Seattle Municipal Golf Courses: A Hole in One for Affordable Housing

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Abstract

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In response to Seattle's affordable housing shortage, the City of Seattle adopted the Housing Affordability and Livability Agenda (HALA), which aims to ensure affordable housing options. Yet with limited developable land, how will the City accomplish such a significant task? A possible option is redevelopment of Seattle's four municipally owned golf courses, which offer huge amounts of developable land. Therefore, this study aims to determine: *When accounting for amount of buildable land on each of Seattle's four municipal golf courses, which course would best aid in reaching goals set forth by HALA?*

Research suggests that this approach is feasible, and, through a multilevel analysis of each municipal golf course, this study will determine each municipal golf courses' redevelopment potential. Based on this analysis, Jefferson Park Golf Course offers the highest redevelopment potential. However, each municipal golf course presents potential to alleviate Seattle's housing shortage. Further exploration regarding redevelopment potential at each municipal golf course

would aid in determining if, when, and how many municipal golf course conversions would be most effective in combatting Seattle's affordable housing shortage.

TABLE OF CONTENTS

LIST OF FIGURES

.

LIST OF TABLES

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CHAPTER 1. INTRODUCTION

The City of Seattle's recent job and population growth has increased at a much faster rate than anticipated. From 2010 to 2016, Seattle's population increased by 15.7 percent, making it one of the fastest growing cities in the nation during this time period.[1] This rapid growth has led to an increase in demand for housing which, in turn, has greatly impacted overall affordability in Seattle's housing stock. According to the City of Seattle (CoS), in 2018, one in seven Seattle households spent more than half of their income on housing, qualifying 45,000 households as severely cost-burdened.[2]

In response to Seattle's urgent need for more affordable housing, in September 2014, former Mayor Ed Murray and Seattle City Council adopted Resolution 31546, known as the Seattle Housing Affordability and Livability Agenda (HALA) to ensure development and preservation of many housing types at a range of affordable prices for Seattle residents.[3] HALA is a multi-prong comprehensive approach geared towards creating a more affordable and livable city.[4] The Mayor's Office and City Council convened a group of twenty-eight stakeholders to serve on the HALA Advisory Committee, who, in July 2015, came up with a goal of creating/preserving 50,000 apartments, houses, and other dwelling units by 2025.[5][6]

This 50,000 unit goal set forth by HALA's Advisory Committee was then subdivided into two affordability categories: 20,000 rent and income restricted (affordable) units and 30,000 new-

[1] Seattle, City of. 2018. "Mandatory Housing Affordability (MHA) Citywide Implementation Director's Report and Recommendation." http://www.seattle.gov/Documents/Departments/HALA/Policy/Directors_Report_MHA_Citywide.pdf%0A%0A.
[2] Ibid.
[3] Seattle, City of. 2015. "Seattle Housing Affordability and Livability Agenda." http://www.seattle.gov/hala.
[4] Seattle, City of. 2019. "What Is HALA? - HALA." 2019. https://www.seattle.gov/hala/about.
[5] Seattle, City of. 2019. "FAQ - HALA." 2019. https://www.seattle.gov/hala/faq.
[6] Ibid, 13.

market rate homes.[7] While the percentage of market rate units set forth by HALA is necessary to keep up with Seattle's rapidly growing population, the need for affordable housing exists across a spectrum of income levels.[8] Thus, the Committee aimed at making the 20,000 affordable units accessible to households ranging from 0 to 80 percent area median income (AMI).[9] They broke the 20,000 affordable units goal down, deciding to dedicate 30 percent of the 20,000 affordable units for residents between 0 to 30 percent AMI range, 45 percent for the 30 to 60 percent AMI range, and 25 percent for the 60 to 80 percent AMI range.[10]

While implementation of HALA strategies, including Mandatory Housing Affordability (MHA) are slated to create approximately 6,000 new affordable units throughout the city, there is still a significant number of affordable units necessary to reach the 20,000 unit goal by 2025.[11] Because of this, the City must consider innovative strategies, and one such recommendation made by the HALA Advisory Committee, is to prioritize the use of public property for affordable housing.[12] Currently, purchase of land is one of the greatest costs in the development process, and as a result, multiple state, county, and city governments in the United States have redeveloped publicly owned land. Specific examples of this approach are explored within the Public Lands and Affordable Housing section of the Literature Review, within this study.

Regarding publicly owned land, the CoS owns four golf courses encumbering 528-acres of park land within Seattle city limits (see Appendix A).[13] In 2018, a memorandum issued by Seattle Parks and Recreation Department (SPR), stated that, "in the last several years course revenues

[7] Ibid.
[8] Ibid.
[9] Ibid.
[10] Ibid, 14.
[11] City of Seattle, "MHA"
[12] City of Seattle, "Seattle Housing Affordability" p 19
[13] Lund, Kjristine, Kathy Scanlan, and Vanessa Lund. 2019. "Strategic Business Plan for the Future of City of Seattle Owned Municipal Golf Courses."

have been declining and have been insufficient to offset all golf related expenses for several reasons."[14] The memo announced that Lund Consulting had been hired to conduct a Strategic Business Analysis for each of the four courses,[15] since the golf courses are underperforming. As such, these large swaths of land (many of which are located near high-frequency transit routes and future light rail stations) offer an opportunity to expand affordable housing within city limits.

When I began this research, the Lund Consulting's report had not yet been released (it was made public in March 2019). While some of the findings from this report will be discussed, Lund Consulting's analysis and alternatives will not be the focus of this study, as their report focused primarily on possible funding options for necessary capital improvements on the municipal courses. Lund Consulting's report does not discuss alternative uses of the municipal courses, differentiating it from this study. Information from the Lund report pertinent to this study includes: number of rounds played between 2013 to 2017 per course, historic information about each course, and deficiencies/needed upgrades that each needed on each course.

The issue of golf course underperformance is not unique to the Seattle area. Across the nation, between 2000 and 2005, golf course closures increased from a rate of 23 percent per year, to more than 90 percent.[16] This sharp increase in closures is likely due to a combination of factors, including an oversupply of golf courses, decline in popularity of the sport, leading to a decrease in number of rounds played.[17] Considering that Seattle's municipal golf courses appear unable to

[14] Fraser, Cheryl, and Kjristine Lund. 2018. "Memorandum- Strategic Business Plan of Seattle Public Golf Courses." https://www.seattle.gov/Documents/Departments/ParksAndRecreation/BriefingPapers/Golf Park Board Briefing Paper Final 2-6-18.pdf.

[15] Ibid.

[16] Salkin, Patricia E. 2007. "Ensuring Continuing Community Amenities Through Golf Course Redevelopment Zoning and Land Use Planning" 628.

[17] Hueber, David, Doctoral Student, Richard H Pennell, and Elaine Worzala. 2010. ""' Code Blue " for U . S . Golf Course Real Estate Development : " Code Green " for Sustainable Golf Course Redevelopment." Journal of Sustainable Real Estate, no. November.

sustain themselves financially, the CoS should consider alternative, more immediate uses for this land that could better serve Seattle residents. The CoS would not be the first municipality to explore golf course redevelopment. Precedent golf course redevelopment cases will be reviewed within the Golf Course Conversion section of the Literature Review, of this study.

Another aspect this research explores, is that while the municipal golf courses fall under the Seattle Parks and Recreation Department umbrella, to what extent should they be treated as public goods? The defining aspects of a public good is that their consumption is "non-rivalrous" (one person's enjoyment of the good does not hinder someone else from enjoying it) and "non-excludable" (people cannot be prohibited from enjoying the good).[18] While the municipal golf courses may be considered non-rivalrous, they certainly do not fit the non-excludability criteria. This is because golf is costly, in terms of both the time and money required to play.

I would like to highlight is that the purpose of this study is not to diminish the importance of municipal golf. I understand the purpose of the municipal courses and the fact that they are much more inclusive than private courses, which often require expensive memberships. Growing up, I golfed with my dad and was a member of my high school's golf team. While golf is a sport I enjoy, I believe that the housing affordability crisis in Seattle can only be solved by analyzing every possible solution. Since Seattle's municipal golf courses are underperforming (requiring subsidies to offset maintenance costs), the City should consider the cost of sustaining these courses when considering Seattle's shortage of developable land and affordable housing.

My analysis aims to demonstrate that Seattle's municipal golf courses offer a unique opportunity to create more affordable housing near high-capacity/high-frequency transportation

[18] Kotchen, Matthew. 2012. "Public Goods." http://environment.yale.edu/kotchen/pubs/pgchap.pdf.

systems, without paying a premium for land. Accordingly, the primary question this study aims to answer is:

When accounting for amount of buildable land on each of Seattle's four municipal golf courses, which course would best aid in reaching goals set forth by HALA? In particular, how can the redeveloping the municipal golf courses aid in reaching HALA's goals of generating 20,000 affordable housing units (assuming a zoning change to Low-rise 1, Low-rise 2, and Low-rise 3 development), and prioritizing transit oriented development?"

Considerations under this umbrella include, "*How much of the total land is actually buildable when taking into consideration environmentally critical areas and their buffers? On that buildable land, how many new units could be built when taking into consideration open-space requirements? How many units per AMI level set forth by HALA could be created on each course? Which of the four courses has the greatest access to public transportation options (as transit oriented development is a key recommendation by HALA)?*

The proceeding Literature Review will focus on four main bodies of literature: the decline of golf, Seattle's Housing Affordability and Livability Agenda (HALA), transit-oriented development, public goods theory, and affordable housing development on public land. Exploring the progression of golf throughout the 20th and 21st centuries will help better inform why profitability of golf courses throughout the U.S. are decreasing. Next, as this research aims to explore how municipal golf course redevelopment could help reach HALA's affordable housing goals, it is important to understand that legislation and the program's progress. Due to the course's proximity to high capacity, high frequency public transportation options such as light rail, it's important to understand the benefits of transit-oriented development. An exploration of public goods theory, will demonstrate why Seattle's municipal golf courses should not be considered a

public good in the same way that other public parks are. Rounding out the Literature Review, I will review possible options for redevelopment, as they apply to the urban fabric of the neighborhoods surrounding the municipal golf courses. With this foundational knowledge, precedent cases related to golf course redevelopment across the U.S. will be analyzed in order to get a sense of what has worked best.

In order to answer the main research question, it is necessary to conduct an analysis of the environmentally critical areas (ECAs) that lie on and adjacent to the four municipal golf courses. Per Seattle Municipal Code (SMC), each ECA requires a protective buffer, limiting development in this area. All ECA analyses will be conducted with the assistance of an environmental consultant specializing in critical areas determinations (particularly in the characterization of wetlands and streams) as they pertain to housing and public works development. Furthermore, SMC maintains open-space requirements for all new development. Once ECAs, corresponding buffers, and open space requirements have been defined, the remaining land area (i.e. developable land) will inform the potential number of units that could be developed at each site.

Next, to determine the number of units each municipal golf course can provide (based on developable land on-site), I will perform land capacity calculations (used in the Seattle Comprehensive Plan) to determine potential number of units under LR1, LR2, and LR2 re-zoning scenarios. Once the potential number of units per site have been determined, I will apply the same affordability proportions set forth by the HALA committee and use those to estimate potential number of units at the three AMI levels (0 to 30, 30 to 60, and 60 to 80 percent). I have chosen to use HALA recommended proportions due to the fact that they were based on an in-depth citywide needs analysis

Through the synthesis of this information, this study will present potential number of affordable housing units available through redevelopment of each of the CoS' four municipal golf courses. It is my hope that these approximations will provide valuable insight as to which of the four courses has the most potential to help the Seattle's target of 20,000 affordable units, set forth by HALA.

In order to further understand which course would be most beneficial in terms of potential redevelopment, I will conduct an analysis on access to public transportation. The main goal of this analysis is to determine which course has access to the largest number of public transit routes.

Once all analyses have been completed, I will present strengths and weaknesses that each site offers in helping reach goals set forth around HALA. Through this study, I expect to find that total acreage of each golf course does not necessarily inform which site has the highest capacity for development, since the sites vary in terms of existing environmental condition. Regarding transit accessibility, I would expect that the courses that are closest to downtown will have the highest access to transit.

CHAPTER 2. LITERATURE REVIEW

This review focuses on five main bodies of literature including the decline of golf, Seattle's Housing Affordability and Livability Agenda, transit-oriented development, public goods theory, and the use of public land for affordable housing development. Below, the Decline of Golf section offers an exploration of the history of golf course production throughout the U.S., the current state of municipal golf, and historic and current conditions of Seattle's municipal golf courses. Next Seattle's Housing Affordability and Livability Agenda will be explored, followed by transit-oriented development. Subsequently, public goods theory and how public goods (such as city parks) differ from municipal golf courses and national parks will be discussed. Lastly, precedent cases involving public land being used to help lower the costs of affordable housing development will be reviewed.

2.1 THE DECLINE OF GOLF

2.1.1 GOLF'S THREE MAJOR BOOMS

There have been three major booms of golf course development within the United States. The first boom occurred during the 1920s, the second during the 1960s, and the third during the 1990s.[19] In terms of the total number of courses, golfers, and rounds played, statistics presented by the National Golf Foundation indicate that the golf industry peaked in 2000.[20]

Golf's first major boom occurred during the 1920s, when most clubs were private and required membership; primarily catering to upper income residents.[21] However, once World War

[19] Ibid.
[20] Hueber, "*Code Blue for U.S. Golf"*
[21] Ibid, 9.

