

APPENDIX C

HEALTH IMPACT ASSESSMENT

INTRODUCTION

Project Background

The North Portland Willamette Greenway Trail is an envisioned trail system in Portland, Oregon that will provide access to and along the Willamette River, stretching from the Steel Bridge in downtown Portland to Cathedral Park near the St. Johns Bridge and extending through Baltimore Woods to Kelley Point Park. The 10-mile trail would link North Portland neighborhoods with the Willamette River, providing a place for recreation and access to jobs.

Project History

Although there have been significant planning efforts done for the Willamette Greenway Trail, the project has yet to move toward full implementation. Short segments of the proposed trail have been constructed over the last thirty years, including River to Lagoon, Captain's Walk, Waud Bluff, Pier/Chimney Bridge. Additionally, while the trail project has been adopted into the City of Portland's Transportation Systems Plan (TSP) and is shown as a future trail on the city's adopted Bicycle Plan for 2030, the overall project has yet to receive dedicated funding.

Grow Willamette Greenway

This HIA is part of a larger strategic plan document produced by a student group at Portland State University. This group, called Willamette Planning Studio, is a team of six graduate planning students and completed as part of the final degree requirements for the Master of Urban and Regional Planning program.

Building upon the efforts already done by various public and private agencies and organizations, Willamette Planning Studio is working to convince stakeholders that the regional, local, and individual benefits that the trail will generate will outweigh the considerable cost that trail construction will require.

HIA and the Willamette Greenway Trail

Overview

HIA is an emerging tool that is used to evaluate the impact of specific policies and projects on health. As defined by the World Health Organization, HIA is *"a combination of procedures, methods and tools by which a policy, programme or project may be judged as to its potential effects on the health of a population, and the distribution of those effects within the population."*

HIA Assessment Process: The HIA process typically includes the steps of Screening, Scoping, Analysis, Reporting, and Monitoring:

- Screening involves deciding whether or not to conduct a Health Impact Assessment on a particular project. The screening process for this HIA took place in January 2015, when Willamette Planning Studio partnered with the neighborhood advocacy group npGreenway.
- Scoping is when those involved in the HIA – public health officials, community members, planners, etc. – decide which health impacts to analyze and which methods to use for the analysis. The scoping for this project took place in February and March of 2015, with the objective to create a plan and timeline for conducting an HIA that identified priority issues, research questions, methods, and participant roles. Key questions were identified through the scoping process, including:
 - ▶ What are the existing levels of physical activity in the study area and how might the proposed trail increase those levels?
 - ▶ What are possible opportunities and concerns that the community might perceive?
 - ▶ Is there community support for the trail and how would people use the trail?

- Analysis of impacts uses existing data and both qualitative and quantitative research to estimate the potential effects on health status or determinants of health status. The analysis also looks at the geographic distribution of potential impacts.
- Reporting is the process of developing recommendations to reduce hazards and improve health.
- Evaluation and Monitoring are the processes of examining the impact of HIA on decision-making and the effects of the policy on health determinants and health status. Evaluation of the HIA process is useful to answer why the HIA worked (or not).

HIA Methodology

In order to compare the information from the literature review to site-specific data on the Willamette Greenway Trail corridor, baseline statistics were compiled from various sources for the corridor and the City of Portland.

Data from the following sources was used to analyze this project:

- Demographics and socioeconomic data were compiled by using the 2009-2013 Five Year Estimates from American Community Survey (ACS) Census Data, 2000 Census Data, 2010 Census Data, and the 2009 National Household Travel Survey (NHTS). This data was compiled at the state, city, and study area levels. ACS is a sample survey conducted every one to five years, depending on geography, that provides estimates of housing characteristics, population characteristics, modes of transportation, etc.¹
- Data on health conditions, risk factors, and behaviors at various geographic levels were obtained through the Coalition for a Livable Future's Regional Equity Atlas toolkit and from the Oregon Health Authority's Healthy Teens Survey.
- Data on social cohesion was obtained through the City of Portland's Auditor Community Survey.
- Data on collisions and injuries was obtained from Dr. Chris Monsere at Portland State University's Civil and Environmental Engineering Department. Dr. Monsere's data was obtained from Oregon Department of Transportation (ODOT).
- Peer-reviewed literature in transportation, urban planning, and public health journals was used to evaluate the relationships between health determinants and trails. The search focused on scholarly journals in Transport Research International Documentation (TRID), Google Scholar and Transportation Research Board (TRB). The condensed timeline of this HIA did not allow for a comprehensive literature review.
- A Congestion Mitigation & Air Quality (CMAQ) Worksheet was adopted from Massachusetts Office of Transportation Planning to estimate reduction in Vehicle Miles Traveled (VMT).

To estimate health benefits, level of trail ridership, mobility benefits, recreational benefits, and decreased auto use benefits, guidelines from the 2005 National Cooperative Highway Research Program 552 (NCHRP 552²) publication were used.

Additionally, the Willamette Planning Studio team was able to provide data on trail usage through conducting bike and pedestrian counts on existing facilities in Portland.

1 http://www.census.gov/acs/www/about_the_survey/american_community_survey/

2 http://onlinepubs.trb.org/onlinepubs/nchrp/nchrp_rpt_552.pdf

WILLAMETTE GREENWAY TRAIL STUDY AREA DEMOGRAPHIC AND SOCIOECONOMIC PROFILE

Study Area Background

The proposed Willamette Greenway Trail spans a 10-mile corridor along the eastern shore of the Willamette River in Portland, Oregon. A study area was identified that follows the length of the corridor and extends 3/4 mile east from the proposed trail.

NpGreenway determined that the construction of a 10-mile long multi-use trail along the Willamette River could address some public health concerns in communities adjacent to the trail, including high levels of diseases like asthma and obesity, physical inactivity, limited access to recreational areas and a high dependence on automobiles. Additionally, advocates for the trail believe that having a low-stress, separated facility would increase comfort and safety for non-motorized modes in the area.

In addition to recreational trips, the trail offers a new and direct connection for North Portland residents to jobs. North Portland has somewhat limited transportation access when compared to more central locations in the Portland region. By improving direct access to employment centers and main street business districts, the Willamette Greenway Trail will open up opportunities and help to reduce the burden of people’s daily commute.

Study Area Demographics

Compared to City of Portland and Oregon, the study area is considerably more diverse. However, while the size of minority groups are growing in both Portland and Oregon, the percentage of those who identify as white alone has grown by nearly four percentage points from 2000 to 2010 (up to 65.7%) (Table 1).

