HEALTH IMPACT ASSESSMENT OF HILLSIDE MASTER PLAN

Final Report

September 8, 2019

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Prepared for:
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The HIA process has been managed by Clackamas County Public Health Department. The content of the HIA has been closely guided by a core group of practitioners including Abe Moland, Jaime Zentner, and Bently Moses in their positions at Clackamas County Public Health Department; Angel Sully, Jemila Hart, and Mary-Rain O'Meara at the Housing Authority of Clackamas County; Valeria Vidal at City of Milwaukie. This team is grateful to the feedback received by the individuals and organizations that generously gave of their time to participate in the greater Hillside Master Plan Advisory Committee. The author also thanks Blake Zetter for his help in data collection and analysis. Finally, the team thanks the residents of Hillside for sharing their values and needs through surveys, participation in open house events, and street walkability audits.

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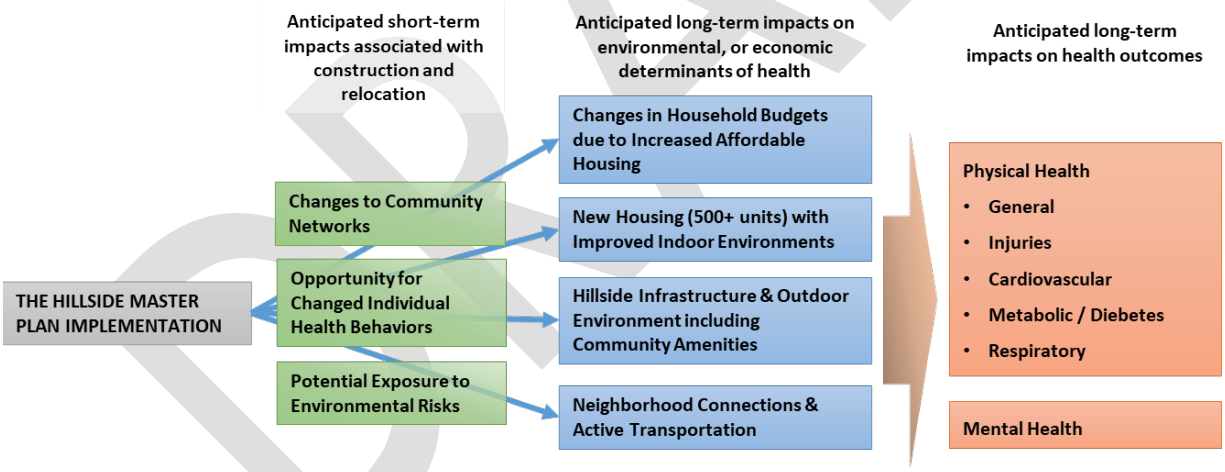
Overview

Health Impact Assessment (HIA) is a growing practice to help identify and consider the health impacts of non-health policies and plans. Clackamas County Public Health (CCPHD) is participating in the Hillside Master Planning effort by working with the Housing Authority of Clackamas County (HACC) to implement a formal HIA process. The greater planning effort will guide the redevelopment of a public housing site in Milwaukie, Oregon. After a year-long process, HACC is proposing to replace 100 unites and add 400 new units at the Hillside site. These units will be a mix of townhomes and 3-4 story mixed-income apartment buildings. In some cases, the buildings will also incorporate important community resources on the ground floor, changing Hillside to a mixed-use neighborhood.

The environments people live in influence their health in many ways. Foremost, increasing the density of Hillside will increase the supply of deeply affordable housing stock; this will facilitate households living in affordable housing, leading to less financial, physical, and emotional stress for those who live in the housing. Beyond housing affordability, a well-planned community of quality housing influences health in many other ways. This HIA specifically evaluates possible impacts related to:

- Indoor environmental quality;
- Outdoor environmental quality;
- Community amenities important to current residents; and
- Transportation and circulation system.



After briefly documenting the process by which this HIA was created, this report is organized by the pathways that are known to connect healthy housing and built environments to individual and population health outcomes. Each section briefly reviews the academic literature; reviews any data collected during the HIA process; and reports on findings based upon the current proposal. Findings are accompanied by 54 recommendations to maximize health benefits, minimize health risks, and outline opportunities to monitor health outcomes.

Major findings include:

- The primary health impact of implementation of the Hillside Master Plan will be expanding the available affordable housing stock by adding 400 new units targeting a range of incomes. This increased supply will house more low and moderate-income individuals and ease their household budgets, resulting in reduced stress and ability to afford other health promoting goods and services.
- Hillside current houses an older population that reports high COPD, asthma, and cardiovascular disease rates; housing adjacent to trains and/or traffic may exacerbate this risk without further mitigation such as high filtration HVAC.
- Hillside residents have a higher rate of diabetes and cardiovascular disease than would be expected in Clackamas County even as they report low physical activity rates. Access to green space including walking trails and outdoor recreation areas as well as expanded and safe pedestrian access to nearby destinations will support more physical activity through walking.
- Common areas such as the community garden, the walking trail, and playgrounds are highly utilized and valued by current residents; each are highly health promoting. Care should be taken to expand these amenities in the redeveloped Hillside.
- Current Hillside residents are highly reliant on alternative modes of transportation with only 36% of residents in the HIA Survey reporting driving in the past week. This justifies much lower parking ratios, but also will require careful thought in the circulation planning to bolster transit, walking, and ride modes for current residents.

Planning for a Redeveloped Hillside

Hillside is a 16-acre public housing site which includes a 9-story high-rise (the "Manor") serving 100 households set among another 100 single-story units in a park like setting in Milwaukie, Oregon (see blue area in Figure). The site is bordered by single-family housing to the north, the Providence Medical Center to the east, and an empty lot ready for private redevelopment to the south (the "Murphy" site). The site is bounded on the west with railroad tracks that are actively used; the Milwaukie Expressway is just beyond the railroad tracks. The site is primarily accessed from 32nd Avenue.

The Manor, located on the west side of the site, is being renewed with Rental Assistance Demonstration (RAD) funds. The 100 units in Hillside Park, however, are also aging and likely need to be replaced. The site, with less than 14 dwelling units per acre, is underutilized, representing a unique opportunity to increase density and therefore increase the affordable housing stock in Clackamas County.

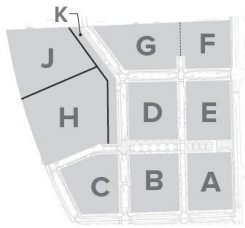
In an effort to align their portfolio with county needs and federal funding sources, HACC embarked in June 2018 on a planning process to develop a master plan for Hillside with particular attention to replacement of the 100 park units. Anticipated outcomes of the process include:

- A vision of a mixed use, mixed income community that enables continued provision of deeply affordable housing to the population currently being served by HACC;
- Creation of opportunities for expanded housing choice and different types of housing;
- Improved pedestrian and transit access on the site; and
- Potential for neighborhood commercial uses.

HACC intends to use this Master Plan to both guide changes to the built environment and leverage federal, state, and local funding opportunities such as the HUD RAD and Section 18 programs, Metro's Affordable Housing Bond, Low Income Housing Tax Credits (LIHTC), and New Markets Tax Credits (NMTC). This Master Plan is anticipated to feature the following elements:

- 400 new units, 100 replacement units, and retention of the 100 unit, 9-story manor;
- New and replacement units will be in a variety of formats from walkup townhomes in the north of the site (near single family homes) to 4 story apartment buildings in the south;
- 500 parking spots in a mixture of surface and garage lots;
- Mixed-use opportunities on the ground floor along 32nd Avenue;
- A community center in the southwest of the site;
- Maintained open space, including the community garden, in the northwest lot;
- Relocation of playground and courts within the site;
- Extension of the existing bike boulevard north of the site on SE 29th to continue through the site;
- Realigned streets with new infrastructure; and
- Streetscapes characterized by sidewalks, high levels of tree canopy, and green infrastructure.

KEY PLAN



TABULATIONS

Lot A	= 1.25 ac	**100 du/ac**
Lot B	= 1.39 ac	**71 du/ac**
Lot C	= 1.36 ac	**40 du/ac**
Lot D	= 1.38 ac	**34 du/ac**
Lot E	= 1.29 ac	**81 du/ac**
Lot F	= 1.05 ac	**38 du/ac**
Lot G	= 1.52 ac	**17 du/ac**
Lot H	= 2.68 ac	**37 du/ac**
Lot J	= 1.95 ac	**0 du/ac**
Lot K	= 0.85 ac	**14 du/ac**
Total	= **14.72 ac**	

Hillside Manor (existing)	= 100 units
Hillside Park (replacement units)	= 100 units
Net New Units (to be developed)	= 400 units
Grand Total	= **600 units**

Off-street parking	= 327 stalls
On-street parking	= 163 stalls
Total	= **500 stalls**

HILLSIDE MASTER PLAN
Design Option | 07.23.2019

REVISED MASTER PLAN OPTION
URBAN EDGES & URBAN GREENSPACES

DRAFT

0 25' 50' 100'

SEA

IROZ ELARDO RESEARCH

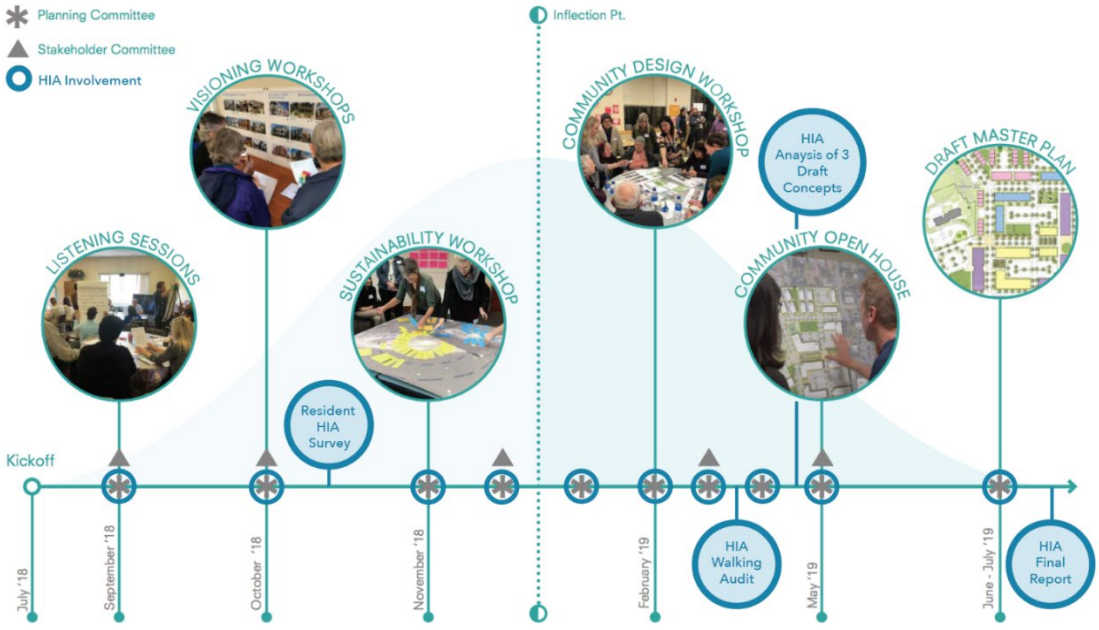
About the HIA Process

HIAs are process-oriented and guided by practice standards[1] that require the following steps: **screening, scoping, assessment, recommendations, reporting, and monitoring.** The screening step evaluates whether an HIA would be an appropriate to the planning effort. Scoping tentatively identifies the most likely impact pathways, potential data, and best ways to engage the community. The assessment step includes both qualitative and quantitative analysis. This analysis is then used to create recommendations to increase health outcomes. The assessment and recommendations are then provided to stakeholders and the community in report form. Finally, the HIA should have a plan for monitoring the implementation of recommendations.

HIAs also incorporate core values of democracy, equity, sustainable development and ethical use of evidence. Democracy implies participation standards in HIA; those undertaken by government agencies minimally require incorporating feedback from multiple stakeholders. Equity requires consideration of differential impacts with the most vulnerable populations explicitly considered. Sustainable development implies that impacts should be analyzed for current and future generations. Finally, ethical use of evidence acknowledges that this interdisciplinary analysis should present both quantitative and qualitative information from a variety of sources, seeking to use the highest-quality evidence available.

HIA Timeline and Engagement

A key goal of HIA practice is to engage the planning process through ongoing interdisciplinary and community discussions including offering informal and formal feedback throughout the creation of a plan. The figure below shows how both the Master Plan and the HIA process unfolded.



[1] This HIA has been guided by Bhatia R, Farhang L, Heller J, Lee M, Orenstein M, Richardson M and Wernham A. Minimum Elements and Practice Standards for Health Impact Assessment, Version 3. September, 2014 as found on the Society of Practitioners of HIA (SOPHIA) website. https://hiasociety.org/resources/Documents/HIA-Practice-Standards-September-2014.pdf.

