

Date: January 18, 2024

To: Sunrise Corridor Visioning Team

From: Allina Cannady, Leah Fisher, Clackamas County Public Health Department

Subject: **Existing Conditions in the Study Area – Health Indicators and Outcomes**

The purpose of this memorandum is to identify and assess a number of elements of the built and natural environment within the Sunrise Corridor Vision Study Area that affect the health of people living, working, and visiting the study area. The project study area is around the OR212/OR224 corridor in Clackamas County, stretching from the eastern edge of I-205 west to roughly SE 172nd Avenue, and from the Clackamas County line to the Clackamas River.

Health indicators and outcomes listed below do not include every possible intersection of the built environment and health and topics below were prioritized based on the unique characteristics of this study area, the project purpose, and areas of concerns. This memorandum includes data and information on: transportation, mobility, and access; health outcomes; and pollution and environmental exposures. This report compares data within census tracts in the study area and County-level data to understand local context within the larger county context.

1. Transportation, Mobility and Access

We all rely on the transportation system everyday to get from home to school, work, and other destinations. People 65 and older, younger than 18, Communities of Color, people with Hispanic/Latino ethnicity, low-income households, people with limited English proficiency and people with one or more disabilities may face greater transportation barriers. These individuals may be more likely to depend on alternative transportation modes like walking, biking or public transit, often live in areas with poor transit service, fewer destinations, and poor connectivity due to historical disinvestment and underinvestment. These burdens can increase transportation costs, increase stress, and create unequal access to economic and educational opportunities, housing, healthy foods, and opportunities for physical activity – all of which have direct impacts on health and vitality.¹ Refer to the Business and Community Memo to better understand the demographics of who lives in the study area.

1.1. Vehicle Ownership and Commute Mode

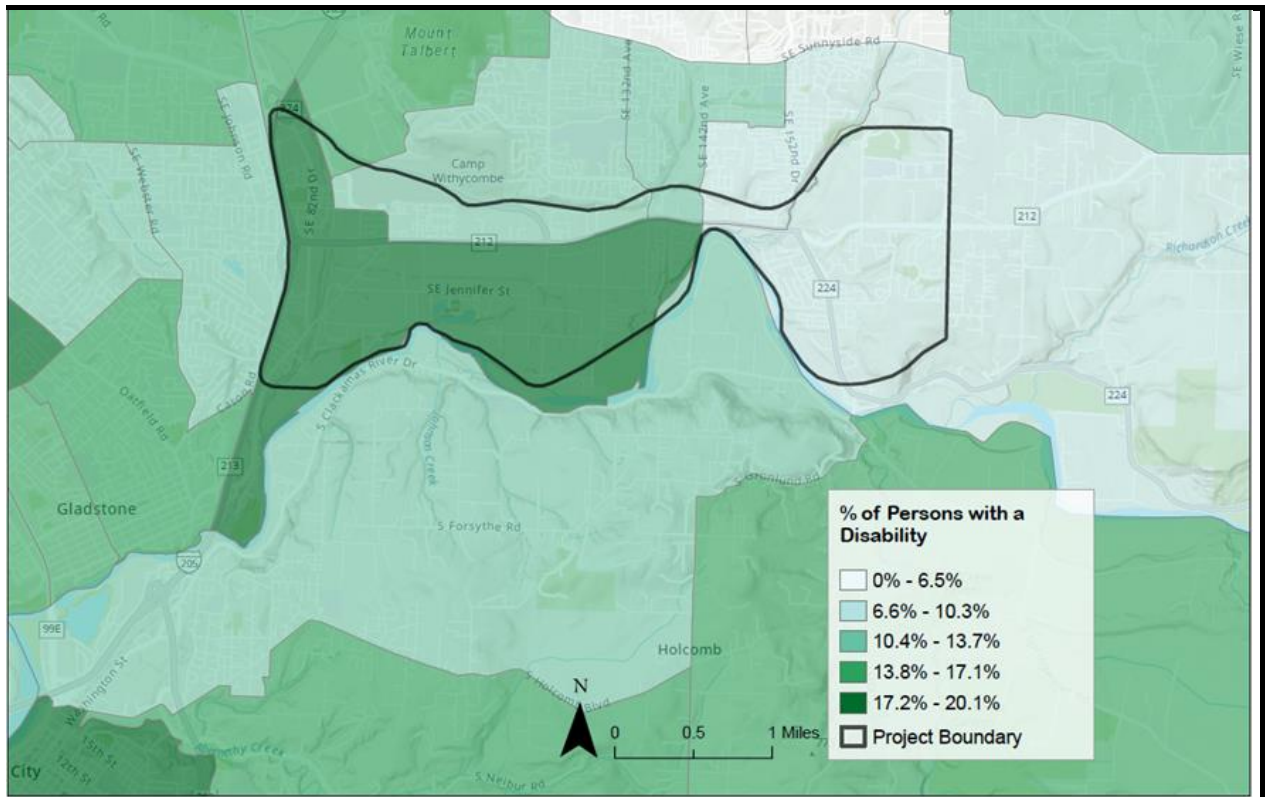
People without access to a vehicle are more likely to be dependent on other transportation modes, like public transportation or walking. Approximately 9.6% of households within the

¹ Upstream Public Health, “Transportation Health Equity Principles”, <https://www.ctdatahaven.org/sites/ctdatahaven/files/Upstream%20Transportation%20Health%20Equity%20Principles.pdf>

1.2. Disability & Accessibility

The built environment significantly affects people with physical, mental, or emotional disabilities. A higher percentage of people living in the west side of the study area have a disability compared to the County average (17.5% vs. 11.8%, respectively), seen in Figure 4.

