May 2024

City of Kitchener Planning and Housing Policy Division

Hidden Valley Land Use Implementation Project: Health Impact Assessment

Developed In Partnership with Region of Waterloo Public Health and Paramedic Services

Region of Waterloo
PUBLIC HEALTH AND
PARAMEDIC SERVICES

KITCHENER

Health Impact Assessment –
Hidden Valley Land Use Implementation Project

Contents

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Territorial Acknowledgement

The City of Kitchener is situated on the traditional territory of the Neutral, Anishinaabeg and Haudenosaunee Peoples. We recognize our responsibility to serve as stewards for the land and honour the original caretakers who came before us.

Our community is enriched by the enduring knowledge and deep-rooted traditions of the diverse First Nations, Métis and Inuit in Kitchener today.

We give this acknowledgement to show respect to the first peoples who inhabited this land and to remind ourselves of our responsibility to the First Nations, Inuit and Métis.

Executive summary

City of Kitchener Council requested to have a Health Impact Assessment to be completed as one of seven concurrent technical studies for the Hidden Valley Land Use Implementation Project. Staff from City of Kitchener and Region of Waterloo Public Health and Emergency Services worked in partnership to complete a Health Impact Assessment.

Completing a Health Impact Assessments is an iterative process that involves the following five steps:

1. Screening
2. Scoping
3. Assessment and analysis
4. Reporting and recommendations
5. Evaluation and monitoring

A Health Impact Assessment process provides a structured approach for planners and policy-makers to objectively evaluate the potential health-related outcomes of an activity or development before it is built or implemented. Positive and negative health outcomes are identified as well as recommendations to leverage positive health outcomes and prevent or mitigate negative health outcomes.

Within this report, geographic details of the Hidden Valley area are described as well as demographic characteristics of Hidden Valley residents. Marginalization indexes are also examined which supports broadly understanding the assets and needs of the community and surrounding neighbourhoods. These community characteristics enhance the understanding of inequalities in various measures of health and wellbeing.

Through the assessment, it was determined that there are a total of ten health outcomes that will be affected by the development within the Hidden Valley study area. Positive and negative health outcomes are not experienced the same by all people. Priority populations are identified through examining Social Determinants of Health, Health Equity and Intersectionality so resources can be allocated to meet equity-deserving groups' unique needs.

The recommendations determined by this report reflect opportunities to integrate a health equity lens into the planning processes. They were developed to address enhancing positive health outcomes while preventing or mitigating negative health outcomes.

Recommendations:

1. Council approve development of a policy that requires City of Kitchener planning to monitor and evaluate health impacts of developments.
2. Ensure access to enhanced greenspace and trails to residents living outside of Hidden Valley neighbourhood.
3. City of Kitchener review development bid process and provide package details to developers that highlights features in built form that enhance and promote health; could prioritize accepting complete applications that have more features that enhance and promote health.
4. Review existing internal policies and enhance or create policies from a health lens.
5. Review City of Kitchener affordability policy to ensure the Hidden Valley Land Use Implementation Project includes requirement for affordable housing.

Upon approval and adoption by council, City of Kitchener staff may amend the Official Plan and subsequent related policies to increase the application of health impact studies through future Official Plan Amendments, Zoning By-law Amendments and Site Plan applications. The requirements for these health impact studies will be established by staff through the development of terms of reference policies and will be evaluated by staff for completeness.

It is anticipated that this work would continue to be reviewed and conducted by both Region of Waterloo Public Health and City of Kitchener Planning staff and will be reviewed through a regularly meeting working group.

While this approach is intended to provide a health lens on all future developments, there are limitations inherent with this method, as certain elements of review may not be monitored and enforced. Ongoing evaluation is recommended to assess uptake and ensure that staff are working with developers and community members to reach positive health outcomes for our community.

Introduction

In 2019, the City of Kitchener (the City) adopted the Hidden Valley Land Use Master Plan (Figure 1) which provided the basis for a city-initiated Land Use Implementation Project, Zoning By-law Amendment, and various supporting technical studies. A Health Impact Assessment (HIA) was one of the technical studies identified to be completed as part of the Land Use Implementation process for Hidden Valley.
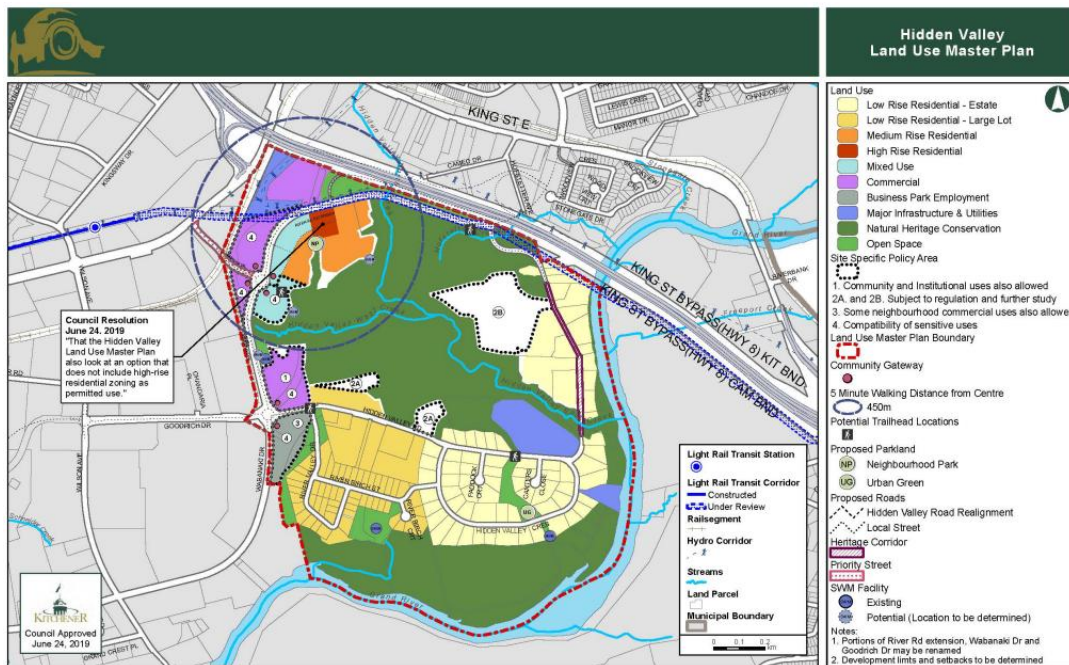
Figure 1. Hidden Valley Land Use Master Plan as approved by City Council on June 24, 2019

For the purpose of the Hidden Valley Land Use Implementation Project (HVLUIP), City of Kitchener staff requested support from Region of Waterloo Public Health and Paramedic Services where a Public Health Nurse was the lead staff assigned to support the HIA process. Through a multi-sectoral, collaborative approach, synergies can be identified and we can enhance the work of both the land use planning and health sectors.[1–4] The HIA for Hidden Valley was a collaboration between City staff bringing knowledge related to land use planning principles and staff from Region of Waterloo Public Health and Paramedic Services binging knowledge and expertise related to interpretation of health data and a comprehensive understanding of how planning decisions can impact health of individuals and communities.

This document presents the results of the HIA that was conducted as part of the Land Use Implementation Project process for the Hidden Valley study area and is intended to inform the City staff, and the general public about key health considerations for developing the Land Use Implementation Project, and how health can be prioritised as the study area continues to evolve.

This HIA was guided by Metro Vancouver's "Health Impact Assessment of Transportation and Land Use Planning Activities Toolkit" and can be found in Appendix A. The tool was used in combination with best practices in the field and professional judgement.

What is a Health Impact Assessment?

As communities continue to evolve, land use planners deal with new and emerging challenges. One such challenge is ensuring all places are planned and designed in a way that is mindful of and considers impacts on the health of people and communities.

HIA is a process that provides a structured approach for planners and policy-makers to objectively evaluate the potential health-related outcomes of an activity before it is built or implemented.[5] These activities can include policies, plans or projects like:

- New land use developments
- Redesign of public spaces (i.e. streets, sidewalks, parks, trails)
- Policy to improve access to cooling and hydration in public spaces
- Policy to ensure equitable access to urban forest and green spaces
- Policy to require separated bike lanes on any new or enhanced roadway infrastructure

Throughout the HIA process, both qualitative and quantitative data are considered that supports decision makers to understand the complex relationships between the proposed activity and health-related outcomes.[5] When completed, HIAs draw attention to potential high risk, negative health-related outcomes and inequities with suggested solutions for mitigation or prevention. HIAs also highlight the positive health-related outcomes that are an anticipated result of an activity. Further, key groups of people and populations are identified who are expected to experience a greater proportion of the burden or benefit of an activity.

HIA is an iterative process that involves the following five steps:

1. Screening: to determine if a HIA will be useful
2. Scoping: to plan the approach for HIA
3. Assessment and Analysis: to identify and describe health impacts, and to develop strategies to enhance health benefits and minimize adverse effects
4. Reporting and recommendations: to communicate the results
5. Evaluation and Monitoring: to understand the effectiveness of the HIA and track health changes over time

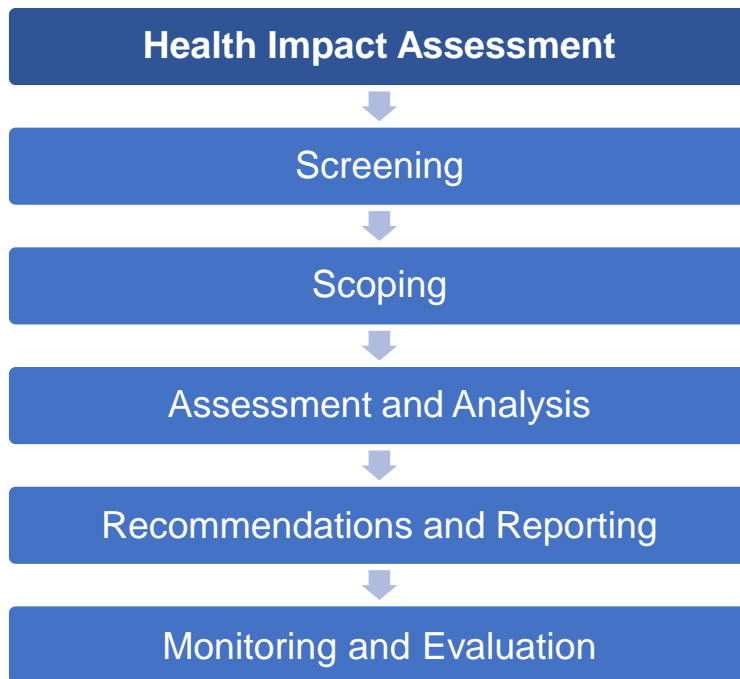An overall summary of the HIA process is noted in Figure 2.

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Figure 2. Health Impact Assessment process

Step 1: Screening

A formal screening process was not completed as the HIA was requested to be completed by City of Kitchener Council.

Step 2: Scoping

Deciding on most appropriate level of HIA

There are three levels of HIAs which determines the level of effort and time required: desktop, intermediate, or comprehensive. Considering staffing resources and time available to complete the HIA, it was decided that a modified intermediate HIA would be completed. An intermediate HIA provides a more thorough assessment of potential health impacts and is completed by a team working on the project rather than a single individual who may be able to complete a desktop HIA.

A limitation of this HIA is that the there was not external engagement from community partners where key informant interviews, focus groups and/or surveys could have provided qualitative data for inclusion in this report.

How land use decisions influence the built environment and health

The **built environment** can be viewed as the physical environment where people live, work, study, play and age. It includes elements in the external environment of communities such as buildings, roads, public transit systems, parks, and any other type of infrastructure.[1] How we design, build and plan our communities has a complex and direct influence on health in many ways.[1] Understanding

these complexities can guide land use decisions and policies to decrease heath disparities and improve health-related outcomes for the people in a community.[1,5]

Health-related outcomes

Health outcomes can be either positive or negative and refer to the health status of both individuals and groups within a population or community. When a community is designed well, there are many positive health outcomes as a result including increased physical activity, improved mental health and wellbeing, and decreased preventable injury; Figure 3 summarizes the positive health outcomes.
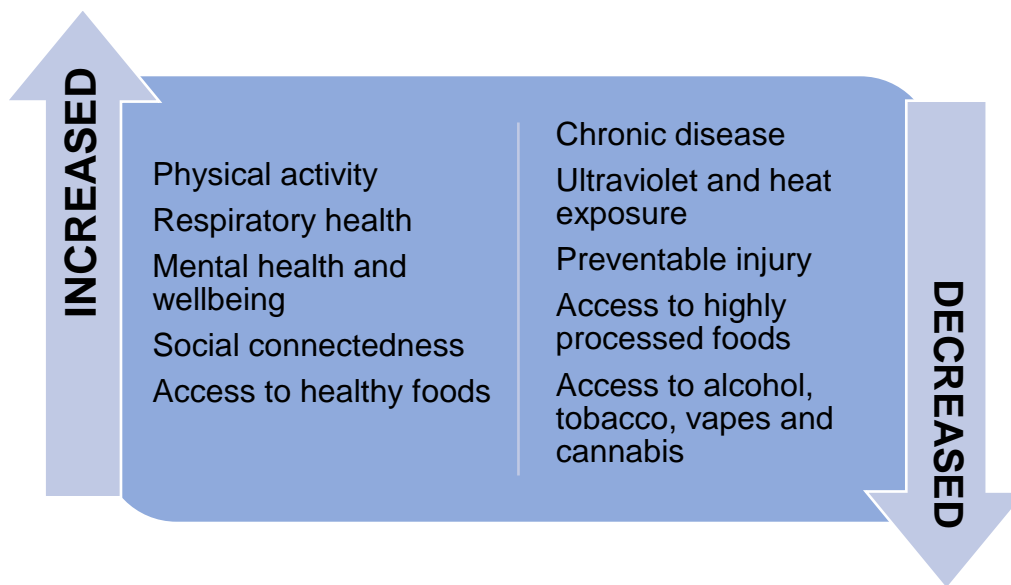
INCREASED

Physical activity

Respiratory health

Mental health and wellbeing

Social connectedness

Access to healthy foods

Chronic disease

Ultraviolet and heat exposure

Preventable injury

Access to highly processed foods

Access to alcohol, tobacco, vapes and cannabis

DECREASED

Figure 3: Positive health outcomes related to activity impacts of the built environment.

On the other hand, when the impacts of planning activities or developments are not examined, a community could be designed in a way that inadvertently marginalizes certain populations or people and results in negative health outcomes like increased chronic disease, decreased social connectedness, increased access to highly processed foods and increased access to alcohol, tobacco, vapes and cannabis.

The health-related outcomes experienced by an individual or community can vary significantly depending on the type of activity impact and how it directly or indirectly effects each person, community or population. [5] Describing the complexities of health, including social determinants of health, intersectionality and health equity are described in detail in Appendix B.

