Public Health Trends

Final White Paper – June 2019

PRIMARY URBAN CENTER DEVELOPMENT PLAN

Content and Structure

This white paper prepared by Raimi + Associates provides an overview of infrastructure existing conditions and issues impacting land use in the Primary Urban Center (PUC) area within the City and County of Honolulu. These findings and conclusions will inform development of the update to the PUC Development Plan (DP), currently underway. This White Paper is one of seven (7) reports that provide background information in support of an update to the Primary Urban Center Development Plan (PUC DP). The PUC DP is the guiding document for land use, transportation, housing and other topics that impact growth, development and conservation in the Primary Urban Center.

1 INTRODUCTION

Purpose of White Paper

This white paper provides an overview of health conditions in the Primary Urban Center (PUC) area of the City and County of Honolulu. This area covers 83,690 acres (131 square miles), is home to 448,675 people, and includes the major population and employment centers of Waikīkī, Downtown Honolulu, greater Honolulu, and Pearl City. Approximately 47 percent of the total population on O‘ahu and 31 percent of the entire State of Hawai‘i is located in the PUC.

Key Issues + Challenges

- The most prevalent chronic health conditions in the PUC are obesity, diabetes, and a lack of physical. Obesity affects more than one in five residents and diabetes one in seven adults.
- Substantial inequities in health and living conditions are present in the PUC, and the areas experiencing the most hardship are concentrated in Kalihi-Pālama, Kalihi Valley, Downtown-Chinatown, and McCully-Mō‘ili‘ili.
- While there are technically no “food deserts” (areas that lack access to full service grocery stores) within the PUC, food prices are high and the vast majority of the island’s food is imported. Mauka PUC neighborhoods have poorer access to full service grocery stores.
- More than one-fifth of the PUC’s population lives within 500 feet of a freeway and therefore reduced air quality and vehicle noise may impact many residents.

Overview of Health and Planning

The health and well-being of everyone, including those living in the PUC, is influenced by a variety of complex and interrelated factors. We know that behaviors, including what we eat, whether we are physically active, whether we smoke, and how often we see a doctor, can affect our health. However, we are also influenced by a myriad of other factors, including the surrounding physical environment in which we live, our social environment, our educational and economic opportunities, exposure to crime and environmental toxins, and more that may have impacts on our health and well-being.

In recent years, many studies have examined the conditions in the environment that affect health outcomes and risks. Research has revealed the links between health and the physical environment, suggesting that variations in land use patterns, urban design, transportation systems, housing, parks, exposure to pollution, and access to healthy foods can strongly impact a community's health behaviors and health status.

Research has also shown that social and economic conditions have a significant impact on an individual's health and wellbeing. These social determinants of health include factors such as education, employment, income, discrimination, ethnicity, immigration, and community safety. Not only are these physical and social determinants drivers of community health, but they also influence our available choices and health behaviors. For example, communities with lower economic hardship also tend to exhibit healthier behaviors. See the sidebar for more resources on the link between health and the built environment.

For more information on health and planning, please see:

- Blue Zones (www.bluezones.com/services/built-environment-impact-public-health/)
- CDC Built Environment & Health Initiative (www.cdc.gov/nceh/information/built_environment.htm)
- ULI Building Healthy Places (uli.org/wp-content/uploads/ULI-Documents/Intersections-Health-and-the-Built-Environment.pdf)

Health Conditions in the U.S.

The United States is facing an epidemic of health crises. The Centers for Disease Control and Prevention (CDC) reports that:

- 40% of adults 20 and over are obese (22% in Hawai'i),
- 29% of adults are overweight (36% in Hawai'i),
- 21% of adolescents aged 12-19 are obese (15% in Hawai'i),
- 1 in 4 deaths are related to heart disease (1 in 3 in Hawai'i),
- 12% of adults 20 years and older have diabetes (13% in Hawai'i), and diabetes is the leading cause of kidney failure, and,
- Only half of adults 18 and over meet the national Physical Activity Guidelines (60% in Hawai'i).

The medical costs attributable to obesity in the U.S. alone are estimated to be $147 billion per year and chronic diseases account for more than 83% of the $1.4 trillion the U.S. spends on health care annually. Annually, per capita health care costs are $9,255 in the United States, and this is more than twice as much as other developed counties including Japan, France, Canada, Italy and Australia. Despite this high level of spending, the U.S. ranks well below other counties in critical health statistics such as life expectancy and prevalence of chronic diseases. Additionally, there are significant health disparities among different segments of the population, with low-income populations and people of color suffering from disproportionately worse health outcomes compared to other segments of the population. In fact, life expectancy and health status can vary dramatically from city to city and neighborhood to neighborhood.

While there is no single reason for these health crises, there is a greater awareness that the "upstream" social and physical determinants of health have a major impact. In fact, studies have shown that these social determinants – such as income, education, access to housing, access to healthy food, and a health-supportive physical environment – have more of an impact on population health and wellbeing than genetics and health behaviors (for example, alcohol use or smoking) combined.[1] As a result, many in the public health profession have begun to shift from a singular focus on disease control/treatment to include addressing the social, economic, and physical or environmental factors that impact health outcomes.

One of the topics that has received a significant amount of attention is the impact that the built environment – including neighborhoods, buildings, roads, food systems, and environmental pollution – has on a person's health. We now understand that walkable, transit-friendly, and mixed-use places can result in better health outcomes than auto-dependent and single use areas[2]. We also understand that buildings,

[1] Centers for Disease Control and Prevention. 2014. Social Determinants of Health: Frequently Asked Questions. Available at: http://www.cdc.gov/nchhstp/socialdeterminants/faq.html

[2] Iravani, Hamid & Rao, Venkat. "The Effects of New Urbanism on Public Health," Journal of Urban Design, published online: 14 Jan 2019.

public space, and even entire neighborhoods and cities can be designed to support positive health outcomes.

Structure of the White Paper

This White Paper provides an overview of conditions and factors that influence public health in the PUC. It also includes a discussion of what constitutes a "healthy community" and the tools that some jurisdictions are using to improve resident health. The paper contains the following sections:

1. **Introduction.** Providing an overview of this paper, a summary of the health challenges in the United States, and identifying healthy planning efforts at the City.
2. **What is a Healthy Community?** This section describes the characteristics of a healthy community, with a focus on those that impact or are impacted by the built environment.
3. **Existing Health Conditions.** This section provides detailed information on health conditions in the PUC. It includes topics for socioeconomic conditions, health outcomes, physical activity, transportation, housing and access to health facilities, among others. Where possible information is organized by Neighborhood Board area and mapped to show the spatial disparities.
4. **Tools for Healthy and Equitable Communities.** This section discusses a number of planning-related tools commonly used to improve health conditions.
5. **Issues and Challenges.** This section provides a brief summary of the health trends, issues, and challenges facing the PUC.

Geographic Scales of Analysis

The maps and associated indicators presented in section three are summarized at a variety of geographic scales:

Neighborhood Board (NB) Areas. **Figure 1** highlights the 19 NB areas in the PUC (the Airport and Moanalua NBs remain unformed). The Neighborhood Boards serve as advisory groups to the Honolulu City Council, City departments and agencies, and other public officials of the State and Federal governments. Where feasible, the white paper compares health outcomes by neighborhood geography to show how health conditions change across the PUC.

- **Census Tracts.** **Figure 2** shows the census tract geography for the PUC Plan Area. Data is from the 2010 U.S. Census.
- **Census Blocks.** **Figure 3** shows the census block geography for the PUC Plan Area. Data is from the 2010 U.S. Census.

Figure 1. Geographic demarcations referenced in this paper (1 of 3): Neighborhood Board Areas (Source: Census, 2010)

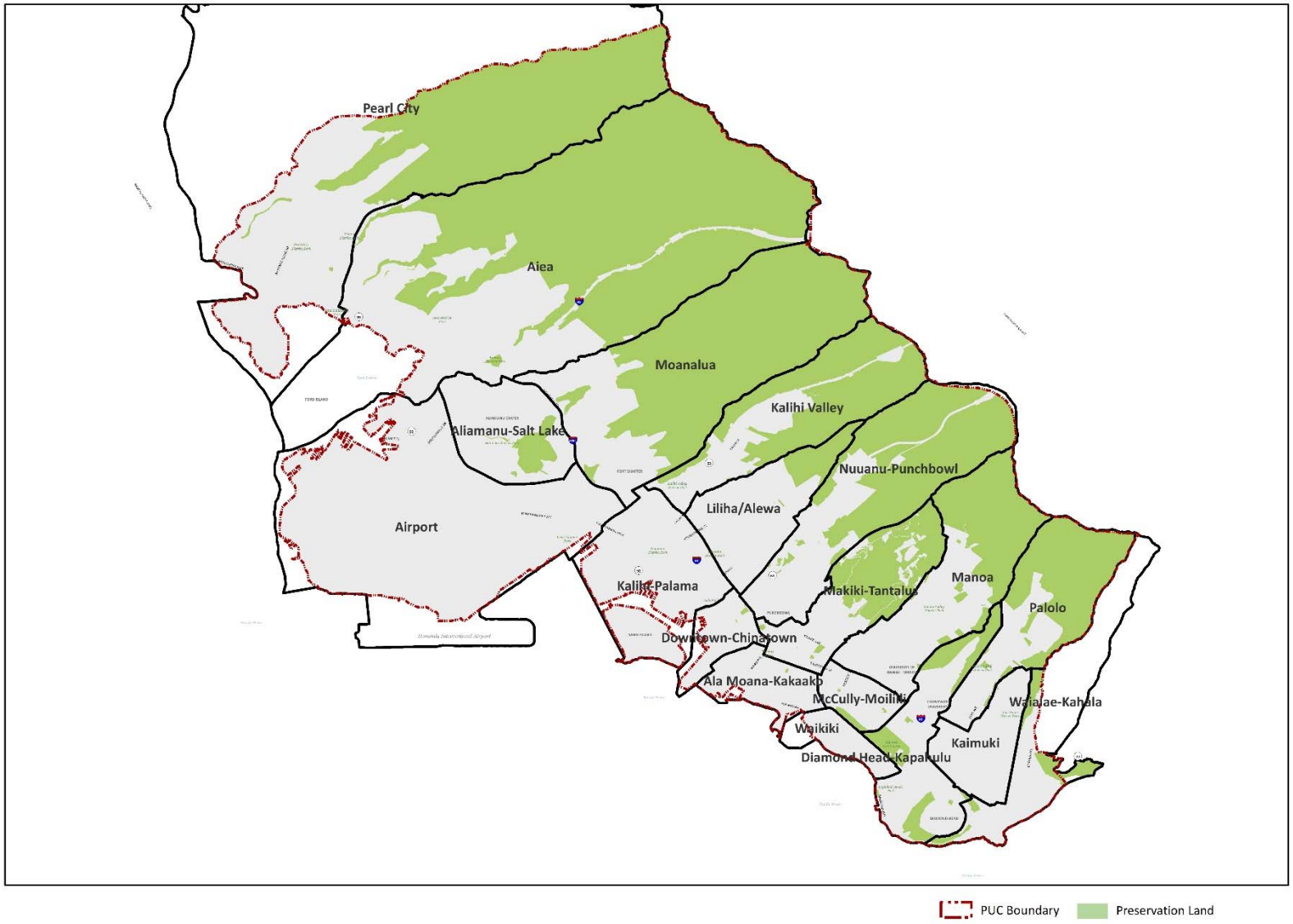
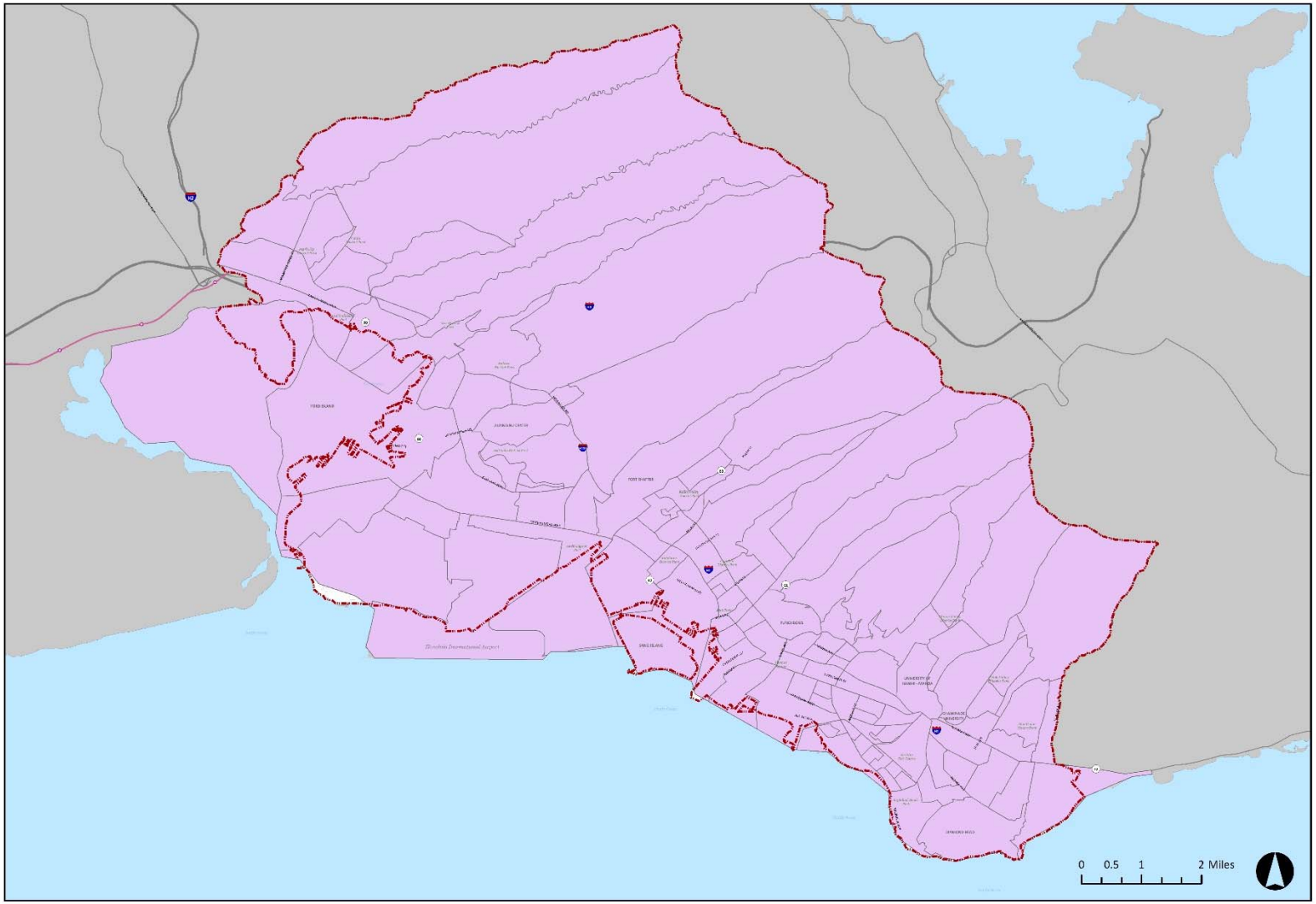


Figure 2: Geographic demarcations referenced in this paper (2 of 3): Census Tracts (Source: Census, 2010)



CENSUS TRACTS

Figure 3: Geographic demarcations referenced in this paper (3 of 3): Census Blocks (Source: Census, 2010)

CENSUS BLOCKS

Current Healthy Planning Efforts

Many healthy planning efforts already exist at the City level. The PUC DP can build upon these through land use policies and guidelines.

500 Cities Project

In 2015, the City of Honolulu was among 500 of the largest cities in the United States to participate in the Centers for Disease Control and Prevention (CDC) "500 Cities Project". The project identifies and reports city and census tract-level data for a number of chronic disease measures such as heart disease, diabetes, and health insurance coverage, among other topics. The data is made available through an online interactive website that allows users to view and download the data. This data helps identify emerging health problems and then track and monitor health objectives in the future.

Honolulu Age-Friendly City Action Plan

The City and County of Honolulu joined the World Health Organization (WHO) Global Network of Age-Friendly Cities and Communities in 2013. To address the growing senior population on Oʻahu, the City and County partnered with WHO, AARP Hawaiʻi, and others to develop an action plan for Honolulu. Honolulu's initiative is titled "Kupuna to Keiki" to underscore the importance of age-friendly policies and design that benefit all ages, from the very young, to the very elderly. This initiative was led by a well-respected Steering Committee of community and health leaders and supported by a Technical Committee and Community Advisory Committee that ensured the process was data driven. The University of Hawaiʻi Center on Aging was selected as the consultant for Honolulu's Age-Friendly City Initiative during a three year pilot phase. Ordinance 18-36 (2018) adopted Age-Friendly Honolulu as an official City program.

Honolulu Complete Streets

The "Complete Streets" model of multi-modal street design supports healthy and sustainable communities by promoting physical activity, reducing vehicle emissions, increasing pedestrian and bicycle safety, and beautifying neighborhoods. In 2009, the State passed a law requiring all Counties and the State Department of Transportation to adopt a Complete Streets policy. In 2016, the City and County of Honolulu finalized its Complete Streets Design Manual and hired a Complete Streets Program Administrator to begin implementing improvements to make Honolulu's streets and neighborhoods safe and inviting for users of all ages or abilities.

Oʻahu Pedestrian Plan

In August 2017, the City Department of Transportation Services (DTS) started developing the Oʻahu Pedestrian Plan. The action plan will include technical recommendations for pedestrian improvement projects and programs that are consistent with the City's Complete Streets Ordinance.

Oʻahu Bike Plan

In the Fall of 2017, DTS began updating the City's 2012 Oʻahu Bike Plan. This update will focus on prioritizing areas for bikeway improvements such as new bike paths, bike boulevards, buffered bike lanes, and protected bike lanes. A range of public engagement efforts will be conducted to gather and respond to public input.

2 WHAT MAKES A HEALTHY COMMUNITY?

> "*Health is a complete state of physical, mental and social well-being, and not merely the absence of disease or infirmity*" —WHO, 1946.

A healthy community, like the health of an individual, is the result of a complex web of factors and events, some of which we can control, and some of which we cannot. The idea that community design choices impact health, especially of vulnerable populations such as children, older adults, and those with lower socioeconomic means, has long been established. Urban design, building architecture, and public spaces create the built environment we inhabit every day and present an extraordinary opportunity to reduce or eliminate some of these vulnerabilities. Being physically active is difficult if you do not have access to sidewalks or parks; eating right is difficult if healthy foods are not available. Therefore, healthy community design is also about planning and designing communities where the healthy choice is the easy choice.

While there is no universally recognized definition of a "healthy community", there are a few characteristics that tend to make communities healthier:

1. **Pedestrian-friendly streets.** Areas with greater walkability have a mix of land uses, connected streets, sidewalks that are in good condition, features that protect pedestrians from traffic, and pleasant scenery. Healthy community design includes pedestrian-friendly streets that make it easy and safe for all people to walk to get goods and services for recreation or employment.
2. **Healthy and active building design.** According to the US EPA, we spend approximately 90 percent of our time indoors. Healthy building design is therefore important to help create spaces that support the nutrition, fitness, mood, sleep patterns, and the performance of its occupants. Healthy building design can promote physical activity through the placement of staircases and elevators. It can also help to adopt standards (e.g. LEED or Well Building Standard) that can prevent or minimize work related hazards and risks associated with the construction, manufacture, use, maintenance, and disposal of facilities, materials, and equipment.
3. **Diversity of land uses.** Well-designed places encourage the co-location of diverse land uses. Research suggests that areas with a greater mix of complementary land uses (goods, services, jobs, and recreation opportunities in close proximity to housing) are more "walkable". More walkable locations tend to encourage more physical activity and consequently, better health.
4. **Access to transit.** Studies have found that living and working near transit, combined with other built environment factors such as a diverse mix of uses and higher densities, results in increased rates of physical activity as transit riders typically walk more than those who drive to work for their daily activities. Thus, healthy community design includes safe and

convenient transit services and promotes mixed-use "transit-oriented development" (TOD) around high-frequency transit stops such as rail and rapid bus systems.

5. **Compact development patterns.** Areas that have compact development patterns are more likely to be walkable, served by transit, and have lower dependence on automobiles. By creating multifamily housing, accessory dwelling units, clustered development, or small-lot developments, more land can be freed up for communal facilities, outdoor spaces, and services to improve the quality of urban living. Compact urban centers also help relieve development pressure and sprawl onto rural lands.
6. **Access to healthy and affordable foods.** The availability and selection of foods impacts a person's nutrition access. Unfortunately, too many U.S. areas lack basic access to healthy foods, and, where they exist, they are often more expensive than unhealthy foods. A healthy food environment should include a diversity of healthy food options at affordable prices including grocery stores, farmers markets, community gardens, and fresh, nutritious prepared options. A healthy food environment should not have high concentrations of liquor stores or fast food establishments-especially in the absence of other options.
7. **Affordable and healthy housing.** Safe, healthy and affordable housing is critical to a healthy community. Examples of home health challenges include older homes with lead paint or plumbing; homes with allergens, mold and other harmful substances; housing that is too expensive leading to overcrowded conditions; and homes that are located too near sources of environmental pollution such as freeways and industrial areas. Healthy communities require the creation of a diversity of safe, affordable, and well-located housing that meets the needs of all segments of the population.
8. **Social capital and community connectedness.** Social capital affects health through the exchange of network-based resources (such as psychological support), collective action (for example, grassroots lobbying for community bike trails), and the enforcement of social norms for healthy behaviors. Healthy communities have gathering spaces within building or neighborhoods to promote social interaction through the design of plazas, community gardens, public squares or front porches and lanais.
9. **Access and exposure to nature and green space.** Evidence supports many benefits related to nature and green spaces, ranging from stress reduction to improved recovery from illness and surgery. Healthy community design may include plantings in building lobbies, views out of windows, biophilic (nature-conscious) building design using natural forms, materials, and colors; and community gardens, parks, and other green space.
10. **A clean environment (clean air, soil, and water).** Healthy site and building design can help mitigate or prevent the negative health impacts of pollutants or contaminates in indoor and outdoor spaces. It requires attention to the materials and energy sources used in projects and buildings to avoid such harms. Healthy design is also about addressing and

redressing the disproportionate exposure to environmental pollution and hazards among lower income populations.

11. **Community safety.** Fear of crime or violence may deter some people from engaging in physical activity in their communities. Healthy community design includes addressing how the design of buildings and landscapes can help reduce crime and violence. It also includes taking steps to address crime in communities and addressing the underlying causes of crime, such as education access and access to employment.
12. **Social equity and inclusion.** While the built environment plays a critical role in a person's health, two of the greatest factors determining an individual's health condition are educational attainment and income. Too often, low-income and minority communities have lower levels of educational attainment and opportunities, leading to lower incomes and disproportionate health outcomes. Healthy-communities efforts should recognize this relationship and take steps to address the underlying socio-economic inequities that affect an individual's health.
13. **Displacement.** Community design improvements can sometimes run the risk of negatively impacting equity by accelerating "gentrification" or resident displacement. For example, healthy community design concepts, such as pedestrian friendly street designs and compact development, can lead to economic and demographic shifts as an area increases in desirability. This can eventually result in displacement of longtime residents and businesses if explicit attention is not paid to equity and the inclusion of mitigation strategies all along the process.
14. **Aging Communities.** Creating a place that accommodates people of all ages and walks of life is an important component of a healthy community. When seniors begin to struggle with everyday tasks, quality of life can go down as a result. Providing affordable housing options, age-friendly 'universal' home and public space design, and timely and responsive public transport, are all measures that could improve ease in day-to-day tasks.
15. **Planning for Climate Change and Sea Level Rise.** Climate change will have significant health impacts and it is important cities are prepared to mitigate and adapt to the changing climate, including the effects of increased nuisance flooding, heat waves, and storm intensity. Climate actions to prepare for and reduce exposure to climate changes have positive health benefits. Climate mitigation actions focused on the most burdened and vulnerable communities can also help alleviate existing health and social inequities. By strengthening everyone's local capacity to respond to natural hazards when they occur, the City can reduce the number and severity of injuries and illnesses when they do happen.

As the preceding list illustrates, healthy community design practices can produce a wide array of benefits that go beyond the health of an individual. These benefits can include:

- Decreased health care costs due to healthier lifestyles and prevention;

- Increased productivity and healthful conditions for workers resulting from better designed buildings;
- Less driving resulting in fewer greenhouse gas emissions and reduced climate change impacts;
- Reduced transportation maintenance costs with less car travel;
- Increased home values from more comfortable and efficient buildings and better designed communities;
- Reduced prevalence of heat island effect from including more green and permeable space; and
- Increased social interaction and reduced stress from better designed and connected community spaces and supportive programs.

Healthy community design is about attention paid to all facets of the planning and design process to create livable, safe and attractive communities that enhance the physical and mental well-being of the people who live, work, and play in our towns and cities. Many current Honolulu programs, initiatives and policies, such as Complete Streets, Age-Friendly Communities, TOD planning, and the O‘ahu Resilience Strategy, to name a few, are all advancing healthy community planning goals.

3 EXISTING HEALTH CONDITIONS IN THE PUC

Introduction

This section provides detailed information on health and equity conditions in the PUC. It includes topics for socioeconomic conditions, health outcomes, physical activity, transportation, housing, and access to health facilities, among others. Where possible, information is organized by Neighborhood Board area and mapped to show where spatial disparities exist. The spatial analysis is the first step in identifying the areas within the PUC DP plan boundary burdened with the most adverse health-related conditions, with the goal to improve health outcomes in the area.

Demographic Conditions

This section provides a data-informed snapshot of the socioeconomic and demographic environment in the PUC.

Income and Poverty

Income is one of the strongest predictors of health outcomes. Health care access, health conditions, and life expectancy improve as income increases. Lower incomes are associated with higher rates of mortality, premature births, and other health issues. Households with higher incomes are likely to have more education, lower unemployment rates, and better access to healthcare.

When households earn incomes much lower than the average cost of living, they tend to make sacrifices in important areas. Those lifestyle compromises can include eating less food and/or more unhealthy food, living in substandard housing, and/or delaying medical care. Additionally, the lack of resources to meet basic needs causes long-term stress, which can make the body less resistant to other health risks.

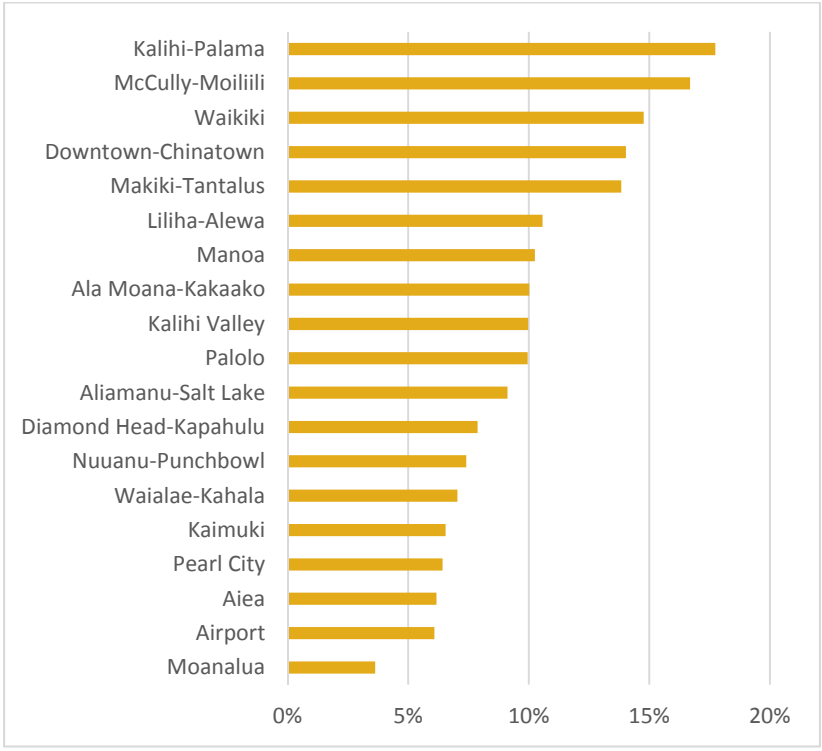
Concentrated poverty is an important health indicator because it is correlated with increased crime rates and poorer health outcomes. Violent crime rates tend to be higher in economically-distressed neighborhoods. Finally, residents living in low-income neighborhoods tend to have increased physical and mental health

issues, such as asthma, depression, diabetes, and heart conditions, compared to higher-income areas.[3]

Poverty is defined as families earning incomes less than the official poverty threshold, a figure which is determined by looking at the total cost of all the essential resources that an average adult consumes in one year. **Figures 4 and 5** summarize poverty rates by neighborhood in the PUC as reported by the U.S. Census for 2018. Neighborhoods with the highest poverty rates include Kalihi-Pālama (18%), McCully-Mōʻiliʻili (17%), and Waikiki (15%).

Average household income in the PUC is reported as $69,975, which is slightly lower than the County average of $74,460. As shown in **Figure 6.1**, the areas with lower median incomes were found in the central flatlands of the PUC, with concentrations in Kalihi-Pālama, Liliha, Makiki, and McCully-Mōʻiliʻili but also dispersed in pockets throughout the Plan Area. **Figure 6.2** illustrates the distribution of population across the entire PUC, for context.

Figure 4: Poverty Rates by Neighborhood



Source: U.S. Census

[3] Hodgkinson, Stacy. "Improving Mental Health Access for Low-Income Children and Families in the Primary Care Setting." Pediatrics, 2017 Jan; 139(1): e20151175

Figure 5: Percent of Households with Incomes below the Poverty Rate (Source: ACS, 2018)

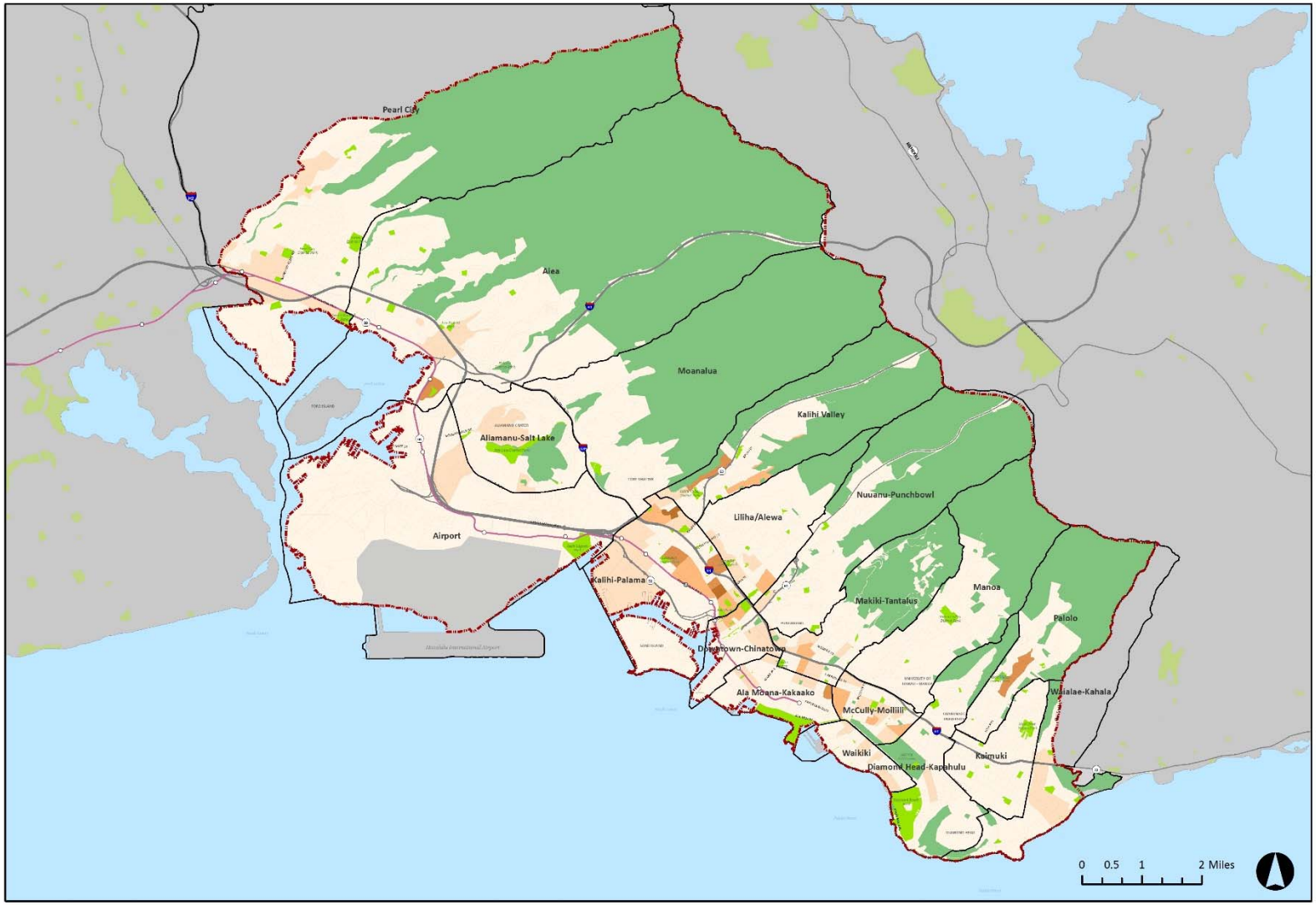


Figure 6.1: Median Household Income (Source: ACS, 2017)