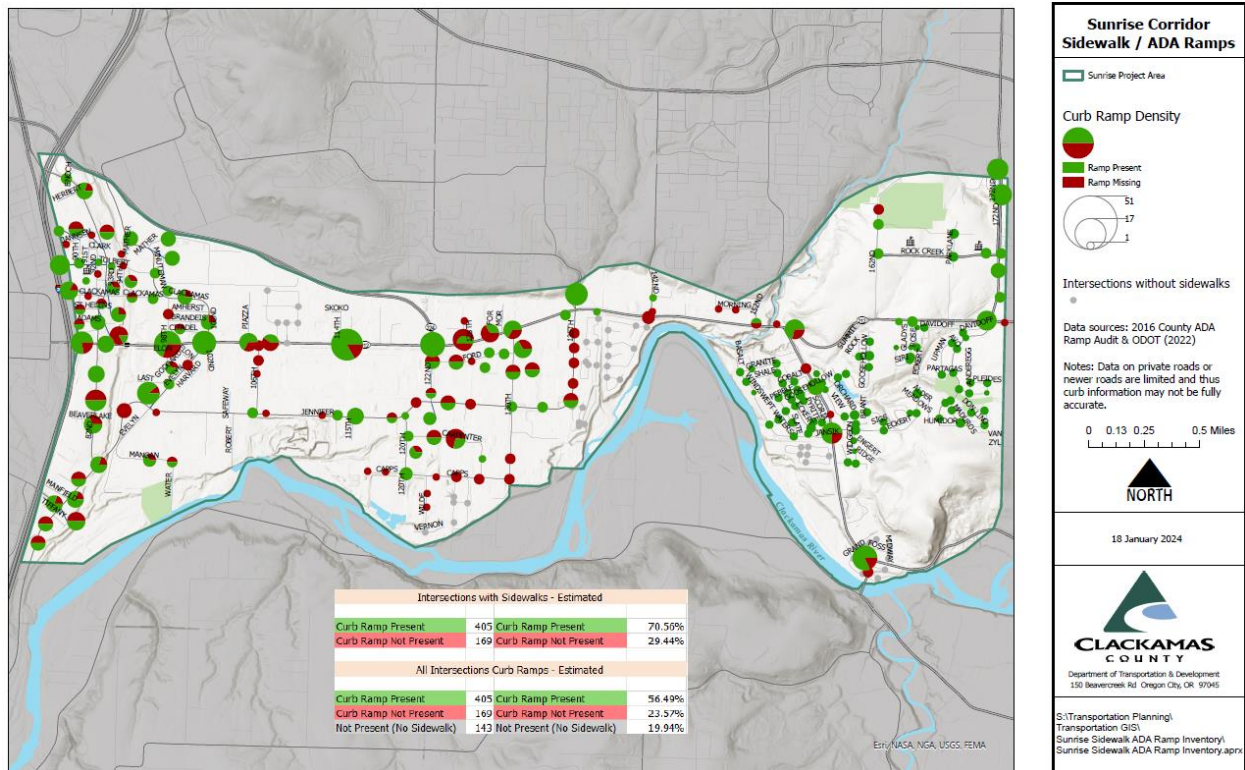
Figure 4. Percentage of people that are limited due to a physical, mental, or emotional condition.



Source: 2017-2021 American Community Survey

An inclusive built environment, such as curb ramps and accessibility to public transportation, can enhance independence, mobility, and social participation for people with disabilities. As seen in Figure 5, the study area overall has a strong presence of (Americans with Disabilities Act) ADA ramps (70.57% for intersections with sidewalks), however, the distribution of ADA curb ramps is not equal within the study area. The newer housing development in the eastern portion of the study area and sidewalks near the schools have a higher presence of ADA ramps, while sidewalks in the western portion of the study have a lower presence of ADA ramps.

Figure 5. ADA Ramps Present and not Present within the Study Area



While ADA curb ramps are one important aspect of a safe and accessible built environment for people with disabilities, additional elements of accessibility includes a complete sidewalk network (See Figure 6), sidewalks and pavement in good repair, signs with braille, verbal and visual announcements at crossings, and infrastructure at the destination such as: ADA parking spaces, step-free access into buildings, ramps, step-free points of access and elevators is also important. Data was not available on these features within the study area.

1.3 Walking and Biking Infrastructure

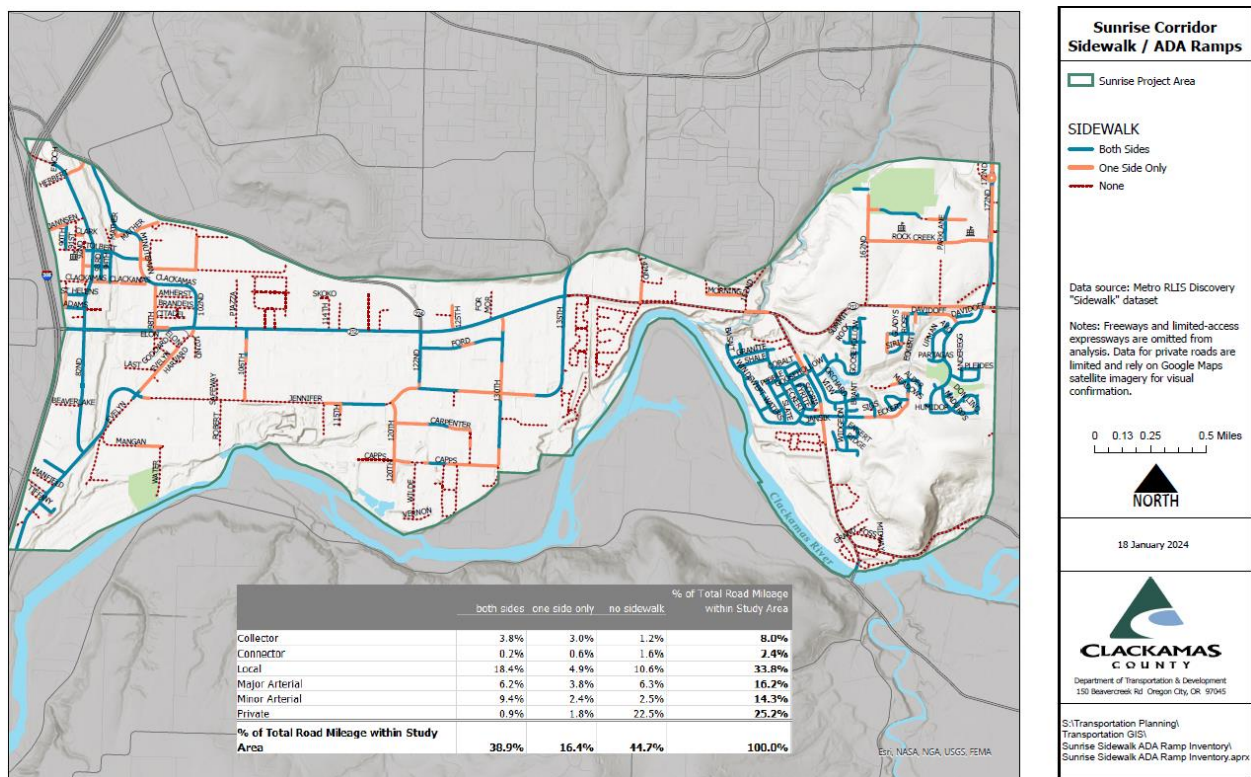
Presence of safe and complete infrastructure, like sidewalks, ramps, bike lanes, safe crossings, and traffic calming elements, help to reduce barriers to walking and biking and create access to goods, services, jobs, and transit stops for people who depend on alternative modes of transportation. Additionally, studies show that people who live near (within 1/2 mile or 15 minutes walking) safe, high-quality biking and walking infrastructure tend to get more exercise than people who don't, particularly among participants without a car.²

² American Journal of Public Health, "New Walking and Cycling Routes and Increased Physical Activity", 2014, <https://ajph.aphapublications.org/doi/full/10.2105/AJPH.2014.302059>

Cross-referencing other existing conditions memorandum there are a number of key destinations within, and adjacent to, the study area worth walking or biking to/from if safe and complete infrastructure is available. The study area has a variety of jobs, schools, basic amenities like a grocery store and pharmacy, health care facilities, shopping, recreation amenities and trails.

