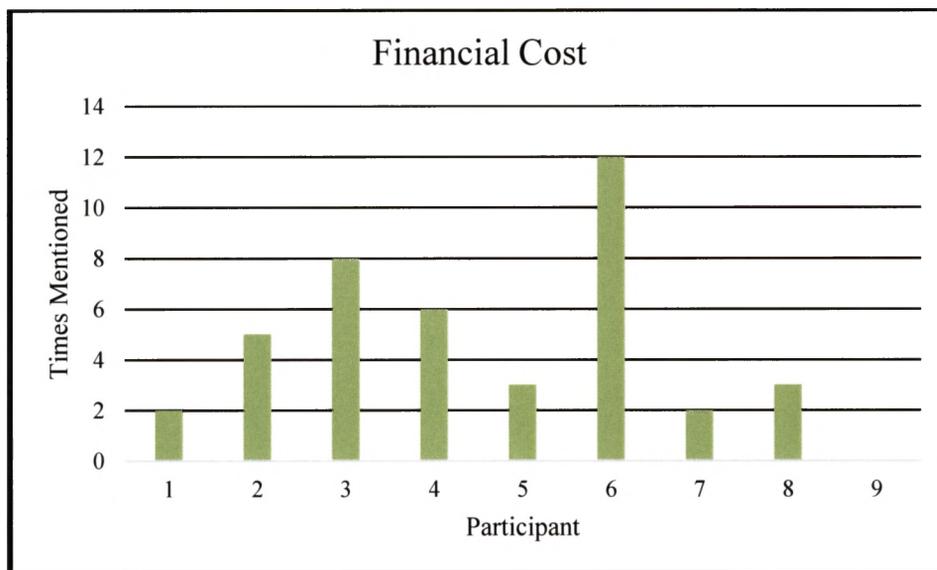


Table 11. Mentions of Financial Cost

Recology San Mateo County is required to provide two separate free on-call curbside bulky item collection for single-family residences and multi-family residential complexes each year (City of East Palo Alto, 2014a). The free service was agreed upon with the City of East Palo Alto to ensure that larger items from customers will be collected and properly disposed (City of East Palo Alto, 2014a). Customers are allowed to place up to two cubic yards of material, one appliance like a washing machine, one bulky item (like a mattress or couch) and one e-waste item like televisions per scheduled bulky collection (Recology San Mateo County, n.d.). For additional collection pickup, the cost per scheduled pickup is \$89.28, which can add up for customers (City of East Palo Alto, 2014a). The alternative for customers that have a lot of waste is to rent a debris box, large bins ranging from 7 to 40 cubic yards, from multiple vendors that offer the service. But the cost for a seven day rental can cost hundreds of dollars.

It's really the cost of transporting and the cost of dropping that material off. – Participant #1

They can't afford the dumping fees. – Participant #2

Getting rid of those stuff is probably five times as much as they will pay for number one. It doesn't make sense because they can't afford to dump it because they either prioritize, "Do I pay the bill, feed the food or doing stuff somewhere else?" – Participant #2

I think furniture, mattresses, I think bulky items that anything that it has a large expense at the dump, you're going to see it here. - Participant #2

It's not cheap to throwaway trash. Nobody wants to pay the throwaway trash. - Participant #3

Based on the discussion around the theme of cost and the participants concern, there is a need for financially sound solutions to address illegal dumping. One solution that worked for a participant was providing small grants to community organizations or groups to clean up their specific neighborhoods. The method engaged the community through civic engagement, educated volunteers about the impact of illegal dumping and was relatively low cost. Volunteers from community churches, schools, or a group of neighbors participated as described below.