TABLE 1 - RACE AND ETHNICITY BY GEOGRAPHY

Race/Ethnicity (%pt change from 2000)	Study Area	Portland	Oregon
White Alone	65.7% (3.8%)	72.2% (-3.2%)	78.5% (-5.1%)
Black or African American Alone	11.5% (-3.5%)	6.1% (-0.4%)	1.7% (0.1%)
American Indian and Alaskan Native Alone	1.0% (-0.3%)	0.8% (-0.1%)	1.1% (-0.1%)
Asian Alone	3.6% (-1.2%)	7.1% (0.8%)	3.6% (0.7%)
Native Hawaiian and Other Pacific Islander Alone	0.9% (0.2%)	0.5% (0.1%)	0.3% (0.1%)
Some other race Alone	0.3% (0.1%)	0.2% (0.0%)	0.1% (0.0%)
Two or more races	4.6% (-0.2%)	3.7% (0.2%)	2.9% (0.4%)
Hispanic or Latino	12.3% (1.0%)	9.4% (2.6%)	11.7% (3.7%)

Source: 2000 Census T14,T15 and 2010 Census T54,T55

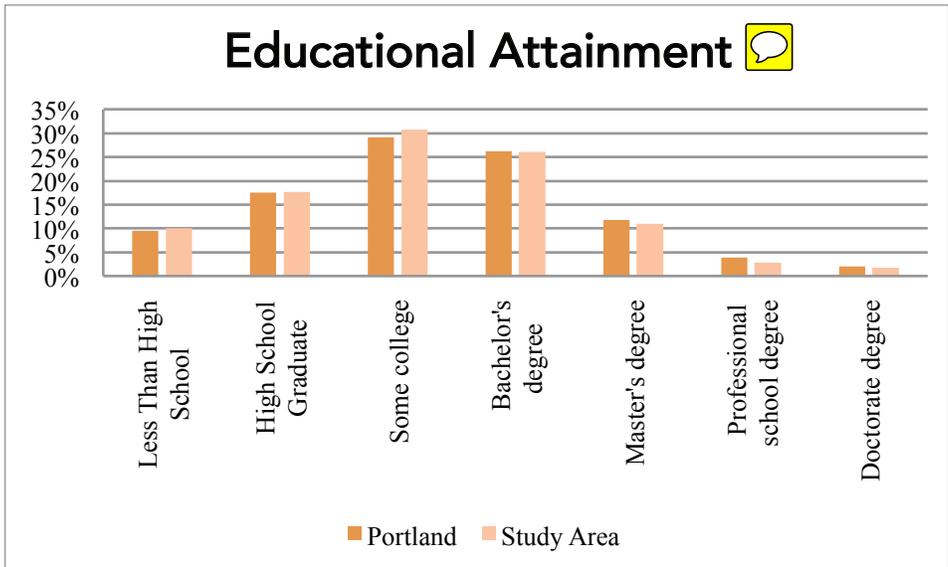
As of 2010, the age breakdown for the study area is representative of Portland as a whole. The highest proportion of the population is aged 18-34 (34% for the study area and 29% for the City). Between 2000 and 2010 both the City and the study area saw a decrease in the proportion of those under 18 and an increase of those aged 18-34 (Table 2). However, this shift is more pronounced within the study area (drop of five percentage points for study area versus two percentage point drop in the City).

TABLE 2 - AGE BY GEOGRAPHY

Age Bracket (%pt change from 2000)	Study Area	Portland	Oregon
Under 18	19% (-5%)	19% (-2%)	23% (-2%)
18 to 34	34% (4%)	29% (1%)	23% (0%)
35 to 44	17% (1%)	16% (-0.43%)	13% (-2%)
45 to 54	12% (-1%)	13% (-1%)	14% (-1%)
55 to 64	10% (3%)	12% (4%)	13% (4%)
65+	8% (-1%)	10% (-1%)	14% (1%)

Source: 2000, 2010 Census T8

When looking at educational attainment, Portland and the study area share similar breakdowns. Both exhibit high peaks where residents have had some college experience, and taper of to where less than 5% hold doctoral degrees (see graph below).



Portland has very high housing occupancy, at 94.4%, and the study area comes in just below that at 93.8%. Only 64% of people living within the study area live in family households, with the remaining percentage living in nonfamily households and group quarters (33% and 4% respectively). Between 2000 and 2010 there was a great shift in the number of those living in family and non-family households, with a roughly 10-percentage point drop in family households, and a gain of nine percentage points in nonfamily households. While the current configuration of housing is on par with Portland as a whole, this breakdown varies greatly when compared to the state as a whole (Table 3).

TABLE 3 - HOUSEHOLD CHARACTERISTICS BY GEOGRAPHY

Characteristics (%pt change from 2000)	Study Area	Portland	Oregon
In family households	64% (-10%)	67% (-4%)	78% (-2%)
In nonfamily households	33% (9%)	30% (3%)	19% (2%)
In group quarters	4% (1%)	3% (0%)	2% (0%)
Average Household Size	2.31 (-0.19%)	2.28 (-0.02%)	2.47 (-0.03%)

Source: 2000 Census T25,T26 & 2010 Census T63,T64

Community Engagement - Stakeholder Identification

A multitude of stakeholders exist for the Willamette Greenway Trail and they were identified early in the scoping process. Understanding their needs, desires for what the trail will provide, and positions within the framework of trail implementation is key to getting the trail funded and built. Below is a brief summary and breakdown of the different stakeholder groups that will be impacted by the proposed trail project.

Trail Users

Anyone in the Portland region, from residents to tourists, are potential users of the trail and so making a trail that encompasses all users is important to the project's success. Amenities meant for a variety of recreational purposes will help to build a broad base of support that can push the trail forward. This stakeholder group will be mainly interested in the final outcome of the trail and how the trail can improve their lives through access to recreation and a direct transportation route to employment.

Neighbors

People living in close proximity to the trail will have the most access to the trail and potentially be affected the most by the trail's completion. Keeping neighbors informed about the process, getting their feedback on design and intended trail connections, wayfinding, as well about the progress of implementation and usage will be key. An important provider of information will be North Portland Neighborhood Associations and the project website.

Businesses

The business community in North Portland is an important constituency key to supporting trail implementation. Business owners will be interested in how the trail can be leveraged to help attract customers, provide employees access to jobs, and generally improve the business climate in their neighborhood. Industrial businesses along the trail alignment are especially important to keep informed and must have their concerns heard and addressed. Concerns about how the trail might affect their daily operations or potential conflicts between trail users and business operations must be addressed. Business associations will be a key part of outreach to this group of stakeholders.

Community Organizations

Many community organizations exist in North Portland that have similar goals that the Willamette Greenway Trail will help to address. Organizations promoting community development, recreational opportunities, active transportation, or organized around specific open spaces and natural areas are potential allies for Willamette Greenway Trail advocates. Community organizations should be consulted and coordinated with about how the trail can be mutually beneficial, as well as consulted about showing and gathering support for the trail.

Property Owners

Property owners of parcels along the alignment are key partners in getting the trail built. If a property owner is not willing to talk and be cooperative, it can potentially delay the trail for years. Easements or purchasing of land will be required for the trail to be built, therefore, working closely with parcel owners, keeping them informed, and jumping on opportunities when they present themselves will be crucial. Concerns of property owners should be carefully considered.

Government Agencies

There are a handful of local, state, and federal agencies that have a stake in the Willamette Greenway Trail. Agencies play the role of allocating funding for planning and construction, providing engineering and design standards, and signing-off on regulatory decisions related to the brownfields cleanup. Keeping the trail on various agencies' radar is key to making progress on the project, as a shift in priorities among one or more agencies could delay completion of the trail.

Community Engagement - Strategy

Various methods were used to connect with the community, including intercept surveys at strategic locations near the proposed trail alignment, a project website, and 6 tabling events at strategic community hubs. The demographics of the study area indicated a need to engage with minority populations, including Spanish-speaking community members. This informed the decision to provide a project website in English and Spanish, as well as a survey, and marketing materials.

Tabling Events

Grow Willamette Greenway held six tabling events that reached over 160 highly diverse community members. Specifically, these tabling locations were St. Johns Public Library, Green Zebra grocery store, Rosa Parks Elementary School, Chimney Park, Ex Novo Brewery, and the City of Portland Water Pollution Lab. These tabling events were an opportunity to provide input on the trail's design regarding factors like trail safety, viewpoints, ideal resting points, areas for neighborhood connectivity, and additional factors -- to ensure that the trail is created in a way that best serves the community. In order to gain this input, we provided large maps to write and place stickers on, a visioning board to write general comments on, and trail renderings to provide input on site-specific details.