According to Figure 6 below, the sidewalk network within the study area is approximately half complete with some gaps along major roadways like OR212. The newer development in the eastern portion of the study area has a higher presence of sidewalks on both sides of the road compared to the major mobile home parks in the western portion of the study area. Additionally, some gaps exist in key areas connecting residential to schools and around parks.

Figure 6. Sidewalk Network within the Study Area



According to maps and information available in Clackamas County’s Draft Walk Bike Plan, bicycle facilities in the study area exist along OR212 and a small portion of OR224, parts of 82nd Avenue, 135th Avenue and SE Jennifer Street. The majority of bicycle facilities within the study area consist of unprotected bike lanes adjacent to vehicle travel lanes with high volumes and speeds.

Figure 7. Bikeways within the Study Area

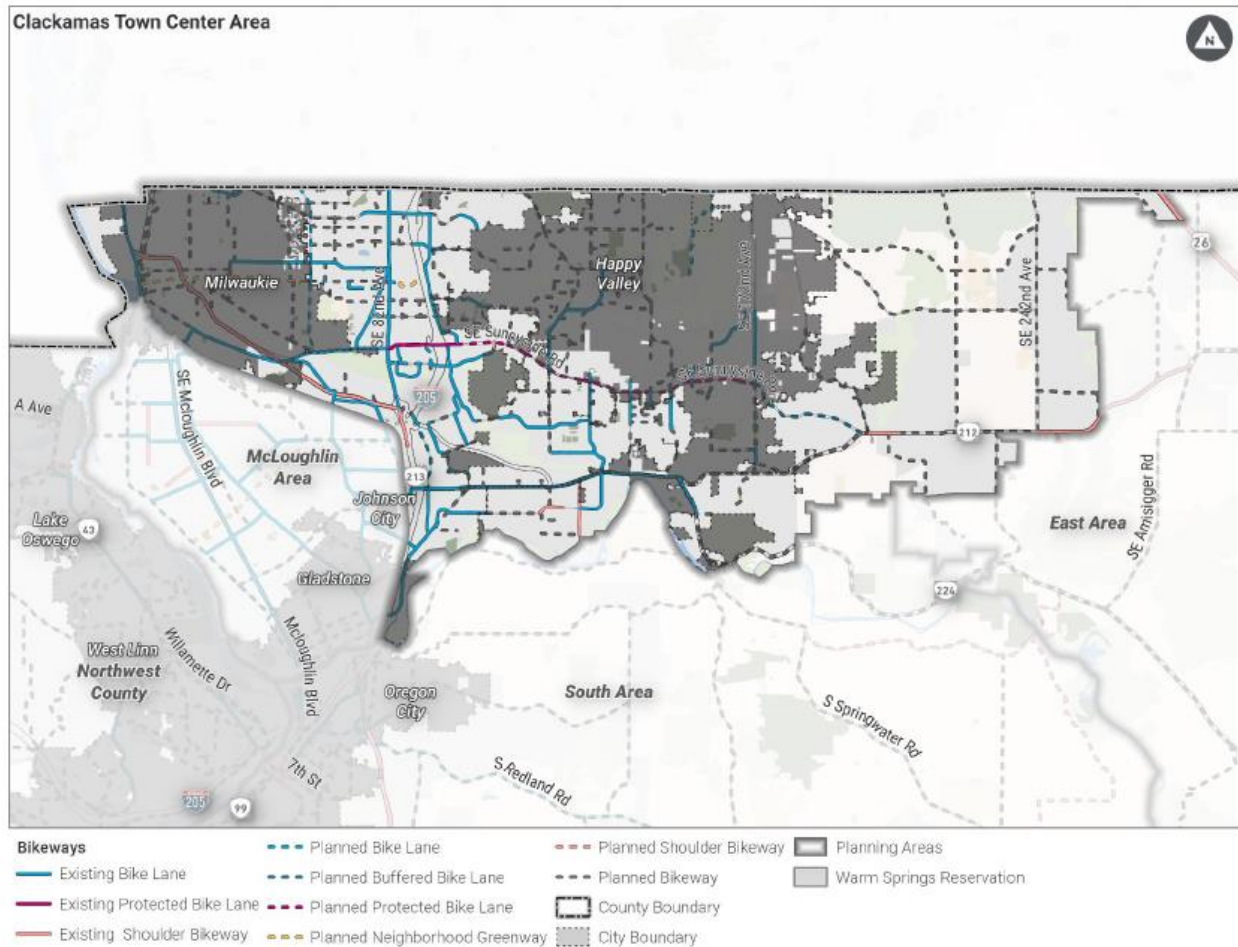


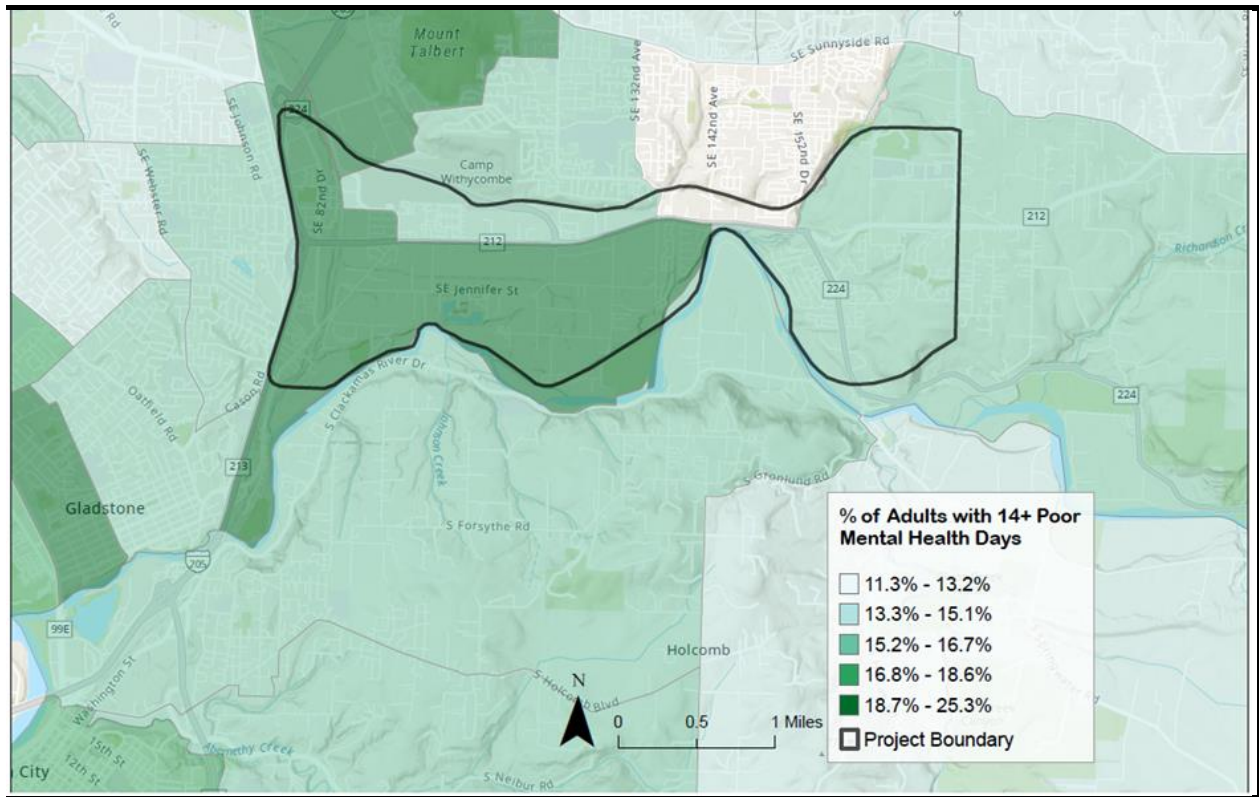
Figure 7 shows the bikeways within the Greater Clackamas Industrial Area, of which, the study area is south. There are 42.9 miles of existing bikeways (including off-street bikeways) and 60.8 miles of planned bikeways (including off-street bikeways) in the Greater Clackamas Study Area. Overall, the Walk Bike Clackamas Plan indicates that bicycle facilities in this area are sparse and have opportunities to improve connectivity. The Interstate 205 trail, running parallel to the highway, provides an off-street shared use path that provides connectivity to the Clackamas Industrial Area and Town Center, but lacks an existing connection from the study area.