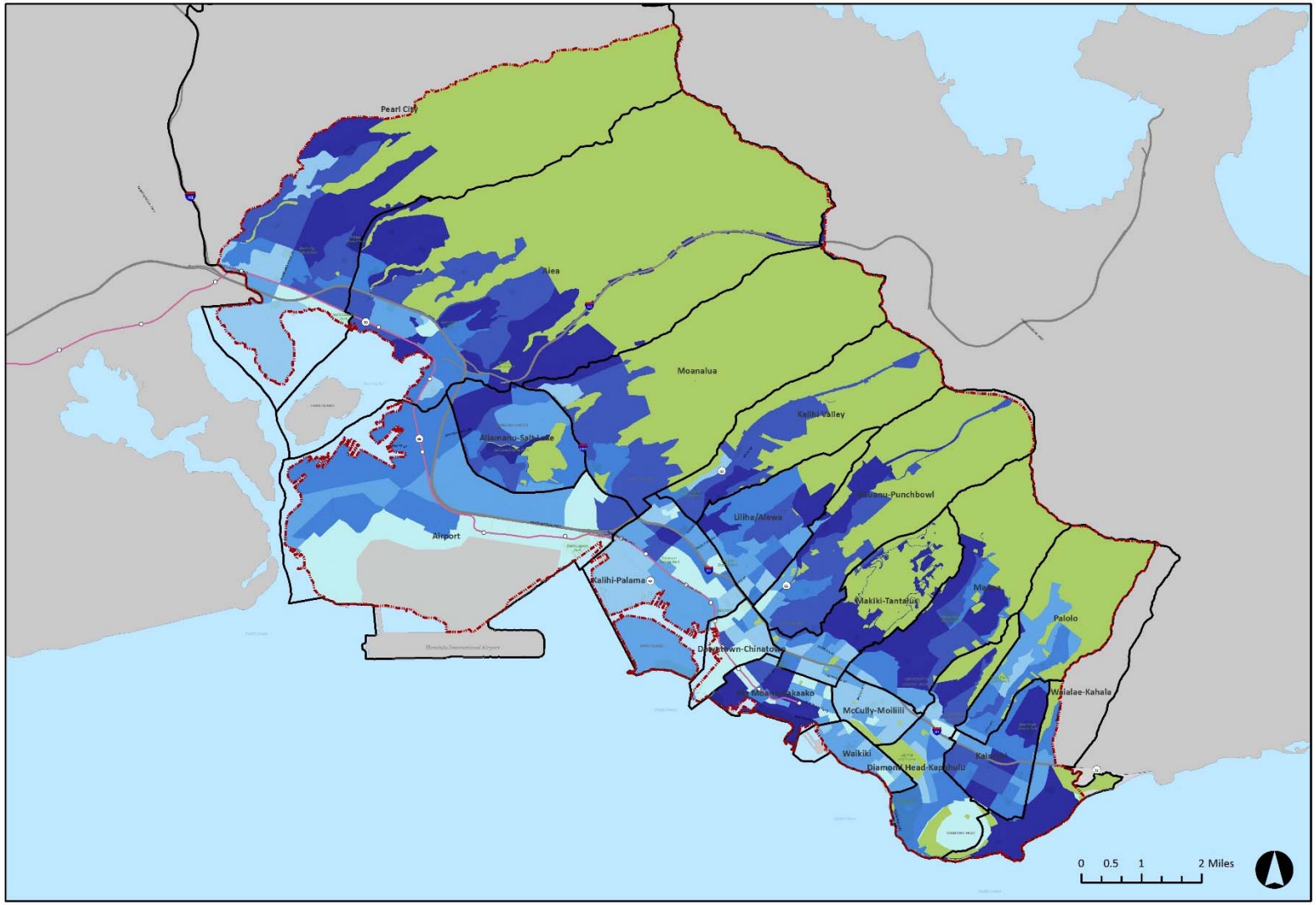
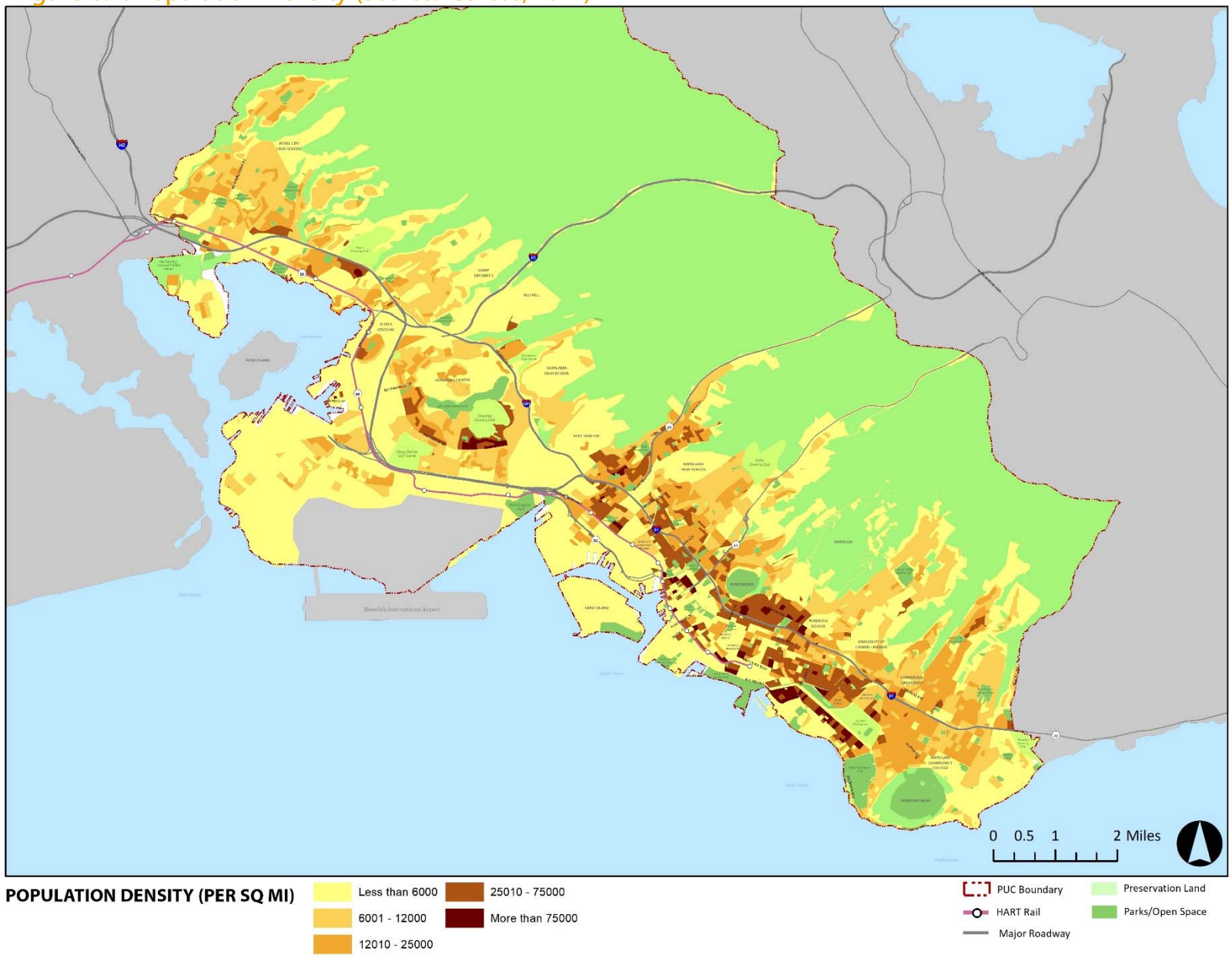


Figure 6.2: Population Density (Source: Census, 2017)

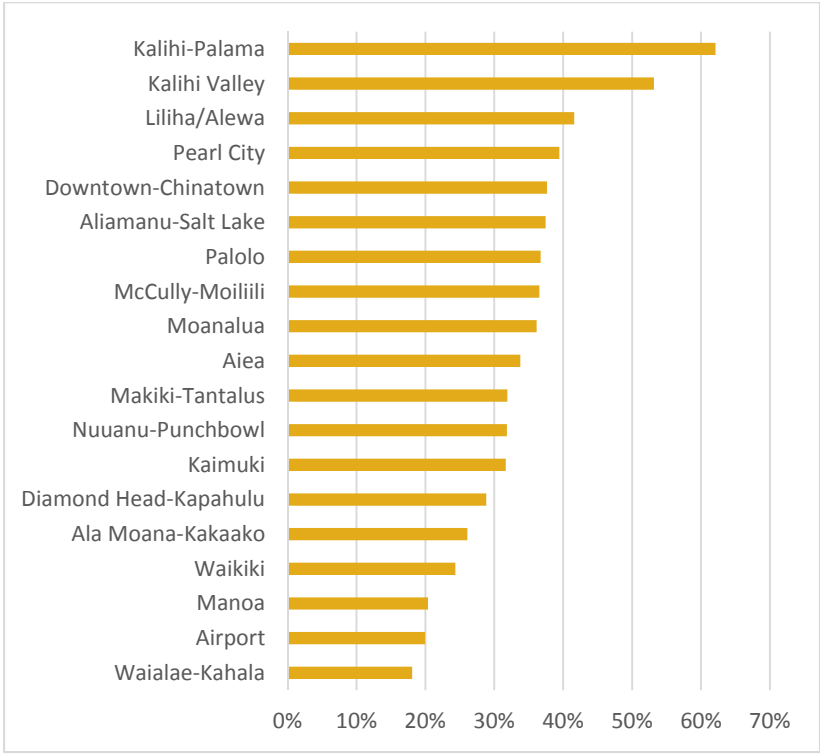


Education

Completing major educational milestones such as graduating from high school or college, has demonstrated economic and health benefits. First, educational attainment is associated with work opportunities offering higher incomes that allow for greater housing and healthy food options and better working conditions (with lower exposure to hazards). Second, it enhances an individual's knowledge and literacy which can lead to better health management behaviors such as better nutrition, increased exercise, and reduced use of drugs and alcohol.

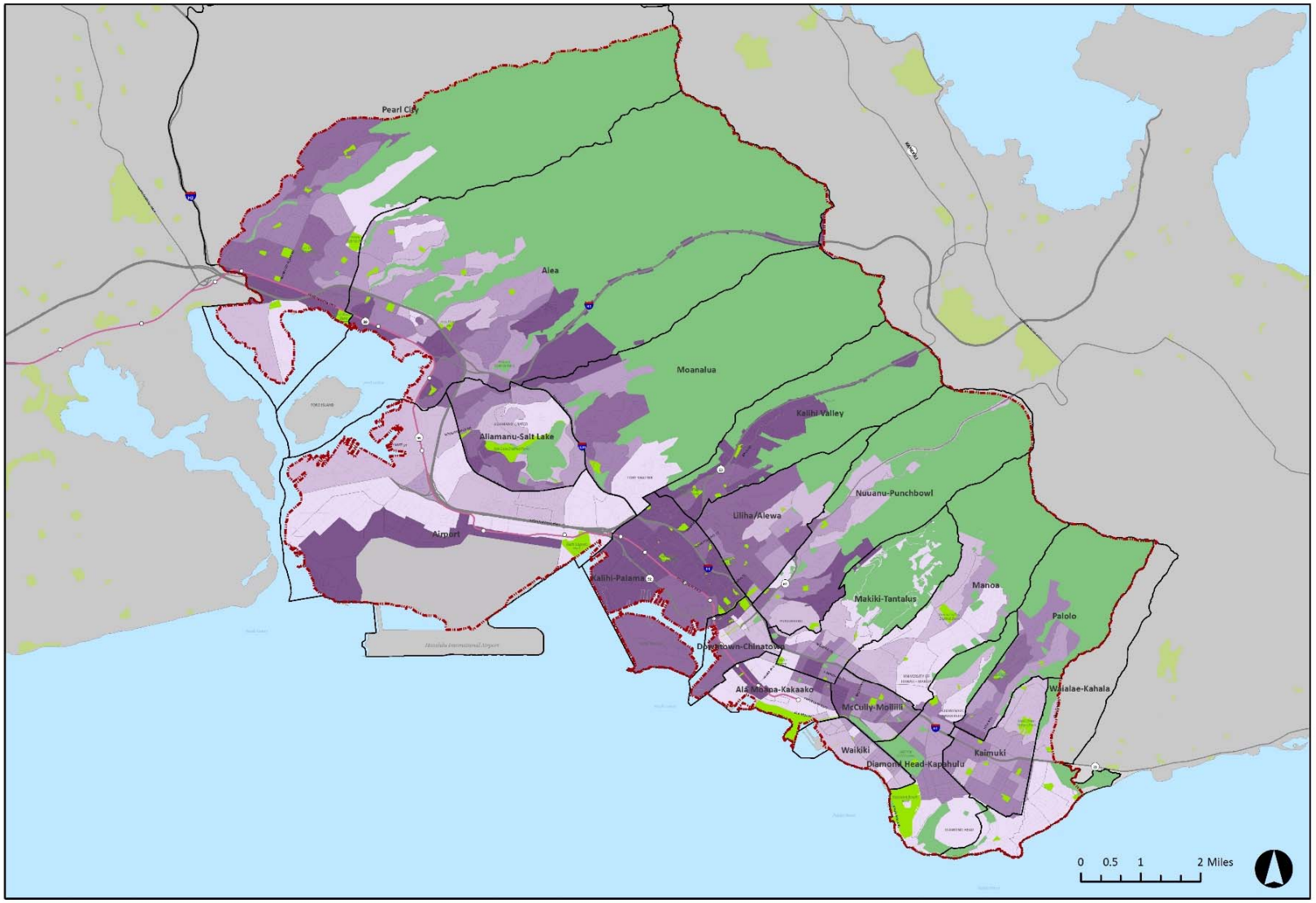
In the PUC overall, just over one-third of the population 25 and over (36%) held a high school degree or less. As shown in **Figure 7**, there are several neighborhoods that exceed the average PUC rate including Kalihi-Pālama (62%), Kalihi Valley (53%), and Liliha/ʻĀlewa (42%). **Figure 8** maps the percentage of the population that holds a high school diploma or less in the PUC.

Figure 7: High School or Less (25 years+)



Source: U.S. Census, 2017

Figure 8: High School Education or Less, Age 25 years+ (Source: Census, 2017)

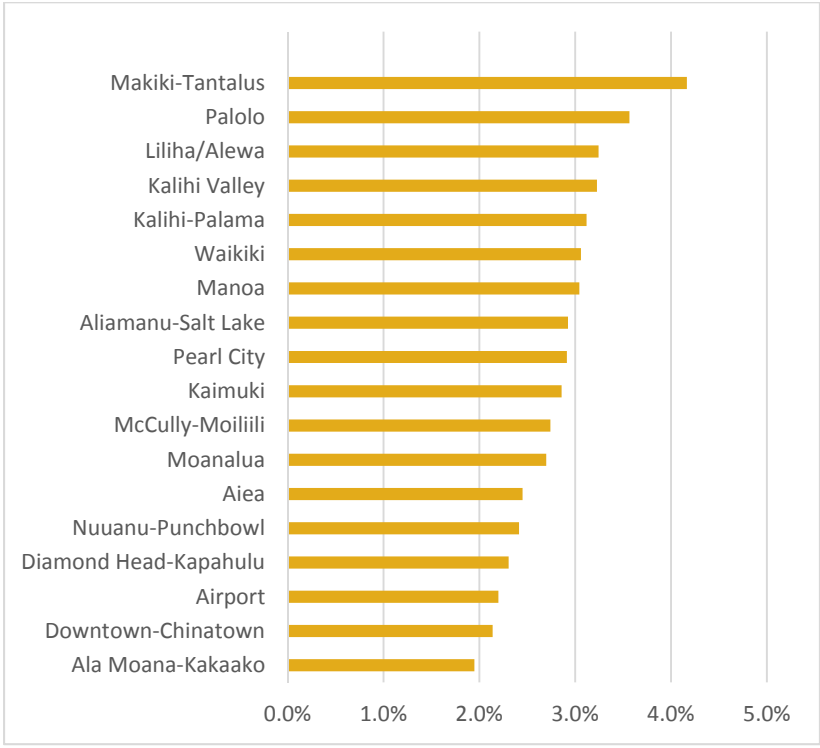


Unemployment

Being unemployed, underemployed, or concerned about job security are common stressors contributing to adverse health effects. Unemployed people may have higher incidence of sleep disorders, anxiety disorders, and substance addictions that, in turn, cause increased demands on the health care system and higher societal costs. Additionally, unemployed men have been found to have increased mortality rates, particularly from suicide and lung cancer.[4]

In 2015, the rate of unemployment for all workers age 16 and over was 2.8% in the PUC. This is significantly lower than the historic rate of unemployment of 6.25%. **Figure 9** shows the percentage of unemployed workers age 16 and over by neighborhood. Of all neighborhoods, Makiki-Tantalus (4%) and Pālolo (4%) have the highest unemployment rates. The remaining 17 neighborhoods were within 1% of the average unemployment rate for the PUC. **Figure 10** illustrates that although the overall employment is high, significant unemployment persists in small pockets scattered throughout the PUC.

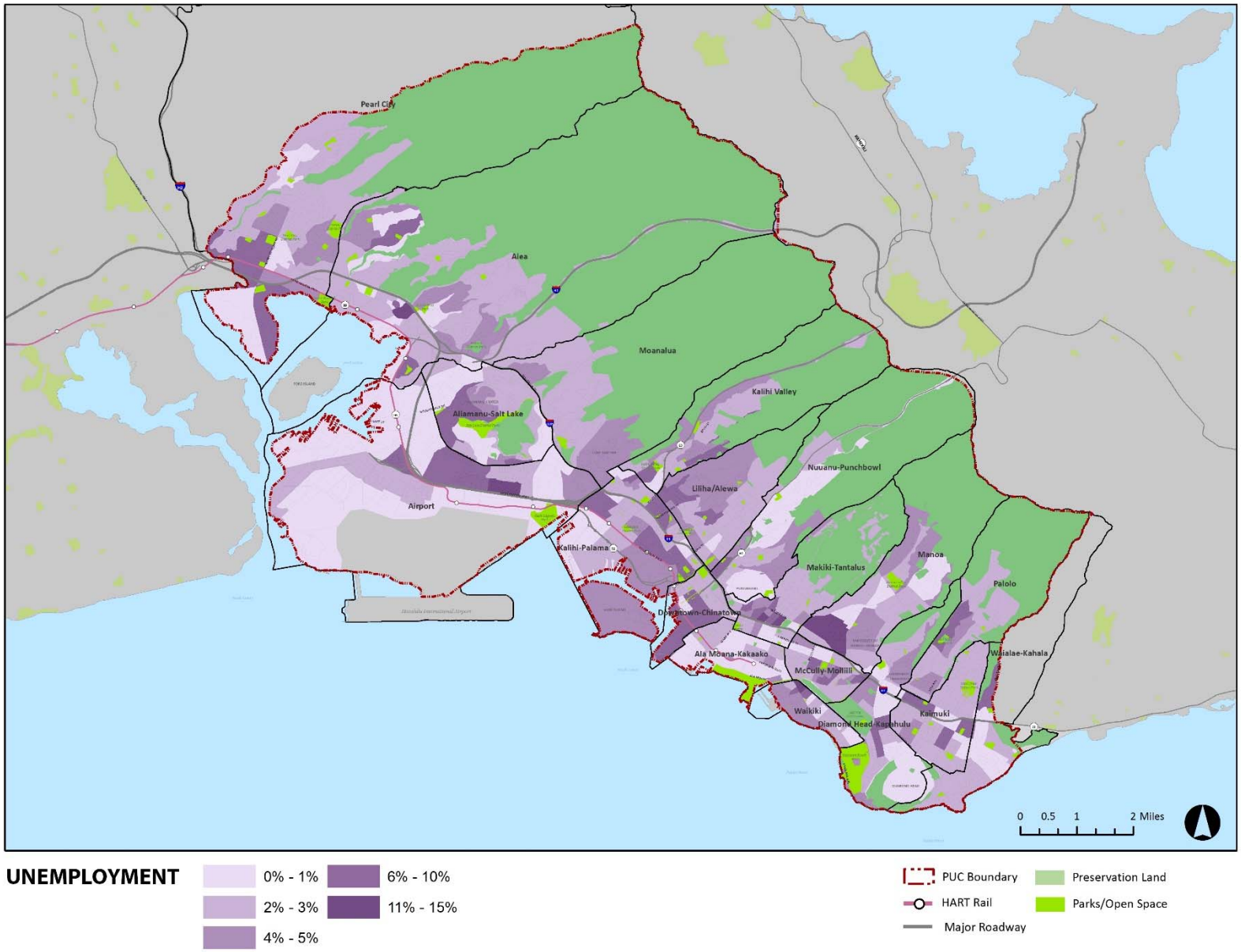
Figure 9: Unemployment



Source: U.S. Census

[4] Tapia, Jose. "Individual Joblessness, Contextual Unemployment, and Mortality Risk," American Journal of Epidemiology. July 2014.

Figure 10: Unemployment (Source: Census, 2015)



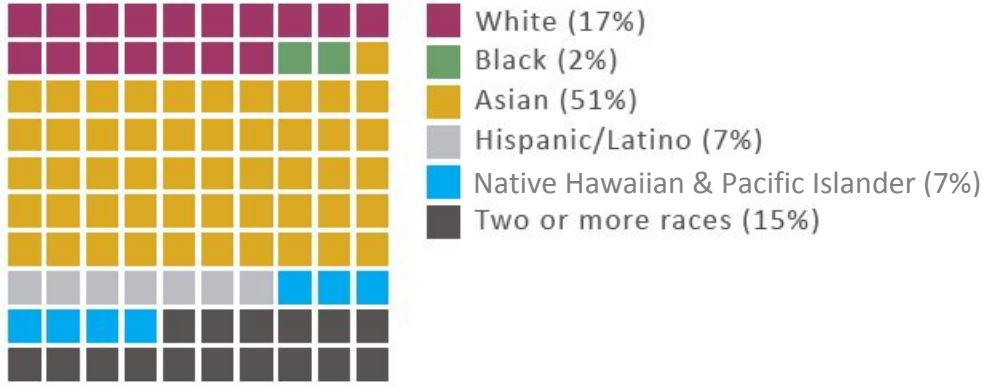
Race/Ethnicity

There is compelling evidence that race and ethnicity correlate with persistent and often increasing health disparities among U.S. populations, differences in neighborhood conditions that contribute to health, and research has found that race-related stress can also influence health outcomes.[5] In the U.S., Non-Hispanic White residents generally have better health outcomes than most other racial and ethnic groups, especially Native Americans, Latinos, African Americans, and some Asian subpopulations. U.S. communities with a high proportion of minority and/or low-income residents often have less access to parks and healthy food, and are disproportionately exposed to pollution and poor housing. Due to demographic shifts, groups that are currently experiencing poorer health outcomes are expected to grow as a proportion of the U.S. population.

As **Figure 11** shows, nearly 51% of residents in the PUC are of Asian descent, comprising the largest racial group. In addition, seven percent of the population identifies as Native Hawaiian/Pacific Islander (NHPI) only, 17% as White, and 15% of residents consider themselves Biracial (or Multiracial). Being the newest U.S. state (1959), and physically remote, Hawai'i's population is ethnically distinct from mainland U.S. However, like many places, Hawai'i's modern population is a reflection of a complex settlement history, of historic labor migration, and of more recent migration patterns. While Hawai'i is the most ethnically diverse state overall in the country, the population of Native Hawaiians remains a minority within the State. Compared to other major ethnic groups, NHPIs experience notable health disparities. Native Hawaiian men and women die from major cardiovascular diseases at a younger average age than all other major racial and ethnic groups in the State. Native Hawaiians had a higher age-adjusted mortality rate for coronary heart disease, and also had the highest stroke mortality rate. NHPIs may also be at an elevated genetic risk for hypertension, and a study of Native Hawaiians in two rural communities found that type 2 diabetes prevalence was four times as high as the average American.[6]

Figures 12.1 through **12.4** show the percentage of the major ethnic groups by neighborhood. **Figures 14 and 15** map Asian and NHPI ethnicities by census block.

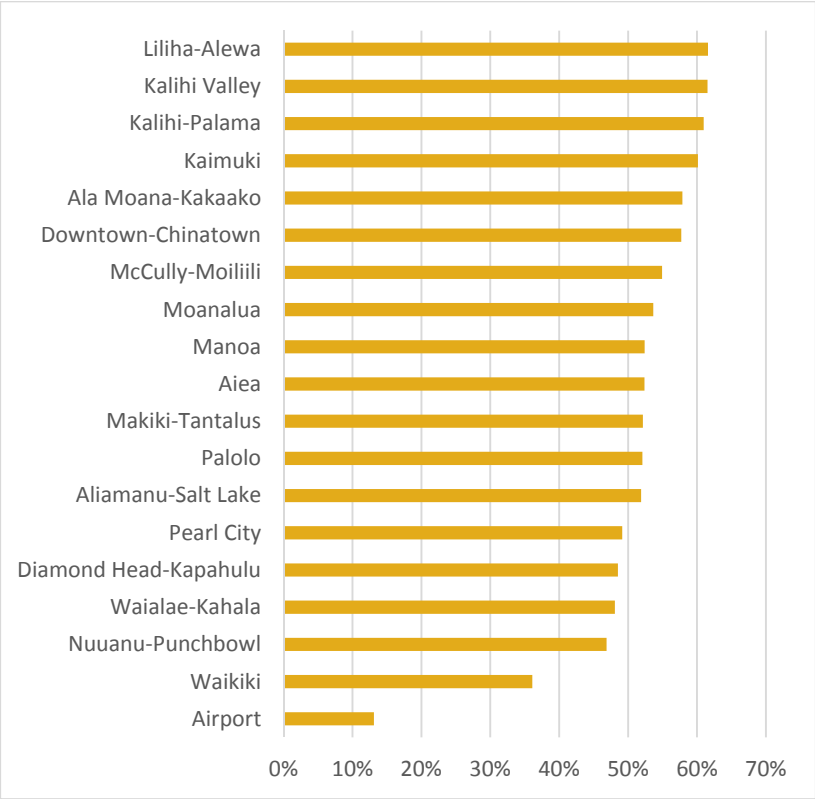
Figure 11: Race/Ethnicity in PUC



[5] Richman, Laura. "The Effects of Race-related Stress on Cortisol Reactivity in the Laboratory." Annals of Behavior Medicine. 2008 Feb; 35(1): 105–110.

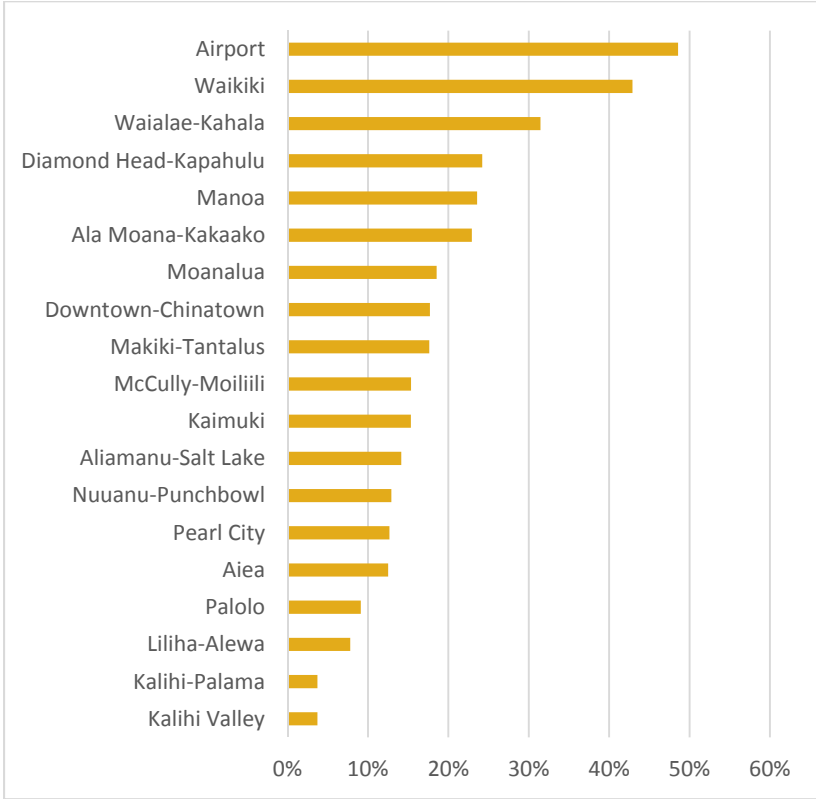
[6] Asian & Pacific Islander American Health Forum. "Native Hawaiian and Pacific Islander Health Disparities," August 2010.

Figure 12.1: Asian Population by Neighborhood



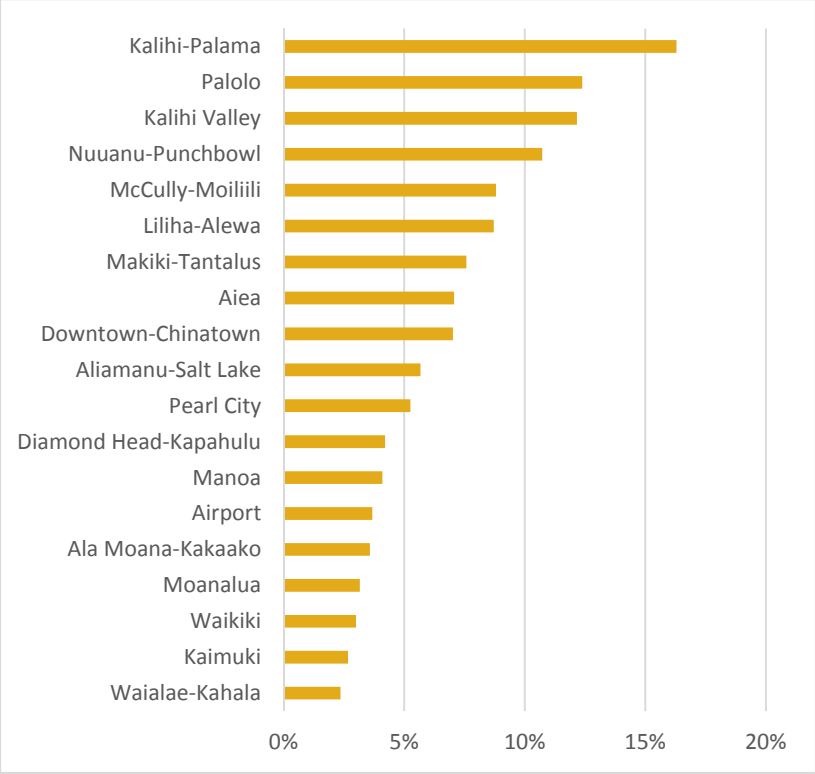
Source: U.S. Census

Figure 12.2: White Population by Neighborhood



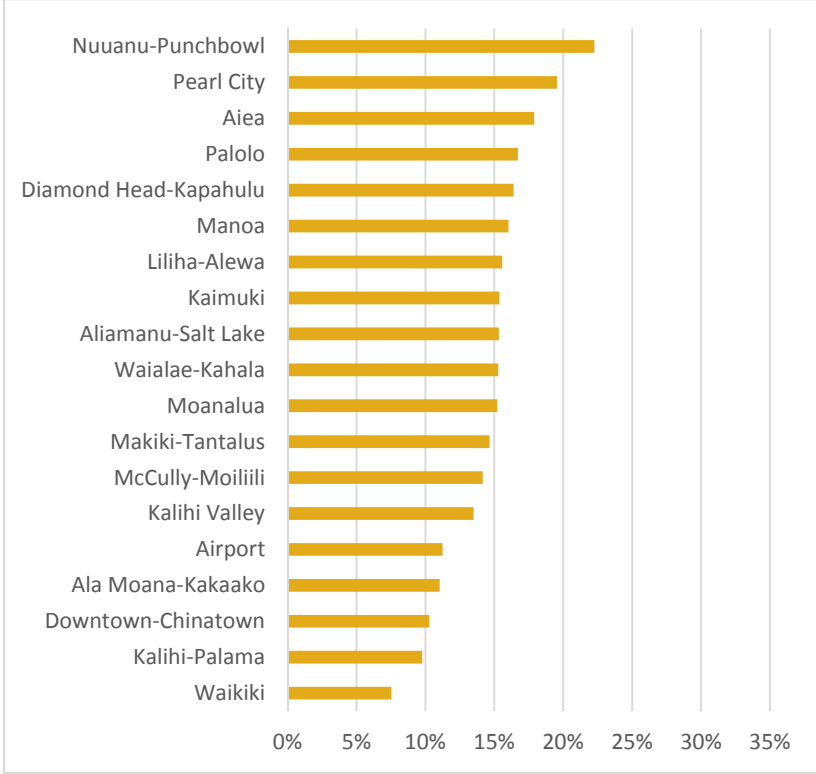
Source: U.S. Census

Figure 12.3: Native Hawaiian/Pacific Islander Population by Neighborhood



Source: U.S. Census

Figure 12.4: Two or More Race Population by Neighborhood



Source: U.S. Census

Figure 14: Asian Population by Census Block (Source: Census, 2017)

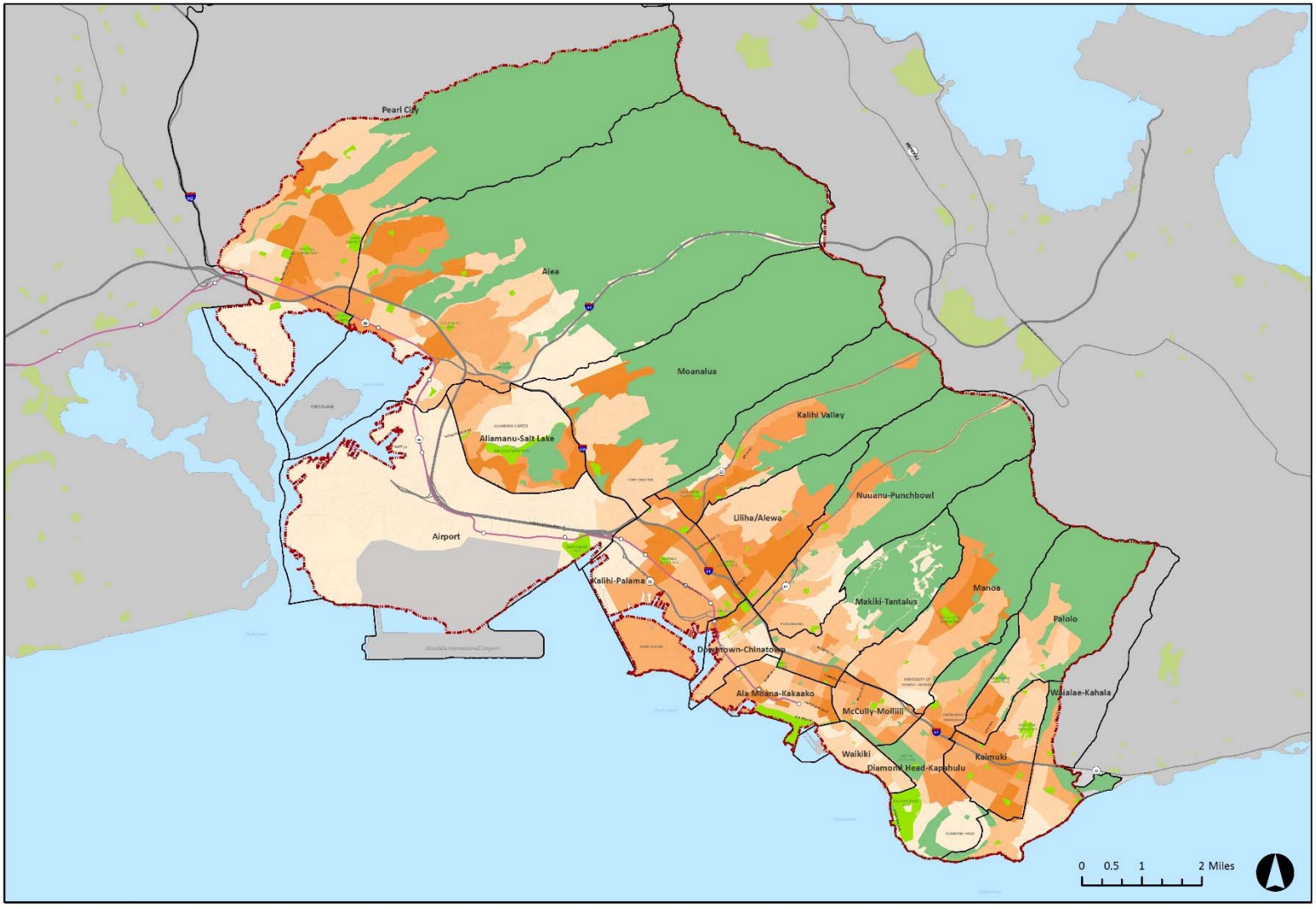
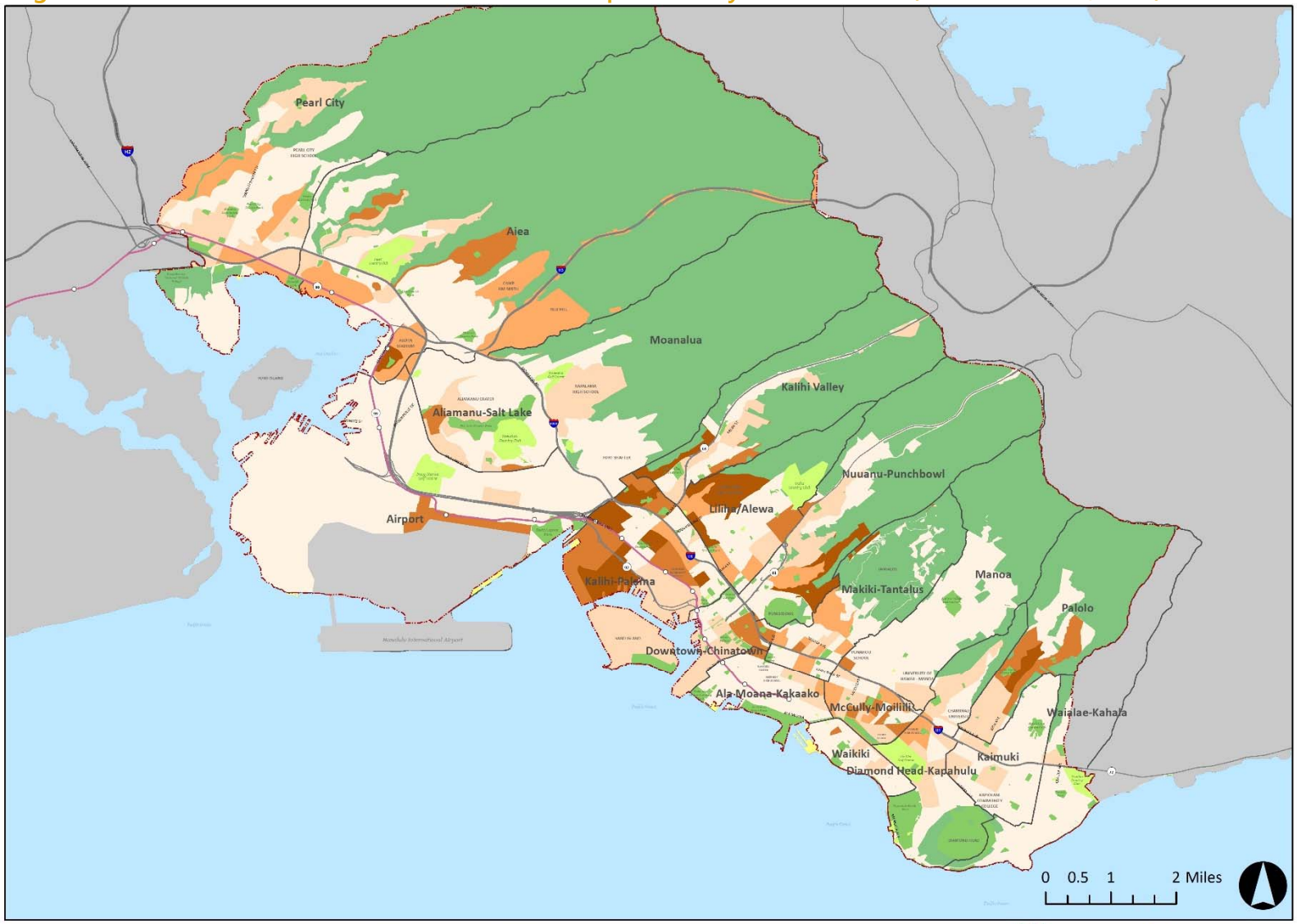


Figure 15: Native Hawaiian and Pacific Islander Population by Census Block (Source: Census, 2017)



Age

Understanding a population's age and gender composition and the changing trends helps policy makers and public health professionals plan for and target appropriate services and programs. For example, a five-year old has different health needs than a 65-year old, just as a female has different health care needs than a male.