Survey

Grow Willamette Greenway created a survey, in Spanish and English, which asked community members about their trail uses and preferences. For example, one question asked what factors deterred people from using the trail (like lighting, slope, and heavy traffic), and another asked about the expected frequency of trail use if the trail was built. This survey was dispersed two ways: by personally handing out business cards that included a link to the survey and through social media outlets, including mailing lists and blogs. The survey received a total of 265 responses.

Interviews

Several interviews were conducted throughout the entire planning process in order to gain a greater understanding of the historical context of the trail and community sentiments towards it. These interviews were typically with Subject Matter Experts, like the head of Active Transportation for Metro and the primary Planner for University of Portland.

Online Presence

The website GrowWillametteGreenway.org was created for the project. This website provides general information about the project and team, downloadable copies of Willamette Planning Studio's work products, contact information, a link to the survey, and additional resources. A Facebook page for Grow Willamette Greenway was also created. This page allows the organization to relay information to the community in a fun and approachable way and gather feedback as the project progresses. As of April 2015, the website had 383 visits and the Facebook page has 130 followers.

A community engagement process was an important component of the HIA and overall Grow Willamette Greenway project. A full report of this process, called *The Community Engagement Strategy*, can be found in the full report the "North Portland Greenway Trail Strategic Plan".

HEALTH IMPACTS: LINKING THE WILLAMETTE GREENWAY TRAIL AND HEALTH

Physical Activity & Chronic Disease

Background & Literature Review

According to the Centers for Disease Control and Prevention (CDC), regular physical activity helps improve overall health and fitness, and reduces the risk for many chronic diseases.³ Despite the importance of getting daily physical activity, most Americans do not get the recommended 30-60 minutes of physical activity daily. In fact, the CDC reports that less than half of adults in the US get the recommended minimum recommended level of 2.5 hours (150 minutes) of physical activity. Additionally, one-third of US adults are obese.⁴

The Task Force on Community Preventive Services strongly recommends the creation of places to engage in physical activity, such as trails, as they are "an effective method for increasing physical activity."⁵ The report also highlights the importance of combining built features (such as a trail) with informational outreach activities, such as trainings, educational workshops and trail promotion.

A literature review conducted by Price, et. al. found "research shows that trails are a preferred activity setting, and that persons who use trails for physical activity are more likely to meet the national physical activity recommendations than those who rarely or never use trails for physical activity."⁶

Studies have found that residents are more likely to use trails located 15 minutes or less from their homes. One study found that trail users "live, on average, 2.89 miles from the trail they use and the majority of trail users live 15 minutes or less from the trail they use."⁷

A literature review looking at studies of before and after trail use found that trails do increase physical activity. "Using a trail intercept survey of almost 2000 users at six Indiana trails ranging in length from 3 to 15 miles, 70% to 87% (range across the six trails) of users at the trail reported that the trail increased their participation in trail activities, such as walking, jogging, or bicycling, while the rest reported that the trail did not increase those activities. The trail users reported a median of 100 to 200 minutes of use per week," and "in a Missouri study, those who were not regular walkers were more likely to report increases in physical activity due to a trail than regular walkers".⁸

3 Centers for Disease Control & Prevention. (2011). Physical activity for everyone. Retrieved from <http://www.cdc.gov/physicalactivity/everyone/guidelines/index.html>

4 CDC Vital Signs. (2012). More People Walk to Better Health. <http://www.cdc.gov/vitalsigns/walking/>

5 Task Force on Community Preventive Services. (2002). Recommendations to increase physical activity in communities. *American Journal of Preventive Medicine*, 22(4S), 67-72.

6 Price, Anna E., Julian A. Reed, and Suresh Muthukrishnan. "Trail User Demographics, Physical Activity Behaviors, and Perceptions of a Newly Constructed Greenway Trail." *Journal of Community Health* 37.5 (2012): 949-56. Web.

7 Price, Anna E., Julian A. Reed, and Suresh Muthukrishnan. "Trail User Demographics, Physical Activity Behaviors, and Perceptions of a Newly Constructed Greenway Trail." *Journal of Community Health* 37.5 (2012): 949-56. Web.

8 Evenson, Kelly R., Amy H. Herring, and Sara L. Huston. "Evaluating Change in Physical Activity with the Building of a Multi-use Trail." *American Journal of Preventive Medicine* 28.2 (2005): 177-85. Web.

Existing Conditions in Study Area

The obesity rate in Oregon has increased 121% since 1990, with 60% of adults being overweight or obese.⁹ In a staggering finding, the Oregon Health Authority predicts, “If Oregon remains on this obesity trajectory, children born today will not live as long as their parents or grandparents do.”¹⁰ In 2009, only 56% of adults in Oregon met the minimum physical activity level.¹¹ In the Portland Metro region, 24% of the population is obese.¹² Additionally, 26% of 8th graders are overweight or obese.¹³

While biking and walking levels are relatively low in the US, both modes are seeing growth. Nationwide, the percentage of people who reported walking at least once for 10 minutes or more in the previous week rose from 56% (2005) to 62% (2010).¹⁴ However, according to the Office for Oregon Health Policy and Research, half of the residents in the Portland area do not regularly engage in physical activity and half are overweight or obese.¹⁵ The activity rates are better for the study area than both the Portland region and US overall. While the Portland Metro area is nationally recognized for its high bicycle commute rate of 3%, the study area has a three times higher rate, with 10% of all commute trips made by bike. Similarly, the walking commute rate is higher than the Metro region’s average and twice that of the U.S. average.¹⁶

Three health indicators were looked at for the study area: diabetes, obesity, and asthma rates. These health indicators are directly related to physical activity, as “lifestyle factors such as physical inactivity are heavily correlated with the development of many chronic diseases.”¹⁷ Physical activity and exercise, combined with other healthy lifestyle choices, are extremely important in preventing the development of chronic disease.¹⁸

Rates of diabetes increase as distance from the downtown core increases. Compared to the rest of Portland, diabetes rates are especially high in the study area (Map 1). While the diabetes rate for the inner east and west side sides of Portland are between zero and 6%, there are only three census tracts within the study area that are within that range. A majority of the tracts have diabetes rates of between 6.2% and 11.5%. None of the tracts in the area have diabetes rates higher than 11.5%.

According to the National Heart, Lung and Blood Institute, a healthy Body Mass Index (BMI) ranges from 18.5 to 24.9. BMI is a typical measurement for determining whether someone is at a healthy weight, overweight or obese. Similar to the geographic distribution of rates of diabetes, the rates of high BMI/obesity rates increase with distance from downtown and inner ring neighborhoods (Map 2). The rates of overweight and obesity are higher in the study area than in the adjacent neighborhoods to the east and south, with the highest concentration to the north of the study area and within Swan Island.

Asthma rates within the study area range from 3% to 25%, with the highest rates found in the northern parts of the study area and the southernmost area (Map 3). These rates are likely due to the location of heavy industrial sites to the north along Columbia Boulevard and the Willamette River, and heavy vehicle traffic to the south, near the confluence of Interstate 5, Interstate 84 and State Hwy 99E.