2. Health Outcomes and Risk

2.1. Mental Health

Mental health can be significantly impacted by built environment. Many of the factors that have a positive influence on a person's physical health can also positively affect a person's mental health. Well-designed urban planning can encourage social interactions and physical activity, promoting positive mental health outcomes. The west side of the study area ranks poorly in terms of mental health outcomes, with one of the highest percentages of adults with depression and poor mental health in the County (Figure 8 and 9).

Figure 8. Percentage of adults aged 18 years and over who stated that their mental health was not good 14 or more days in the past month.



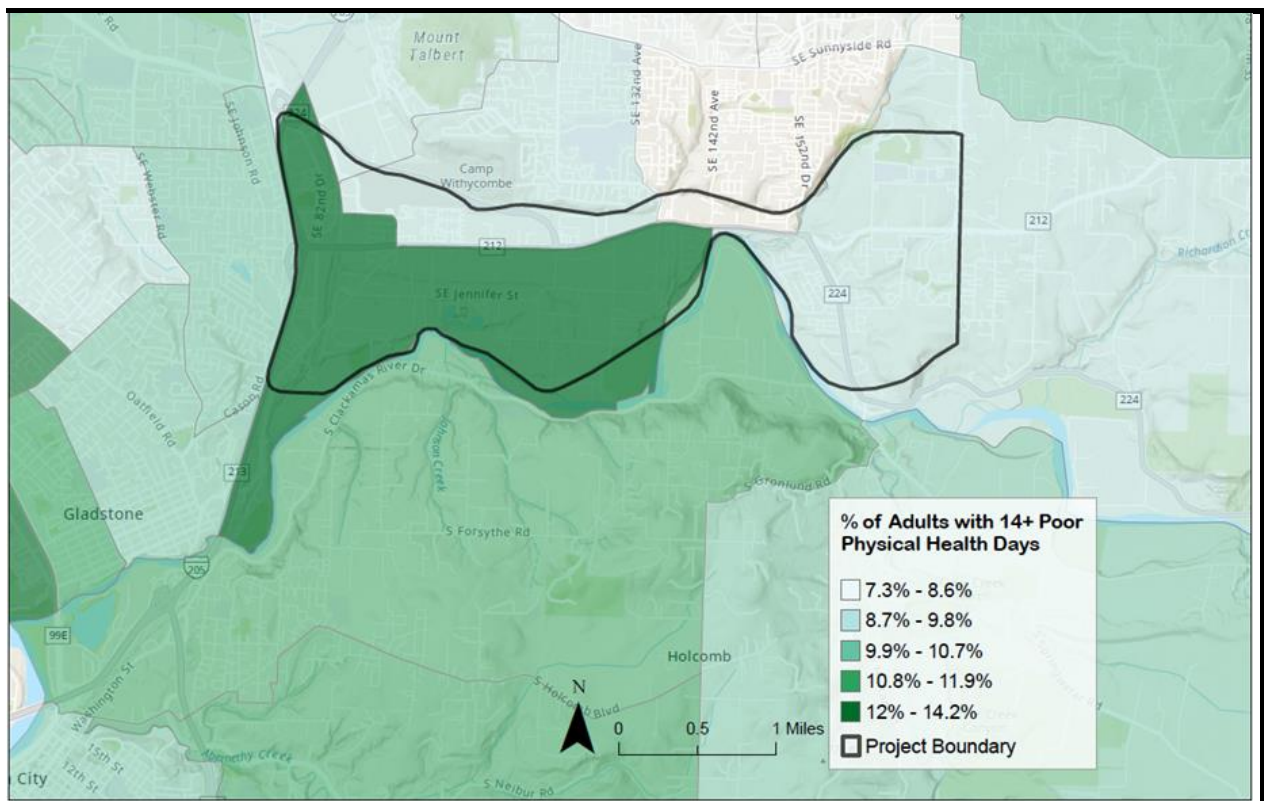
Source: CDC PLACES, 2021

2.2. Physical Health

Physical health is how well your organs and body systems function. It includes a healthy weight and body composition, ability to perform daily activities without pain, and a strong resistance to illness or fatigue. Physical health is often linked to one's built environment. The availability and connectedness of sidewalks, parks, trails, healthy food, healthcare facilities, and other neighborhood characteristics influence physical activity levels, obesity, heart disease, diabetes, and other health conditions.³

The west side of the study area has the highest percentage of adults experiencing poor physical health and obesity in the County (Figure 10 and 11). Additionally, when people feel healthy, they are more likely to participate in their community socially and economically.