The program is a comprehensive local environmental area neighborhood program where we encourage non-profits or any group that is a non-profit base, that they come out on a Saturday for a couple of hours. We will then give them a stipend for their non-profit to buy whatever they need. It really becomes powerful when we have a group of 20 people going through each neighborhoods picking up [trash] and having the residents saying, 'Why are you cleaning up my neighborhood?' It also gives them the sense, "Gee, it's so embarrassing. I have other people come and sweep the streets, rake my lawn." – Participant #2

In addition to community-based action, municipalities like East Palo Alto can take advantage of CalRecycle's Illegal Disposal Site Abatement Grant Program, which has provided funding for clean-ups of communities throughout California. The Illegal Disposal program was established to provide financial assistance of up to \$500,000 for public entities for clean-up and mitigation of illegal disposal sites. In fiscal year 2015-2016, the City of Richmond, California a community predominantly of people of color, was awarded more than \$430,000 in funding for current illegal dumping cleanup and abatement measures. The City of Richmond's goal was to transform the illegal dumping

program to decrease the impacts on public health and safety and the environment (CalRecycle, 2017). In fiscal year 2013-2014, the City of Santa Monica was awarded close to \$400,000 to address illegal dumping from multi-family dwellings in predominantly low-income housing complexes and homeless encampment with the goal to mitigate garbage from entering storm drains and reduce public health risk (CalRecycle, 2017). The only challenge posed by the CalRecycle Grant is available funding. In fiscal year 2016-2017, funding was not available for two grant cycles (3 cycles in a fiscal year) as there were no available funds for the other cycles. Funding needs to be allocated annually to help communities address illegal dumping.

6. Lack of Outreach/Information

One of the biggest challenges combating illegal dumping is ensuring that communities know viable options available to them to dispose of their waste.

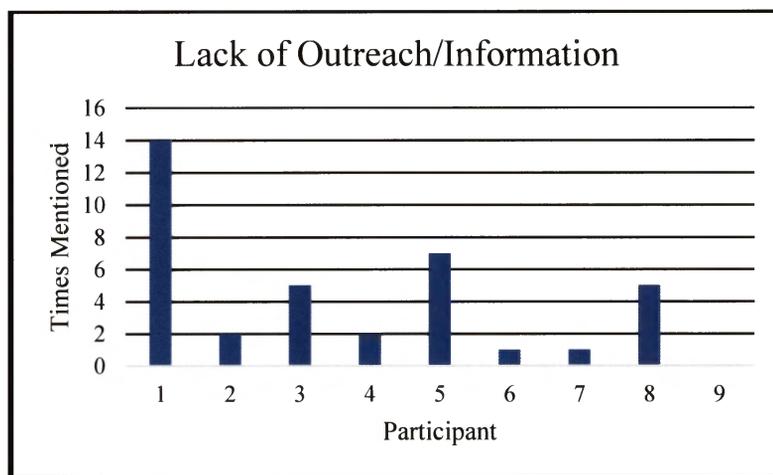


Table 12. Lack of Outreach/Information.

Finding the information about disposal location and cost must be easy and multi-lingual, especially in communities with a diverse ethnic makeup. In addition, with the City of East Palo Alto having a high percentage of rental units housing, information must directly reach all stakeholder, including building owners and individual renters.

If you have to go through a series of prompts and at the end of the call you're not sure how you're going to get rid of the material, people might get frustrated and just put it out on the curb. – Participant #1

If a newsletter is being mailed to the homeowner, they may not even live in that city. So if you're renting, traditional outreach may not work. – Participant #4

If they're renting they wouldn't [use the bulky collection] and the landlord is the person who has to put [an order]. Usually, they're going to hold on to [the free bulky collection] until the tenant leaves so that they can clean up and do their dumping. So yes, I think not as many people know about it. – Participant #3

It's that people don't know – even with like English speakers. – Participant #5

I mean it's – money is going to help big time but it's – the educational component is getting in there, making it as simple as you can because they're not going to haul it across town or anywhere else. – Participant #8

We've also done some flyer distribution at every single home. The problem is that people are not reading them. They're recycling them. Participant #1

As stated by Participant #1, even if information is provided to all stakeholders, it may be discarded and not seen or read.



Figure 16. Recology outreach material sent to homeowners.