II (WWII) and the Great Depression hit, courses built during this period took a major blow and many were faced with the decision of closing or opening their doors to the public.[22] Consequently, the number of private versus public courses went from an 80:20 split to 60:40 by 1950.[23] It was around this period that three of Seattle's four municipal golf courses, Jefferson Park Golf Course (1915), Jackson Park Golf Course (1930), and West Seattle Golf Course (1935), were opened for play.[24]

Beginning incrementally following WWII, and accelerating into the 1960s, golf's second boom was driven largely by a growing post-WWII economy and the emergence of the middle-income households. These households had increased time and money to put towards recreational activities such as golf.[25] By 1970, the number of golf courses had more than doubled since the boom of the twenties.[26] Most of the courses built during this period were open to the public, further pushing the number of private: public courses ratio towards an even 50:50 split by 1960 and 45:55 by 1970.[27] Courses built during this period grew larger in response to technological improvements in equipment such as golf clubs and balls that increased the range of play. Additionally, real estate developers discovered that property fronting golf courses could increase overall property sales and turnover. This led to a push for larger courses in order to maximize the number of course-fronting properties.[28] This marked the point where golf course development and real estate first became

[22] Ibid, 10.
[23] Ibid.
[24] Seattle, City of. 2009. "Seattle Parks and Recreation Golf Master Plan." https://www.seattle.gov/Documents/Departments/ParksAndRecreation/Business/RFPs/Attachment4_2009GolfMasterPlan.pdf.
[25] Hueber, "Code Blue for U.S. Golf", 11.
[26] Ibid.
[27] Ibid.
[28] Ibid.

intertwined. The recession of the 1970s, in tandem with high interest and inflation rates, brought a close to the second boom of golf.[29]

Starting in the 1990s and peaking in the 2000s, golf's third boom differed from those preceding it, in that it was driven by the expectation that aging baby boomers would golf as frequently as their predecessors had in retirement. This led to the conclusion that the existing supply of courses would not be enough to meet this increased demand.[30] In response, the National Golf Foundation (NGF) created a "Strategic Plan for the Growth of the Game." A central theme of this plan was to build a course a day from 1990 to 2000 to ensure the anticipated increase in demand would be met.[31] The 'course a day' slogan drew major media attention and gave the impression that there was ample opportunity for profit in the golf industry.[32] This marked the beginning of the third boom in golf. Millions of dollars were invested in the production of courses and by the year 2000, over 16,000 courses existed, however, the breakdown of municipal versus private courses is unknown.[33] In addition, the connection between real estate and golf course development grew stronger, with approximately sixty percent of the 400 courses built per year throughout the 1990s associated with master planned golf course community development.[34] Longer, real estate associated golf courses required an increased amount of land, increasing the cost to build and maintain them, leading to economic unviability.[35] Overall, golf's third boom left the golf industry with an oversupply of courses that did not tailor to the needs of the average golfer. It was during this boom that Seattle's Interbay golf facility was opened (1997), although, this

[29] Ibid.
[30] Ibid, 12.
[31] Ibid.
[32] Ibid, 13.
[33] Ibid.
[34] Ibid.
[35] Ibid, 15.

course was not intertwined with real-estate in the same way other courses built during this period were.[36]

Much like the rest of the nation, the Seattle-Tacoma region experienced a massive expansion of golf courses during the 1990s.[37] Although many of the courses built during this period were located to the east, north, and south of the municipal courses, these courses still created indirect competition for the municipal courses.[38] The overall increase in supply of courses and the plateau of the golf market in the 2000s put Seattle's municipal courses in a pinch.

2.1.2 After the Booms

Over the last ten years, the National Golf Foundation (NGF) has tracked 1,500 golf course closures.[39] According to the NGF, the closures can be attributed to a balancing out of supply and demand in a historically oversaturated industry.[40] According to the NGF, this trend of closures is not expected to change any time in the near future.[41]

2.1.3 The State of Municipal Golf

A 2013 study in the Journal of Public and Municipal Finance explores the economic viability of municipal golf courses, focusing specifically on municipal golf courses in Florida. The study concludes that municipal golf courses have a direct negative economic impact upon the

[36] CoS, "Golf Master Plan" 57
[37] Ibid, vii
[38] Ibid, 2.
[39] Cederberg, Kelly. 2018. "Taking Golf Out of Golf Course Golf Course: Trajectories to Convert Facilities to Parks and Open Space Facilities." Landscape Research Record, no. 7.
[40] Foundation, National Golf. 2018. "GOLF FACILITIES IN THE US 2018."
[41] Ibid.

municipalities that own and operate them.[42] The authors found that, "returns on courses over the last fifteen years have not yielded what even the safest government investment would, and the trend indicates that operating income may very well continue to decline."[43] The study indicates that returning these investments to a point of profitability would require an unprecedented improvement in operating income.[44] While this study spotlights courses in Florida, the authors also reviewed evidence that their findings are widespread among municipal courses throughout the United States.[45] This problem has worsened as the supply of courses have increased and the number of rounds played has decreased.[46]

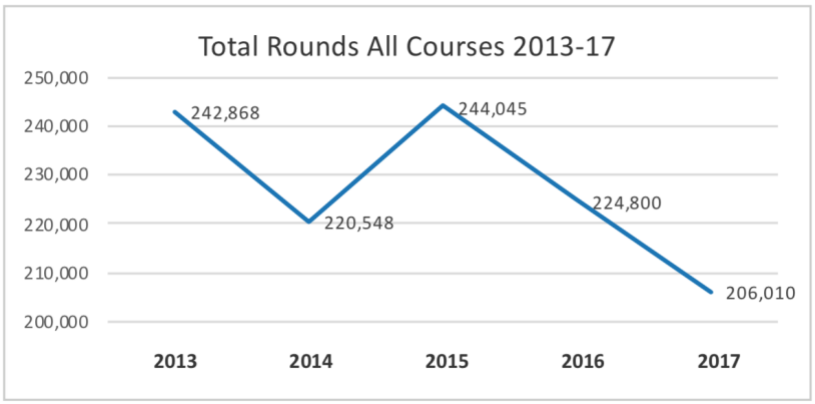
2.1.4 Municipal Golf In Seattle

The findings of the aforementioned study ring true for Seattle's four municipal courses. Seattle's courses are set up as an enterprise fund, where revenue earned from course fees are supposed to cover all operation costs and all additional earnings are supposed to contribute to SPR's general fund to help support other programs within the department.[47] However, over the past several years, course revenues have declined and have been unable to cover all golf-related expenses. A 2013 study in the *Journal of Public and Municipal Finance* states that golf course profitability is directly related to number of rounds played per course.[48] Figure 1 shows the overall decline in number of rounds played on Seattle municipal courses between 2013 and 2017. This is

[42] Ingram, Marcus A, Lee Hoke, and Jared Meyer. 2013. "The Declining Economic Viability of Municipal Golf Courses." Public and Municipal Finance 2 (1): 46.
[43] Ibid, 49.
[44] Ibid.
[45] Ibid.
[46] Ibid, 51.
[47] Ibid.
[48] Ingram, "Declining Economic Viability" p. 51

a trend that is projected to continue indefinitely, according to a memo posted by the City of Seattle.[49]

Figure 1, Seattle Municipal Golf Courses Rounds Played 2013-17



Source: Lund, Kjristine, Kathy Scanlan, and Vanessa Lund. 2019. "Strategic Business Plan for the Future of City of Seattle Owned Municipal Golf Courses."

In February of 2018, the Seattle's Parks and Recreation Department (SPR) contracted Lund Consulting to conduct an objective analysis regarding how to guide the future of Seattle's municipal golf courses.[50] When this research first began, the consultant's report had not yet been released, but in March of 2019, the report became available to the public. The primary purpose of this report was to provide a strategic business plan to guide the future of Seattle's public golf courses and related programs.[51] The consulting team consisted of Scanlan Consulting, Cocker Fennessy, and Lund Consulting, Inc.[52] An in-depth financial analysis of all four courses was conducted for the period between 2013-2017. Specific findings on each course will be presented within the Analysis Section of this paper.

[49] Ibid.
[50] CoS, "Strategic Business Plan"
[51] Lund, K., "Strategic Business Plan" p. 1
[52] Ibid.

2.2: HOUSING AFFORDABILITY AND LIVABILITY AGENDA (HALA)

In response to Seattle's housing affordability issues, former Mayor Ed Murray and Seattle City Council adopted Resolution 31546, also known as Seattle's Housing Affordability and Livability Agenda (HALA) in September 2014.[53] The primary aim of the agenda is to ensure development and preservation of housing types across a broad range of prices for Seattle residents.[54] Per the Mayor's request, the target housing goal of HALA is to create or preserve 50,000 housing units.[55] Of those units, 40 percent (20,000 units) are to be reserved for AMI levels, 0-30%, 30-60%, and 60-80%.[56] The remaining 60 percent (30,000 units) are to be priced at market-rate.[57] A committee of 28 stakeholders were brought together to help guide this work.[58] They divided the HALA process into three phases of work, including:

1.) Build an understanding of housing affordability needs through data and public participation
2.) Host in-depth discussions of potential solutions and strategies
3.) Craft and refine a complete list of recommendations.[59]

In total, the committee came up with 65 recommendations.[60] One recommendation that has seen implementation within Seattle is R.1: Partnership for Mandatory Inclusionary Housing – Development Driven Affordability Strategy which, "boosts market capacity by extensive citywide upzoning of residential and commercial zones; and (2) matches this increased capacity with a

[53] City of Seattle, "Seattle Housing Affordability" p 10
[54] Ibid.
[55] Ibid.
[56] Ibid.
[57] Ibid.
[58] Ibid.
[59] Ibid, 11.
[60] Ibid.

mandate to build affordable housing in emerging market-rate buildings."[61] This high impact recommendation is known as Mandatory Housing Affordability (MHA), and requires all new development to include either affordable units/homes or contribute to a City fund for affordable housing development.[62] As of March 18, 2019, City Council voted to implement citywide MHA legislation.[63] Previously, it had been limited to the neighborhoods of U-District, Downtown, South Lake Union, Chinatown/International District, Uptown, and portions of the Central District.[64]

Another high impact recommendation from HALA is Strategy MF.1. Strategy MF.1 aims to devote more land to multifamily housing, particularly in areas near transit, services and amenities. This strategy directly recommends employing transit-oriented development, which will be covered in greater depth within Section 3.3 of this study. As the four municipal golf courses are owned by the City and located near existing and future high capacity/high frequency transit stops, they offer an opportunity to further the affordable housing unit goals of HALA (20,000 units priced according to 0 to 80 percent AMI). The cost of land barrier would be null if the City decides to redevelop their golf courses - thus, this research focuses how many affordable housing units could potentially be developed through reutilizing these underutilized assets.

2.3 TRANSIT-ORIENTED DEVELOPMENT

Transit-oriented development (TOD) refers to high-density development located within easy walking distance of a major public transportation system with an emphasis on pedestrian

[61] Ibid, 15.
[62] Seattle, City of. 2019. "Mandatory Housing Affordability (MHA)." Seattle.Gov. 2019. http://www.seattle.gov/hala/about/mandatory-housing-affordability-(mha)#mhafaq.
[63]Seattle, City of. "Seattle Housing Affordability." p 15
[64]Seattle, City of, "Mandatory Housing Affordability"

access.[65] It is generally characterized by compact, mixed-use activities, located specifically around light or heavy rail stations.[66] According to a report published by the Mineta Transportation Institute, a walkable distance in regards to TOD is considered less than half a mile.[67] TOD has gained popularity as a form of sustainable urban development worldwide,[68] and within the United States, TOD has gained recognition as a promising way to promote smart growth and expand the ridership base of urban rail and bus systems.[69] Within this section, I will discuss the primary goals and objectives of TOD and discuss how it aligns with the potential redevelopment of Seattle's four municipal golf courses.

2.3.1 Goals of Transit-Oriented Development

A study conducted by the Transit Cooperative Research Program (TCRP) in 2004, surveyed public-sector stakeholder groups across the U.S. in order to understand what the main goals and objectives of TOD are. They found the primary goal of TOD is to increase ridership on public transportation systems.[70] Another major goal identified is to promote economic development and job growth through TOD.[71] Additionally, stakeholders cited increased quality of life and expanding housing options for citizens as primary goals of TOD projects.[72] The role of

[65] Evans, John, Richard Pratt, Andrew Stryker, and Richard Kuzmyak. 2016. "Traveler Response to Transportation System Changes Handbook, Third Edition: Chapter 17, Transit-Oriented Development." TRANSIT COOPERATIVE RESEARCH PROGRAM. https://doi.org/10.17226/14077.
[66] Cervero, Robert, and Cathleen Sullivan. 2011. "Green TODs: Marrying Transit-Oriented Development and Green Urbanism." International Journal of Sustainable Development & World Ecology 18 (3): 210–18. https://www.tandfonline.com/doi/full/10.1080/13504509.2011.570801.
[67] Bossard, Earl G, Jeff Hobbs, Brett Hondorp, Tara Kelly, Scott Plembaeck, Dayana Salazar, Andrea Subotic, et al. 2002. "Envisioning Neighborhoods with Transit-Oriented Development Potential." http://transweb.sjsu.edu.
[68] Ibid.
[69] Cervero, Robert, Steven Murphy, Christopher Ferrell, and Natasha Goguts. 2016. "Transit-Oriented Development in the United States: Experiences, Challenges, and Prospects." TRANSIT COOPERATIVE RESEARCH PROGRAM. https://doi.org/10.17226/23360.
[70] Ibid, 9.
[71] Ibid.
[72] Ibid, 10.

TOD in promoting affordable housing was also heavily emphasized by stakeholders who took part in the survey.[73]

2.3.2 Transit Oriented Development & Seattle's Municipal Golf Courses

The concept of TOD is especially important when considering the potential redevelopment of Seattle's municipal golf courses, because the four courses are located within a half mile walkshed of existing and proposed light rail stations.

Light rail offers a high capacity, high frequency transportation option for those living in metropolitan areas, and building around these areas is directly in line with the goals of HALA strategy MF.1 ("Devote more land to multifamily housing particularly in areas near transit services and amenities")[74]. While some light rail stations in Seattle are located in heavily developed areas, the golf courses offer a unique opportunity to greatly increase density near stations, as this land is buildable, declining in profitability for the City, and highly accessible. Specific details of each golf course's location in relation to light rail stations and other transit options will be explored further within the analysis section of this study.

2.4 GOLF COURSES AS PUBLIC GOODS

Finding a single definition of urban public space is difficult, in that these spaces are interdisciplinary in nature and diverse in function, form, rank and level of publicness.[75] Urban spaces and public spaces (such as local city parks, municipal golf courses, and national parks exhibit) offer varying levels of publicness, which will be discussed in further detail below.