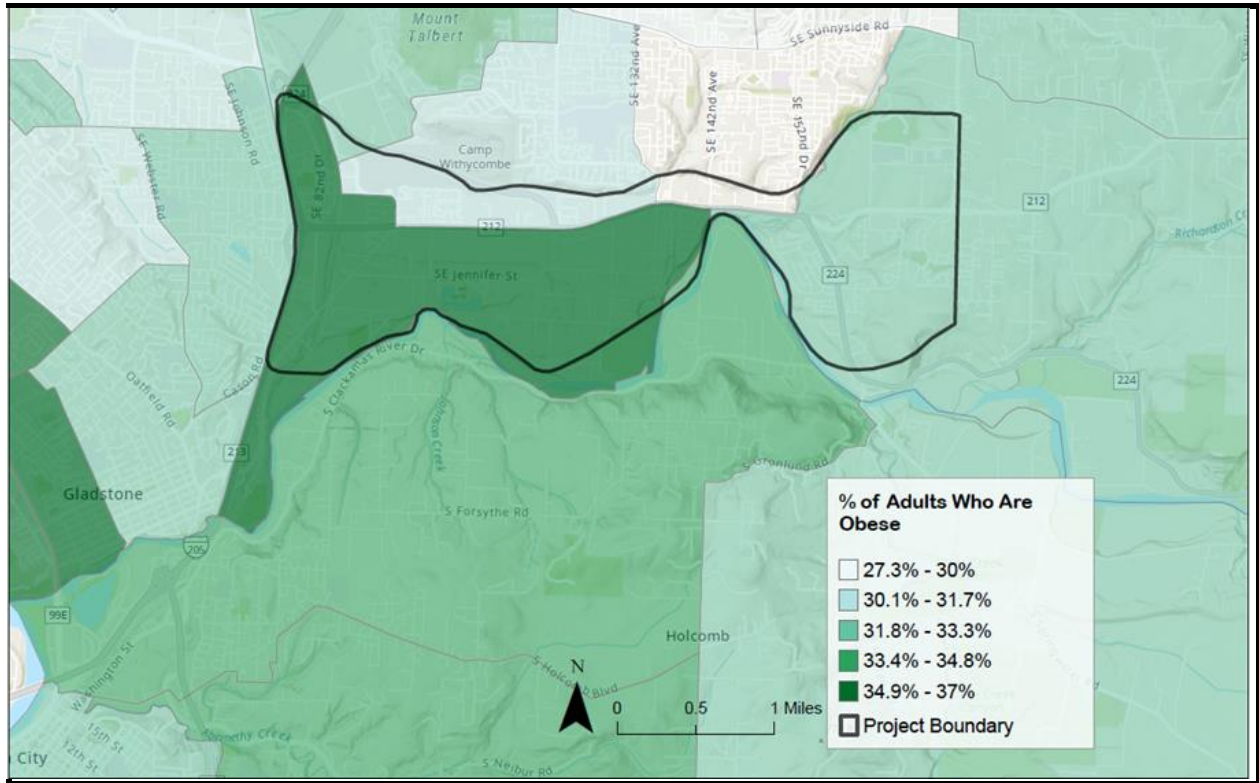
Figure 10. Percentage of adults aged 18 years and over who stated that their physical health was not good 14 or more days in the past month.



Source: CDC PLACES, 2021

³ US Department of Transportation, "Proximity to Roadways", 2015, <https://www.transportation.gov/mission/health/proximity-major-roadways>

Figure 11. Percentage of adults aged 18 years and over who are obese according to the Body Mass Index (BMI)



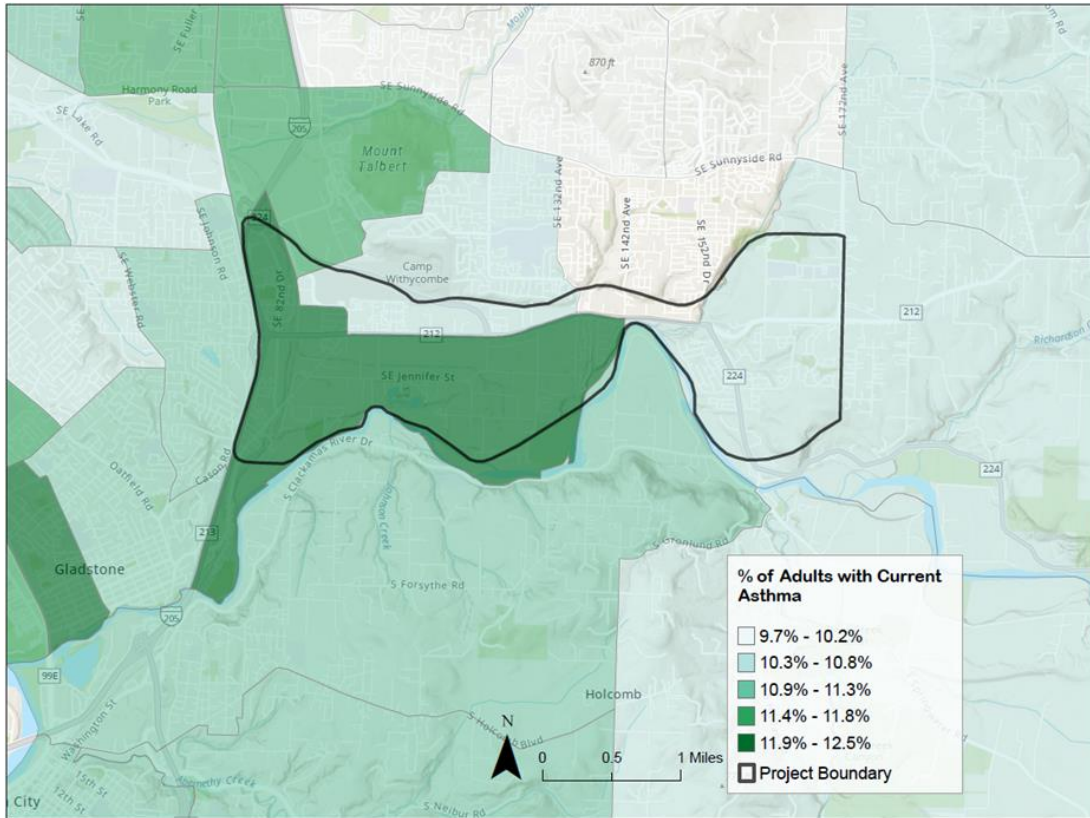
Source: CDC PLACES, 2021

2.3. Asthma

Asthma is a chronic lung disease that affects people of all ages. Symptoms can include coughing, wheezing, shortness of breath and chest tightness and can be mild or severe based on a number of biological, environmental and behavior factors. Although asthma is a manageable condition, in extreme cases it can result in hospitalization and even premature death.

