

Golf as Land Use: The Case of Edmonton, Alberta

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HGEO 497: Golf as Land use

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Executive Summary

Golf is a very land-intensive sport that imposes environmental costs and can have socially exclusionary effects, in contrast to other sports such as tennis or cricket, which only take a fraction of land to meet the goal of active outdoor recreation. The demand for golf is declining and yet many municipalities operate and subsidize this particular sport. In Edmonton, golf courses are a significant land use in the river valley and ravine system. Some of these courses are municipally-owned, but leased to private operators and made available for use to very small numbers of members who pay high fees for playing. The public does not have access to the public land used for golf, even when nearby parks are closed for rehabilitation. Given the presence of many golf courses on private land, and declining interest in the sport, it is questionable whether municipal land should also be used for golf courses. There is a significant opportunity cost to current arrangements; public land used for golf courses cannot be used for parks, other forms of recreation, or housing. This report addresses the following objectives:

- To visualize and quantify the extent of golf courses within the City of Edmonton;
- To calculate the percentage of river valley and ravine system space that is used by golf courses within the City of Edmonton.

The main findings of this report are:

- There are 19 golf courses within the City of Edmonton, of which 13 are privately-owned and six are municipally-owned. Of the six municipally-owned golf courses, three are operated by the city, and three are leased out to third parties.
- The total area of golf courses in the City of Edmonton is 1281 ha, of which 897 ha (72%) is privately owned and 364 ha (28%) is municipally-owned.

- To put the 364 ha of municipally owned golf courses in perspective, the University of Alberta's north campus is 89 ha. Therefore, their combined land area is four times that of the north campus.
- The Royal Mayfair Golf Club is a privately operated course on 72 ha of municipal land, adjacent to William Hawrelak Park, which occupies 60 ha of municipal land. The park is currently closed for three years of rehabilitation, while the golf club has only 475 members.
- Five municipally owned golf courses are located within the river valley in the centre of the city, from Royal Mayfair in the west to Highlands in the east.
- There are 11 golf courses in Edmonton located within the main river valley area. The total area occupied by these 11 golf courses is 692 ha, which represents over 14% of all land within the river valley system land (4799 ha).
- An additional 2 golf courses with a combined area of 287 ha are located within or immediately adjacent to ravines within the river valley system. This brings the total land area occupied by golf courses within the river valley system to 980 ha, or over 20% of the total area of this natural resource.

This analysis illustrates that golf courses occupy over a fifth of the prime river valley land and ravine systems. Their impact on the river valley's ecosystems needs to be considered. Included in the river valley and ravine systems are all six municipally-owned courses, with a total land area of 364 ha. This land is public property, but during golf season it is available only to those playing the sport, whether members of the public who pay green fees, or private members.

This report concludes that there needs to be a bylaw governing the land used by golf courses. The lease agreements for golf courses operated on municipal lands should be made publicly accessible. Rather than outsourcing underperforming golf courses on municipal lands to third parties, I suggest using them for other sports that are more socially inclusive and less land-intensive or reverting the land to open-access parks.

Keywords: Golf; Land use; Land ownership; Municipal land; Recreation; Social exclusion

Introduction

In recent years, the high costs of operating golf courses and the search for new revenue sources for municipalities have often led them to sell or privatize their golf courses (Spoceter, 2017). Edmonton is among the municipalities to have considered such an approach to low-benefit municipal golf courses (Cook, D. 2021). The sale of municipal assets as a revenue-generating method can be criticized for its negative economic, and social impacts. Yet golf courses are also often criticized for their negative environmental impacts: for example, “Golf courses sprawl across the land, and consume large amounts of pesticides and water” (Schmidt, 2006, pg. 1). From the loss of habitat that precedes their development to the significant water usage required for their upkeep, golf courses are costly for the environment, a factor that is often neglected during cost and benefit analysis for outsourcing their operations. In the case of Edmonton, Alberta, the environmental cost of these golf courses and their development near the river valley include bio-diversity loss and removal of native vegetation and parkland (City of Edmonton, 2008).

Golf has received a negative reputation as a land use, particularly in urban municipalities due to the very large land areas required for golf courses, the high opportunity costs associated with not being able to use this land for other purposes (including housing, conservation easements, playgrounds, etc.), and the environmental impacts of maintaining and operating golf courses. Furthermore, these golf courses are not only land-intensive, but they are expensive to build and operate as well. An average 9-hole golf course costs \$5-\$10 million to build (Sports Ruby, 2022), and once operating relies on generating revenue from green fees and membership fees. Unfortunately, despite these huge capital expenditures, most city-run golf courses are underperforming financially in the City of Edmonton (Seaton, 2020). For example, Rundle Park

golf course was only recovering 44% of the costs it took to operate (Seaton, 2020). This economic loss ultimately led to its temporary closure and further considerations for privatizing it.

Based on the analysis done for the City of Edmonton by KPMG: *Outsourcing Golf Courses* (KPMG, 2021), there is a decline in the demand for golf experiences, and the existing demand is more than met by privately operating golf courses in Edmonton Metropolitan Area. Moreover, due to these factors, many Canadian municipalities are increasingly assessing whether golf should continue to be a service provided by a municipality, as many municipally-owned, ageing golf facilities require significant capital investments coupled with a consistent operating deficit. “For example, Calgary, Ottawa, Brandon (Manitoba) and London (Ontario) have all reviewed outsourcing or considered divesting of municipal golf courses due to financial challenges” (KPMG, 2021 pg. 8).

In addition, any golf course can only be accessed by a few people at a time, and these people are likely to be relatively privileged residents in the middle class or above (City Nerd, 2022). An average 9-hole golf course occupies 80-100 acres (approximately 32–40 hectares) of land (Sport Ruby, 2022). Even at maximum usage, each hole on the course can serve only 8 people at a time—4 on the green and 4 teeing off (City Nerd, 2022). This suggests that a 9-hole golf course operating at full capacity has (at most) 72 people playing at any one time. According to the KPMG report (2021), there is a recognition that although the city strives to be highly responsive to community needs, it risks over-delivering golf programming to those who can easily access services from the market.