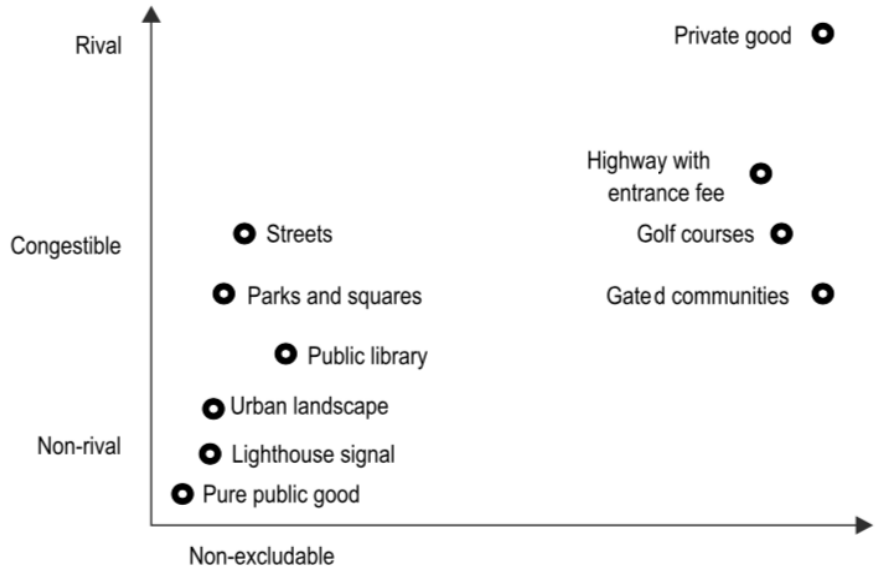
[73] Ibid.
[74] Seattle, City of, "Seattle Housing Affordability" p 7
[75] Polko, Adam. 2012. "URBAN PUBLIC SPACES – FROM ECONOMICS TO MANAGEMENT." University of Economics in Katowice, Poland.

According to economist Adam Polko, three essential elements contribute to a person's enjoyment of a public space: necessary activities, optional activities, and social activities.[76] Necessary activities (such as waiting for the bus) are those that will happen regardless of the quality of the environment.[77] Optional activities, such as walking, jogging, or shopping, rely more heavily upon what an area has to offer.[78] Lastly, social activities are those that happen spontaneously in a public space, like conversing with a stranger or children playing.[79] The more social and optional activities that occur, the better the space.[80]

In an economic context, urban public space can be considered a public good based on two characteristics they exhibit: non-rivalry and non-excludability.[81] Non-excludability means that it is difficult to keep people from consuming the good once it has been produced, and non-rivalry means that once it is produced for one person, additional consumers can consume it at no additional cost.[82] As exemplified in Figure 2, urban public spaces exist on a spectrum between non-rivalry and non-excludability. Parks fall within the lower left corner, exhibiting low excludability and slightly higher rivalry (since parks must be maintained and have a capacity constraint).

[76] Ibid, 10-11.
[77] Ibid, 11.
[78] Ibid.
[79] Ibid.
[80] Ibid.
[81] Ibid, 12.
[82] Halcomb, Randall G. 1997. "A Theory of Public Goods." Review of Austrian Economics 10 (1): 1–22.

Figure 2, Urban Public Space



Source: Halcomb, Randall G. 1997. "A Theory of Public Goods." Review of Austrian Economics 10 (1): 1–22.

Where parks exist within the spectrum of public goods is of particular interest, due to the fact that Seattle's four municipal golf courses are considered part of the City's 6,414-acre public park system. While the municipal courses do offer benefits such as open green space, a more economical way for people to golf, and potential wildlife habitat, the fact that user fees are required does affect their function as a public good. Other Seattle parks (such as Volunteer Park, Discovery Park, and Cal-Anderson Park) have a much higher occurrence aforementioned optional and social activities, allow for multiple uses within the same space, and are free of cost. Contrastingly, use of Seattle's municipal golf courses, require an entrance fee in order to use that publicly owned space. Additionally, Seattle's municipal courses lack optional activities, as golf is the only allowed use on these premises.

Another important point to consider is the sheer breadth of land that Seattle's municipal golf courses encumber - 528 acres to be exact, making up 6.4 percent of Seattle's public park

system. Due to the nature of golf and potential for injury that exists (if one were to be struck by a ball in play), it is necessary for users to be spaced out from one another. This results in a much lower number of potential users per acre, than that of other Seattle public parks.

Of course, the City's municipal golf courses are not the only public parks that require an entry fee. National Parks throughout the United States require user fees in order to offset operating fees. However, most national parks are not located in densely populated urban areas facing a shortage of affordable housing and developable land. While I am not an advocate for developing all public park land, I do want to draw attention to the huge amount of publicly owned land that the City of Seattle has reserved for a single-use, low-density, and a declining sport within our urban growth boundary.

It is important to note that golf courses aren't the only underutilized sports facilities in Seattle city limits. Seattle parks house tennis, basketball, and soccer facilities, which are not always heavily utilized, but differ from the municipal golf courses in two major ways, the first being that the overall footprint of sports facilities such as basketball courts is much smaller than that of a golf course. Secondly, when the aforementioned sports facilities are not being utilized for their intended use, those facilities can be home to many other activities such as skateboarding, playing soccer, bike polo, or simply lounging. In contrast, Seattle's municipal golf courses are always reserved for golf, and cannot be utilized for any other purpose based on course policies and associated entry fees.

2.5 PUBLIC LAND AND AFFORDABLE HOUSING

In the Seattle area and many metropolitan regions throughout the United States, the cost of land can be one of the highest costs in the development process. This can make the production of

new affordable housing especially difficult. In response to this, government agencies across the nation are alleviating affordable housing development costs by redeveloping land that is already publicly-owned. Within this section I will discuss the primary determinants of land value, discuss recent legislation related to development of public lands for affordable housing in the Seattle area, and explore best practices in development of publicly-owned land for affordable housing focusing on three main geographies including, Washington, DC, San Francisco, CA, and Austin, TX.

2.5.1 LAND COST

While many factors determine cost of land, a few primary drivers include location, supply of accessible sites, housing demand, competition from other uses, cost of labor and materials, and development potential of the site.[83] According to the City of Seattle, land can account for up to fifteen percent of total building costs.[84] All of the aforementioned factors have contributed to the hike in land costs in the Seattle area and have led to the overall housing affordability issues the City currently faces. Providing land that is already owned by a local municipality can offer a valuable form of support for affordable housing production. However, it is important to note that this is just one piece of the solution.[85] In order to maximize the benefit that public land for affordable housing presents, jurisdictions should supplement the remaining affordability gap with subsidies and or tax credit equity.[86]

[83] Ibid, 4.
[84] Seattle, City of. 2019. "Building More Affordable Housing Using Surplus Public Land - Council | Seattle.Gov." Seattle.Gov. 2019. https://www.seattle.gov/council/issues/land-disposition-policy.
[85] Hickey, Robert, and Lisa Sturtevant. 2015. "Public Land & Affordable Housing in the Washington DC Region: BEST PRACTICES AND RECOMMENDATIONS." https://sfplanning.org/public-land-housing.
[86] Ibid.

2.5.2 WASHINGTON DC REGION PUBLIC LANDS PROJECTS

Due to a strong economy, increasing population, and diminishing availability of developable land, the Washington DC metropolitan region has become increasingly unaffordable for a number of residents.[87] One way these issues of affordability are being offset in this region is by offering public lands to developers at little or no cost in order to reduce overall development costs which significantly reduces barriers to affordable housing development.[88] A report prepared for the Urban Land Institute outlined three major affordable housing projects built on public land in the Washington, D.C. region: The Bonifant, 1115 H Street, and Arlington Mill Residences. The Bonifant focuses on serving seniors who earn between 30 and 50 percent AMI.[89] 1115 H Street is a mixed-income condominium development aimed towards first-time home buyers earning between 50 and 80 percent AMI.[90] The final project, Arlington Mill Residences is the largest of the three and focuses on housing families who earn less than 60 percent of AMI, therefore most of the apartments are two or three bedroom units.[91] While all three projects vary in size, they all emphasize affordable housing development on public land along prime transit corridors. Without the discounting of public land, the projects would not have been able to provide as many affordable units in convenient, desirable locations.

[87] Ibid.
[88] Ibid.
[89] Ibid.
[90] Ibid.
[91] Ibid.

2.5.3 PUBLIC LAND FOR PUBLIC HOUSING | SAN FRANCISCO, CA

In 2014, San Francisco's Mayor, Ed Lee, called on all City agencies to examine their underutilized sites and assess their potential to aid in combating San Francisco's housing affordability challenges.[92] An interagency work group was created to draft guiding principles for potential development of the sites, initial site analysis, site selection criteria, and stakeholder engagement.[93] The guiding principles are as follows:

1.) Optimize land utilization

2.) Provide public benefits

3.) Fund Public Services

4.) Utilize innovative approaches to deliver projects & public benefits

5.) Complement neighborhood context and engage the community

While the primary focus of redeveloping selected parcels is affordable housing, other public benefits that will be incorporated into each housing development project include transportation demand management (TDM) measures, open space, affordable ground floor space for nonprofits, businesses, and community services.[94] As a result of this work, four main sites are under development: Balboa Reservoir, 4th & Folsom, 1950 Mission Street, and Balboa Park Upper Yard.[95] Balboa Reservoir is being developed with mixed-income housing, open space, and community amenities.[96] Slated to be finished in 2022, the 4th & Folsom project is an

[92] San Francisco Planning. 2019. "Public Land for Housing." City of San Francisco. 2019. https://sfplanning.org/public-land-housing.
[93] Ibid.
[94] Ibid.
[95] Ibid.
[96] San Francisco, City of. 2019. "Balboa Reservoir." San Francisco Planning. 2019. https://sfplanning.org/project/balboa-reservoir#timeline.

environmentally sustainable mixed-use development with a focus on housing families, 30 percent of which have experienced homelessness in the past.[97] Located in San Francisco's historic Mission District, the 1950 Mission Street site will be home to 150+ new units with a focus on housing low-income families and formerly homeless families.[98] The Balboa Park Upper Yard will soon be home to 80-120 low to very-low income families.[99]

2.5.4 MUELLER | AUSTIN, TX

Austin, Texas is home to one of the best job markets in the United States.[100] While this has led to a thriving economy, levels of housing affordability in the city have decreased.[101] Located northeast of Austin's city center, the Robert Mueller Municipal Airport located in Austin, TX officially closed in 1999.[102] The 700 acre site has remained in City ownership and is in the process of being turned into a large master planned mixed-use urban village.[103] The Mueller Affordable Homes Program includes both rental and ownership options available at a variety of price points. For-sale homes are available to those making no more that 80 percent AMI and for-rent homes are available to anyone making below 60 percent AMI.[104] Once finished, the project will be home to approximately 14,300 residents who will enjoy on-site office and retail amenities, as well as 140

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[97] Tenderloin Neighborhood Development. 2019. "4th and Folsom." 2019. http://www.tndc.org/indevelopment/4th-and-folsom/.
[98] Mission Housing Development Corporation. 2019. "1950 Mission Street." 2019. https://missionhousing.org/mhdc_project_type/1950-mission-2/.
[99] Mission Housing Development Corporation. 2019. "Balboa Park Upper Yard." 2019. https://missionhousing.org/mhdc_project_type/balboa-park-upper-yard/.
[100] Mueller. 2019. "Mueller Austin." 2019. http://www.muelleraustin.com/about/austin/.
[101] Ibid.
[102] Mueller. 2019. "History." 2019. http://www.muelleraustin.com/about/history/.
[103] Spotts, Michael, Ahmad Abu-Khalaf, and Genevieve Hale-Case. 2017. "Public Benefit from Publicly Owned Parcels: Effective Practices in Affordable Housing Development | Enterprise Community Partners." https://www.enterprisecommunity.org/resources/public-benefit-publicly-owned-parcels-19782.
[104] Mueller. 2019. "Affordable Homes." 2019. http://www.muelleraustin.com/homes/home-types/affordable-homes/.

acres of open public space.[105] This case is particularly relevant to this research due to the fact that this site is so large. It really highlights the positive impact that redevelopment of such a large underutilized site can hold.

2.6 GOLF COURSE CONVERSIONS

As golf courses have closed throughout the United States, the issue of what to do with such a large amount of land has come into question. In the face of these closures, three common golf course redevelopment strategies have emerged[106]:

- Strategy 1: Reduce the size of the golf course (to an executive golf course or comparable reduced hole course), enabling redevelopment of other areas on-site. This allows for golf facilities to remain, but function at a reduced maintenance cost.
- Strategy 2: Completely remove the golf facility to allow for a combination of redevelopment and open space.
- Strategy 3: Completely remove the golf facility and maintain the entire area as open space/park land.

A primary goal of this research is to determine how many housing units could be developed on Seattle Municipal Golf Course land, considering site limitations such as environmentally critical areas and open space requirements. In regard to this research question, I will focus on Strategy 2, since it focuses on eliminating golf facilities, allowing for maximum development of housing units. The primary development of interest in this case is affordable housing development.

[105] Mueller. 2019. "About." 2019. http://www.muelleraustin.com/about/.
[106] American Planning Association. 2018. "Golf Course Redevelopment and Conversion." 2018. https://learn.planning.org/course/view.php?id=502.

Looking to precedent cases of golf course redevelopment, I have chosen three cases that offer valuable context for potential redevelopment the City of Seattle golf courses. While not all of these cases employ Strategy 2 (total golf facility removal), they all focus on redeveloping municipally-owned golf course land to housing. The precedent cases are as follows: Marquee on Meeker (Kent, Washington), Fanling Golf Course (Hong Kong, China), and Red Cedar (Lansing, Michigan).