Public health professionals consider younger residents (under 18 years of age) and older adults (65 years and older) to be more vulnerable to disease and poor health than adults. Younger residents are considered vulnerable because their bodies are not yet fully developed and are therefore more susceptible to environmental risk factors. Older adults are considered more vulnerable because they have more existing chronic health problems than younger adults.

According to the "Aging in Place Action Plan" prepared by The University of Hawai'i Center on Aging and AARP, Hawai'i is growing older at a faster pace than the rest of the nation. In 2030, 24% of Hawai'i's population will be aged 65 or older, compared to 21% nationally. On O'ahu, 27% of residents will be 65 years and older by 2040 as the large baby-boomer generation ages (born 1946-1964). And between 2010 and 2040, Hawai'i's population 65 years and older will increase 104%, compared with a total population increase of 28%. Hawai'i is revered as one of the best places to grow old in America – in large part because of the natural beauty of the islands, clean and lush environment, and the communities' spirit of aloha. Accordingly, Hawai'i leads the nation in longevity and has the longest average *healthy* life expectancy of all states, meaning that a 65 year-old Hawai'i resident can expect to live another 16 additional years of life in good health. However, Hawai'i's cost of living and cost of senior citizen health care is among the highest in the country, making retirement increasingly challenging for low-income seniors.

Under 18

In 2015, 18% of the population in the PUC was age 18 and under (compared to 23% for O'ahu and 21% for the entire State). **Figure 16** shows the percentage broken down by neighborhood, and **Figure 17** shows the percentage of population 18 and under by census block. A higher proportion of residents are under 18 on the 'Ewa side of the Plan Area (in the Airport, Kalihi Valley, and Āliamanu-Salt Lake neighborhoods).

Figure 16: Population Under Age 18

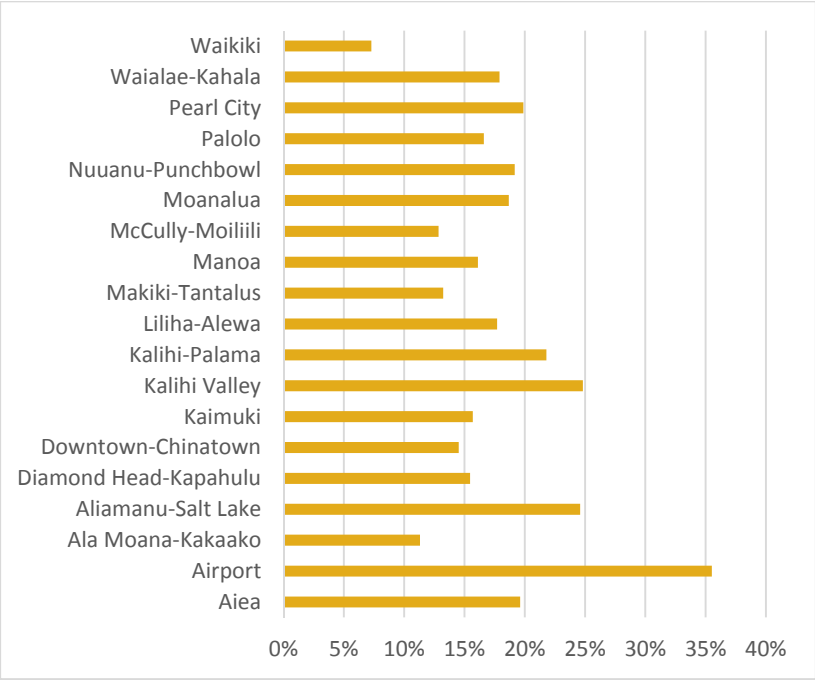
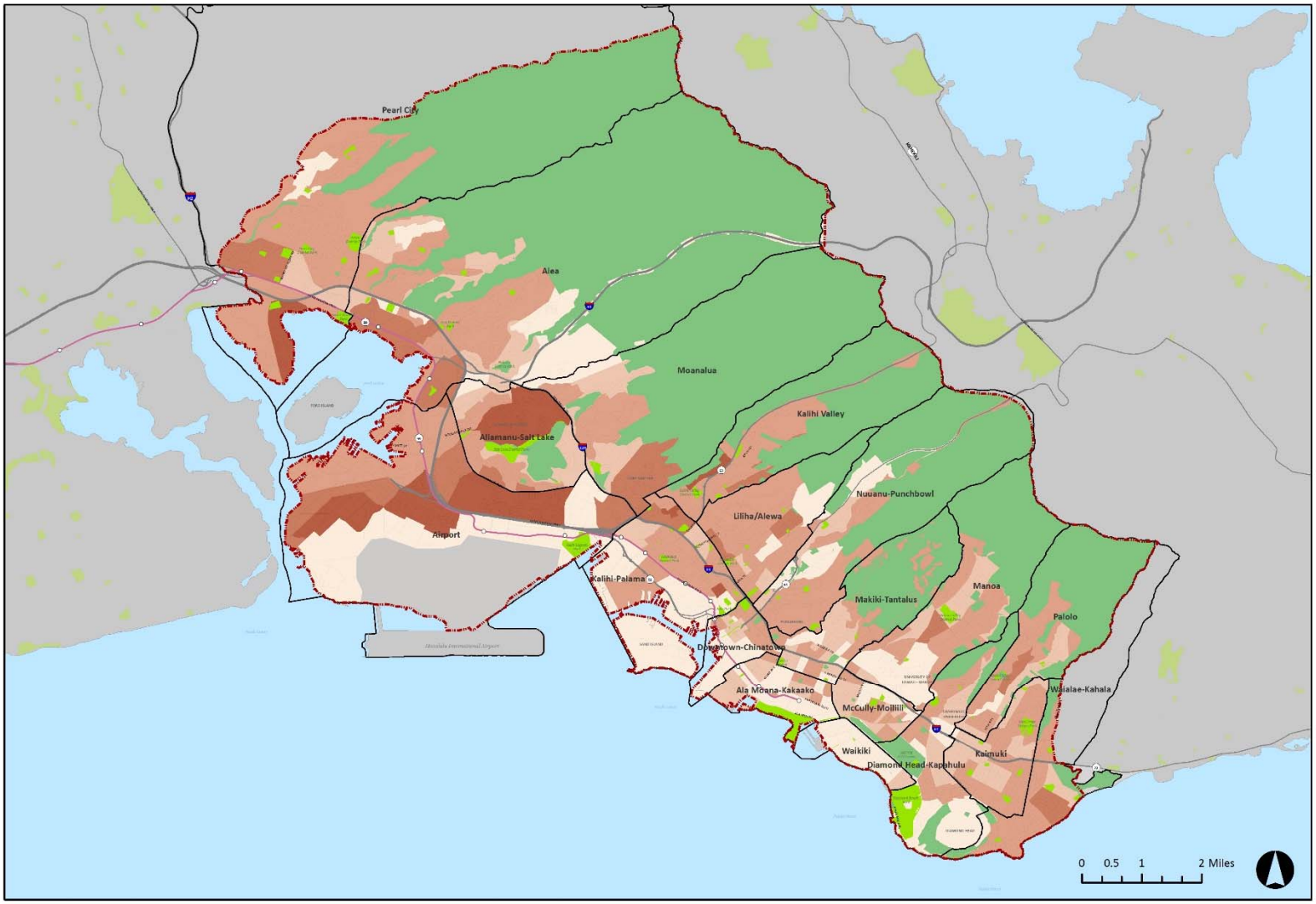


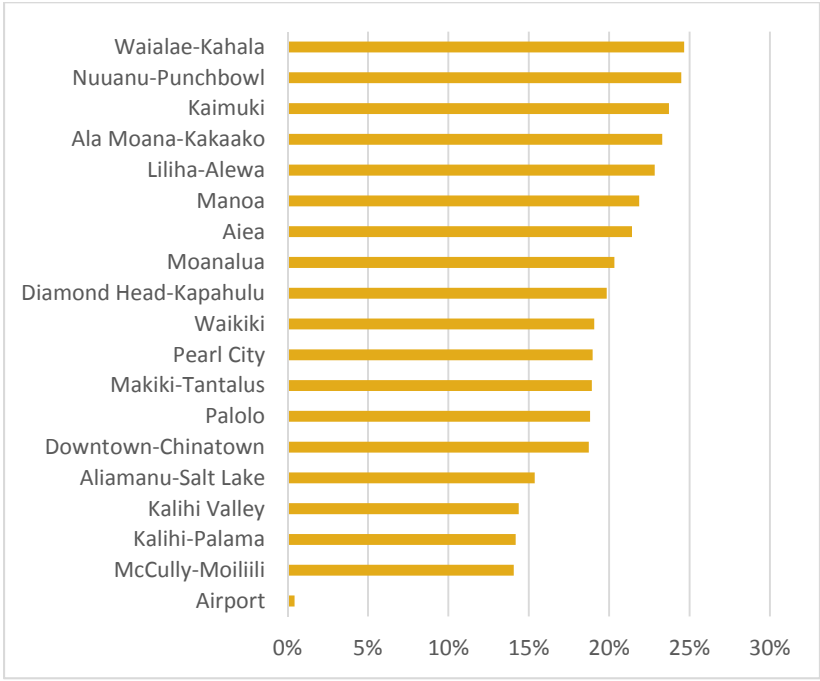
Figure 17: Population Under 18 by percent of census block (Source: Census, 2017)



Over 65

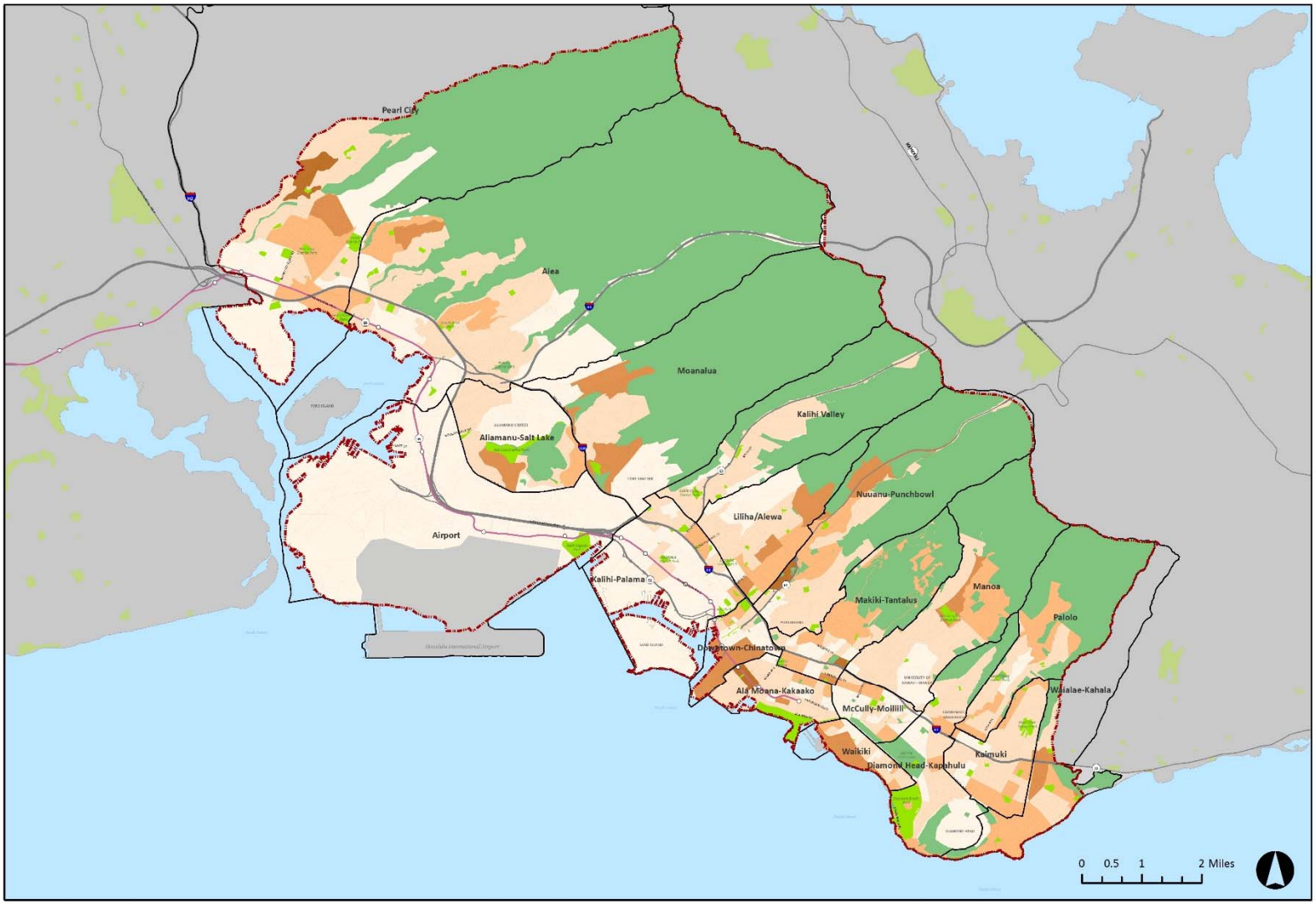
In 2015, 18% of the population in the PUC was age 65 and over. This is lower than the County average of 24%. Figure **18** shows the percentages broken down by neighborhood, and **Figure 19** shows the percentage of population over 65 by census block. As shown, older residents are more present in certain neighborhoods, especially Waiʻalae-Kāhala, Nuʻuanu-Punchbowl, and Kaimukī. Within larger neighborhoods, there are further concentrations of elderly, such as the upper parts of Mānoa, areas of Moanalua, lower Salt Lake, and along the Pali Highway in Nuʻuanu. The Airport neighborhood has the fewest residents over the age of 65 at only 1%. This is likely due to the nearby military base, which means the adjacent neighborhoods would be expected to house many young adults enlisted in the Army and their families.

Figure 18: Population over Age 65



Source: U.S. Census

Figure 19: Population Over 65 by percent of census block (Source: Census, 2017)



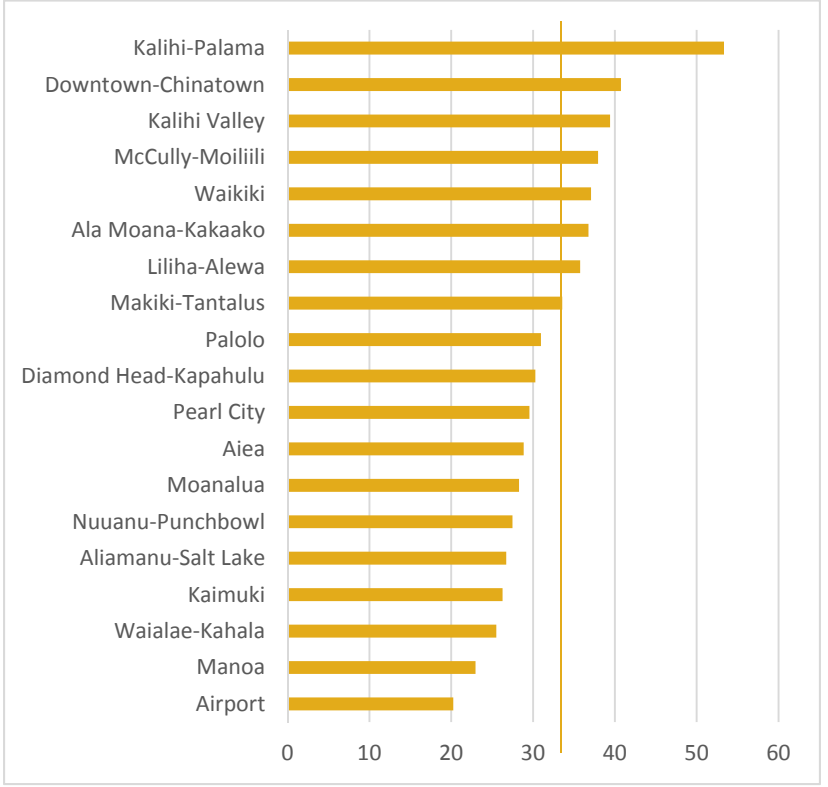
Hardship Index (combination of age, education, employment, income, poverty)

The "Hardship Index" was developed by the Nelson A. Rockefeller Institute of Government to compare the economic conditions of one neighborhood to another.[7] The Index standardizes six demographic and socioeconomic variables on a scale and then averages them together (the following five variables were selected for this analysis):

- **Age:** Percentage of population over age 65 and the percentage of population under age 18
- **Education:** Percentage of population over age 25 that did not graduate high school
- **Employment Status:** Percentage of unemployed workers age 16 and over
- **Income:** Household income
- **Poverty:** Percentage of population with income less than the Federal Poverty Level

Figures 20 and 21 show the Hardship Index score for each neighborhood in the PUC, ranging from 20 to 55, illustrating major disparities in standards of living. The average Hardship Index score is 33 (shown as a yellow line), thus neighborhoods scoring under this median experience "low" or "very low" levels of hardship. These are mostly single-family neighborhoods predominantly located in the upland areas. Neighborhoods scoring above the median experience higher levels of the index factors. These are predominantly denser multifamily areas where a majority of the PUC residents live.

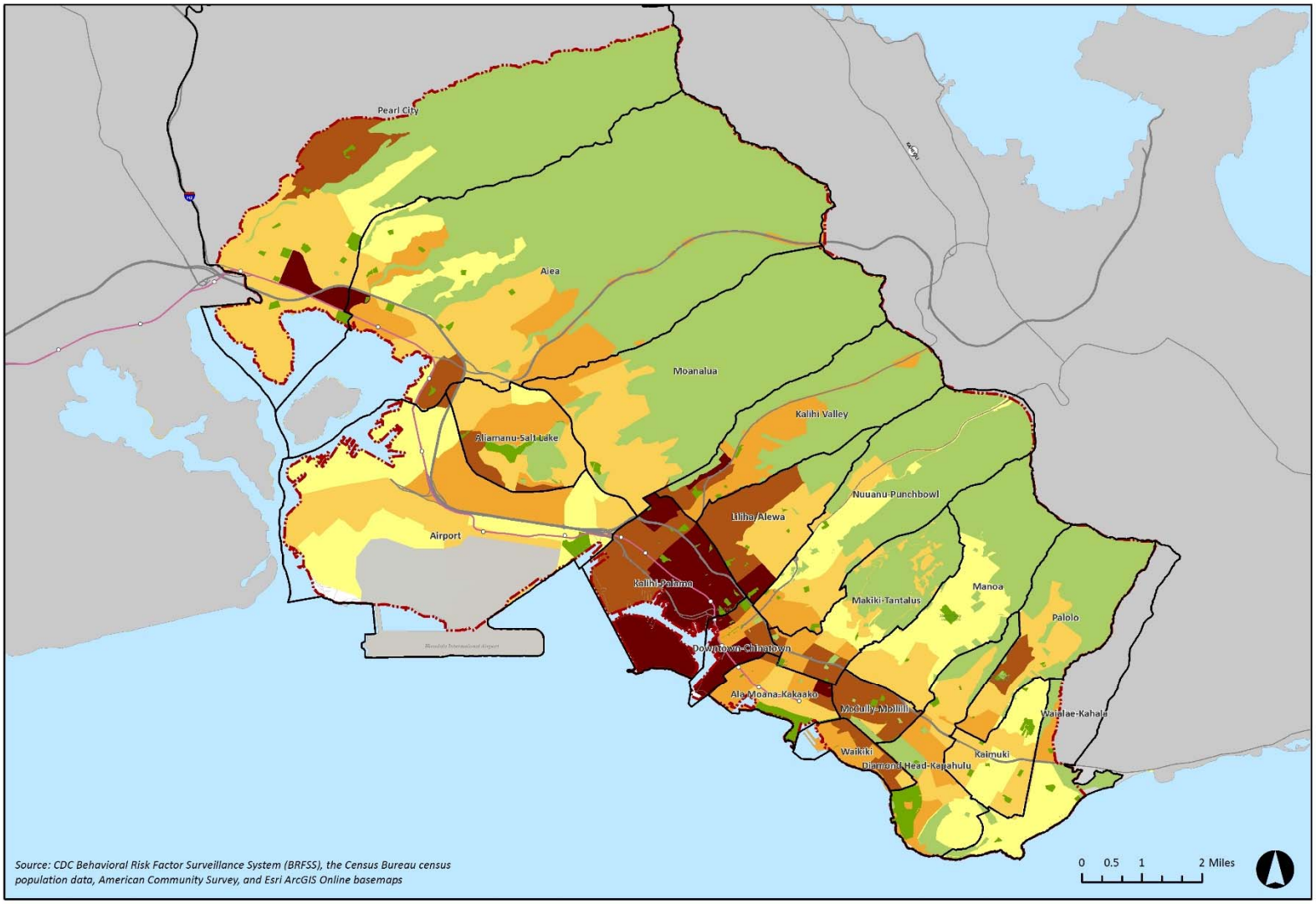
Figure 20: Hardship Index



V LOW: 0-24 LOW: 24-30 AVERAGE: 30-36 HIGH: 36-44 V HIGH: 44-60

[7] The initial *Hardship Index* was developed in 2004 using census data, and was updated in 2007 (https://rockinst.org/issue-area/hardship-americas-cities-suburbs/). It remains a valuable tool for comparing socioeconomic conditions across jurisdictions.

Figure 21: Hardship Index by percent of census block (Source: Census, 2017)



Overall Health Conditions and Chronic Disease in the PUC

This section describes the existing chronic disease and serious health conditions affecting PUC residents. Degenerative chronic diseases have become the most pressing health problem during the 21st century. Over the last few decades, the medical and public health fields have begun to focus less on reducing these diseases among individuals and more heavily on improving community conditions and the other factors that contribute to these diseases. This section presents information on the top six chronic diseases facing the PUC (for which BFRSS data is available): asthma, obesity, diabetes, heart disease, stroke, and high cholesterol.

Preventing disease and injury is central to improving health. To effectively promote health and prevent disease, it is important to first identify the leading causes of death and disability, as well as to begin to understand the behavioral, social, economic, and environmental determinants of health.

The City and County of Honolulu benefits when every resident has the opportunity to live a long, healthy, and productive life; however, the burden of disease and injury does not fall equitably on the population. As highlighted throughout this section, the PUC like many communities faces "health disparities" – defined as differences in health outcomes or risk factors influenced by race/ethnicity, geographic location, socio-economic status, gender, or other characteristics. Reducing disparities in health outcomes will improve the quality of life for all residents.

Data for the following sections was obtained through the Behavioral Risk Factor Surveillance System (BRFSS). It is run by the Centers for Disease Control and Prevention and consists of a telephone survey, with a core set of questions on topics such as car safety, obesity, and exercise. The purpose of presenting the information here in a planning context is to begin to draw parallels between health outcomes and spatial geographies in a way that may be useful in planning more healthful spaces and identifying where further resources are needed. Data is sorted in two different ways: by census tract and by neighborhood, and thus higher percentages may be present at the tract level than are shown at the aggregated neighborhood scale.

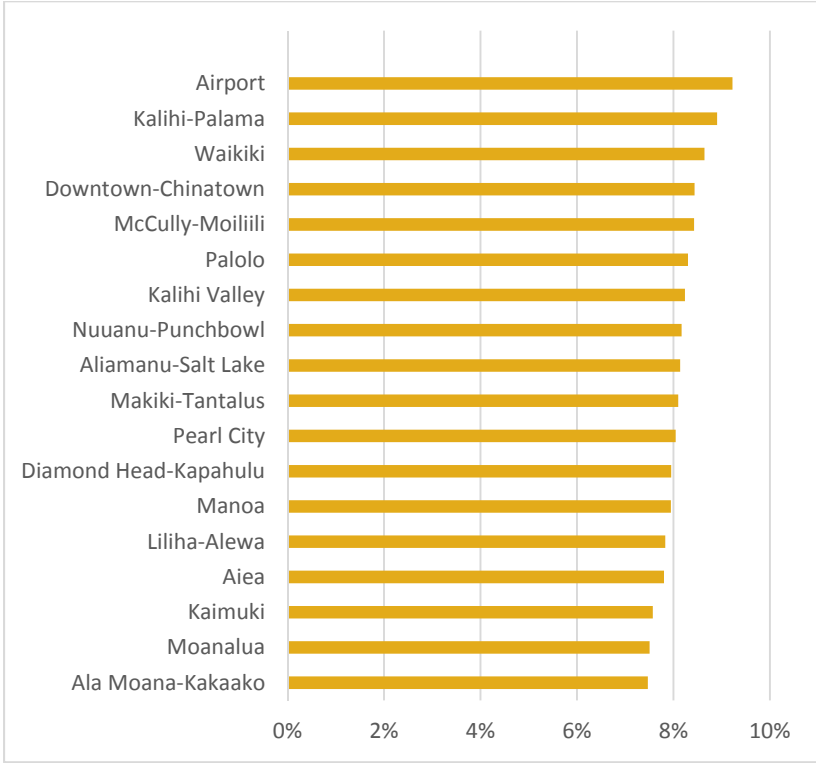
Data for life expectancy is not available in Hawai'i at a disaggregated level of analysis (smaller than zip code) and thus is not included in this report; however, at the State level, life expectancy does vary significantly across Hawai'i.

Asthma[8]

Diseases of the respiratory system are an important public health issue, especially in urban settings where many air pollutants are common. Respiratory diseases include a range of conditions, including upper respiratory infections, such as the common cold, influenza, and pneumonia; and chronic lower respiratory diseases, such as asthma and chronic obstructive pulmonary disease (COPD).

Asthma is a chronic lung disease that includes inflammation and intermittent narrowing of the airways. Asthma can cause repeated episodes of wheezing, chest tightness, shortness of breath, and coughing. Asthma attacks are triggered by a number of factors, including smog, dust, pollen, and smoke. Although asthma cannot be cured, it can be managed with appropriate treatment and medication.

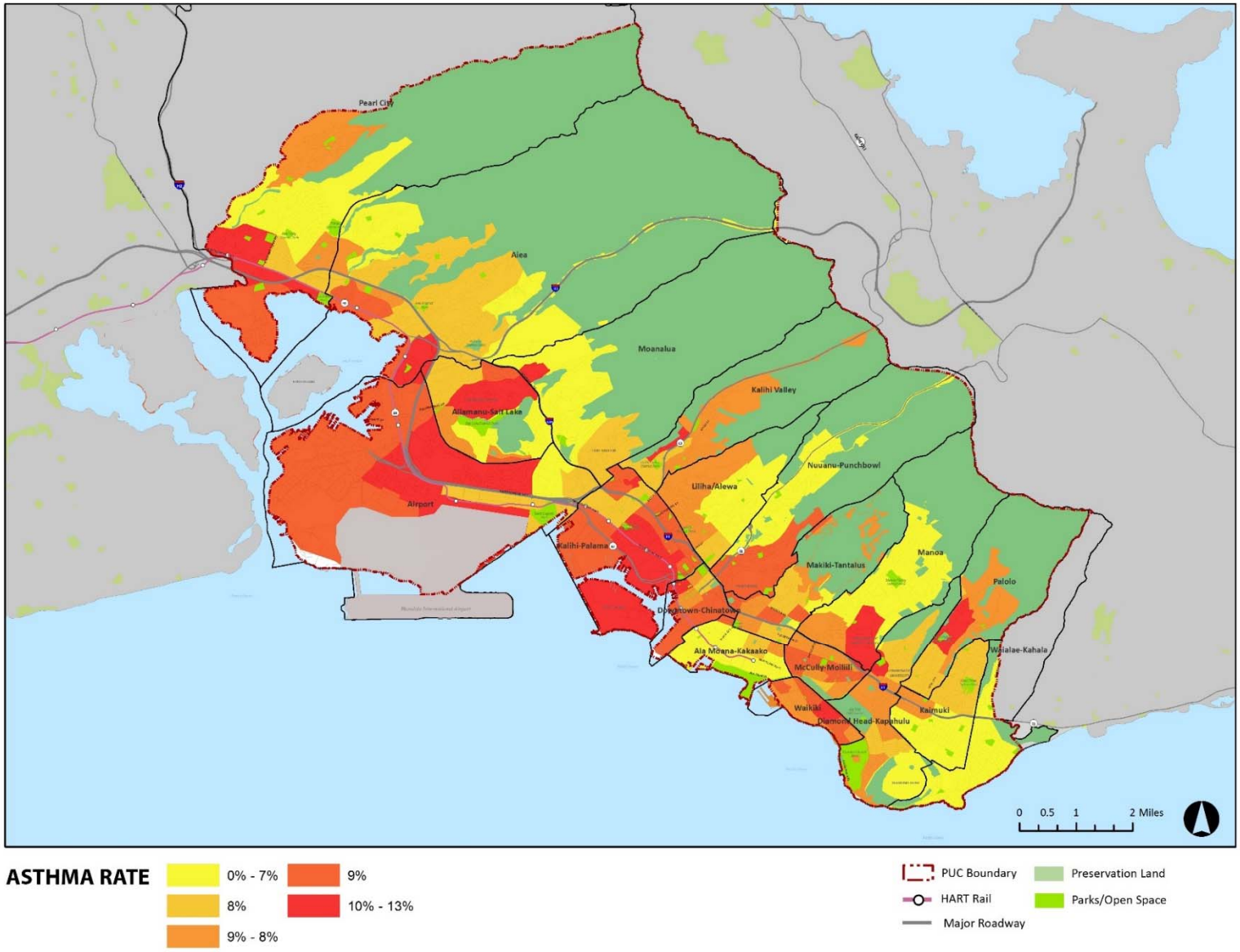
Figure 22: Population Diagnosed with Asthma



Source: The Behavioral Risk Factor Surveillance System (BRFSS)

[8] Additional information about chronic diseases can be found here: https://www.cdc.gov/chronicdisease/resources/publications/aag.htm

Figure 23: Asthma by percent of census tract (Source: CDC BRFSS, 2014)



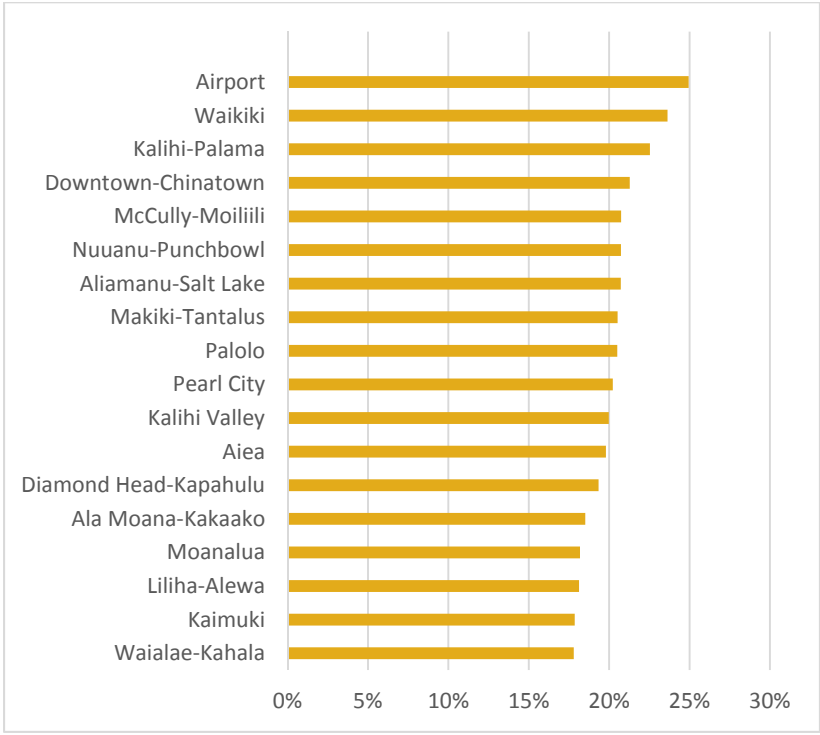
Obesity[9]

Obesity is a leading contributor to the nation's mortality, morbidity, disability, healthcare utilization, and healthcare costs. People in the U.S. of all ages, ethnic backgrounds, income, and education levels are affected by obesity.