For the purpose of this HIA, the 'activity impact' is broadly the development of the Hidden Valley area which is comprised of many distinct changes. As seen in Figure 4, the Land Use Implementation Project will influence the following determinants: physical environment, built environment, community and social factors, livelihood factors and lifestyle factors.
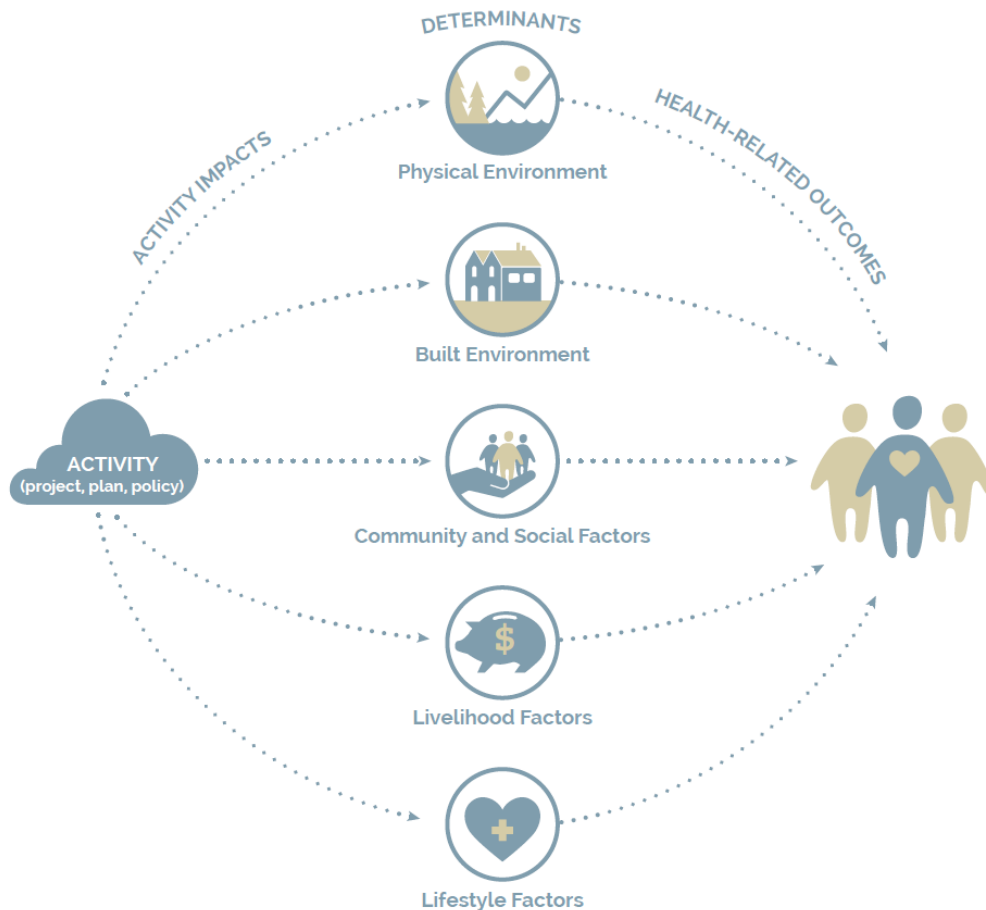
Figure 4: Activity impacts, determinants and health-related outcomes.

Health-related outcomes relevant to Hidden Valley Land Use Implementation Project

It is important to note that for the health outcomes related to the built environment, notable changes in health status of a community are not realized immediately. Many of the above health outcomes are long-term, like chronic diseases, where notable changes are realized in months, years, or even decades later.[6] Additionally, these health outcomes can overlap and intersect with one another. For example, increased physical activity leads to decreased chronic disease as well as improved mental health and wellbeing.[1]

Although there is a complex link between the built environment and health status, cities and communities can be designed and built to set people up for success so that healthy choices are the easier choices.[1,7] Furthermore, community design choices will have a direct impact on worsening or improving health inequities.[1,7]

Below are definitions with explanations of various health-related outcomes and why they are important as they will be affected by the policy decisions framed in the HVLUIP.

Physical activity

Includes all movement when someone moves their body either during leisure time, for transport to get to and from places, or as part of a person's work.[8] People who are physically active experience less chronic disease, improved respiratory health, and improved mental health and well-being.[1]

Active transportation is a key way that people can be more physically active while living in the Hidden Valley area. When people feel they can navigate the community safely as a pedestrian or cyclist, they are more likely to choose active transportation as an alternate mode of travel.[1] Infrastructure design is an important component in creating these safe spaces for pedestrians and cyclists. There are effective approaches to influence traffic safety, including: reducing speed (e.g. speed bumps, speed limits, narrowing lanes), decreasing points of conflict with pedestrians and cyclists, increasing visibility of pedestrians (e.g. curb extensions, appropriate lighting) and diverting vehicular traffic away from residential areas.[1,9–12]

Respiratory health

Can be generally defined as an absence of lung disease like lower respiratory tract infections, allergic reactions, and chronic conditions such as asthma, chronic obstructive pulmonary disease (COPD), emphysema, and/or lung cancer.[13,14]

When considering respiratory health in the context of HVLUIP, it is important to consider air quality and exposure to air pollution as these increase the risk of premature mortality from heart disease, stroke, and lung cancer.[15] Health outcomes associated with poor air quality include lower respiratory tract infections, allergic reactions, and chronic conditions such as asthma, chronic obstructive pulmonary disorder (COPD), and/or lung cancer.[13]

Air pollution refers to the pollutants that scientific studies have associated with wide-ranging health effects and to which the population is exposed in the outdoor environment. These pollutants include fine particulate matter (PM2.5) and coarse particulate matter (PM10) , ground-level ozone, and nitrogen dioxide (NO2).[15]

Mental health and wellbeing

It is a positive sense of emotional and spiritual wellbeing that respects the importance of culture, equity, social justice, interconnections and personal dignity.[16] When people experience positive mental health and wellbeing, it increases the capacity of each and all of us to feel, think, and act in ways that enhance our ability to enjoy life and deal with the challenges we face in life.[16]

Social connectedness

Having a sense of belonging and feeling accepted to a group, family, or community. It is about the relationships people have with each other and their engagement with the broader community.[17] With feeling connected to a community, people tend to know their neighbours, feel motivated to get involved, build relationships, and contribute to the creation of strong social networks.[17]

Access to healthy foods

Ability to easily access food found in Canada's Food Guide like fresh fruits and vegetables, whole grains, plant-based protein foods as well as low fat milk.[18]

Eating a healthy diet with plenty of fruits and vegetables lowers the risk of developing chronic health conditions such as type 2 diabetes, cardiovascular disease, some cancers, and is associated with improved mental health.[18]

Access to highly processed foods

Limiting highly processed foods, which are higher in sugar, sodium and saturated fat is associated with better mental health and reduced risk of chronic diseases, certain cancers, and cavities in children. It is also associated with better academic achievement in children.[19]

The food guide also recommends limiting highly processed foods as they are higher in sugar, sodium and saturated fat (i.e. sugary drinks, candy, chips, pastries, frozen prepared entrees, and processed meats).[20,21]

Chronic disease

A medical condition that typically lasts for a long time, often for the rest of a person's life.[22] These diseases generally progress slowly and may require ongoing medical management and lifestyle adjustments.[22]

Examples of chronic disease include diabetes, hypertension (high blood pressure), cardiovascular disease (coronary artery disease, heart failure, stroke), chronic respiratory disease (COPD, asthma), cancer and neurological conditions (Alzheimer's disease, other dementias, Parkinson's disease).[23]

Ultraviolet radiation and heat exposure

Exposure to ultraviolet (UV) radiation from the sun can lead to skin and eye cancers, other eye-related disorders such as cataracts, and weakening of the immune system.[24,25] Damage caused by the sun is cumulative, in other words long-term, daily exposure to sunlight adds up.[25] A person's risk for developing melanoma (the deadliest form of skin cancer) is strongly associated with the amount or degree of sun exposure they experience early in their life (i.e. in childhood or adolescence), even though the effects of UV radiation damage may not appear until later in life.[24,26,27]

Hot temperatures impact human health by affecting the thermoregulation of the human body. An inability to regulate core body temperature can lead to heat rash, heat cramps, dehydration, fainting, heat exhaustion, and heat stroke.[28] Exposure to extreme heat has also been found to exacerbate pre-existing health conditions affecting the circulatory, respiratory, and cerebrovascular systems (blood flow to the brain).[29]

Preventable injury

Unintentional injuries are one of the leading causes of disability, hospitalization and avoidable death.[30] Researchers estimate that about 90% of unintentional injuries are predictable and preventable when evidence-based interventions are implemented.[30] If injury is not prevented, people can experience life-altering injuries or death which has significant impacts the individual, their family and society.[31]

In the context of the HVLUIP, the prevention of injury for pedestrians and cyclists is of high importance as they bear the burden of more severe injuries while using transportation networks, particularly in the context of a collision involving pedestrians/cyclists and motor vehicles. Having safer road design and construction, enforcing regulations and ensuring use of healthy policies are ways to prevent injuries for all road users.[31]

Access to alcohol, tobacco, vapes and cannabis

Alcohol

There are acute short-term risks and chronic long-term risks with alcohol use. Acute short-term risks can happen when someone drinks too much alcohol on a single occasion like impulsive behaviour, impaired judgement, aggressive and violent behaviour and nausea and vomiting. Chronic long term risks happen when someone frequently drinks too much alcohol leading to damage of organs (including liver, brain, heart, and stomach), increased risk of cancer, high blood pressure, hormone irregularities and infertility, disturbed sleep patterns, anxiety, depression and suicidal depression.[32]

As the most commonly used psychoactive substance across Ontario, alcohol is responsible for a significant number of deaths, injuries, and illnesses each year. In 2020, there were 6,202 deaths and 319,580 emergency room and hospital visits in Ontario. Despite perceptions that alcohol is a large revenue generator, when factoring in expenses related to alcohol, including health care expenditures, lost productivity, and enforcement, it actually costs Canadian taxpayers annually. In 2020, alcohol produced $5.162 billion in revenue for the province of Ontario but $7.109 billion was spent on alcohol-related harms, creating $1.947 billion in deficit for the province.[33]

Tobacco

There is strong medical evidence that smoking tobacco is related to more than two dozen diseases and conditions. It has negative effects on nearly every organ of the body and reduces overall health. Smoking tobacco remains the leading cause of preventable death and has negative health impacts on people of all ages: unborn babies, infants, children, adolescents, adults, and older adults.[34]

Vapes

Health effects of vaping includes sore mouth or throat, cough, shortness of breath and nausea. Vaping exposes people to chemicals that may cause health harms, including lung damage and exposure to nicotine which can lead to addiction.[35]

Cannabis

Youth and young adults are more likely to experience harms from cannabis. Effects on the brain and body can include: altering your senses, anxiety, fear or panic, psychosis, difficulty controlling your body, difficulty learning and remembering things. Smoking cannabis exposes individuals to toxins and cancer-causing chemicals which damages lungs can negatively effect the heart.[36]

Regardless of the legal substance, improved health outcomes are associated with limited access. The more substances are seen, the more normalized the substance becomes, and this leads to increased use.

Step 3: Assessment and Analysis

About the Hidden Valley Area

The Hidden Valley study area spans across 183 hectares of land that is bounded by Highway 8 in the North, the Grand River in the East and South, and Wabanaki Drive and rail corridor near Fairway Road in the West (Figure 5). The area has unique attributes and is primarily characterized by significant natural environmental features, the Grand River, large estate residential lots, and a rolling topography.
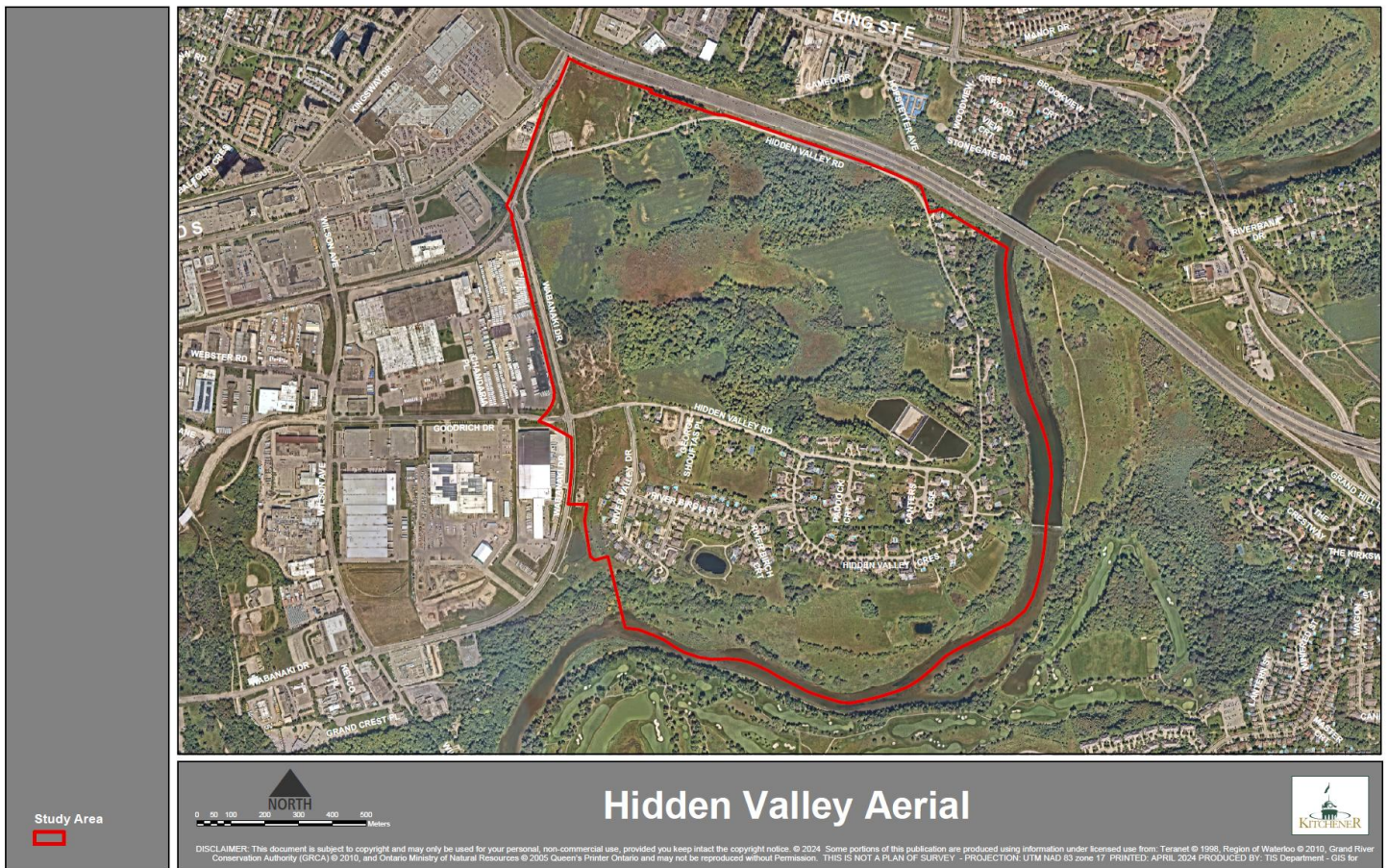
Figure 5. Hidden Valley Land Use Implementation Project Area

Demographic characteristics of Hidden Valley residents

In 2021, the population of the Hidden Valley Study area was 608 people, which represents 0.23% of Kitchener's population of 259,109 people (see Table 1). There were 129 households with an average household size of 4.7, which is much higher than the average household size of 2.55 for Kitchener.

Table 1:Total population and households for the Hidden Valley Study Area and the City of Kitchener

	Hidden Valley Study Area	Kitchener
Total Population	608	259,109
Total Households	129	101,472

Hidden Valley has a slightly older population compared to Kitchener. The average age of males and females in Hidden Valley is 45 and 41 respectively. In contrast, the average age of males and females in Kitchener is 38 and 40 respectively. Figure 6 illustrates smaller proportion of young population aged 0 to 24 years in Hidden Valley.