9 Health Promotion and Chronic Disease Section. 2012. Oregon Overweight, Obesity, Physical Activity and Nutrition Facts. Available online at <http://public.health.oregon.gov/PreventionWellness/PhysicalActivity/Pages/pubs.aspx>

10 Health Promotion and Chronic Disease Section. 2012. Oregon Overweight, Obesity, Physical Activity and Nutrition Facts. Available online at <http://public.health.oregon.gov/PreventionWellness/PhysicalActivity/Pages/pubs.aspx>

11 Health Promotion and Chronic Disease Section. 2012. Oregon Overweight, Obesity, Physical Activity and Nutrition Facts. Available online at <http://public.health.oregon.gov/PreventionWellness/PhysicalActivity/Pages/pubs.aspx>

12 Beil, Kurt. (2011). Physical Activity and the Intertwine. http://www.portofportland.com/Library/Tiger/Intertwine_Study.pdf

13 Oregon Healthy Teens Survey. Oregon Health Authority. https://public.health.oregon.gov/PreventionWellness/PhysicalActivity/Documents/Oregon_PANfactst_2012.pdf

14 CDC Vital Signs. (2012). More People Walk to Better Health. <http://www.cdc.gov/vitalsigns/walking/>

15 Beil, Kurt. (2011). Physical Activity and the Intertwine. http://www.portofportland.com/Library/Tiger/Intertwine_Study.pdf

16 US Census Bureau. American Community Survey. 2012

17 Durstine, J. Larry, Benjamin Gordon, Zhengzhen Wang, and Xijuan Luo. “Chronic Disease and the Link to Physical Activity.” *Journal of Sport and Health Science* 2.1 (2013): 3-11. Web.

18 Durstine, J. Larry, Benjamin Gordon, Zhengzhen Wang, and Xijuan Luo. “Chronic Disease and the Link to Physical Activity.” *Journal of Sport and Health Science* 2.1 (2013): 3-11. Web.

Assessment

Trails create places where community members can be physically active and engage in outdoor recreation. A 2006 study in the U.S. found that trails are commonly used for physical activity, with one quarter of adult survey respondents using a walking, hiking or bicycling trail at least once per week.¹⁹

The increased physical activity that a trail enables also brings a monetary benefit to cities. Studies have found that, from a cost-benefit perspective, trails make economic sense for cities to invest in. A literature review found many studies that support the economic benefits of trails. A recent study in Nebraska, looking at data from the National Medical Expenditure Survey, found a significant economic benefit to building trails: for every \$1 spent on trails, there were \$3 in savings in direct medical costs.²⁰

Approximately 67,000 people live within 3/4 mile of the proposed trail, and this trail also has the potential to act as a regional trail, attracting people from all over the Portland Metro area and creating an important link in the region's active transportation network. While all residents of the Portland region would benefit from the trail, residents who live or work in close proximity to the proposed trail will have increased access to the trail and the physical activity the trail will provide.

Using tools developed in the NCHRP 552 report, three classes of potential trail ridership were estimated (low, moderate, and high)²¹. Using specifics of the trail, study area demographics, and a one-mile buffer,²² a low estimate of daily trail use is 3,793, a moderate estimate is 15,228 users, and a high estimate is 23,822 users. The low and moderate estimates are somewhat consistent with Metro's own 2013 modeling work for portions of the Willamette Greenway Trail.²³ Nearly 1,000 new commuters have been estimated to use the trail per day.

Based on estimates from the NCHRP 552 guidelines, a moderate estimate of health benefits for the trail will be \$1,949,177 annually. This is based on average annual per-capita cost savings from physical activity and the number of potential trail users. Additionally, a moderate estimate of recreational net benefits of having the trail amounts to \$52,071,995 annually. This is an estimate of net benefits, which extends beyond value of time and the time an activity requires. The annual estimated savings due to decreased automobile usage will total \$1,277,854, and the annual benefit of increased mobility and having an off-street bicycle facility will total \$3,617,494.²⁴

Note: For more information on the trail usage estimates and the modeling methodology, see Appendix D: Modeling in the full report "North Portland Greenway Trail Strategic Plan".

Community Engagement

Survey respondents expressed support for the Willamette Greenway Trail, as it would provide more opportunities for physical activity. A sample of responses from the community engagement process includes the following comments:

- "If there was a safe path from Kelley Point to Steel Bridge I would use it a lot. Thank you for pursuing this!"
- "I would convert from commuting 99% by car to realistically 80-85% (and hopefully build up to 100%) by bike if there was a dedicated trail/multi-path to Swan Island. Please make this happen!"
- "This sounds like a great idea! I love riding the Columbia Slough Trail to Kelley Point Park. I ride it three times a week."
- "I want people to exercise."
- "My goal is to run."

19 Active Living Research (2011). The Power of Trails in Promoting Physical Activity in Communities.

20 Active Living Research (2011). The Power of Trails in Promoting Physical Activity in Communities.

21 Limitations to using this estimation tool exist. It is assumed that existing cyclists will all shift to the new facility once it is built, the facility will induce new cyclists as a function of existing cyclists, and the tool should only be used to give a high level forecast.

22 Shown to be an important distance, which will encourage people to use the facility.

23 Regional Bicycle Network Evaluation: Technical Report for the Regional Active Transportation Plan. Metro. 2013.

24 This estimate assumes that no bicycle facility was accessible previously. This estimates reflects the benefit of commuters biking to work three times a week.

Safety

Background & Literature Review

Cyclists and pedestrians, while making up a relatively small proportion of road users, are a very vulnerable group. While only 9.5% of all trips are made by biking and walking, 13% of all motor vehicle crash deaths are pedestrians and cyclists²⁵ and the crash outcomes are particularly severe for those road users, as they “lack by far the same level of protection mandated for, and offered to car and other vehicle occupants.”²⁶

AASHTO recommends constructing paths along railroad corridors, as they tend to have few intersections with roadways, therefore minimizing potential conflicts between trail users and vehicles.²⁷ Trails can increase the safety of cycling and walking, by creating a dedicated space separated from motor vehicles. A literature review found evidence for a reduced risk of injury on off-road paths in comparison to roadways.²⁸ A study conducted in 1994 found that for all cyclists, including both adults and children, there was a 90% higher risk of injury on streets than on off-road bike paths or trails.²⁹

A review of 23 studies on bicycling injuries found that bike facilities, including off-road paths, on-road marked bike lanes, and on-road bike routes, are where bicyclists are safest,³⁰ compared with riding on non-bike designated streets. A 1997 survey of North American commuting found that majority of bike crashes occur on major streets without bike facilities, followed by minor streets without facilities, bike paths, and bike lanes. Additionally, the survey found that 40% fewer accidents occur on bike paths than local streets.³¹

Existing Conditions in Study Area

While Portland has a lower traffic fatality average than other comparably sized cities, the number of cyclists and pedestrians killed annually has remained consistent.³² On average, there are 12 pedestrian deaths and 2 cyclist deaths every year on Portland streets.³³

Within the Willamette Greenway Trail study area, there were hundreds of collisions involving pedestrians, cyclists and vehicles between 2011-2013 (Map 4). During that time, there were approximately 200 collisions involving a bicyclist and a vehicle that resulted in a cyclist injury and approximately 100 collisions involving a pedestrian and a vehicle that resulted in a pedestrian injury. There were 2 vehicle-involved fatalities in the study area between 2011-2013;³⁴ a cyclist was killed at the intersection of North Greeley and North Interstate Avenue and a pedestrian was killed on East Burnside and NE Martin Luther King Jr. Blvd.

As illustrated in the Crash Map for the study area (Map 4), large concentrations of incidents between both bicyclists/pedestrians and vehicles occur along North Lombard Street, NE Broadway Street, and East Burnside Street. There are several collisions between bicycles and vehicles along North Greeley Ave, particularly near the Albina Yards and Rose Quarter areas. The data also show a high concentration of bicycle collisions in inner Northeast Portland, along North Vancouver Ave, North Williams Ave and NE Multnomah Street. It should be noted that a protected bike lane was added to this stretch of NE Multnomah Street in 2012. One year after the protected facility was added, bicycle

25 Pucher, J. and J. L. Renne (2003). “Socioeconomics of urban travel: evidence from the 2001 NHTS.” *Transportation Quarterly* 57(3): 49-77.