The costs of obesity have a significant impact on the healthcare system. Adults and children who are obese are more like to develop other problematic health conditions such as high blood pressure, high cholesterol, type 2 diabetes, and coronary heart disease, among others. Additionally, national studies have found that obesity limits a person's physical ability to accomplish basic daily tasks, interferes with social activities, and makes basic movements more difficult, such as standing up from a chair and walking moderate distances.

Figure 25 shows the percentage of the population that is obese by census tract.

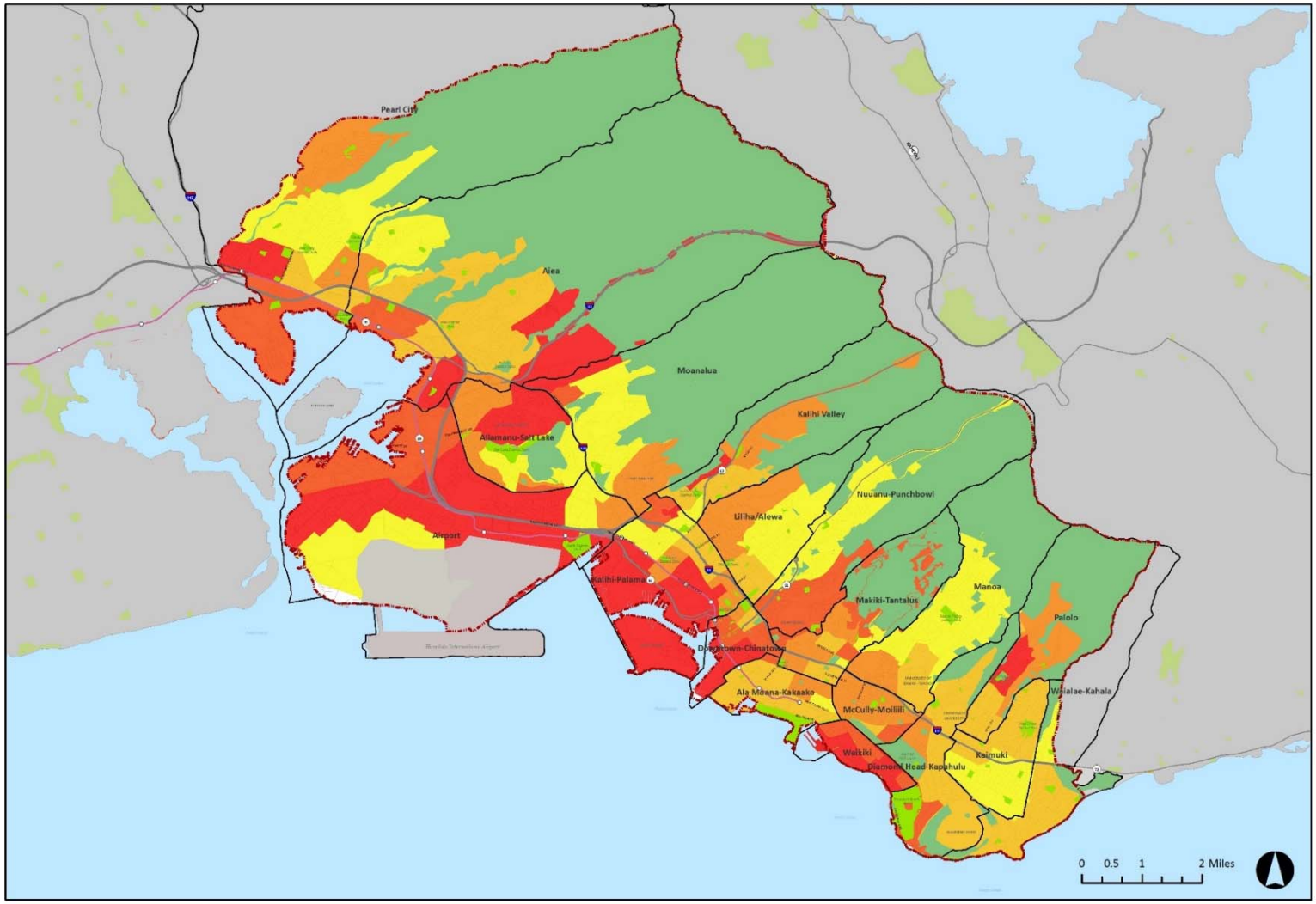
Figure 24: Obesity by Neighborhood



Source: The Behavioral Risk Factor Surveillance System (BRFSS)

[9] Additional information about chronic diseases can be found here: https://www.cdc.gov/chronicdisease/resources/publications/aag.htm

Figure 25: Obesity by percent of census tract (Source: CDC BRFSS, 2014)



Diabetes[10]

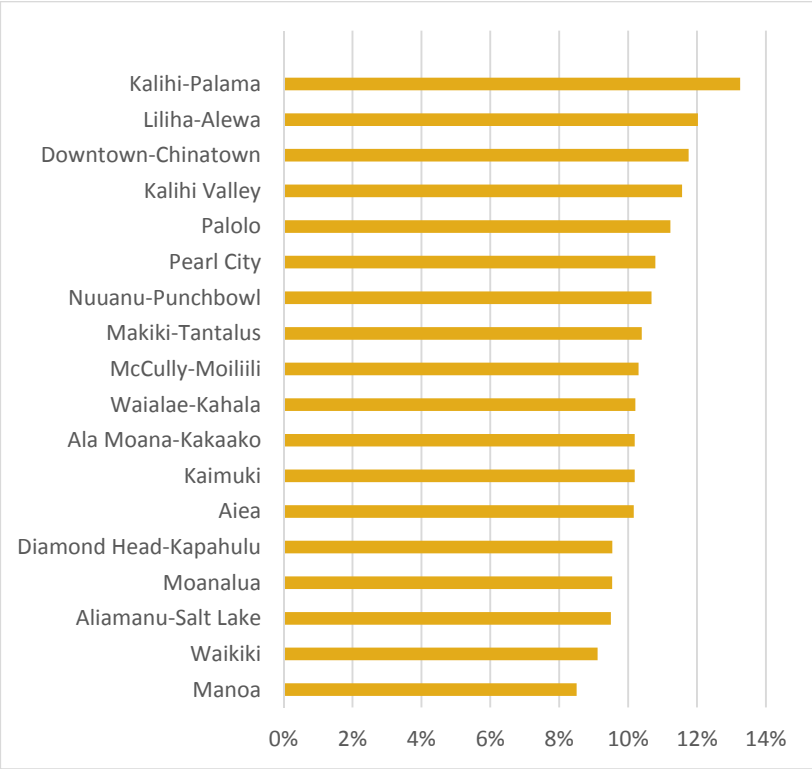
Diabetes is the seventh leading cause of death in the United States and is a health problem that is growing in severity and concern. Diabetes affects how a person's body uses blood sugar (glucose). The body produces insulin to convert glucose, which is derived from food, to energy in order to fuel the body's cells. Insulin takes the glucose from the blood into the cells. With Type 1 diabetes, the body is unable to make insulin (type 1 diabetes); with Type 2 diabetes, the body is not able to produce enough or use insulin well resulting in a buildup of glucose in the blood. Complications from diabetes can be severe including heart disease, blindness, and kidney failure, among others.

Since the 1970s, the risk of developing diabetes has increased by over 50% for American adults. Researchers have attributed this increased risk to higher rates of obesity, poorer diet, and reduced physical activity levels.

Overall, all PUC neighborhoods ranged between 9-13%.

Figure 27 maps those diagnosed with diabetes at the census tract level. A study of Native Hawaiians in two rural communities found that type 2 diabetes prevalence was four times as high as the average American. In 2007, NHPIs (20.6%) had the highest age-adjusted percentage of people with diabetes among all the racial groups in the United States, more than three times as high than Whites (6.8%) and about twice as high than Hispanics (11.1%) and Asians (8.9%).

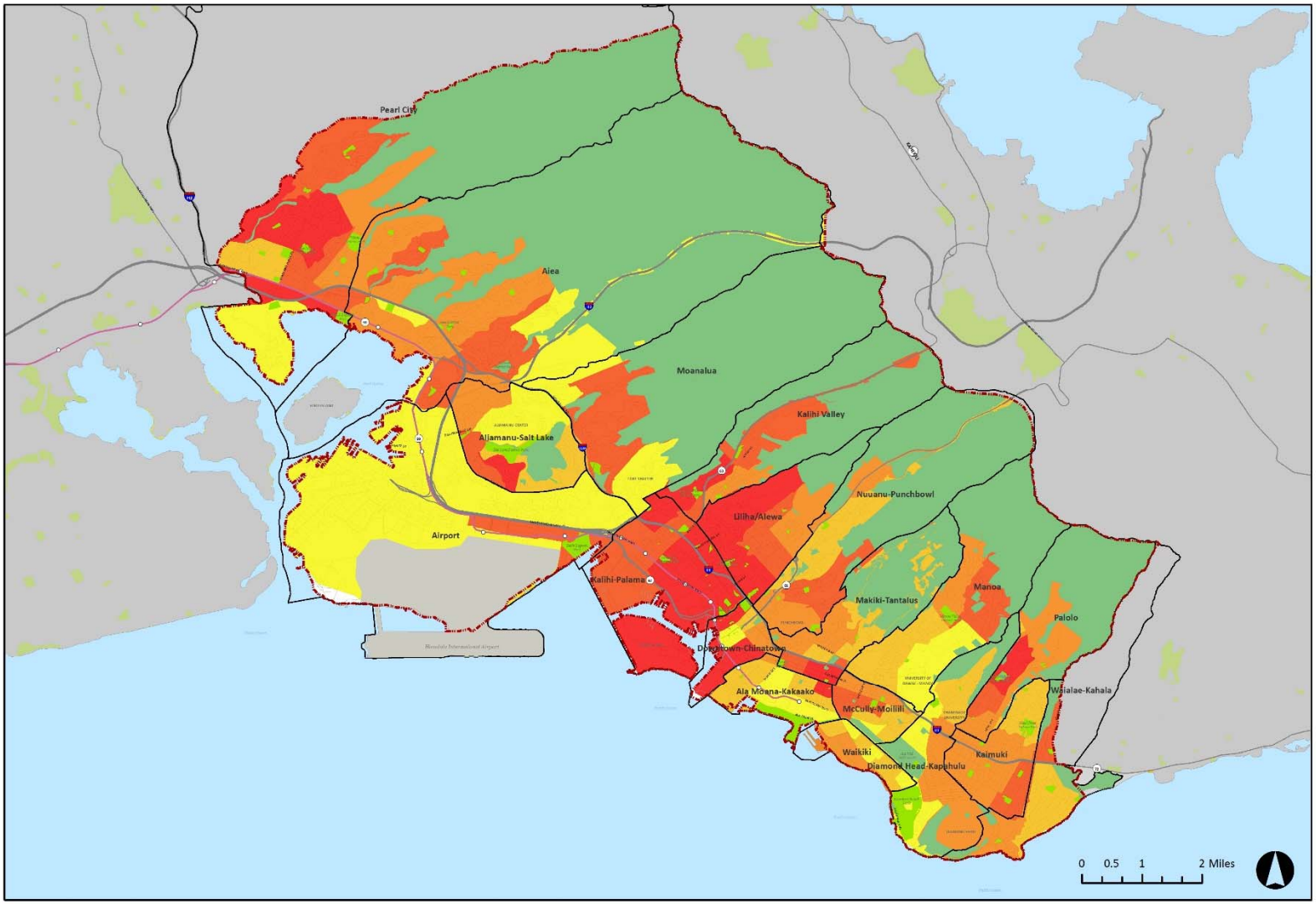
Figure 26: Population Diagnosed with Diabetes



Source: The Behavioral Risk Factor Surveillance System (BRFSS)

[10] Additional information about chronic diseases can be found here: https://www.cdc.gov/chronicdisease/resources/publications/aag.htm

Figure 27: Diabetes by percent of census tract (Source: CDC BRFSS, 2014)



Heart Disease[11]

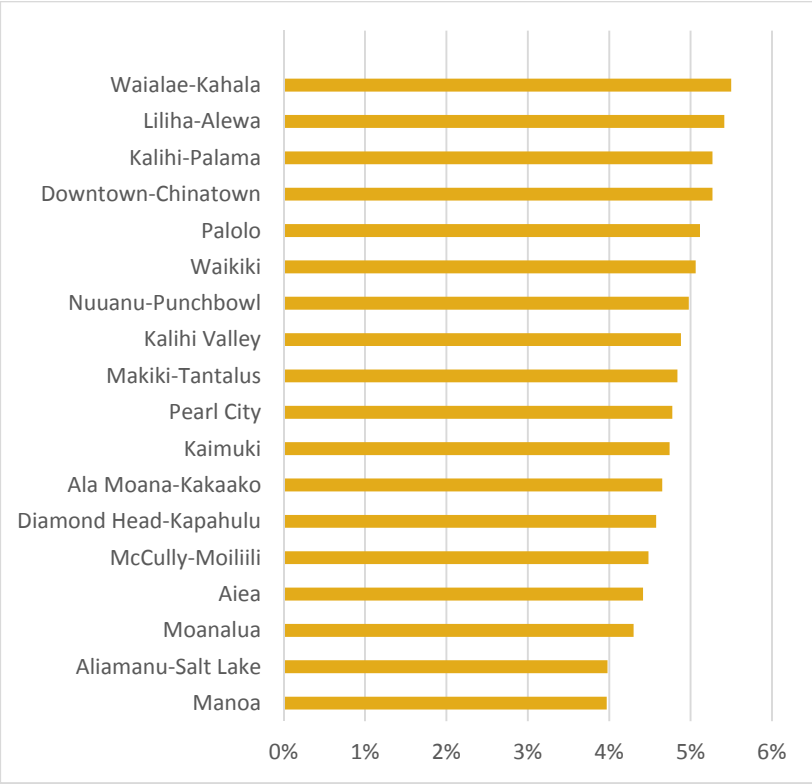
"Heart disease" is a general term used to refer to a range of diseases that affect the heart including diseases of the blood vessels (such as coronary artery disease), heart rhythm problems, (arrhythmias); and heart conditions that people are born with (congenital heart defects).

Heart disease is the leading cause of death in the U.S. Each year more than 600,000 people die from heart disease. Furthermore, 715,000 Americans have a heart attack each year, and 73% of these heart attacks are the first for an individual. Coronary artery disease, which is a term often used interchangeably with coronary heart disease (CHD), is the most common type of heart disease. It is a disease in which plaque builds up on the inside walls of the coronary arteries. Over time, the plaque can harden and/or rupture, reducing blood flow to the heart and potentially resulting in angina (chest pain) or heart attack. Long-term, CHD can also lead to arrhythmia and heart failure.

Major risk factors for heart disease include high blood pressure, high cholesterol, and smoking. Other conditions and lifestyle factors contribute to higher risk, including diabetes, overweight/obesity, poor diet, physical inactivity, and excessive alcohol use.

Figure 29 maps the percentage of the population diagnosed with heart disease by census tract.

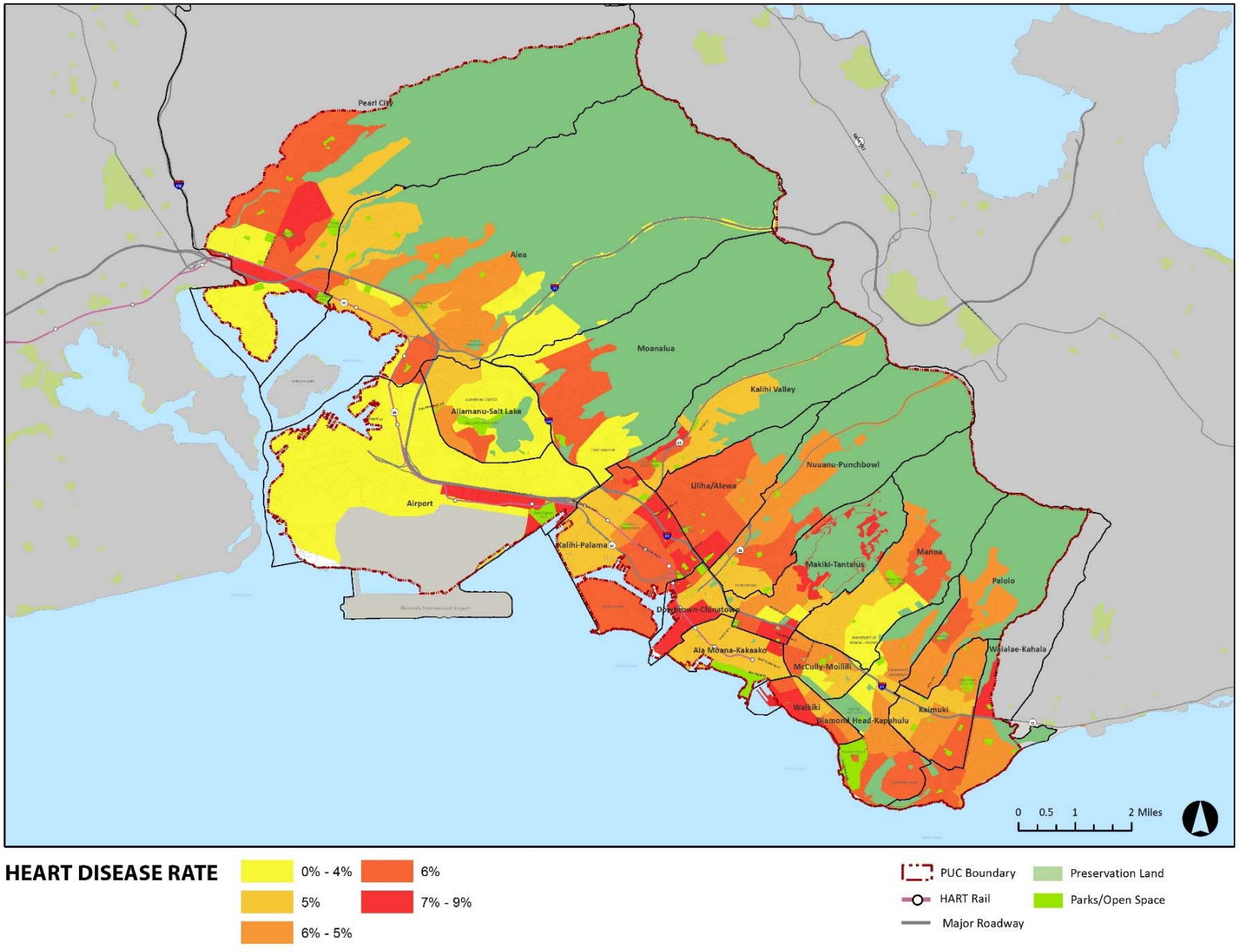
Figure 28: Population Diagnosed with Heart Disease



Source: The Behavioral Risk Factor Surveillance System (BRFSS)

[11] Additional information about chronic diseases can be found here: https://www.cdc.gov/chronicdisease/resources/publications/aag.htm

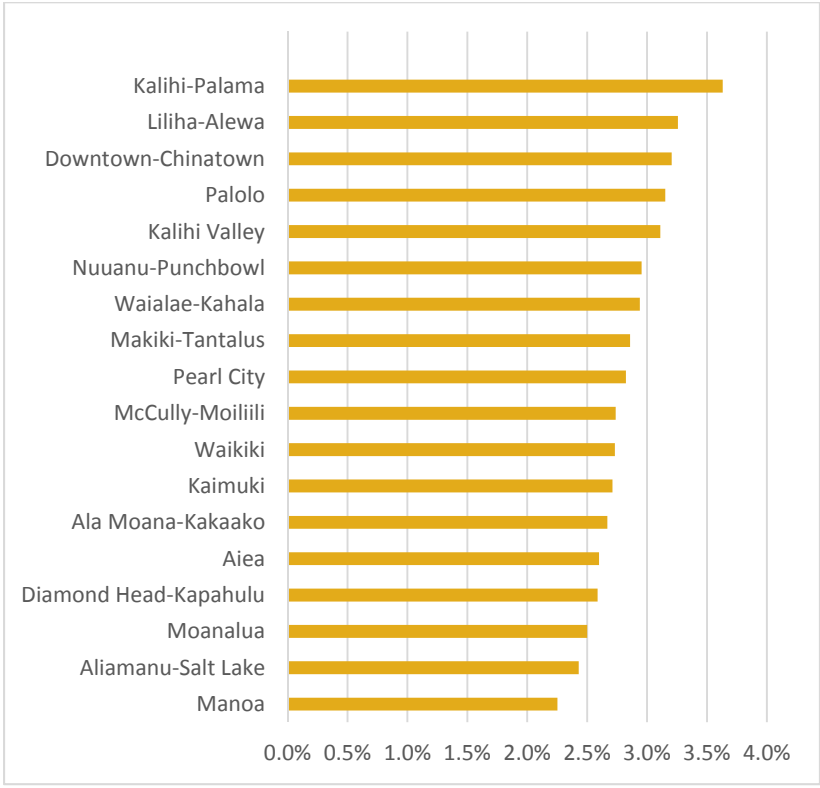
Figure 29: Heart Disease by percent of census tract (Source: CDC BRFSS, 2014)



Stroke[12]

Stoke is a leading cause of death in the U.S. While not technically a chronic health condition itself, it stems from chronic behaviors. Stroke, which may also cause disability, can occur when a blood vessel ruptures in the brain or a clot blocks the blood supply to the brain. The risk of stoke can be reduced through healthy lifestyle choices, such as eating a healthy diet, being active, limiting smoking and alcohol use, and maintaining a healthy weight.

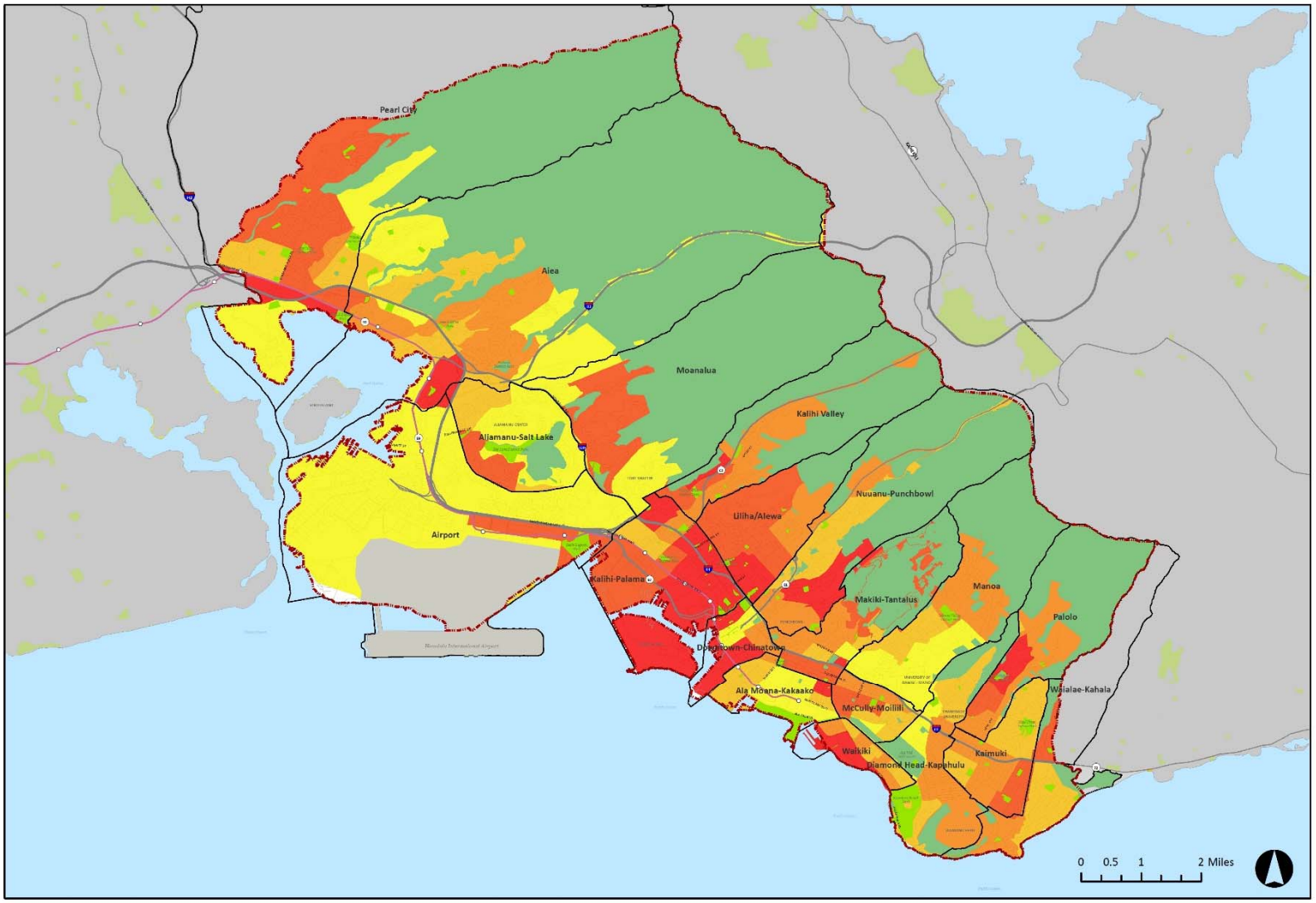
Figure 30: Stroke Mortality by Neighborhood



Source: The Behavioral Risk Factor Surveillance System (BRFSS)

[12] Additional information about chronic diseases can be found here: https://www.cdc.gov/chronicdisease/resources/publications/aag.htm

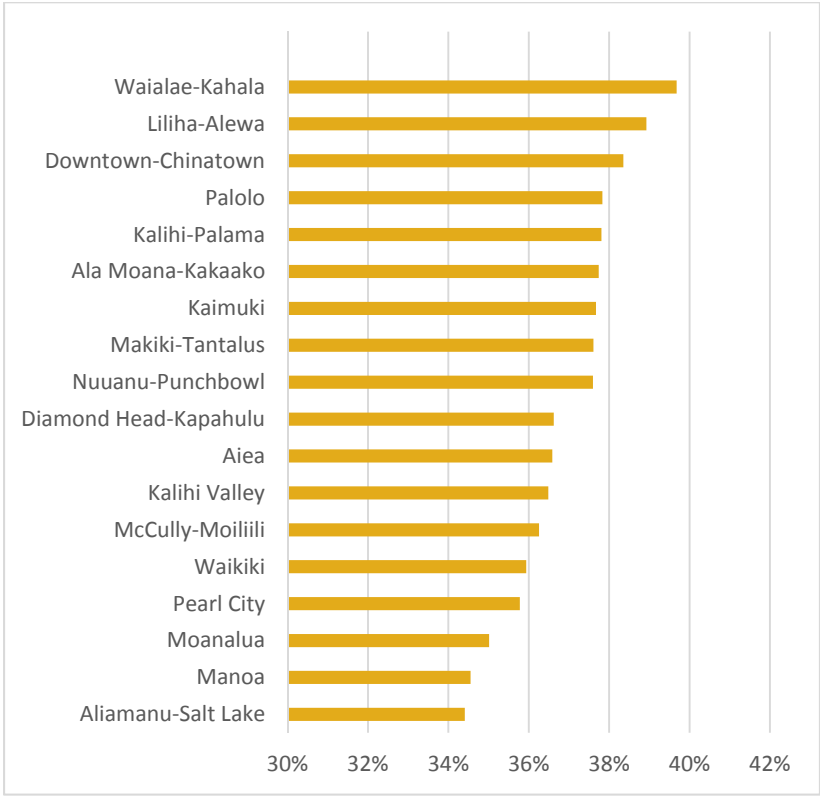
Figure 31: Stroke Incidence by percent of census tract (Source: CDC BRFSS, 2014)



High Cholesterol[13]

Figure 32 shows the percentage of the population with high cholesterol. High cholesterol is an issue because of the higher risk of heart and blood vessel disease and other complications that could lead to a stroke or heart attack.

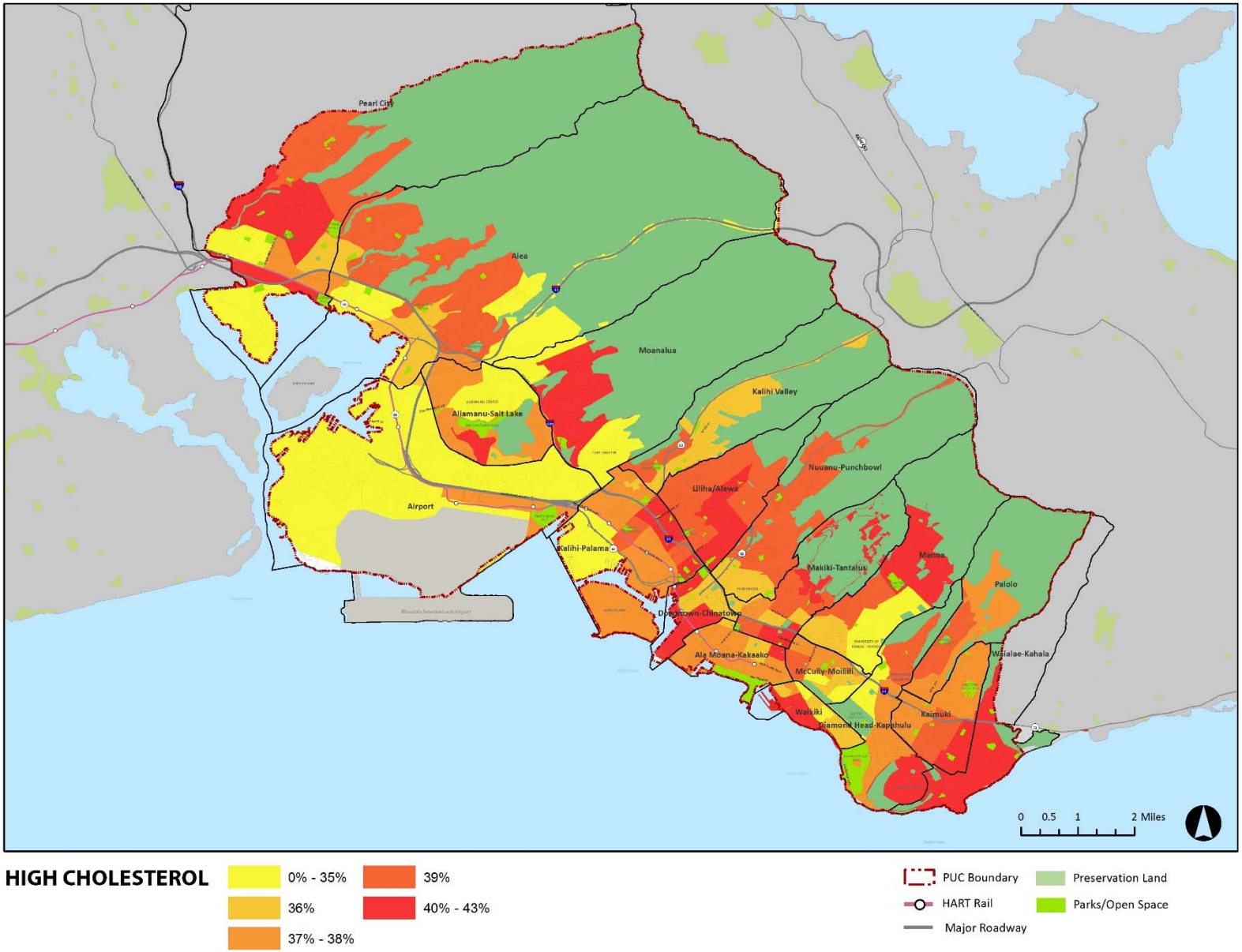
Figure 32: Population Diagnosed with High Cholesterol



Source: The Behavioral Risk Factor Surveillance System (BRFSS)

[13] Additional information about chronic diseases can be found here: https://www.cdc.gov/chronicdisease/resources/publications/aag.htm

Figure 33: High Cholesterol by percent of census tract (Source: CDC BRFSS, 2014)



Physical Activity

Physical activity, whether for transportation, exercise, or recreation, is a key ingredient to maintaining health and preventing disease. Researchers have found that physical activity helps control weight, reduces the risk of cardiovascular disease, Type 2 diabetes and some cancers, strengthens bones, improves mental health and mood, helps to prevent falls among older adults, and increases chances for a longer life. These benefits can occur for healthy people, people at risk for chronic diseases, and people with chronic diseases or disabilities.