Characteristics of the build environment, like proximity to tobacco retailers, outdoor air quality, and the quality of housing stock (exposure to mold, dust mites) can result in higher rates of asthma in a geography and/or heightened asthma symptoms or health outcomes due to increase exposure to toxins. Currently, the study area experiences overall a higher burden of asthma compared to the rest of the County (12.2% vs 10.6%, respectively). As seen in Figure 12, the census tract in the western portion of the study area south of OR212 is experiencing the highest rates overall.

Figure 12. Percentage of adults aged 18 years and over who have been told by a health care provider that they currently have asthma.



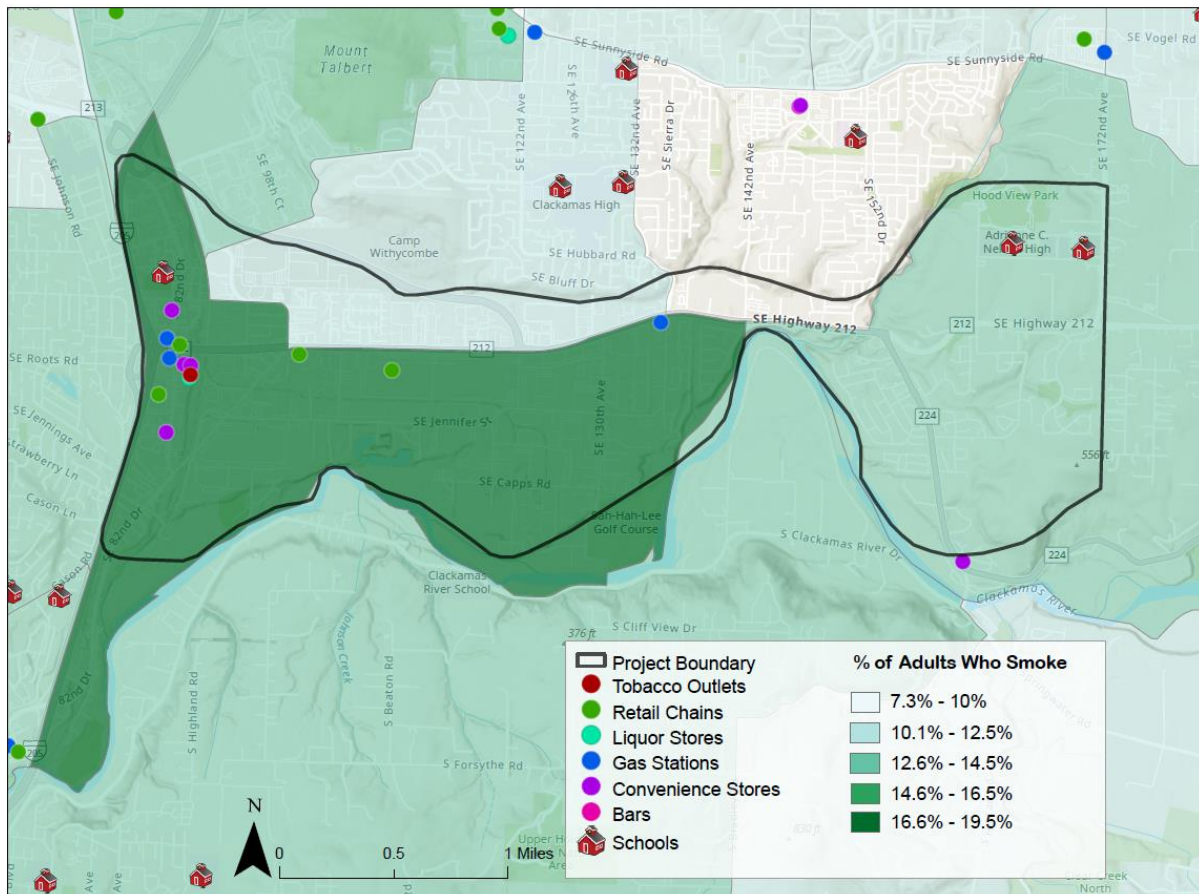
Source: CDC PLACES, 2021

2.4 Smoking and Tobacco Retailers

Tobacco use continues to be the number-one cause of preventable death and disease in Oregon.⁴ People living with lower incomes, less education, and marginalized social groups smoke at higher rates than other social groups.⁵ Tobacco retailers are often more concentrated in lower income communities and communities of color and tobacco density and proximity are associated with higher rates of tobacco use.

The study area has 13 tobacco retailers, mostly clustered around the intersection between I-205 and OR212. The west side of the study area also has the highest rate of adults who smoke in the County, with an estimated 19.5% of adults who smoke (Figure 13).

Figure 13. Tobacco Retailers and Percent of Adults Who Smoke



Source: Oregon Department of Revenue, 2023 & CDC PLACES, 2021

⁴ Oregon Health Authority (OHA), "Oregon Tobacco Facts" <https://www.oregon.gov/oha/PH/PreventionWellness/TobaccoPrevention/Pages/oregon-tobacco-facts.aspx#:~:text=Tobacco%20use%20affects%20all%20Oregonians.%20Tobacco%20use%20is,in%20medical%20expenses%20and%20lost%20productivity%20%28Table%202.4%29.>

⁵ *ibid*

Figure 14, indicates the west side of the study area, right off of I-205 and OR212, is exposed to the highest volume of traffic in the study area and the County.

Health impacts from lands uses and transportation infrastructure with high environmental noise exposure and proximity to residential uses appears relevant in this study area, however, additional measures and study would need to be conducted to understand who and what areas are most impacted.

3.2. Outdoor Air Pollution

Outdoor air can include a number of pollutants associated with a variety of negative human health impacts such as heart attacks, asthma attacks, bronchitis, hospital and emergency room visits, work and school days lost, restricted activity days, respiratory symptoms, and premature mortality.⁷ Air pollution can have the greatest impact on sensitive populations, identified by the EPA, as children, elderly, and people with asthma. It can cause babies to be born premature and raises the baby's risk of health complication in the short and long term.⁸

Heightened outdoor air pollution in the built environment is most often attributed to proximity to freeways and major roadways, construction activities/sites, and industrial land uses or freight-dependent industries.