The HIA Master Plan has included bi-monthly meetings in which both CCPHD and the HIA consultant have taken an active role. In addition, a subgroup of stakeholders (CCPHD, HACC, and City of Milwaukie) has been meeting regularly since September 2018 to explicitly consider the health impacts as the Hillside proposal was developed. The following documents were created as a result of this HIA work:

- HIA Scope Memo (10/7/18)
- Literature Review Memo (10/07/18)
- Site Research Memo (4/3/19)
- Current Conditions/Survey Memo (4/3/19)
- Analysis Memo for Three Design Concepts – included preliminary recommendations (4/30/19)
- Recommendations on draft Final Scenario Memo (7/12/19)
- Monitoring and Evaluation Plan Memo (8/20/19)

The remainder of this report draws from the documents above to summarize the anticipated health impacts from the redevelopment of Hillside. It is also important to recognize points of public health influence during the planning process. Key discussions in the greater Master Plan process that incorporated health in real time included consideration of:

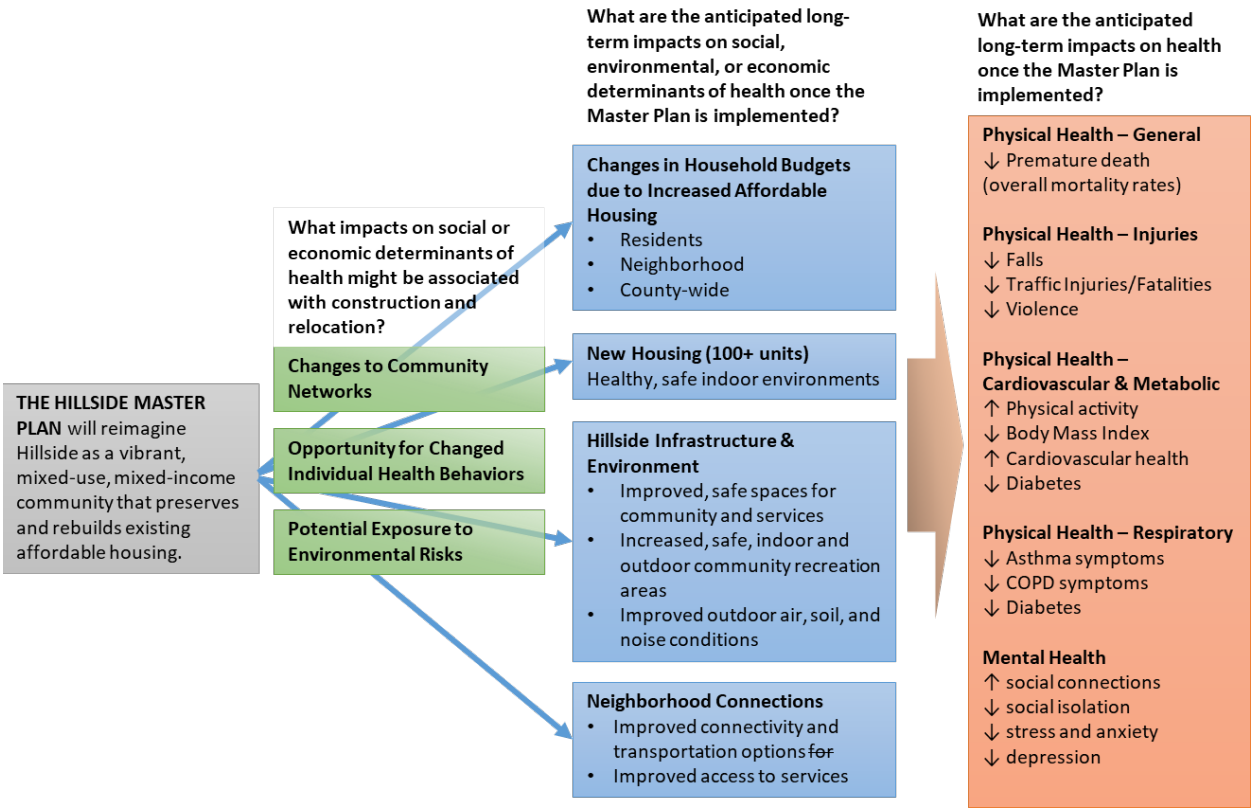
- the importance of community amenities such as community gardens, playgrounds, and walking trails to current low-income residents via the HIA Survey (see subsequent section);
- railroad and traffic as localized pollution sources (diesel emissions, particulate matter) in addition to sources of noise and implications on setbacks and use of Lot C addressed by other consultants;
- reduced parking ratios as a way to support active travel and align with a low-driving population as verified in the HIA Survey.

Additional documentation of the HIA process and how it influenced the master planning process in real time is found in the Evaluation and Monitoring Plan in Appendix C.

Health Pathways

The goal of the Hillside Master Plan is to reimagine Hillside as a vibrant, mixed-use, mixed-income community that preserves the community amenities important to current public housing residents while rebuilding and expanding the stock of affordable housing. The health pathway model (next page) was created early in the HIA process to identify potential short and long term health changes from redeveloping Hillside. While the HIA team was flexible in engaging emerging topics from the Master Plan stakeholder group, every element was discussed at some point. It has been shared with all stakeholders involved in the process including current Hillside residents and community members. It has also guided internal discussions about health impacts, analysis, and recommendations.

This HIA is primarily focused on long-term impacts on social, environmental, and economic determinants of health (blue) and anticipated health outcomes (orange) as a result of the redevelopment of Hillside. However, it is also important to acknowledge that the construction phase may require some relocation and will likely have some disruptive impacts for residents who remain on site.



HIA Data Collection and Community Engagement

HIA practice standards encourage a wide range of analyses and data integration to account for the interdisciplinary nature of plans in which it engages. Data, both qualitative and quantitative, is often a compilation of trends in the academic literature, current conditions sourced from a variety of surveillance datasets, and some limited primary data collection. When possible, HIAs engage the community most impacted by the proposed plan as a data source. An HIA team member attended most community engagement events to listen for health concerns from residents.

Data Collection: HIA Survey

To support understanding the current health conditions of Hillside residents, the HIA team created the Hillside Health Questionnaire in September 2018. Known as the "HIA Survey" to the greater Master Plan effort, this instrument collected data and context about health behaviors and risks including transportation patterns, use of site-specific amenities, and disease prevalence.

The HIA consultant lead the development of the HIA survey; members of the HIA working group contributed to the content and specific wording. Emphasis was placed on creating a questionnaire without jargon or technical language. The final product was 2-pages (see Appendix A) and made available in English, Spanish and Russian. It collected demographics and asked about travel behaviors, access to resources/amenities, and health conditions.

The HIA Survey health conditions questions were modeled after the U.S. Centers for Disease Control and Prevention's (CDC) Behavioral Risk Factor Surveillance System (BRFSS), the gold-standard in chronic disease prevalence rates. This was done so that Hillside results could be compared to BRFSS rates at the county and state levels. It also allows for comparison to the 500 City Dataset – a CDC sponsored small

area estimate at the Census Tract scale based off of county level rates adjusted for demographic factors. This memo reports at all three spatial scales to help contextualize the health vulnerability of Hillside residents.

Respondents were provided multiple opportunities to complete the survey from September through December 2018. The survey was: mailed to every household with pre-addressed and pre-stamped return envelope; available in the Hillside Park main office; and advertised at several public events such as the Food Basket Program and community-oriented Hillside Master Plan meetings. Hillside staff assisted respondents who are sight and motor-functionally impaired.

A total of 94 responses were gathered, an impressive response rate considering the entire complex is approximately 200 households. Six respondents were Russian language; one was Spanish language. Respondents were older; 35% of all respondents between 60-69 years old and 28% reported being over 70 years old. The respondent was about twice as likely to be female as male (57 versus 30 percent). Approximately 61 percent reported receiving Supplemental Security Income. Additionally, survey respondents were more likely to live in the Manor (58%) than the Park (35%). The average reported time living at Hillside was just over 10 years.

The survey played a significant role during the Master Plan process in grounding assumptions about transportation patterns and utilization of community amenities in community-reported data. The survey results are incorporated throughout the remainder of this report. A key way in which public health can continue to be involved in the implementation of the Hillside Master Plan is to re-survey residents at key points in the redevelopment process.

Data Collection: Walking Audit

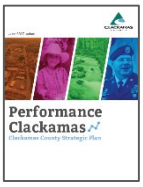
In some HIAs, communities are asked to engage in primary data collection. In April 2019, the HIA team invited stakeholders and community members to collect built environment pedestrian data using a modified version of the Pedestrian Audit of Pedestrian Streetscape (MAPS) Abbreviated[2] tool. A morning training was held with attendance by 4 community members and several non-public health professionals. That afternoon, the HIA team led group audits. Several community members continued the audits over the subsequent couple of weeks.

Data from the walking audit is still being analyzed, however several important themes emerged from this process. Specifically, several of the residents live with mobility-oriented disabilities and were highly attuned to the quality of sidewalks and lack of trip hazards. The audit process also highlighted how important benches and places to sit are for older adults and those with mobility challenges.

[2] http://sallis.ucsd.edu/measure_maps.html

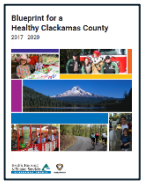
Additional Planning Activities Informing this HIA

The HIA was informed by several strategic planning efforts by Clackamas County and the City of Milwaukie. Many of the developed HIA recommendations work to advance several goals within these plans. Planning efforts and relevant goals/actions include:



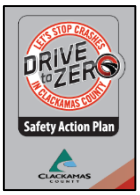
Clackamas County – Performance Clackamas (2017)

- Ensure safe, healthy, and secure communities
- Build strong infrastructure



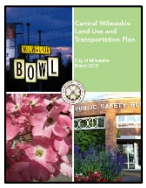
Clackamas County – Blueprint for a Healthy Clackamas County Community Health Improvement Plan (2012-2020)

- Improve physical environments and access to transportation
- Use housing as a platform to improve health



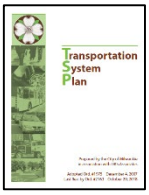
Clackamas County – Drive to Zero Transportation Safety Action Plan (2019)

- Eliminate all fatal and serious crashes by 2035



City of Milwaukie – Central Milwaukie Land Use and Transportation Plan (2015)

- Add a mix of uses to support a district that is lively and active
- Maintain an overall character complementary to and protective of surrounding neighborhoods
- Improve access to and within the area for pedestrians, cyclists, and vehicles



City of Milwaukie – Transportation System Plan (2018)

- Goal 1 Livability: Design and construct transportation facilities in a manner that enhances livability of Milwaukie's community
- Goal 2 Safety: Develop and maintain a safe and secure transportation system
- Goal 3 Travel Choices: Plan, develop, and maintain a transportation system that provides travel choices and allows people to reduce the number of trips by single-occupant vehicles.
- Goal 4 Quality Design: Establish and maintain a set of transportation design and development regulations that are sensitive to local conditions.
- Goal 5 Reliability and Mobility: develop and maintain a well-connected transportation system that reduces travel distance, improves reliability, and manages congestion.
- Goal 6 Sustainability: Provide a sustainable transportation system that meets the needs of present and future generations.
- Goal 8 Compatibility: Develop a transportation system that is consistent with the City' Comprehensive Plan and coordinates with County, State, and regional plans.
- Goal 9 Economic Vitality: Promote the development of Milwaukie's, the region's, and the state's economies through the efficient movement of people, goods, and services, and the distribution of information.

City of Milwaukie – Climate Action Plan (2018)

- Land Use and Transportation Action: Implement the Safe Access for Everyone (SAFE) street and sidewalk improvement program to expand bike and pedestrian access.
- Land Use and Transportation Action: Partner with Metro and TriMet to increase transit service, particularly to underserved employment areas.
- Land Use and Transportation Action: Lower parking ratios near high capacity corridors.
- Vehicles and Fuels Action: Work with Clackamas County, TriMet and Metro to develop micro-transit from park-and-ride or light rail station to local destinations.
- Urban Forest Action: Increase tree canopy to 40% [from 26%] by 2040.
- Urban Forest Action: Work with the Tree Board to develop a tree planting program focused on shielding low income neighborhoods from heat.
- Public Health and Emergency Preparedness Action: Plan for cooling and air quality relief centers
- Public Health and Emergency Preparedness Action: Promote more sophisticated home air filtration systems.

City of Milwaukie – 2019 Urban Forest Management Plan

- Foster urban forest growth to achieve 40% canopy coverage by 2040 and sustain that level through time (in alignment with Milwaukie's Community Climate Action Plan).
- Manage street trees appropriately to maximize benefits and minimize hazards and conflicts with infrastructure.
- Foster community support for the local urban forestry program and encourage good tree management on privately-owned properties.

Current Health Conditions of Hillside Residents

Table 1 shares a demographic overview of the Hillside residents in comparison to the surrounding neighborhood, city, and county. Per the demographic profile completed by Enviroissues to support the public outreach process for the plan, the Ardenwalk-Johnson Creek neighborhood boundary is approximated by Census tract 41005020900.