In this report, I will start by explaining the history of golf courses in Canada and then assess how sustainable they are, by understanding their economic, environmental, and social impacts, through reviewing the scholarship available on this subject. This project focuses on The

City of Edmonton because it has the largest urban park (i.e. the river valley) in Canada, which is 22 times larger than the Central Park in New York (University of Alberta, n.d.). However, many of Edmonton's golf courses are situated within, or proximate to, the river valley, which limits public access, up to and including complete privatization. This report aims to understand and quantify the land area used by golf in the city and the river valley. It will then ascertain whether golf courses are an appropriate land use in Edmonton, with particular reference to the leasing of courses (outsourcing) on public land to third parties. Although many of the golf courses and lease agreements date back decades, I want to determine if this is efficient in present times by probing whether municipalities need to subsidize this service at all.

What do the bylaws say?

Interestingly, despite golf courses occupying so much land in Edmonton, the City of Edmonton Bylaws do not clearly define golf as a land use or identify rules that apply to their use and operation. The only mentions of golf in the City's bylaws are as follows:

According to the City of Edmonton Public Places Bylaw 14614,

Golf courses are excluded from the definition of "parkland."

Golf courses are excluded from the definition of "sports field" (pg. 7)

According to the City of Edmonton Parkland Bylaw 2202,

While on Parkland no person shall: play golf except on a golf course. (pg. 8)

According to Zoning Bylaw 12800,

"Outdoor Participant Recreation Services means development providing facilities which are available to the public at large for sports and active recreation conducted outdoors.

This Use Class does not include Community Recreation Services, Spectator sports

Establishments and Outdoor Amusement Establishments. Typical Uses include

golf courses, driving ranges, ski hills, ski jumps, sports fields, outdoor tennis courts, unenclosed ice surfaces or rinks, athletic fields, boating facilities, outdoor swimming pools, bowling greens, riding stables and fitness trails.”

According to Development regulations for the South Zone of North Saskatchewan River Valley Edmonton.

“Golf courses and other Developments typically subject to potentially large amounts of fertilizer use *may* be required to submit a nutrient loading assessment that would address possible nutrient discharge to waterways and groundwater. Such an assessment would be required to be prepared by a qualified environmental professional member as defined in the Professional Responsibilities in Completion and Assurance of Reclamation Work in Alberta Joint Practice Standard and identify mitigative measures to address any areas of concern, including nutrient loading minimization if required. (Bylaw 12800)”

Therefore, golf courses are neither clearly defined in any of the bylaws, and nor is the land use described officially. The assessments of loading rates of nutrients discharging from golf courses are neither mandatory nor publicly accessible. This makes it problematic to hold any organization accountable and make data available for public opinion and discussions.

Why did golf courses become so popular in Canada?

Golf courses arrived in Canada in the 1910s to reflect and nurture cosmopolitan masculinity. Historically golf courses were promoted by transportation and resort clubs for tourism, especially Canada’s railway lines, to make these new golfsapes an addition to the destination vacation packages (Jewett, 2015 p. 121). This took off due to the popularity of golf and the desire for membership in a high social class-exclusive cultural area (Jewett, 2015, p. 121). A similar trend was followed by American railway counterparts. The motivation behind this was to portray the

'West' as a series of places comparable if not superior to the most desirable destinations in Europe. Canadian and American resort clubs heavily advertised their courses to a transnational audience in golf magazines (Jewett, 2015). This provides a key example of the cosmopolitanism of this identity. The advertisements for young caddy recruits were highlighted as shown in Figure 1. It further illustrates that golfers could turn rugged boys into well-posed boys.



Figure 1: An advertisement in Canadian Golfer magazine for caddies (Briggs, 1917).

According to Tim Schmitt (2021), golf courses were built during the 1990s to early 2000s by many cities, towns, and counties, often in conjunction with private developers, for two main reasons:

- because golf was popular at that time, and the municipalities had the land.

- suburbs had only a few trump cards to woo potential residents namely: good schools and better recreation. Hence, golf courses were built in residential neighbourhoods during that time.

The motive behind building these courses was not because the demand for golf wasn't being met, but because the developers saw an opportunity to sell land in the suburbs at higher prices (Schmitt, 2021). According to Do Hyun Han, golf courses are accelerated by profit-seeking land developers to gain land value appreciation after the development of golf courses (1995). This inflated land value and reduction in the land available for other public uses is one of the factors which indirectly fuels the housing crisis.

Literature Review

In the context of golf courses, Neo (2001) observes that what is economically lucrative is not always sustainable and used equitably. Since golf courses interact with the area in which they are located, any assessment of their net value or contribution should consider their economic, social and environmental impacts (Salgot and Tapias, 2006).

Economic Case for Golf Courses: Decline, Closure and Future Uses

Behind the façade of beautifully kept golf courses, the reality shows a mismatch in supply and demand between available courses and interested players. Although, during the COVID-19 pandemic, golf's popularity surged due to social distancing mandates and working from home (Schmidt 2021), this does not point to an assured sustainable future for the sport itself, as it has been in near continuous decline for the last two decades. McGinnis et al. (2021) stated that there is a decline in participation in golf, especially among Millennials, due to changing gender norms, and leisure constraints. The *WSJ (Wall Street Journal)* as cited in McGinnis et al. (2021) also noted that golf is suffering from a generation gap because participation levels have decreased

consecutively for many years. Some prominent golf industry executives believe that passionate golfers will keep the game strong in the future, although they acknowledge the prevalent barriers, such as time commitments, environmental impacts, and lack of accessibility to all (Schmidt 2021).