According to available air quality data, the study area is exposed to a relatively average amount of ozone, diesel particulate matter (PM), and PM2.5 compared to the rest of the County (Figures 15, 16 and 17). These exposures fall within the EPA standards.^{9, 10} However, given the point sources (traffic, manufacturing uses, freight) within the study area, factors of heat and air quality, and a lack of tree canopy, ongoing monitoring and site-specific measurements within the study area would be helpful to inform site-specific mitigation strategies and limit pollution exposure to residents, employees, and visitors.

⁷ United States Environmental Protection Agency (EPA), "Outdoor Air Quality", 2023, [Outdoor Air Quality | US EPA](#)

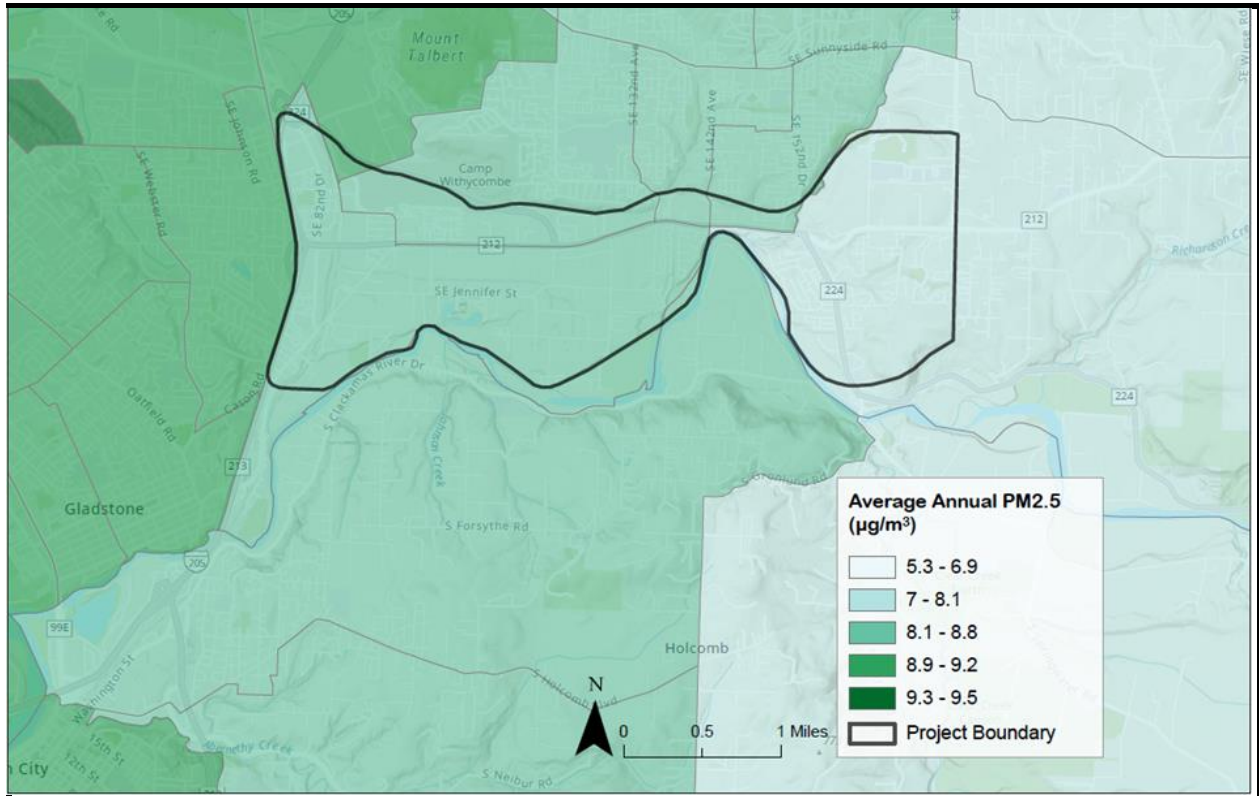
⁸ NYU Langone Health, "Air Pollution & Preterm Births in the United States", <https://med.nyu.edu/departments-institutes/pediatrics/divisions/environmental-pediatrics/research/policy-initiatives/air-pollution-preterm-births#:~:text=Exposure%20to%20air%20pollution%20in%20pregnancy%20has%20been,surrounding%20the%20fetus%20and%20lead%20to%20preterm%20birth.> ⁸ United States Environmental Protection Agency (EPA), "Outdoor Air Quality", 2023, [Outdoor Air Quality | US EPA](#)

⁸ NYU Langone Health, "Air Pollution & Preterm Births in the United States", <https://med.nyu.edu/departments-institutes/pediatrics/divisions/environmental-pediatrics/research/policy-initiatives/air-pollution-preterm-births#:~:text=Exposure%20to%20air%20pollution%20in%20pregnancy%20has%20been,surrounding%20the%20fetus%20and%20lead%20to%20preterm%20birth.>

⁹ EPA, "The National Ambient Air Quality Standards for Particle Pollution", https://www.epa.gov/sites/default/files/2016-04/documents/2012_aqi_factsheet.pdf

¹⁰ United States Environmental Protection Agency (EPA), "Ozone National Ambient Air Quality Standards (NAAQS)", <https://www.epa.gov/ground-level-ozone-pollution/ozone-national-ambient-air-quality-standards-naaqs>

Figure 17. Average annual Particulate Matter 2.5 in air ($\mu\text{g}/\text{m}^3$).



Source: United States Environmental Protection Agency. 2023. EJSCREEN. www.epa.gov/ejscreen. Values derived from the 2019 Office of Air Quality Planning and Standards (OAQPS).