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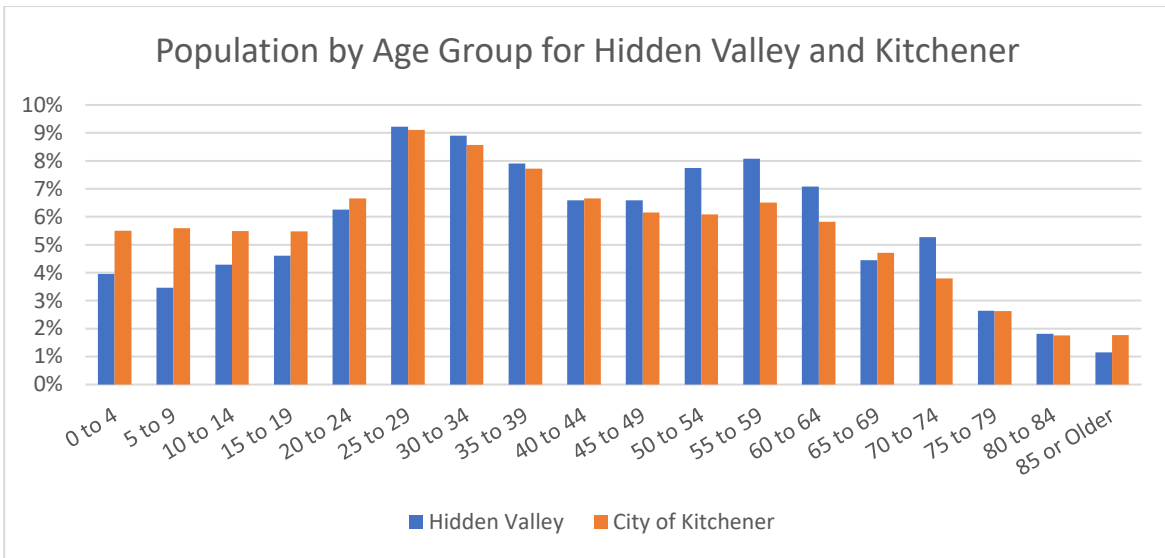
Figure 6. Population by Age Group, Hidden Valley and City of Kitchener

Figure 7 shows how Hidden Valley has a higher household income than Kitchener on average. Approximately 60% of the households in Hidden Valley earn over $200,000. In comparison approximately 9% earn over $200,000 in the City.[37] Additionally, in Hidden Valley, 18% of households have household income $99,999 or less. This compared to Kitchener where 61% of households have a household income of $99,999 or less.

Figure 7. Household Income, Hidden Valley and City of Kitchener

Table 2 illustrates the employment rate for Hidden Valley Study Area was 44% whereas the rest of Kitchener was 51%. The unemployment rate was much lower in Hidden Valley than the rest of Kitchener with 1.3% and 5.32% respectively.

Table 2: Employment rates in the study area versus the City of Kitchener.

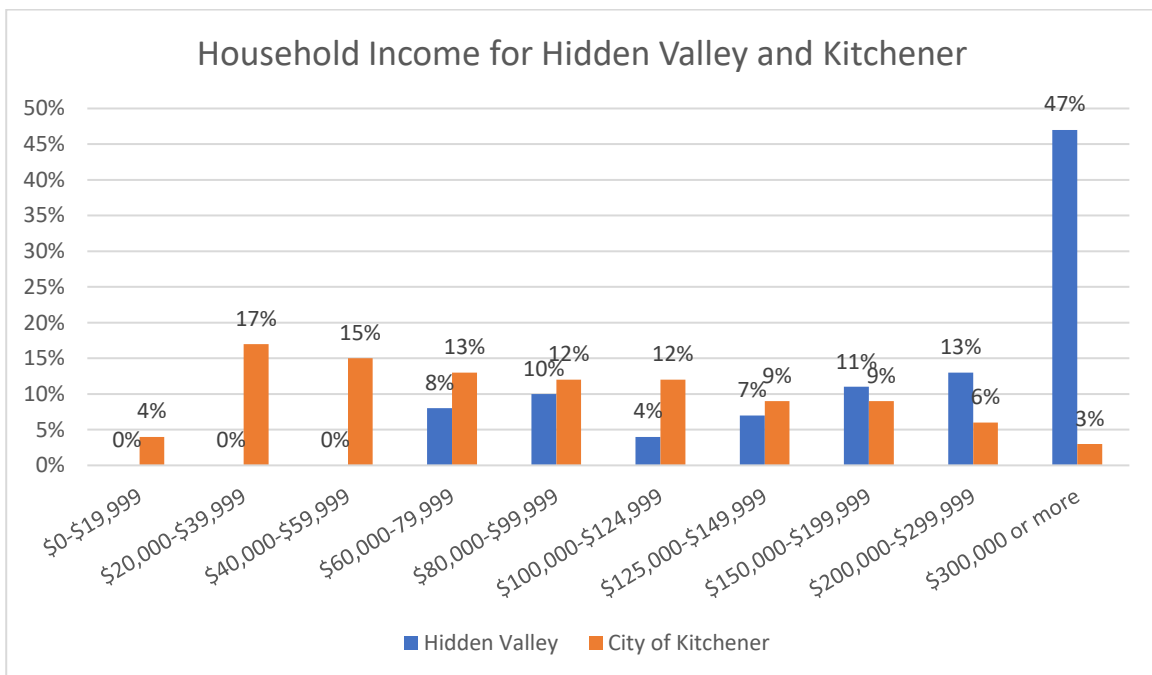|	Hidden Valley Study Area	Kitchener
Employment rate	44% (n=268)	51.2% (n=133,877)
Unemployment rate	1.3% (n=8)	5.32% (n=13,799)

Neighbourhood and physical environments

The study area comprises of predominantly large estate residential lots. There are approximately 150 residential lots ranging from 0.10ha to 5ha+. In contrast, 50th percentile of zoned lots which allow for single detached houses in Kitchener is 0.0531ha. The proportion of home ownership is considerably high with over 95% of the households in Hidden Valley owning their homes; home ownership in Kitchener is about 60%.[38]

The area lacks in community services. The Hidden Valley area lacks diversity where residents can access various amenities like health care services, sports or recreation facilities, community centres and commercial options like grocery stores. However, the parcel fabric of the area with large estate lots allow personal swimming pools, tennis and/or basketball courts to be accommodated.

The transportation infrastructure includes roadways but lacks in pedestrian and active transportation infrastructure such as sidewalks, cycling lanes, and trails. There are no transit services to the area and most households rely on private vehicles for transportation.

Measuring health of Hidden Valley residents and surrounding neighbourhoods using the Ontario Marginalization Index

What is marginalization?

Public Health Ontario, an agency of the Government of Ontario and key partner in Ontario's public health system, describes marginalization as "the process by which individuals and groups are prevented from fully participating in society."[39] Marginalized populations can experience barriers to accessing meaningful employment, adequate housing, education, recreation, clean water, health services and other social determinants of health. Both community and individual health are deeply impacted by marginalization.[39]

When seeking to understand the health context of people who live in the Hidden Valley area, the Ontario Marginalization Index (ON-Marg) can provide a broad understanding of assets and needs of a community and surrounding neighbourhoods. ON-Marg[40] draws data from the Census of Canada and can be used as an area-based index that seeks to:

- Show differences in marginalization between geographic areas across Ontario.

- Understand inequalities in various measures of health and social wellbeing, either between population groups or between geographical areas.

The data points drawn from the Census of Canada and can be reviewed in more detail in Appendix C.

ON-Marg geography and dimensions

ON-Marg provides interactive mapping for various geographic units (like census tracts and dissemination areas), allowing users to examine differing levels of marginalization in urban and rural areas in Ontario.

ON-Marg focuses on four dimensions that contribute to the process of marginalization:

- The **households and dwellings** dimension relates to family and neighbourhood stability and cohesiveness, and is based on measures of the types of density of residential accommodations and family structure characteristics.
- The **material resources** dimension is closely connected to poverty and refers to the inability for individuals and communities to access and attain basic material needs relating to housing, food, clothing, and education.
- The **age and labour force** dimension relates to area-level concentrations of people who do not have income from employment, including older adults, children, and/or those who are unable to work due to disability.
- The **racialized and newcomer populations** dimension measures the proportion of newcomers, and/or non-white, non-Indigenous populations. These communities may experience high levels of racialization and xenophobia (dislike or prejudice against people from other countries).[41]

Each of the four dimensions are divided into five quintiles containing 20% of the Dissemination Areas (DAs) in Ontario, ranked from 1 (low marginalization) to 5 (high marginalization). For example, if an area has a value of five on the material resources scale, it means it is in the most marginalized 20% of areas in Ontario.

The 2021 edition of ON-Marg was used to determine marginalization for the Hidden Valley dissemination area, with each dimension described below. Technical details can be found in the User Guide.

ON-Marg borders for Hidden Valley

ON-Marg index borders of the Hidden Valley dissemination area include Manitou Drive on the west, Fairway Road South to the north, Grand River on the east and Huron Road/Homer Watson Boulevard to the south. Although there are very few residences outside of the Hidden Valley study area within this dissemination area, the data are slightly misaligned with the borders of the Hidden Valley study area (Figure 8).

Figure 8: Hidden Valley study area and ON-Marg dissemination area.

Households and dwellings

The indicators included in the households and dwellings dimension measure the types and density of residential accommodations, as well as certain family structure characteristics. Stable households and dwellings promote cohesive communities which provide a supportive society that contributes to good health by promoting positive socially supportive environments which then counteracts social isolation.[40] Stable neighbourhoods contribute to the residents' sense of community, engagement in acts of 'being neighbourly' and watching out for each other; this increases the attractiveness of living in a certain area as neighbourhoods are both geographic and social units.[40,42] In order to achieve community well-being, the social environment must also promote health equity by advancing economic, environmental and social sustainability, and fostering belonging, inclusivity and diversity.[40]

In the Hidden Valley area, there is neither high nor low measure of marginalization for households and dwellings (Figure 9). In 2021, the proportion of home ownership was over 95% in Hidden

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Valley[38]. A high proportion of home ownership in Hidden Valley suggests residents experience housing stability and may have established relationships and social connections with other residents in the area which in turn builds resiliency and promotes mental health and well-being.[40] Homeowners move far less frequently than renters, and hence are embedded into the same neighbourhood and community for a longer time.[43]
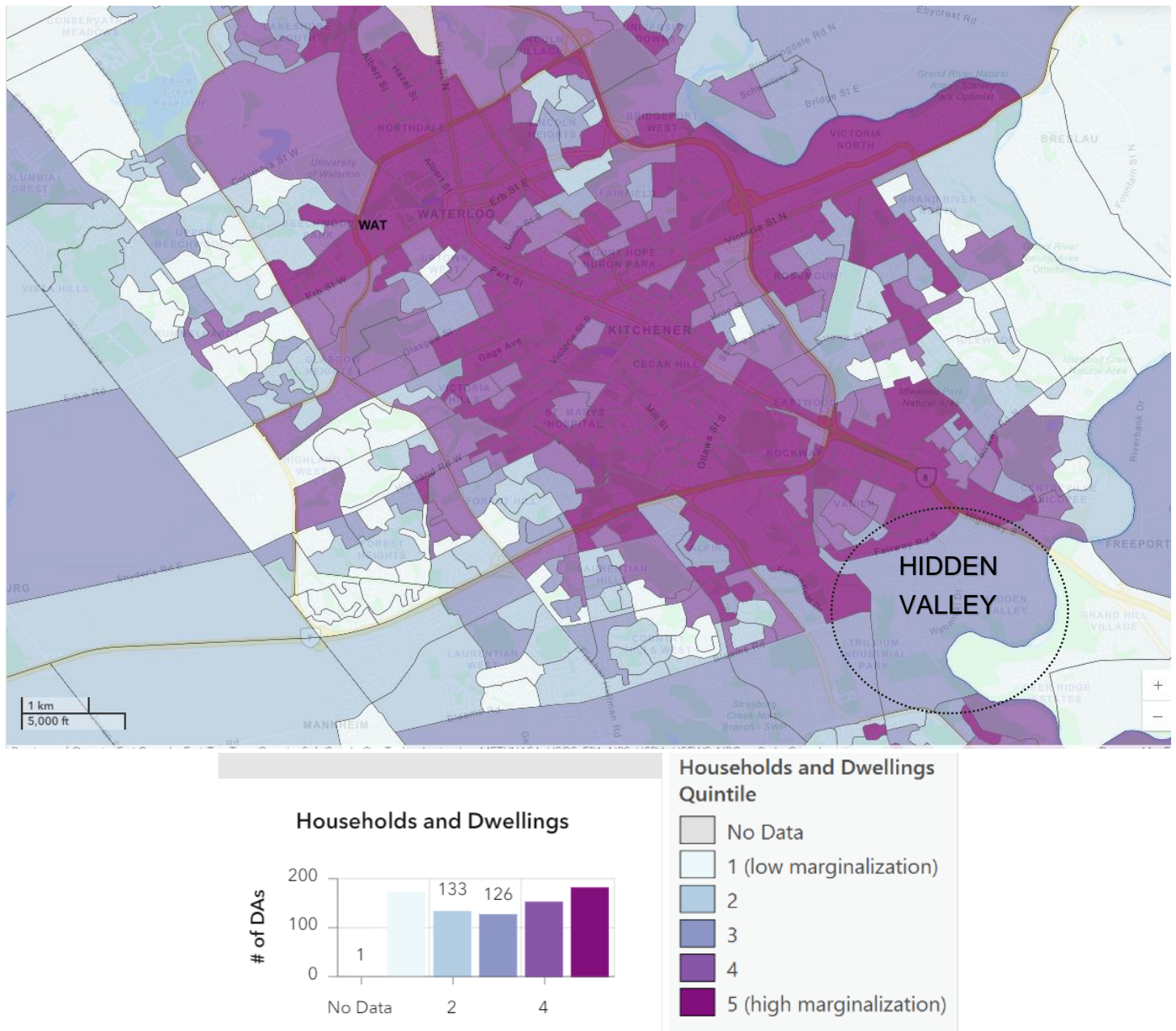
Figure 9 - People who live in Hidden Valley dissemination area fall into the middle quintile, (3) Among all DAs (n=766) within Waterloo Region, Hidden Valley is one of 126 DAs assigned with a category 3 marginalization (neither low nor high).

Material resources

The differences and disparities in health across the material resources dimension reflect the pervasive impact that socioeconomic impact has on a person's access to necessities for good health, exposure to unhealthy stress and instability, and support for healthy behaviours.[40] Higher education

and income (also known as higher socioeconomic position) provides more opportunities to address barriers to good health and wellness, including access to education to make informed decisions about health, better access to preventative health care (such as cancer screening and dental care) and the resources to cope with stressful situations.[40] Marginalization related to lower education and income (low socioeconomic position) is associated with precarious employment, which interferes with the ability to earn a living wage and access upward social mobility, and has impacts on social and psychological well-being.[40]

Figure 10 illustrates that the people living in Hidden Valley experience low marginalization and fall into the least deprived quintile (1) suggesting educational achievements, reliable income and good housing conditions.
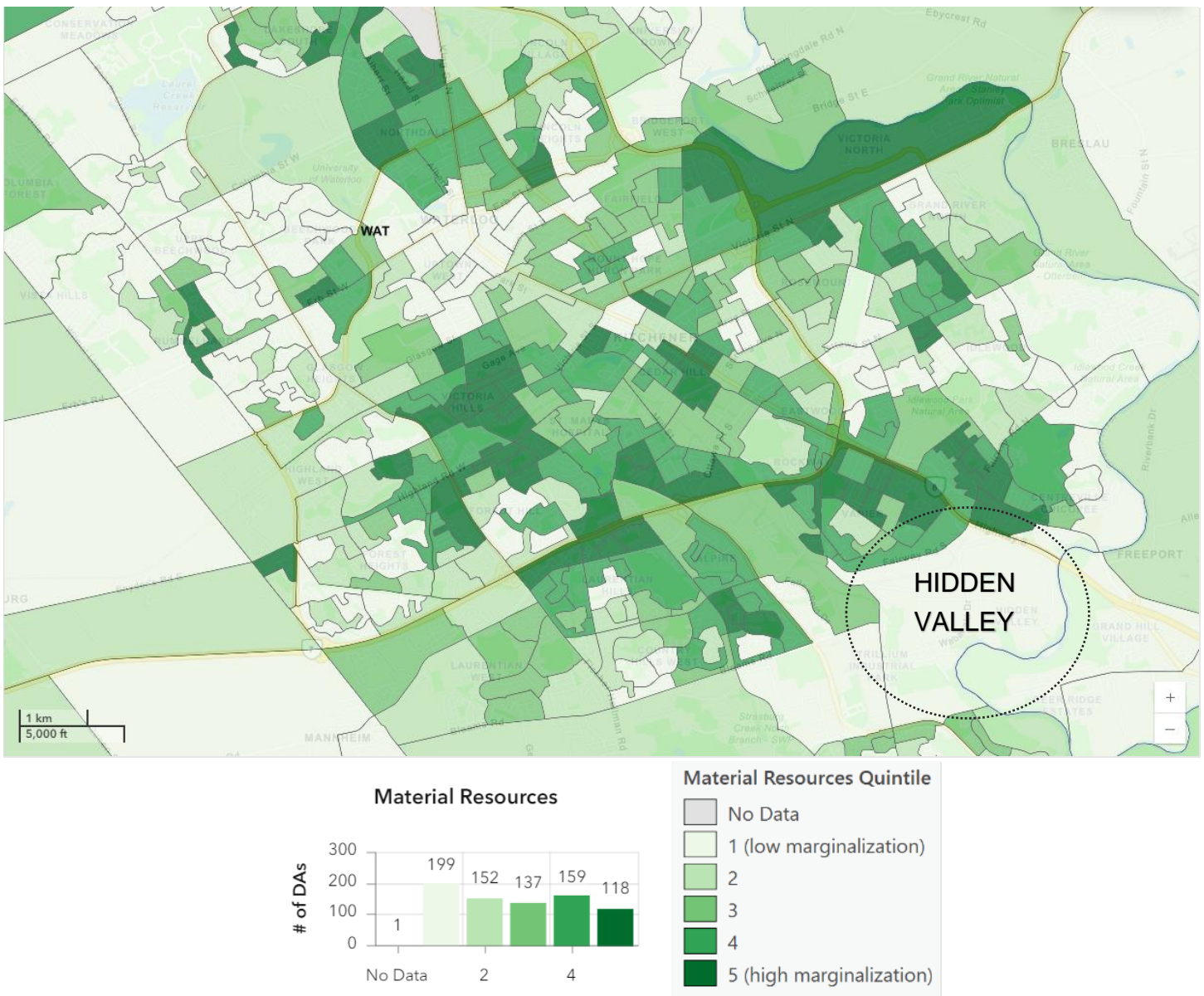

Figure 10 - People who live in the Hidden Valley dissemination area fall into the least marginalized quintile (1) for material resources. Among all DAs (n=766) within Waterloo Region, Hidden Valley is one of 199 DAs assigned with a category 1 low marginalization.