If these obstacles remain, golf course owners may consider shutting down and selling the property, opening the possibility of alternative uses for this land depending on its infrastructure conditions (Schmidt 2021). Due to the excessive supply of golf courses lack of players coupled with high operational losses many ‘dead golf courses’ (see Table 1) are considered for repurposing. The role that municipal governments will vary; in cases where they own the land, they will have greater involvement in the golf course afterlife (Schmidt, 2021).

| | |
|-----------|---|
| Closed | Shut down permanently due to decreased revenue or decline in demand. |
| Abandoned | Lack of maintenance for an extended period. |
| Condemned | Specifically comes from government condemnation proceedings, which opens the golf course to acquisition by private parties. |

Table 1: Defining ‘dead’ golf courses.

Further, Schmidt (2021) advocated for the government’s active role as a necessary action in striking this balance of supply and demand through informed zoning and making decisions for closed, abandoned, and condemned golf courses. As courses continue to close, Schmidt (2021) stated that local governments should consider various factors for guiding the community planning processes, with the help of neighbourhood planners to yield net positive results for the community. This cost and benefit analysis is primarily guided by visions of political and economic success in neighbourhoods where golf courses lie.

Environmental Impacts

Salton and Tapais argue that an environmental assessment of golf courses must include aesthetic, historical, cultural, economic, and social elements of the surroundings (2006). It is essential to consider the impact of golf courses on land, water, soil and other flora and fauna rather than solely relying on their economic and political success. Since golf is the most territorially hungry sport (Lowerson 1994, as cited in Neo 2001), and land is scarce in urban areas, it is especially important to quantify the impacts of golf courses on land.

Neo explained that golf course maintenance demands considerable amounts of pesticides, fertilizers, and water (2001, pg. 6). Additionally, they rely on high volumes of water for their maintenance, which depletes aquifers and contaminates groundwater as well as freshwater sources due to the use of pesticides, fertilizers, and herbicides. To conceptualize the annual water consumption of golf courses, a study was conducted in Los Cabos, Mexico located at the tip of Baja California peninsula, an area with an arid climate hosting 13 golf courses. The area was studied by Wurl (2019) using methods such as satellite imagery and geographic information systems because golf courses are exempt from reporting their water demand publicly. The estimated annual water consumption of the 13 courses was 7.09 million m³, which was more than the water volume used for agriculture in the entire area (Wurl, 2019). Since for typical arid areas, groundwater is the only reliable natural source for freshwater consumption and irrigation, the annual water extraction rates indicated that the aquifer in that region was overexploited. Durán (2001), as cited in Wurl (2019), estimated, “water consumption on the golf courses in Spain (standard 18 holes) has an annual average between 150,000 and 300,000 m³ [whereas] the daily consumption [of water] in the months of maximum irrigation reaches values between 1500 and 2000 m³ per day” (p. 3). Wurl claimed that in some cases, “fresh water is also used, despite

the high competition for water, the recurring shortage of supplies and banning its use for irrigation of fields” (2019, p. 3). In the case of Singapore, Neo found that despite Singapore’s water and land scarcity, concern for the use of both water and land for golf courses was ironically minimal (2001).

Tietge (1992) as cited in Neo (2001) emphasized that all species, including humans, are ultimately affected by the potential exposure of pesticides applied on golf course turfgrass. The application of these harmful pesticides is intensified because the golf courses only consist of one or two grass species which allows the diseases to thrive (Matthews et al 1995). Salton and Tapais pointed out that there must be clarity about the correct amounts of pesticides being used which would cause a minimum loss of salts, and nutrients to the soil, groundwater pollution and impacts on non-targeted organisms (2006). Additionally, Matthews et al. mentioned that the proximity of golf courses to aquatic ecosystems should warrant a study of the long-term environmental impacts of pesticide use at those sites (1995).

Social exclusionary aspects of golf courses

It is crucial to emphasize that municipal golf courses were always intended to operate for the benefit of citizens, rather than to generate profit. However, the nature of golf imposes restrictions on the use of public places, even though a municipality had intended to provide this service to promote accessibility to the public. This is not only a physical restriction (i.e. there is no general public access to the land, at least while golf is being played) but also a socio-economic one. According to Neo, golf is an ostentatious good in economic terms and its elitism cannot be masked whatsoever (2001). This is especially true where municipal golf courses are privately operated, as the high cost of a private golf club membership and the process of membership acquisition is exclusionary. Even where municipal courses are publicly operated at much lower

cost, they are only practically accessible to those with the time and resources to play the game and pay the green fees. This sport even to date has a high gender disparity with men playing more than women. Golf was and is still used as an executive sport. Research by Miami University and the University of Cincinnati was conducted on 4018 CEOs over 12 years to conduct gender pay differences and found that CEO golfers were less likely to hire female executives (Corinne 2023). Corinne mentions that “Women executives’ compensation is also 13% lower than men’s under a golf-loving CEO (compared to 8% lower when the CEO is not a golfer)” (2023, para 2).

Rosselli (2011, p. 5) mentions that “Golf is historically considered a White social space” and the creation of private clubs has allowed the wealthy to display their upper-class status. The secure, and gated spaces of golf estates are aimed at the privileged classes and have become enclaves of wealth (Spocter 2017). According to Davidson (1979) as cited in Rosselli (2011) membership in golf private clubs has nothing to do with golfing ability, and social considerations are the determining factor. Rosselli (2011, p.14) stated that “in a typical private club setting, new members are invited by old members”. Membership fees can be quite expensive, often reaching thousands of dollars and this high cost is not easily attainable to people in the middle class, vulnerable groups, and those in racial minorities. This implies that the high socioeconomic inequalities in society are imprinted by the inequality in the built environment (Spocter, 2017). This points out that the nature of golf courses is to function as quasi-private spaces, and when combined with restrictive accessibility they represent enclaves of wealth and an embodiment of class-based segregation governed by rules of access and securitization of space (Spocter, 2017, p. 10). Regardless of ownership or membership arrangements, when golf is operating, the course is essentially a private space for players and not a public space enjoyed by all members of society.

The privatization of land occupied by golf not only affects the specific public spaces being sold; but has wider implications on the provision of other community services, including housing.