TABLE 1. DEMOGRAPHIC PROFILES OF HILLSIDE WIITH COMPARISON TO NIEGHBORHOOD, CITY, AND COUNTY

Demographic Indicator	Hillside Campus[1]	Ardenwald-Johnson Creek neighborhood	City of Milwaukie	Clackamas County
% of Households 65+	34%	15%	16.2%	16.5%
Income <$30,000*	94%		25.1%	17.9%
Household with Disability	76%		7.2%	12.9%
White	91%	92%	89.7%	91.9%
Black or African American	7%	2%	3.4%	1.7%
American Indian and Alaska Native	3%	0%	2.3%	1.9%
Asian	0%	2%	6.4%	5.7%
Native Hawaiian Pacific Islander	0%	0%	0.5%	0.6%
Some other race	6% (5% Hispanic, 1% other)	4%	1.6%	2.0%

Source: Hillside and Ardenwald from Enviroissues report; City and County from American Fact Finder – American Community Survey 2013-17.
*US Census cut points are $25-35K; estimates for City and County are extrapolated midpoints.

Currently, there are 295 residents living in approximately 200 units at Hillside. Most household have only one or two people (64% and 25% respectively). In addition to being primarily composed of very low-income households, the Hillside community has more than double the percentage of households over the

TABLE 2. PREVELENCE RATES OF CHRONIC DIESASE FROM SELF REPORTED HIA SURVEY AS COMPARED TO OTHER GEOGRAPHIES

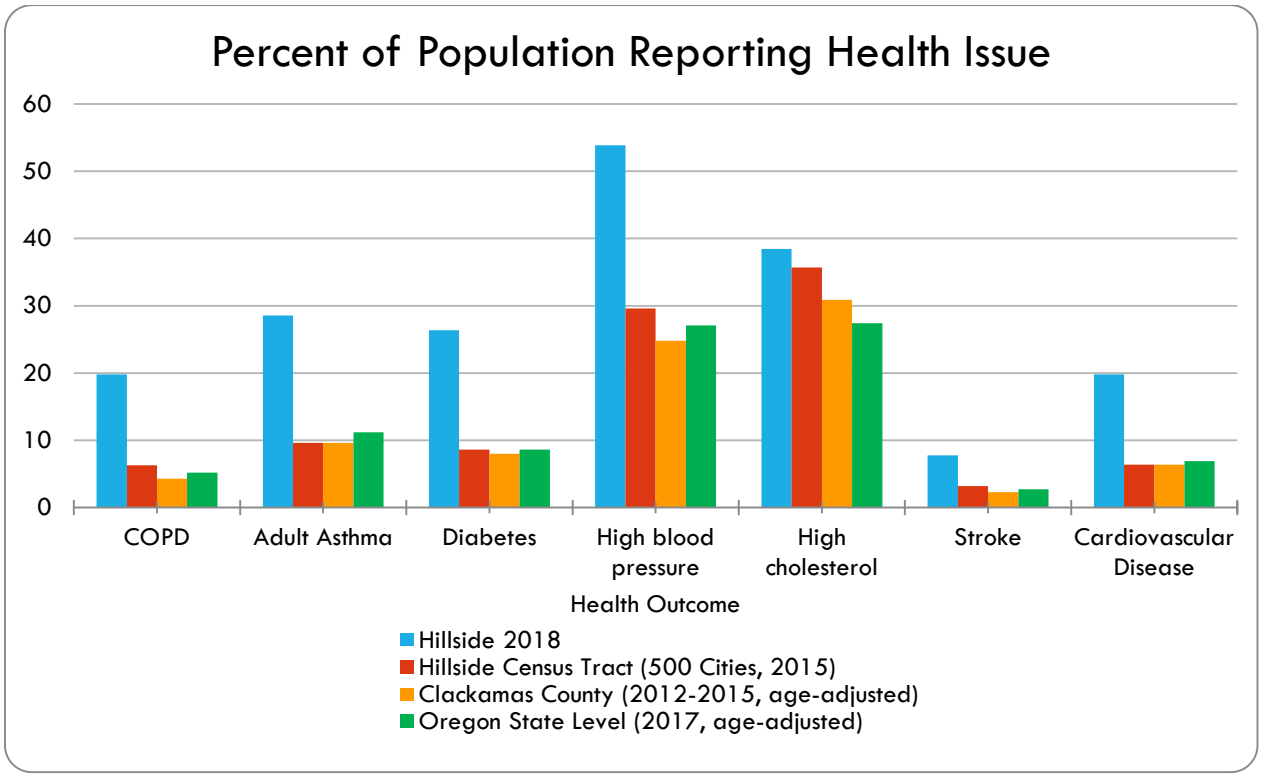
Health Outcome	Prevalence Rate				
	Hillside Survey Respondents (2018)	Hillside Census Tract (2015)[1]	Clackamas County (2012-2015, age-adjusted)[2]	Oregon (2017, age-adjusted)[3]	Oregon (2017, 65+, crude)[3]
COPD	19.8	6.3	4.3	5.2	10.3
Adult Asthma	28.6	9.6	9.6	11.2	14.9
Diabetes	26.4	8.6	8	8.6	19.4
High blood pressure	53.9	29.6	24.8	27.1	53.3
High cholesterol	38.5	35.7	30.9	27.4	49.6
Stroke	7.8	3.2	2.3	2.7	9.1
Cardiovascular Disease	19.8	6.4	6.4	6.9	15.9

1. 500 Cities (derived from BRFFS) https://www.cdc.gov/500cities/index.htm
2. BRFFS as found at https://www.oregon.gov/oha/PH/DISEASESCONDITIONS/CHRONICDISEASE/DATAREPORTS/Pages/index.aspx
3. BRFSS as found at https://www.cdc.gov/brfss/brfssprevalence/

age of 65 than surrounding neighborhood, city, and county. Heads of Hillside households are more likely to be female and 6-10 times more likely to live with disability.

Hillside residents reported significantly higher rates of chronic disease in the HIA survey than surveillance data for the surrounding area would indicate. For example, residents at Hillside reported lung diseases (asthma and Chronic Obstructive Pulmonary disease) 3-4 times more often than residents in Clackamas County or Oregon. Even considering the older age distribution at Hillside and comparing to Oregonians over the age of 65, Hillside residents are about twice as likely to report lung diseases.

Diabetes also is also alarmingly high among Hillside residents: 28.6 percent reported being diabetic, about 3 times the rate of the general population. The rate of diabetes remains high even when comparing to Oregon's 65+ year old population (19.4 percent). This data, combined with residents reporting that their most common travel destination was food shopping, underscores the need to residents to have access to fresh, healthy food on site.



Cardiovascular disease and important risk factors such as high blood pressure are also alarmingly high for Hillside residents. Over half of the respondents (53.9%) reported high blood pressure, nearly twice that of the general population; this rate is also about the expected rate of the over 65 years old population. High cholesterol is only slightly higher than the general population. Residents of Hillside are more than twice as likely to report surviving a stroke than the population at large. Finally, 19.8% of residents of Hillside report having cardiovascular disease, approximately 3 times as likely as the population at large.

Comparisons between the health status of Manor versus Park populations show some interesting differences. Those living in the Manor are more likely to have respiratory disease but have largely better health than their Park counterparts in every other category.

TABLE 3. PREVELENCE RATES OF CHRONIC DIESASE FROM SELF REPORTED HIA SURVEY – MANOR VERSUS PARK

Health Outcome	Prevalence Rate of Hillside Survey Respondents (2018)		
	Manor	Park	All
COPD	22.2	12.1	19.8
Adult Asthma	29.6	24.2	28.6
Diabetes	25.9	30.3	26.6
High blood pressure	50.0	60.6	53.9
High cholesterol	37.0	39.4	38.5
Stroke	5.6	9.1	7.8
Cardiovascular Disease	14.8	24.2	19.8

Analysis, Findings & Recommendations

Analysis of the data collected, stakeholder engagement, and best practices generated a set of recommendations for each health pathway. Recommendations are categorized into four types:

- **Support:** Emphasizes the master plan element as a highly health-promoting aspect.
- **Enhance:** Highlights the master plan element as health-promoting and identifies ways to increase the health benefit.
- **Mitigate:** Suggests ways to lessen potentially health harming aspects or unintended consequences of the redevelopment process or master plan.
- **Study:** Indicates areas for further monitoring of master plan progress and implementation to ensure health across the lifespan of the project.

Increasing the Affordable Housing Stock and Impacts on Households

Provision of deeply affordable housing will remain stable per HUD regulations and there is potential for a significant increase in the amount of moderately affordable housing. **Increasing the affordable housing stock is the primary health impact of the master plan and is highly health promoting.** Housing is considered a fundamental precondition for health and wellbeing. It is clear that being homeless has negative physical (Bernstein et al., 2015; Edidin et al., 2012; Fitzpatrick-Lewis et al., 2011) and mental health (Bassuk et al., 2015; Edidin et al., 2012) implications, though the manifestations may change over the life course (Bassuk et al., 2015; Edidin et al., 2012; Woodhall-Melnik and Dunn, 2016). Housing instability also negatively affects health. A review based on an expert panel suggests that the evidence for rental vouchers benefiting health is solid with less suffering from overcrowding, malnutrition due to food insecurity, and the ills of neighborhood poverty (Lindberg et al., 2010). A recent review's focus on childhood health concludes that while it appears that most studies suggest housing assistance improves child health, methodology and rigor could be improved (Slopen et al., 2018). Vazquez et al (2017) address the research linking threat of eviction and negative mental health (e.g. depression, anxiety, psychological distress, and suicides) and physical health (poor self-reported health, high blood pressure and child maltreatment) outcomes.

TABLE 4. AFFORDABLE HOUSING KEY FINDINGS AND RECOMMENDATIONS

Key Finding	Recommendations
All additional less-than-market-rate units are highly health promoting by decreasing the stress on a household and potentially freeing up budgets for more health promoting goods, services and activities.	SUPPORT: Maximize the number of deeply affordable and below-market rate housing options as this will be the most health promoting aspect of redevelopment. ENHANCE: When deciding on distribution of unit sizes, demand analyses should continue to incorporate *county-wide* waitlists for HACC and, if possible, a tri-county look at affordable housing need. ENHANCE: Avoid studio units in favor of 1-bedroom to provide sense of control and privacy to a population that often has neither. STUDY: Use the H&T Index (https://htaindex.cnt.org/) to monitor joint housing and transportation costs for Hillside units, including market-rate units, to assure affordability at the household budget level. Compare to other options in the HACC portfolio and common areas in both Clackamas County and the tri-county Metro area.

Temporary Impacts During Construction

The demolition and construction period can be stressful to low-income individuals with significant changes to community networks and environmental exposures. This stress may have negative physical and mental health impacts. Clackamas County is strongly committed to supporting residents throughout the entirety of this transition. HACC retains a relocation consultant to work with each resident to understand and meet their needs and desires, both when moving off campus and returning to Hillside. Residents that remain on site during the construction process may have a higher risk of exposure to pollutants unearthed from demolition and remodeling.

Demolition of older homes has a higher risk period for exposure to environmental toxins such as lead (from lead paint) and asbestos. Remodeling and construction are also a period in which there is potential to higher exposures to other pollutants such as "off-gassing" VOCs. The U.S. EPA provides guidance to homeowners about minimizing exposure[3]. Housing authorities must also follow the National Emission Standards for Hazardous Air Pollutants (NESHAP) for asbestos[4] and the Lead Renovation, Repair, and Painting Rule[5]. Minimizing exposure for residents will also improve exposures for workers – an important consideration since the act of retrofitting itself can be a hazard (Jacobs and Forst, 2017).

Social capital is considered protective of non-communicable disease (Hu et al., 2014) and mental health (Nyqvist et al., 2013). An early seminal paper in this area makes a clear distinction between different types of social capital and health. Bonding ties – or close ties – help with daily social support that is foundational to healthy behaviors whereas bridging ties are needed to widen the suite of resources an individual can draw upon (Szreter and Woolcock, 2004). Social capital also buffers negative health effects for low socioeconomic populations (Uphoff et al., 2013). Protecting community ties during construction through minimal relocation is a strategy that will be considered at Hillside. Further, explicitly supporting healthy behaviors such as healthcare access, food access, and circulation within the community can help residents cope with the disruption.