Age and labour force

The **age and labour force** dimension relates to the impact of disability and dependence.[40] It refers to area-level concentrations of people who do not have income from employment, including older adults, children, adults whose work is not compensated (i.e. taking care of households or people in the community) and/or those unable to work due to disability.[40] While some conditions associated with disability result in poor health, people with disabilities may face additional obstacles to health due to discrimination, social exclusion, and difficulty accessing quality health care.[40] This measure can also be connected to the economic vitality of the community and the ways in which resources and infrastructure are allocated.[40] As an example, ageism (discrimination on the grounds of a person's age) can result in fewer community resources made available to older persons which then leads to reduction in quality of health care, and social exclusion.[44]

Figure 11 shows that people living in Hidden Valley are in quintile two (2) and experience lower age and labour force marginalization suggesting most residents have income from employment.
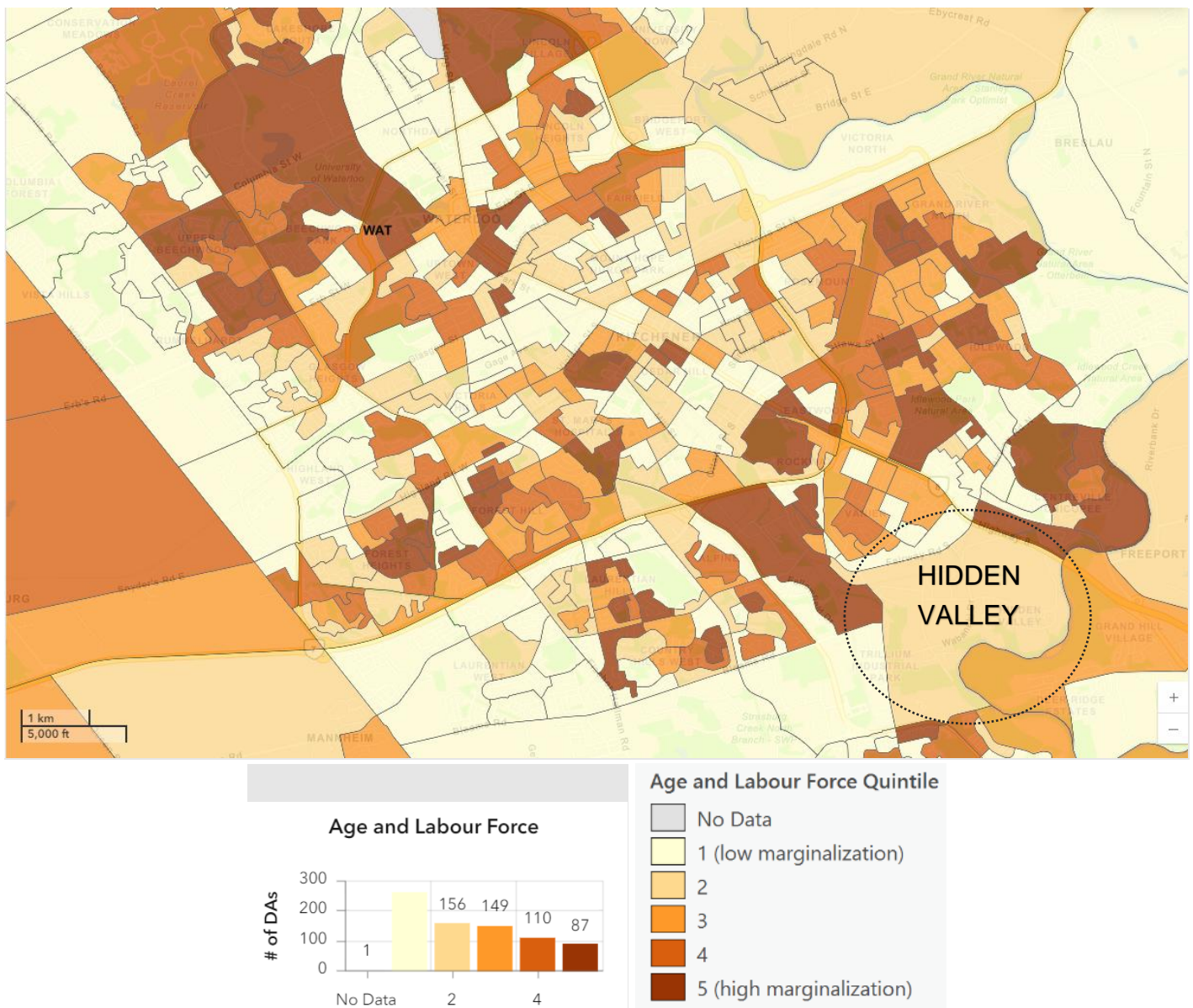

Figure 11 - Those who live in Hidden Valley are categorized one of 156 in quintile 2, meaning they experience lower age and labour force marginalization.

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Racialized and newcomer populations

Racialized groups include people who experience different treatment on the basis of race, ethnicity, language, religion or culture.[45] "Race" is a social construct without biological meaning.[45] The categorization of people as Indigenous, Black, and other racial categories have been historically and are currently used to mark certain groups for exclusion, discrimination and oppression.[45] Disparities across this measure are the result of interpersonal and structural racism, and not the result of individual-level causal factors; people do not encounter racism by choice. Experiences of racism result in chronic stress and trauma, which have direct impact on physical health and mental health and well-being.[45] Furthermore, access to material resources that contribute to health and well-being are restricted, including economic and employment opportunities, and impacts the treatment of individuals in the health system, even discouraging them from accessing services.[46]

Upon arrival to Canada, newcomers (landed immigrants who came to Canada up to five years prior to a given census year[47]) often have better overall health outcomes when compared to Canadian-born counterparts, a phenomenon commonly known as the "healthy immigrant effect."[40] Studies suggest that many newcomers experience declining health linked to the adoption of Western lifestyle (e.g., sedentary lifestyle, consumption of highly processed convenience foods and sugary drinks), the cumulative exposure to stress associated with racism and discrimination, and systemic barriers to employment, housing and health care.[48] Research is clear that both structural racism and anti-immigrant discrimination have profound impacts on individual, community and population health.[48]

Figure 12 shows that people living in Hidden Valley are represented in the fourth quintile suggesting a higher concentration of people who are racialized or are newcomers. These people experience systemic racism and discrimination which have a direct negative impact on their health and well-being.
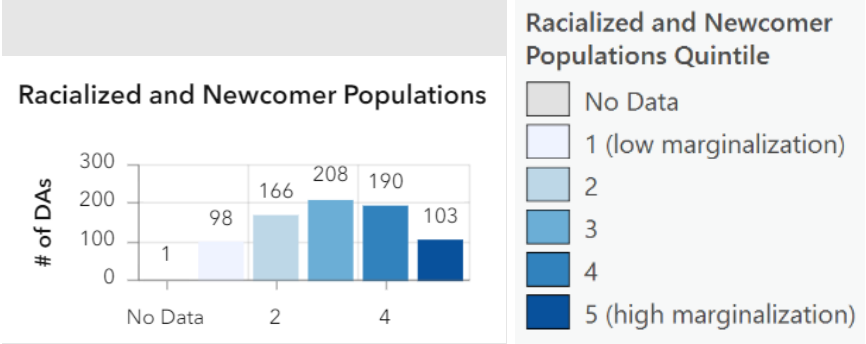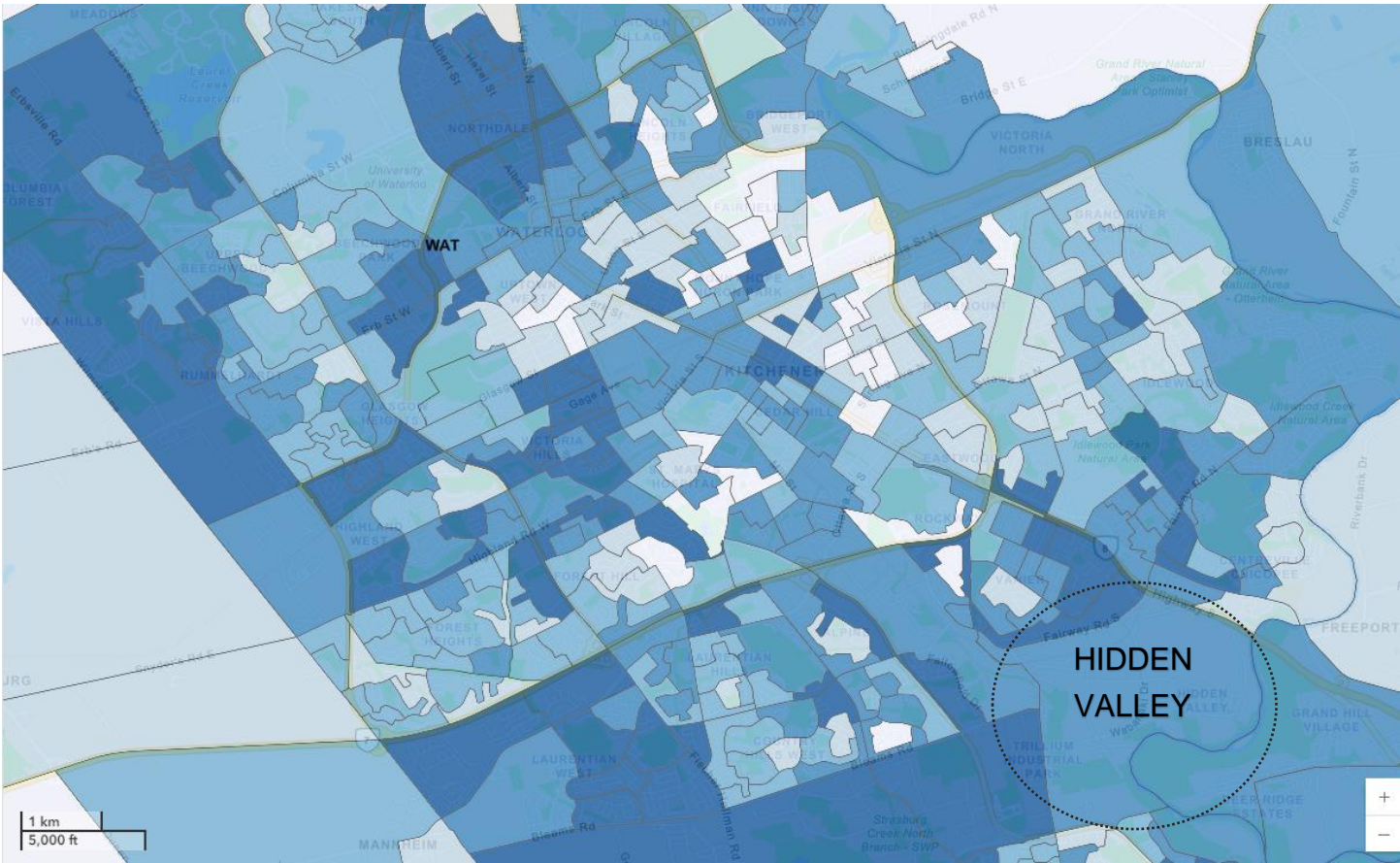
Figure 12 - People who live in Hidden Valley are one of 190 DAs in the second highest quintile (4) for marginalization of racialized and newcomer populations.

ON-Marg Hidden Valley summary and comparison to Kitchener

Table 3 summarizes the level of marginalization for residents of Hidden Valley, with 1 being low and 5 being high.

Table 3: ON-Marg summary for Hidden Valley residents.

Dimension	Quintile	Marginalization
Household and dwellings	3	Represents neither low nor high marginalization
Material resources	1	Represents lowest level of marginalization (least marginalized 20% of areas in Ontario)
Age and labour force	2	Represents second lowest level of marginalization (least marginalized 40% of areas in Ontario)
Racialized and newcomer populations	4	Represents second highest level of marginalization (most marginalized 40% of areas in Ontario)

Table 4 compares Hidden Valley to Kitchener where three out of four of the dimensions score lower in marginalization with only age and labour force scoring slightly higher in marginalization. This means Hidden Valley has a combination of a higher proportions of people aged 65+ years, 0-14 years and those not participating in the labour force compared to Kitchener as a whole. However, overall Hidden Valley is in the second lowest level of marginalization for this dimension when compared to Kitchener.

Table 4: Hidden Valley area scores lower in marginalization for three out of four dimensions when compared to Kitchener.

Level of geography	Dimension and quintile number			
	Households and dwellings	Material resources	Age and labour force	Racialized and newcomer populations
Hidden Valley	3	1	2	4
Kitchener	5	3	1	5

The comparison between Hidden Valley and Kitchener indicates that overall Hidden Valley residents experience lower levels of marginalization relative to the rest of Kitchener and that the high level of marginalization in terms of racialized and newcomer populations may be offset by improved material resources such as income.

Summary of positive and negative health outcomes for Hidden Valley Land Use Implementation Project

Positive health outcomes

There are six positive health outcomes as a result of the activity impacts identified in the HVLUIP. It can be noted that many of the positive health outcomes are repeated for different activity details:

- **Increased physical activity, improved respiratory health, improved mental health and wellbeing, decreased chronic disease and decreased UV and heat exposure** due to increased access to natural areas.
- **Increased physical activity, decreased chronic disease, increased social connectedness and improved mental health and wellbeing** through establishing multi-use trails that will connect active transportation infrastructure.
- **Decreased chronic disease and improved mental health and wellbeing** through zoning for health-promoting services.
- **Improved social connectedness and improved mental health and wellbeing** through establishing ways to connect the community and creating a sense of belonging.
- **Increased physical activity, improved respiratory health, improved mental health and wellbeing, and decreased chronic disease** through designing a community where people can work close to their home
- **Increased physical activity, improved respiratory health, improved mental health and wellbeing, decreased chronic disease and increased social connectedness** through installation of well-connected active transportation and infrastructure and public transit.