When existing courses ‘die’, there is an opportunity to repurpose the land to meet public needs (Schmidt, 2021).

Methodology and Findings

This research on golf as land use in the City of Edmonton complements and extends the body of academic work on golf courses by developing and analyzing a primary database of land dedicated to golf courses within Edmonton. This is extended by developing three case studies on three municipally owned (Royal Mayfair, Highlands, and Mill Woods) golf courses which have already undergone outsourcing of operations.

Visualize and Quantify the Extent of Golf Courses in Edmonton

There are 19 golf courses within the City of Edmonton, of which 13 are privately-owned and six are municipally-owned. Of the six municipally-owned golf courses, three are operated by the city, and three are leased out to third parties (see Figure 2). In Edmonton, the municipally-owned and operated golf courses are Riverside, Rundle Park, and Victoria, while the municipally-owned golf courses that are leased out to third parties are Royal Mayfair, Mill Woods, and Highlands.

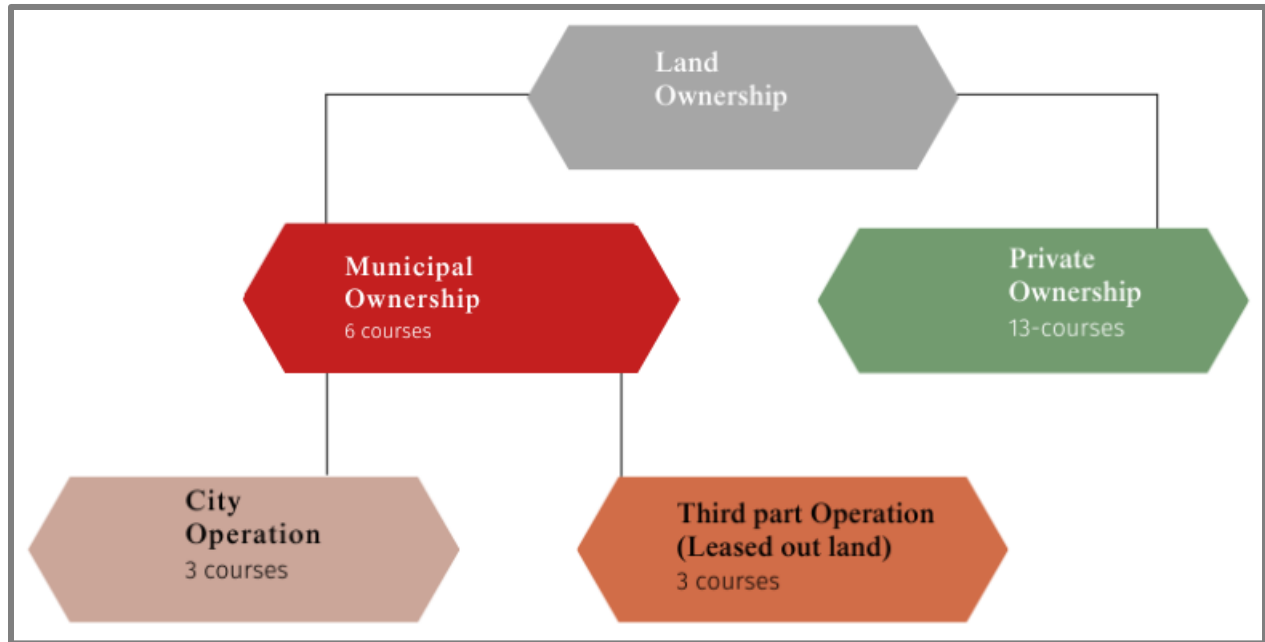


Figure 2: Land ownership and operation of 19 golf courses in the City of Edmonton

Courses that are on public land may be leased out to generate additional revenue for the municipality and to avoid escalating costs of operating golf courses (KPMG, 2021). However, in Edmonton, it is observed that many of these lease agreements have been in place for multiple decades and third parties pay only a small fraction of the market value of the lease or nothing as lease payments (Parsons, 2019). These lease agreements are not available for public viewing and their negotiations often happen privately. This arrangement has spurred many debates, including the recent Royal Mayfair Golf Club lease extension (Mertz, 2019).

Figure 3 shows the distribution of golf courses within the City of Edmonton. Of note is that they are found throughout the city (as evidenced by their distribution across municipal wards), although there is a concentration of six golf courses (including one pitch and putt) in the centre of the city, from Royal Mayfair in the west to Highlands in the east.