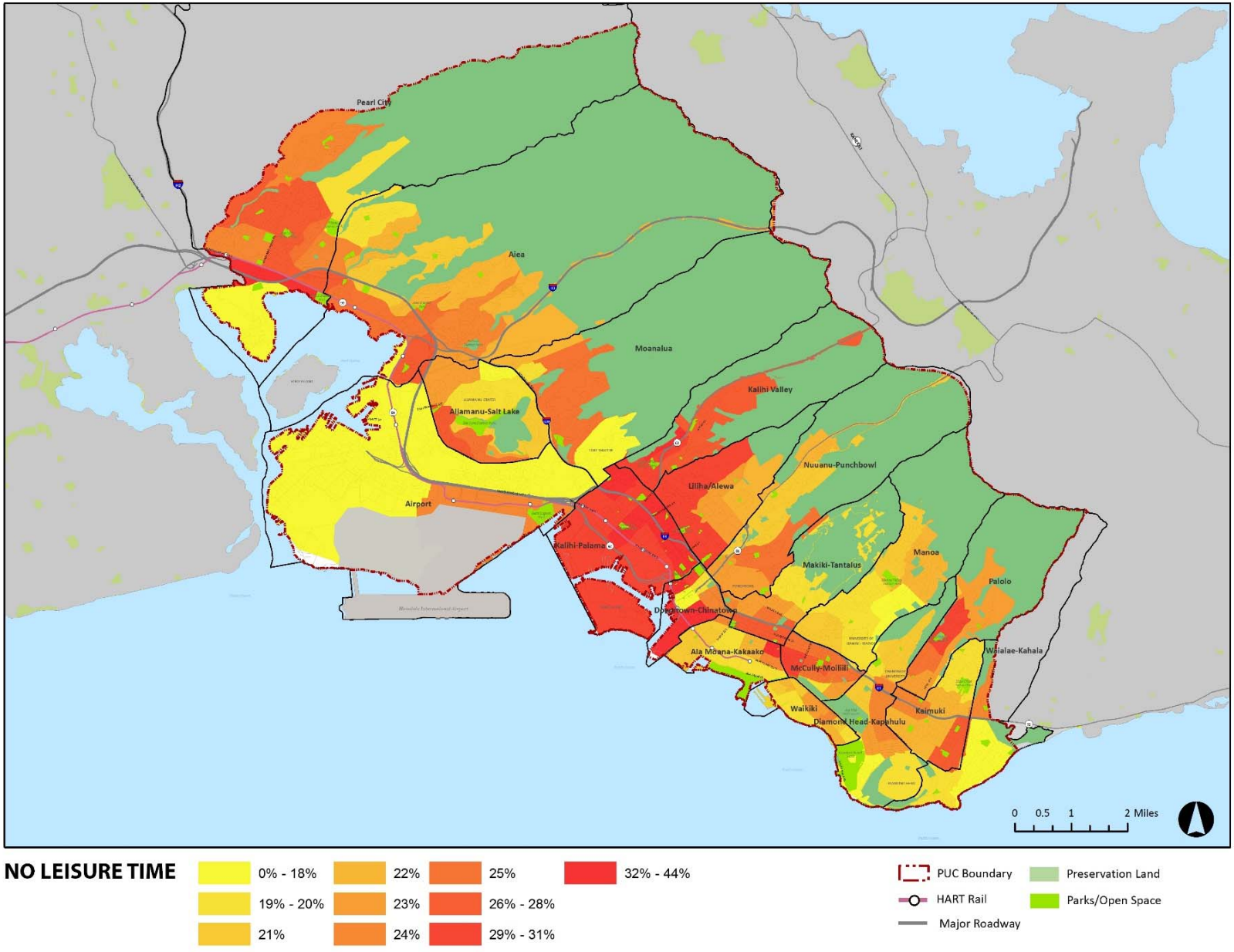
Built environment characteristics (such as land use patterns, urban design, and transportation systems), social environment characteristics (including societal values and preferences, market forces, and public policy), and individual behaviors and characteristics (such as demographic factors, lifestyle, and habits) are all important contributors to physical activity levels.

Understanding the differences among physical activity patterns is complex. However, there are some basic planning and design considerations that can help boost physical activity opportunities. For example, cities and neighborhoods can improve the accessibility to and quality of parks. Additionally, communities can restructure the physical environment to remove barriers to physical activity, by building sidewalks where there are none, or improving existing ones. Similarly, attention to pedestrian comfort and active ground-floor uses can encourage people to walk for short trips to obtain goods and services instead of defaulting to their car. Multi-use trails that connect residences, neighborhoods, schools, and parks can encourage residents to benefit from outdoor exercise by making it convenient and pleasant. These improvements can contribute to increased physical activity levels leading to the improved health and well-being of residents.

Leisure-time Physical Activity

Figure 34 shows the percentage of adults 18 years and older in the PUC who reported they don't have any leisure-time physical activity in a given day. Neighborhoods with the highest percentage of residents who do not get regular leisure-time physical activity include Kalihi-Pālama, Liliha-ʻĀlewa, McCully-Mōʻiliʻili, and Kalihi Valley. In these areas, between one-third and just under one-half (44%) of adults do not engage in regular leisure-time physical activity. Areas with the highest levels of reported leisure-time physical activity include the Airport, Waiʻalae-Kāhala, and Diamond Head.

Figure 34: No Leisure Time by percent of census tract (Source: CDC BRFSS, 2014)



Park Access

Proximity to parks is associated with increased park usage, increased physical activity, and better overall health. Improving access to parks can increase the amount of time children exercise, decrease their risk of chronic diseases, and even reduce juvenile delinquency. Adults who live closer to parks and green spaces report reduced stress and fatigue, improved mental health, better self-rated health, and reduced incidents of chronic diseases.[14] **Figure 36** shows access to parks by ¼ mile and ½ mile walk distance.

Figure 37 maps the census blocks with low median household incomes (less than $35,000 AMI, and $35,000 to $55,000 AMI) and compares those with ¼ mile "walksheds" or walking access to parks. This comparison reveals several low-AMI neighborhoods in the PUC that are underserved by parks – especially Kalihi, Pālama, Downtown/Chinatown and parts of Pearl City.

Population Density and Park Access

Overall, 74% of the PUC's population is located within a ¼-mile walkshed to a park. **Figure 38** maps census blocks with higher than average population densities (over 6,001 persons per square mile) that are not within a ¼-mile walkshed to a park in the PUC. Generally, dense neighborhoods fall within a ¼ mile walkshed, but the map reveals several population "hotspots" that are exceptions, including in Makiki, Kalihi, Pearl Harbor, and Pearlridge. Secondary hotspots include Kapahulu and parts of Pālolo, Kaimukī, Salt Lake and Pearl City. These areas should be investigated further to determine whether new parks are needed.

Park Level of Service (Acres/1,000 People)

Along with access, the quantity of parks is also associated with increased usage and physical activity and better overall health.[15] This analysis did not include natural preserve areas in the PUC (which are not always publicly accessible) and only considered public neighborhood, regional, and State parks. Open space areas on private property, whether accessible by the public or not, were also not counted. **Figures 35 and 39** show the number of public parks per 1,000 people in the PUC. Overall, a majority of the neighborhoods are being underserved by public parks. Fourteen of the nineteen neighborhoods have less than 3 park acres per 1,000 people, which is universally used as the typical service standard. Diamond Head (17.5 acres per 1,000) and Ala Moana-Kaka'ako (7.8) have the highest number of parks in the PUC, primarily because these areas feature large regional-serving parks including Kapi'olani Park, Ala Moana Beach Park, Ala Wai Park, and the open space surrounding/adjacent to Diamond Head National Park. The Liliha-'Ālewa area is shown as having the fewest parks acres for every 1,000 residents (0.9 acres).

[14] Wood, Hooper, Foster, & Bull. "Public green spaces and positive mental health – investigating the relationship between access, quantity and types of parks and mental wellbeing," Health & Place, Volume 48, 2017, pp 63-71.

[15] Kaczynski, Potwarka, and Saelens. "Association of Park Size, Distance, and Features With Physical Activity in Neighborhood Parks." American Journal of Public Health, Volume **98**, 2008, pp1451-1456.

Figure 35: Park Acres per 1,000 People by Neighborhood

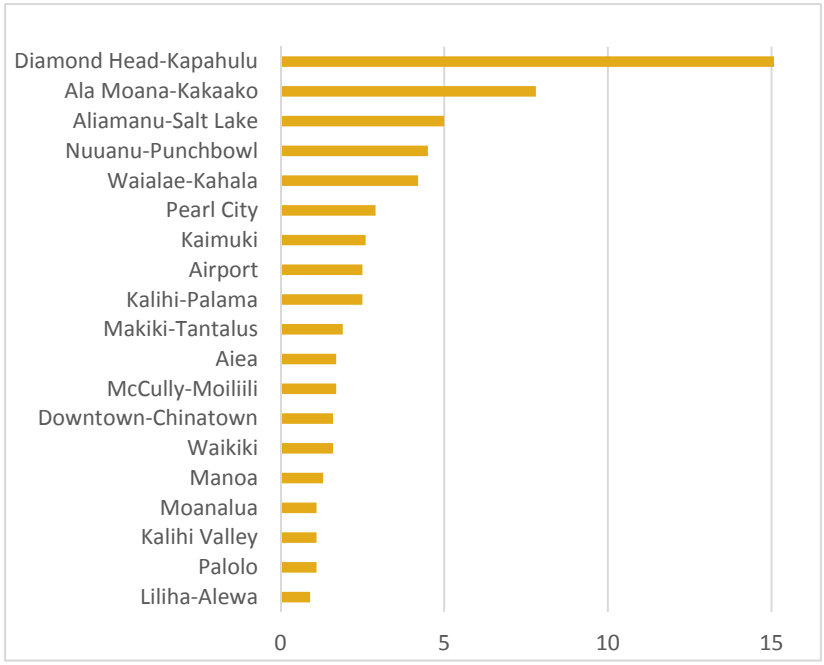


Figure 36: Park Access (Source: R+A, HOLIS, 2017)

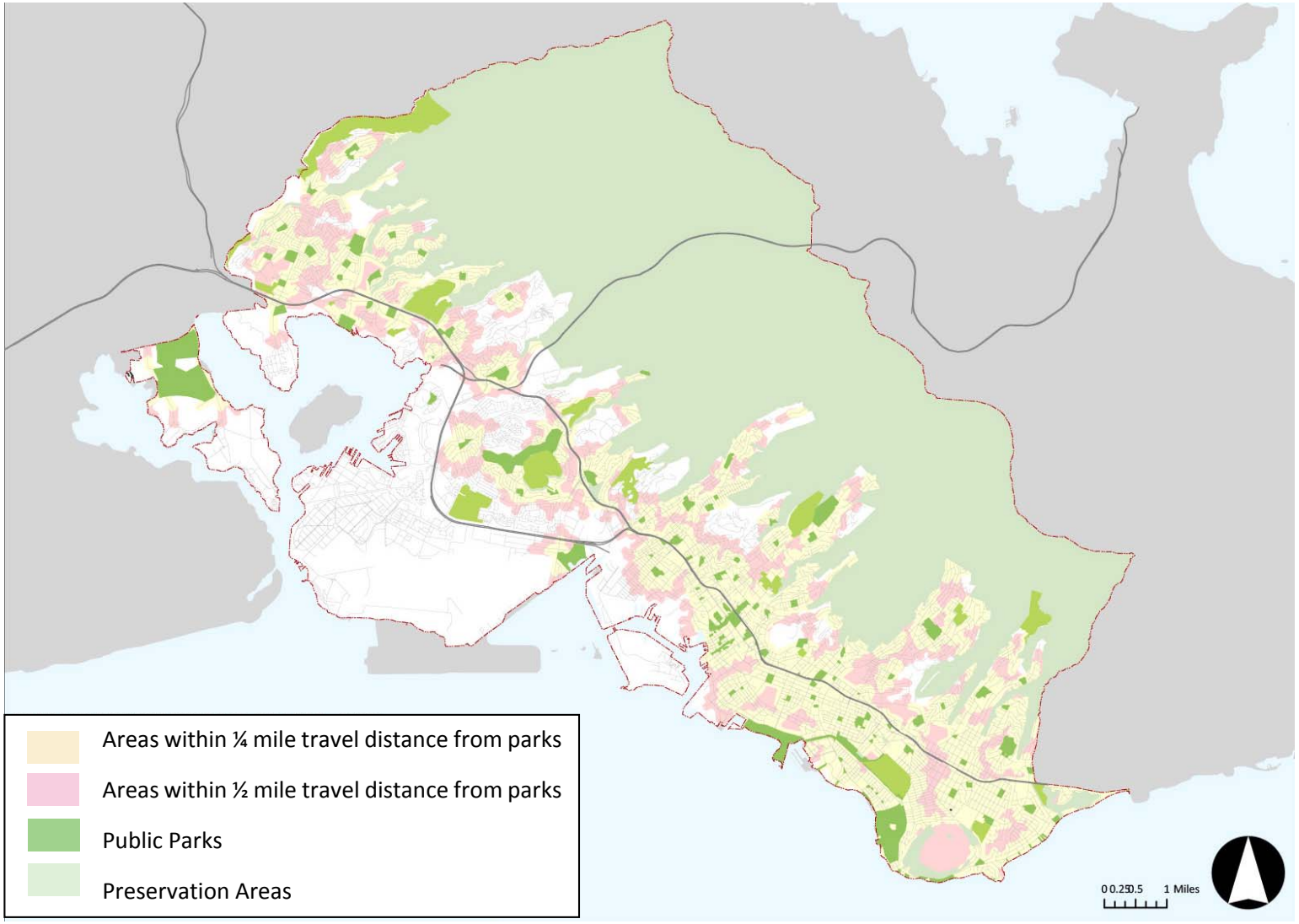


Figure 37: Walking Access to Parks for Households Earning Less than $55,000 AMI (Source: R+A, HOLIS, 2017)

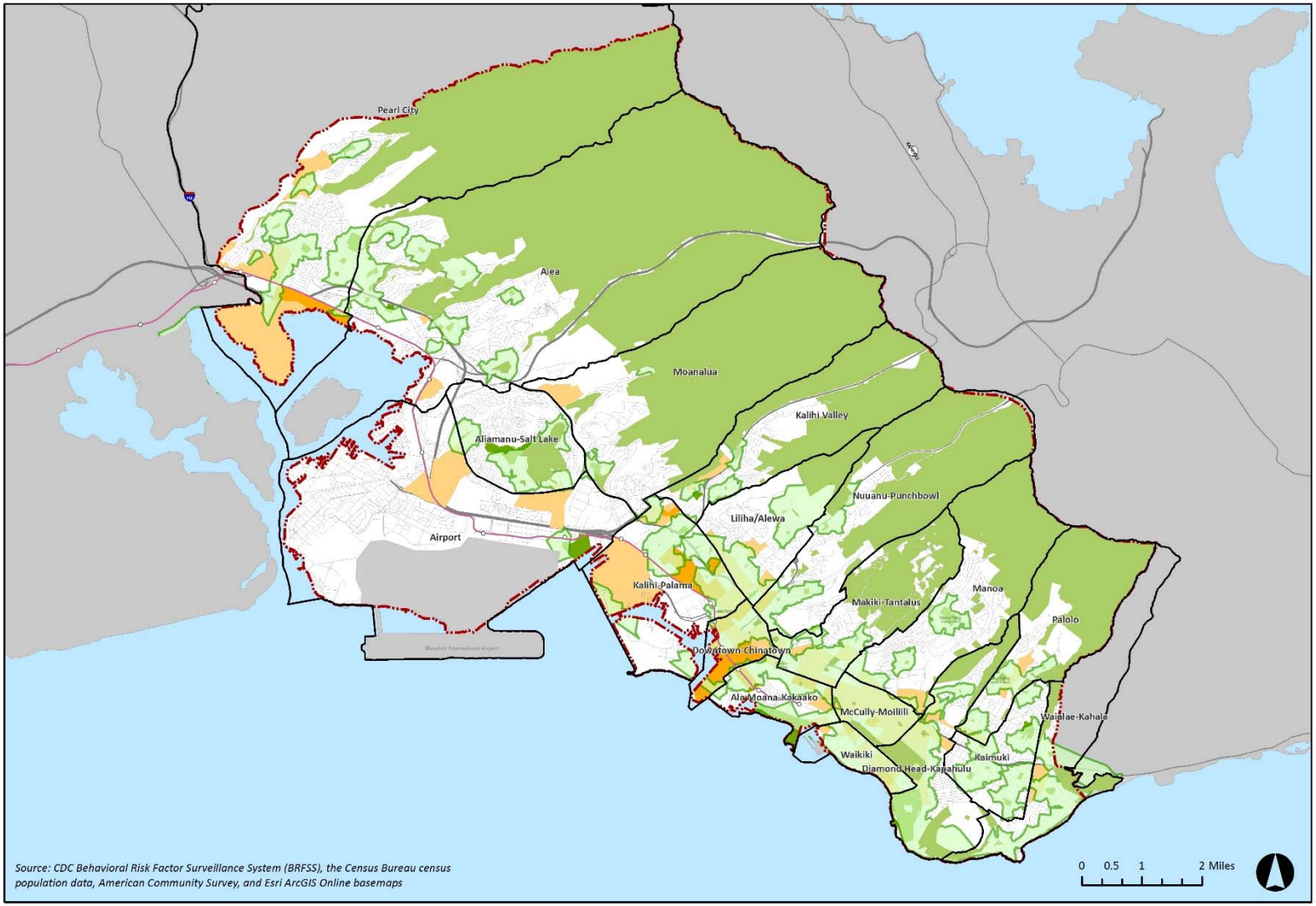


Figure 38: Areas of High Population Density and Walk Access to Public Parks (Source: R+A, HOLIS, 2017)

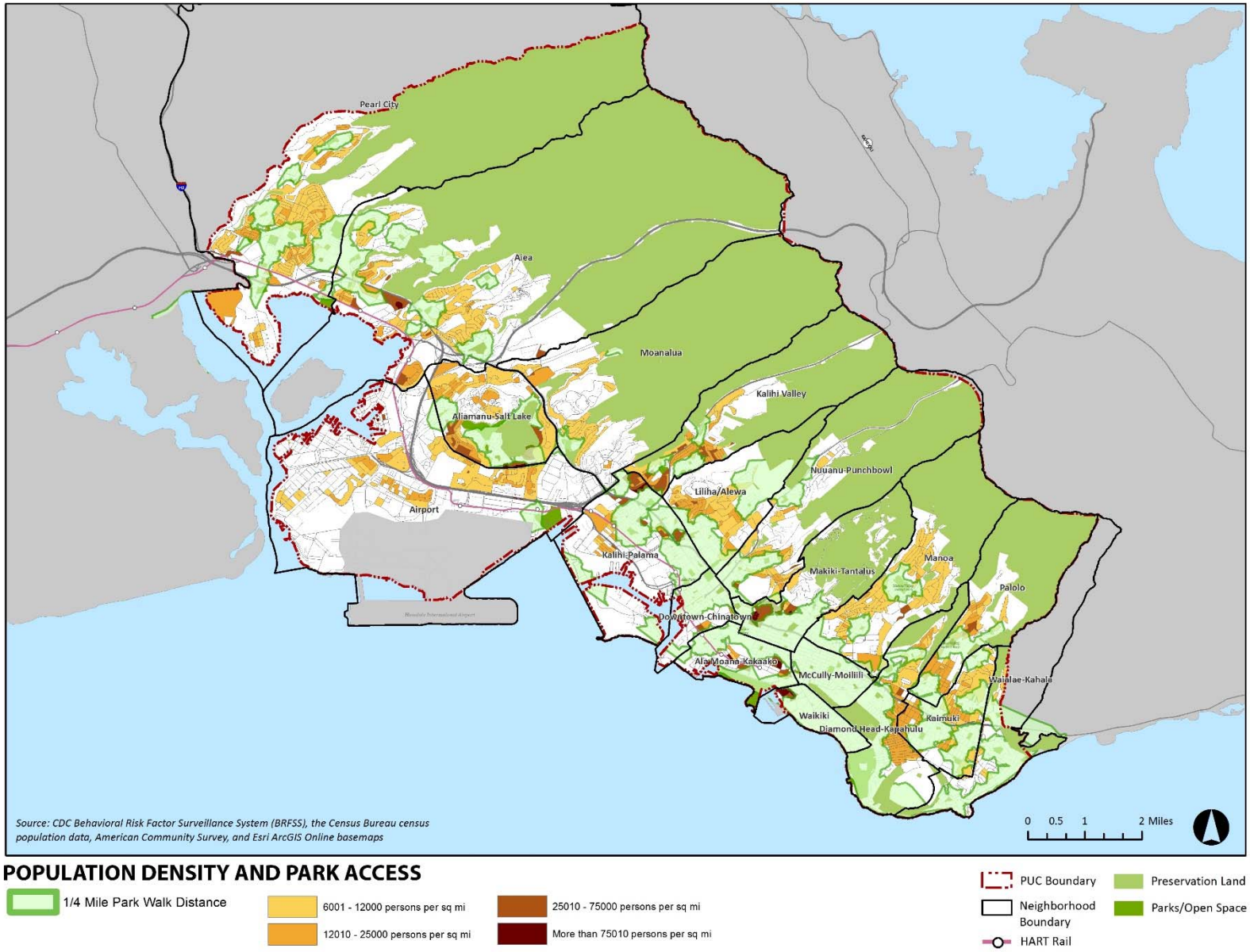
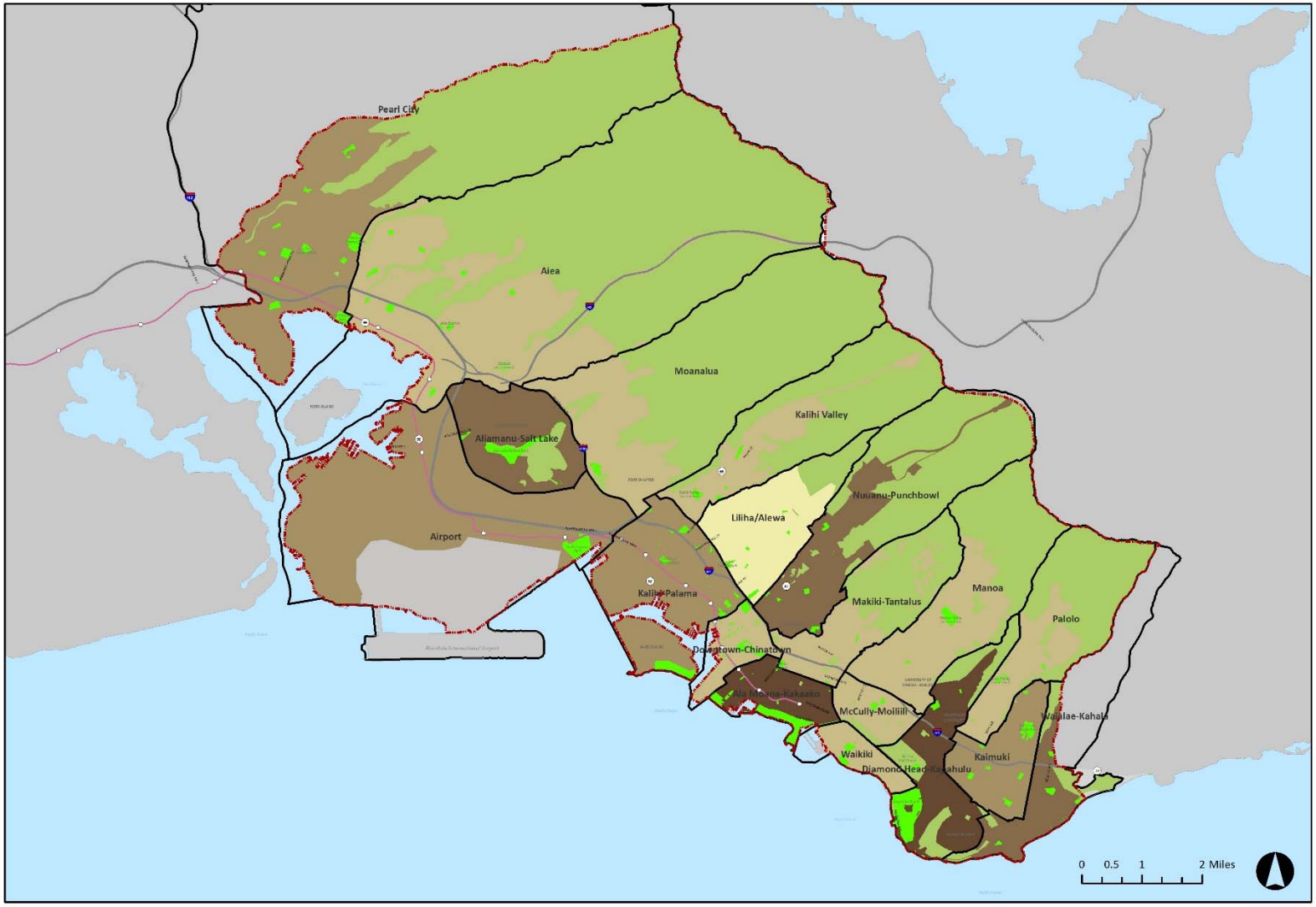


Figure 39:Acres of Parks Per 1,000 Residents (Shown by NB Area)(Source: R+A, HOLIS, 2017)



Healthy Food

Poor nutrition and unhealthy eating habits are risk factors for many leading causes of disease. Given the growing national concern around the obesity epidemic and other food-influenced chronic diseases such as diabetes and heart disease, improving widespread access to and knowledge about nutritious foods is of great importance.

Personal eating habits are shaped by a broad spectrum of influences – from international trade, federal agricultural policies and pervasive advertising at the macro scale, to family traditions, social/cultural norms, and personal nutrition knowledge at the micro scale. For their part, local governments and health agencies can encourage people to eat healthier through policies and programs at the local level that can improve people's access to healthier food options and to make these the easier, or default, choice. These strategies can include things like encouraging farmer's markets, community garden and farming programs, and educational programs promoting healthful habits.

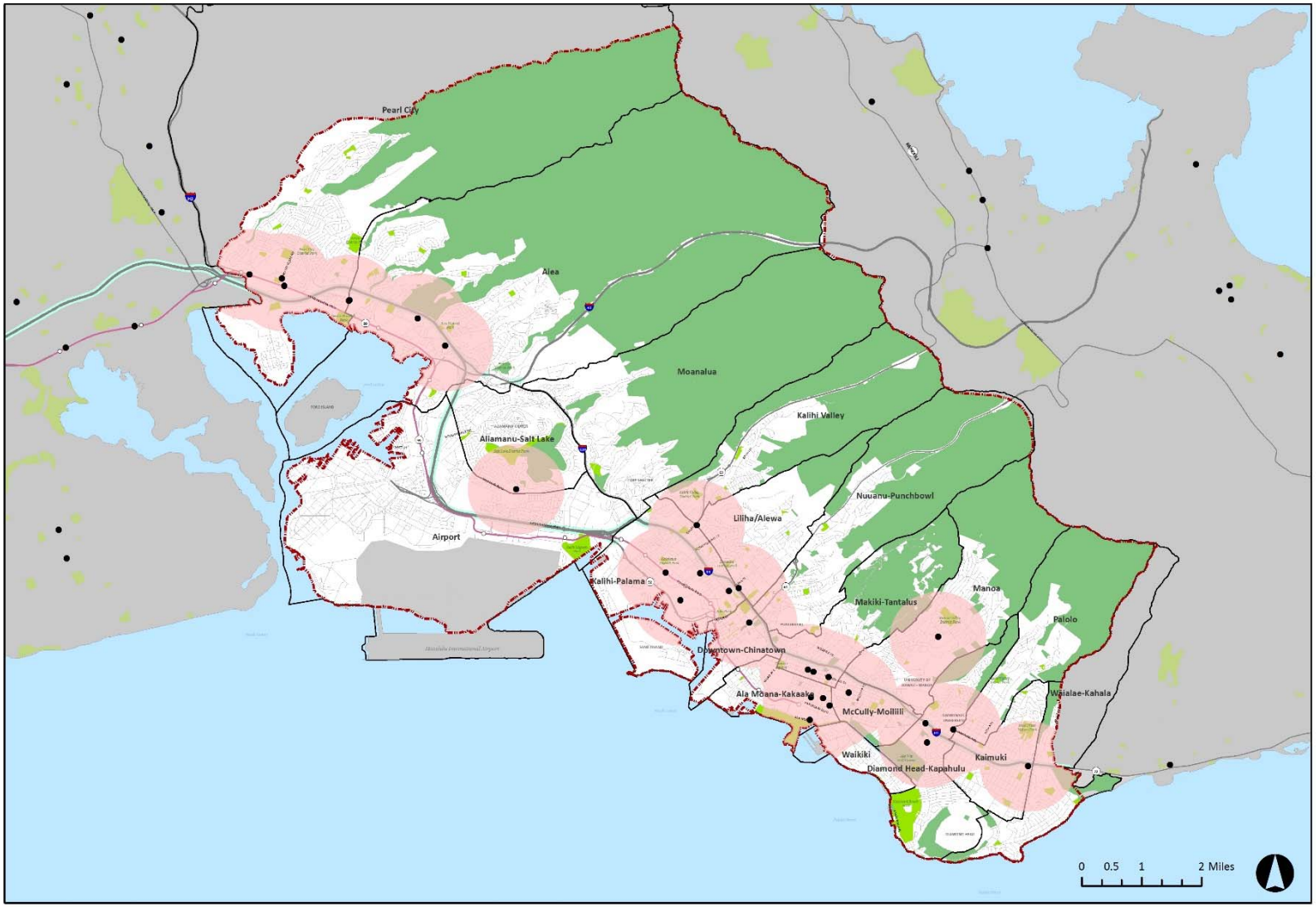
Supermarket Access

Residents of communities who live near a full-service grocery store or supermarket tend to eat more fruits and vegetables, have lower body weights, and lower rates of chronic diseases.[16] Conversely, those in communities without access to supermarkets generally have higher body weights (on average) and suffer from higher rates of premature death and chronic disease. In addition, areas with more fast food restaurants and convenience stores than grocery stores experience higher rates of obesity and chronic disease across all income groups.

Figure 40 maps all of the supermarkets in the PUC. A one-mile buffer was added to each supermarket to highlight neighborhoods that lack full-service groceries close to where they live. The highest density of supermarkets is in the central PUC area where there is the highest population density. Constrained by topography, and usually lower in population density, valley/ridge neighborhoods have noticeably less access to full-service grocery stores (this analysis does not include farmers' markets or food stands). The Salt Lake, Moanalua, and Airport neighborhoods are also particularly underserved.

[16] Hilmers, David and Angela. "Neighborhood Disparities in Access to Healthy Foods and Their Effects on Environmental Justice." Am Journal of Public Health. 2012 September; Volume 102(9): 1644–1654.

Figure 40: Supermarkets with 1-mile Buffer (Source: State Dept of Health, 2017)



Electronic Benefit Transfer (EBT)/Choose Healthy

"Food security" is defined by USDA as having access to enough food for an active, healthy life for all people at all times. Food insecurity, by contrast, can lead to undernourishment and malnutrition, conditions which coincide with fatigue, stunted child development, and other health issues. Undernourished pregnant women are more likely to bear babies with low birth weight, and the babies are then more likely to experience developmental delays that can lead to learning problems.[17] Hunger and food insecurity can also accelerate the development of disease or worsen existing diseases. Ironically, food insecurity and obesity co-exist in some households where people eat foods that are inexpensive while high in fat and sugar, but low in nutritional quality. Finally, food insecurity causes anxiety and stress, which weakens immune systems and decreases overall quality of life.

Households that lack "food security" are typically low-income and qualifying households can obtain supplemental assistance from government programs, such as the Supplemental Nutrition Assistance Program (SNAP). In 2017, approximately 9% of households in the PUC were SNAP recipients, but as **Figure 42** shows, the recipients are overwhelmingly clustered in just a few neighborhoods. The neighborhood with the highest proportion of SNAP recipients was Kalihi-Pālama neighborhood, where 29% of households participated in the program. In the Kalihi Valley and Downtown-Chinatown neighborhoods, over 16% of the households participated in SNAP. Conversely, the Airport and Waiʻalae-Kāhala neighborhoods had the lowest number of households participating in the program, with less than 2 percent. **Choose Healthy Now** is a program run by the State Department of Health that identifies and promotes healthy snacks and drinks that meet Nutrition Criteria. These items are promoted through signage, product placement, and price incentives, and are available at many corner/convenience stores in the PUC.

[17] Martorell and Gonzalez-Cossio."Maternal Nutrition and Birth Weight." Yearbook of Physical Anthropology. Volume 30:195-220 (1987).