2.6.1 MARQUEE ON MEEKER | KENT, WASHINGTON

Marquee on Meeker is a mixed-use apartment complex located in Kent, WA, under development on a portion of Kent's municipally-owned Riverbend Golf Complex.[107] A 9-hole golf course (part of the larger complex) was sold to Auburn-based FNW, Inc. and Landmark Development Group in order to help pay off the City's four million dollar enterprise golf fund debt.[108] The rest of the Riverbend Golf Complex (including an 18-hole course, driving range, miniature golf, and golf retail facility) will continue to operate.[109] Upon completion of construction, Marquee on Meeker will feature 500 apartment units atop 12,000 square feet of retail space.[110] The redevelopment focuses a on public access, including a 200 foot open space buffer to help preserve the park-like quality of the area.[111]

The case of Marquee on Meeker, serves as an example of golf course redevelopment in a municipality just outside the City of Seattle. Similar to Seattle's golf courses, the City of Kent's

[107] Kent, City of. 2019. "Current Projects." 2019. https://www.kentwa.gov/doing-business/economic-development/current-projects.
[108] Hunter, Steve. 2018. "Kent Officially Closes Riverbend Par 3 Course." Kent Reporter. 2018. https://www.kentreporter.com/news/kent-officially-closes-riverbend-par-3-course/.
[109] Riverbend Golf Complex. 2019. "About Us." 2019. https://www.riverbendgolfcomplex.com/course/.
[110] Ken, City of, "Current Projects"
[111] Ibid.

golf course, Riverbend Golf Complex, was accruing a considerable amount of debt. Additionally, Marquee on Meeker is located in the same county and state as Seattle, thus, the pre-existing environmental conditions and regulations in this precedent case are similar to those that would be encountered in redeveloping Seattle's municipal courses.

2.6.2 FANLING GOLF COURSE | HONG KONG, CHINA

Over the last nine years, the city of Hong Kong has been ranked as having one of the world's least affordable housing markets.[112] In response, 80 acres of a 425 acre golf course have recently been approved for housing redevelopment, much of which will be public housing.[113] Redevelopment of Fanling Golf Course was one of eight strategies proposed by a land-supply task force who were studying ways to address Hong Kong's land/housing shortage.[114] The government will be conducting a technical analysis later this year to determine how many apartments will be built and what infrastructural work is necessary to support the additional housing.[115]

Similar to the City of Seattle, Hong Kong is facing an affordable housing shortage at crisis level. In Hong Kong, there is very little land left to develop, thus, as Fanling Golf Course is owned by the city government, they have the authority to repurpose the course to better serve the community. Additionally, there is a parallel between Hong Kong's land-supply task force, and the consulting firm in Seattle, Lund Consulting, who were hired to determine how to best use golf course land in the face of declining revenue.

[112] Hui, Mary. 2019. "Golf or Housing? A Land-Use Controversy in Hong Kong." CityLab. 2019. https://www.citylab.com/life/2019/02/hong-kong-golf-affordable-housing-development-home-prices/583534/.
[113] Ibid.
[114] Ibid.
[115] Ibid.

2.6.3 RED CEDAR | LANSING, MICHIGAN

In the city of Lansing, MI, the municipally owned Red Cedar Golf Course (which closed in 2007) is set to become a dense, urban, mixed-use development.[116] This project will help realize the City's Master Plan density goals, by providing 1,100 student housing units, 150 market-rate apartments, two hotels, and an assisted living and memory care facility.[117] In addition to dense new housing, the site will also include retail facilities and twenty-two acres of park space with a river-trail system.[118] In addition, this redevelopment project will serve as an important gateway between Lansing and East Lansing.[119] This will be Lansing's largest mixed-use development tax base on a property that currently generates no tax revenue for the City.[120]

This golf course redevelopment will provide a connection between two (previously isolated) parts of Lansing, Lansing and East Lansing. As golf courses occupy large tracts of land and require an entry fee, they often are barriers to mobility. By removing this barrier, residents of Lansing will more easily be able to get around. This case is a particularly relevant parallel to Seattle's golf courses because of future light-rail expansion. All four of Seattle's courses are located near current or future light-rail stations, and these large swaths of land currently reserved for golf, will inhibit efficient to access these stations.

Additionally, this redevelopment project emphasizes housing density. Through researching golf course redevelopment precedents, many cases involve redeveloping land to serve as single-

[116] Hansen, Haley. 2019. "Red Cedar Developers to Seek $54M in Infrastructure Reimbursements." Lansing State Journal. 2019. https://www.lansingstatejournal.com/story/news/2019/02/20/red-cedar-developers-infrastructure-reimbursements-brownfield-ferguson-kass/2913652002/.
[117] Ibid.
[118]Lansing, City of. 2018. "Red Cedar Redevelopment '…a Mixed-Use Development Project.'" https://www.lansingmi.gov/DocumentCenter/View/5200/Red-Cedar-Development-Presentation-2262018.
[119] Hansen, "Red Cedar Developers to seek.."
[120] Ibid.

family housing. As single-family zoning takes up 64.8 percent of Seattle's residential zoning, it is vital that the City emphasize denser land use practices, as the City of Lansing will on Red Cedar Golf Course.

CHAPTER 3. METHODOLOGY

As previously stated, the primary question this study aims to answer is, *"When accounting for amount of buildable land on each of Seattle's four municipal golf courses, which course would best aid in reaching goals set forth by HALA? In particular, how can the redeveloping the municipal golf courses aid in reaching HALA's goals of generating 20,000 affordable housing units (assuming a zoning change to Low-rise 1, Low-rise 2, and Low-rise 3 development), and prioritizing transit oriented development?"* Analysis required to answer this question will be divided into three sections: Buildable Lands Analysis, Potential Number of Housing Units Analysis, and Transit Accessibility Analysis, all of which will be discussed in detail below.

3.1 Buildable Lands Analysis

The goal of the buildable lands analysis is to identify all environmentally critical areas located on and in the immediate vicinity of the four sites. Seattle Municipal Code (SMC) Chapter 25.09 outlines regulations for environmentally critical areas (ECAs), which include geologic hazard areas and steep slope erosion hazard areas, flood-prone areas, wetlands, fish and wildlife habitat conservation areas, riparian corridors (i.e. streams), and abandoned landfills. Since an on-site analysis of environmentally critical areas conditions on the four municipal golf courses is not feasible, boundaries of environmentally critical areas will be determined based upon Seattle Department of Construction & Inspections GIS Map, aerial photography, and topographic contours. Given these resources, it appears that wetlands, riparian corridors, and steep slope erosion hazard areas are located within the boundaries of the golf courses. As previously stated, these approximate determinations will be made with the assistance of an environmental consultant

specializing in critical areas determinations (particularly in the characterization of wetlands and streams) as they pertain to housing and public works development.

According to SMC 25.09.160(A), wetlands will be rated using the *Washington State Wetland Rating System for Western Washington (Ecology Publication #14-06-029).* Upon determining the category and habitat score of each wetland, SMC 25.09.160 Table A will be used to determine buffer widths for each wetland. Since development within wetland buffers is limited per SMC 25.09.160(C)(1), for the purposes of approximating developable land on site, wetlands and their corresponding buffers will be excluded from the developable calculation.

Per SMC 25.09.012(D)(5), riparian corridors (i.e. streams) will be typed according to Washington Administrative Code (WAC) 222-16-030 and 222-16-031. Pursuant to SMC 25.09.012(D)(5), a riparian management area shall be projected 100 feet horizontally landward from the ordinary high-water mark of the watercourse. Because many types of development are prohibited within riparian management zones (SMC 25.09.200(3)(b)), for the purposes of approximating developable land on site, riparian corridors and their associated riparian management zones will be excluded from the developable land calculation.

In regard to steep slopes, SMC 25.09.012(A)(4), states that steep slope erosion hazard areas are areas with a slope with an incline of 40 percent or more within a vertical elevation change of at least 10 feet. 25.09.090(C)(1), steep slope erosion hazard areas have 15-foot buffers from the top and toe of a slope. As such, steep slope erosion hazard areas and their corresponding buffers will be excluded from the developable land calculation.

Once the aforementioned ECAs on site (and in the near vicinity, whose buffers may project on-site) and their buffers have been determined, I will subtract this acreage from the total area on-site for each of the four municipal golf courses. This will result in potential developable area on-

site, giving consideration to environmentally critical areas restrictions. Next, I will incorporate open space requirements specified in SMC 23.48.230(E) by multiplying the potential developable area (with respect to ECAs restrictions) on-site by 20 percent. The resulting value from this calculation will reflect each municipal golf courses total potentially developable land.

3.2 Potential Number of Housing Units Analysis

Once the total area of developable land has been determined, calculations regarding potential number of units per course will be calculated. Seattle's Department of Planning and Development utilizes the following formula to determine development capacity of a given land parcel:

Potential Housing Units = (Developable Land Area x Expected Floor Area Ratio) ÷ Expected Square Feet per Unit (mid/high rise multifamily).[121]

Since this is the standard formula used within Seattle's Comprehensive Plan Development Capacity Report, I will use it to calculate potential number of units available through redevelopment per municipal golf course. Values for expected Floor Area Ratio (FAR) will be determined by Lowrise 1, Lowrise 2, and Lowrise 3 maximum zoning allowances all of which are provided within Seattle Municipal Code Chapter 23.49.011. Regarding Expected Square Feet Per Units, I will use the same estimates of square feet per unit in all Lowrise zoning categories as identified in Seattle's Comprehensive Plan Development Capacity Report.[122] Once total potential number of units have been calculated for each of the four courses, that number will be broken

[121] Seattle, City of. 2015. "Zoned Development Capacity." http://www.seattle.gov/DPD/cs/groups/pan/@pan/documents/web_informational/s051319.pdf.
[122]Ibid, 16.

down by the same proportions reflected in HALA recommendations to get an approximate number of units per AMI level.

3.3 Transit Accessibility Analysis

In order to better understand each course's overall transit accessibility, I will first create a half mile walkshed around the boundary of each municipal golf course in ArcGIS. Based on this walkshed, I will identify all transit stops within that area. I will then determine which transit routes serve each stop and the total number of transit routes that serve each walkshed. Each course's overall transit accessibility will be ranked based upon the total number of routes serving each course. It is important to note that this analysis is focused primarily on accessibility of transit in these areas, it does not take into account ridership capacity of those routes nor does it consider level of frequency of each route.

3.4 Course-by-Course Redevelopment Analysis

After the aforementioned analyses have been conducted, strengths and weaknesses regarding each municipal golf courses redevelopment potential will be discussed in order to better understand how each course's redevelopment can aid in alleviating Seattle's affordable housing crisis.

CHAPTER 4. ANALYSIS

For the purposes of this report, developable land is defined as all land left over when environmentally critical areas, corresponding buffers, and Seattle's 20 percent open space requirement are taken into account. Potential number of units will be calculated using the following formula at the Lowrise 1, Lowrise 2, and Lowrise 3 zoning levels:

$$\boldsymbol{Potential\ Number\ of\ Units} = \frac{\text{Developable Land Area X Expected FAR}}{\text{Expected Sq. Ft. per unit}}$$

Expected values for FAR and Square Feet Per Unit at each zoning level are as follows:

Table 1 Zoning FAR and Expected Square Feet

	Expected FAR	**Expected Sq. Ft. Per Unit**
Lowrise 1	1	1,000
Lowrise 2	1.15	1,000
Lowrise 3	1.3	1,000

Regarding Area Median Income (AMI) Analysis, the following proportions proposed by HALA will be used to determine potential number of units at each level of AMI.

Table 2 Area Median Income Proportions

AMI Level	**Proportion**
0-30% AMI	30%
30-60% AMI	45%
60-80% AMI	25%

4.1 JEFFERSON PARK GOLF COURSE

HISTORY

In response to the growing popularity of golf the United States, Seattle's first municipal golf course, Jefferson Park Golf Course, was opened in 1915.[123] The course occupies a total of 123 acres.[124] The course designer, Thomas Bendelow, recalled pushback towards using public park land for golf, due to beliefs that golf was a "rich man's game."[125] Upon opening, Jefferson Park offered an 18-hole course.[126] Since then, the course has gained additional golf facilities including a 9-hole course, golf driving range, clubhouse, and support facilities.[127]

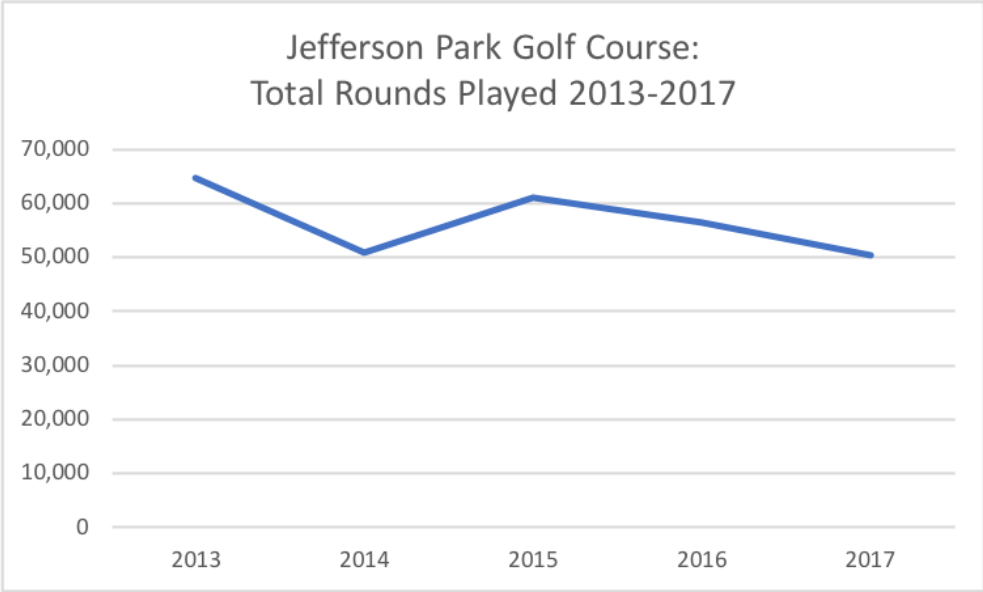
The recent study performed by Lund Consulting presented total number of rounds played from 2013-2017 for each of the four courses. Jefferson Park Golf Course has seen the second highest decrease in total number of rounds played between 2013-2017 among the four courses (See Figure 3, below).