A participant suggested

[We should be] talking on a person to person basis [to educate about options]. When we see an overflowing trash can, when we see a pile of debris outside, they need to knock on doors and find out what's going on. What kind of help does this resident need? Because clearly they need a little more handling. – Participant #1

Lastly, outreach and information must be representative. Participant #5 pointed out a commonly forgotten community is the homeless community. The homeless community generates waste. Unlike homes and apartments, the homeless communities do not have access to proper waste receptacles. As this population continues to grow due to higher cost of housing in the bay area, homeless encampments will generate more and more waste. The City of East Palo Alto needs to educate the homeless community as well as

provide centralized waste receptacles, portable showers and restrooms. This can decrease environmental health concerns of putrid waste and public urination.

So you need to be able to communicate with homeless people because they're a community too and they're people too. – Participant #5

There are concerns of illegal dumping from homeless encampments, however, if they are given resource to properly dispose of waste, it may help reduce the incidence of dumping from the homeless community.

7. Lack of Responsibility

The lack of federal and state enforcement on illegal dumping makes it difficult to figure out who is responsible for illegal dumping activities.

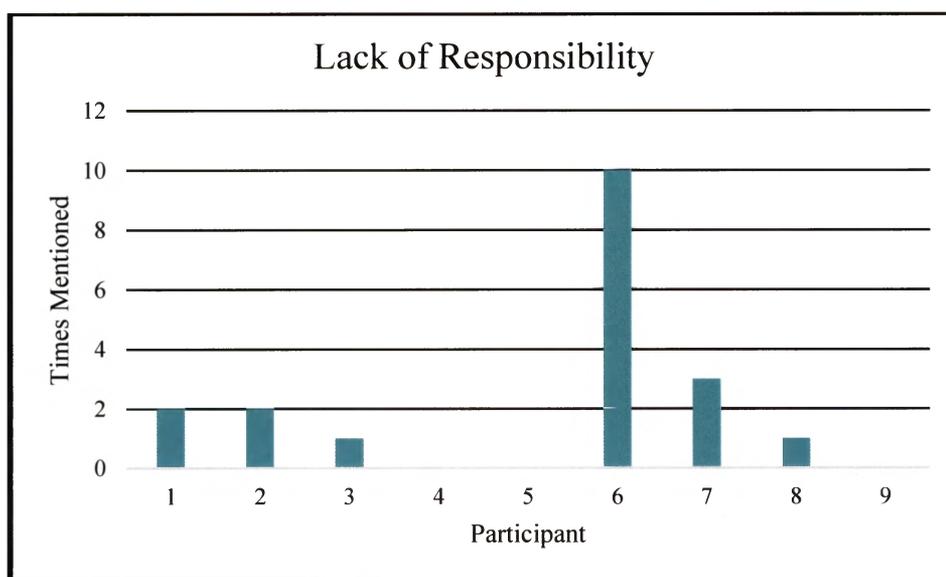


Table 13. Lack of Responsibility

At the state level, there are 27 codes pertaining to illegal dumping ranging from penal code, health and safety code, vehicle code, public resources code, fish and game code, and street and highways code. The penal codes on illegal dumping give strict rules on the financial cost cities can impose if an individual is convicted of dumping. For example, penal code 374.3 states that if an individual is convicted of unlawful dumping of waste on public or private roads, the fines are no less than \$250 and no more than \$1000 on the first conviction (California Penal Code, Part 1. Title 10, 373.3., 2007). Local municipalities use the state penal codes to develop local rules for enforcement. However, enforcement is difficult for some municipalities like East Palo Alto because they do not have a designated department to deal with the problem. There are municipalities that have designated departments like Public Works or require contracted waste haulers to address all illegal dumping phone calls received from citizens such as the case in San Francisco (San Francisco Public Works, n.d.).

Participant #6 addresses a big challenge for municipalities. No one wants to take responsibility for addressing illegal dumping on all levels of government. This perpetuates illegal dumping in disadvantaged communities.