26 International Transport Forum. Working Group on Cycling Safety. “Cycling Safety: Key Messages.” 2012. <http://www.internationaltransportforum.org/Pub/pdf/12Cycle-Safety.pdf>

27 AASHTO Guide. 1999.

28 Massachusetts Area Planning Council. “Quequechan River Rail Trail Phase 2 Health Impact Assessment”. https://drive.google.com/a/pdx.edu/?tab=mo#folders/0B_OYAQqAHEVLdDNGY0JuOEF0dKE

29 Tinsworth et al. “Bicycle-related injuries: Injury, Hazard, and Risk Patterns” (1994).

30 Reynolds, C., et al., 2009 - The impact of transportation infrastructure on bicycling injuries and crashes: a review of the literature, *Environmental Health*, 8:47

31 Moritz, W., 1997 - Survey of North American bicycle commuters: Design and aggregate results, *Transportation Research Record: Journal of the Transportation Research Board*, 1578, 91-101

32 Vision Zero Report. PBOT. 2015.

33 Oregon Department of Motor Vehicles crash data, 2009-2013

34 Portland Bureau of Transportation. <http://pdx.maps.arcgis.com/apps/MapSeries/index.html?appid=28c26c3acc604f2cba87aff0fe7f7b24>

commuting increased over 25% in the Lloyd District.³⁵ (Crash data for the street after the protected facility was added is not available at this time.)

While there is some data on these types of collisions, it is important to note that this information only reflects a small sample of the total number of pedestrian and bicycle incidents, as these types of collisions are widely under reported. The data here represents only the reported cases, and many incidents between vehicles and pedestrian/bicycles are not reported.

Assessment

A multi-use path like the proposed Willamette Greenway Trail can encourage more biking and walking by creating a designated and safe place for trail users. Currently, cyclists traveling between North Portland and inner North and Northeast Portland must ride on roadways shared with vehicles. The Willamette Greenway Trail would be an alternative route to many on-street bicycling facilities, including those on North Greeley Avenue and North Willamette Boulevard. It would also create an additional connection to the extremely popular Eastbank Esplanade, a multi-use path that currently connects cyclists to the Steel Bridge, Morrison Bridge and Hawthorne Bridge, all of which have separated bike/pedestrian facilities that create a safe connection to downtown Portland.

The trail would likely reduce bicycle and pedestrian traffic on North Greeley Avenue and North Lombard Street, two designated freight routes that currently see a high concentration of bike/pedestrian and vehicle collisions. Some of these bicycle and pedestrian trips would likely be transferred to the proposed Willamette Greenway Trail.

An off-street facility, such as the proposed multi-use path, is significantly safer than an on-street facility because an off-street facility:

- reduces speed by eliminating vehicle travel adjacent to cyclists and pedestrians
- reduces weight of a striking vehicle, as bikes weigh less and travel slower than cars, thereby causing less damage
- changes the functional class of the facility cyclists and pedestrians are traveling on.³⁶

For these three reasons, combined with the moderate estimate of 15,228 users daily, we estimate the improvements to safety caused by constructing the Willamette Greenway Trail to be substantial.

By investing in a separated multi use path like the Willamette Greenway Trail, the city would be showing its support for Vision Zero, a vision for a safer city where no bicyclists or pedestrians are killed on the streets. Vision Zero is a policy adopted by Portland Bureau of Transportation (PBOT) that strives to make the city's transportation system as safe as possible, with no traffic fatalities in the next 10 years. PBOT will focus on "designing streets that support the most vulnerable road users, because a system that works for vulnerable users is a system that works for everyone."³⁷ Over the next 10 years, it is PBOT's goal that 80% of Portlanders will live within 1/2 mile of a low stress bicycle facility. A multi-use path like the Willamette Greenway Trail can contribute to PBOT's mission of creating a safe, reliable, efficient, and socially equitable transportation system.

Community Engagement

Many survey respondents said safety is a large concern for them and one reason why they support the Willamette Greenway Trail. A sample of survey responses include the following comments:

- "Access to Swan Island is limited and down right dangerous having to cross Going. Traffic is heavy and unfriendly to bicycles."
- "I would love to commute by bicycle, but a multi-use trail at least most of the way is the only way I can actually imagine doing it."

35 Portland Bureau of Transportation. <https://www.portlandoregon.gov/transportation/article/466382>

36 These three ideas are taken from the ITHIM model <http://www.cedar.iph.cam.ac.uk/research/modelling/ithim/>

37 Vision Zero Report. PBOT. 2015.

- “I feel that a path like this would significantly reduce road congestion. It would also greatly improve the safety of bike commuters. In addition, it would connect North Portland to the SE, SW, and NW neighborhoods, which would be amazing.”
- “This trail would be fantastic! I never bike on Greeley anymore, very unsafe on a bike!”
- “I would bike to Swan Island more if it weren’t so dangerous.”
- “At this time I would love to have a bike path to Swan Island. I do not currently bike as I feel the current paths are not safe.”
- “I live in Kenton and am extremely supportive of this project. I bike to work 2-3 times a week, and the only options are either Greeley or Interstate, which are not safe, or Vancouver, which is crowded and out of the way. A safe, separated path connecting downtown is one of the most important issues to this neighborhood in my opinion.”
- “Thanks! I’m really excited to see this project completed so I can get from St. John’s to Downtown where I work without having to ride on busy roads the whole way. I would feel a lot safer going to work on a path like this. Plus, it would take a lot less time!”
- “I don’t want to cycle next to cars, separation is very important.”
- “I prefer a direct route, but I want that route to be safe, preferably separated infrastructure.”
- “Willamette Blvd is hazardous to cross, can’t cut into neighborhood easily.”

As illustrated by comments from the community, many people support the trail because it is an off-road facility that would allow them to bike separated from motor vehicle traffic, particularly the large commercial vehicles entering and exiting Swan Island.

Residents also voiced concern for safety along the trail, once the project is built. Community members expressed a desire for lighting along the trail to increase safety and visibility along the corridor. Police patrols along the trail were also suggested.

- “Emergency call boxes along the trail.”
- “Better lighting”
- “Police patrols around the trail”
- “More police patrols in cathedral park”
- “Quite frankly, I already use the Willamette Greenway. I’ve ran the tracks between the St. Johns Bridge and UP for 20 years at least once a week (1000 trips). Safety will be terrifically important because this is a very desolate area.”

Air Quality

Background & Literature Review

Trails that connect households with employment areas and key destinations can be used as an active transportation corridor, reducing commuters’ dependence on single occupancy vehicles, thereby reducing vehicle miles travelled (VMT) and the emissions associated with those trips. One of the major externalities associated with VMT is air pollution, a leading environmental threat to public health.