COURSE DEFICIENCIES

The Lund Consulting report also explored course deficiencies. Regarding Jefferson Park Golf Course deficiencies, cart storage is inadequate in terms of capacity and condition. Additionally, the course maintenance buildings are over fifty years old and inadequate in size.[128]

[123] Ibid, 37.
[124] CoS, "Golf Master Plan" 37
[125] Ibid, 24.
[126] Ibid, 39.
[127] Ibid, 38.
[128] Ibid, 40.

Figure 3, Jefferson Park Golf Course Total Rounds Played



Source: Lund, Kjristine, Kathy Scanlan, and Vanessa Lund. 2019. "Strategic Business Plan for the Future of City of Seattle Owned Municipal Golf Courses."

BUILDABLE LANDS ANALYSIS

Environmentally Critical Areas

It appears that Jefferson Park Golf Course contains one wetland (Wetlands A) and multiple steep slope erosion hazard areas on-site. Per SMC 25.09.090(C)(1), steep slope erosion hazard areas require a 15-foot setback from the top and toe of slope. A summary of information pertinent to Wetland A can be found in Table 3, below. See Appendix B, for approximate environmentally critical areas locations.

Table 3 Jefferson Park Golf Course Wetlands

Wetland	**Hydrogeomorphic Classification**	**Cowardin Classification**	**Department of Ecology Rating/Habitat Score**	**City of Seattle Buffer Requirement**
Wetland A (on-site)	Depressional	Palustrine, Forested, Saturated	IV/4 points	50 feet

Total Buildable Land

After identifying and accounting for all ECAs and their buffers there are 117 acres of developable land. After taking into account the 20 percent open space requirement, the total buildable area comes to 93.6 acres.

HOUSING UNIT ANALYSIS

Table 4, identifies the potential number of units available by redeveloping Jefferson Park Golf Course, considering zoning changes to Lowrise 1, 2, and 3. A zoning designation of Lowrise 3 yields the highest number of potential units.

Table 4 Jefferson Park Golf Course Total Potential Units

Zoning	**Potential Number of Units**
Lowrise 1	4,077
Lowrise 2	5,300
Lowrise 3	6,689

AREA MEDIAN INCOME ANALYSIS

Lowrise 1

Table 5 Jefferson Park Golf Course Low Rise 1 Units Per Area Median Income Level

Level of AMI	**Number of Units**
0-30%	1,223
30-60%	1,834
60-80%	1,019

Lowrise 2

Table 6 Jefferson Park Golf Course Lowrise 2 Units Per Area Median Income Level

Level of AMI	**Number of Units**
0-30 %	1,590
30-60%	2385
60-80%	1325

Lowrise 3

Table 7 Jefferson Park Golf Course Lowrise 3 Units Per Area Median Income Level

Level of AMI	**Number of Units**
0-30%	2,006
30-60%	3,010
60-80%	1,673

TRANSIT ACCESSIBILITY ANALYSIS

Within the half mile walkshed of Jefferson Park Golf Course, there are a total of thirteen bus routes serving the area. Additionally, there are two existing light-rail stations that lie within this walkshed, Columbia City Station to the southeast and Mount Baker Station to the northeast (see Appendix C).

4.2 JACKSON PARK GOLF COURSE

HISTORY

Occupying a total of 160 acres, Seattle's second municipal golf course, Jackson Park Golf Course was first opened for play in 1930.[129] Upon opening, the site consisted of an 18-hole, and was added to in 1954, when fourteen more acres were purchased to create an additional 9-hole course.[130] Today the Jackson Park Golf Course consists of and 18-hole course, 9-hole course, two-tiered driving range, clubhouse, restaurant, 2.2 mile perimeter trail, and supporting facilities.[131] Of the four courses, Jackson Park has seen the highest decrease in total number of rounds played between 2013-2017 (Figure 4).

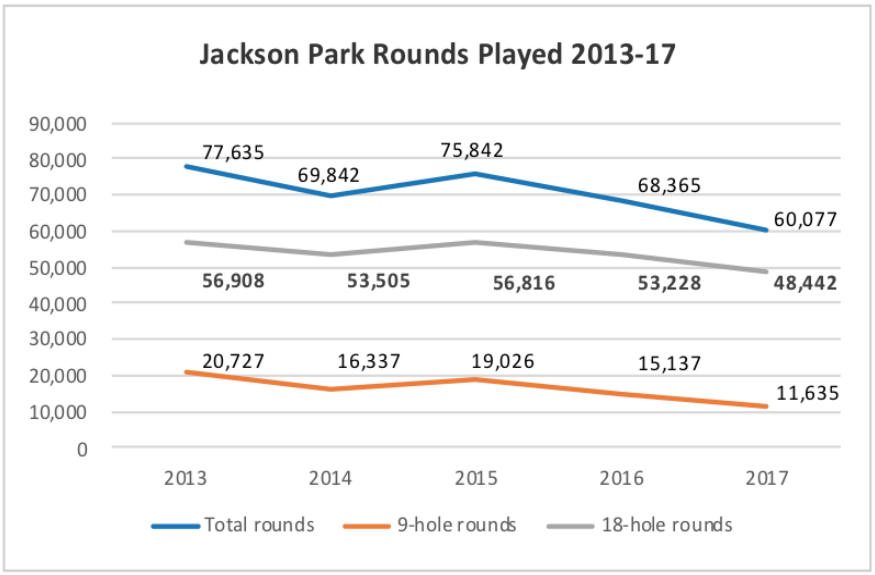
COURSE DEFICIENCIES

One issue Jackson Park Golf Course faces is inadequate vehicle parking.[132] Another major issue facing this course is that of irrigation regarding both amount of water and irrigation infrastructure inadequacy.[133] Currently the main source of water for irrigation is the Thornton Creek, but during the summer months this water becomes insufficient.[134] Additionally, the irrigation system is severely outdated and inadequate, leading to a loss of thousands of gallons of

[129] CoS, "Golf Master Plan" 21
[130] Lund, K., "Strategic Business Plan" 36
[131] Ibid, 35.
[132] Ibid, 36.
[133] Ibid.
[134] Ibid.

water daily during the irrigation season.[135] Structures throughout the course including cart barns, maintenance structures, and clubhouse facilities are all in need of improvements as well.[136]

Figure 4, Jackson Park Golf Course Total Rounds Played



Source: Lund, Kjristine, Kathy Scanlan, and Vanessa Lund. 2019. "Strategic Business Plan for the Future of City of Seattle Owned Municipal Golf Courses."

Buildable Lands Analysis

Environmentally Critical Areas

It appears that eight wetlands (Wetlands A through H) are located on Jackson Park Golf Course, as well as two streams (Littles Creek and Thornton Creek), and multiple steep slope erosion hazard areas on-site. Per SMC 25.09.090(C)(1), steep slope erosion hazard areas require a 15-foot setback from the top and toe of slope. A summary of wetlands and streams can be found in Tables 8-9, below. See Appendix D, for approximate environmentally critical areas locations.

[135] Ibid.
[136] Ibid, 36-37.

Table 8 Jackson Park Golf Course Wetlands

Wetland	**Hydrogeomorphic Classification**	**Cowardin Classification**	**Department of Ecology Rating/Habitat Score**	**City of Seattle Buffer Requirement**
Wetland A	Riverine	Palustrine, Forested, Seasonally Flooded	II/6 points	110 feet
Wetland B	Depressional	Palustrine, Forested, Saturated	III/6 points	110 feet
Wetland C	Slope	Palustrine, Forested, Saturated	III/5 points	110 feet
Wetland D	Riverine	Palustrine, Forested, Seasonally Flooded	II/6 points	110 feet
Wetland E	Depressional	Palustrine, Aquatic Bed, Permanently Flooded	III/5 points	110 feet
Wetland F	Depressional	Palustrine, Aquatic Bed, Permanently Flooded	III/5 points	110 feet
Wetland G	Depressional	Palustrine, Aquatic Bed, Permanently Flooded	III/5 points	110 feet
Wetland H	Depressional	Palustrine, Forested, Seasonally Flooded	III/5 points	110 feet

Table 9 Jackson Park Golf Course Streams

Stream	Hydrogeomorphic Classification	Cowardin Classification	SMC/WAC Stream Type	City of Seattle Buffer Requirement
Littles Creek	Riverine	Riverine, Intermittent, Cobble-gravel	Type Np	100-foot Riparian Management Zone
Thornton Creek	Riverine	Riverine, Upper Perennial, Cobble-gravel	Type F	100-foot Riparian Management Zone

Total Buildable Land

After identifying and accounting for all ECAs and their buffers there are 102 acres of developable land. After taking into account the 20 percent open space requirement, the total buildable area comes to 81.6 acres.

HOUSING UNIT ANALYSIS

Table 10, below, identifies the potential number of units available by redeveloping Jackson Park Golf Course, considering zoning changes to Lowrise 1, 2, and 3. A zoning designation of Lowrise 3 yields the highest number of potential units.

Table 10 Jackson Park Golf Course Total Potential Units

Zoning	Potential Number of Units
Lowrise 1	3,554
Lowrise 2	4,087
Lowrise 3	4,620

AREA MEDIAN INCOME ANALYSIS

Lowrise 1

Table 11 Jackson Park Golf Course Low Rise 1 Units Per Area Median Income Level

Level of AMI	**Number of Units**
0-30%	1,066
30-60%	1,599
60-80%	888

Lowrise 2

Table 12 Jackson Park Golf Course Lowrise 2 Units Per Area Median Income Level

Level of AMI	**Number of Units**
0-30 %	1,226
30-60%	1,839
60-80%	1,021

Lowrise 3

Table 13 Jackson Park Golf Course Lowrise 3 Units Per Area Median Income Level

Level of AMI	**Number of Units**
0-30%	1,386
30-60%	2,079
60-80%	1,155

Transit Accessibility Analysis

Within the half mile walkshed of Jackson Park Golf Course, there are a total of nineteen transit routes currently serving the area (see Appendix E). Regarding light rail stops, there are two proposed light rail stations that lie within the half mile walkshed.

4.3 WEST SEATTLE GOLF COURSE

History

Seattle's third municipal course, West Seattle Golf Course, was opened in 1940.[137] The course occupies approximately 120 acres of the 130 acre site, consisting of an 18-hole regulation length golf course, clubhouse, and support facilities.[138] As part of the 2009 Golf Master Plan, the course was set to receive a driving range but was not implemented due to design issues.[139] Of the four courses, the West Seattle course has seen the third highest decrease in total number of rounds played between 2013-2017 (Figure 5).[140]

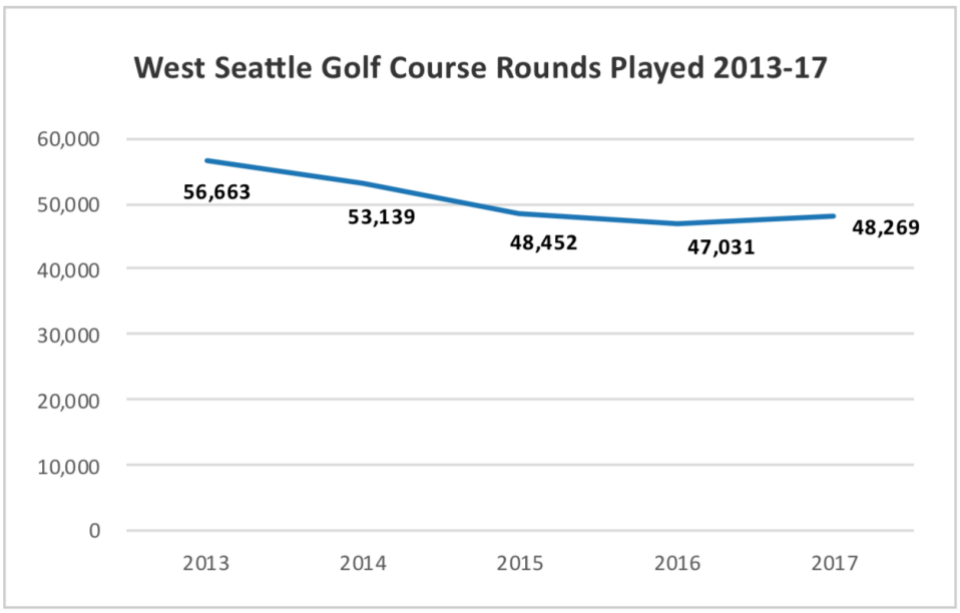
Course Deficiencies

A major issue with the West Seattle course is its lack of drainage which leads to limitations of use during the winter season.[141] Similarly to other courses, the course's irrigation system is

[137] Ibid, 41.
[138] Ibid.
[139] Ibid.
[140] Ibid.
[141] Ibid, 42.

dated, necessitating maintenance and upgrades.[142] Additionally, the clubhouse, cart storage facilities, and equipment storage facilities are all in need of renovation or reconstruction.[143]

Figure 5 West Seattle Golf Course Total Rounds Played



Source: Lund, Kjristine, Kathy Scanlan, and Vanessa Lund. 2019. "Strategic Business Plan for the Future of City of Seattle Owned Municipal Golf Courses."

Buildable Lands Analysis

Environmentally Critical Areas

Five wetlands (Wetlands A through E) were approximated on West Seattle Golf Course, as well as three streams (Longfellow Creek, Stream A, and Stream B), and multiple steep slope erosion hazard areas. Per SMC 25.09.090(C)(1), steep slope erosion hazard areas require a 15-foot setback from the top and toe of slope. A summary of wetlands and streams can be found in Tables 14-15, below. See Appendix F, for approximate environmentally critical areas locations.

[142] Ibid.
[143] Ibid.