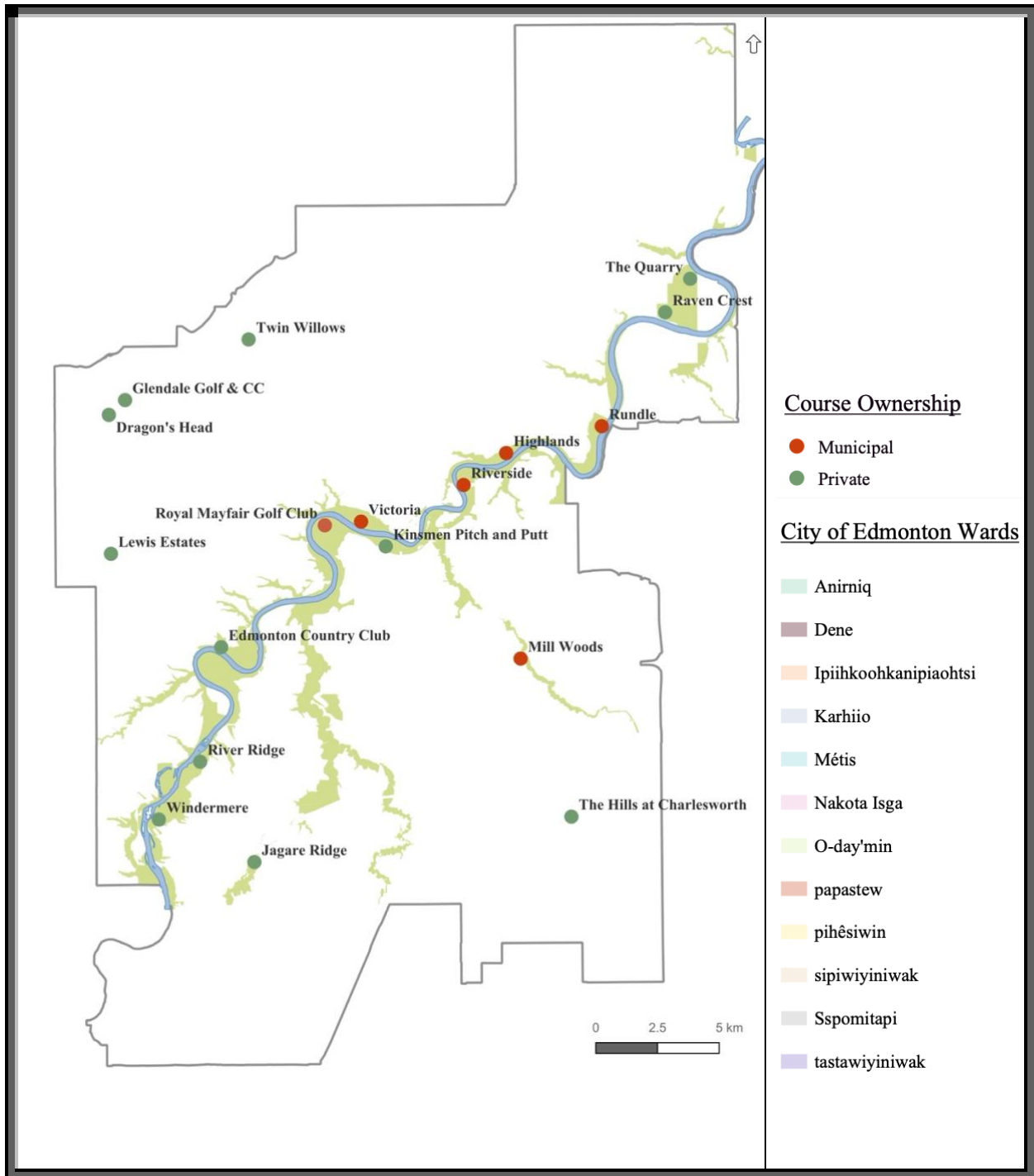


Figure 3: Map of all golf courses within the City of Edmonton

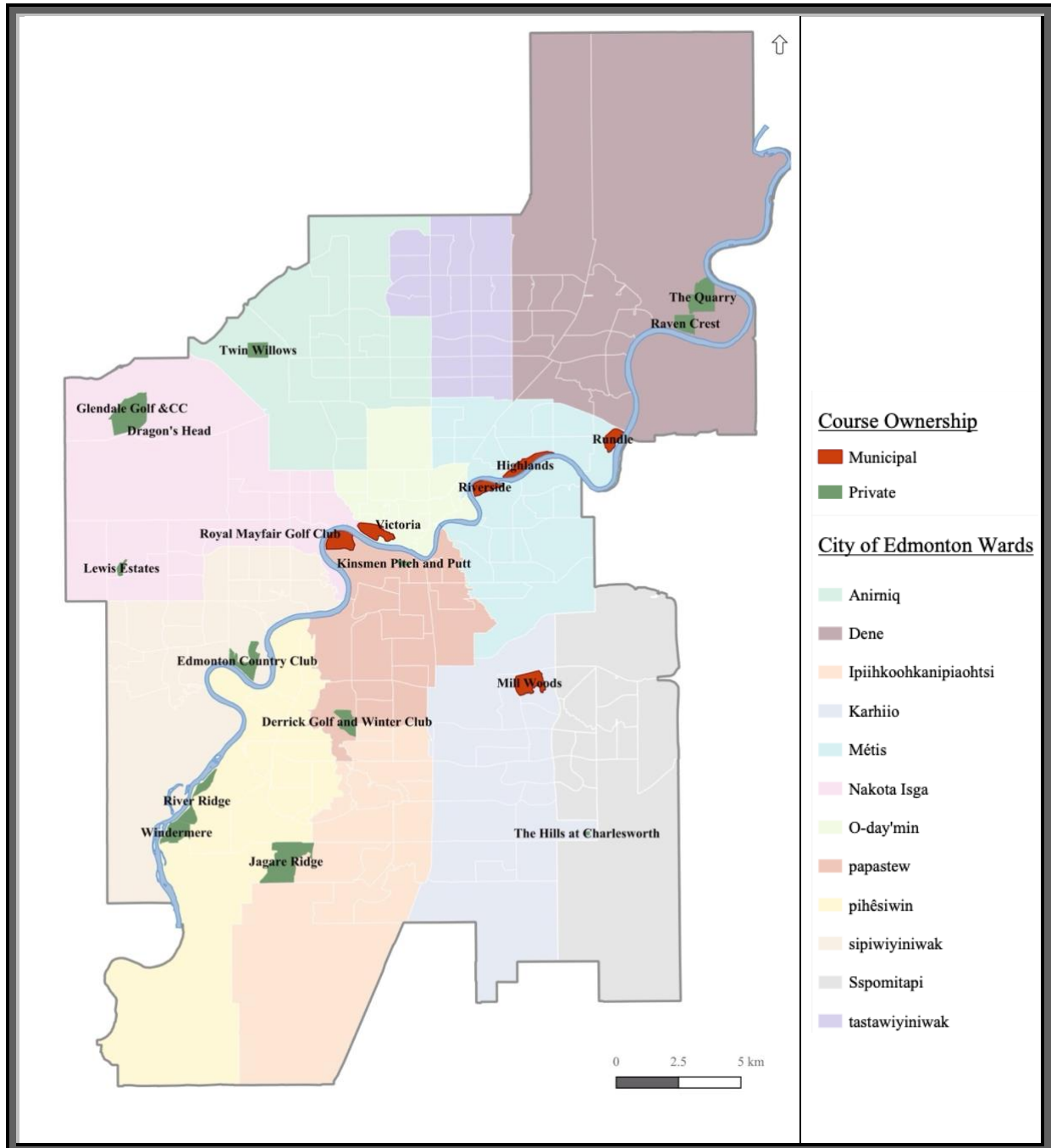


Figure 4: Areal extent of all golf courses within the City of Edmonton

| Course | Land Ownership | Area (Ha) |
|------------------------------|-----------------------|------------------|
| Jagare Ridge | Private | 205.50 |
| The Quarry | Private | 119.26 |
| Glendale Golf &CC | Private | 110.92 |
| Edmonton Country Club | Private | 84.50 |
| Mill Woods | Municipal | 82.05 |
| Royal Mayfair Golf Club | Municipal | 72.14 |
| Windermere | Private | 71.53 |
| River Ridge | Private | 69.51 |
| Highlands | Municipal | 66.04 |
| Dragon's Head | Private | 64.57 |
| Victoria | Municipal | 59.48 |
| Derrick Golf and Winter Club | Private | 57.53 |
| Raven Crest | Private | 54.52 |
| Twin Willows | Private | 49.41 |
| Riverside | Municipal | 43.62 |
| Rundle | Municipal | 41.21 |
| Lewis Estates | Private | 15.80 |
| Kinsmen Pitch and Putt | Private | 10.20 |
| The Hills at Charlesworth | Private | 3.67 |

Table 2: Golf courses by land area and ownership

Table 2 shows the area (in Hectares) occupied by all 19 golf courses in the City of Edmonton. The smallest golf course by land area is The Hills at Charlesworth occupying 3.6 ha. The largest golf course by land area is Jagare Ridge occupying 205 ha. The average size of a golf course in the City of Edmonton is 67.44 ha. Figure 5 below shows the comparison by area of municipal vs. private golf course land ownership. The total land area used by all golf courses within the City of Edmonton boundary is 1281 ha, of which 364 ha (28%) is municipally-owned. To put it in perspective, the University of Alberta's North campus has 150 buildings on 89 ha (Wikipedia, n.d.). This means our municipally-owned golf courses are equivalent in land area to four University of Alberta north campuses.

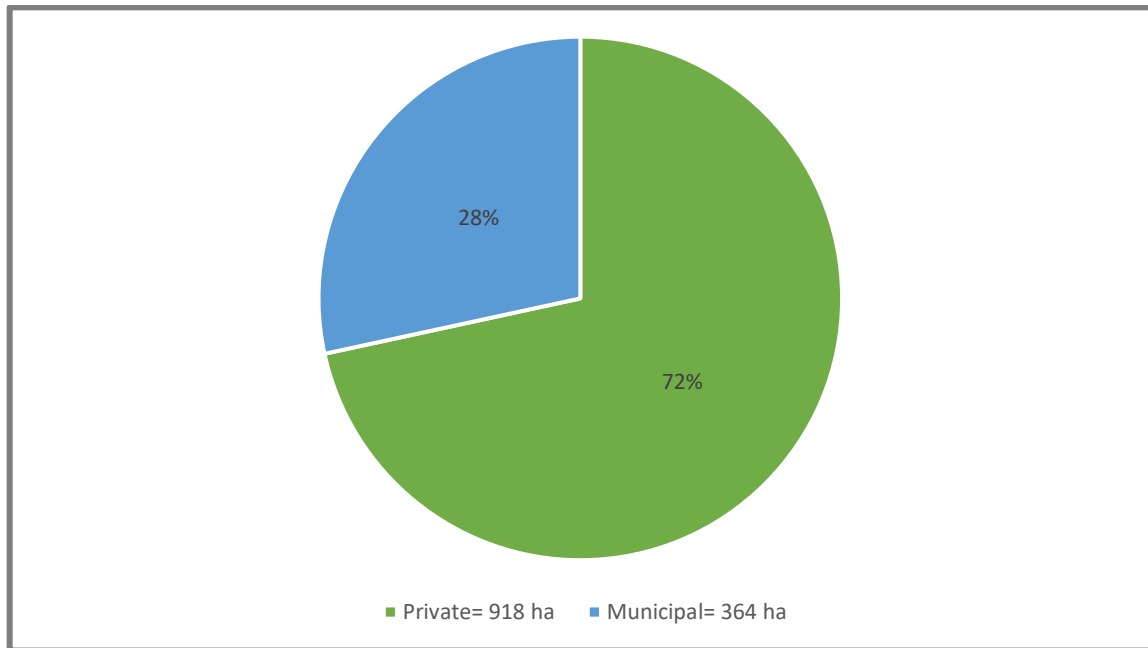


Figure 5: Land area occupied by private and municipally-owned golf courses in Edmonton