TABLE 5. CONSTRUCTION PHASE KEY FINDINGS AND RECOMMENDATIONS

Key Finding	Recommendations
Demolition and construction phases will result in temporary negative outdoor air, soil, and noise conditions.	MITIGATE: Follow best containment practices during demolition. MITIGATE: Institute quiet hours that meet or exceed all current noise ordinances and communicate this to residents during demolition and construction.
Asbestos and lead are known carcinogenic and neurotoxins, and demolition of housing is a known risk factor for exposure. These substances are now banned, but were commonly used in building materials in the past. New housing will have virtually zero risk; however, the demolition period of current buildings at Hillside may increase risk of exposure, particularly in units adjacent to the area being demolished.	MITIGATE: All contractors involved in the demolition phase must have workers on site that are asbestos and lead abatement certified. Contractors should follow asbestos and EPA Repair, Renovation, and Painting Program (RRP) best practices throughout demolition including an inventory and plan of removal before demolition begins. STUDY/MONITOR: Following EPA Repair, Renovation, and Painting Program best practices should minimize lead risk. However, demolition is a known risk factor (see Question #2) on the Oregon Lead Risk Assessment Questionnaire[6] for children under age 5, triggering a blood lead level test (BLL). This questionnaire and follow-up BLL tests would also be appropriate for pregnant and lactating women. A pre and post demolition BLL to the aforementioned residents would transparently communicate that lead risk has been neutralized.

[3] https://www.epa.gov/indoor-air-quality-iaq/best-practices-indoor-air-quality-when-remodeling-your-home
[4] https://www.epa.gov/asbestos/asbestos-national-emission-standards-hazardous-air-pollutants-neshap
[5] https://www.epa.gov/lead/renovation-repair-and-painting-program
[6] https://www.oregon.gov/oha/PH/HEALTHYENVIRONMENTS/HEALTHYNEIGHBORHOODS/LEADPOISONING/COUNTYHEALTHDEPARTMENTS/Documents/Lead-Screening-Protocol-2016.pdf

Relocation during demolition and construction can stress social ties and reduce social capital.	MITIGATE: Phase construction to support as many households remaining on site as possible. MITIGATE: Provide additional social supports to those who choose to move out of Hillside during the construction phase.

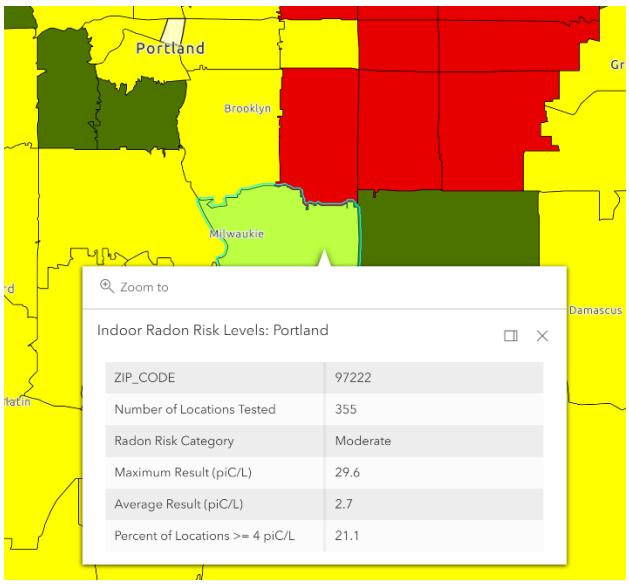
New Housing and Quality of Indoor Living Environments

Redeveloping Hillside will result in replacing 100 units built in the 1950s with units constructed using modern day standards. Substandard housing and housing that does not meet modern day standards increases risk to environmental health exposures and injuries (Jacobs, 2011). A recent review of indoor environmental quality and "social" or public housing (Patino and Siegel, 2018) found strong evidence that public housing is associated with high prevalence of respiratory health conditions, higher levels of PM2.5, and presence of cigarette smoking in the building (Patino and Siegel, 2018). Asthma is generally the primary health concern in indoor environments (Kanchongkittiphon et al., 2015; Krieger, 2010; Krieger et al., 2010; Leas et al., 2018). Hillside residents, as self-reported in the HIA survey, have 2-4 times the rates of COPD, adult asthma rates 2-3 times, and cardiovascular disease 2-3 times the rates of the general population.

New housing is anticipated to reduce indoor allergens (Leas et al., 2018; Tischer and Heinrich, 2013); reduce dampness (Liddell and Guiney, 2015; Mendell et al., 2011); provide more even and efficient heat (Thomson et al., 2013) and air conditioning; reduce smoke exposure (Snyder et al., 2016); and reduce other environmental hazards such as lead (Sandel et al., 2010) and asbestos when following current building standards. Advanced HVAC filtration systems can be particularly helpful in addressing both heat health and air pollution associated with nearby transportation and days with poor air quality associated with weather patterns or wildfires. (See Milwaukie's 2018 Climate Action Plan for more information about climate adaptation and resilience.)

Current building standards will also result in a significant upgrade in seismic readiness and ADA standards. Because the low-income population served at Hillside is older with 63% over the age of 60, adopting universal design elements would further increase safety for older adults and those with disabilities.

There is some concern that a tighter building envelop with new materials may increase exposure to volatile organic compounds (VOCs) and formaldehyde which are known respiratory risks. The tighter envelope may also result in higher radon levels on the ground floor. Radon is a known lung cancer risk and the Portland metro area is considered a high risk area. Although it is difficult to predict the specific exposure at a site, Hillside is in a moderate risk zip code with 21.1% of homes having actionable radon levels as defined by the EPA.



Source: Oregon Health Authority Radon Program, https://geo.maps.arcgis.com/apps/Styler/index.html?appid=b48af2492fac4dd7857e5601c54dbf0f

Appendix B contains more information about the various indoor exposures that may be impacted by implementing the redevelopment of Hillside. The

following key findings and recommendations were developed to support healthier indoor environments at Hillside.

TABLE 6. NEW HOUSING (INDOOR ENVIRONMENTS) KEY FINDINGS AND RECOMMENDATIONS

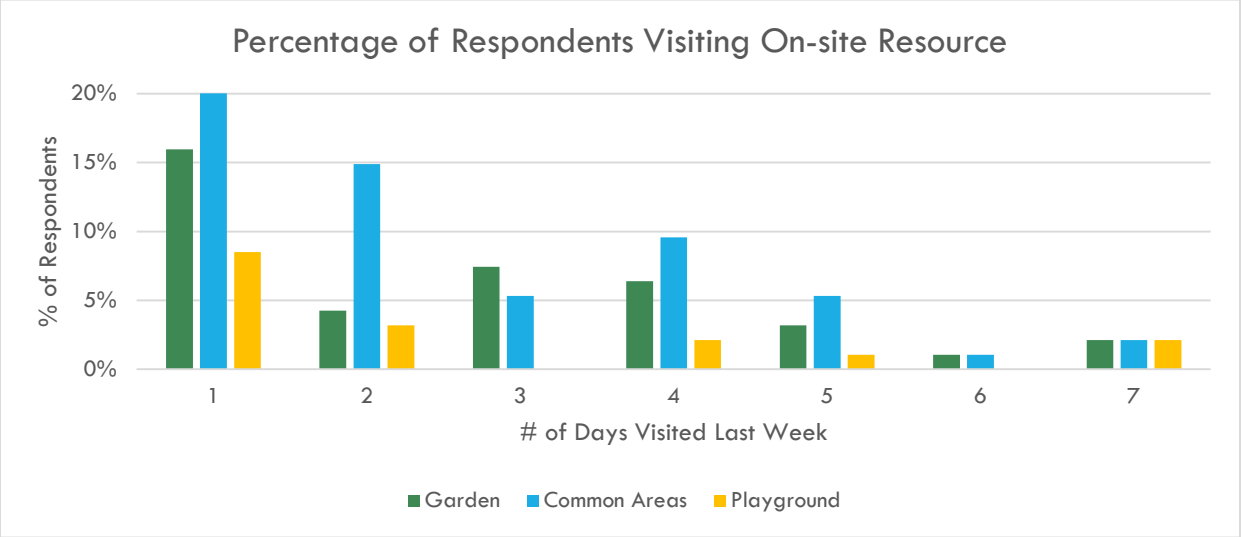
Key Finding	Recommendations
Respondents to the Hillside HIA Survey reported lung disease such as asthma (28.6%) and COPD (19.8%) at much higher rates than expected.	STUDY: Continue to monitor asthma and COPD rates to understand vulnerability, particularly for low income residents, using future waves of the HIA Survey.
Indoor air quality could worsen due to the following: Off-gassing from new materials and tighter envelopes could put residents at higher risk for VOC and formaldehyde exposure. Choice of materials including flooring (carpet versus laminate) has been shown to harbor dust, a known trigger for people with asthma.	MITIGATE: Install electric cooking appliances to minimize carbon monoxide inside homes. MITIGATE: Partner with Clackamas County Sustainability to train residents and staff about green cleaning agents in individual units and in common areas. ENHANCE: Set aside 40% or more of units as "Breathe Easy" units including installing low-VOC finishes, no carpet, and an energy recovery ventilator (ERV) with a filter, which captures 99 percent of air particulates and reduces indoor air humidity while achieving 70 to 80 percent energy recovery. (See "Breathe Easy Homes", Seattle Housing Authority[7]).
Indoor exposure to radon is difficult to predict in new housing. However, Hillside is located in a moderate risk area[8]; this combined with assumed tighter building envelopes suggests monitoring is appropriate.	MONITOR: Develop a pre-occupancy monitoring plan for radon for all ground floor units.
Housing smoking policy, including on public sidewalks and courtyards, can expose residents and visitors to second hand smoke. There is no safe level of exposure to second-hand smoke.	MITIGATE: To protect the greater population, enforce a strict nonsmoking policy in all buildings, common areas and within 25 feet of building entrances, including commercial buildings. Pair with aggressive smoking cessation programs.
Units along 32nd Ave and along the railroad tracks are at higher risk for respiratory, cardiovascular events, and cancer from increased exposure to particulate matter, emissions, and noise. Even with the additional setback, Lot C continues to be at risk for noise and air pollution from diesel trains.	MITIGATE: High-efficiency HVAC systems will reduce noise and indoor exposure to exhaust and pollution from the train and traffic if installed in units adjacent to these known risk sources. SUPPORT: The HIA team recognizes the effort made to set back new buildings as far as possible from the railroad tracks on Lot C, increasing the overall setback from current housing in Hillside. MITIGATE: Remove the 55 units on Lot C or designate Lot C units as market rate in order to place the least vulnerable populations close to the noise/emissions source. Units could be replaced with more community space to accommodate services and amenities for residents. MITIGATE: Ask the railroad to idle south of Harrison in a commercial area instead of along the property to reduce diesel emission exposure and noise to Hillside residents and neighboring Ardenwald neighborhood.
Respondents to the Hillside HIA survey tended to be older with 63% over the age of 60. New housing will meet all	ENHANCE: Incorporate as much universal design as feasible to reduce trip hazards and support an older and disabled population to age in place.

[7] https://www.seattlehousing.org/about-us/redevelopment/high-point-redevelopment/breathe-easy-homes
[8] https://www.oregon.gov/oha/PH/HEALTHYENVIRONMENTS/HEALTHYNEIGHBORHOODS/RADONGAS/Pages/zipcode.aspx

ADA requirements, increasing safety for older adults and those with disabilities.	ENHANCE: Seek contractors/developers that specialize in aging-in-place design and construction. ENHANCE: Continue to engage with residents on what features are most important to them within the units.

Outdoor Infrastructure and On-site Community Amenities

Redeveloping Hillside will improve the general community infrastructure including outdoor and on-site community amenities. It is important, however, to make sure the planned Hillside exceeds the current experience of residents by including the amenities they already use on a daily basis. To document these health-promoting amenities, residents were asked to recall how many times they visited three resources in the past week: the community garden, common areas, and the playground. Common areas were the most popular with 59 percent reporting at least one visit; 18 percent reported visiting these areas at least four times a week. Forty (40) percent of residents visited the community garden at least once. Seventeen (17) percent reported visiting the playground at least once.



Respondents were also asked to write in other important public spaces. The walking path was mentioned most (7 times) while the garden (4 times) and play areas (2 times) were also reiterated. Other outdoor spaces mentioned included basketball courts, a smoking area, picnic tables and benches, the parking lot and balconies. Indoor spaces mentioned included the laundry room (8 times), fellowship room (3 times), computer room (2 times) and elevator/lobby spaces (2 times). The community center, office, mail area, and garbage/recycling centers were also mentioned as important public areas.

TABLE 7. RESIDENT REPORTED USE OF HILLSIDE AMMENITIES IN HIA SURVEY – OUTDOOR AND INDOOR SPACES

Outdoor Spaces	# of Mentions	Indoor Space	# of Mentions
Walking Path	7	Laundry	8
Garden	4	Fellowship Room	3
Play areas	2	Computer Room	2
Basketball courts	1	Elevator/Lobby	2
Smoking area	1	Community Center	1
Parking Lot	1	Office	1
Balconies	1	Mail	1
Picnic tables and benches	1	Garbage/Recycling Area	1

A key goal of the redeveloped Hillside is to increase sustainability through extensive green infrastructure. Green infrastructure and green space is associated with increased physical activity, health, social capital, and wellbeing, particularly in older adults (Hong et al., 2018; Jennings and Bamkole, 2019; Ulmer et al., 2016). Access to greenspace and parks has been shown to protect health with the most likely cause being increased physical activity and reduced stress (Aerts et al., 2018; van den Bosch and Sang, 2017). Access to greenspace has also been an important environmental justice topic. Recent reviews suggest there may not be a differential in access to greenspace and parks as measured by proximity; the literature however shows that low-income populations have smaller parks of lower quality (Boulton et al., 2018; Jennings and Gaither, 2015; Rigolon, 2016).