Figure 41: Households Participating in Food Assistance Programs

Source: The Behavioral Risk Factor Surveillance System (BRFSS)

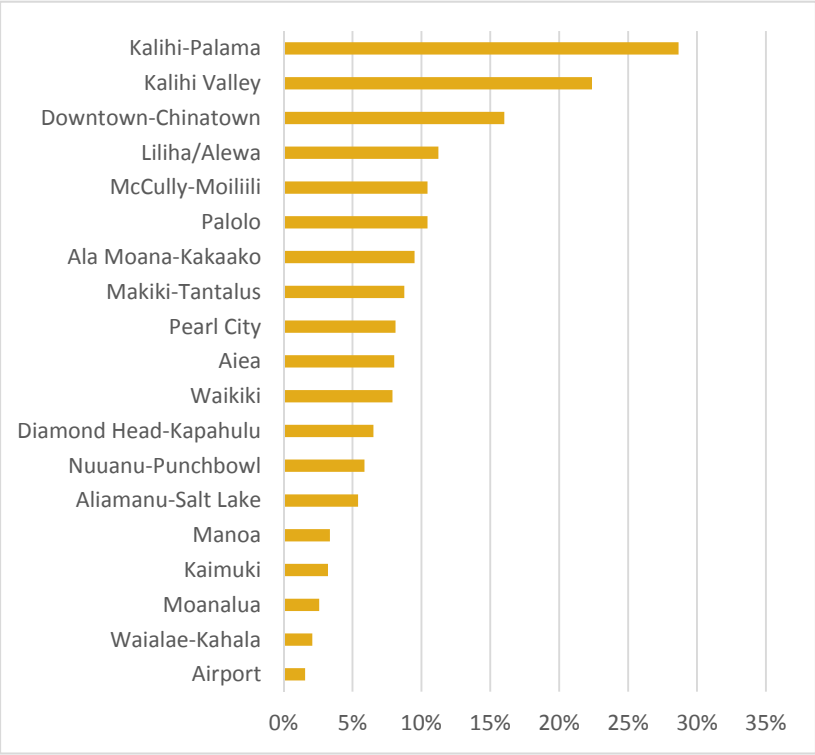
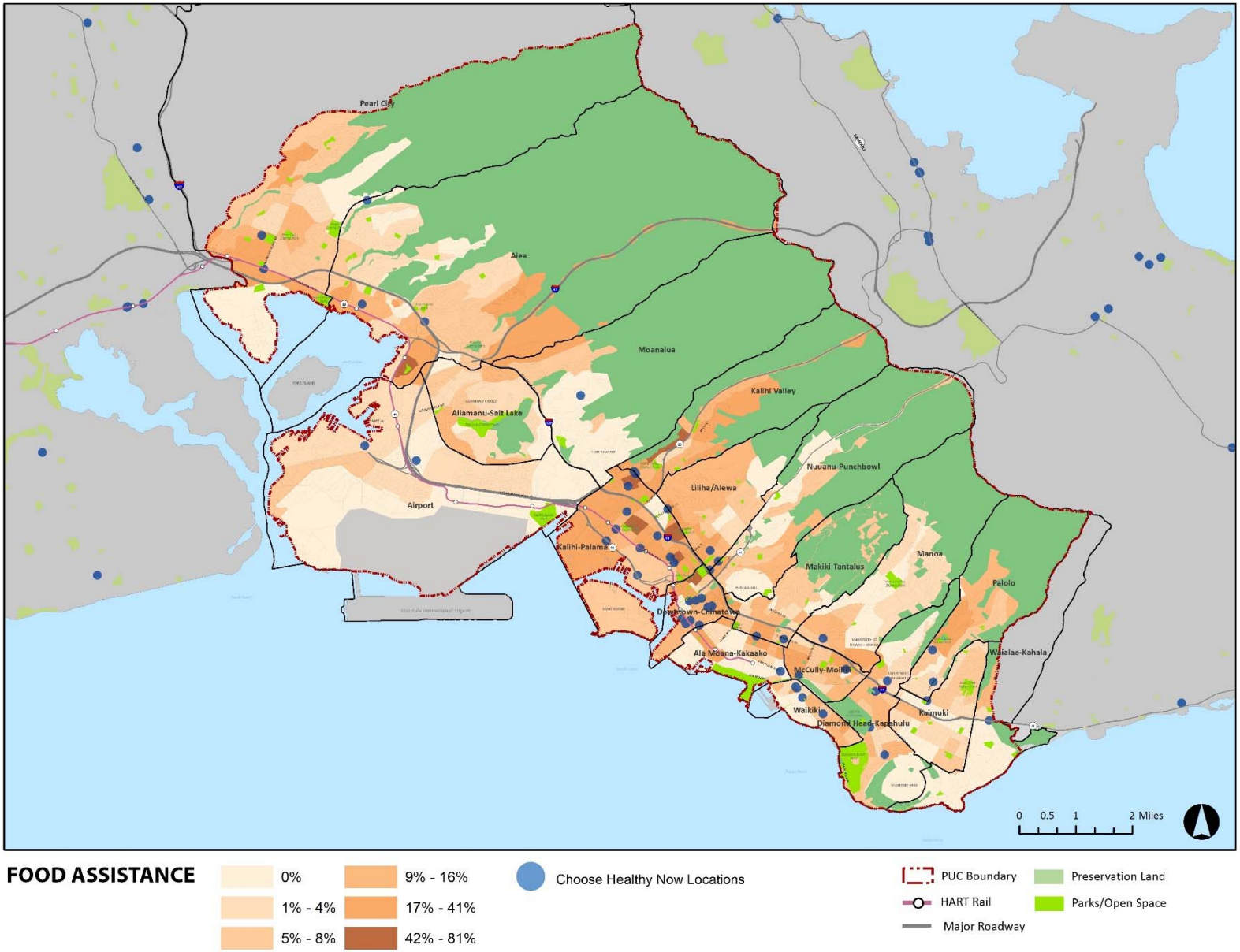


Figure 42: Households Receiving Food Assistance + Choose Healthy Now Locations (Source: State Dept of Health, 2017)



Transportation

The way we travel can have significant effects on our health and wellness. For example, high reliance on private cars can contribute to higher rates of air pollution and respiratory illness. Streets that are built for the primary function of moving cars and that do not accommodate pedestrians and cyclists (either adequately or at all) encourage higher vehicle speeds, which in turn contributes to more severe collisions, and resultant injuries and fatalities. Streets that accommodate all modes of travel tend to be safer streets, while also encouraging physical activity and reducing air pollution.

The following sections explore the rates of collisions for pedestrians and bicyclists across the PUC, in terms of raw collision rate and also per 10,000 residents in a given neighborhood. All data for the collision mapping comes from EMS (Emergency Medical Services) calls, and thus represents all collisions that were severe enough to require an ambulance – from moderate injury up to fatality. This data thus excludes minor collisions.

This Transportation portion of the paper also touches on the prevalence of households with no personal vehicle access; bus access and frequency data; and population density near freeways.

Bike Ridership

Figure 44.1 shows the percent of commuters that ride bicycles to/from work in the PUC. Most areas show little to no bicycle commuting but key areas around UH Mānoa, Downtown, and Waikīkī have rates near or above 10%.

Bike Collisions

Figure 43 shows the number of bike collisions per 10,000 people from EMS data, 2012-2016. Neighborhoods show wide differences with the highest number of bike collisions reported in Diamond Head, Ala Moana-Kaka'ako, Wai'alae-Kāhala, and McCully-Mō'ili'ili. As shown in **Figure 44.2**, these incidents are concentrated in the area bounded by Ward Ave, University Ave, and H1 where more people are likely to bike.

Figure 43: Number of Bike Collisions Per 10,000 People

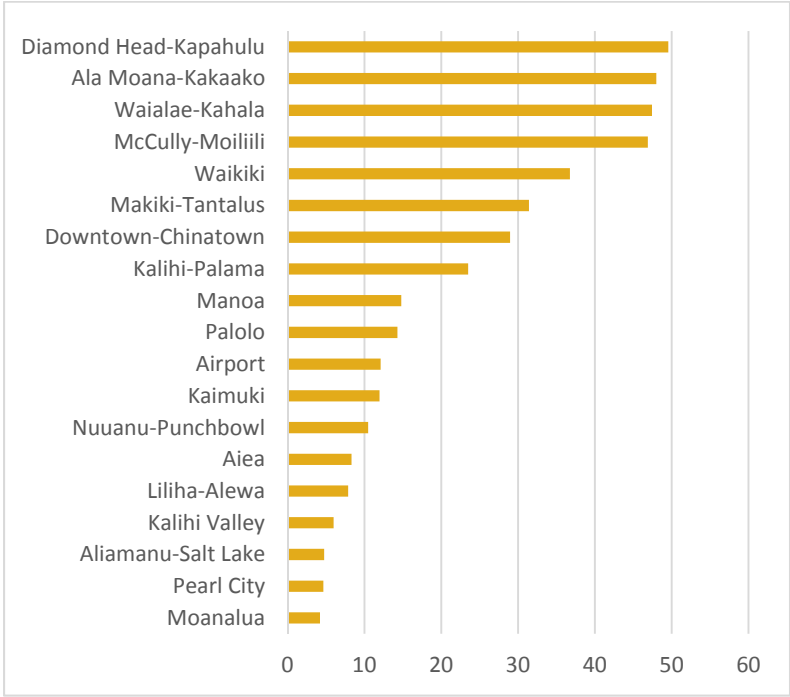


Figure 44.1: Bicycle Commuting Share (Source: ACS, 2017)

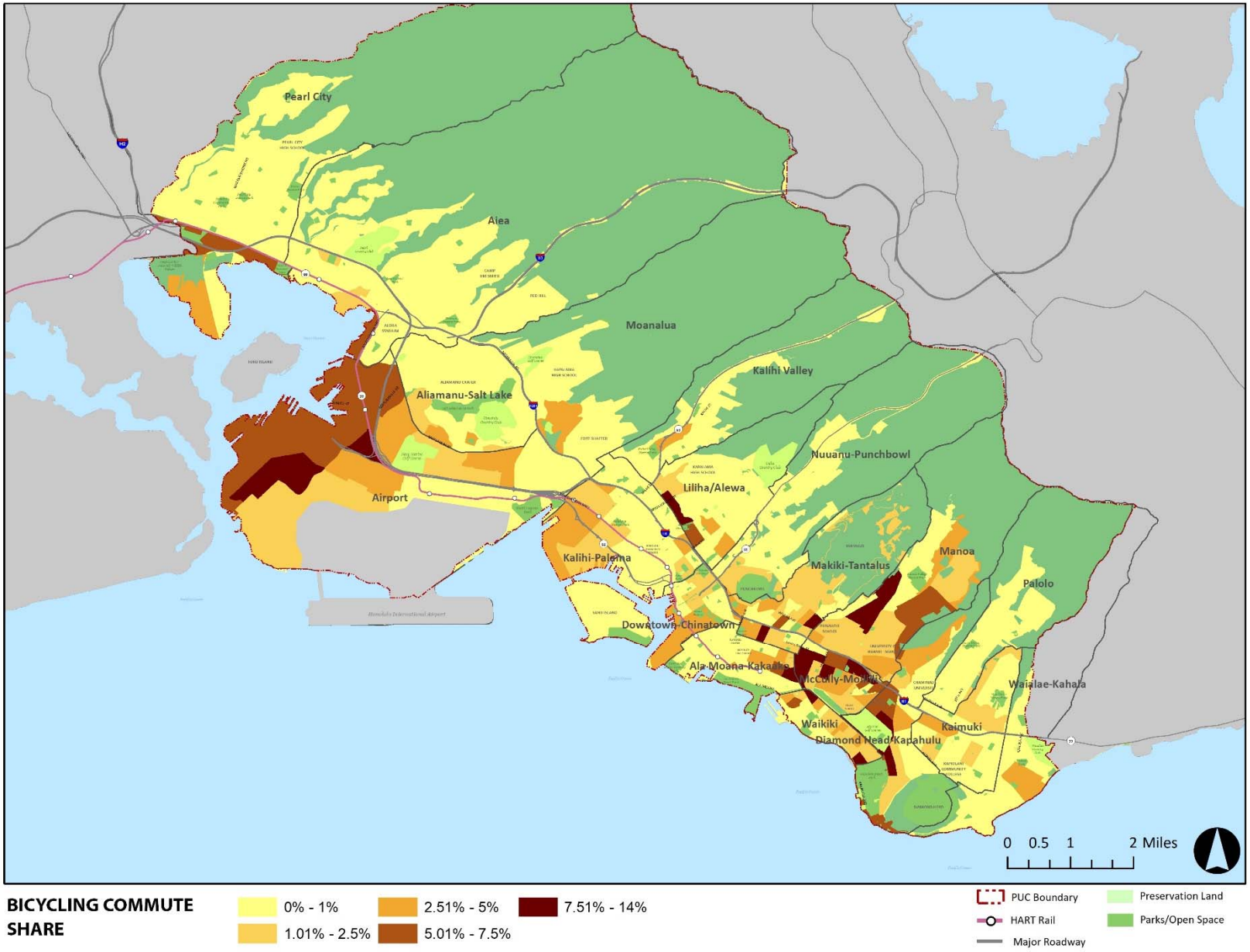


Figure 44.2: Bicycle Collisions Heat Map (Source: EMS Data 2012-2016)

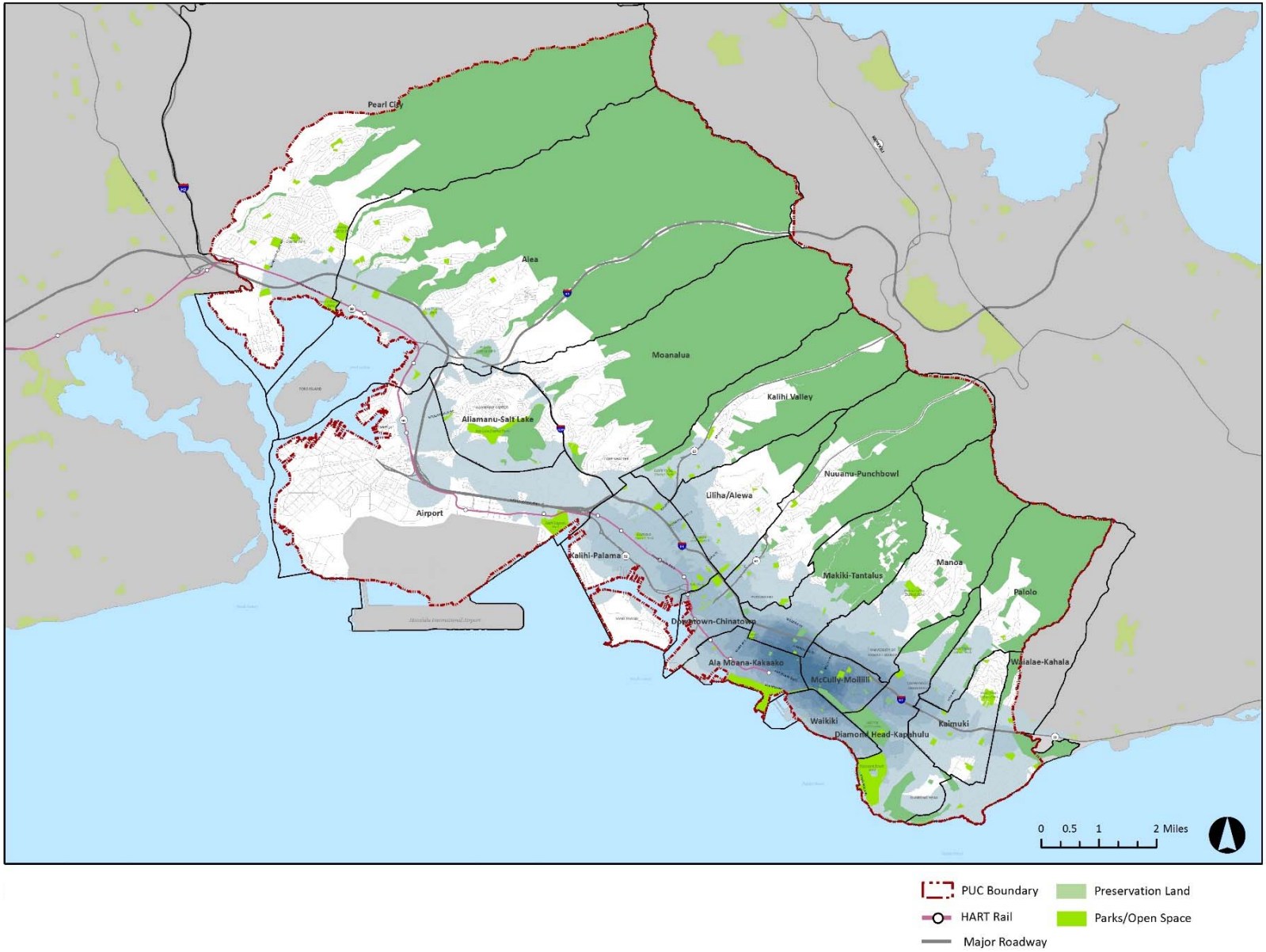
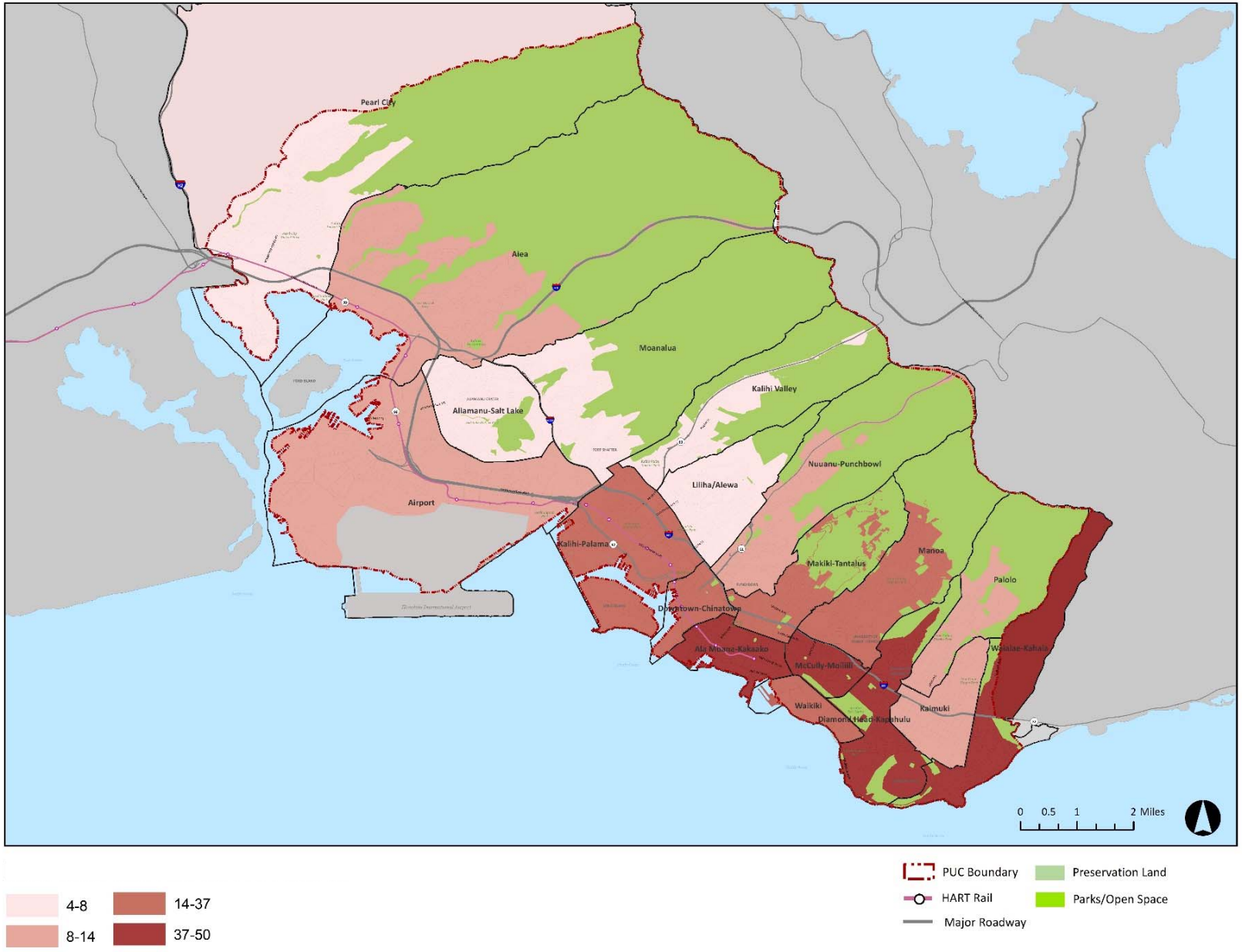


Figure 45: Bike Collisions per 10,000 (Source: EMS data 2012-2016)



Pedestrian Collisions

Figure 46 illustrates the number of pedestrian collisions per 10,000 people from EMS data, 2012-2016. The neighborhood with the highest reported number is Ala Moana-Kaka'ako, followed by Waikīkī, and Downtown-Chinatown. As shown in **Figure 47**, these crashes are concentrated where many large hotels and tourists are located, in Ala Moana where several major retail outlets are located and in Downtown which has high rates of walking. Recent trends (since 2016) have indicated worsening rates of vehicle/pedestrian collisions, especially in crosswalks and along major arterials.

Pedestrian Collisions Near Bus Stations

Figure 49 maps pedestrian collisions that occurred near a bus station in the PUC. A majority of incidents occurred in the urban core, in Downtown-Chinatown, Waikīkī, and Ala Moana-Kaka'ako.

Figure 46: Number of Pedestrian Collisions Per 10,000 People (2012-2016)

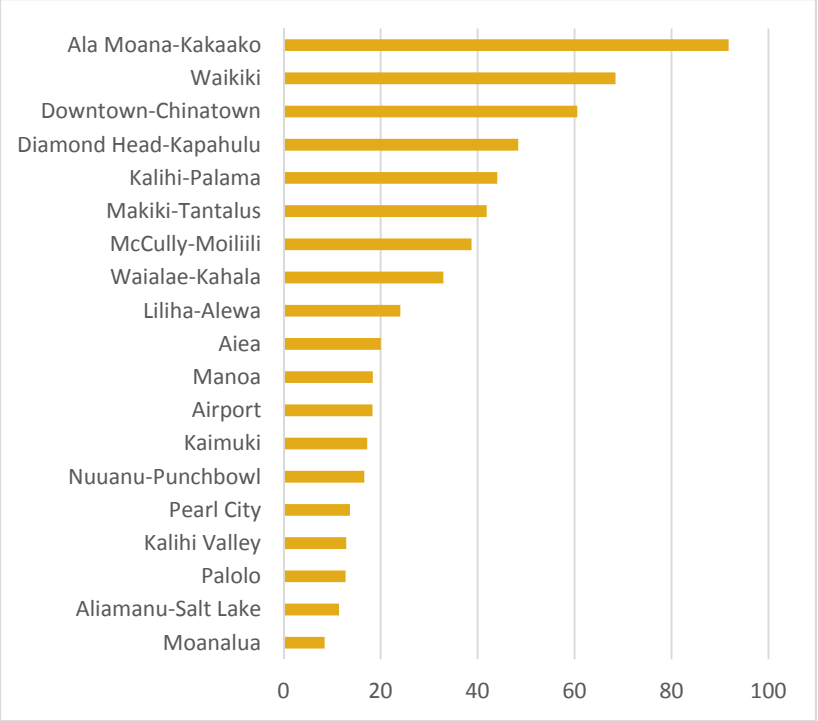


Figure 47: Total Pedestrian Collisions Heat Map (Source: EMS data 2012-2016)

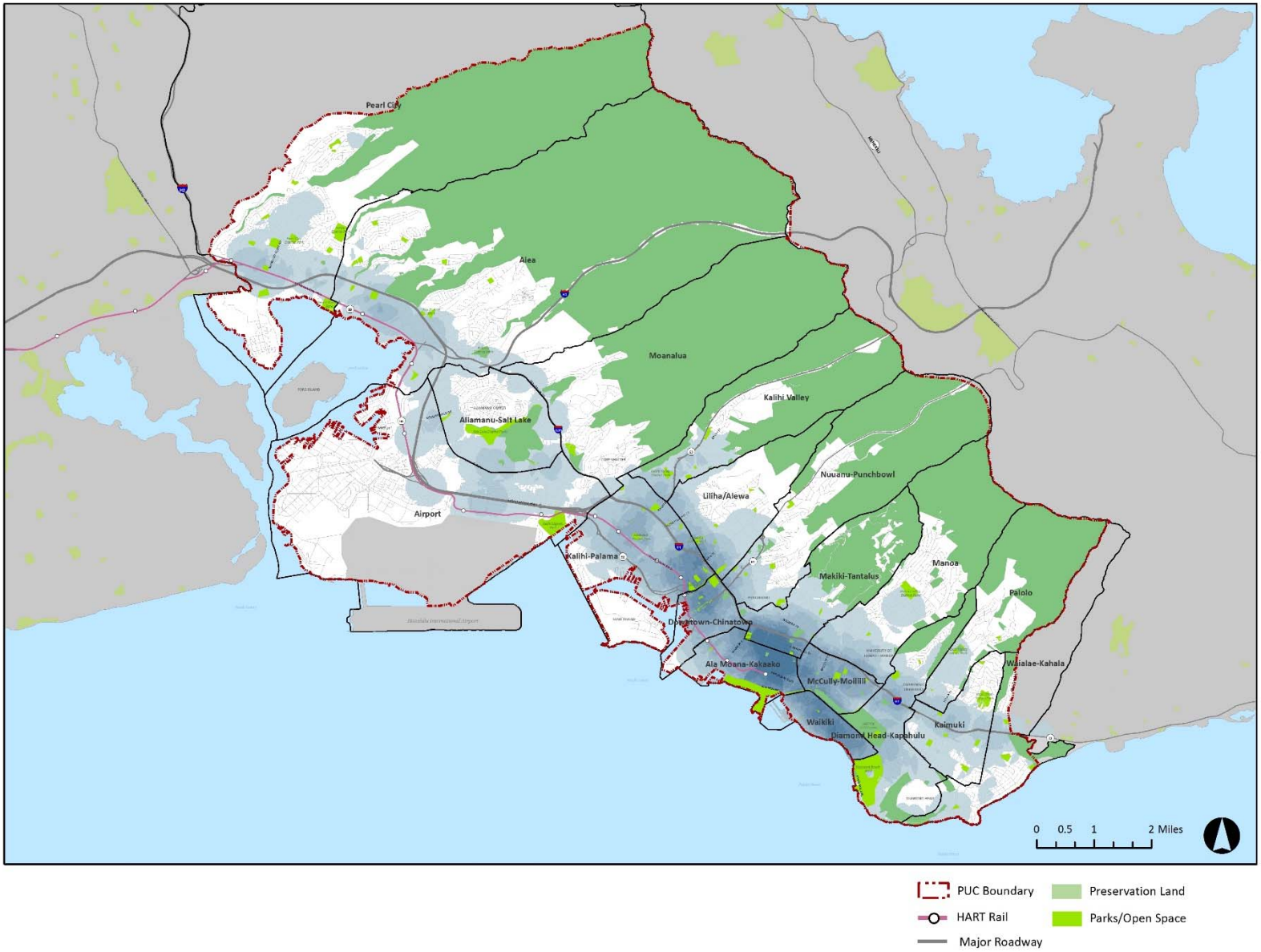


Figure 48: Pedestrian Collisions per 10,000 (Source: EMS data 2012-2016)

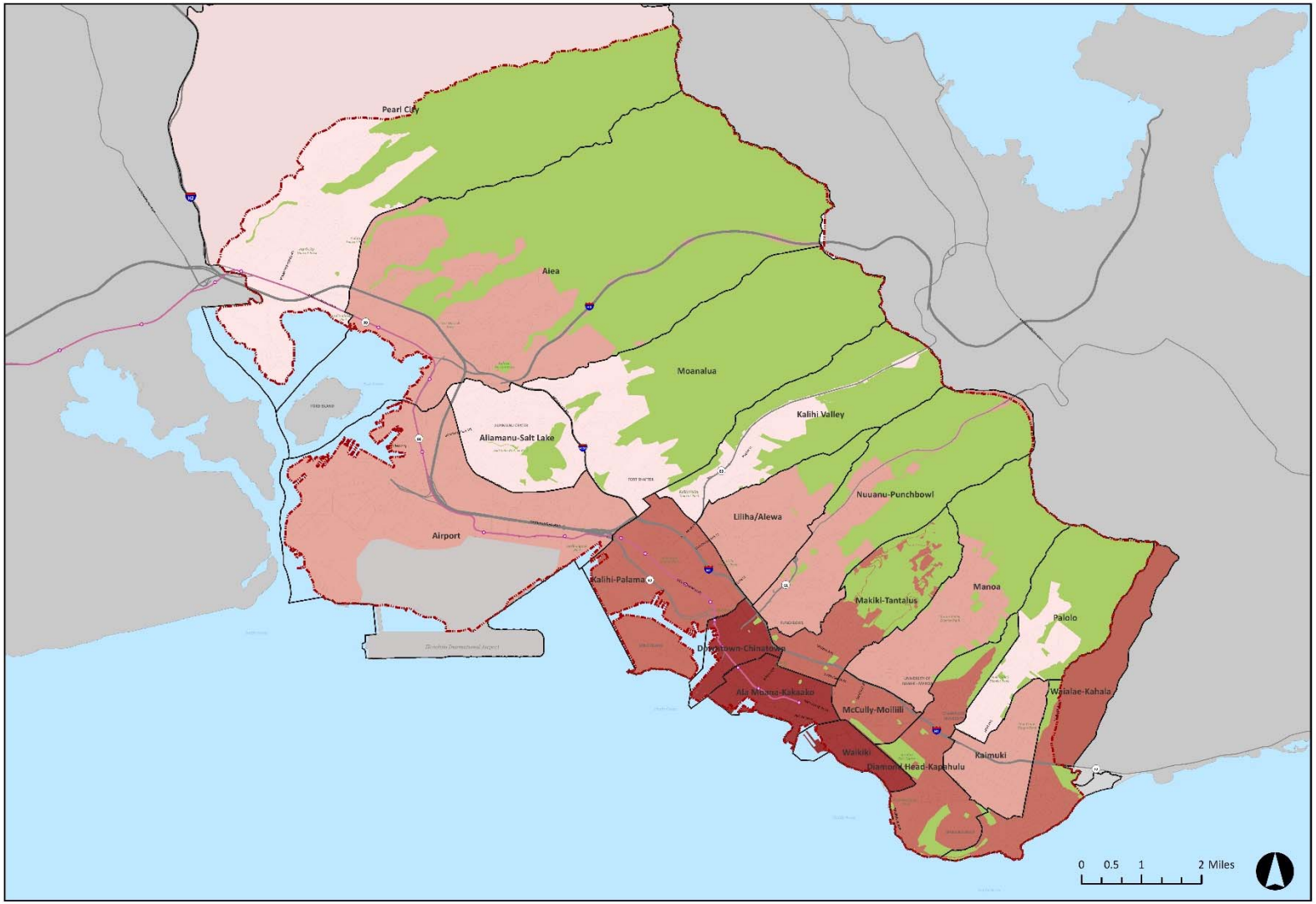
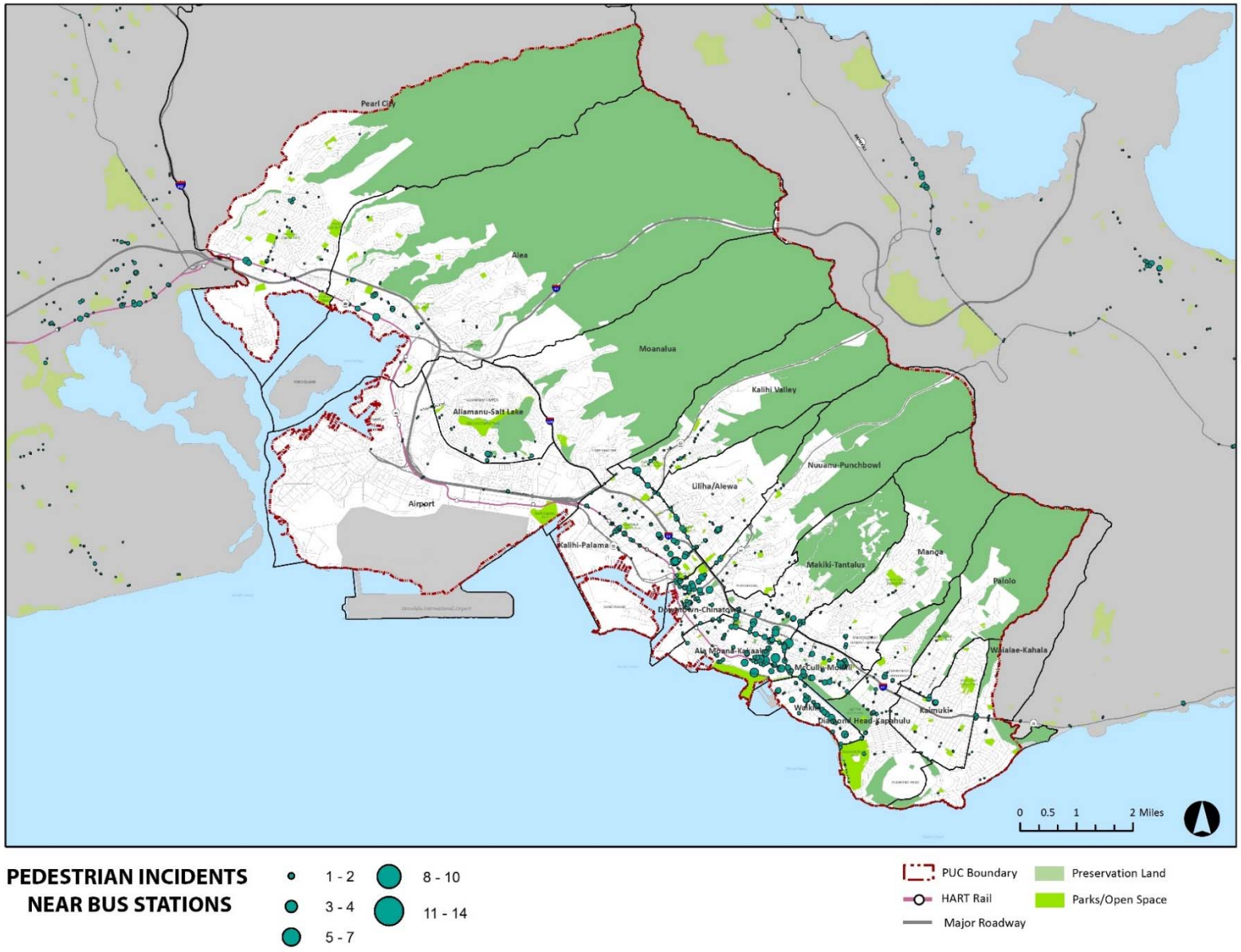


Figure 49: Pedestrian Incidents Near Bus Stations (Source: EMS data 2012-2016)



Zero Vehicle Households

"Zero-vehicle" households are those that do not own or have regular access to an automobile. Households without access to a car may have more difficulty accessing one or more regular destinations such as jobs, schools, shopping areas and medical care. This is particularly true in lower density areas since households must rely on (less frequent) public transit, walking, biking, or carpooling to reach destinations that are farther apart. **Figure 50** shows areas by census block that do not have a vehicle at home. Blocks located in the densest urban neighborhoods and flat lands had a higher percentage of households without a vehicle.

Air Pollution

Air pollution from motor vehicles is a leading cause of respiratory illnesses such as asthma. Studies have found that people living close to high volume roadways, such as freeways, suffer from higher rates of respiratory illnesses.[18] **Figure 51** maps the census blocks within 500 feet of a freeway. The map shows that more than one-fifth, or 21% of the PUC's population lives within 500 feet of a freeway, and passes through both low- and high-density neighborhoods, impacting a wide cross-section of the PUC's residents.[19]

Access to Bus Service

Figure 52 shows the frequency of TheBus service, overlaid with population density. Residents in low income and densely populated areas without adequate bus service may be limited in their means of transportation, impacting their quality of life. Conversely, major corridors with high frequency bus service may be candidates for higher density zoning, in order to maximize the beneficial relationship of transit and compact, mixed-use development. Generally, the greatest frequency of bus service is appropriately focused along corridors where population density is also highest (Kamehameha Highway, School St, King St, Wai'alae Ave, Kapi'olani Blvd, Kalākaua Ave, Wilder St, Date St, etc), indicating a sound and effective existing bus network.

Bike Share Network

As of late 2018, Honolulu's bike-share operator, Biki, has announced record ride numbers, with total rides per day exceeding 100,000. Initially launched with 100 stations and 1,000 bikes, the operator will continue to expand services (using funds from the federal Transportation Alternative Program), adding about 30 stations and 300 more bikes in 2019 in neighborhoods including Iwilei, UH-Mānoa, Makiki and Waikīkī.

[18] Health Effects Institute Panel on the Health Effects of Traffic-Related Air Pollution, *Traffic-Related Air Pollution: A Critical Review of the Literature on Emissions, Exposure, and Health Effects.* Health Effects Institute: Boston, 2010. Available at www.healtheffects.org.