Illegal dumping is not assigned to anybody. Nobody in state government is in charge of doing anything about it and nobody in the county government is in charge. – Participant #6

Participant #1 confirms the lack of responsibility but wants to do right and the ethical decision on the issues of illegal dumping by taking responsibility.

Nobody's really been responsible. I'm taking responsibility because somebody has to take responsibility – Participant #1

8. Cultural Indifference

Seven of the nine participants mentioned cultural indifference (not caring for the community or taking pride) as a concern. Because illegal dumping has become a common occurrence in low-income communities and communities of color, people who don't live in the community assume that the local residents have given up on their community by letting the dumping happen.

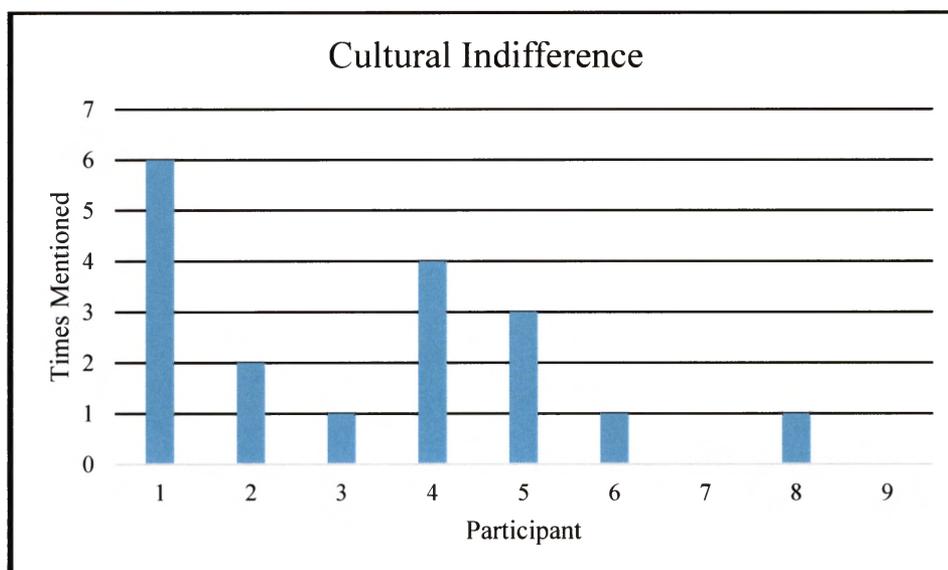


Table 14. Cultural Indifference.

As discussed by Participants 1, 3, and 4, the impacted community has gone numb from the environmental injustice such that they may no longer resist. They presume that not all residents care. It is likely that there are residents who are passionate about the concerns of illegal dumping, but do not have the time or resource to make a difference in the community through community engagement. That is why engaging the community through civic engagement is important. A future study may shed light on this subject.

A culture has developed where people just put their extra solid waste out on the street – Participant #1

You have people that are doing it and they just really don't care. - Participant #3

It's in their interest financially to keep their home value up. Where if you're a renter that's less of an issue. – Participant #4

9. Access

Discussion on the concerns of accessibility was the least discussed theme during interviews. Only five participants mentioned concerns of accessibility even though the lack of accessibility to a disposal site is a big hurdle in combating illegal dumping.