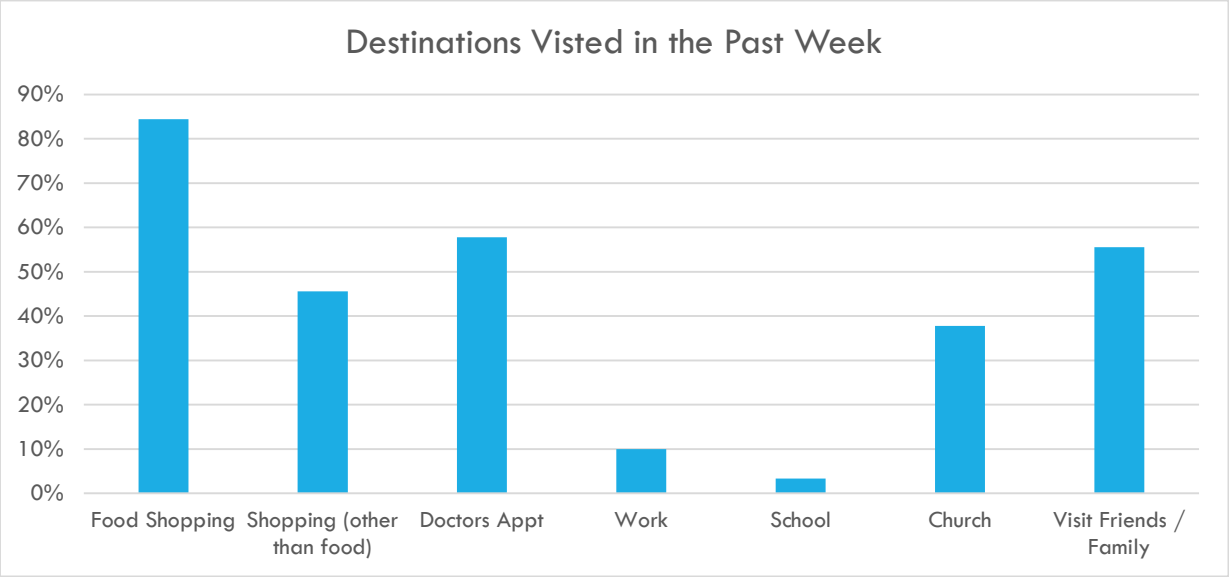
TABLE 8. OUTDOOR ENVIRONMENTS, INFRASTRUCTURE, AND AMMENITIES KEY FINDINGS AND RECOMMENDATIONS

Key Finding	Recommendations
Outdoor air, soil, and water conditions should remain stable or improve in the long run.	MITIGATE: Follow best containment practices during demolition. ENHANCE: Aggressive use of green infrastructure will support improved outdoor environmental conditions and resident experiences.
After expanding the housing stock, physical activity associated with active living is expected to be the most health promoting aspect of Hillside. With thoughtful design and implementation of best practices, outdoor and indoor community areas will be improved, safe and inviting. Current plans suggest that courts and playgrounds are being replaced and that playgrounds space is being slightly expanded. The community garden remains but no additional gardens have been identified. Laundry facilities remain unclear.	ENHANCE: Match or exceed per-capita square footage of current amenities including: meeting space, laundry facilities, community gardens including smaller pocket gardens, and playground/courts. MITIGATE: Activate the space along the railroad by including pedestrian oriented design, good lighting, and emergency phones. ENHANCE: Partner with NCPRD to provide longer-term programming and maintenance and to coordinate with Belfour Park site. ENHANCE: Explore the addition of dog park in the northwest lot. ENHANCE: Strategically place benches throughout the site, under tree canopies whenever possible, and in conversational clusters to support older adults and those with disabilities. Identify the conversational clusters to increase social capital.
Redevelopment of Hillside will increase impervious surfaces, increasing the urban heat. Risk of heat-related illnesses are expected to rise in coming decades with infants, older adults, and individuals with respiratory disease at increased risk. Respondents to the Hillside HIA survey tended to be older with 63% over the age of 60 and reported lung disease such as asthma (28.57%) and COPD (19.78%) at much higher rates than expected.	MITIGATE: Air conditioning, insulation, wall thickness, shading from direct light, site orientation, and natural ventilation at night can help protect against heat-related illnesses. MITIGATE: Consistent with the 2018 Milwaukie Climate Action Plan, install high quality HVAC that includes air-conditioning. Pair with financial assistance in summer months for low-income households. MITIGATE: Tree canopy is considered best practice for shading and thus should be maximized on the site along south and western facing walls, on green roofs, and in parking lots. Overall site coverage should meet or exceed 40%. MITIGATE: Playgrounds and nearby seating areas for adults should be covered with a sun shade to reduce both ambient and surface temperatures, prevent burns and enhance physical activity levels. Shading the basketball court with a waterproof material would likely increase use during both rainy months and high heat. ENHANCE: Community gardens – a highly valued amenity visited by 40% of current residents in the past week – should be expanded significantly with explicit space identified in the master plan to meet community values, diet security, and green-infrastructure goals.

	STUDY: Monitor ambient and surface temperatures throughout the site to verify green infrastructure is meeting goals in reducing surface temperatures on buildings, green roofs, parking lots and sidewalks. Study could also identify areas where increased greening would be beneficial.

Connecting Hillside Residents to the Greater Community

Connections to the community are important to help meet basic daily needs such as employment, shopping for food, and attending medical appointments. Low-income households are often located in areas with poor access to goods and services that are important to health. For example, low-income households have worse access to affordable, healthy food (Caspi et al., 2012; Gamba et al., 2015; Lytle and Sokol, 2017; Walker et al., 2010). Low-income individuals and those with disabilities are also less likely to rely on a personal car for transportation. While this could potentially prompt more active travel (walking and biking), it also restricts access the activities and health promoting resources. Current residents of Hillside were asked to recall if they traveled to some common destinations in the past week and the mode of transportation used in the past week to better understand these needs.



Shopping – including for food – is a common reason to leave Hillside. Eight-four (84) percent reported shopping for food off-site; 46 percent reported shopping for items other than food. A little over half (56 percent) visited family or friends in the past week; 38% traveled to church. Very few (10%) traveled to work and even fewer (4%) reported traveling to school.

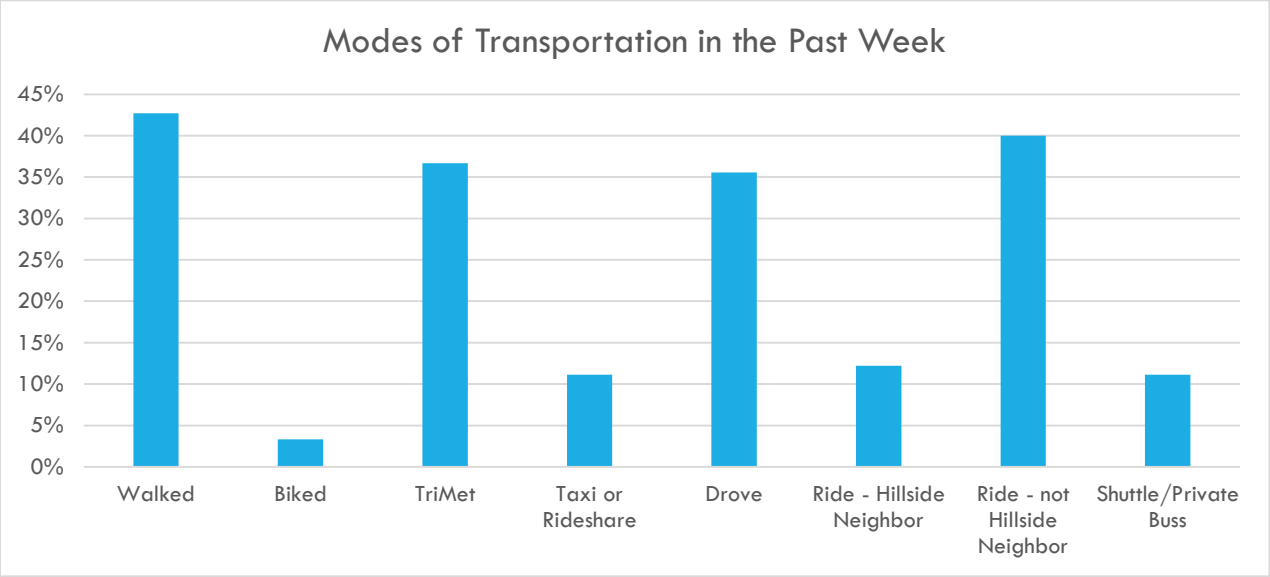
A remarkable **58 percent of respondents reported attending a doctor's appointment in the past week**. To put this in perspective, the average person in the U.S. visits a doctor, outpatient facility, or emergency room 4 times a year. The average senior visits 7-8 times a year or about once every seven weeks; this works out to 14 percent of seniors having a doctor's appointment weekly[9]. Hillside residents are high utilizers of the healthcare system with medical appointments at about 4-8 times the rate of the general population. Much of residents' demand for travel is linked to this healthcare need. Increased distance or travel time to healthcare providers is associated with worse health outcomes (Kelly et al., 2016).

Residents were also asked about how they traveled in the past week. **Only 36 percent of respondents reported driving in the past week;** this is significantly less than the 83 percent that report driving every or

[9] https://www.cdc.gov/nchs/data/hus/2017/076.pdf

most days in a recent Gallup poll[10]. Because of this, residents at Hillside are far more dependent on alternative modes of transportation. TriMet (37 percent), taxi/rideshare (11 percent), and paratransit (11 percent) indicate a high demand for alternative mechanized modes. Almost all of those reporting using these modes did not report driving. It is also notable that while 40 percent rode with a non-Hillside neighbor, only 12 percent reported riding with a neighbor from Hillside. Forty-three (43) percent walked to a destination, suggesting care should be taken in supporting the pedestrian neighborhood around Hillside.

Comparing Manor to Park residents illustrated some similarities and differences. Destinations were very similar with Park residents slightly more likely to go to a doctor's office, school, or church. Rates of walking, biking, Taxi/rideshare and rides from neighbors were similar. Manor residents are slightly more likely to take the bus (42%), less likely to drive (30%) or take a shuttle bus (8%), and much more likely to get a ride from someone not living at Hillside (51%).



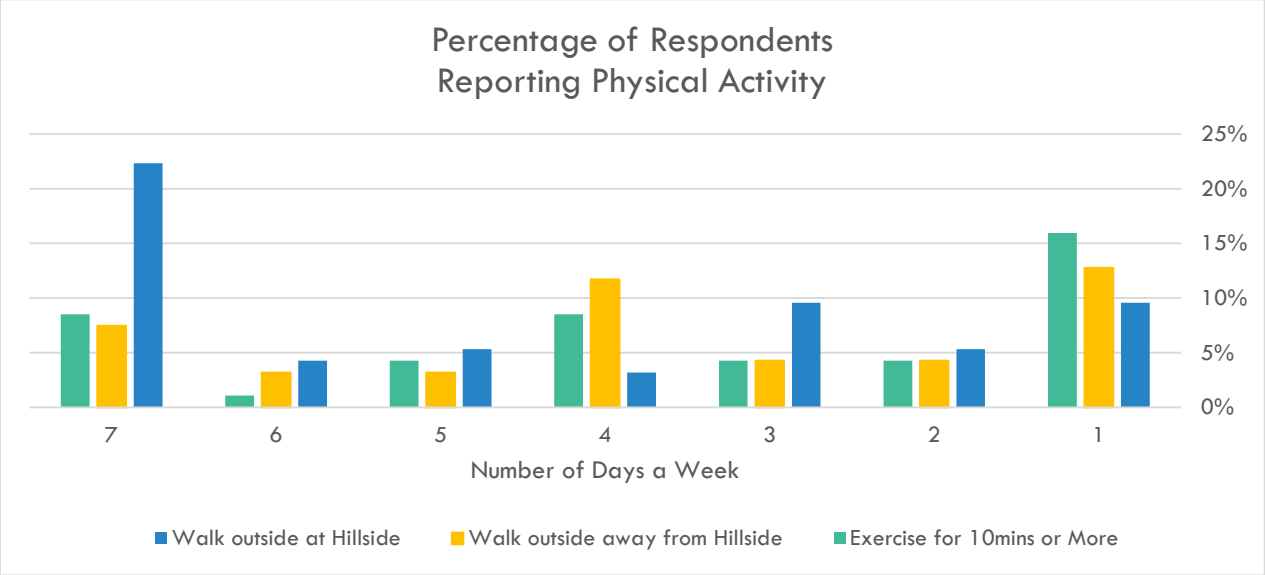
The proposed Hillside Master Plan will greatly improve the pedestrian and bicycling experience in the neighborhood via improved connectivity, newer sidewalks, and a better pedestrian streetscape. While not all residents will be able to bike or take long walks, neighborhood environment characteristics that influence walkability (like density and connectivity to destinations) and access to parks and green space influence physical activity levels (Hunter et al., 2015; Smith et al., 2017) and levels of chronic disease such as diabetes and cardiovascular conditions. A recent analysis of multiple public housing developments showed that increases in density and improvements in pedestrian environments increased physical activity among public housing residents (Parker et al., 2016), while perceived safety is a primary barrier to public housing residents walking for physical activity (Bennett et al., 2007).