Royal Mayfair Golf Club

This golf course occupies 72 hectares of public land, which is leased to a third party, and is restricted to private members only. According to a report in the *Edmonton Journal*, this exclusive club has “475 shareholder members all of whom paid \$39,500 entry fee and \$10,000 in annual dues” (Parsons, 2019, para. 2) (CBC, 2019, para 7). Further, “the club pays \$200,000 annually to operate on the publicly-owned land on the edge of the North Saskatchewan River valley — \$35,000 is the lease payment and the rest is property taxes” (Parsons 2019, para 2). Previously Royal Mayfair’s lease was last extended in 2001 to 2051 for \$1.75 million (Riebe, 2019). In 2019, its lease was extended to February 2069, in return for \$870,000 in prepaid market rent for an additional 18 years (Romero, 2019). The Parks for People advocacy group challenged this lease extension, stating:

“It's our land. Many of us are aghast that we're in this situation in the first place where a prime jewel of the river valley has been the exclusive playground of 475 people in perpetuity, virtually. And to even think for another 20 years they're going to have exclusive access, paying virtually nothing.... It just seems really, really unfair.” (Taproot Edmonton, podcast – Michael Janz)

Royal Mayfair Golf Club lies adjacent to William Hawrelak Park (see Figure 6), which is shut down for rehabilitation until 2026 (Knopp, n.d.). According to the City of Edmonton, although the River Valley trail system remains open, the park itself (including fields, paths, parking, public washrooms, etc.) is closed, making it inaccessible for people to enjoy this area. It is instructive to compare the land areas of William Hawrelak Park (60 ha) and the Royal Mayfair Golf Club (72 ha), which are both public lands: the former used to host tens of thousands of

people when it was open, while the latter hosts only 475 people (CBC, 2019, para) (as members of the private country club), despite having larger land mass than the park.