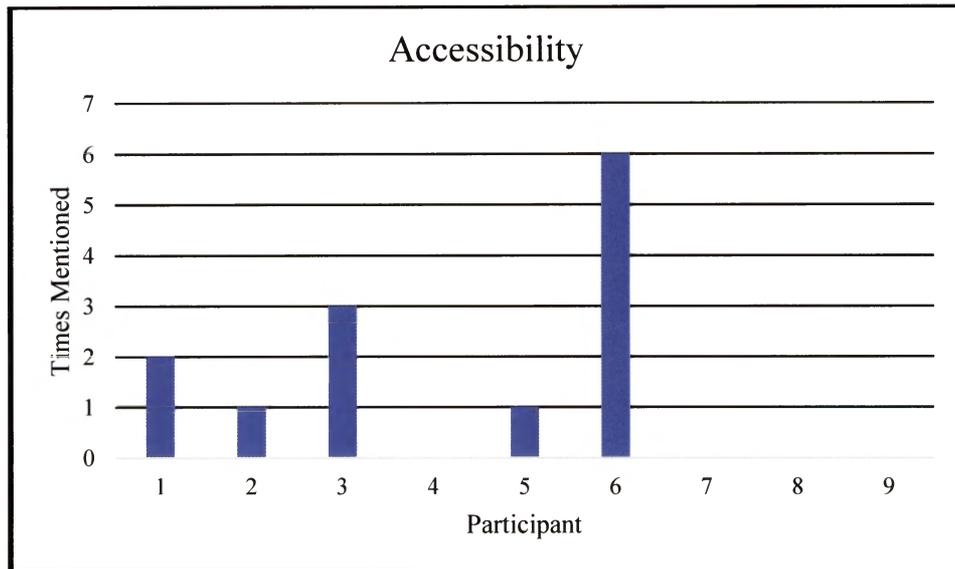


Table 15. Accessibility.

One way residents in East Palo Alto deal with accessibility is to hire other individuals or companies (legal or illegal) to pick up the residents' waste and pay them to dispose of the material. As seen in figure 17, 18 and 19, trucks and trailers collect the unwanted material. The trucks in turn hoard the waste until they legally dispose of the waste or illegally dumped them back in the community. The trailer in Figure 18 shows illegal dumping of waste on top of the tarped items. The white trash bag was likely illegally dumped.



Figure 17. Waste hauling truck full of waste. The truck was red tagged by parking enforcement due to lack of movement.



Figure 18. Trailer parked full of waste.



Figure 19. Trailer parked full of waste on Bay Street.

If you build it, they will come. If you provide it, they will use. -
Participant #1

They're hauling hazardous materials, tires, everything else. What about if we looked at a way of making them legal? What has happened now, Sacramento County has done that with franchises. They've said, OK, anybody that has a trailer, anything else like this, just to get all the mom and pops because there's a lot of them, must have a franchise and a permit. They now have 13 franchise companies and he says what's interesting on it is we have dropped our illegal dumping because these people are under permits –
Participant #6

10. Other Consideration

Other notable themes brought up in interviews include homelessness, population, government collaboration, and assistance. The homeless population must be considered as part of the community that needs information and be active in engagement because they are a vulnerable community that is also impacted by the injustice of waste. As the

population of the San Francisco Bay Area grows, the increase of waste generation needs to be considered. Government agencies must act collaboratively to address dumping. Illegal dumping can easily cross-jurisdictional boundaries. The waste of one community should not be the responsibility of the jurisdiction that is was dumped in, but rather should be a collaborative measure from all neighboring jurisdiction or municipality. Although these topics are important to the issues of illegal dumping, there was limited discussion from participants about the themes. The topic of homelessness is too large of subject to be addressed in this study but was mentioned by some participants. Future study on the impact of homelessness on illegal dumping should be conducted.

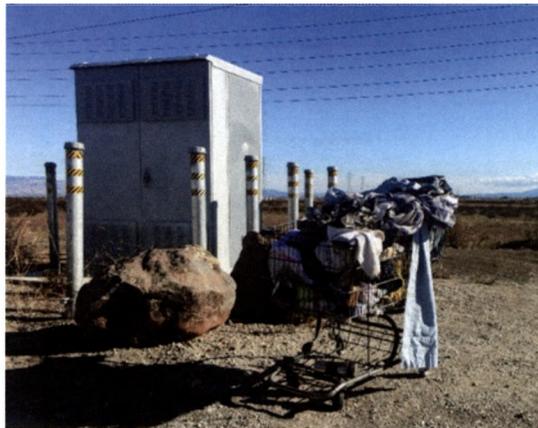


Figure 20. Shopping cart full of clothes and personal items.