To understand the need for walkable environments, Hillside residents were asked about their travel and exercise habits. Respondents were asked about their physical activity levels: "how many days a week do you exercise for 10 minutes or more?" Only 14 percent reported getting this minimal amount of exercise 5 or more days a week, significantly less than federal guidelines are for 300 minutes of moderate activity (60 minutes a day, 5 days a week). When combined with the high rates of chronic disease reported by

[10] https://news.gallup.com/poll/236813/adults-drive-frequently-fewer-enjoy-lot.aspx

residents, it is clear that **Hillside residents would benefit greatly from any additionally physical activity prompted by gardens, walking paths, and easy-to-walk-to destinations.**

Residents were asked how many days a week they walked around the Hillside property and walked offsite away from Hillside. Sixty percent of respondents reported walking around the Hillside property at least once a week. At least one out of five residents (22%) report walking *daily* around the Hillside campus. This supports the data presented in the previous section that the walking path is a highly valued community space and resource. Fewer – only 47 percent - reported walking off the Hillside campus more than one day a week, suggesting that connections to nearby amenities could be improved.



Increased density as proposed in the Master Plan will support more and closer destinations and services; this is a known facilitator of walking and other healthy behaviors. However, this density can also bring multi-modal conflicts if the built environment is not well designed. A key tenant of Clackamas County's 2019 *Drive to Zero Safety Action Plan*[11] is to protect vulnerable users such as pedestrians and cyclists through safe infrastructure design. It calls for roads that

> "integrate pedestrian safety considerations by providing pedestrian infrastructure, encouraging slower motor vehicle speeds, and minimizing conflict points between pedestrians and motorists [through]:
>
> - Sidewalks, pathways, and other walkways separating pedestrians from motor vehicles along roadways
> - Enhanced roadway crossings, where appropriate
> - Pedestrian-focused traffic signal timing, such as elimination of permissive right-turns on red and leading pedestrian intervals."

Similarly, the *Drive to Zero Safety Action Plan* recognizes that roadway design must also integrate appropriate bicycle infrastructure, encourage slower motor vehicle speeds, and minimizing conflict points via shared lane markings, wayfinding, and where necessary, traffic calming for lower speed and volume roadways. It also suggests "increasing physical separation between people biking and motor vehicles as motor vehicle volumes and speeds increase, including physical barriers at higher speeds and volumes." Attention to bicycle infrastructure is particularly important due to the extension of SE 29th as a bike

[11] https://dochub.clackamas.us/documents/drupal/ae811741-789e-465c-9b79-9fba2261ccd0

boulevard; this makes the intersection of SE 29th and Meek as well as Meek and SE 32nd particularly important for reduced conflicts between bikes, pedestrians and motor vehicles.

The following table outlines strategies to mitigate these conflicts and enhance healthy travel behaviors.

TABLE 9. TRANSPORTATION AND CIRCULATION KEY FINDINGS AND RECOMMENDATIONS

Key Finding	Recommendations
Current residents drive far less than most residents in region with only 36% of residents in the HIA Survey reporting driving in the past week. The vast majority of residents in the HIA Survey report one or more chronic conditions that could be improved by regular walking. The new master plan improves connectivity, particularly for active modes, within the site which is likely to improve active transportation rates, a demonstrated way to improve physical activity and reduce chronic disease. National evidence suggests walking paths are the most used physical activity amenity by older adults in parks and open spaces. Nearly 10 percent of HIA Survey respondents reported visiting the walking path in the last week.	SUPPORT: Proposed parking ratio will help increase non-motorized travel and thus improve active transportation. ENHANCE: Incorporate aggressive complete street design that designates uses (cars, bikes, pedestrians including those with walkers or wheelchairs). ENHANCE: The walking path should be resurfaced to encourage use and prevent falls from uneven pavement. ENHANCE: Incorporate wayfinding that emphasizes the number of steps and times to different destinations on the site (i.e. community center, community garden). ENHANCE: Ground-level retail on 32nd should be oriented towards both sides of the street. ENHANCE: Residential buildings should have entrances both towards parking and towards the "back" or street side. In cases where the building is mixed use, residential should have its own secured entrances. ENHANCE: Secure, covered bicycle parking should be identified in 2-3 spots throughout the campus in the master plan.
Multi-modal transportation conflicts are likely to increase without very explicit design to mitigate. This will also encourage active transportation and reduce injuries.	SUPPORT: Extending the bikeway down SE 29th will increase active travel. MITIGATE: The residential density with accompanying increases in motorized traffic suggest SE 29th should be upgraded from a sharrow/bike boulevard to a marked bicycle lane. MITIGATE: The intersection of SE 29th and SE Meek should clearly mark and prioritize bicyclists. MITIGATE: Complete and connect the sidewalk on the southwest corner of the manor for walkers to enjoy a complete walking loop. MITIGATE: The multi-modal needs for intersection of SE 32nd and SE Meek needs to be designed before finalizing the building footprint in Lot A. Specifically, a 2-stage "jug handle" turn for northbound bicyclists needs to be designed while also maintaining the bus stops and pedestrian island. This intersection should also have a flashing beacon installed for both pedestrian and cyclists.
The current population at Hillside is highly dependent on rides to meet basic needs. 37% reported taking TriMet, 40% rode with a non-Hillside neighbor, 11% took taxi or rideshare, and 11% took paratransit in the last week according to the HIA Survey.	MITIGATE: The length and grade of the walk from the Manor to current bus stops combined with the increased density of a built out Hillside suggests engaging Tri-met to reroute the bus closer to the Manor.

Connectivity to resources in the nearby community and within the county could be enhanced.	MITIGATE: Pickup and drop-off areas for ride shares, para-transit and other short-term visitors/service providers should be explicitly identified in the master plan. ENHANCE: Engage Providence to consider a shuttle at peak times to the Max. ENHANCE: Identify bike and pedestrian enhancements already on the priority list and work with the City to raise the priority level to accurately reflect the at-risk population and increase in population density. ENHANCE: Increase the pedestrian and bicycle specific facilities including continuous sidewalks, bike lanes, and wayfinding between Hillside park and open space and Belfour Park. ENHANCE: Consider where a bike share station could be sited in the future. ENHANCE: Actively consider the basic needs of public housing residents (i.e. fresh food) when seeking ground-level retail tenants.

Planning for Implementation and Beyond

The final step of an HIA is to evaluate the process and monitor implementation of recommendations. Appendix C contains an Evaluation and Monitoring Plan, linking each recommendation with potential performance measures. It also links performance measures to partners that need to be engaged for implementation and/or to provide data for monitoring. HACC is often the lead agency to address the recommendation; CCPHD is also willing to continue to be an active partner. However, consistent collaboration with the following partners will lead to smoother implementation and a healthier Hillside:

- Oregon Health Authority, Environmental Public Health Division holds deep expertise in environmental hazards including in asbestos, lead, radon as well as chronic disease prevention of asthma, cardiovascular disease and diabetes.
- Clackamas County, in addition to CCPHD, also has the following divisions with interest in collaboration:
    - Transportation holds expertise in active transportation design;
    - Clackamas County Sustainability could help with training on indoor cleaning to reduce asthma;
    - Social Services will be essential during any relocation of county residents.
- City of Milwaukie will remain a partner and decision maker as issuer of zoning changes, parking requirements, and building permits. Redevelopment of Hillside is an excellent opportunity to meet safety, equity, sustainability, and climate goals articulated in existing City of Milwaukie plans including the 2018 Transportation System Plan and 2018 Climate Action Plans. Collaboration with its transportation department will likely improve the active transportation facilities. Collaboration with sustainability and green infrastructure staff will also strengthen the new Hillside.
- North Clackamas Parks and Recreation Department runs parks – including Belfour Park – in the Milwaukie. They could potentially play an active role in maintenance and programing of Hillside open spaces.
- Regional health systems such as Providence, Kaiser Permanente NW, and Legacy all have a vested interest in preventative care and embedding health in the environment to reduce costs. Each should be approached as service partners and potential funders of community amenities. Providence, as a neighbor, could also play a more active role in community-based transportation options such as hosting a bike share and/or a commuter shuttle to the MAX station.
- The choice of architecture, design, and landscape architecture firms will be important for implementation of healthy design choices. A firm that has expertise in universal design, green design, and active transportation will be needed to support the unique needs of this project.

In addition to the active collaboration with partners mentioned above, the Monitoring Plan suggests convening the HIA team twice a year to discuss performance measures and monitor progress towards recommendations.

Conclusions

Affordable, quality housing is a basic human need that facilitates healthy environments and habits. Redevelopment of HACC's Hillside property will promote health by drastically increasing the stock of affordable housing. Care should be taken to support current residents during the demolition and construction phases. The new housing is expected to be better in quality and thus indoor environmental quality. Similarly, the outdoor environment is expected to improve, particularly for pedestrians and bicyclists and through extensive green infrastructure. HACC should prioritize community amenities such as community gardens, playgrounds, and walking paths important to residents and facilitators of healthy habits. HACC should also continue to engage community partners to link residents to social services and destinations needed by this population. These and other recommendations in this report will help support the new Hillside as a vibrant and healthy community.

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Health Survey[12] for Hillside Residents

Dear Hillside Resident,

As part of the planning for the future of the Hillside community, we are working with the Clackamas County Public Health Division to better understand health conditions of residents.

This survey is an optional list of questions to gather information about your current health and how you get services and access to things you need. The information we get from the survey will help us prioritize the kinds of services residents need to be healthy.

The survey is anonymous and we will not know who has completed it. We will only share a summary of how everyone answered. The information you and your neighbors give us will be used in the plan for the redeveloped community.

If you need help with this survey, please stop by Angel's office hours onsite any Wednesday from 9-11AM in the Hillside Community Room. Or call 503-650-3165 to ask for another time to meet with Mary-Rain.

Thank you for your help!

[12] Note that the original survey and cover letter was translated into Spanish and Russian.

Why is a health analysis a part of developing new housing?

- We hope to make sure that the new buildings in the Hillside Park area help resident's health.

What are you doing with this survey?

- If a lot of residents fill it out it, we will know what kind of health, resources, and transportation challenges we need to plan for.
- We will make a short summary that will be communicated to you in January 2019.

I'm worried about sharing my information.

- It is anonymous, so nobody will know these are your answers.

Why so many transportation questions?

- Transportation takes you to things you need (food, doctor, appointments). Walking or walking to transit also helps you get physical activity.

I already filled this out at another meeting or place. Should I do it again?

- No. One survey per person is enough.

I don't have time to fill this out right now.

- That is ok. You can take it and return it to the Hillside office. However, you will be entered in a drawing for a $25 Visa card if you do it right now.

Can I fill this out for my neighbor or roommate and enter the drawing twice?

- No. You can help, but just one per person please.

I need help filling this out.

- Please go visit Jamilla, Angel, or anyone else in the Hillside office.

I am worried about having to move.

- Yes, we know that is concerning. This is still several years away. At that time, the Housing Authority will have help in making the transition as easy as possible.

I have a health condition that I need help with.

- We are not trained doctors. Please see the Hillside office to get connected to medical help.

As a part of the redevelopment planning for Hillside, a Health Impact Assessment is being done to understand how Hillside currently helps support health and wellbeing of residents. This survey is anonymous; answers will only be used to describe Hillside and will not be attributed to you personally. You can return it to the Hillside Manager's Office. If you have questions, please contact Nicole via irozelardo@gmail.com or call 971-313-9160.

Do you live at the Hillside complex? □Yes, I live in the *tower* (Manor)
□Yes, I live in a *house* at Hillside
□No, live *near* Hillside but am not a Hillside resident

How long have you lived here? _____

Do you receive SSI? □Yes □No

How old are you?

12-17 years	18-29 years	30-49 years	50-60 years	60-69 years	70+ years
□	□	□	□	□	□

Do you identify as:

Male	Female	Gender nonconforming
□	□	□

Has a doctor, nurse, or other health professional *ever told you that you had* any of the following health conditions (check the box):			
	YES	**NO**	**NOT SURE**
Diabetes			
High Blood Pressure (Hypertension)			
High Cholesterol			
Coronary Heart Disease (Angina)			
Stroke			
Asthma			
COPD, emphysema, or chronic bronchitis			
Depression or Mood Disorder			
Other (please specify) _____			

Where do you get health information? (circle all that apply)	
Doctor/nurse	Internet search
Friends	Social media (Facebook, Twitter, etc.)
Family	Social service provider
Other (specify):	

In the last week (7 days), on *how many days*[13] did you……	
Walk outside at Hillside for exercise or to walk your dog?	1 2 3 4 5 6 7
Walk to a store, work, school, or an appointment?	1 2 3 4 5 6 7
Exercise (in addition to walking) for 10 minutes or more?	1 2 3 4 5 6 7
Visit or work in the community garden?	1 2 3 4 5 6 7
Spend time in an indoor common area (recreation room, laundry, etc)?	1 2 3 4 5 6 7
Spend time at the playground?	1 2 3 4 5 6 7

What public spaces in the Hillside Complex are important to you?