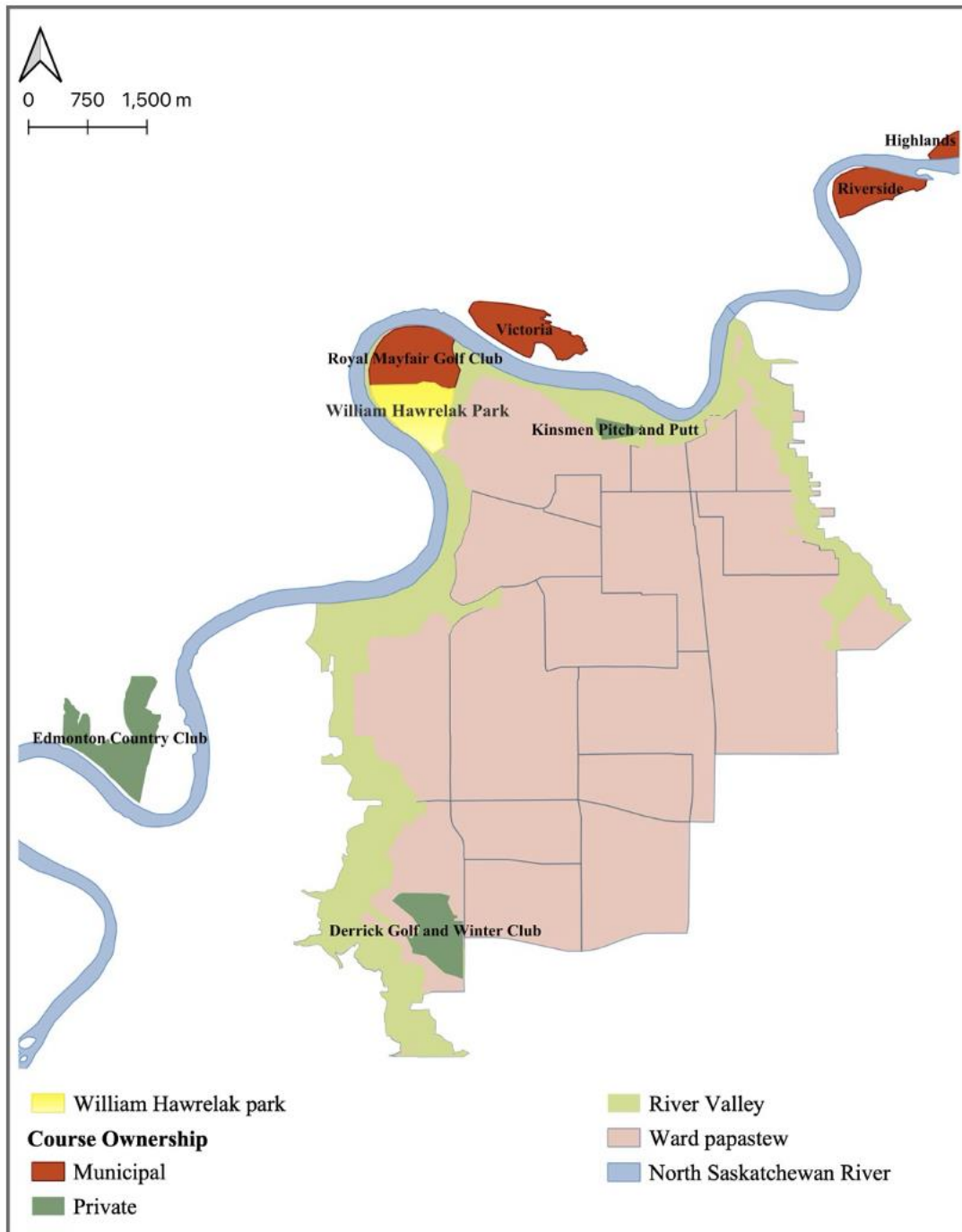


Figure 6: Golf courses and river valley land in Ward papastew

Figure 6 also illustrates the close proximity of some golf courses in central Edmonton. Specifically, three golf courses (including one pitch and putt) are within Ward papastew, with a further four nearby. Identifying and visualizing this clustering may inform debate over whether the City of Edmonton needs to use municipally-owned land for golf courses for the benefit of public leisure (in the case of municipally-operated courses) or leaseholders (in the case of privately-operated courses). As mentioned during the debates on Royal Mayfair Golf Club's lease extension,

"It's a really good opportunity to ask our councillors: 'On whose benefit are you making decisions? What about the 900,950 of us who are not [Royal] Mayfair members? What about us? What benefit do we possibly derive from a virtually free lease to a golf course?'" (Taproot Edmonton, podcast - Michael Janz)

Within Ward papastew, two of the courses (Royal Mayfair, Kinsmen Pitch and Putt) fall within the river valley system (including the North Saskatchewan Valley and Whitemud Ravine). The total area of the river valley system within Ward papastew is 889 ha. The two golf courses take up 82.3 ha or 9.3% of this area. In addition, the Derrick Golf and Winter Club (57.53 ha) is immediately adjacent to the river system, above the Whitemud ravine.