[19] To learn more about the impacts of and potential mitigations for highway air pollution, visit: https://www.epa.gov/sciencematters/living-close-roadways-health-concerns-and-mitigation-strategies

Figure 50: Zero-Vehicle Households (Source: ACS, 2017)

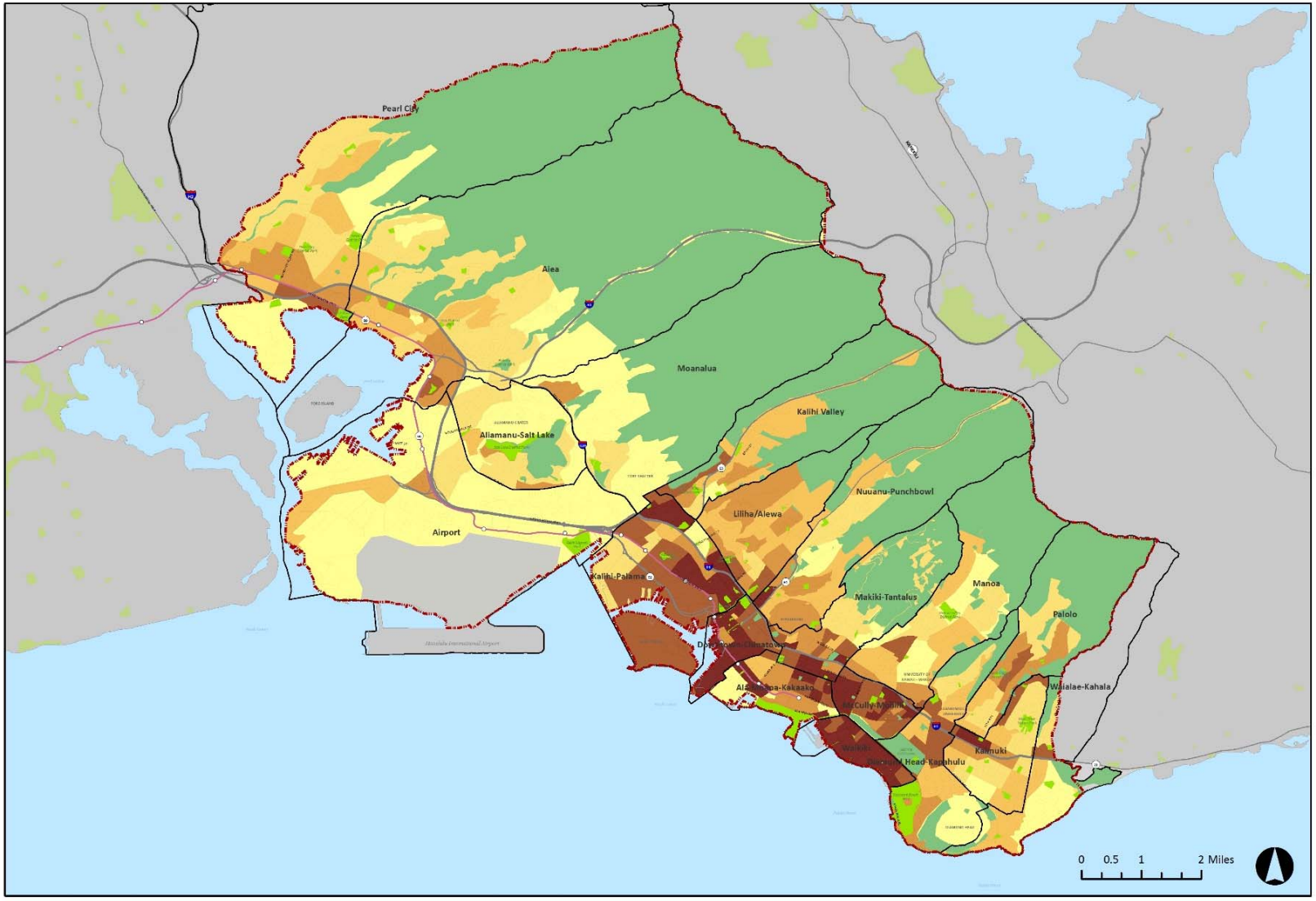


Figure 51: Population Density Near Freeways (Source: ACS, 2017)

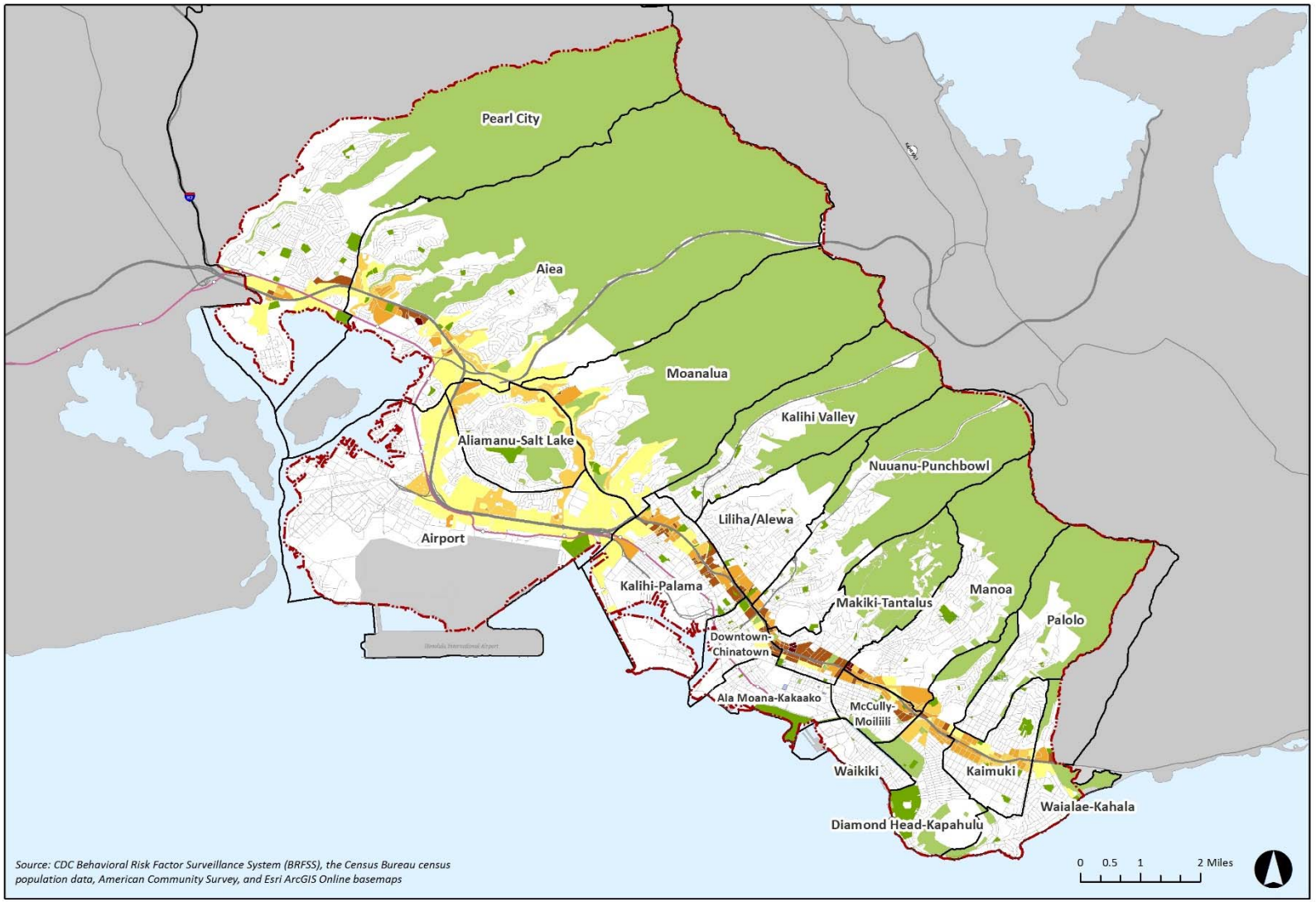
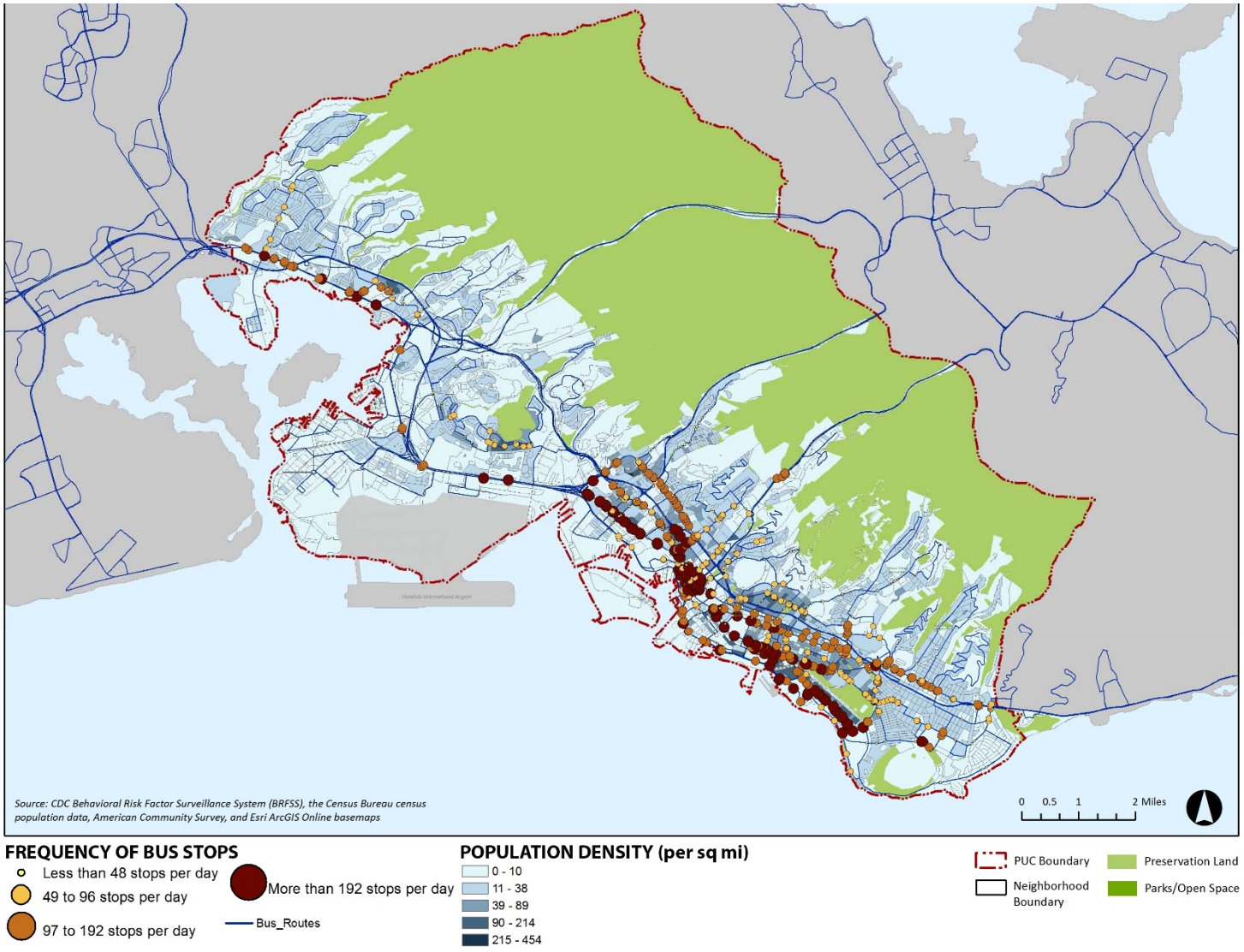


Figure 52: Bus Frequency and Population Density (Source: DTS, ACS, 2017)



Access to Health Services

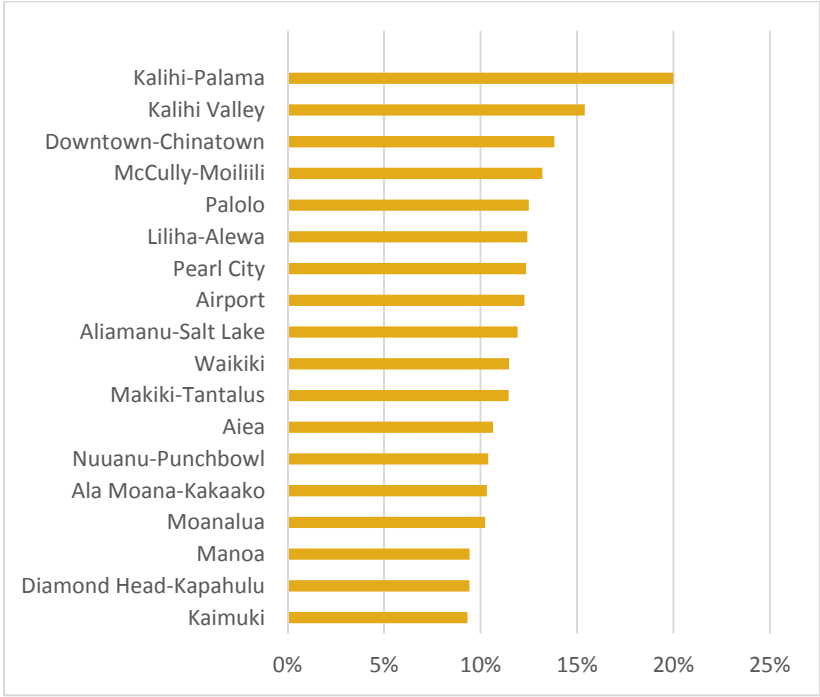
Access to health care and mental health services is an important determinant of health and disease prevention, and increasing the number of people with health insurance will very likely improve public health. Preventive measures and screenings reduce the incidence and severity of illnesses, and are often less expensive than the costs of care once someone has become sick. In other words, prevention is less expensive than treatment. People with health insurance are more likely to take steps to prevent an illness (seek preventative services) than individuals without health insurance.

The distance and access to transportation and health care facilities can influence health care utilization, particularly among the elderly, poor, and ethnic minority populations, who may have fewer mobility options. Further, the distance to hospitals in central-city areas has a significant effect on whether children and the elderly receive preventive care.

Lack of Health Insurance

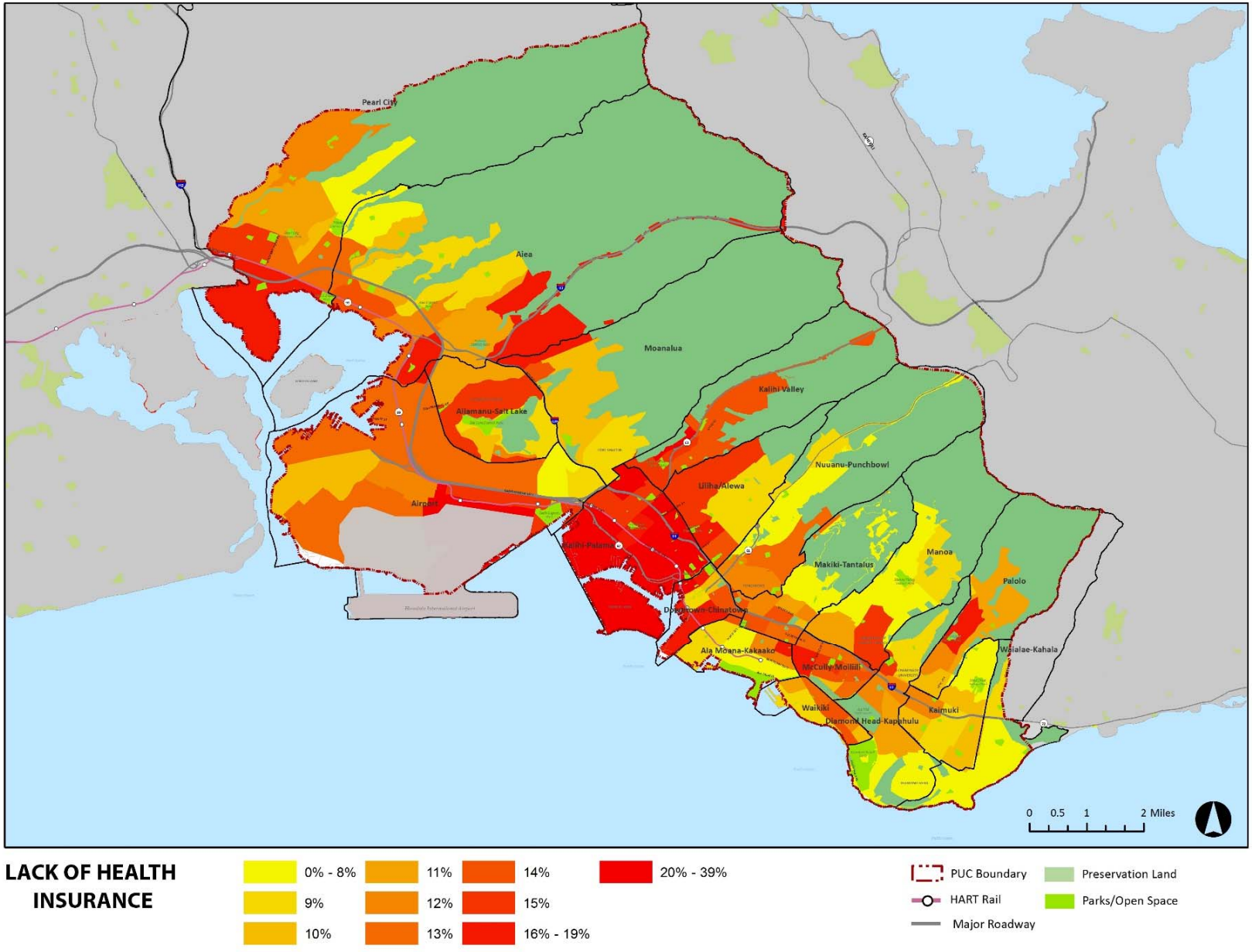
Figure 53 shows the percentage of adults between the ages of 18-64 that don't have health insurance in each neighborhood. Neighborhoods with the highest percentage include Kalihi-Pālama (20%), Kalihi Valley (15%), and Downtown-Chinatown (14%).

Figure 53: Adults (Age 18-64) without Health Insurance



Source: The Behavioral Risk Factor Surveillance System (BRFSS)

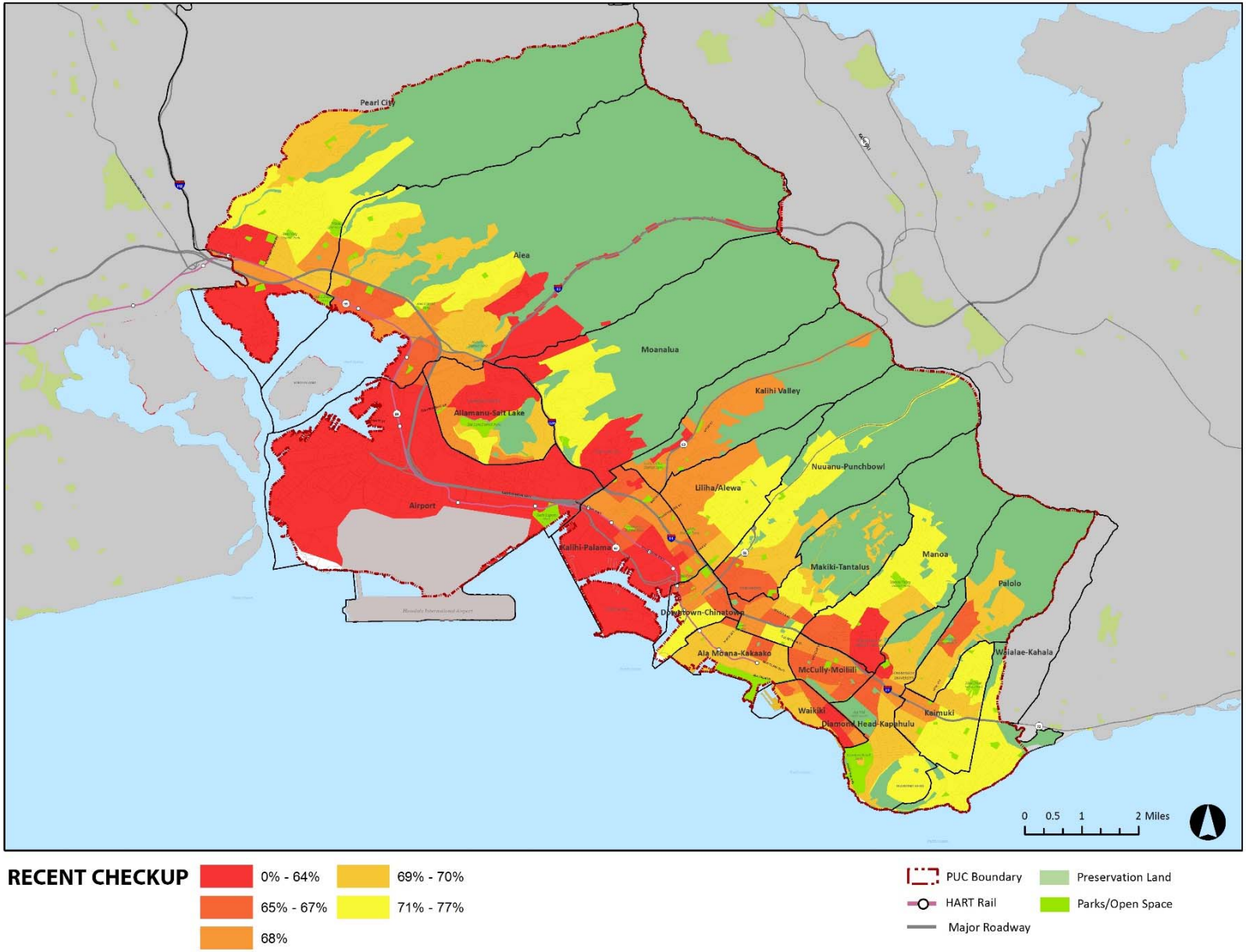
Figure 54: Adults (Age 18-64) without Health Insurance (Source: BRFSS, 2015)



Recent Checkup

Figure 56 shows the percentage of adults who have visited a doctor for a routine checkup in the past year. Neighborhoods with the lowest rates include Kalihi-Pālama and Airport. Likewise, the UH Mānoa area has lower percentages of students visiting a doctor. Those that live in the valley/ridge neighborhoods tend to visit the doctor more often. Areas with low check-up rates could benefit from more flexible zoning and attraction of uses that support neighborhood health clinics.

Figure 56: Recent Checkup (Source: BRFSS, 2015)



Housing

A home represents safety, security, shelter, family, and friends. It is often the single largest expenditure for most people. The conditions within a home, housing affordability, and the surrounding neighborhood affect the health of our residents and families. Substandard and inadequate housing can contribute to: mold and lead exposure; respiratory conditions including asthma; injuries resulting from poor construction or maintenance; and other health-related issues. A scarcity of affordable housing can limit choice about where to live, often requiring families, households, or individuals to move into inadequate or substandard housing in neighborhoods with higher crime and violence. Housing affordability also affects a household's financial stability and ability to afford health insurance and other necessities.

Housing Cost Burden

Housing affordability may lead to better health outcomes for residents. Higher rents or mortgage payments, especially for low- and moderate-income households, limits the amount that can be spent on other necessities, such as healthy food, transportation, and health care. Households with access to affordable housing are also less likely to move frequently. Residential stability, in turn, can reduce emotional and behavioral problems among children, and lower the risk of pregnancy, drug use, and depression during adolescence.[20] An adequate supply of affordable housing may also improve the health of the elderly and those with disabilities and chronic disease by creating a stable platform for health care and services. Scarce affordable housing in the city center also limits a household's choice about where they live, often forcing a move into inadequate housing or facing the prospect of commuting long distances. This contributes to problems of stress, increased levels of traffic congestion on area roadways, and increased levels of air pollution.

Housing affordability is defined as the cost of housing (rent or mortgage) relative to household income. Housing is considered affordable if it costs less than 30% of a household budget. HUD considers households that pay more than 30% of their monthly income on housing as considered cost-burdened.

Per the 2017 American Community Survey, 40% of the households in the PUC pay more than 30% of their monthly income on housing; **Figure 57** displays the proportion of households in each census block that pay more than 30% of their monthly income on housing. Most census blocks along the coast and within central PUC are cost-burdened, whereas those living in the valley and ridge neighborhoods spend less of their income on housing.

As shown in **Figure 58**, neighborhoods that are the most cost-burdened include the Airport area, Ala Moana-Kakaʻako, and McCully-Mōʻiliʻili. Conversely, neighborhoods that are least cost-burdened are Kalihi Valley, Mānoa, and Nuʻuanu-Punchbowl.

[20] Gilman, Kawachi, Fitzmaurice, Buka. Socioeconomic status, family disruption, and residential stability in childhood: Relation to onset, recurrence, and remission of major depression. Psychological Medicine. 2003; Volume 33:1341–1355.

Figure 57: Housing Cost-Burdened (Source: ACS, 2017)

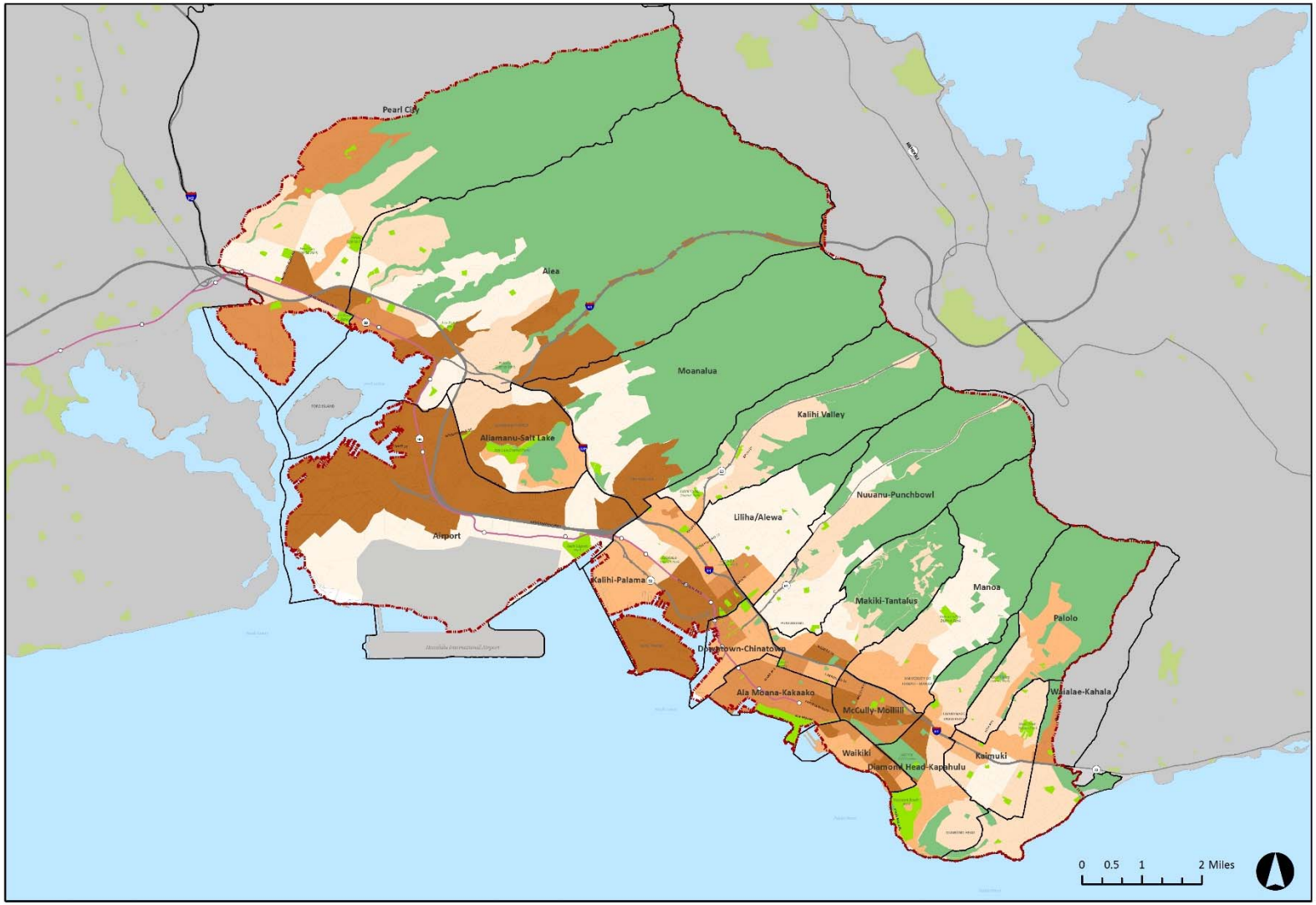
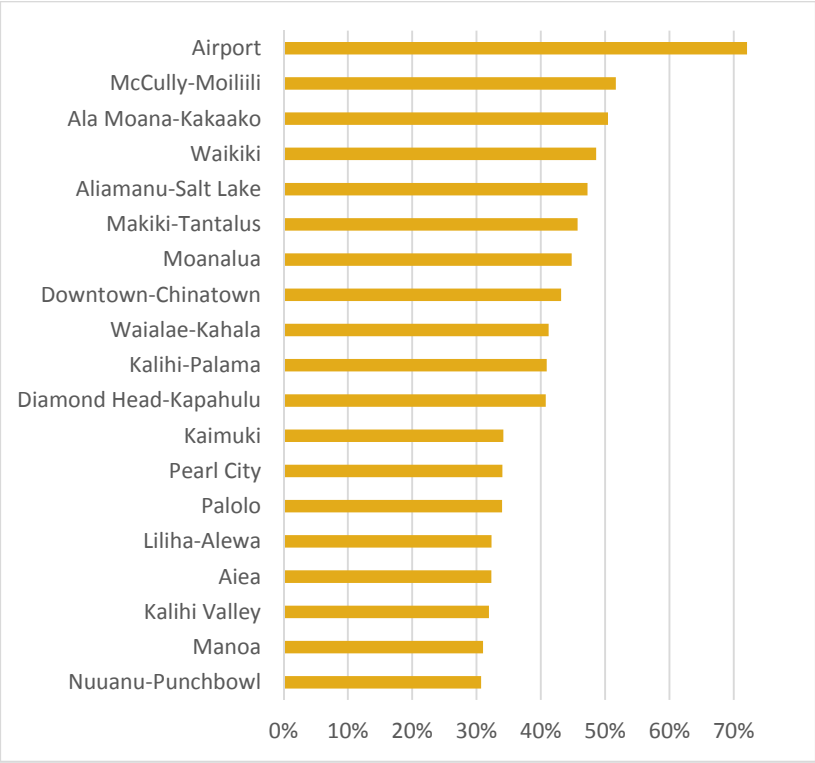


Figure 58: Cost-Burdened Households



Source: U.S. Census

Overcrowding

Overcrowded housing can directly influence a person's physical and mental health, and can affect the development and educational achievements of children.[21] Studies have found a relationship between overcrowding and respiratory health, meningitis, and tuberculosis in children. For adults, a relationship exists between overcrowding and respiratory diseases and some forms of cancer. Evidence also suggests that overcrowding is associated with mental health issues in women and racial and ethnic minorities. Overcrowding is also associated with child mistreatment and domestic violence.[22] In addition, overcrowding can increase noise, which increases overall chronic stress and decreases the amount and quality of sleep.

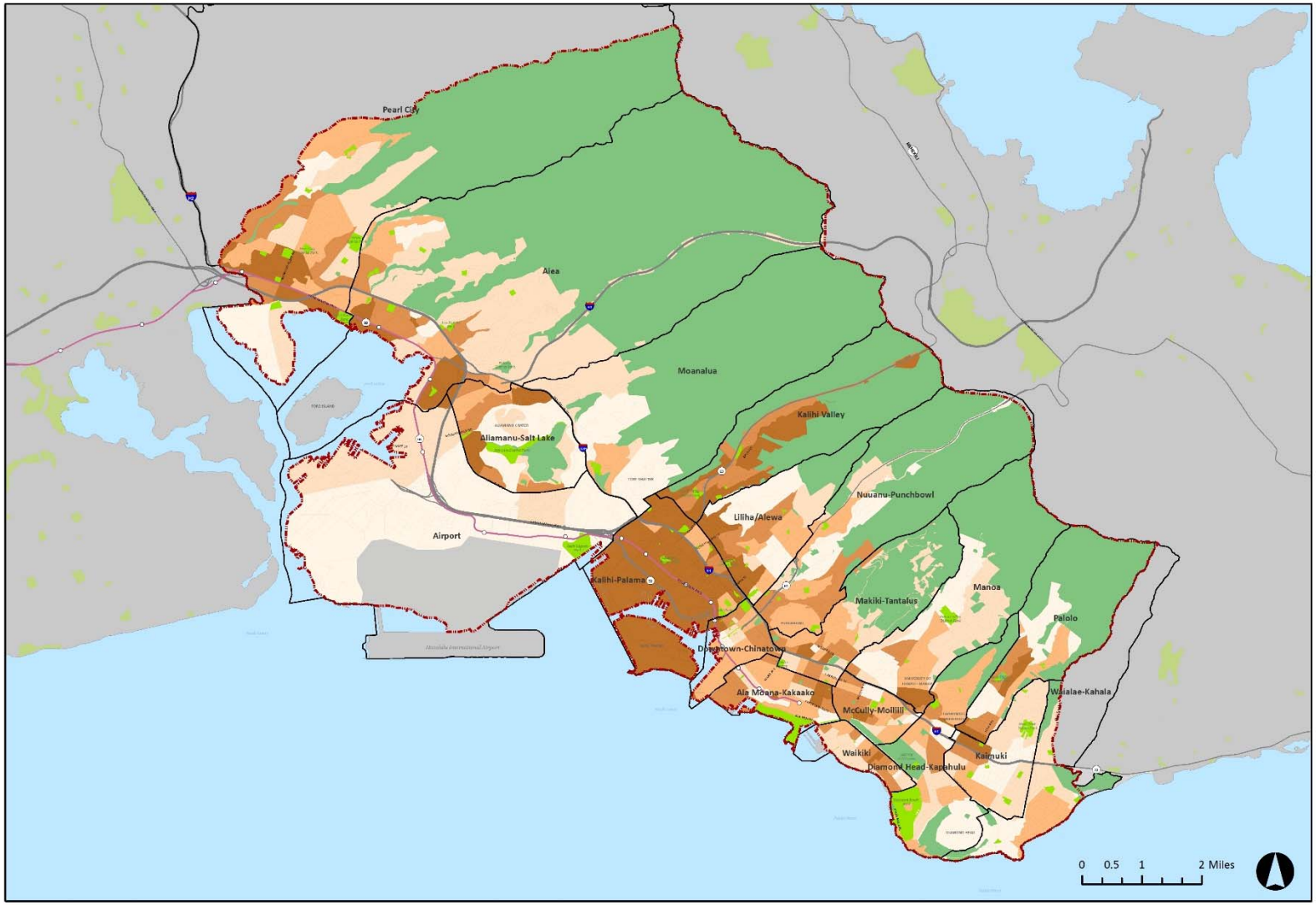
The U.S. Census Bureau defines overcrowded housing as housing with more than one person per room, including the living room in the housing unit. Having more than 1.5 persons per room is considered severe overcrowding.