Negative health outcomes

There are five key health outcomes of concern based on the activity impacts identified in the HVLUIP:

- **Increased access to highly processed foods** which can lead to decreased mental health and wellbeing and increase in chronic diseases over time.
- **Decreased respiratory health** due to additional particulate matter in the air due to increased vehicular traffic on roadways.
- **Increased exposure to heat and UV radiation** creating heat island effect due to increased hard surfaces that reflect heat and due to the removal of trees.
- **Increased preventable injuries** and death for road users, particularly for pedestrians and cyclists.
- Risk of **increased access to alcohol, tobacco, vapes and cannabis** through commercial zoning allowances.

Figure 13 illustrates the influence of the various activity impacts for the Hidden Valley Land Use Implementation Project as well as corresponding positive and negative health outcomes.
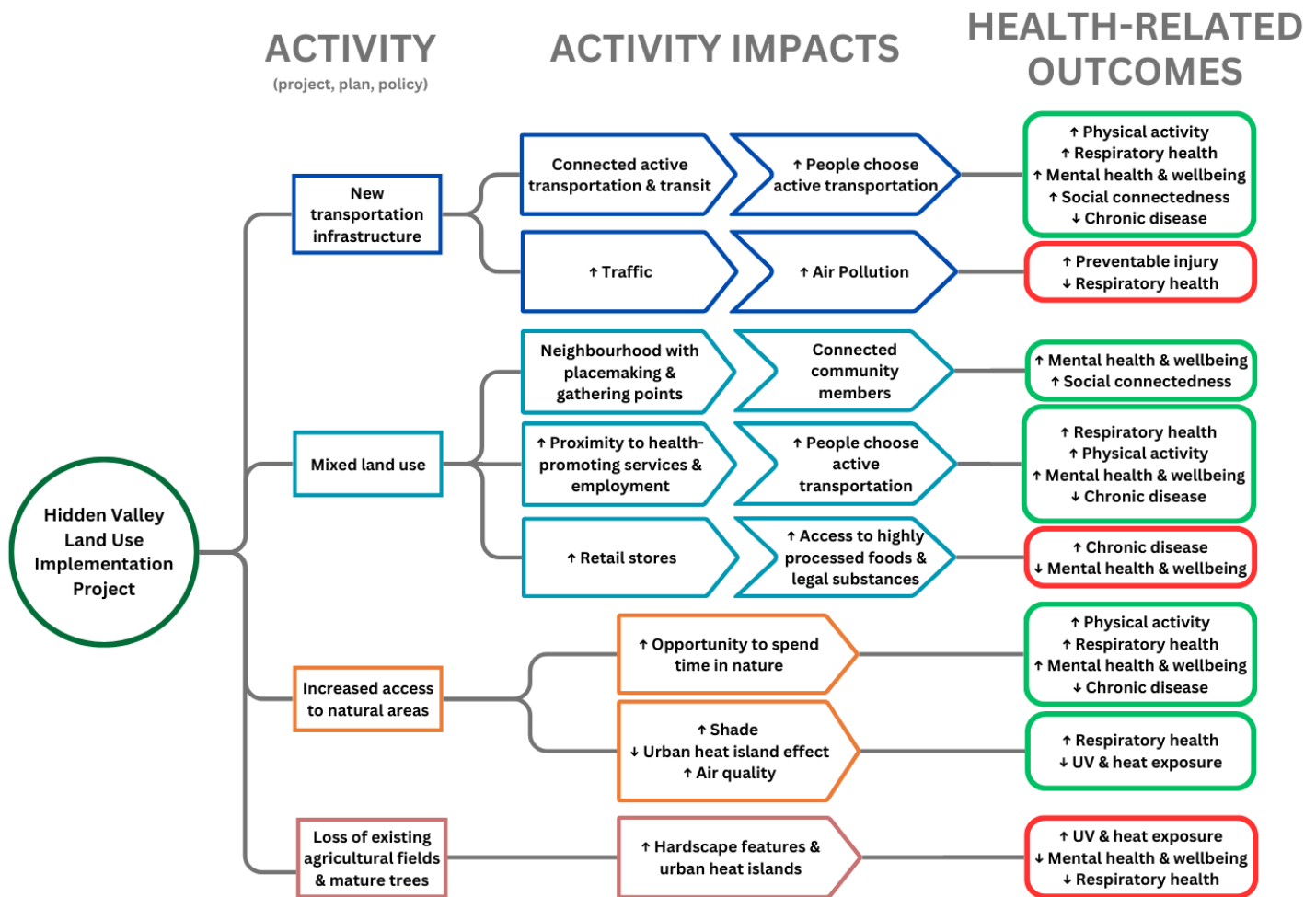
ACTIVITY
(project, plan, policy)

ACTIVITY IMPACTS

HEALTH-RELATED OUTCOMES

Hidden Valley Land Use Implementation Project

New transportation infrastructure
- Connected active transportation & transit → ↑ People choose active transportation → ↑ Physical activity / ↑ Respiratory health / ↑ Mental health & wellbeing / ↑ Social connectedness / ↓ Chronic disease
- ↑ Traffic → ↑ Air Pollution → ↑ Preventable injury / ↓ Respiratory health

Mixed land use
- Neighbourhood with placemaking & gathering points → Connected community members → ↑ Mental health & wellbeing / ↑ Social connectedness
- ↑ Proximity to health-promoting services & employment → ↑ People choose active transportation → ↑ Respiratory health / ↑ Physical activity / ↑ Mental health & wellbeing / ↓ Chronic disease
- ↑ Retail stores → ↑ Access to highly processed foods & legal substances → ↑ Chronic disease / ↓ Mental health & wellbeing

Increased access to natural areas
- ↑ Opportunity to spend time in nature → ↑ Physical activity / ↑ Respiratory health / ↑ Mental health & wellbeing / ↓ Chronic disease
- ↑ Shade / ↓ Urban heat island effect / ↑ Air quality → ↑ Respiratory health / ↓ UV & heat exposure

Loss of existing agricultural fields & mature trees
- ↑ Hardscape features & urban heat islands → ↑ UV & heat exposure / ↓ Mental health & wellbeing / ↓ Respiratory health

Figure 13: Influence of Hidden Valley Land Use Implementation Project activities, activity impacts and health-related outcomes.

Summary of HIA matrix

The summary of the HIA matrix includes full descriptions of activity impacts that are part of the HVLUIP as well as various health outcomes that will result from the implementation of an activity. Health equity considerations are described including those who the people/populations that are most likely to experience negative health outcomes from the various activity impacts included in the HVLUIP. Evidence-informed interventions include different land use planning activities that will decrease the chance of further worsening health outcomes and inequities for the community.

Health Determinant: Physical Environment

Activity impacts	Health-related outcomes and direction of change	Health linkages and research findings	Equity considerations
Enhanced access to natural area	**Positive outcome:** Improved respiratory health. Decreased chronic disease. Improve mental health and wellbeing. Decreased UV and heat exposure.	Increased green space density is associated with several positive health outcomes, including healthier births, decreased stress and reduced all-cause mortality (overall deaths due to any cause or due to cardiovascular disease specifically).[46] The provision of multi-functional greenspace supports physical activity which leads to decreased chronic disease, improved respiratory health and improved mental health and wellbeing.[1,47] Natural areas create spaces where social interactions between people in the community can occur naturally leading to improved social connectedness.[48] Availability of access to trees supports providing a cooling atmosphere and protection from ultraviolet radiation (UVR), particularly on hot, sunny days.[48] Natural areas provide the benefits of shading and cooling which addresses urban heat island effect and improves local air quality.[48]	There is consistent evidence that green space provides greater health benefits to people living with lower socioeconomic status than to the general population.[47] Associations between green space and reduced mortality are strongest in socioeconomically deprived neighbourhoods, and cannot be explained by increased physical activity.[46] Vulnerable populations who will be impacted the most by urban heat islands include older adults aged 55 years or more, young children, individuals of lower socioeconomic status, individuals with chronic illness or disability, and those under-housed or homeless, or living in a shelter, apartment, or basement dwellers with no renter's insurance or access to air conditioning.[48]
Loss of existing agricultural field and mature trees	**Negative outcome:** Increased UV and heat exposure. Decreased mental health and wellbeing. Decreased respiratory health.	Increased surface and ambient temperatures through removal of agricultural field and mature trees combined with increased hardscape features can lead to urban heat islands leading to decreased adaptive capacity to the human health impacts of heat, UVR and climate change overall.[48] Hot temperatures impact human health by affecting the self-regulation of how the human body can heat or cool itself. An inability to regulate core body temperature can lead to heat rash, heat cramps, dehydration, fainting, heat exhaustion, and heat stroke.[28] Exposure to extreme heat has also been found to exacerbate pre-existing health conditions affecting the circulatory, respiratory, and cerebrovascular systems.[29] There is increasing urgency to mitigate the negative impacts of extreme heat, as climate change will increase the number of hot days in Waterloo Region. Expanding the use of vegetation and natural elements across the built environment mitigates the urban heat island effect. In urban centres, the cooling effects of vegetation through parks, urban agriculture and bodies of water, can be significant. Trees and vegetation lower surface and air temperatures by providing shade and through evapotranspiration. Shaded surfaces, for example, may be 11–25°C cooler than the peak temperatures of unshaded materials. Evapotranspiration, alone or in combination with shading, can help reduce peak ambient summer temperatures by 1–5°C.[49] Planting of deciduous trees allows for heat and sun protection during warm weather and provides warmth and sunlight when the leaves are off the trees in the cold winter months.	

Evidence-based Interventions

Improve access for people of all ages, abilities, and backgrounds to parks and natural environments
- **Easy and safe access -** Provide easy and safe access to natural trails, parks and other green spaces.[50]
- **All ages and abilities -** Ensure communal green spaces are designed for the needs of all ages, physical abilities and cultural groups, with features such as adaptive playground design elements, wheelchair-accessible paths, and shaded places for individuals or groups to comfortably sit and talk.[50,51]
- **Cultural considerations** - Consider creating additional prayer spaces in parks to increase accessibility and inclusivity for racialized groups.[52]

Increasing and improving blue and green infrastructure
- **Vegetation and trees to mitigate heat -** Increase the number of trees, shrubs and other vegetation in outdoor public settings and along multi-use pathways and sidewalks.[53–56]
- **Vegetation and trees to reduce air pollution -** Use landscape architecture (trees and plants) across the built environment to help clean the air of pollutants; for example, by increasing vegetation in developments, neighbourhoods, along major roadways and transit hubs.[50]
- **Water features with moving/flowing water-** Integrate water features into urban designs to control microclimates at both the local and regional scales. At the local scale, cities may, for example, install fountains in parks or restore previously covered streams and rivers.[55]
- **Conduct temperature and shade audits -** A shade audit is a tool for individuals or organizations to identify how your outdoor space is used and whether the existing shade (natural or built) is sufficient. A shade audit can:
  - Assist in the preplanning stage of the design of a site
  - Direct the changes needed to existing sites
  - Be used for making the case to decision makers for increasing shade
  - Prioritizing of sites based on usage/greatest need for shade
  - Utilizing summer students or possibly partnering with a post-secondary institution may be an option to conduct audits on a number of sites to help with prioritization for tree planting or installing of shade structures.

Trees and vegetation planting and stewardship
- **Non-native trees -** Consider including non-native tree species due to the changing climate. What may survive well now, may not do so in future climate conditions. Trees will need to be able to survive difficult situations such as poor soil, drought and extreme weather conditions including wind/ice storms and flooding. See Shade Tree List for example of list of shade trees that includes both native and non-native species.
- **Tree diversity -** When planting trees, consider a requirement to plant for species <u>and</u> age diversity. This is to ensure that not all trees are lost due to disease, insect, wind/ice storms, or that they reach their end-of-life expectancy at the same time.
- **Large caliper trees -** Consider planting larger caliper sized trees for the purpose of more immediate health benefits (sun protection/heat respite) to the users of the space. Small caliper trees can take decades to provide some shade.
- **Planting intervals on streets or multi-use pathways -** Plant trees at regular intervals (7-8 metres spacing recommended) to provide continuous natural shade on residential streets with significant levels of regular pedestrian traffic (at least on one side of the street).[57,58] When applied correctly, trees support creating a comfortable space for citizens by providing protection from the sun and heat, a safer travel system through traffic calming and creating a physical barrier from vehicles.[59,60]
- **Maintenance -** To improve public safety, particularly for women and girls, keep vegetation and trees maintained along paths, entrances, corners and intersections to improve visibility for users of the space.[61] Maintain tree canopies above head-height to ensure a clear view and plant medium to large trees on the periphery of core areas and back from the main paths.[61] Green space that is well-maintained is associated with improved public safety.[62]

Design and layout of outdoor spaces
- **Incorporating shade design principles -** To ensure shade is considered and applied correctly to provide maximum health benefit to the public, consider incorporating the shade principles found in the Shade Design Fact Sheet.
- **Shadow casting -** Plan for the tree shade to fall where it is needed, shadow casting is most successful when trees are placed to the south and southwest of the area to be shaded.
- **Playground equipment and park site furnishings -** Ensure that all playground equipment, play elements (e.g. sandpit), supervision areas, seating/tables, etc. have either natural or constructed shade.[58,63]
- **Playground footprint -** Playground size and layout are important to consider when designing them as it is difficult to provide shade over a large playground structure. Consider instead breaking up the playground into smaller structures and activity areas to allow for a footprint where trees can be planted throughout the space thereby providing shade over the structure and any rubberized safety surfacing.
- **Boulevards -** Consider implementing wider boulevards with street trees to separate pedestrian and vehicular traffic for the perceived and actual protection.
- **Transit stops -** Consider positioning transit stops that do not have a shelter adjacent to already-existing sources of shade from trees or buildings.[57]

Activity impacts	Health-related outcomes and direction of change	Health linkages and research findings	Equity considerations
New construction of transportation infrastructure for motorists, cyclists and pedestrians.	**Negative outcome:** increased preventable injury	By virtue of people using roads, sidewalks, trails and bike lanes, humans are likely to make mistakes resulting in collisions between various road users like pedestrians, cyclists and motorists.[64] The impacts of road traffic collisions (RTCs) are far reaching and with great costs to individuals, families and society. RTCs remain a leading cause of unintentional injury for Canadian children, youth and young adults.[65] Each year about 3,100 residents from Waterloo Region visit an Emergency Department and 23 residents die as a result of injuries caused by RTCs.[66,67] In 2018 the cost of injury for transport related incidents in Canada totalled \$3.6 billion.[31] Financial costs of road crashes and injuries include lost earnings, health care and rehabilitation expenses, and the costs of property damage, administration, police, legal, and insurance.[65] Injuries from such incidents can range from minor to severe including life-altering permanent disabilities like paraplegia, quadriplegia and brain injury. Those injured may experience chronic physical pain, as well as emotional trauma effects personally and within their families.[65]	Community design needs to consider and prioritize the needs of children, youth, and older adults, particularly for pedestrians and cyclists. Children, youth and older adults experience higher frequency and severity of injury related to RTCs due to physical, cognitive, auditory and social development.[65,70,71] Pedestrians and cyclists are known as vulnerable road users and are more seriously injured in collisions than motorists due to lack of protection when their bodies are struck by a motor vehicle.[65] Prioritize safety and enjoyment of public and active transportation in low-SES neighbourhoods. Interventions may include safe street crossings, traffic calming techniques, and enforcement measures such as speed limit reductions; development of linear parks, multi-use trails, greenways and sidewalks, and organization of walking groups.[46] Longitudinal research indicates that young children in low-SES neighbourhoods are more likely to use active transportation to get to school, and are more likely to be exposed to environmental hazards such as dangerous traffic or unsafe neighbourhoods.[46]
Additional vehicular traffic will generate more air pollution.	**Negative outcome:** decreased respiratory health	The transportation sector is responsible for 49 percent of greenhouse gas emissions in Waterloo Region[68]. More vehicles leads to more emissions and atmospheric particulate matter in the air which has a direct negative impact on respiratory health, particularly for children, older adults and those who are already living with respiratory disease like asthma, emphysema or chronic obstructive pulmonary disease.[4]	Ensure that locations and schedules for public and active transportation options support the daily activity flows of people who depend on them. Public and active transportation links should connect the places where people live, work, shop for necessities, go to school, and play. Miss-matched transit and work schedules, infrequent transit routes, and poor route connections cost the people who depend on them in terms of time and stress. Consider the risks of increased housing or living costs when new transit developments—positive features that might lead to gentrification—are introduced to a neighbourhood.[46] Recent studies in the United States of America have shown that even when controlling for differences in population size and walking rates, older adults, people of color, and people walking in low-income communities are disproportionately represented in fatal crashes involving pedestrians.[72] In Waterloo Region, people aged 50+ years, and especially those 75 years and older, are particularly overrepresented in deaths involving pedestrians.
Establishing multi-use trails will connect with active transportation infrastructure new central park space in mixed use community.	**Positive outcome:** Increased physical activity. Decreased chronic disease. Increase social connectedness. Improved mental health and wellbeing.	Well connected active transportation infrastructure like multi-use trails leads to more people having the choice to use active transportation to get to and from destinations; this leads to more people walking, cycling and using transit and reaping the health benefits.[1,4,35,69]	