According to the Environmental Protection Agency, motor vehicles are responsible for 50% of smog-forming volatile organic compounds (VOCs), more than half of the nitrogen oxide (NOx) emissions, and 50% of the toxic air pollutant emissions in the United States. Motor vehicles account for 75% of carbon monoxide emissions nationwide.³⁸ It is critical that cities and transportation networks are designed in a way that minimizes residents’ dependence on motor vehicle

³⁸ Environmental Protection Agency. Clear Air Act. http://www.epa.gov/airquality/peg_caa/carstrucks.html

trips, as “reducing automobile trips by increasing mass transit use, carpooling, walking, and bicycling can help reduce air pollution, especially in urban areas.”³⁹

While bicycling and walking have many benefits, some consider the environmental implications to be the more important. “By far the greatest environmental benefit of bicycling and walking, however, is that they bypass the fossil fuel system to which the American economy has become addicted. Bicycle-riding and walking do not contribute to the environmental damage inherent in extracting, transporting, processing, and burning petroleum or other fossil fuels.”⁴⁰

A 2011 study by the European Cyclists Federation explored the comparison between the CO₂ emissions of bicycling versus other modes of transportation. The purpose of the study was to encourage “policy makers to make bicycle promotion a larger part of their greenhouse gas emission reduction toolkit.”⁴¹ The study, which looked at the complete life cycle of each mode found that for CO₂ per passenger per kilometer traveled, bicycles released 21 grams of CO₂, while personal vehicles released 271 gram and buses released 101 grams. There is an extensive body of literature linking vehicular air pollution to mortality and hospitalizations due to chronic respiratory problems, chronic lung disease, heart attacks, heart disease, cancer and major cardiovascular disease.⁴²

Existing Conditions in Study Area

The City of Portland is classified as an “attainment” area by the Environmental Protection Agency (EPA) for ground level ozone, meaning that ground level ozone levels are within the acceptable levels of the National Ambient Air Quality Standards (NAAQS). However, Portland is on the EPA’s “maintenance plan”, meaning that the city has a history of nonattainment, but is now consistently meeting the NAAQS. Maintenance areas have been re-designated by the EPA from “nonattainment” to “attainment with a maintenance plan.”⁴³ Therefore, it is a priority of the City to reduce its emissions of volatile organic compounds (VOCs) and nitrogen oxides (NO_x), the two major precursors to ozone formation.

An *Oregonian* report, which used Department of Environmental Quality data, mapped the risk of air toxics by Census block groups for the Metro area. The report used DEQ’s estimates of average pollution in each block group by the year 2017 and compared the levels to “ambient benchmark concentrations”, benchmark health goals, which are set at very low levels. Pollution less than 10 times the benchmark is good, while levels more than 100 times above the benchmark raises concerns. The ambient benchmark concentrations for the Willamette Greenway Trail study area range between 10 and 150 times the benchmark.⁴⁴

Assessment

Trails can reduce vehicle miles travelled (VMT) through promoting alternative transportation modes, such as biking and walking for transportation. A reduction in VMT positively impacts the environmental characteristics of the air, including improving air quality. Because of this, bike and pedestrian trail projects are eligible for federal funding through the Congestion Mitigation and Air Quality (CMAQ) Improvement Program. This program is specifically targeted at “improving air quality through transportation infrastructure construction and programs to reduce single occupancy vehicle use in areas that are in non-attainment of the National Ambient Air Quality Standards (NAAQS) of the Clean Air Act. Ozone and particulate matter are major pollutants regulated by the Clean Air Act that are attributed to vehicles.”⁴⁵

The Oregon Legislature has required the Portland metropolitan area to reduce per capita greenhouse gas emissions from cars and small trucks by 2035.⁴⁶ One strategy recommended in Metro’s Climate Smart Communities Report is to increase active transportation.

39 CDC. (2009). Respiratory Health and Air Pollution. <http://www.cdc.gov/healthyplaces/healthtopics/airpollution.htm>

40 FHWA. “The Environmental Benefits of Biking and Walking.” <http://atfiles.org/files/pdf/BikePedBen.pdf>

41 J Maus. BikePortland.org <http://bikeportland.org/2011/12/12/new-study-compares-bicyclings-co2-emissions-to-other-modes-63536>

42 McCubbin, Donald, Delucchi, Mark. “The High Costs of Motor Vehicle Related Air Pollution.” *Journal of Transport Economics and Policy*, September 1999. Volume 33 part 3.

43 Oregon DEQ. Air Quality Maintenance and Non Attainment Areas. <http://www.deq.state.or.us/aq/planning/maintenance.htm>

44 The Oregonian. “Metro Area Air Pollution”. <http://projects.oregonlive.com/pollution/>

45 US Department of Transportation. Federal Highway Administration. CMAQ Funding. http://www.fhwa.dot.gov/environment/bicycle_pedestrian/guidance/cmaqfunds.cfm

46 Metro. Climate Smart Communities. http://www.oregonmetro.gov/sites/default/files/rto_neighborhood_052213_final.pdf

The Willamette Greenway Trail would provide an opportunity to decrease single occupancy vehicle use and vehicle miles traveled by creating a corridor for active transportation. Through reducing VMT near the trail, there will be less vehicle emissions and improved air quality for all Portland residents. However, while walking and biking trips on the Willamette Greenway Trail would replace a small number of vehicle trips, the resulting improvements in air quality would likely be minimal.

Based on an estimation tool used by the Metropolitan Area Planning Commission (MAPC) to assess reductions in VMT as a result of bicycle and pedestrian projects, the Willamette Greenway Trail will eliminate an estimated 26,012 VMT per day (See APPENDIX? for spreadsheet). Extrapolated to the whole year, the trail will eliminate an estimated 1,391,661 VMT annually.

Based 2008 emissions factors from the EPA^{47,48} and the estimated reduction in VMT, the trail would annually save nearly:

- 3,200 Lbs of VOC,
- 2,124 Lbs of NO_x,
- 28,814 Lbs of CO, and
- 1,129,268 Lbs of CO₂

Note: For more information on the trail usage estimates and the modeling methodology, see Appendix D: Modeling in the full report "North Portland Greenway Trail Strategic Plan".

Community Engagement

A representative from Neighbors for Clean Air attended the St. Johns Library tabling session and provided input on the proposed Willamette Greenway Trail project. Air pollution from industrial sites near the Willamette River and on Swan Island are a large concern for the group, which advocates for the reduction of air pollutants across Oregon. The group is particularly concerned with the release of fine particulate matter at the bluff above Swan Island from diesel emissions and paint fumes.

Air quality was not a specific concern for community members, as few comments were received citing air quality or pollution specifically. However, there were comments expressing a need for additional tree canopy in the area and along the proposed trail and a reduction of street noise.

Social Cohesion

Background & Literature Review

A healthy community as defined by the California Center for Healthy Cities and Communities "promotes a positive physical, social, and economic environment that supports the well-being of its members."⁴⁹ According to Portland-based non-profit Coalition for Livable Futures, walkable neighborhoods "foster greater social cohesion and a sense of community."