Table 14 West Seattle Golf Course Wetlands

Wetland	**Hydrogeomorphic Classification**	**Cowardin Classification**	**Department of Ecology Rating/Habitat Score**	**City of Seattle Buffer Requirement**
Wetland A	Depressional	Palustrine, Forested, Seasonally Flooded	III/6 points	110 feet
Wetland B	Depressional	Palustrine, Forested, Seasonally Flooded/Saturated	III/6 points	110 feet
Wetland C	Riverine	Palustrine, Forested, Seasonally Flooded/Saturated	II/6 points	110 feet
Wetland D	Riverine	Palustrine, Scrub-shrub, Seasonally Flooded	II/6 points	110 feet
Wetland E	Riverine	Palustrine, Scrub-shrub, Seasonally Flooded	II/6 points	110 feet

Table 15 West Seattle Golf Course Streams

Stream	**Hydrogeomorphic Classification**	**Cowardin Classification**	**SMC/WAC Stream Type**	**City of Seattle Buffer Requirement**
Longfellow Creek	Riverine	Riverine, Upper Perennial, Cobble-gravel	Type F	100-foot Riparian Management Zone
Stream A	Riverine	Riverine, Intermittent, Cobble-gravel	Type Ns	100-foot Riparian Management Zone
Stream B	Riverine	Riverine, Intermittent, Cobble-gravel	Type Ns	100-foot Riparian Management Zone

Total Buildable Land

After identifying and accounting for all ECAs and their buffers there are 88.5 acres of developable land on site. After taking into account the 20 percent open space requirement, the total buildable area comes to 70.8 acres.

HOUSING UNIT ANALYSIS

Table 16, identifies the potential number of units available by redeveloping West Seattle Golf Course, considering zoning changes to Lowrise 1, 2, and 3. A zoning designation of Lowrise 3 yields the highest number of potential units.

Table 16 West Seattle Golf Course Total Potential Units

Zoning	**Potential Number of Units**
Lowrise 1	3,084
Lowrise 2	3,546
Lowrise 3	4,009

AREA MEDIAN INCOME ANALYSIS

Lowrise 1

Table 17 West Seattle Golf Course Lowrise 1 Units Per Area Median Income Level

Level of AMI	**Number of Units**
0-30%	925
30-60%	1,387
60-80%	771

Lowrise 2

Table 18 West Seattle Golf Course Lowrise 2 Units Per Area Median Income Level

Level of AMI	**Number of Units**
0-30 %	1063
30-60%	1595
60-80%	886

Lowrise 3

Table 19 West Seattle Golf Course Lowrise 3 Units Per Area Median Income Level

Level of AMI	**Number of Units**
0-30%	1,202
30-60%	1,804
60-80%	1,002

TRANSIT ACCESSIBILITY ANALYSIS

Within the half mile walkshed of West Seattle Golf Course, there are a total of thirteen transit routes currently serving the area (see Appendix G). Additionally, there are three proposed light rail stations to the north of the site that lie within the half mile walkshed.

4.4 INTERBAY GOLF CENTER

HISTORY

Interbay Golf Center was opened in 1997 and is home to a 45 acre facility consisting of a driving range, 9-hole course, clubhouse, and short-game practice area.[144] Prior to serving as a golf

[144] Ibid, 34.

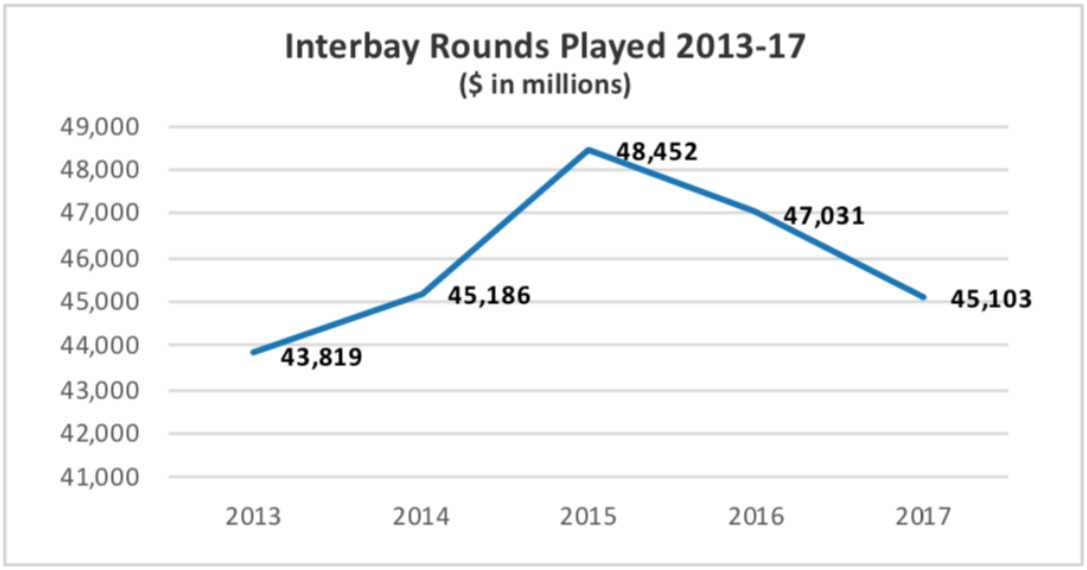
facility, the land was used as a landfill.[145] Upon being turned over to the Seattle Parks and Recreation Department in 1963, the landfill was converted into what today serves as Interbay Golf Center.[146] The Interbay Golf Facility is unique from the other four courses, in that it is the only course that has seen a net gain in total number of rounds played between 2013-2017 and is the most profitable of the four municipal courses (Figure 6).[147]

COURSE DEFICIENCIES

Overall, the Interbay Golf Center is in good working condition. One of the main issues is that the net height is too short for people to use certain long-range clubs on the upper deck of the driving range which poses a major safety issue for anyone on the other side of the net such as Seattle Pacific University's playfields.[148] Irrigation improvements are also needed at this course.[149]

[145] Ibid.
[146] Ibid.
[147] Ibid.
[148] Ibid, 25.
[149] Ibid.

Figure 6 Interbay Golf Center Total Rounds Played



Source: Lund, Kjristine, Kathy Scanlan, and Vanessa Lund. 2019. "Strategic Business Plan for the Future of City of Seattle Owned Municipal Golf Courses."

Buildable Lands Analysis

Environmentally Critical Areas

It appears that Interbay Golf Center contains multiple steep slope erosion hazard areas on-site. It appears that two wetlands (Wetlands A and B) are located immediately off-site, which project buffers onto the Interbay Golf Center. Per SMC 25.09.090(C)(1), steep slope erosion hazard areas require a 15-foot setback from the top and toe of slope. A summary of off-site wetlands found in Table 20, below. See Appendix H, for approximate environmentally critical areas locations.

Table 20 Interbay Golf Center Wetlands

Wetland	**Hydrogeomorphic Classification**	**Cowardin Classification**	**Department of Ecology Rating/Habitat Score**	**City of Seattle Buffer Requirement**
Wetland A	Depressional	Palustrine,	III/4 points	60 feet

(off-site)		Scrub-shrub, Saturated		
Wetland B (off-site)	Depressional	Palustrine, Scrub-Shrub, Saturated	IV/4 points	50 feet

Total Buildable Lands

After identifying and accounting for all ECAs and their buffers, there are 34.2 acres of developable land on the Interbay Golf Center site. After taking into account the 20 percent open space requirement, the total buildable area comes to 27.4 acres.

HOUSING UNIT ANALYSIS

Table 21, below, identifies the potential number of units available by redeveloping Interbay Golf Center, considering zoning changes to Lowrise 1, 2, and 3. A zoning designation of Lowrise 3 yields the highest number of potential units.

Table 21Interbay Golf Center Total Potential Units

Zoning	**Potential Number of Units**
Lowrise 1	1,193
Lowrise 2	1,372
Lowrise 3	1,551

AREA MEDIAN INCOME ANALYSIS

Lowrise 1

Table 22 Interbay Golf Center Lowrise 1 Units Per Area Median Income Level

Level of AMI	**Number of Units**
0-30%	357

30-60%	536
60-80%	298

Lowrise 2

Table 23 Interbay Golf Center Lowrise 2 Units Per Area Median Income Level

Level of AMI	**Number of Units**
0-30 %	411
30-60%	617
60-80%	343

Lowrise 3

Table 24 Interbay Golf Center Lowrise 3 Units Per Area Median Income Level

Level of AMI	**Number of Units**
0-30%	465
30-60%	697
60-80%	387

TRANSIT ACCESSIBILITY ANALYSIS

Within the half mile walkshed of Interbay Golf Center, there are a total of seven transit routes currently serving the area (see Appendix I). Northeast of the site, there is one proposed light rail station that lies within the half mile walkshed.

CHAPTER 5. RESULTS

5.1 DEVELOPABLE LAND

Given environmentally critical areas and associated buffers on-site, as well as SMC open space requirements, it appears that Jefferson Park Golf Course offers the most developable land of the four municipally owned golf courses, totaling 93.6-acres. Though Jackson Park Golf Course and West Seattle Golf Course are large in terms of area, the amount of environmentally critical areas estimated on these two sites restrict the potential developable area. As such, the estimated at developable area available on Jackson Park Golf Course is 81.6-acres, and 70.8-acres for West Seattle Golf Course. Despite a relative lack of environmentally critical areas on-site, Interbay Golf Center (being the smallest of Seattle's four golf courses) offers the least amount of developable area, at just 27.4-acres.

5.2 MAXIMIZED ZONING

Among the three levels of Lowrise zoning, Lowrise 3 maximizes the potential number of units per site. This is due to the fact that the expected Floor Area Ratio, 1.3, is the highest of the three Lowrise zoning categories.

5.3 NUMBER OF UNITS

At the Lowrise 3 zoning level, the site with the most potential units is Jefferson Park Golf Course, which could accommodate an estimated 5,300 units. Corresponding to the aforementioned developable land available at each golf course (after defining environmentally critical areas, buffers and SMC open space requirements), the course with the second highest potential number of units is Jackson Park Golf Course, at 4,620 units. Next is West Seattle Golf Course, with a

maximum potential number of units at 4,009, followed by Interbay Golf Center which could accommodate an estimated 1,551 units.

5.4 Transit Accessibility

Of the four courses, Jackson Park Golf Course has access to the highest number of transit routes, totaling nineteen routes within its half mile walkshed. West Seattle Golf Course and Jefferson Park Golf Course were tied with a total of thirteen transit routes serving their half mile walksheds. Interbay had the lowest transit accessibility with a total of seven routes serving its half mile walkshed. It is important to note this analysis only accounts for total supply of routes. Future research should consider existing rider capacity and frequency of each of those transit routes.

5.5 Course-by-Course Redevelopment Analysis

All four of Seattle's municipal golf courses have their own strengths and weaknesses in terms of redevelopment potential, which are summarized below in Table 25.

Table 25 Seattle Municipal Golf Course Total Redevelopment Potential

	Strengths	**Weaknesses**
Jefferson Park Golf Course	• 93.6 developable acres • Two existing light rail stations within ½ mile walkshed • 13 bus routes serve this ½ mile walkshed • Minimal ECAs to work around • Adjacent to multi-family zoning	• Adjacent to single-family zoning
Jackson Park Golf Course	• 81.6 developable acres • Two future light rail stations within ½ mile walkshed • 19 bus routes serve this ½ mile walkshed • Adjacent to multi-family zoning	• Located farthest from downtown Seattle • Significant ECAs to work around • Adjacent to single-family zoning

West Seattle Golf Course	• 70.8 developable acres • Adjacent to multi-family and mixed-use zoning • Three future light rail stations within ½ mile walkshed • 13 bus routes serve this ½ mile walkshed	• Site has drainage issues • Adjacent to single-family zoning • Significant ECAs to work around
Interbay Golf Center	• 27.5 developable acres • One future light rail station within ½ mile walkshed • Close to downtown • Adjacent to multi-family zoning • 7 bus routes serve this ½ mile walkshed	• Adjacent to manufacturing/industrial zoning • Far less developable land than the other three sites

The existing size of each golf course as well as environmentally critical areas on site limit the redevelopment potential of each municipal golf course. However, quantitatively, the course with the largest amount of developable land is Jefferson Park Golf Course (93.6 developable acres), as it has relatively few ECAs to work around. Contrastingly, Jackson Park Golf Course and West Seattle Golf Course have many wetlands, streams, and steep slope areas on site. Despite this, these courses closely follow Jefferson Park Golf Course with developable land totaling 81.6 and 70.8 acres, respectively. Due to Interbay Golf Center's urban location and small size (but few on site ECA restrictions) it has the least developable acres, topping out at 27.5 acres.

In terms of transit accessibility (within a half-mile walkshed) each course is located near existing or future light rail stations and bus routes, which makes them ideal candidates for redevelopment to affordable housing. The course with the greatest existing transit accessibility is Jackson Park Golf Course, with two future light rail stations and 19 bus routes within half mile walkshed. This is comparable to Jefferson Park Golf Course and West Seattle Golf Course; however, these courses have two and three future (i.e. not yet constructed) light rail stations,

respectively, within half mile walksheds, as well as 13 bus routes serving each area. Due to the number of existing transit options (specifically bus routes), Jackson Park Golf Course ranks first in terms of transit accessibility. Coming in last in terms of transit accessibility is Interbay Golf Course, with one future light rail station and 7 bus routes within a half mile walkshed.

All four courses are adjacent to existing multi-family zones which I believe strengthens the case for a rezone of all four courses. However, there is a significant amount of single-family zoning adjacent to each of the courses as well. Throughout my experience and education, I have found single-family zoned areas to be the most averse to multi-family rezoning. Therefore, any redevelopment on any of the four courses would require extensive neighborhood outreach and input.

Based on this, the golf course that would best aid in reaching the goals of HALA (including 20,000 affordable units and TOD) would be Jefferson Park Golf Course, as its redevelopment would result in the most number of units. This is largely due to the overall size of the course and low occurrence of ECAs. This site alone could produce 27 percent of the needed 20,000 units with 1,590 0 to 30 percent AMI units. 2,385 30 to 60 percent AMI units, and 1,325 60 to 80 percent AMI units. However, taking transit accessibility into account, Jackson Park Golf Course's total redevelopment meets that of Jefferson Park Golf Course's.