Evidence-based Interventions

Bring destinations closer together
- **Plan for greater mix of land uses** with higher building density and increased travel network connectivity[50,73]

Prioritize active transportation
- **Use street safety features** such as red-light cameras, reduced vehicle speeds, and automated speed enforcement to decrease traffic collisions and injuries among all road users.[50]
- **Consider using market measures** that are known to increase travel using active transportation include:
  - Increasing the availability and quality of public transit[50]
  - Developing dedicated rail lines, bus lanes, and bus queue jump lanes[50]
  - Prioritizing infrastructure that supports multi-modal trips[50]
  - Considering road pricing, high priced parking, and gas taxes[50]
  - Designing closed off roads[50]
  - Road diets, road redesign and volume diversion[50]
  - Disruptive (non-grid) street design for cars[50]
  - Continuous and well-connected pathways for pedestrians and cyclists[50]
  - Ensure sidewalks and cycling lanes do not end abruptly[74]
- **Clearly differentiate bike, pedestrian, and multi-use pathways** in order to reduce the rate of injury and collision. Bike paths have one-ninth the risk of injury to cyclists compared to major streets with parked cars and no bike infrastructure.[50]
- **Use traffic calming methods** such as narrower traffic lanes and residential traffic diversion to reduce traffic speeds, traffic volume and to increase perception of safety and number of people walking.[50]

Make active transportation networks safe and accessible for all seasons, ages, and abilities
- **Consider the diversity of populations** who are most likely to benefit from access to active transportation infrastructure and their specific needs, including language, affordability, connection to health services and schools, and specific needs for people using mobility devices.[50,75]
- **Use appropriate signage and wayfinding** to clearly designate walking and cycling paths, and connections to common destinations.[50] For those who speak English as an additional language, visual signage (e.g. symbols and pictures) can offer support to enhance understanding.
- **Ensure adequate and appropriate lighting along streets and pathways.**[76,77]
  - Pedestrian scale lighting is preferred as light is distributed from the source outward in horizontal and vertical rays.
  - The levels of horizontal and vertical illumination are the main performance criteria determining the choice of light source. Horizontal illumination, measured at pavement level, enables cyclists to see the cycling route direction, surface markings and obstacles. Vertical illumination, measured 1.5 m above the pavement, makes vertical surfaces visible (e.g. cycling facility signage or approaching cyclists).[78]
  - Provision of lighting should be considered where cycling at night is expected, such as along active transportation paths or multi-use trails serving students or commuters, or where paths cross barriers through underpasses or tunnels.[78]
  - Ensure there is lighting along paths to transit stops to increase safety and encourage individuals to use paths to transit spots regardless of the time of day.[74]
- **Create quiet bikeways and off-street bike paths/trails** that are readily accessible to residential areas and connected to common areas of work, play and learning.[50]
- **Make active transportation and outdoor physical activity options safer by separating vulnerable road users** (e.g. people who walk and cycle) from vehicle traffic through space or time by implementing appropriate measures such as the following:[50]
  - **Spatial/physical separation**
    - Spatially separate sidewalks and bicycle lanes, e.g. protect sidewalks and cycle paths with some kind of barrier, build underpasses or overpasses for pedestrians and cyclists[53]
    - Incorporate pedestrian medians and sidewalk bulges[50]
    - Clearly delineate pedestrian and cyclist zones at intersections[50]
    - Divert bicycle lanes around bus stop zones ("floating bus stops")[50]
- **Separation through time**
  - Leading Pedestrian Intervals (LPIs)[50]
  - Pedestrian scrambles (exclusive WALK phase for pedestrians in all directions)[50]
  - Dedicated signal phases for cyclists[50]
  - Prohibition on right-turn-on-red for vehicles[50]
  - Elimination of permissive left turn for vehicles (where a dedicated left turn signal is not required, but left turns are permitted when there is a break in traffic), and elimination of concurrent traffic movements[50]

Evidence-based Interventions

- **Commit to a winter maintenance policy for cycling networks** to have a dedicated budget, snow maintenance vehicles (e.g. sidewalk ice crushers, plows) and crews to operate the equipment.[79]
- **Change the physical environment for all road users** to create spaces where people of all ages can safely walk and cycle; it is also important to have an emphasis on creating safe pedestrian and cycling environments for children, youth and older adults.[1,70,71,80-84] Some solutions include:
  - **Pedestrians**
    - Presence of sidewalks and crosswalks at intersections[1]
    - Adequate and appropriate street lighting[77,85]
    - Traffic calming with speed limits between 30-40km/hr in residential and high pedestrian traffic areas[65]
    - Adoption of Complete Streets[65]
    - Signs and signals for pedestrians[65,80]
    - Decreasing points of conflict with pedestrians and cyclists[1]
  - **Cyclists**
    - Marked lanes for cycling; improved safety for cyclists when cycling lanes are separated and not on the same grade as motorists[65,80]
    - Clearly and appropriately placed signage including bicycle traffic signals[1]
    - Decreased speed limits for motorists[10]
    - Adequate and appropriate street lighting[85]
    - Implement temporary road closures to motorized traffic and instead limit traffic to major peripheral roads to reclaim street space for play for pedestrians and cyclists.[87,88]
    - Limit availability of motor vehicle parking and have vehicle-free areas[1]
    - Decreasing points of conflict with pedestrians and cyclists[1]
  - **Motorists**
    - Traffic calming measures[9]
    - Adequate and appropriate street lighting[85]
    - Installation of roundabouts[8,77,89,90]
    - Community design that reduces motor vehicle traffic[91–93]
    - Clearly marked drop-off and pick-up areas[94]
- **Provide well-lit and covered areas** to secure bikes, bike-sharing services, wide paved paths for mobility devices and strollers[87,95]
- **Boulevards -** Consider implementing wider boulevards with street trees to separate pedestrian and vehicular traffic for both perceived and actual protection.

Design connected routes for active transportation and support multiple modalities
- **Provide bike shelters, racks and consider providing secured bike parking** at transit stations or key destination points[50,96]
- **Make public transit service and waiting areas convenient, safe and accessible** for all levels of physical mobility.[50] This includes providing seating at designated transit waiting areas.[63]
- **Ensure there are separate, clearly marked cycle paths** for cyclists for the safety and comfort of older pedestrians, older cyclists, and older drivers.[97]

Create safe and welcoming destinations to create a sense of place [50]
- Develop linear parks, multi-use trails, and greenways along travel networks[98,99]
- Create playscapes only accessible to pedestrians and bicycles[88]
- Make small parkettes with fitness or playground equipment in existing non-park spaces[87]

Consider microclimate and human comfort along pedestrian and cyclist networks and within neighbourhoods
- **Install shade structures at transit stops** and in places where there is not space for trees[56]
- **Increase green infrastructure** by planting and maintaining trees, shrubs and other vegetation along travel networks.[55,56]
- **Implement climate-sensitive urban design and planning** for roads, sidewalks, parking lots, and driveways. This includes selecting surface reflectivity materials to reduce material heat absorption. [55,56]
- **Integrate water features into urban designs**[55]
- **Install amenities** to support active transportation through the installation of bike racks at destination points (e.g. transit hubs), install seating/rest nodes for pedestrians at key destination points and along major pedestrian routes to support those who may need rest/breaks. These amenities ideally would be shaded and protected from weather elements.
- **Transit stops -** Consider positioning transit stops that do not have a shelter adjacent to already-existing sources of shade from trees or buildings.[57]

Evidence-based Interventions

Ensure there is inclusive community engagement and consultation
- **Engage in inclusive consultation strategies** that allow groups to participate who have historically been excluded to ensure that that the built environment supports their safety needs.[74]
- **Utilize different consultation and built environment approaches** that acknowledges that each community may need a different approach to consultation and different built environment interventions to ensure safe and accessible transportation. The consultation process needs to fit the needs of equity-deserving community members [100]
- **Health equity-focused built environment change** strategies are required to address the sometimes conflicting built environment needs of people with different disabilities.[74]
- **Promote cycling and road safety workshops** to help children develop traffic, road and cycling safety skills and increase their parent's confidence in their children to independently travel. Addressing parental concerns regarding traffic safety can increase children playing travelling and playing outdoors.[101]
- **Implement a transportation training program** or workshops to help support older adults with navigating the transportation system [102]
- **Involve youth in the decision-making process** and conversations surrounding active transportation as youth have emerging independent mobility and need to be included in decision-making for public transportation policy [103]

Interventions that address health equity
- **Design wider sidewalks** to allow room for mobility devices and room to pass.[74]
- **Incorporate supportive systems into transit that ensure that people of all income levels can equitably afford active transportation**. This can look like removing or reducing fare enforcement for those who cannot afford transit, or making active transportation free or more affordable for youth or individuals with low-income.[106] This could be done by creating a devoted funding system to remedy system inequities[104]
  - **Important to implement available transportation in a range of affordable options** for all people[105]
- **Ensure that the locations and transportation schedules support the daily activities of individuals who depend on them**.[99,106] Infrequent transit service, poor route connections and miss-matched transit and work schedules cause stress and waited time for those who depend on them[99]
- **Provide availability of accessible, convenient and affordable coordinated public transportation and community transport services** (i.e. shuttle vans, taxis) to transport older adults to appointments, events, shopping excursions, field trips. Ensure community drivers are compensated (e.g. gas money) for their volunteer efforts and that the services area available throughout the day and evening.[94]
- **Maintain sufficient disabled parking spots that are regularly enforced**[94]

Health Determinant: Social and Community Factors

Activity impacts	Health-related outcomes and direction of change	Health linkages and research findings	Equity considerations
Zoning for health-promoting services (dentist, physiotherapy offices, counseling services, etc.) will improve access to those who live and work in the area.	**Positive outcome:** Decreased chronic disease. Improved mental health and wellbeing.	By nature of proximity to services, people have the choice to access services that can promote and protect their health.[107]	Having health-promoting services near where people live makes it easy for people to get to their appointments and to use active transportation as a means to travel.[107]
Establishing ways to connect the community will increase the feeling of belonging to those who live, work and play in the area (e.g. placemaking, gathering points).	**Positive outcome:** Improved mental health and wellbeing. Improved social connectedness.	When people can interact with their neighbours in the community, this leads to increased social connectedness including decreased loneliness and an overall sense of belonging.[1] People with a sense of community and belonging are more likely to report having excellent or very good physical and mental health.[1,108]	People who may benefit the most are those who do not have a personal vehicle for transportation, newcomers, and people living with lower income.[109]

Evidence-based Interventions

Maximize opportunities for placemaking to allow community members to socialize and connect with others
- **Create community hubs** or multi-purpose facilities that serve as gathering spaces.[110]
- **Support place-keeping initiatives** where residents actively contribute to the upkeep, improvement, or maintenance of public spaces. This may include initiatives such as community gardening, community programming or public art installations.[111]
- **Include a trauma-informed approach to planning the built environment**.
- Example: Environments with poor lighting, loud noises and dangerous traffic could elicit a trauma response and be distressing to those who have experience trauma. Incorporating noise barriers, restrictions on construction start time, increasing lighting, and implementing safe traffic measures could help promote feelings of safety and could minimize a trauma response.
- A trauma-informed neighbourhood is where trauma-informed principles are adapted for and applied to the built environment.[115] Trauma-informed approaches to the built environment are critically needed, given the clear impact of neighbourhoods on health and the potential for physical neighbourhood characteristics to either re-traumatize of promote healing, especially in neighbourhoods where many residents have experienced trauma.[112]
- **Implement inclusive public spaces** where older adults and intergenerational community members can engage in activities for the whole family to promote a sense of belonging.[102,105]
- **Ensure there are informal gathering places within the community** to act as seniors' congregating spaces.[97] Provide opportunities for social participation in leisure, social, cultural, and spiritual activities with people of all ages and cultures.[113]

Maximize opportunities for inclusive community engagement and consultation in the planning and design process
- **Provide meaningful engagement opportunities** for community members including equity-deserving groups (e.g. low-income, older adults, unhoused/under housed, individuals with mobility, sensory and cognitive disabilities or chronic health conditions, immigrants, refugees, 2SLGBTQ+, single mothers, Black, Indigenous, and people of colour (BIPOC) to participate and fully engage in decision-making and planning interventions to the built environment and culturally relevant public open spaces as they are uniquely equipped to identify actions needed to address sources of inequity.[99,106,114–116,62]
- **Provide background information in advance** to allow for reflection to support informed decision-making[95] and compensate community members fairly during consultations for their time.[95]
- **Engage with children and youth during consultations** to instill the importance of community and public space design at an early age.[95]
- **Ensure a variety of accessible and culturally appropriate engagement strategies** are used (e.g. multilingual materials, digital platforms, community meetings and events).[116] These may include:
  - Using plain language to increase the ease of understanding information discussed during engagement strategies.
  - Ensuring the locations of events and activities are convenient to older adults in their neighbourhoods. Provide support to enable older people to participate in meetings, including reserved seating and transportation.[97] Focus on community-based interventions that improve social connectedness and participation in older adults[117]
  - Engagement strategies such as discussion forums, workshops, public-awareness campaigns to encourage bottom-up engagement from residents.[118]
  - Fostering mentorship and knowledge sharing (e.g. funding opportunities, skills to design and activate public spaces) to develop culturally responsive public spaces and ensure continuity, accessibility and collaboration of information.[95]
- **Ensure community feedback is utilized** in final plans and that there are ways for community members to provide on-going feedback throughout the project (e.g. advisory boards, community-based decision-making boards, and regular community meetings and surveys).[116,119]
- **Consider universal design early in the developing process** to ensure it is accessible and usable by as many people as possible, regardless of their age, ability, or other factors.[120]

Health Determinant: Livelihood Factors

Activity impacts	Health-related outcomes and direction of change	Health linkages and research findings	Equity considerations
People living in community may have opportunity to also work within and/or will be able to access public transit/use active transportation facilities.	**Positive outcome:** Increased physical activity. Improved respiratory health. Decreased chronic disease.	When there are neighbourhoods with high residential and employment density, healthy daily activities such as walking, cycling and other forms of physical activity are naturally promoted through the built environment. Distance is a common barrier for participating in active transportation – if someone's workplace is closer to where they live, they are more likely to use active transportation as a way to travel around their neighbourhood, thus reaping all of the health benefits that active transportation has to offer.[35]	Increasing the availability of alcohol such as adding more retail outlets is associated with increased alcohol harms to the surrounding community; this includes violence, assault, crime, and injuries. The impact of outlet density on high-risk drinking is especially concerning among young drinkers and marginalized drinkers; [121] people who are marginalized experience inequalities in various measures of health and social wellbeing.[37] Children and youth are more likely to smoke whey they live or go to school in a neighbourhood that has tobacco retailers. Retail outlets are more likely to be present in low-income neighbourhoods and within walking distance to schools. The proximity to tobacco retailers serves to increase tobacco exposure and the opportunity to purchase tobacco products which may aid in the transition from experimenting with smoking to becoming regular smokers. [122,123]
Evidence-based Interventions			
See section "Health Determinant: Built Environment" as evidence-based interventions for this activity impact are the same as those for active transportation facilities.			