D. Discussion and Conclusions

How effective has the City of East Palo been in reducing illegal dumping in the community? Following the preventative measures suggested by Croft et al., has the City

implemented solutions that fall under primary and secondary preventative measures for illegal dumping? Table 16, compares the mitigation measures for illegal dumping suggested by Croft et al. and the activities the City of East Palo Alto has conducted that would fall under the measures.

Situational Crime Prevention Measures	Croft et al. examples	East Palo Alto activity
Increasing the Effort	Controlling access to property and space, and making it time consuming to dump, deflecting offenders away from property or space, and controlling facilitators, which aid the commission of offense.	At the time of case study, no activity has been done to increase the effort to commit illegal dumping
Increasing the risk	Implement screening, improve lighting, CCTV for surveillance, natural surveillance from community	Hot spots have adequate lighting but dumping continue, CCTV on private property has not decreased dumping due to lack of enforcement
Reducing benefits	Increase the costs of illegal dumping, reduce expense of legal disposal	Cost of illegal dumping has capped at \$1000 due to the State of California maximum allowable fines. The cost of legal disposal has not decreased for the city or county.
Displacement	Wider range of preventative measures to prevent displacement of waste in another community	No current activity was conducted during the case study to prevent displacement of waste

Table 16. East Palo Alto Situational Crime Prevention Activities.

The City of East Palo Alto has implemented measures to increase the effort to monitor dumping and increase the risk of getting caught. But, the City has not implemented measures for reducing the benefits of illegal dumping or reducing displacement of waste. It is hard to speculate if the City would see a decrease of dumping if all measures were implemented. The circumstance, geography and community in Croft et al.'s case study in Australia is different from East Palo Alto.

Illegal dumping should be considered an environmental injustice because the cumulative impact of illegal dumping is significant and affects predominantly low-income communities and communities of color compared to neighboring predominantly white and higher income cities. Because this research focused on the small city of East Palo Alto, further research on a larger scale can help determine the extent of environmental injustice of illegal dumping disproportionate impacts on low-income communities and communities of color generally.

Illegal dumping is not strictly a problem in East Palo Alto, but affects many communities throughout the United States. Results from this study can be replicated in other similar communities like Richmond or Oakland, California that have similar demographics facing increased illegal dumping and cost for mitigation and cleanups.

It was surprising to hear that an increase in penalty for illegal dumping conviction was favored for some participants without the necessary staffing to enforce the law. Some participants stated that household sizes are much larger in East Palo Alto and may not be

reflected in census data. This may likely be due to fear of immigration legal status or the maximum household size landlords allow to live in a rented unit. Larger households do not necessarily equal larger household income. Larger household sizes will produce more household waste, which in turn increases disposal cost for the household. East Palo Alto also has a large rental housing market. Most of the dwellings west of Highway 101 are comprised of apartments and generate a lot of waste. In apartment complexes, residents do not directly pay for garbage service. Because they are not homeowners and are not invested in the property, they may not value the aesthetics or contribute to the community as compared to if they were owners. In single family households, garbage rates are set to a flat rate and size option (96 gallons garbage), and is paid through the residential property tax. This system does not give residents the opportunity to try and reduce waste if they continue to be charged for a 96 gallon garbage can. The City of East Palo Alto needs to address the rate structure of garbage service and provide residents the opportunity to choose the right size for the right service for waste disposal. In conjunction with the opportunity to have the right size, right service, the City or waste hauler must have the capacity to correct the service for residents who are not complying with disposal laws.

The findings in this research could not answer the effectiveness of the NPDES Trash Load Reduction Plan in mitigating illegal dumping because cities have only submitted one annual report on the NPDES stormwater permit to the San Francisco Bay Regional Water Quality Board. However, this study helped to start a discussion of

addressing illegal dumping as an environmental justice. In this regard, although five participants were not familiar with the concept of environmental injustice, they engaged in a robust conversation about it during the research. Thus, I offer the opportunity for stakeholders to discuss and raise awareness about illegal dumping, understand the history and the concept of environmental justice so that they can start to have the dialogue within the communities they serve. Without a clear understanding of the cycle of environmental injustice, it can be difficult to develop a sustainable solution that is equitable.