3.2 Heat Exposure

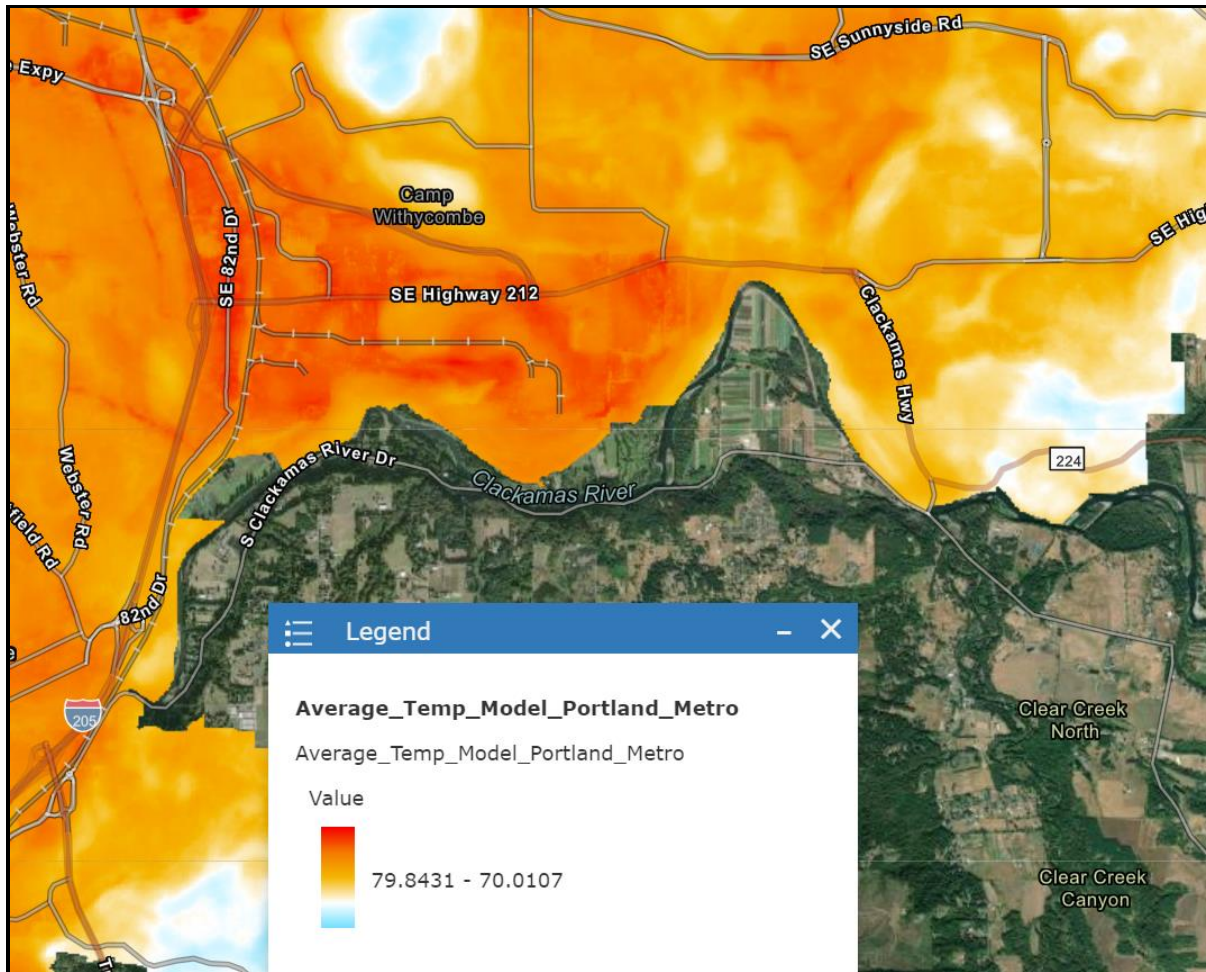
Heat affects everyone, however, certain individuals are more vulnerable to extreme heat such as: adults over the age of 65, children, pregnant people, people with chronic medical conditions like heart disease or poor blood circulation, people living or working outside, people with few social connection and limited social networks, and people with no access to cooling systems at home.¹¹

Characteristics of the built environment play a role in temperatures and heat exposure can vary widely across a geography resulting in unequal exposure to residents, employees, and visitors of the study area. A 2023 heat study across the metro area found that urban and suburban areas with low tree canopy cover and majority impervious surfaces saw the highest temperatures. Land use classification areas of Multi-Family Residential, Mixed-Use Residential,

¹¹ Multnomah County Health Department, Washington County Health Department, and Clackamas County health Department, "2012-2022 Regional Climate and Health Monitoring Report", 2023, p.8

Commercial and industrial in particular were the hottest areas.¹² Within the study area, temperatures are higher within the Clackamas Industrial Area and along I-205 and OR212 compared to the east side of the study area (Figure 18). Residents and employees who live and work outdoors in areas considered heat islands can be more susceptible to heat-related illnesses and even death. Additionally, related negative effects include worse air quality in areas with higher heat and a higher cost burden of utility bills like air conditioning.¹³

Figure 18. Heat Map - Average Temperature Model



Source: Portland Metro health Watch Report, 2023

¹² CAPA Strategies, "Portland Metro Heat Watch Report", December 2023.

¹³ Environmental Protection Agency (EPA), "Heat Islands and Equity", 2023, <https://www.epa.gov/heatislands/heat-islands-and-equity#health-consequences>

4. Social Determinants of Health

Social determinants of health (SDOH) are the conditions in the environments where people are born, live, learn, work, play, and age that affect a wide range of health, functioning, and quality-of-life outcomes and risks.¹⁴ The built environment, pollution, and transportation, discussed above, are major components of health. Additionally, safe affordable housing, poverty and living wages, and social and community connections also come up based on project scope and study area characteristics and demographics and may be worth further consideration.

4.1 Housing Displacement Risk

Stable, affordable, and safe housing is a fundamental component of health. Any time an area experiences modest or significant investment, there is a risk of involuntary displacement of existing residents. Renters, those lacking college degrees, and lower income households cannot easily cope with the rising costs of living, making them more vulnerable to involuntary displacement.

Data contained in the Business and Community memo reveals that the study area, when compared to county and region, has lower income residents, lower average housing price, above average shares of vulnerable residential populations, and below average wage jobs. Distribution of vulnerability elements are not shared equally across the study area and certain areas may be impacted more than others. Data contained in other memo, along with community perspectives and lived experience shall dive deeper into housing displacement risk and strategies to mitigate displacement into the future.

4.2. Poverty and Living Wages

Income is one of the strongest and most consistent predictors of health outcomes identified in research literature. Data contained in the Business and Community memorandum and the Economic Development memorandum can inform this conversation and future mitigation strategies.

4.3. Social and Community Connections

People's relationships and interactions with family, friends, co-workers, and community members can have a major impact on their health and well-being.¹⁵ Social connections also help to build community resiliency to help people during and recover from natural and man-made disasters. Currently no data was collected on this topic for the study area. It is possible information from community outreach efforts can inform mitigation strategies on social and community connections.

¹⁴ US Department of Health and Human Services, "Social Determinants of Health"
<https://health.gov/healthypeople/priority-areas/social-determinants-health>

¹⁵ *ibid*