CHAPTER 6. DISCUSSION

One of the goals of this research is to highlight the large amount of land that Seattle's municipal golf courses occupy and the fact that they are unable to cover the cost of operation. While these courses do lower the cost barrier to access the sport of golf (as compared to private courses), the required entrance fees do differentiate them from other public, fee free parks in Seattle. Since affordable housing is such an immediate need in Seattle at this time, my research emphasizes how the City can utilize an existing resource (the municipal golf courses) in an impactful way in terms of production of affordable housing units.

6.1 Lessons for Practice

From a review of the literature, lessons to take away from previous golf course redevelopment focus on utilizing existing adjacent infrastructure and maximizing livability features. The literature suggests developing publicly owned land to decrease the cost barriers to developing affordable housing, which makes the publicly owned golf courses prime candidates for redevelopment. Another takeaway is to locate the densest housing types near transit stations, which is plausible for each of the municipal courses, as they are located near existing/future light rail station and a myriad of bus routes.

In terms of livability, the literature suggests maintaining open space in redeveloped areas. This option benefits residents in terms of recreational activity space, clean air, and would help restore habitat function in areas maintained as open space. Lastly, in reviewing golf course redevelopment, many that were successful maintained a portion of existing golf courses. I believe that this would help quell public discord regarding taking away reasonably priced golf facilities from those who use them.

These lessons point towards one precedent case reviewed in particular, that being Marquee on Meeker, located not far from Seattle, in Kent, Washington. This case marries the aforementioned principles, as this housing development is located on city owned land, is located near public transit stops, incorporates mixed use development (including park/open space), and the redevelopment did not completely remove golf facilities from the premises. I believe that this case's success, diversity in terms of implementing successful development practices, and proximate location make it an ideal model for the City of Seattle in redevelopment of their municipal golf courses.

6.2 LIMITATIONS

Given the time and resources available, and with the assistance of an environmental consultant (i.e. an environmental consultant specializing in wetland and stream characterization), I was able to estimate the extent of on-site environmentally critical areas and come up with preliminary ratings of these wetlands. Obviously, an on-site delineation and survey of the subject golf courses would be necessary to definitively approximate developable land, but this was not feasible given the scope and resources allocated to this project.

Though this study does address development determinants such as environmentally critical areas restraints and open space requirements, future research should consider how much area at each site must be taken up by infrastructure. This includes access roads, storm water management, etcetera.

However, despite this study's limitations, my estimated developable land calculations and affordable units per course are valuable, given that previously conducted, cursory analyses regarding redeveloping Seattle's municipal golf courses have not factored in the extent of environmentally critical areas and City open space requirements.

6.3 Future Research

The findings of this research reflect Seattle municipal golf course redevelopment potential at a very specific level of zoning, and, assumes complete removal of the existing golf facilities (as mentioned within the Literature Review, this study focused on redevelopment Scenario 2). It would benefit future research to explore alternative redevelopment scenarios, where elements such as open space are a higher priority, as opposed to maximum buildout.

Additionally, this research focused primarily on physical site characteristics and constraints, whereas future research should explore existing socioeconomic conditions of the neighborhoods surrounding each of the four sites and overall neighborhood needs that could be addressed through redevelopment. It is also vital that future research into municipal golf course redevelopment explore what mix of housing types would best integrate with the surrounding neighborhoods. Subsequently, in order to redevelop Seattle's municipal golf course, studies regarding impacts to existing capacity of transit, schools, and the like would be critical in order to determine which surrounding neighborhood could most easily accommodate a large influx of residents.

Lastly, the affordable housing unit goals set forth in HALA were set forth in 2015. It is likely that the number of affordable units needed by Seattle citizens has increased since that time, given Seattle's continued growth. It is likely that the aforementioned estimates regarding Jefferson Park Golf Course' capacity to alleviate the housing shortage is below what would be necessary to meet the needs of residents in 2019 and beyond. To this end, the City of Seattle might consider redeveloping multiple municipal courses to some extent (in addition to implementing other strategies recommended by HALA) to combat the ongoing issue of lack of affordable housing in Seattle.

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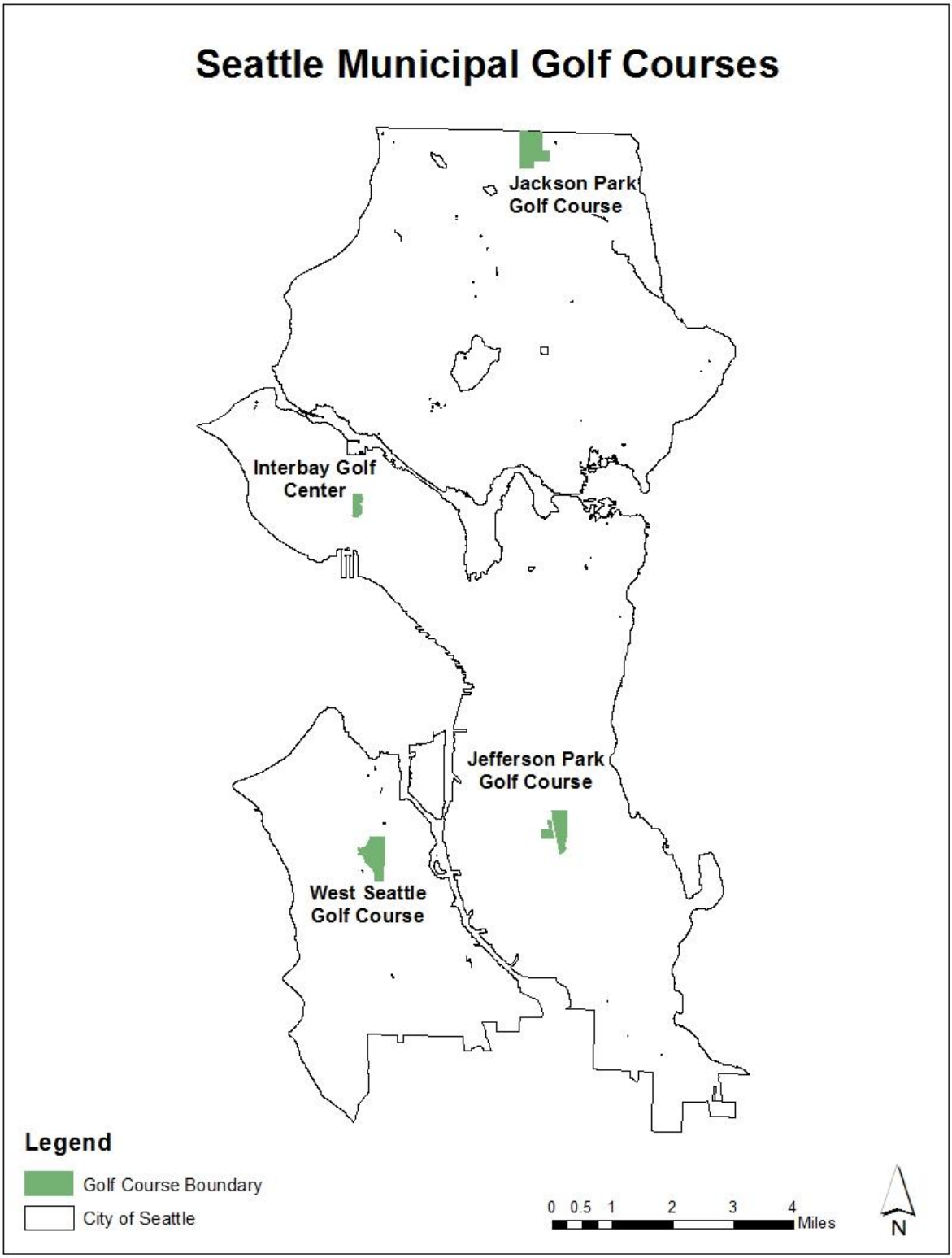
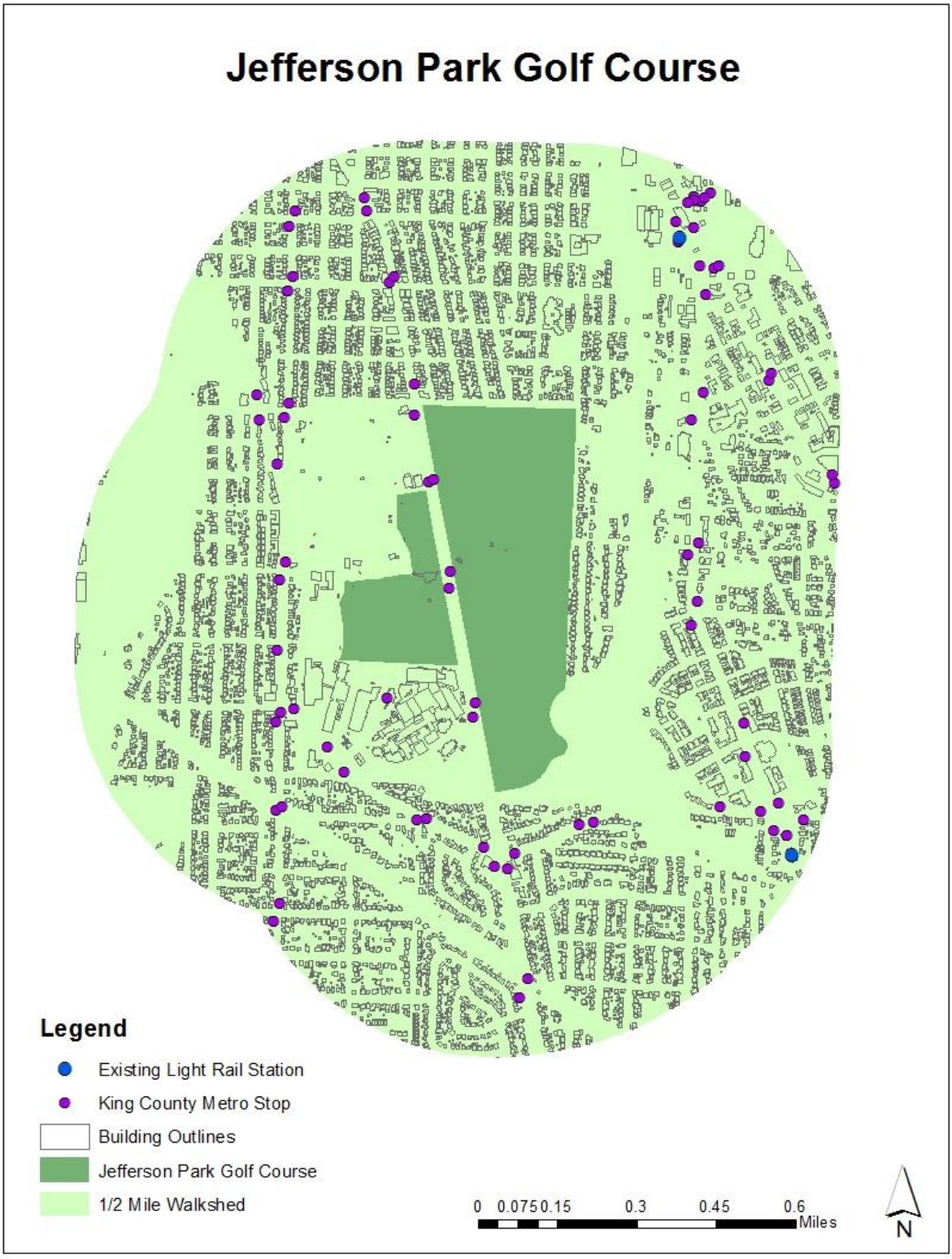
APPENDIXA


Seattle Municipal Golf Courses
Jackson Park Golf Course
Interbay Golf Center
Jefferson Park Golf Course
West Seattle Golf Course
Legend
Golf Course Boundary
City of Seattle
0 0.5 1 2 3 4
Miles
N

APPENDIX B


POTENTIALLY DEVELOPABLE AREA MAP
Jefferson Park Golf Course
S SPOKANE ST
BEACON AVE S
APPROXIMATE POTENTIALLY DEVELOPABLE AREA: 117 AC
CHEASTY BLVD S
Scale 1" = 500'
0
500
1,000
LEGEND
PROPERTY BOUNDARY
NON-DEVELOPABLE LAND
DEVELOPABLE LAND
PLEASE NOTE: THIS MAP IS APPROXIMATE FOR DISCUSSION PURPOSES ONLY. THIS DOES NOT REPRESENT A PROFESSIONAL SURVEY. ALL WETLAND, BUFFER, POTENTIAL STEEP SLOPE EROSION HAZARD AREAS, AND PROPERTY LINE LOCATIONS ARE APPROXIMATE.
Potentially Developable Area Map
Jefferson Park Golf Course
City of Seattle
Jefferson Park Golf Course
4101 Beacon Ave S
Seattle, WA 98108
Drawn by: MK