In the last week, where did you travel? (circle all that apply)	
Food shopping	School
Shopping (other than food)	Church
Doctor's appointment[14]	Visit family or friends
Work	Other appointment

Did you travel to other places last week not listed above (please specify)?

_____

Where is your primary care doctor's office located? _____

Which hospital/insurance system do you use? _____

In the last week, what method(s) of transportation[15] did you use? (circle all that apply)	
Walked	Drove yourself
Biked	A ride from someone who lives at Hillside
TriMet (Bus or MAX)	A ride from someone **not** a Hillside resident
Taxi or Rideshare (Uber, Lyft)	Shuttle/Private Bus Service (LIFT, etc.)

Is there anything else you want to tell us about your health?

[13] Future versions of the survey should add "None" as a choice.
[14] Because of the high volume of medical appointments, future versions should consider breaking this category out to routine versus emergent medical appointments.
[15] Future versions should add a question about car and bike ownership/parking and consider harmonizing transportation questions with state and national travel surveys.

APPENDIX B – Likely Impacts of Indoor Environmental Quality Pathways

The likely impact, its magnitude and direction, severity of impact, scientific strength of evidence and differential impacts on particular populations are provided in the table below.

Health Determinant	**Magnitude /Direction of Health Impact from Plan**	**Severity of Impact on Quality or Quantity of Life**	**Scientific Evidence Strength**	**Notes on Assumptions and/or Differential Impacts on Vulnerable Populations**
Reduced Microorganisms (mold, mildew)	++	Moderate	***	Higher impact on individuals with respiratory conditions
Reduced Airborne Particles (particulate matter from diesel and traffic emissions; pollen; wildfire smoke)	++++	Moderate - High	****	This assumes high quality HVAC to filter outdoor air. Higher impact on individuals with respiratory or cardiovascular conditions
Increased volatile organic compounds (VOCs) and formaldehyde	--	Moderate	***	Higher impact on individuals with respiratory conditions. Indoor finishes can be highly variable.
Household Odors (cooking smells, etc.)	+	Minor	*	
Reduced Lead Risk	++++	High	****	New housing will eliminate lead paint risk within units. Children under age 6 and pregnant women most vulnerable during demolition.
Asbestos	++++	High	****	All new housing will eliminate asbestos risk.
Radon	++++	Moderate - High	****	Hillside is in a moderate risk zip code with 20.7% of homes having actionable levels. Bedrooms on the ground floor are at highest risk.
Smoking	+++	High	****	Assumes the campus will become smoke free.
Flooring choice (carpet vs linoleum)	+++	Moderate	***	Hard flooring can reduce irritants for those with pre-existing respiratory conditions.
Reduced Falling Hazards	+++	Moderate - High	***	Universal design will help minimize risk.
Noise	++	Moderate	***	Indoor noise from traffic and trains highly dependent on window placement.
Seismic Upgrades	++	Major	****	

APPENDIX C – Evaluation and Monitoring Plan

The final HIA step is to evaluate and monitor the impact of the HIA and its effects on social determinants of health and health outcomes. The following sections briefly document the HIA process as a preliminary process evaluation and provide a plan for ongoing monitoring.

HIA Process Evaluation

HIA practice standards state "The HIA may be evaluated in terms of process. Process evaluations attempt to determine the effectiveness of how the HIA was designed and undertaken." While a full process evaluation is not included in the scope of work, the following is being documented to help with future evaluation work.

Funding, Sponsors, and Facilitation

This HIA was funded by a grant to HACC awarded by Metro. HACC and CCPHD jointly sponsored the project with HACC maintaining administrative control while CCPHD served as the convening sponsor. The grant was used to hire an HIA consultant – Dr. Iroz-Elardo – through a competitive RFP process. The consultant facilitated meetings and drafted materials; the HIA team, including CCPHD, consistently provided written feedback on all draft materials.

Composition of HIA Team

One strength of HIA practice is the ability to draw from a breadth of expertise in identifying and analyzing health impacts from the proposed plan. The core HIA team can influence the types of health impacts considered. The following individuals participated in the HIA team over the life of the project:

- **Nicole Iroz-Elardo,** PhD - HIA Consultant and expert in HIA including health impacts of land use, transportation and housing plans; Assistant Research Professor in Planning at University of Arizona
- **Jamie Zentner,** Masters of Public Health - Program Planner at Clackamas County Public Health
- **Angel Sully,** Bachelors in Community Development – Affordable Housing Developer for Housing Authority of Clackamas County
- **Jemila Hart,** Masters of Social Work – Employment and Education Services Coordinator for the Housing Authority of Clackamas County

There was significant turnover in agency staff during the year this HIA was completed. These individuals provided important feedback while employed by participating agencies but changed employment before completion:

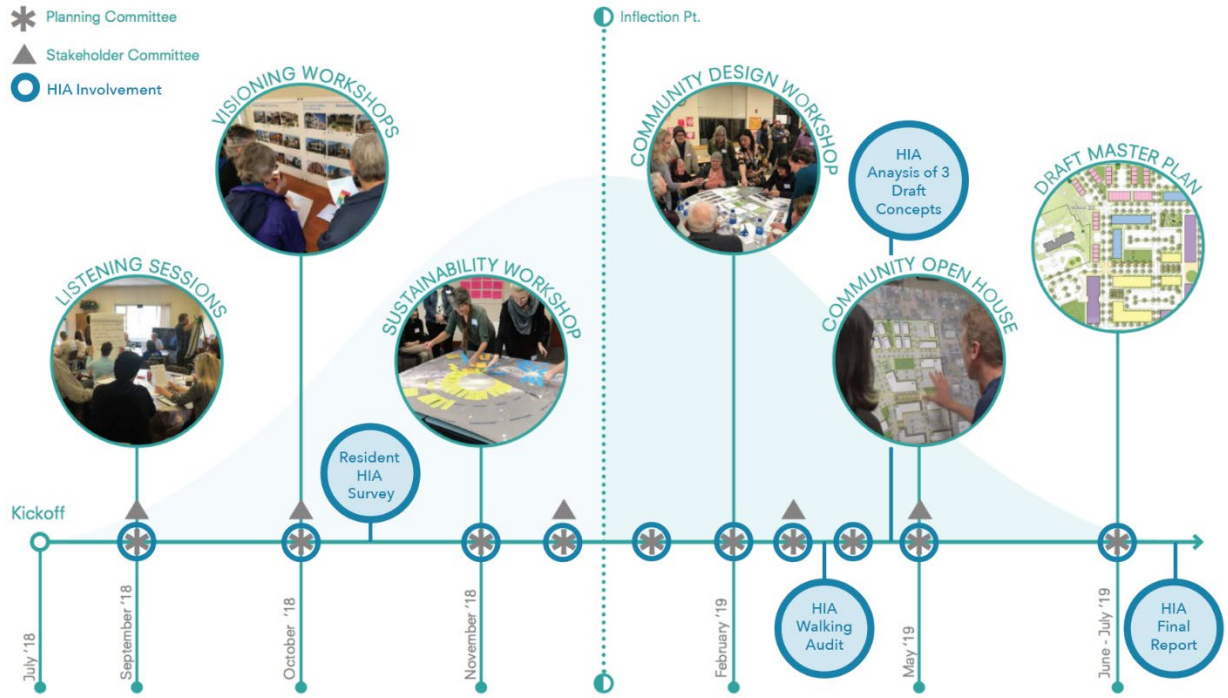
- **Bentley Moses,** Masters in Public Health – Population Health Strategies Program Manager for Clackamas County Public Health
- **Mary-Rain O'Meara,** Masters of Urban and Regional Planning – Housing Development Coordinator for Housing Authority of Clackamas County
- **Valeria Vidal,** Masters of City Planning - Housing and Economic Development Coordinator for the City of Milwaukie

Midway through the process, **Abe Moland** was hired into a unique position split between Clackamas County's public health and transportation departments. Abe holds both a Masters of Urban and Regional Planning and a Masters of Public Health with prior formal training in HIA.

Timeline

A key goal of HIA practice is to engage the planning process through ongoing interdisciplinary and community discussions including offering informal and formal feedback throughout the creation of a plan. The HIA Master Plan included bi-monthly meetings in which both CCPHD and the HIA consultant have taken an active role. In addition, the core HIA team met nearly monthly from September 2018 onwards to

explicitly consider the health impacts as the Hillside proposal was developed. The timeline below highlights how the HIA was integrated into the rest of the planning process:



The following documents were created as a result of this HIA work:

- HIA Scope Memo (10/7/18)
- Literature Review Memo (10/07/18)
- Site Research Memo (4/3/19)
- Current Conditions/Survey Memo (4/3/19)
- Analysis Memo for Three Design Concepts – included preliminary recommendations (4/30/19)
- Recommendations on draft Final Scenario Memo (7/12/19)
- Evaluation and Monitoring Plan Memo (9/2/19)

Capacity Building and Influence

A part of the scope of work for this HIA was to increase capacity for CCPHD such that they would be well positioned to undertake HIAs in the future. This was accomplished with explicit training modules embedded into HIA Team Meetings. Topics included HIA process and values; how to scope an HIA; developing pathway models; analyzing for direction and magnitude of impacts; and developing HIA recommendations.

It is also important to recognize points of public health influence during the planning process. Key discussions in the greater Master Plan process that incorporated health in real time included consideration of:

- the preference for 1-bedroom over studio apartment units for affordable housing;
- the importance of community amenities such as community gardens, playgrounds, and walking trails to current low-income residents via the HIA Survey;
- railroad and traffic as localized pollution sources (diesel emissions, particulate matter) in addition to sources of noise and implications on setbacks and use of Lot C; and

- reduced parking ratios as a way to support active travel and align with a low-driving population as verified in the HIA Survey.

The HIA Survey was brought up repeatedly in Master Plan committee meetings to ground discussion of needs in the current population. The HIA overall was mentioned in City of Milwaukie City Council and Clackamas County Board of Commissioner Business Meetings to support the Master plan final concept.

The next step in an expanded evaluation would be to have CCPHD complete brief interviews with all HIA Team members and a large sample of Master Plan stakeholders to further understand the extent of the HIA influence. Potential discussion topics include:

- What was stakeholder familiarity with HIAs before the process began? How has it changed?
- How was the HIA developed and carried out? What worked and what did not work?
- How were health inequities addressed throughout the process?
- What are impacts of the HIA in stakeholder work? How did the HIA benefit stakeholder work?
- What were the lessons learned?
- How were decision-makers engaged throughout the process? What worked and what did not work?

Monitoring Plan

Understanding the impact (or outcome) of an HIA on improving health determinants and outcomes for the population impacted requires ongoing monitoring. While "monitoring is properly the responsibility of the project proponent or and authorizing, funding, or implementing public agency", HIA practice standards state that "the HIA should, where possible, propose a monitoring plan".

The table below lists recommendations made in the HIA report, links them to potential performance measures, and identifies potential partners in either implementing or monitoring. Without a clear timeline line of implementation of the Hillside Master Plan redevelopment, it is difficult specify short versus long-term monitoring goals as suggested by practice standards. While there is currently no resources identified for monitoring, CCPHD should minimally convene the HIA core team every six months to review performance measures, anticipate upcoming monitoring activities, and seek resources if necessary.

As a monitoring plan and an evaluation focused on HIA impact solidify, questions should focus on how and when recommendations were implemented or adopted, as well as what allowed them to be successfully implemented.