Health Determinant: Lifestyle Factors

Activity impacts	Health-related outcomes and direction of change	Health linkages and research findings	Equity considerations
Retail stores may offer highly processed foods, lack of access to healthy foods, increased access to substances like alcohol, tobacco, vaping products and cannabis.	**Negative outcome:** Increased access to highly processed food. Increased access to legal substances. Increased chronic disease. Decreased mental health and wellbeing.	Diet quality is one of the most important risk factors for human health.[125] Waterloo Region has an overabundance of retailers and restaurants that sell highly processed foods, especially in areas that have a high proportion of individuals living with low-income.[126] This is an issue because an individual's ability to make consistent healthy food choices to promote good health, can be overwhelmed by exposure to highly processed foods.[127–129] A healthy diet is one that follows Canada's food guide and emphasizes vegetables, fruit, whole grains, plant-based protein foods as well as low fat milk, fish, and lean meat.[20] Eating a healthy diet lowers the risk of developing chronic health conditions such as type 2 diabetes, cardiovascular disease, and some cancers.[125,130] Following the recommendations in Canada's food guide also promotes environmental sustainability.[125] To reduce population exposure to highly processed foods, the total number of retailers should be reduced, especially near settings where children live, learn and play (such as schools, parks, playgrounds and recreation centres) and in neighbourhoods where a large proportion of the population lives with low-income and neighbourhoods with a greater number of Indigenous residents[99]. This is because all retail land uses may offer highly processed foods for sale, even those that do not offer food as a primary product, e.g., hardware stores, clothing stores, gas stations, and pharmacies that sell sweetened beverages, chips, chocolate bars, candy, etc.[131] Easy access to alcohol, tobacco, cannabis and vaping products is linked increased use of substances which leads to negative health impacts like various lung diseases, various cancers, and decreased level of mental health and well-being.[132]	**Diet Quality** Access to highly processed foods may be particularly apparent in neighbourhoods with a high percentage of residents living with low-income, as limited access to affordable healthy food and greater exposure to highly processed foods are more common and can negatively influence dietary habits.[126,133–135] Children and youth are particularly sensitive to cues to eat highly processed as their brains are still developing and therefore lack the self-control required to overcome environmental cues to consume highly processed foods.[136–138] **Access to Alcohol, Tobacco, Vapes and Cannabis** Increasing the availability of alcohol such as adding more retail outlets is associated with increased alcohol harms to the surrounding community; this includes violence, assault, crime, and injuries. The impact of outlet density on high-risk drinking is especially concerning among young drinkers and marginalized drinkers; [124] people who are marginalized experience inequalities in various measures of health and social wellbeing.[40] Children and youth are more likely to smoke whey they live or go to school in a neighbourhood that has tobacco retailers. Retail outlets are more likely to be present in low-income neighbourhoods and within walking distance to schools. The proximity to tobacco retailers serves to increase tobacco exposure and the opportunity to purchase tobacco products which may aid in the transition from experimenting with smoking to becoming regular smokers. [125,126]

Activity impacts	Health-related outcomes and direction of change	Health linkages and research findings	Equity considerations
Installation and connecting active transportation and public transit will allow more people to see transit use and active transportation as an option to move around the community.	**Positive outcome:** Increased physical activity. Improved respiratory health. Improved mental health and wellbeing. Decreased chronic disease. Increased social connectedness.	Access and presence of active transportation facilities leads to more people choosing active transportation as a means of travel and recreation.[1,107] Increased active transportation means more time being physically active which leads to improved mental health and well-being, decreased chronic disease and increased social connectedness.[1]	Low-income residents, marginalized and newcomer populations are more likely to rely on active transportation and public transit as their main form of transportation. People without access to a motor vehicle and non-drivers are also more likely to walk and cycle.[35] Supporting children, students, older adults, women, and people with disabilities to access public transit enables them to connect with health and social services and recreation, and be more involved in community life.[35] People with disabilities' right to inclusion in neighbourhoods is found in 'disability' legislation (i.e. Accessibility for Ontarians with Disabilities Act [AODA] and United Nations Convention on the Rights of Persons with Disabilities [UNCRPD]). However, it is known from disabled peoples organizations, disability advocates, human rights commissions' complaints lists, media reports, and people with disability themselves, that significant difficulty in exercising such rights is still being experienced. People with disabilities continue to experience challenges with navigating the built environment of neighbourhoods and cities. [124]

Evidence-based Interventions

<u>**Diet Quality**</u>

Neighbourhood – land use mix
- Consider adding retail land uses to residential settings on a case by case basis, rather than a best practice.[130]
- When making the decision around retail uses to promote healthy eating, consider the complexity of food purchasing behaviours including access to healthy food and exposure to highly processed foods, along with food affordability, food quality, safety, transportation, atmosphere in the store, and store operating hours.[130,142–144]

Transportation system (e.g. streets, transit, active transportation, trails, pathways, transit stops, boulevard, cycling facilities)
- Ensure public transit routes serve residents living with low-income and enable them to have access to a large grocery store. This may be a viable strategy compared to incorporating smaller retail spaces within the neighbourhood in the hopes that a small retailer will offer healthier food.

Places where people gather (e.g. city square, placemaking)
- Permit temporary vegetable and fruit markets or mobile vegetable and fruit vendors within other land uses for placemaking purposes.[145–147]
- Permitting land uses to grow food within all other land uses may be an effective placemaking initiative.[145,148] Community gardens encourage citizens to interact and cooperate, be physically active and become interested in preparing and consuming vegetables and fruit.[149–152] Consider supportive municipal policies that incorporate community gardens within dense residential settings or require community gardens to be incorporated into new development designs.[145] Municipal staff support is required to obtain necessary resources for a successful community garden (e.g., administrative support, land, soil, tools, building materials, storage, water).[145]
- Certain services such as temporary vegetable and fruit markets and mobile vegetable and fruit vendors can enhance the health of the population and contribute to community food security by promoting local agricultural products.[145,148] Consider municipal policy options such as:
    - Permitting temporary vegetable and fruit markets in all community centres.[145]
    - Creating by-laws that exempt temporary vegetable and fruit markets from being enclosed within a building.[145]
    - Amending licensing by-laws to permit temporary vegetable and fruit markets or mobile vegetable and fruit vendors to operate in residential zones and close to schools.[145]
    - Aligning zoning and licensing by-laws to ensure that it is clear where temporary vegetable and fruit markets and mobile vegetable and fruit vendors are permitted to operate.[145]
    - Reducing or waiving fees for temporary vegetable and fruit markets or mobile vegetable and fruit vendors.[145]

Evidence-based Interventions

Access to health promoting amenities
- Incorporate other land uses into development plans to get people interacting and walking, such as parks, community gardens, other green spaces, open air concert or play venues, libraries, or community spaces to learn gardening, healthy cooking, crafts, computer skills, etc. This can serve to create a sense of place without simultaneously creating unsupportive retail spaces that can have the effect of diminishing diet quality.

Access to Alcohol, Tobacco, Cannabis and Vaping Products

Municipal Alcohol Policy
- While most alcohol policy is governed at the provincial and federal level, municipalities can address alcohol-related risk and harm on municipally owned property through municipal alcohol policies (MAPs), and through by-laws governing municipally owned property, zoning, and licensing restrictions.[33]
- Municipalities have significant interests in reducing alcohol-related harms. These harms affect individuals, families, communities, and neighbourhoods. From nuisance, to violence, to public safety concerns, municipalities devote much time and resources to dealing with alcohol. Municipal level policies can make a real difference when it comes to decreasing local alcohol-related harms and costs.[33]
- **Regulating physical access through density and location restrictions**[33]
    - Establish limits regarding the number of liquor licensed establishments by neighbourhood.
    - Location restrictions to protect sensitive land uses, such as schools and parks, and to address clustering by establishing minimum distance requirements between alcohol outlets.
    - Collaborate with local Public Health Unit to identify priority neighbourhoods that are more susceptible to alcohol harms to limit locations of alcohol retailers and licensed establishments.[33]
- **Marketing**[33]
    - Establish policies controlling the promotion of alcoholic beverages on municipally-owned lands or facilities.

Examples of Municipal Policy for Tobacco, Cannabis and Vaping Products
- The Ontario Municipal Act gives local governments broad scope of authority for bylaws concerning "health, safety and well-being of persons", for "consumer protection" and for "business licensing".[153] Municipal policy can be created related to tobacco, cannabis and vaping products.
- **Ontario municipalities have authority to say where businesses can operate.**
    - Creation of policies that limit tobacco retailers in residential areas and close to places where children and youth live, learn and play; this policy could be expanded to also include vaping products. [150]
- **Municipalities can impose fees to retailers** who sell tobacco and vaping products. Some Ontario municipalities charge retailers significantly more than businesses for which the city has less regulatory involvement:[150]
    - Ottawa's annual tobacco vendor fees are now $928, compared with a fee of $152 for food premises.
    - Hamilton charges an annual fee of $669 for tobacco retailers, with an additional fee of $72.00 for those who sell e-cigarettes, compared with $295 for food premises.
- **Ontario municipal bylaws have set rules for retailers** including:[150]
    - Burlington prohibits tobacco licensees to sell matches or lighters to children.
    - Brampton maintains the right to refuse a licence to anyone who has previously been convicted of selling to minors.
    - Several Ontario cities have banned Shisha cafés (hookah lounges), including Ottawa, Peterborough, Peel, Toronto and others. The Ontario Court of Appeal has upheld such laws.
- **Establish limits on buffer zones and intensity**[150]
    - Municipalities which have imposed minimum separation distance between alcohol outlets and schools, or community facilities include Surrey (400 m), Edmonton (100 m), Fredericton (300 m), Calgary (150 m).
    - Municipalities which have imposed minimum separation distance between alcohol stores include Surrey (1 km), 91 Edmonton (500 m), and Calgary (300 m).

Active Transportation
See section "Health Determinant: Built Environment" as evidence-based interventions for this activity impact are the same.

Step 4: Recommendations and reporting

Recommendations

In the previous section, the negative and positive health outcomes of the HVLUIP were identified and evidenced based strategies for leveraging or mitigating health outcomes were described. After reviewing all possible recommendations, the working group identified a number of structural recommendations that may allow for improved health outcomes at the land-use planning level beyond the HVLUIP. These recommendations reflect opportunities for the City, the Region, and identified potential partners to apply best practices through a health lens.

The baseline community profile indicated that residents of Hidden Valley have lower overall marginalization than the rest of Kitchener and the majority of activities already lend to improved health outcomes with five negative health outcomes identified. The working group determined that a number of existing activities could offset the potential negative health outcomes. The working group sought to prioritize recommendations that can have a broader impact on health and equity by focusing on policy changes and maximizing the benefits of project activities for all Kitchener residents.

Recommendations	Rationale	Potential partners
1. Council approved development of a policy that requires City of Kitchener planning to monitor and evaluate health impacts of developments.	Council requested an HIA for the HVLUIP, however HIA are not a requirement of all developments including the final step of the HIA which is monitoring and evaluating. This recommendation would provide staff with the policy requirement to designate internal resources to completing and monitoring HIAs. At a minimum there is a recommendation that Council instruct City of Kitchener Planning to monitor implementation of the HVLUIP HIA.	• City of Kitchener Council • City of Kitchener Planning
2. Ensure access to enhanced greenspace and trails to residents living outside Hidden Valley neighbourhood.	The HVLUIP has built in improvements to the existing greenspace which has known health benefits. This recommendation seeks to improve connectivity to other neighbourhoods to expand and maximize the benefits to Kitchener residents. For example, ensuring transit access e.g. trails, transit, parking, bike lockers	• Region of Waterloo (GRT (Grand River Transit)) • Region of Waterloo (Public Health) • City of Kitchener Planning • Waterloo Region Community Garden Network (WRCGN); City of Kitchener Planning

Recommendations	Rationale	Potential partners
		• City of Kitchener Love my Hood
3. City of Kitchener review development bid process and provide package to developers that highlights healthy building designs similar to sustainability checklist. Could potentially prioritize how healthy their development is. Could be part of complete statement (i.e. complete application). This may also look like the including of HIAs as part of this package.	There is an opportunity at the beginning of each development stage to implement options from a health lens. The HIA identified several land-use planning options to mitigate negative health outcomes or leverage positive health outcomes. Through the process it was identified by the working group that City of Kitchener already uses a sustainability checklist as part of their complete application process for developers. This recommendation would follow this approach by having a healthy built environment checklist added to this process. This would allow for the learnings from the HVLUIP HIA to translate to all City of Kitchener planning initiatives.	• City of Kitchener Planning • Region of Waterloo (Public Health)
4. Review existing internal policies and enhance or create policies from a health lens.	The HIA working group identified several existing policies that could be enhanced from a health lens as well as new policies that could be added based on the evidence review of ways to leverage or mitigate health outcomes. The first step would be for City of Kitchener to complete policy review and identify gaps. Please see appendix for initial review (pull from tool 4A).	• City of Kitchener Planning
5. Review City of Kitchener affordability policy to ensure HVLUIP includes requirement for affordable housing to be included in the HVLUIP.	In order to ensure City of Kitchener does not contribute to further marginalization within the city this recommendation requires early consultation with reviewing City of Kitchener's existing affordability policy to ensure there are no gaps for the HVLUIP. City of Kitchener could consult with Region of Waterloo's housing department to review options. Under the direction of the federal Housing Accelerator Fund (HAF) the City will fulfill requirements for new affordable and market rate rental and ownership housing development. These	• City of Kitchener Planning • City of Kitchener Housing • Region of Waterloo (Housing Services)

Recommendations	Rationale	Potential partners
	elements will be further considered in the review of the City of Kitchener Official Plan.	

Reporting

The Kitchener Growth Management Strategy Annual Monitoring Report would act as the primary form for reporting on the uptake towards the identified theme areas. This report identifies the types of applications and subsequent forms of growth experienced across the city over the course of the year. While the report will not directly reference the completion of HIA statements in a given year, this number can be derived based on the complete application requirements as noted above.

It is recommended that a working group be established with City of Kitchener and Region of Waterloo Public Health and Paramedic Services staff to meet every 6 months to review and report on the adoption of health impact assessments through the application process. This would be best timed in such a way as to allow for one meeting to be following the release of the annual monitoring report to facilitate discussion.

The intent of these meetings would be to review the response from applicants, including what strategies have been found to be most appealing and effective. This will allow for the opportunity to assess the findings from the ON-Marg data and establish strategies by which to respond moving forward. Additional requirements for review may be identified by council which may include engagement with community members and our partners in the development industry.

Step 5: Monitoring and evaluation

Implementation and monitoring

Based on the health risks and the policy review provided through the previous steps of this report, it is recommended that City of Kitchener Staff should draft a terms of reference policy framework which would identify requirements for development best practices from a health lens. This would be adopted by council through an amendment to the City's Official Plan in order to strengthen policy language to require a Health Impact Assessment as part of a complete application.

The recommendations would require modifications to existing policies under 6.C.1, specifically revising 6.C.1.2 to require the form to be completed on all Official Plan Amendments, Zoning By-law Amendments, and Site Plan applications to be processed by the City. This would effectively cover new residential developments of various scales as well as commercial and institutional uses. Currently the Health Impact Assessment is included under *Other Information and Materials* which may be included as a complete application. This policy change is intended to extend the scope of projects where it might apply and would need to be updated throughout section 17.