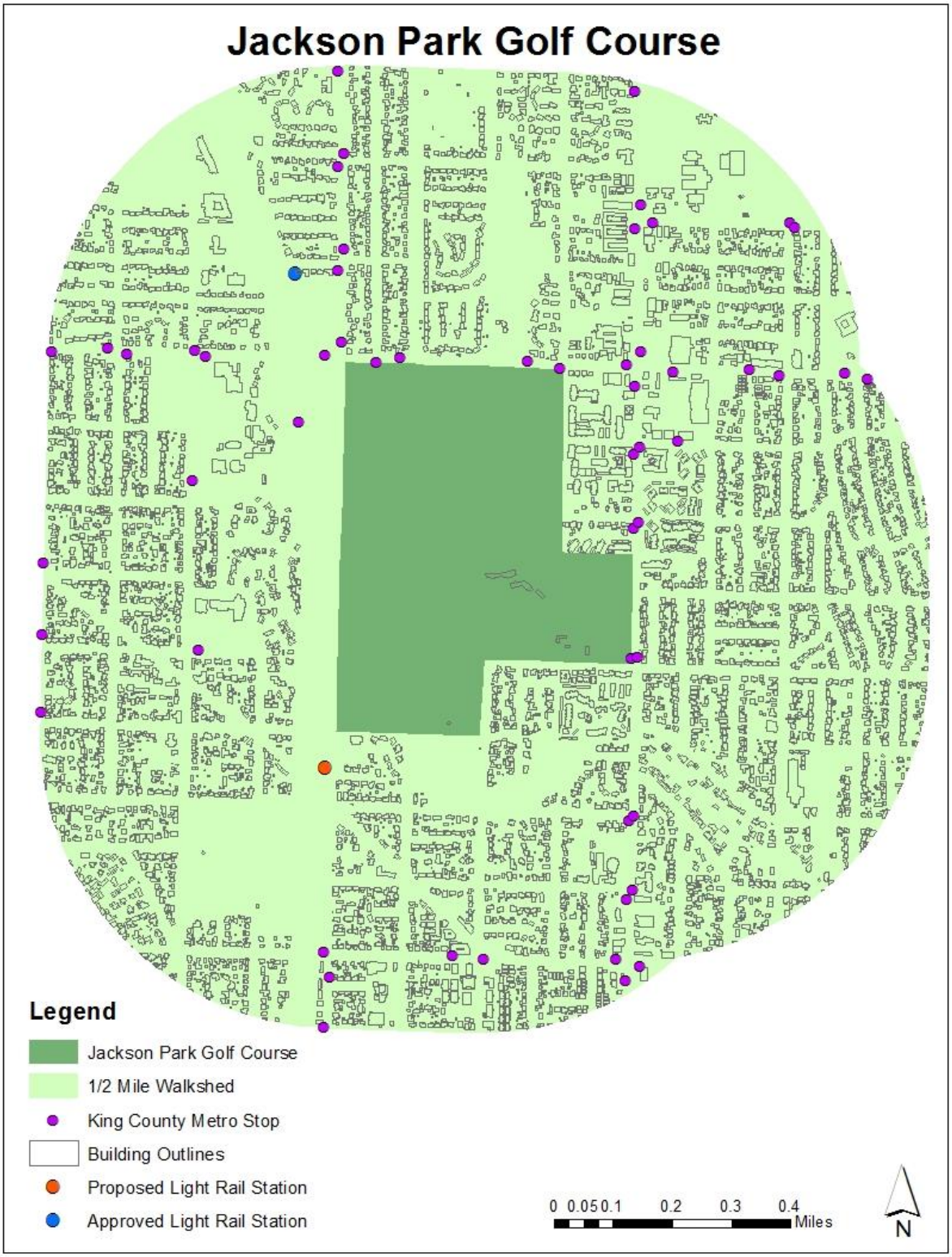
APPENDIX C


Jefferson Park Golf Course
Legend
Existing Light Rail Station
King County Metro Stop
Building Outlines
Jefferson Park Golf Course
1/2 Mile Walkshed
0 0.075 0.15 0.3 0.45 0.6
Miles
N

APPENDIX D


POTENTIALLY DEVELOPABLE AREA MAP
Jackson Park Golf Course
NE 145TH ST
15TH AVE NE
APPROXIMATE POTENTIALLY DEVELOPABLE AREA: 102 AC
LEGEND
PROPERTY BOUNDARY
NON-DEVELOPABLE LAND
DEVELOPABLE LAND
Scale 1" = 300'
0 150 300 450 600
PLEASE NOTE: THIS MAP IS APPROXIMATE FOR DISCUSSION PURPOSES ONLY. THIS DOES NOT REPRESENT A PROFESSIONAL SURVEY. ALL WETLAND, BUFFER, POTENTIAL STEEP SLOPE EROSION HAZARD AREAS, AND PROPERTY LINE LOCATIONS ARE APPROXIMATE.
Potentially Developable Area Map
Jackson Park Golf Course
City of Seattle
Jackson Park Golf Course
1000 NE 135th St
Seattle, WA 98125
Drawn by: MK

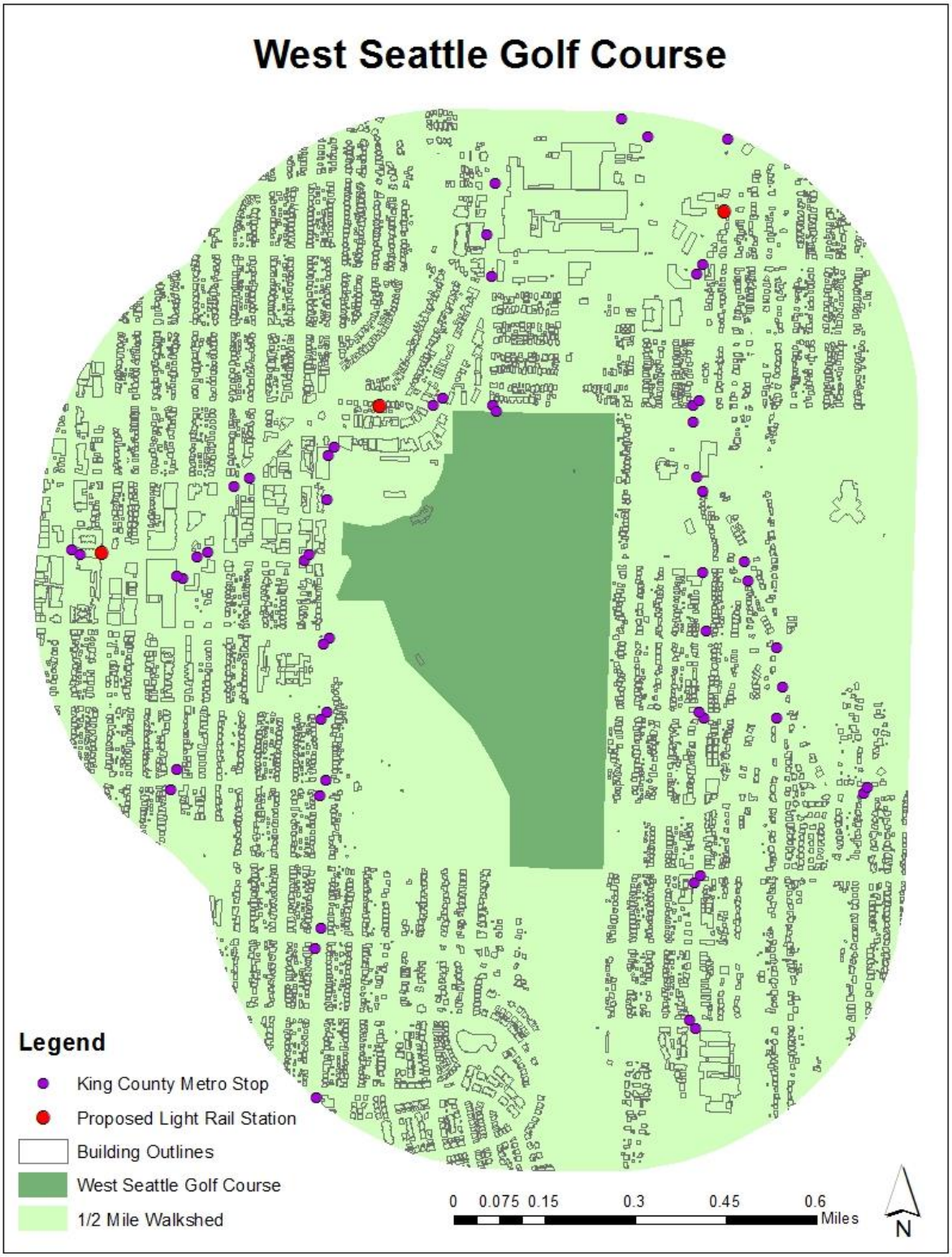
APPENDIX E


Jackson Park Golf Course
Legend
Jackson Park Golf Course
1/2 Mile Walkshed
King County Metro Stop
Building Outlines
Proposed Light Rail Station
Approved Light Rail Station
0 0.05 0.1 0.2 0.3 0.4
Miles
N

APPENDIX F


POTENTIALLY DEVELOPABLE AREA MAP
West Seattle Golf Course
APPROXIMATE POTENTIALLY DEVELOPABLE AREA: 88.5 AC
LEGEND
PROPERTY BOUNDARY
NON-DEVELOPABLE LAND
DEVELOPABLE LAND
Scale 1" = 300'
0 150 300 450 600
PLEASE NOTE THIS MAP IS APPROXIMATE FOR DISCUSSION PURPOSES ONLY. THIS DOES NOT REPRESENT A PROFESSIONAL SURVEY. ALL WETLAND, BUFFER, POTENTIAL STEEP SLOPE EROSION HAZARD AREAS, AND PROPERTY LINE LOCATIONS ARE APPROXIMATE.
Potentially Developable Area Map
West Seattle Golf Course
City of Seattle
West Seattle Golf Course
4600 35th Ave SW
Seattle, WA 98126
Drawn by: MK

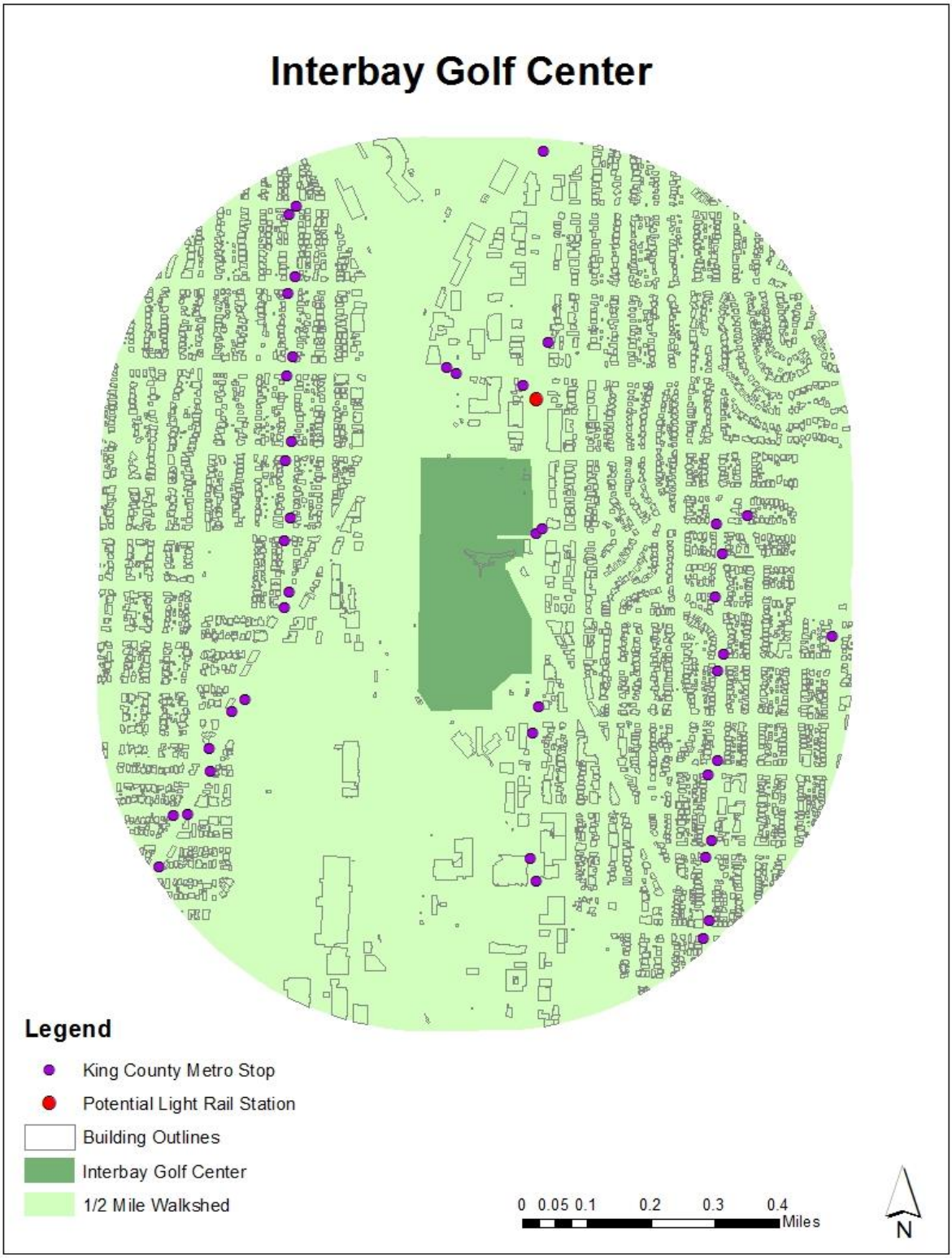
APPENDIX G


West Seattle Golf Course
Legend
King County Metro Stop
Proposed Light Rail Station
Building Outlines
West Seattle Golf Course
1/2 Mile Walkshed
0 0.075 0.15 0.3 0.45 0.6
Miles
N

APPENDIX H


POTENTIALLY DEVELOPABLE AREA MAP
Interbay Golf Center
APPROXIMATE POTENTIALLY DEVELOPABLE AREA: 34.2 AC
15TH AVE W
LEGEND
PROPERTY BOUNDARY
NON-DEVELOPABLE LAND
DEVELOPABLE LAND
PLEASE NOTE: THIS MAP IS APPROXIMATE FOR DISCUSSION PURPOSES ONLY. THIS DOES NOT REPRESENT A PROFESSIONAL SURVEY. ALL WETLAND, BUFFER, POTENTIAL STEEP SLOPE EROSION HAZARD AREAS, AND PROPERTY LINE LOCATIONS ARE APPROXIMATE.
Scale 1" = 300'
0
300
600
Potentially Developable Area Map
Interbay Golf Center
City of Seattle
Interbay Golf Center
2501 15th Ave W
Seattle, WA 98119
Drawn by: MK

APPENDIX I


Interbay Golf Center
Legend
King County Metro Stop
Potential Light Rail Station
Building Outlines
Interbay Golf Center
1/2 Mile Walkshed
0 0.05 0.1 0.2 0.3 0.4
Miles
N