Due to the impact public spaces can have on residents, it is important for cities to design spaces where community members can gather, interact with each other and create opportunities to participate more often in civic life. However, a literature review conducted in 2012⁵⁰ found very few studies that focus on the role of community trails in encouraging social cohesion and a sense of community. One study found that neighborhood green spaces "may actually draw people out of their homes into the outside where they have more opportunities for social interactions, fostering more

47 <http://www.epa.gov/otaq/consumer/420f08024.pdf>

48 This is based on consumption for passenger vehicles as of July 2008.

49 Center for Civic Partnerships. California Healthy Cities and Communities. <http://www.civicpartnerships.org/#!ca-healthy-cities-and-communities-progra/cjhg>

50 Massachusetts Area Planning Council. "Quequechan River Rail Trail Phase 2 Health Impact Assessment".

social cohesion and better ties among neighbors.”⁵¹ Another study concluded that neighborhood green spaces can reduce mental stress for nearby residents, by creating a place for physical activity and socialization.⁵²

A study in Portland found that residents reported feeling more connected to their neighborhood and community and improved mental health after neighborhood beautification projects, such as painting murals, installing benches and building planter boxes, were implemented. The study concludes, “this is particularly evident in public spaces, such as parks and plazas; increasing social capital corresponds with health improvements.”⁵³

Trail activities such as walking and bicycling are relatively inexpensive, unorganized activities, providing accessible recreation opportunities to all and may have a positive impact on residents living nearby. “Greenways located close to one’s home are accessible to all income groups. Trails that can be used easily as a route to the corner store or to commute to work or school, will rapidly become part of community life.”⁵⁴

A study looking at perceptions of greenway trails found that users felt that local trails were contributing most to “community quality of life through resident health/fitness, the natural areas they provide, better land use and resident pride.”⁵⁵ A literature review found that social interaction and encounters are an important benefit of community trails. When describing trail facilities, the majority of trail users described the social interactions they engaged in, even just exchanging waves and smiles.⁵⁶

Existing Conditions in Study Area

An annual survey from the City of Portland’s Auditor’s office collects responses to questions from 9,800 residents about city services. Resident’s opinions are collected in each of Portland’s seven neighborhood areas (North, Inner Northeast, Central Northeast, East, Southeast, Southwest, and Northwest/Downtown) and for the city overall (Map 6).

The area for the North Portland neighborhood encompasses all of the Willamette Greenway Trail study area, while also extending much farther to the east than the study area. However, due to the relative lack of data regarding social cohesion in this area, the HIA team found this information to be an acceptable data source. Several of the questions asked by the survey address topics related to social cohesion and community livability, including perceptions of safety, access to parks and feelings of safety related to biking and walking.

While a majority of residents citywide reported feeling very safe or safe in their neighborhoods at night (62 percent), only 49% of residents in the North Portland area reported feeling very safe or safe at night. However, when rating their feelings about safety in parks at night for the entire city, residents were less positive – 33 percent reported feeling very safe or safe in their neighborhood parks at night (Map 7).

The majority of Portland residents rated the overall quality of both City parks and City recreation services positively. In the North Portland area, 11% of survey respondents reported visiting a City park daily, while 35% reported visiting at least once a week. Additionally, 33% of residents reported that someone in the household participated in a Parks and Recreation activity, such as a class, event or camp. This participation rate is slightly higher than the citywide average (32%), and higher than participation rates in four of the seven neighborhood areas (Map 8).

Citywide, resident ratings of neighborhood and city livability have remained steady since 2010. The majority of survey respondents (84%) in the North Portland area reported feeling very good (33%) or good (51%) about their neighborhood livability. Factors that influence livability include access to parks, proximity to public transit, availability of on-street parking and access to services (Table 4).

51 Sullivan, W. C., F. E. Kuo, and S. F. Depooter. 2004. “The Fruit of Urban Nature.” *Environment and Behavior* 36 (5): 678–700.

52 Fan, Yingling, Kirti V. Das, and Qian Chen. 2011. “Neighborhood Green, Social Support, Physical Activity, and Stress: Assessing the Cumulative Impact.” *Health & Place* 17 (6) (November).

53 Center for Civic Partnerships. California Healthy Cities and Communities. <http://www.civicpartnerships.org/#!ca-healthy-cities-and-communities-progra/cjhg>

54 American Trails. “The Social, Health and Heritage Benefits of Trails.” <http://atfiles.org/files/pdf/BenGo4green.pdf>

55 Shafer, Scott. et al. “The Tale of Three Greenway Trails: User Perceptions Related to Quality of Life”. *Landscape and Urban Planning*. Volume 49. (2000).

56 Shafer, Scott. et al. “The Tale of Three Greenway Trails: User Perceptions Related to Quality of Life”. *Landscape and Urban Planning*. Volume 49. (2000).

Assessment

While it is difficult to assess social cohesion and social capital, particularly in a short time frame, research shows that community oriented outdoor spaces such as the Willamette Greenway Trail provide opportunities for neighbors and residents to socialize and create incentives for people living nearby to engage in their communities. The proposed trail would likely improve North Portland's social environment, helping to build social capital and strengthening social cohesion among residents, while increasing neighborhood livability and connectivity.

Because the City of Portland's City Auditor survey is administered annually, it will be possible to analyze the before and after conditions related to social cohesion over time, particularly after the Willamette Greenway Trail is built.

Community Engagement

While the terms "social cohesion" or "neighborhood connectivity" weren't specifically used, many comments from neighborhood residents were related to those ideas. Community members expressed the idea that the Willamette Greenway Trail could build an identity for the neighborhood and act as a catalyst for the development of additional community amenities, such as parks, playgrounds and community spaces.

- "It would help to build an identity for North Portland."
- "The community is getting better every day."
- "More community rest stops, gathering places, parks along the route."
- "Connect North Portland to the rest of the city."
- "Make North Portland more peaceful."
- "Family oriented place."
- "I like to see places that are fun and good to play."
- "Quiet space to ride."

While the responses regarding the social element of the trail were mostly positive, there was also feedback from residents who love the neighborhood, but have feelings of concern around safety, particularly gang activity in the area. Concerns about gentrification were also expressed, as the redevelopment of the corridor could lead to unintended consequences.

- "Less gangs."
- "Keep gentrification out."
- "Less trash."
- "Clean parks."

Seniors and Children

Background & Literature Review

Vulnerable populations, including older adults, children, minority groups and low-income households, bear a higher burden of chronic disease than other populations. This is particularly true for older adults and children, who are highly susceptible to air toxins and fine particulate matter. Studies show that "a lack of efficient alternatives to automobile travel disproportionately affects vulnerable populations such as the poor, the elderly, people who have disabilities, and children by limiting access to jobs, healthcare, social interaction, and healthy foods."⁵⁷

It is very important to create safe places for older adults to engage in physical activity, as they are the least active age group, with 35% of 65-74 year olds engaging in no physical activity. Additionally, 80% of older adults are afflicted with at least one chronic condition, and 50% have two or more. "Research has shown that seniors who have healthy

57 CDC. (2012) CDC Transportation Recommendations. <http://www.cdc.gov/transportation/recommendation.htm>

lifestyles that include regular physical activity reduce their risk for chronic diseases and have half the rate of disability of those who do not.”⁵⁸

Safety concerns are the most disproportionate for the elderly and children. Older adults have slower walking speeds and increased reaction time, both of which put this population at greater risk of pedestrian injury.⁵⁹ Several studies have found that older adults prefer walking over other physical activities, demonstrating the importance of providing safe and comfortable places for people of all ages to walk,⁶⁰ particularly a facility that is separated from potential interaction with vehicles. An economic report for the Wolf River Greenway found “studies show that increased physical activity helps seniors stay mentally fit, reduces the risk of coronary heart disease, and even decreases the amount of insulin needed by people with Type I diabetes.”⁶¹

Children perceive traffic much differently than adults, making them particularly vulnerable to biking and walking on any on-road facilities where they must interact with vehicle traffic.⁶² Studies have found that, even when children are paying close attention to vehicle traffic, they have difficulty understanding the speed at which a vehicle is approaching. A London study found, “this is not a matter of children not paying attention, but a problem related to low-level visual detection mechanisms, so even when children are paying very close attention they may fail to detect a fast approaching vehicle.”⁶³

For children ages 5 to 9 years, recreational injuries are most likely to occur on the playground and while riding bicycles. Likewise, for older children, cycling injuries are among the most common.⁶⁴ The available data on children and bicycle safety shows a need for two safety strategies; the first is to provide children with places to cycle away from vehicles, while the second is to provide bicycle safety training in schools.