This format would follow similarly structured requirements currently required by the City for sustainability statements and will identify thematic areas which developers will be required to illustrate efforts towards conformity. This open-ended approach allows for diverse situations and will provide applicants with a range of opportunities while ensuring all core areas are considered.

The focus would be informed by the findings of this report, particularly ensuring connectivity for active transportation/public transit, complete community design to allow for diverse healthy food options within reasonable distance, improving air quality, and reducing urban heat island effect. These theme areas are critical in promoting physical activity, respiratory health, mental health and wellbeing while reducing the number of people who live with new and existing chronic diseases, and preventable injury through the built form.

Evaluation

It is recommended that applications would be reviewed at the time of submission, and uptake will be monitored by City of Kitchener staff through the development process. This will identify where and when these tools have been applied and contribute towards a better understanding of how staff can work with industry partners to create more options for healthy development.

Additionally, City staff will continue to review ON-Marg data as it applies to health impacts identified through this report. By reviewing these items staff will be better informed on where/how our processes will need to work to address points of vulnerability and risk. Given the geographic nature of this data source, monitoring will support understanding health outcome changes over time for current and future residents.

In the case of Hidden Valley, it is expected that this report would be completed at the site plan stage. The report would ideally highlight the increased connectivity of the community to outside the boundaries of the study area, ensuring equity in access to the planned and existing green spaces. Further, it would be recommended that any commercial development would support the positive health outcomes identified in this report by providing healthy food options to residents and surrounding communities. This could also include community gardens in existing and planned future park/open spaces. Finally, it should be identified what measures have been put in place to ensure that air quality is prioritized and contributions to the urban heat island effect are minimized. This would likely take the form of tree and native vegetation planting/preservation.

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Appendix A

Metro Vancouver's "Health Impact Assessment of Transportation and Land Use Planning Activities Toolkit"

https://metrovancouver.org/services/regional-planning/Documents/health-impact-assessment-toolkit.pdf

Appendix B

Social determinants of health

Social determinants of health refer to a specific group of social, economic and political factors within the broader determinants of health that shape health inequities and disparities among different populations.[154] These are the factors that shape the conditions of daily life and the conditions in which people are born, grow, live, work, and age. [8] The *social determinants of health* include:[154,155]

- **Socioeconomic status**: income, education, occupation and wealth disparities
- **Social support networks**: availability of family, friends and community support systems
- **Neighbourhood and physical environment**: housing conditions, access to healthy food, transportation, and exposure to environmental hazards
- **Health services**: accessibility, affordability and quality of healthcare services
- **Cultural factors**: language, cultural norms, and practices that influence heath behaviours and outcomes
- **Political and social factors**: policies, governance, discrimination, and social inequalities

Research demonstrates that the *social determinants of health* can be more important and impactful than health care or lifestyle choices on influencing health.[155] It is suggested that *social determinants of health* account for 30-55% of health-related outcomes.[155] Additionally, estimates show that the contributions of sectors outside of health to overall population health outcomes exceeds the contribution from the health sector alone;[155] examples of these sectors include land use planning policy like neighbourhood design, transportation network design, and housing policy.

To understand the elements of social determinants of health, Figure 14 provides examples of life experiences people may encounter.
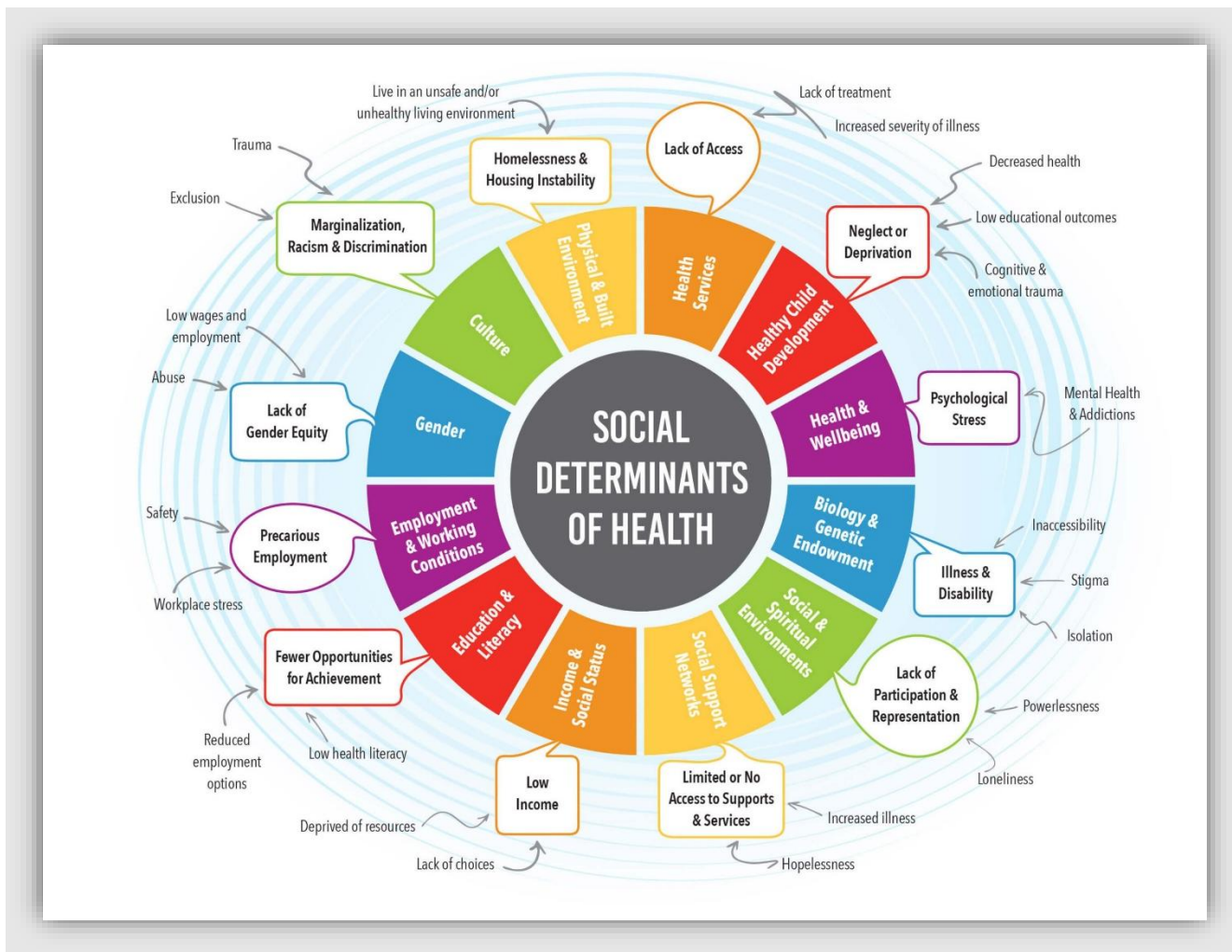
Figure 14: Social Determinants of Health and Wellbeing, United Way Halifax

Intersectionality

When reviewing social determinants of health, it is often found that several health determinants and health inequities are interwoven and overlapping in a complex manner. These complexities further deepen the health disparities and social injustice that certain groups of people experience; this is known as **intersectionality**.[156]

Intersectionality helps us consider ways that systems of power and oppression like racism, classism and sexism are interwoven; light is shed on how these systems influence the health and wellbeing of people differently based on their varying and overlapping social positions and identities, such as their gender, race and class. [156]

Figure 15 demonstrates various systems of power and oppression that people experience.
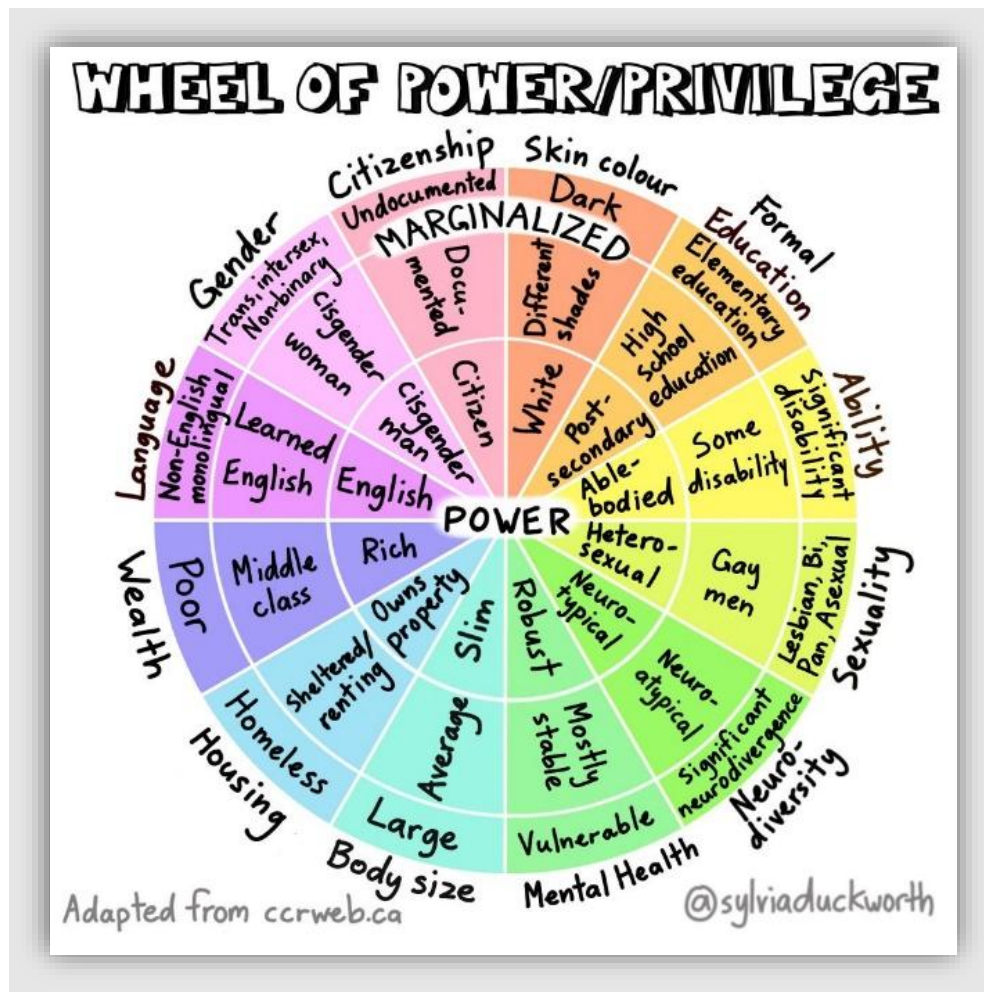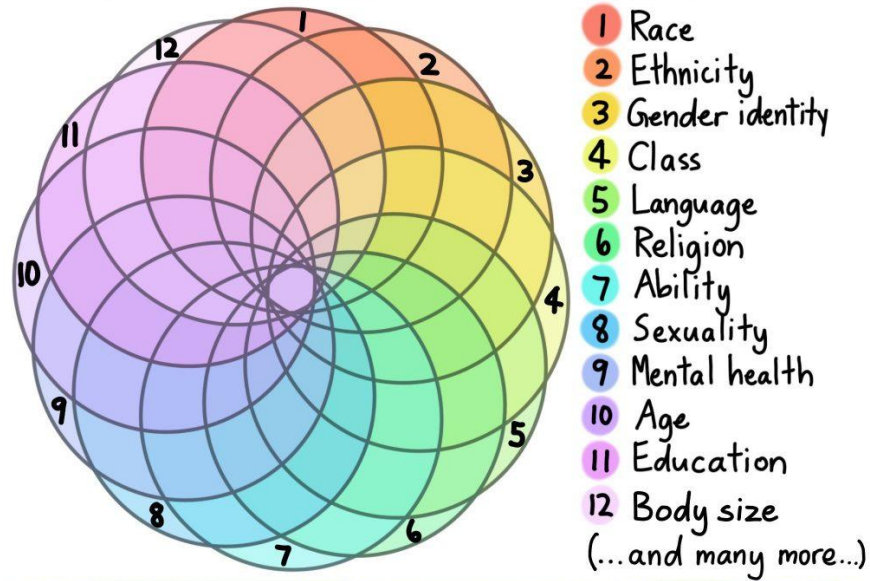
Figure 15: Wheel of Power/Privilege

Considering all the aforementioned variables and factors, this leads to creating the unique experiences and circumstances that people encounter every day – Figure 16 shows the intersection and overlap of these complex factors.

Figure 16: Intersectionality

> **Intersectionality refers to how sources of discrimination *overlap* and *reinforce* each other.**[45] It also refers to the reality that we all have many identities that intersect to make us who we are.

Communities consist of diverse people with varying health levels and needs. Directly involving equity-deserving populations is essential to create meaningful change. [156] Collaboration among different sectors is also crucial for addressing multiple forms of oppression and advancing health equity (e.g. planning and/or engineering professionals working in collaboration with public health professionals on land use and/or transportation policy). [1,156] Designing communities and the built environment with thoughtful policies can help decrease systemic power imbalances and promote health equity. [1,156]

Health equity

Health equity is the absence of unfair systems and policies that cause health inequities. Health equity seeks to reduce inequalities and to increase access to opportunities and conditions conducive to health and wellness for all.[154]

> Example: when people have access to safe, reliable public transportation, people of all ages and abilities can travel in and around their community. The knowledge of how to drive a car, expense and availability of a car are not required to be able to reach destinations for daily life like work, school, appointments or grocery shopping.

Health inequity refers to differences in health status of individuals or communities that are unfair or unjust and modifiable.[3]

> Example: when people do not have safe, reliable and easy access to various transportation options (including public transit), this limits the ability of people being able to easily travel in and around their community for all their daily life needs.

Health inequalities cost Canada's health care system at least $6.2 billion every year.[157]

- Health care costs generally decline as income rises.
- The lowest income group accounts for 60% ($3.7 billion) of health care costs.
- Improving the health of people living with low-income could significantly reduce these costs.

Neighbourhood design that worsens health inequality

Certain features can worsen health inequity, particularly in disadvantaged or marginalized neighbourhoods. Such features include:[158,159]

- Lack of transportation options
- Limited access to healthy food, housing and health care
- Lack of parks and recreation facilities
- Empty buildings and vacant lots
- Lack of green infrastructure
- Poor air or water quality
- Lack of safety, higher crime
- Increased social isolation
- Residential segregation

How to improve health equity through community design

While much of the research that has been compiled about how the impact of the built environment on healthy living has focused on adults, it is known that children, youth, older adults and marginalized groups may be more at risk to health inequities.[1] These marginalized groups can include people living with lower socioeconomic status, Indigenous peoples, sexual and racial/ethnic minorities, immigrants, and people living with disabilities.[160]

Health inequities are unfair, have significant social and economic costs to both individuals and societies, and could be reduced by the right mix of government policies.[155,161] By pursuing health equity, this means striving for the highest possible standard of health for all people and giving special attention as well as aligning more resources to support the needs of those who are at greatest risk of poor health based on social conditions.[155]

Appendix C

ON-Marg indicators

Appendix: ON-Marg Indicators

Households and dwellings (previously residential instability)
Proportion of the population living alone

Proportion of the population who are not youth (age 5-15)

Average number of persons per dwelling

Proportion of dwellings that are apartment buildings

Proportion of the population who are single/divorced/widowed

Proportion of dwellings that are not owned

Proportion of the population who moved during the past 5 years

Material resources (previously material deprivation)
Proportion of the population aged 25 to 64 without a high-school diploma

Proportion of families who are lone parent families

Proportion of total income from government transfer payments for population aged 15+

Proportion of the population aged 15+ who are unemployed

Proportion of the population considered low-income

Proportion of households living in dwellings that are in need of major repair

Age and labour force (previously dependency)
Proportion of the population who are aged 65 and older

Dependency ratio (total population 0-14 and 65+ / total population 15 to 64)

Proportion of the population not participating in labour force (aged 15+)

Racialized and newcomer populations (previously ethnic concentration)
Proportion of the population who are recent immigrants (arrived in the past 5 years)

Proportion of the population who self-identify as a visible minority