	HIA RECOMMENDATION	POTENTIAL PERFORMANCE MEASURE	POTENTIAL PARTNER (PRIMARY BOLDED)
Increasing the Affordable Housing Stock and Impacts on Households	SUPPORT: Maximize the number of deeply affordable and below-market rate housing options as this will be the most health promoting aspect of redevelopment.	% of new housing that is deeply affordable; affordable; and market rate	**HACC** Metro
	ENHANCE: Distribution of unit sizes should incorporate *county-wide* waitlists for HACC and, if possible, a tri-county look at affordable housing need.	Comparison of unit mix to HACC waitlists across entire portfolio	**HACC**
	ENHANCE: Avoid studio units in favor of 1-bedroom to provide sense of control and privacy to a population that often has neither.	Presence of nothing smaller than 1-bedrooms for non-market rate units	**HACC**
	STUDY: Use the H&T Index (https://htaindex.cnt.org/) to monitor joint housing and transportation costs for Hillside units, including market-rate units, to assure affordability at the household budget level. Compare to other options in the HACC portfolio and common areas in both Clackamas County and the tri-county Metro area.	Joint housing and transportation costs for deeply affordable, affordable, and market rate households at Hillside	**HACC** Metro
Temporary Impacts During Construction	MITIGATE: Follow best containment practices during demolition.	% workers asbestos trained % workers RRP (lead) trained	**HACC** **Contractors** Oregon Health Authority – Environmental Public Health
	MITIGATE: Institute quiet hours that meet or exceed all current noise ordinances and communicate this to residents during demolition and construction.	Presence of quiet hour policy Average day time noise levels	**HACC** Contractors
	MITIGATE: All contractors involved in the demolition phase must have workers on site that are asbestos and lead abatement certified. Contractors should follow asbestos and EPA Repair, Renovation, and Painting Program (RRP) best practices throughout demolition including an inventory and plan of removal before demolition begins.	% workers asbestos trained % workers RRP (lead) trained	**HACC** **Contractors** Oregon Health Authority – Environmental Public Health
	STUDY/MONITOR: Demolition is a known risk factor (see Question #2) on the Oregon Lead Risk Assessment Questionnaire for children under age 5, triggering a blood lead level test (BLL). This questionnaire and follow-up BLL tests would also be appropriate for pregnant and lactating women. A pre and post demolition BLL to the aforementioned residents would transparently communicate that lead risk has been neutralized.	% with blood lead level tests - Under 5 years - Pregnant or lactating - Women under 45	**CCPHD** Oregon Health Authority – Environmental Public Health Regional hospital/insurance providers Medicaid EMR records

	MITIGATE: Phase construction to support as many households remaining on site as possible.	% of Hillside Park residents able to remain on site throughout	**HACC**
	MITIGATE: Provide additional social supports to those who choose to move out of Hillside during the construction phase.	% of reallocated residents receiving additional social supports/services	**HACC** Regional Service Providers Regional Health Service Providers
New Housing and Quality of Indoor Living Environments	STUDY: Continue to monitor asthma and COPD rates to understand vulnerability, particularly for low income residents, using future waves of the HIA Survey.	Self-reported prevalence rates	HACC **CCPHD**
	STUDY: Develop a pre-occupancy monitoring plan for radon for all ground floor units.	% ground level units tested for radon prior to occupancy	**HACC** HUD **CCPHD** Oregon Health Authority – Environmental Public Health
	MITIGATE: Install electric cooking appliances to minimize carbon monoxide inside homes.	% units with electric cooking appliances	**HACC** Architecture Firm
	MITIGATE: Partner with Clackamas County Sustainability to train residents and staff about green cleaning agents in individual units and in common areas.	# of trainings held # of people trained	**CC Sustainability** HHAC
	ENHANCE: Set aside 40% or more of units as "Breathe Easy" units including installing low-VOC finishes, no carpet, and an energy recovery ventilator (ERV) with a filter, which captures 99 percent of air particulates and reduces indoor air humidity while achieving 70 to 80 percent energy recovery. (See "Breathe Easy Homes", Seattle Housing Authority).	Presence of a "Breathe Easy Homes" program % of COPD or Asthmatics in Breath Easy homes	**HACC** **CCPHD** Health / Insurance Providers
	MITIGATE: To protect the greater population, enforce a strict nonsmoking policy in all buildings, common areas and within 25 feet of building entrances. Pair with aggressive smoking cessation programs.	Presence of a campus-wide non-smoking policy # of events yearly for smoking cessation	**CCPHD** **HACC** Oregon Tobacco Quit Line
	MITIGATE: High-efficiency HVAC systems will reduce noise and indoor exposure to exhaust and pollution from the train and traffic if installed in units adjacent to these known risk sources.	% of units along rail and 32nd Ave with more aggressive HVAC systems	**HACC** Architecture/Design Firm City of Milwaukie
	SUPPORT: The HIA team recognizes the effort made to set back new buildings as far as possible from the railroad tracks on Lot C, increasing the overall setback from current housing in Hillside.	N/A	N/A
	MITIGATE: Remove the 55 units on Lot C or designating Lot C units as market rate in order to place the least vulnerable populations close to the noise/emissions source. Units could be replaced with more community space to accommodate services and amenities for residents.	Lack of housing units on Lot C	**HACC**

	MITIGATE: Ask the railroad to idle south of Harrison in a commercial area instead of along the property to reduce diesel emission exposure and noise to Manor and other Hillside residents.	Presence of an agreement with railroad	**HACC** **CCPHD** **Union Pacific, Amtrak** ODOT
	ENHANCE: Incorporate as much universal design as feasible to reduce trip hazards and support an older and disabled population to age in place.	Presence of universal design expert in architecture/design teams	**HACC** Architecture/Design Firm AARP
	ENHANCE: Seek contractors/developers that specialize in aging-in-place design and construction.	Presence of universal design expertise in architecture/design teams	**HACC** Architecture/Design Firm AARP
	ENHANCE: Continue to engage with residents on what features are most important to them within the units.	Presence of universal design expertise in architecture/design teams Additional resident input on universal design features	**HACC** Architecture/Design Firm AARP Clackamas County Social Services
Outdoor Infrastructure and On-site Community Amenities	MITIGATE: Follow best containment practices during demolition	% workers asbestos trained % workers RRP (lead) trained	**HACC** **Contractors** Oregon Health Authority – Environmental Public Health
	ENHANCE: Green infrastructure will support improved outdoor environmental conditions and resident experiences; tree canopy should meet or exceed 40%.	Presence of green infrastructure on each block % tree canopy coverage meeting or exceeding City goals	**HACC** Architecture/Design Firm City of Milwaukie
	ENHANCE: Match or exceed per-capita square footage of current amenities including: meeting space, laundry facilities, community gardens, and playground/courts.	Per-capita square footage of amenities	**HACC** Architecture/Design Firm
	MITIGATE: Activate the space along the railroad by including pedestrian oriented design, good lighting, and emergency phones.	Presence of pedestrian oriented facilities, design, and amenities on Lot C	**HACC** Architecture/Design Firm CCPHD CC Transportation
	ENHANCE: Partner with NCPRD for longer-term programmatic and maintenance needs and to coordinate with Belfour Park site.	MOU between NCPRD and HACC	**HACC** **NCPRD**
	ENHANCE: Explore the addition of dog park in the northwest lot.	Presence of dog park	**HACC** Architecture/Design Firm
	ENHANCE: Aggressively place benches throughout the site and in conversational clusters to support older adults and those with disabilities. Identify the conversational clusters to increase social capital.	Presence of benches along each block	**HACC** Architecture/Design Firm

		Presence of conversational clusters on each lot	
	MITIGATE: Air conditioning, insulation, wall thickness, shading from direct light, site orientation, and natural ventilation at night can help protect against heat-related illnesses.	Inventory of building elements used to reduce heat.	**HACC** Architecture/Design Firm
	MITIGATE: Consistent with the 2018 Milwaukie Climate Action Plan, install high quality HVAC that includes air-conditioning. Pair with financial assistance in summer months for low-income households.	Presence of HVAC in all units. Presence of a utility assistance program during summer months.	**HACC** Architecture/Design Firm City of Milwaukie
	MITIGATE: Tree canopy is considered best practice for shading and thus should be maximized on the site along south and western facing walls, on green roofs, and in parking lots. Tree canopy should meet or exceed 40%.	% tree canopy	**HACC** Architecture/Design Firm
	MITIGATE: Playgrounds and nearby seating areas for adults should be covered with a sun shade to reduce both ambient and surface temperatures, prevent burns and enhance physical activity levels. Shading the basketball court with a waterproof material would likely increase use during both rainy months and high heat.	Presence of shading on playgrounds and courts	**HACC** Architecture/Design Firm NCPRD
	ENHANCE: Community gardens – a highly valued amenity visited by 40% of current residents in the past week – should be expanded significantly with explicit space identified in the master plan to meet community values, diet security, and green-infrastructure goals.	% increase in community garden plots	**HACC** Architecture/Design Firm
	STUDY: Monitor ambient and surface temperatures throughout the site to verify green infrastructure is meeting goals in reducing surface temperatures on buildings, green roofs, parking lots and sidewalks. Identify areas where increased greening would be beneficial.	Presence of ambient and surface temperature goals	**HACC** Landscape Architecture / Sustainability Expertise
Connecting Hillside Residents to the Greater Community	SUPPORT: Proposed parking ratio will help increase non-motorized travel and thus improve active transportation.	Parking ratio does not exceed proposed 5 spaces per 6 units	**HACC** Architecture/Design Firm City of Milwaukie
	ENHANCE: Incorporate aggressive complete street design that designates uses (cars, bikes, pedestrians including those with walkers or wheelchairs).	Presences of complete street design and facilities for all users.	**HACC** Architecture/Design Firm City of Milwaukie CC Transportation
	ENHANCE: The walking path should be resurfaced to encourage use and prevent falls from uneven pavement.	Presence of resurfaced walking path.	**HACC** Architecture/Design Firm NCPRD
	ENHANCE: Incorporate wayfinding that emphasizes the number of steps and times to different destinations on the site.	Presence of wayfinding signage throughout Hillside.	**HACC** Architecture/Design Firm
	ENHANCE: Ground-level retail on 32nd should be oriented towards both sides of the street.	Presence of entrances and signage for ground-floor along SE 32nd on both east and west sides.	**HACC** Architecture/Design Firm City of Milwaukie

	ENHANCE: Residential buildings should have entrances both towards parking and towards the "back" or street side. In cases where the building is mixed use, residential should have its own secured entrances.	Presence of entrances to residential buildings on both parking lot and non-parking lot sides.	**HACC** Architecture/Design Firm City of Milwaukie
	ENHANCE: Secure, covered bicycle parking should be identified in 2-3 spots throughout the campus in the master plan.	Presence of secure, covered bicycle parking in multiple locations.	**HACC** Architecture/Design Firm City of Milwaukie
	SUPPORT: Extending the bikeway down SE 29th will increase active travel.	N/A	
	MITIGATE: The residential density with accompanying increases in motorized traffic suggest SE 29th should be upgraded from a sharrow/bike boulevard to a marked bicycle lane.	Presence of marked bike lanes along SE 29th.	**HACC** Architecture/Design Firm City of Milwaukie
	MITIGATE: The intersection of SE 29th and SE Meek should clearly mark and prioritize bicyclists.	Presence of clear wayfinding and pavement markings for bicyclists in intersection.	**HACC** Architecture/Design Firm City of Milwaukie CC Transportation
	MITIGATE: Complete and connect the sidewalk on the southwest corner of the manor for walkers to enjoy a complete walking loop.	Presence of completed sidewalk and crosswalk on SE corner of Manor.	**HACC** Architecture/Design Firm
	MITIGATE: The multi-modal needs for intersection of SE 32nd and SE Meek needs to be designed before finalizing the building footprint in Lot A. Specifically, a 2-stage "jug handle" turn for northbound bicyclists needs to be designed while also maintaining the bus stops and pedestrian island. This intersection should also have a flashing beacon installed for both pedestrian and cyclists.	Completion of a design for the intersection before breaking ground. Presence of a 2-stage turn for northbound bicyclists.	**HACC** Architecture/Design Firm City of Milwaukie CC Transportation
	MITIGATE: The length and grade of the walk from the Manor to current bus stops combined with the increased density of a built out Hillside suggests engaging Tri-met to reroute the bus closer to the Manor.	Request to Trimet Presence of bus stop closer to Manor.	**HACC** Trimet
	MITIGATE: Pickup and drop-off areas for ride shares, para-transit and other short-term visitors/service providers should be explicitly identified in the master plan.	Pickup/dropoff areas for each lot identified prior to breaking ground.	**HACC** Architecture/Design Firm City of Milwaukie Rideshare and paratransit services
	ENHANCE: Engage Providence to consider a shuttle at peak times to the Max.	MOU with Providence for shuttle to MAX.	**HACC** **Providence**
	ENHANCE: Identify bike and pedestrian enhancements already on the priority list and work with the City to raise the priority level to accurately reflect the at-risk population and increase in population density.	Increased prioritization for bike and pedestrian facilities within 2 mile walkshed of Hillside.	**HACC** City of Milwaukie CC Transportation

	ENHANCE: Increase the pedestrian and bicycle specific facilities including continuous sidewalks, bike lanes, and wayfinding between Hillside park and open space and Belfour Park.	Presence of sidewalks and wayfinding between Belfour and Hillside Park.	**HACC** City of Milwaukie **NCPRD**
	ENHANCE: Consider where a bike share station could be sited in the future.	Inclusion of a bike share station area in Master Plan.	**HACC** Architecture/Design Firm City of Milwaukie Biketown Providence
	ENHANCE: Actively consider the basic needs of public housing residents when seeking ground-level retail tenants.	Evidence of engagement with social services, grocers, etc.	**HACC** City of Milwaukie Community Development Clackamas County Social Services Providence, KP, and Legacy