While an assessment of the existing data show that vulnerable populations benefit from trails, there is very little data focused on these populations. While there are various studies on trails and trail use, one literature review found that no studies on trail use have focused on children, and very few studies focused on trail use among minority populations, including racial and ethnic groups.

Existing Conditions in Study Area

The Willamette Greenway Trail study area is home to approximately 67,000 residents, with 18% of the population under 18 years old, or almost 15,000 children. There are 36 schools within 3/4 mile of the proposed Willamette Greenway Trail, plus the University of Portland, with an average enrollment of 4,000 college-aged students.

The City of Portland’s Safe Routes to School program recently surveyed 51 elementary schools in Portland and found that 41% of Portland students either walked or biked to school in fall 2013, compared to about 12% nationally⁶⁵. Key findings for schools within the study area are seen in the table below. Within the study area, rates of biking and walking are consistently higher than the national average.

58 “Trails for Health: Promoting Healthy Lifestyles and Environments”. CDC. www.healthierUS.gov

59 Harrell, W. Precautionary street crossing by elderly pedestrians. *International Journal of Aging & Human Development*. 1991; 32: 65-80.]

60 Price, Anna E., Julian A. Reed, and Suresh Muthukrishnan. “Trail User Demographics, Physical Activity Behaviors, and Perceptions of a Newly Constructed Greenway Trail.” *Journal of Community Health* 37.5 (2012): 949-56. Web.

61 Memphis Gets Moving: Health and Economic Impacts of Building the Wolf River Greenway. <http://wolfriver.org/news/posts/the-wolf-river-greenway-health-and-economic-impact-report>

62 Plumert, Jodie, Joseph Kearney, and James Cremer. “Children’s Perception of Gap Affordances: Bicycling Across Traffic-Filled Intersections in an Immersive Virtual Environment.” *Child Development* 75.4 (2004): 1243-253. Web. <http://www2.psychology.uiowa.edu/Faculty/Plumert/publications/images/BikePaper.pdf>

63 Children’s Perception and Traffic Danger. Cyclorama. <http://www.cyclorama.net/blog/cycling-news/20s-plenty/>

64 National SAFE Kids Coalition. (2004). Recreational Injury Fact Sheet. South Carolina Institute of Medicine and Public Health (IMPH). (2013). A Health Impact Assessment of Park, Trail, and Green Space Planning in the West Side of Greenville, South Carolina. www.imph.org

65 Bike Portland. “Portland’s Best and Worst Elementary Schools for Biking”. <http://bikeportland.org/2014/01/17/portlands-least-and-most-auto-dependent-elementary-schools-100062>

Student Travel Modes to School

	Bike	Walk	Car or Carpool	Bus
Rosa Parks	2%	64%	34%	0%
Peninsula	16%	37%	41%	5%
James John	4%	30%	48%	18%
Astor	7%	41%	43%	7%
Cesar Chavez	10%	35%	52%	3%
Beach	19%	34%	40%	6%
Boise Eliot	0%	30%	49%	19%
Trillium	21%	2%	70%	6%

According to the “Action Plan for an Age-Friendly Portland”, populations in both Portland and nationwide are growing older due to increasing lifespans and a decline in birthrates. Between 2010 and 2030, older populations (65+) in Portland are projected to increase by 106%, compared to an increase in the region’s overall population of 34%⁶⁶. Approximately 20% of the population within the study area is over 55 years old, which is comparable to 23% in the City of Portland overall. While there has also been an influx of younger residents and families moving to the area, there are longtime residents of the areas will continue to grow older in North Portland, and it is important to create safe places for recreational and physical activity for residents of all ages and abilities.

Assessment

An off-road biking and walking facility, such as the Willamette Greenway Trail, provides a safe and comfortable place for all residents to enjoy the benefits of active transportation.

According to an HIA conducted by Washington County, “evidence-based recommendations for improving health outcomes through transportation projects include promoting active transportation to improve safety for all users and ensure equitable access to transportation networks.”⁶⁷ An equitable system is one that all community members are able to benefit from, including children and seniors. The Willamette Greenway Trail would contribute to an equitable transportation system in the region by providing a place for residents of all ages and abilities to bike and walk.

Community Engagement

One community engagement session was held at Rosa Parks Elementary School, a K-5 school located within the New Columbia neighborhood. Serving approximately 500 students, the school is located 1.5 miles north of the proposed trail. Due to the school’s proximity to the project, the Willamette Greenway Trail could serve as a safe recreational opportunity for the students and families at Rosa Parks Elementary.

People of all ages were engaged at the various community outreach sessions. Many older adults expressed interest in the trail, while children also provided great input. The students at Rosa Parks Elementary were very enthusiastic about the proposed trail and provided their ideas regarding the design elements and amenities desired through a visioning exercise. The students were also asked to write down any thoughts they had about the trail or biking and walking in general. A sample of responses follows:

- “Keep it safe”
- “Trails mean less dying”
- “A lot of cars are bad”

⁶⁶ The Age Friendly Portland Advisory Council. “Action Plan for an Age-Friendly Portland”. October 2013. <http://www.aarp.org/content/dam/aarp/home-and-family/livable-communities/2014-01/age-friendly-portland-action-plan.pdf>

⁶⁷ Washington County. (2014) Augusta Lane Bicycle and Pedestrian Bridge Health Impact Assessment.

- “Biking is a great thing”
- “I like to ride my bike in quiet places”
- “I want to see people ride their bikes”
- “I like to see places that are fun and good to play”
- “Make it a happy place”

CONCLUSION

Through the HIA process, the potential positive health impacts of the Willamette Greenway Trail and potential barriers to achieving these benefits were identified. The project presents a transportation and recreational opportunity that could be very beneficial to the health of residents who live near the proposed trail. The potential to increase physical activity, build social cohesion, encourage people to drive less, and create a riverfront natural space all could lead to improved health outcomes. These positive health impacts include, but are not limited to:

- increasing physical activity and reducing rates of inactivity,
- reducing automobile dependence and vehicle miles travelled (VMT)
- reducing rates of obesity, diabetes and cardiovascular disease;
- reducing pedestrian and bicycle related injuries and
- increasing social cohesion within the neighborhoods adjacent to the trail.

There are additional ways to encourage positive health outcomes of the Willamette Greenway Trail through the design and programming of the corridor and adjacent land.

Recommendations

Based on the literature review, community feedback and stakeholder input, the analysis concludes that the proposed Willamette Greenway Trail would have positive health impacts for the North Portland area. The following are recommendations about how to maximize the potential health benefits of the trail, while addressing concerns expressed during the community engagement process. (Note: a full set of recommendations can be found in the final report.)

- Promote awareness and trail use among vulnerable and underserved populations, including specific age and ethnic groups. A literature review found the need to “highlight an opportunity for efforts to promote trail use among females, racial minorities, and older adults,”⁶⁸ to increase awareness and encourage those groups to use trails.
- Continue advocating for an entirely off-road alignment
- Address safety concerns, including lighting, police patrols and trash/litter.
- Partner with other advocacy groups who share a mission similar to npGreenway’s, like Neighbors for Clean Air.
- Utilize the City of Portland’s City Auditor survey to understand the aspects of social cohesion in the area, before and after the trail is built.

⁶⁸ Price, Anna E., Julian A. Reed, and Suresh Muthukrishnan. “Trail User Demographics, Physical Activity Behaviors, and Perceptions of a Newly Constructed Greenway Trail.” *Journal of Community Health* 37.5 (2012): 949-56. Web.