Current policies to address the illegal dumping of municipal solid waste are inadequate, does not decrease incidences of illegal dumping, and can persecute the communities that are dumped on. Policies to address illegal dumping work for communities with higher incomes and have more civic engagement from residents. More research on similar communities that have successfully decreased illegal dumping needs to be studied in the hopes that other communities can mitigate the injustices of illegal dumping. There is an opportunity to confront environmental justice in illegal dumping at powers of authority of waste management so that they can lead and train everyone in the organization to be aware in order to make informed decisions about environmental justice problems.

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F. Appendix 1



San Francisco State University
Informed Consent to Participate in Research
Impacts of Illegal Dumping in East Palo Alto: An Environmental Justice Analysis

A. PURPOSE AND BACKGROUND

The purpose of this research is to analyze the effectiveness of the current National Pollutant Discharge Elimination System (NPDES) policy to address illegal dumping, how illegal dumping impacts communities of color, and how the community of East Palo Alto can participate through civic engagement to combat illegal dumping. Information gained from this project may provide a better tool for municipalities to address illegal dumping in communities that face a disproportionately high illegal dumping rate.

The researcher, Misty McKinney, is a graduate student at San Francisco State University conducting research for a master's degree thesis in the Geography department. You are being asked to participate in this study because you are a professional working on the topic of trash load reduction, illegal dumping, community engagement and/or environmental justice, or a resident/community member of East Palo Alto.

B. PROCEDURES

If you agree to participate in this research, the following will occur:

- You will be interviewed for approximately sixty minutes about your experience working on environmental issues related to trash load, illegal dumping, community engagement and/or environmental justice.
- The interview will be audio recorded to ensure accuracy in reporting your statements.
- The interview will take place at a time and place convenient for you.
- The researcher may contact you later to clarify your interview answers or to continue our conversation.
- The researcher estimates the total time commitment to participate will be approximately one to two hours.

C. RISKS

A risk of participating in the project is the potential loss of privacy. However, this risk will be minimized by keeping all research data in a locked cabinet in my faculty advisors office. Electronic data will be encrypted on a password protected computer. Only the researcher and faculty advisors will have access to the research data. All participants will have the option whether or not they would like their names or identities used in any published report of the research.

The participants can answer only those questions he/she chooses to answer. If there is discomfort or anxiety due to the nature of the questions asked, you can stop participating in the research at any time.

D. CONFIDENTIALITY

The research data will be kept in a secure location and only the researcher and thesis advisors

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Misty McKinney

will have access to the data. All research data will be stored in an encrypted document on a password protected computer in a locked cabinet in my thesis advisor's faculty office. Audio or video recordings will be stored for a minimum of three years under CSU policy for storing data. Your participation in the research will be anonymous.

E. DIRECT BENEFITS

There will be no direct benefits to the participant.

F. COSTS

There will be no cost to you for participating in this research.

G. COMPENSATION

There will be no compensation for participating in this research.

H. ALTERNATIVES

The alternative is not to participate in the research.

I. QUESTIONS

You have spoken with Misty McKinney about this study and have had your questions answered. If you have any further questions about the study, you may contact the researcher by email at mistymckinney@gmail.com or you may contact the researcher's advisor, Professor Chitewere at tendar@sfsu.edu.

Questions about your rights as a study participant, or comments or complaints about the study, may also be addressed to the Human and Animal Protections at 415: 338-1093 or protocol@sfsu.edu.

J. CONSENT

You have been given a copy of this consent form to keep.

PARTICIPATION IN THIS RESEARCH IS VOLUNTARY. You are free to decline to participate in this research, or to withdraw your participation at any point, without penalty. Your decision whether or not to participate in this research will have no influence on your present or future status at San Francisco State University.

Research Participant Name: _____

Research Participant Signature

Date: _____

Misty McKinney, Principal Investigator

Misty McKinney Signature

Date: _____