The percentage of housing units with more than one person per room in the County of Honolulu is 9%. As shown in **Figure 59**, the Kalihi-Pālama neighborhood experiences some of the worst overcrowding. Other areas prone to overcrowding are located in Kalihi Valley and Liliha-ʻĀlewa, parts of Salt Lake and pockets of lower ʻAiea and Pearl City.

[21] Office of the Deputy Prime Minister. (2004) The Impact of Overcrowding on Health and Education: A Review of the Evidence and Literature. Retrieved from http://dera.ioe.ac.uk/5073/.

[22] Evans, G., and Marcynyszyn, L.A. (2004). Environmental Justice, Cumulative Environmental Risk, and Health among Low and Middle Income Children in Upstate New York. American Journal of Public Health, 94, pp. 1942 - 1944.

Figure 59: Overcrowding



4 PLANNING TOOLS FOR HEALTHY COMMUNITIES

Overview

This section identifies policy and planning tools that can be used by cities to help create healthier communities. These strategies range from citywide plans down to rating systems for individual buildings, and include regulatory tools, and project evaluation representing best practices in healthy community planning occurring across the United States. For some of the tools, case studies are provided. The tools are intended to provide ideas for decision-makers on new programs and policies that can be included in or promoted by the Primary Urban Center Development Plan and future planning efforts.

The tools discussed in this section are:

1. Comprehensive Plans
2. Zoning
3. Food Policy and Planning
4. Health Districts
5. Building and Site Design Guidelines
6. Public Works and Street Standards
7. Health-Focused Master Planning
8. "Healthy Community" Rating Systems
9. Building Codes
10. Health Impact Assessment
11. Health in All Policies

1. Comprehensive Plans

Many cities and counties in the United States maintain and regularly update a citywide comprehensive plan (or a comprehensive plan for a portion of a jurisdiction such as the PUC DP), addressing broad policy topics like land use, transportation, parks, and infrastructure. While Honolulu's General Plan is the City's guiding document that provides both the vision and policy direction that all City agencies must follow, the Development Plans (DPs) and Sustainable Communities Plans (SCPs) are the means to implement this guidance on a smaller, regional scale, and in greater detail. As such, the DPs and SCPs are ideal planning tools to promote healthy community design. The plans can have a powerful influence on health-related topics like ensuring access to parks, promoting access to healthy food, and the preservation of agricultural lands; Investing in an active and multi-modal transportation system; Creating policy for walkable neighborhoods and affordable and equitable housing; Promoting environmental sustainability, social cohesion, and support for mental and physical health programs and public safety initiatives; And the cultivation of well-designed public space, great neighborhood centers and gathering places, and providing ample recreation opportunities for residents. In addition, comprehensive area plans are often the basis for zoning, as is the case for Honolulu, providing the platform for regulations and adjustments that provide for the use, intensity, and requirements of what is allowed on each parcel.

There are three primary ways that healthy community concepts can be included in a comprehensive plan. First, the overall vision of the plan can include health and equity concepts. These can become part of the over-arching principles for the plan. Second, the plan can include a stand-alone health chapter that includes goals, objectives, policies and programs for a diversity of health-related topics. A stand-alone community health chapter is an increasingly common feature in comprehensive plans of cities across the country. Finally, each topic-specific chapter in the comprehensive plan (for example, land use, transportation, or parks) can include policies, programs, and guidelines that support positive health outcomes in a community.

During an update to a comprehensive plan, planners are in an excellent position to promote walkable built environments and create detailed plans for areas of the community where change is expected. They can also create goals and policies for well-designed public spaces, help the community understand how broadly-written policies translate into a built form, and craft parcel-specific regulations that are realized through the zoning code process.

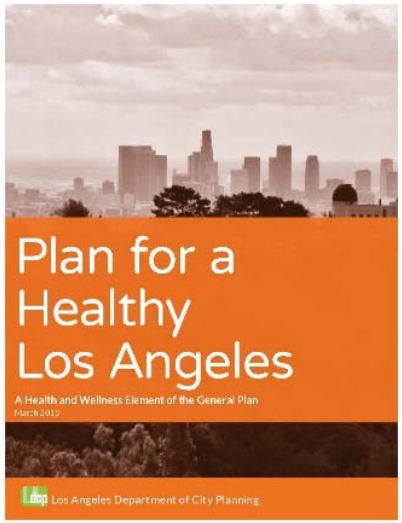
The City and County's Development Plans (DPs) and Sustainable Communities Plans (SCPs) outline regional priorities for growth and development. These plans define the region's overall growth pattern and outline transportation and infrastructure decisions that support local projects. They can also help guide the neighborhood form, design character, and quality of different places within the region.

Best Practice: Plan for a Healthy Los Angeles

In March 2015, the Los Angeles City Council unanimously adopted the Plan for a Healthy LA (www.healthyplan.la) as a chapter of its citywide comprehensive plan. The Plan includes guiding principles, objectives, policies, and an implementation program that applies a

health and social equity lens to traditional urban planning topics (such as land use, transportation, housing, parks, environment, economic development) as well as to cross-disciplinary topics (such as health and social services, education, criminal justice and safety, food, civic engagement, and cultural arts). The ground-breaking Plan establishes a health and equity basis for future policy and development decisions throughout Los Angeles.

The process included a broad assessment of health and equity concerns in the City, including a citywide "health atlas" and interactive website that provides a point-in-time snapshot of the city's socio-demographic, physical, and economic environments that contribute to health inequities within and among LA's numerous neighborhoods. The work resulted in the adoption of the Plan for a Healthy Los Angeles that contains detailed goals, policies and actions to address health, wellness and equity in the city.



2. Zoning

When a local government adopts a comprehensive plan, zoning ordinance is one of the most important legal devices used to implement the plan, and thus the vision of the community. A zoning ordinance divides a community into districts, or zones, that regulate the uses of land and buildings, the intensity of development and the bulk of buildings.

Traditionally, zoning ordinances are used to create a separation of land uses to protect property values and to shield certain land uses (such as homes) from incompatible land uses (such as industrial areas). This has resulted in a regulatory system that often prohibits the mixing of uses and intensities, relying instead on the ubiquity of freeways and auto travel to connect homes with goods, businesses, and services. Perhaps unintentionally, this has created many U.S. communities with single use areas where it is difficult to walk to shopping, schools, or work and in some cases is even difficult to serve with public transportation. In the extreme, zoning codes have been used to prohibit certain activities – such as gardens – because of aesthetic reasons. While there is legitimate need for zoning for health and safety, protection of resources, and general community planning purposes, zoning codes that are *too* highly restrictive can limit the design flexibility needed to create beautiful and enduring buildings and memorable civic spaces. These and other factors make examining the zoning code an important tool for enabling healthy community design and allowing activities (and uses) that promote healthy lifestyles.

To this end, there are a number of zoning strategies that jurisdictions have used to create healthier and more active communities. These include, but are not limited to, the following:

- **Zoning for transit-oriented development.** Compact, mixed-use development is strongly desired near high-frequency transit service since it encourages transit ridership and maximizes public investment in transit. To achieve this end,

some communities have developed transit-oriented development zoning. These zoning districts allow for higher density and mixed use development (often with retail on the ground floor and office or residential above) within walking distance of transit. Besides boosting public transit ridership, TOD development creates the conditions for walkable and bikeable neighborhoods, encouraging residents to leave the car behind for more trips.

Honolulu's IPDT and PDT permits. The Interim Planned Development – Transit (IPD-T) and Planned Development-Transit (PDT) permits corresponding to Honolulu's TOD District is a good example of zoning that responds to environmental, health, and transportation imperatives, rewarding the development of mixed-use projects and the provision of new infrastructure or community benefits with density and height bonuses.

- **Form-based codes.** Unlike traditional use-based zoning, form-based codes focus less on use and numeric values of intensity and more on the overall form and character of a community. While use is still regulated, more emphasis is placed on the building type, the frontage character, and the relationship between buildings to create vibrant public spaces. Like TOD planning, form-based code tends to prioritize a lively, walkable, street environment.
- **Active transportation and multi-modal streets.** While the focus of zoning codes are traditionally on land use and design, some codes or other regulations include specification that street design is not only for cars, but that it must also ensure that streets are safe for walking and biking. This can occur through requirements for sidewalks, bike lanes, street trees, crosswalks and pedestrian amenities, such as benches and drinking fountains.

Honolulu's Complete Streets Ordinance. Pursuant to adopting a Complete Streets Ordinance, the Honolulu's Complete Streets Design Manual was finalized in 2016. It sets forth specific standards to Honolulu planners, designers, developers, and City employees to guide the design of roads with Complete Street principles. It supplements the current Traffic Standards Manual, last updated in 1976, by implementing modern best practices in roadway design. The Honolulu Complete Streets Design Manual presents multimodal solutions designed to accommodate pedestrians, bicyclists, drivers, and public transit users.

- **Regulations on certain uses and mix of uses.** The regulation of use types is one of the bedrocks of a zoning code. Codes can be modified to encourage certain desirable uses such as affordable housing, supermarkets and community gardens through incentives such as density bonuses, streamlined development review and reduced fees. Some communities use zoning codes to prohibit undesirable uses or uses that are highly concentrated in a neighborhood – such as liquor stores and fast food restaurants.
- **Gardening and urban agriculture**. Surprisingly, many zoning codes and homeowner/condo association bylaws prohibit individuals from gardening on their property and do not allow community gardens in neighborhoods. There are many

examples of communities that have reviewed and modified their zoning to allow for growing fruits and vegetables, to allow a limited number of farm animals such as backyard chickens, and to allow for a wider range of urban agricultural activities in and around residential areas.

- **Protection from noxious uses.** Zoning can be used to separate residential and other "sensitive" uses from harmful pollution. Examples include requiring buffers between polluting industrial or agricultural and residential uses and requiring mandatory setbacks between freeways and other sources of air pollution and residential uses.

Best Practice: Healthy Zoning Requirements, Minneapolis/St. Paul, MN

The Minneapolis zoning code currently incentivizes green and healthy building strategies through its amenity requirements for planned unit developments. It promotes healthy, active living by awarding amenity points to development projects that offer gardens or on-site food production, shared bicycle programs, and site planning that preserves significant natural open space or ecological features.

3. Food Policy and Planning

Food is among the most basic human needs but is often neglected in comprehensive, strategic, and site planning because it is tempting to think that food policy has little overlap with urban land use planning. However, in the context of regional food systems, the risks to food supplies from climate change, the limited availability of land and water, fossil fuel price fluctuations, and the risks to population health from malnutrition or increasing rates of obesity and other diet related diseases, the community food system is an increasingly critical environmental health and even design issue.

The design and layout of our cities and towns can have a major effect on what foods people can readily access. For many people, eating a healthy diet may be difficult because healthy food options are not readily available, easily accessible, or affordable in their communities. Often called "food deserts", communities without full service grocery stores are usually served instead by numerous fast-food restaurants and/or convenience and liquor stores. Several studies have found that low-income communities frequently have limited access to stores that sell healthy food, especially high-quality fruits and vegetables. Such disparities in access and availability raise equity, social justice, and community health issues that need to be addressed when agencies are planning and designing with the goal of improvement in overall community health in mind. Easy access to healthy food choices where people live, work, and play is important to achieving and maintaining health and wellbeing.

There are a number of tools that communities are using to promote healthy food access. These include:

- Developing a citywide "food action plan;"
- Removing barriers in the zoning code and building code to local food production such as farmers markets
- Expanding or establishing programs such as community gardens, urban agriculture, and rooftop gardens;
- Using economic development tools and levers to bring full-service markets and other healthy food sources to "food deserts;"

- Prohibitions on unhealthy food sources (for example, in-school vending machines); and
- Incentives for liquor stores and corner stores to carry healthy food options such as the States' Choose Healthy Now Program.

Best Practice: Seattle's Food Action Plan, Seattle, WA

http://www.seattle.gov/environment/food

Seattle's Food Action Plan is a five-year plan adopted in 2013 by the mayor and city council to get more healthy food to more Seattle residents, expand opportunities to grow food in the City, strengthen the regional food economy, and reduce food-related waste. It makes locally grown food available to schools and unused city land available for farming. It calls for incorporating food system planning into the City's ongoing planning and programmatic activities like comprehensive planning and neighborhood planning. Coordination and monitoring of plan implementation is led by the City's Office of Sustainability and Environment.

4. Health Districts

There is a growing recognition that investing in disease prevention, support for healthy behaviors, and economic opportunity has a stronger benefit for public health than additional spending on health care services. These social, economic, and behavioral determinants of health are a strong predictor of overall health. At the same time, medical campuses, hospitals, clinics, and other health care facilities can play an important role in this holistic approach to community health.

Health districts are an emerging concept to promote synergies between health care facilities and their surrounding communities. They aim to support community health and equity through a health facility's programming, partnerships, physical design, and integration with the neighborhood. While many hospital projects of the past fifty years have tended to be insular and inward-focused in their design and provision of services, facilities in a Health District seek to cater to the needs of the surrounding community. This can mean pedestrian-scaled architecture and urban design, as well as neighborhood-accessible services and facility spaces. It can also mean making physical improvements to the streetscape, parks, transportation system, food environment, or public space in the surrounding neighborhood. Many medical campuses create demand for ancillary uses like restaurants, office space, other medical facilities, and even housing. The recruitment and planning for these uses can explicitly seek to serve the needs of the existing neighborhood as well as the health care facility.

Administratively, a Health District can be formally established through a variety of planning mechanisms – including a facility master plan, an overlay zone, an area plan, and/or a community services plan – depending on the needs, partners, and precedents in a local community. The most successful health districts arise from a close partnership between a local government, a cluster of health service providers, and the surrounding neighborhood, as well as partners such as public health agencies, schools, employers and local businesses, and local non-profits or service providers. It is essential to design health care facilities that physically and socially address the needs of the surrounding neighborhood and the population served by the facility.

Best Practice: Vita Health and Wellness District, Stamford, CT www.vitastamford.com

The Vita Health and Wellness District (Stamford, Connecticut) was founded in 2010 to improve the health of the West Side neighborhood surrounding Stamford Hospital. The Westside has historically suffered from a disproportionately high share of chronic diseases and poor health outcomes compared to the rest of the City. The Vita Health and Wellness District Strategic Plan and the 2013 Community Health Needs Assessment guide efforts in the neighborhood, with a focus on reducing health disparities that result from the "social determinants of health" (the conditions in which people are born, grow, live, work, and age). The Vita Health and Wellness District is a collaboration between Stamford Hospital, the City of Stamford Department of Health and Social Services, and nearly a dozen other partners and agencies aligned under the Stamford Community Collaborative.

There are a number of implementation efforts associated with the Health and Wellness District. Fairgate Farm, founded in 2011, is an all-organic, all volunteer community farm next to Stamford Hospital. Food grown at the farm goes to health care facilities, neighbors, workers, and patients in the Health District. The Stamford Community Collaborative has also been instrumental in developing the new Greenfield affordable housing community, in coordination with Stamford's public housing authority.

In a related effort, the City established a new Village Commercial District Zoning along the Vita District's main corridor, to attract new businesses and services for neighbors, patients, and health care workers alike. In addition, the new, walk-in Fairgate Community Health Center provides physical exams, vaccinations, and other low-cost services to residents, and there is now a free Health Center-sponsored clinic bus that visits two West Side locations every week. All of these efforts have set the stage for the 2016 opening of the new Stamford Hospital, and its evolving identity as a resource for the entire community.

5. Building and Site Design Guidelines

Design guidelines are a tool well-known to most architects and designers. They provide a way for city governments or other entities to suggest, encourage, and sometimes require certain design approaches in different contexts – building rehabilitations in historic districts, streetscape design in pedestrian districts, or home additions in single-family neighborhoods, to name a few. However, design guidelines can also be a powerful tool for promoting physical activity and health through the design of buildings, streets, and public space.

Many design guidelines focus on building architecture and design. In a health context this can include indoor strategies such as usable staircases, accessible bicycle storage, or ventilation and building materials to ensure high indoor air quality. It can also include strategies to activate the exterior of the building for pedestrians and integrate with nearby parks and public space. In addition to more conventional topics like building massing, architectural character, and signage, design guidelines can integrate health-supportive strategies such as incentivizing a healthy food environment, integrating green space, creating public gathering spaces, encouraging pedestrian-oriented design, and ensuring universal design and equitable access.

Best Practice: Active Design Guidelines (New York, NY)

www.centerforactivedesign.org/dl/guidelines.pdf

New York City's Active Design Guidelines, adopted in 2010, provides architects and urban designers with a manual of strategies for creating healthier buildings, streets, and urban spaces, based on the latest academic research and best practices in the field. The tool was developed through a partnership with the New York City Departments of Design and Construction, Health and Mental Hygiene, Transportation, City Planning, and Office of Management and Budget. The Active Design Guidelines are a voluntary benchmark for healthy design in four areas: active transportation, active buildings, active recreation, and food access. Since adoption, the design guidelines have been amended to address safety, affordable housing, and sidewalk experience.

Oakland Healthy Development Guidelines (Oakland, CA)

The Oakland Healthy Development Guidelines is an innovative, collaborative community planning effort that created citywide developments standards and incentives that promote health and equity. The Healthy Development Guidelines provide development standards, guidelines, and incentives for a broad array of topics including housing, economic opportunity, culture and community, food, transportation, open space and recreation, environmental health, and safety.

The Healthy Development Guidelines are implemented through a variety of mechanisms. In some cases, they will be adopted as new standards or guidelines or adjustments to the zoning code. In other cases, proposed standards were already addressed through efforts such as existing open space or recreation requirements, or through the City's housing nexus fee, so the Healthy Development Guidelines provide support to continue and expand those policies.

6. Public Works and Street Standards

Planners and designers are uniquely positioned to influence the design of our city's outdoor "public rooms" in a positive way. They can bring a more nuanced understanding of physical space, human-centered design, and aesthetics to a realm that has often, in recent memory, been dominated by engineering concerns and the desire to move high volumes of cars as quickly as possible.

Some of the great legacy city plans and public spaces in the world are the result of work by designers and urbanists – Pierre L'Enfant, Antonio Gaudí, Frederick Law Olmstead, Jože Plečnik, and Jan Gehl, to name a few. In a contemporary context, there is a great opportunity to reclaim the important role good public space design can have in a city. Since the public right-of-way is usually owned and maintained by the local jurisdiction, this means influencing and improving the design standards used by the jurisdiction's public works department. Public works standards can address larger community design concepts such as:

- Street design to encourage active transportation
- Safe routes to schools to encourage children to walk or bike to school
- Streetscape, landscape design
- Public space design to encourage pedestrian activity and social interaction
- Green streets and green infrastructure

- Design and provision of recreational facilities
- Community orchards and growing spaces
- Multi-modal transportation network and connections
- Street design and right-of-way standards

In most cities, street design standards are particularly ripe for re-imagining with a designer's lens. Many are still driven by traffic engineering imperatives such as automobile level of service, which can actively work against efforts to promote active tranpsortation through walking and bicycling.

Street Design in Honolulu

Honolulu DTS (Department of Transportation Services) is working to introduce concepts such as multi-modal streets, pedestrian- and bicycle-priority streets, and traffic calming into the city's street standards. Transforming the transportation system in this way can encourage daily physical activity and improve the safety of all street users.

An investment in beautiful, active public space is also an investment in social equity, providing spaces that all members of society – rich or poor, young or old – can enjoy equally.

Best Practice: Portland Bureau of Transportation, Street and Public Realm Standards (Portland, OR)

Portland has long been a national leader in street design to promote bicycling, walking, and transit. Its Bureau of Transportation integrates a number of public realm standards and guidelines into its regular maintenance of the public street and right-of-way network. This includes Guidelines for Creating Public Streets and Pedestrian Connections, Pedestrian Design Guidelines, and a Design Guide for Public Street Improvements, all available here. Many of these concepts, in turn, are reflected in its paving and striping plans, Sidewalk Repair Manual, and engineering standards for new and existing streets. Portland, in particular, is a leader in incorporating on-street bicycle facilities into its road network, and maintains engineering and design standards for doing this as part of the street design process.

The Bureau also maintains an Active Transportation Division and staff. Its goal is to implement standards and infrastructure improvements that make it easy for a majority of Portlanders to walk, bike and ride transit to work, thereby increasing fitness, saving money, reducing traffic congestion, and helping maintain a livable environment.

7. Health-Focused Master Planning

Master plans for a large development (or redevelopment) effort are a common tool used in Hawai'i. They can also be used to promote health and equity. As with comprehensive plans and other planning tools, health can be integrated into the master planning process at a variety of scales and for a number of topics, from land use, transportation, and open space to urban design, architecture, and building programming. Establishing resident and community health as a project goal at the beginning of the process can help frame a project's overall development program. It can also establish a cross-cutting design imperative for a project, creating a criteria for project success that can be shared by all involved.

Like Health Districts, discussed previously, master plans provide the opportunity to promote health in the entire community, not just the private areas within the site. Providing accessible public space is an excellent way to do this. This can mean including bicycle and pedestrian facilities, new parks and public spaces, restored natural areas and open space, or recreation facilities. It can also mean attracting specific tenants – such as grocery stores, clinics, community rooms, or affordable housing – to meet community health and equity needs that the project team has identified. Within the site itself, the master planning team can support resident health with everything from building design and construction techniques to healthy tenant programming and education. As a simple adaptation of an existing tool, health-focused master planning is a flexible, powerful way to promote health and equity in large development projects.

Best Practice: Mariposa Redevelopment Master Plan and Healthy Living Initiative Toolkit, Denver, CO

http://mithun.com/special/Mariposa_Healthy_Living_Initiative/http:/#ixzz2rip080Qq

The Mariposa Redevelopment Master Plan and Healthy Living Initiative is a ground-breaking effort to deeply integrate physical, mental, and community health into the redevelopment of a large public housing project in Denver, Colorado. A master planning design team conducted a health impact assessment, established baseline metrics, and tailored the existing Healthy Development Measurement Tool to help designers, developers, and other practitioners address community wellbeing in a comprehensive manner. The resulting Mariposa Redevelopment Master Plan guides an equitable, health- and transit-oriented redevelopment project for 270 existing public housing units. The redevelopment of this 17.5-acre site is adding a mix of uses and nearly tripling the existing density, with 900 new mixed-income homes (1/3 public, 1/3 workforce, 1/3 market rate). It provides a replicable model for documenting the existing health of a community and evaluating the potential effects of proposed development.

8. "Healthy Community" Rating Systems

Most rating systems for "green" building also have a significant overlap with human health and well-being, and health improvement has long been recognized as one of their most profound benefits. In the past decade, there has been a proliferation of green rating systems for buildings, neighborhoods, and community design, and most have recognized human health as one of their goals, in addition to sustainability. Some, like the Well Building Standard, are specifically intended to promote healthy building and development. Others, like LEED for Neighborhood Development, maintain an environmental sustainability focus but also rely on health analysis to select and weight rating system standards, incorporating health and equity language into the goals and requirements of the program.

Cities, institutions, companies, and developers can use rating systems to promote community health and well-being in their various community development activities. This can happen in individual building projects, but is even more powerful when adopted across an entire portfolio, campus, or city. Some of the most common and innovative rating systems that can be used to promote health are as follows:

- LEED Building Rating Systems. LEED (Leadership in Energy and Environmental Design) is a family of rating systems maintained by the U.S. Green Building Council, and the most widely used green building certification system in the world. LEED provides standards in the areas of energy, water, sustainable sites, location and transportation, materials and resources, and indoor environmental quality. Many of these strategies can promote health, particularly indoor air quality, natural lighting, active transportation, and the use of non-toxic building materials.
- LEED for Neighborhood Development (LEED ND). LEED for Neighborhood Development is the LEED standard for green neighborhood development. It is designed for multi-building projects, including streets, public space, and infrastructure. LEED-ND rewards project in a walkable, infill location, particularly those with access to transit, pedestrian-oriented urban design, green infrastructure, high-performing green buildings, and diverse and affordable housing.
- Well Building Standard. The Well Building Standard is one of the first building standards in the world to focus exclusively on human health and wellness. It combines best practices in architecture and design with evidence-based medical and scientific research to promote seven concepts: air, water, nourishment, light, fitness, comfort, and mind. Like LEED, the Well Building Standard provides additional levels of certification for higher performance in its various topic areas. In addition, the Well Building standard is being developed for the community scale with the Well Community Standard.
- Living Building Challenge. The Living Building Challenges is a building certification program and advocacy tool aimed at promoting the most advanced sustainability performance currently possible. While LEED aims to "transform the market," to improve everyday building, Living Building Challenge seeks to push the boundaries and expand the notion of what is possible in green building. Its seven areas of focus have strong overlaps with health and equity, and include: Place, Water, Energy, Health and Happiness, Materials, Equity, and Beauty.
- Living Community Challenge. Based on the ideals of the Living Building Challenge, this aggressive standard requires regenerative, "deep green" strategies at the community scale, in the topic areas of water, energy, materials, health and equity, and happiness and beauty.
- EcoDistricts. EcoDistricts is a program and tool for forming, assessing, implementing, and managing neighborhood-scale sustainability. Like many sustainability tools, it has strong overlap with healthy community concerns, and promotes efforts in the following "Performance Areas": Equitable Development, Health and Wellbeing, Community Identity, Access and Mobility, Energy, Water, Habitat and Ecosystem Function, and Materials Management.

Best Practice: LEED Building Policy, Minneapolis, MN

In 2006, the City of Minneapolis began requiring LEED (Leadership in Energy and Environmental Design) standards in the planning design, construction and commissioning of all municipal facilities. Like many other U.S. cities that have done the same, this requirement ensures sustainable, healthy buildings across the entire municipal portfolio,

while setting a leadership standard that can be replicated by other institutions, companies, and private developers in the City.

9. Building Codes

Building codes establish a building's quality, safety and energy performance for years to come, because initial design and construction decisions determine operational and maintenance costs for the life of the building. Building codes (and design and construction decisions) affect us every day. Some requirements such as fire safety codes and structural and seismic standards protect us in obvious ways. Others, such as lighting quality, acoustics and indoor air quality can also have major effects on our health and productivity.

According to the US Environmental Protection Agency, most people spend up to 90 percent of each day inside of buildings. Thus, buildings can have a profound effect on an individual's health. This includes health-related topics of indoor air quality, options for physical activity, access to natural light, and energy efficiency. While building codes are designed to protect health, safety and welfare, they often set the minimum standard and make it difficult for implementing innovative building design and systems.

Changes that promote healthy building design could impact the location and design of staircases, building systems that promote health and sustainability, rooftop gardens, operable windows, and strategies to bring nature into buildings, such as "living walls."

10. Health Impact Assessment

Health impact assessment (HIA) is defined by the World Health Organization as "a combination of procedures, methods, and tools by which a policy or project may be judged as to its potential effects on the health of the population, and the distribution of those effects within the population." The final result of an HIA is usually a report similar to an Environmental Impact Statement (EIS), however the process, purpose, stakeholders, and scope are different. HIAs can be used to understand the health impacts and benefits of a wide range of projects from transportation improvements (such as a new roadway) to a policy change to a specific development plan or project.

HIA professionals have created guidelines to conduct them which includes six key steps: 1) Screening; 2) Scoping; 3) Assessment; 4) Recommendations; 5) Reporting; and 6) Monitoring and Evaluation. Collaboration, transparency, and inclusivity are key features of the HIA practice. Typically, a team will include a mix of technical professionals, the project sponsor, public agency staff, community based organizations, academic partners, and local community members. A mix of quantitative and qualitative methods are used to identify potential (and sometimes unintended) positive and negative health impacts of a project, policy, or program and how those effects are distributed within the population. Ideally the HIA team will broadly engage potentially impacted stakeholders throughout the process.

Cities and counties can request that planners for large master planned projects engage an outside team to conduct an HIA to help find creative solutions to improve health outcomes.

After the assessment, the team can work with stakeholders to produce recommendations that will enhance the health benefits and reduce potential harm of the project.

Best Practice: Health Impact Assessment Housing Stock Upgrade Initiative, Curry County, OR

In Curry County, Oregon, approximately one in three people live in manufactured homes- more than five times the national average. Oregon housing advocates and Curry County Economic Development proposed a pilot project called the Housing Stock Upgrade Initiative (HSUI) that would provide lower cost loans or other funds to make repairing or replacing a manufactured home more affordable to Curry County residents.

An HIA was done to assess and document the health benefits and impacts of this pilot program while it was occurring and to ensure that health was a consideration throughout. Homes in question were posing health risks such as disease vectors from rodent infestations; physical hazards such as holes in the floor and unsafe electrical connections; and mold, mildew, and asbestos problems affecting indoor air quality. The HIA team found that the HSUI has the potential to improve indoor air quality and home structural integrity as well as increase the potential for residents to stay in their homes as they age.

11. Health in All Policies

Health in All Policies (HiAP) is a fundamental approach to healthy community design and planning. It is a collaborative approach to improving the health of all people by incorporating health considerations into decision-making across sectors and policy areas. HiAP helps ensure that all decision-makers are informed about the health, equity, and sustainability consequences of various policy options during the policy development process. The HiAP approach identifies the ways in which decisions in multiple sectors affect health, and how better health can support the achievement of goals from multiple sectors. It engages diverse governmental partners and stakeholders to work together to improve health and simultaneously advance other goals, such as promoting job creation and economic stability, transportation access and mobility, a strong agricultural system, environmental sustainability, and educational attainment. While groups can successfully implement targeted one-time HiAP collaborations, the HiAP approach ultimately seeks to institutionalize considerations of health, equity, and sustainability as a standard part of decision-making processes across a broad array of sectors.

Five Key Elements of Health in All Policies:

1. Promote health, equity, and sustainability.
2. Support inter-sectoral collaboration.
3. Benefit multiple partners.
4. Engage stakeholders.
5. Create structural or procedural change.

Best Practice: 2013 Active Design Executive Order, New York City, NY

http://home.nyc.gov/html/om/pdf/eo/eo_359.pdf

The legislature requires active design in city-funded development projects through building code and design standard changes. Agencies are expected to review all new construction and major renovation projects during the project's preliminary design phase to assess opportunities for implementation of the adopted Active Design Strategies. In addition, agencies are asked to enhance the capacity of their personnel by coordinating trainings on active design. This is an example of how health-promoting strategies can be routinely integrated throughout city practice. The use of executive action to increase systematic incorporation of evidence-based active living elements into the built environment should be considered as an additional tool to help promote active living.

5 CONCLUSIONS

The analysis and research performed for this paper has revealed some key conclusions that can inform future health-oriented policies in the PUC DP and help State and local health agencies to generate a strategy to reduce disparities in health outcomes for PUC residents. Key takeaways include:

Context & Background

- Research has found a strong link between planning, the built environment, and health outcomes. Where we live greatly impacts how long and how well we live.
- A healthy community is created through the positive confluence of a myriad land use and regulatory factors, including environmental quality, access to sidewalks, parks, transit, daily goods and services, and healthy foods.
- Many planning tools are available to improve health in the PUC and beyond, such as health districts, site design guidelines, health-focused master planning, "Healthy Community" rating systems, and Health Impact Assessments.

Socioeconomics

- A combined analysis of socioeconomic conditions (education, income, employment, etc.) reveal clear differences in living standards within the PUC. The areas that were shown with the most hardship factors are predominantly multifamily areas concentrated in the central portion of the Plan Area, especially Kalihi-Pālama, Downtown-Chinatown, Kalihi Valley, and McCully-Mōʻiliʻili. In particular, Kalihi-Pālama is shown by these measures to experience hardship that is dramatically **more** severe than any other PUC neighborhood.
- Older residents are more present in certain neighborhoods, especially Waiʻalae-Kāhala, Makiki-Punchbowl, and Kaimukī. Within the PUC, there are also clear focal points of elderly residents, such as in the Moanalua Hillside Apartments, Upper Mānoa, Lower Salt Lake, and along the Pali Highway in Nuʻuanu. Specific pedestrian enhancement and safety interventions (such as traffic calming, sidewalk and bus shelter improvements, zoning to encourage health care facilities, and additional shade) may be appropriate in these areas.

Chronic Health Disparities

- Among the most prevalent health conditions for the PUC are obesity, diabetes, and a lack of physical activity.
- Health disparities were shown as most severe in Kalihi-Pālama and Kalihi Valley, and to a lesser extent in Liliha-ʻĀlewa.
- Generally, residents were shown as experiencing good health in the Airport, Mānoa, ʻAiea, Salt Lake, and Waiʻalae-Kāhala neighborhoods, and share a combination of factors: younger

residents on average, higher incomes, and good access to health insurance.

- Obesity is one of the most serious health problems facing the PUC, affecting more than one in five residents. Waikīkī (24%), and Kalihi-Pālama (23%) are shown as having the highest percentage of obese residents.
- The incidence of diabetes shows some of the strongest geographic distributions of all chronic health issues. A very high concentration is shown in the central area of the PUC in Kalihi-Pālama (13%) and Liliha-ʻĀlewa (12%), as well as in the eastern edge of Pearl City.
- Neighborhoods in this analysis with the highest percentage of residents who report not getting regular physical activity include Kalihi-Pālama, Liliha-ʻĀlewa, McCully-Mōʻiliʻili, and Kalihi Valley.

Healthy Food

- While there are technically no food deserts within the PUC, food prices are high, and most of the island's food is imported.
- Valley and ridge neighborhoods have noticeably less access to full service grocery stores; Aside from the Mānoa Safeway, there are very few supermarkets mauka of H1. The Salt Lake, Moanalua, and Airport neighborhoods are also noticeably underserved by supermarkets.
- The neighborhoods with the highest percent of households receiving SNAP food assistance are also well-served by Choose Healthy Now locations (Kalihi-Pālama and Kalihi Valley).

Transportation Safety

- Based on the data analyzed, bicycle collisions are highest in the area bounded by Ward Ave, University Ave, and H1; dense areas where biking is common and many cars are on the road. The distribution of highest numbers of pedestrian collisions is similar to bicycles but it extends farther throughout Waikīkī and over to Kalihi-Pālama.
- Generally, the greatest frequency of bus service is focused along corridors where population density is also highest. Corridors with high frequency bus service may be well served by allowing higher density zoning and more intense uses.
- Air quality is generally quite good in the PUC overall, owing to the tradewinds blowing across the island and the general lack of major industrial polluters. However, more than one-fifth (21%) of the PUC's population lives within 500 feet of a freeway, which impacts a wide cross-section of the PUC's residents.

Housing

- In the PUC, two in five (41%) households pay more than 30% of their monthly income on housing, commonly known as "cost burdened." The most cost-burdened neighborhoods are Airport, Ala Moana-Kakaʻako, and McCully-Mōʻiliʻili.
- Overall, one in ten housing units has more than one person per room. The Kalihi-Pālama neighborhood experiences the worst overcrowding, while other areas prone to overcrowding are Kalihi Valley and Liliha-ʻĀlewa.