Highlands course

This course is on 66 hectares of municipal land, leased to a private operator, and is restricted to private members only. According to the Highlands Golf Club website, 419 shareholders pay \$5000+ GST for share and transfer fees plus the shareholder membership dues. In addition to the shareholder members, there are other membership categories such as Juniors, spouses, and intermediates (19-35 years old) that make up another 230 members who have various restrictions

on when they can play. There is a “waitlist of 2-3+ years for all people under the age of 36 who wish to become members” (Highland Golf Club, para 5).

The *Highlands Golf Club's* first lease with the City of Edmonton was in the 1930s. It was for a 21-year term with a 20-year option to renew to pay approximately \$408 per year (Highlands Golf Club, para. 4). The club did not pay any rent for the first two years, however (Highlands Golf Club). In 1989, after many long years of negotiations, the City of Edmonton and the Highlands Golf Club executed a 50-year lease with a 10-year renewal term (Highlands Golf Club). However, the details about fees and taxes of this lease agreement are not publicly available.

Mill Woods course

This course is 82 hectares of municipal land and is managed and operated by a not-for-profit organization MCARFA– Mill Woods Cultural and Recreational Facility Association (Mill Woods Golf Club). It is open to the public. According to the KPMG report (2021), the contractor operating the Mill Woods course previously paid the city a management fee of \$75,000 per year (2021, p.13). This operation was deemed no longer financially viable, and the agreement was renegotiated eliminating the fee paid to the city (KPMG, 2021, p. 13).

Percentage of River Valley space used by Golf Courses

All existing datasets for the river valley in the City of Edmonton were missing features. So, I had to create a primary dataset to answer my research question. Figure 7 illustrates the dataset creation process. The finding of this dataset is that the total land area of the river valley system was determined to be 4799 ha. This finding will help in calculating percentages.

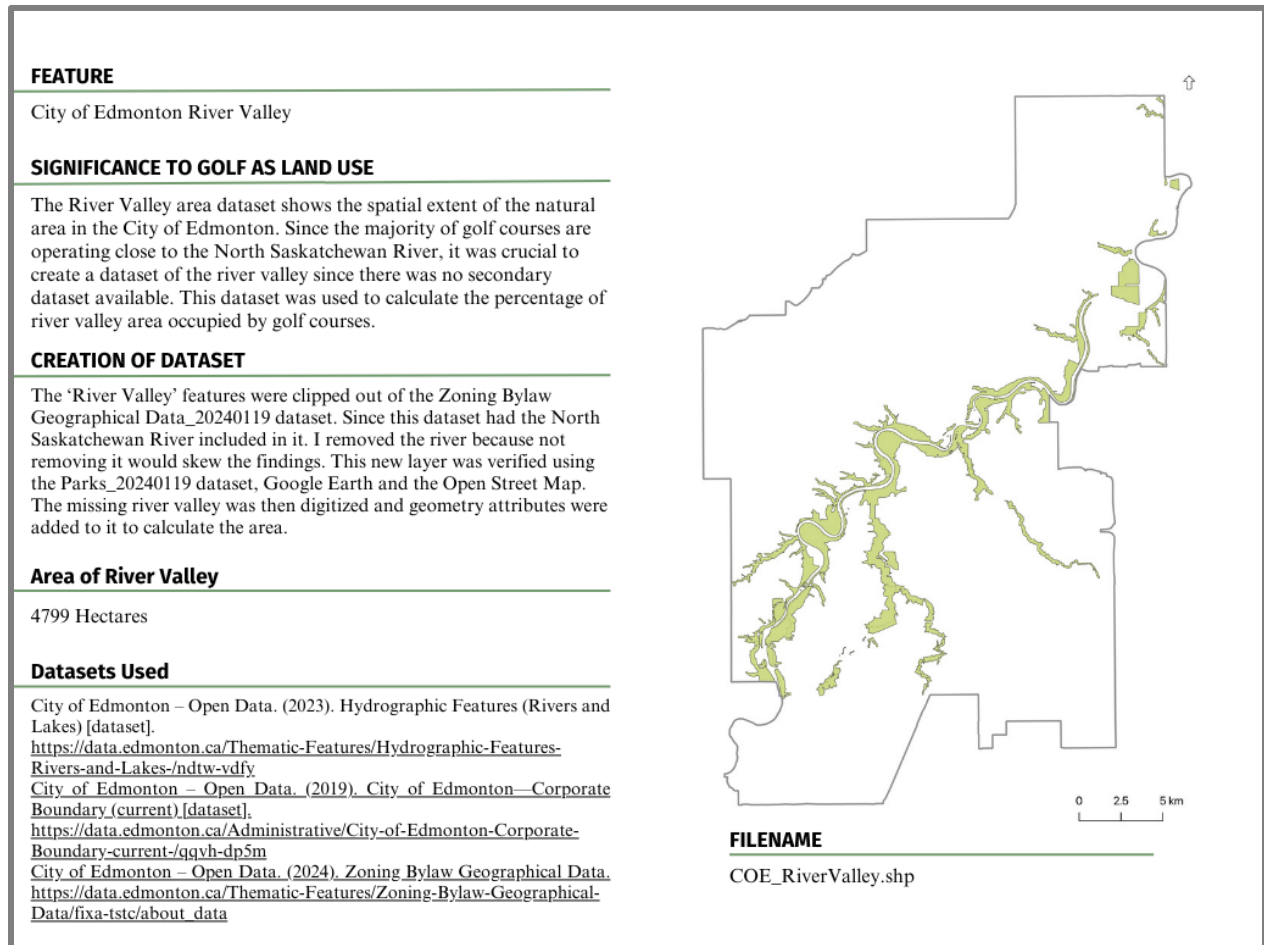


Figure 7: Map of the river valley system (including ravines) within the City of Edmonton

Figure 8 shows that there are 11 golf courses in Edmonton within the main river valley area. The total area occupied by these 11 golf courses is 692 hectares (see Table 2). Therefore, the proportion of total river valley system land occupied by these golf courses is 14.41% ($692/4799 \times 100$).

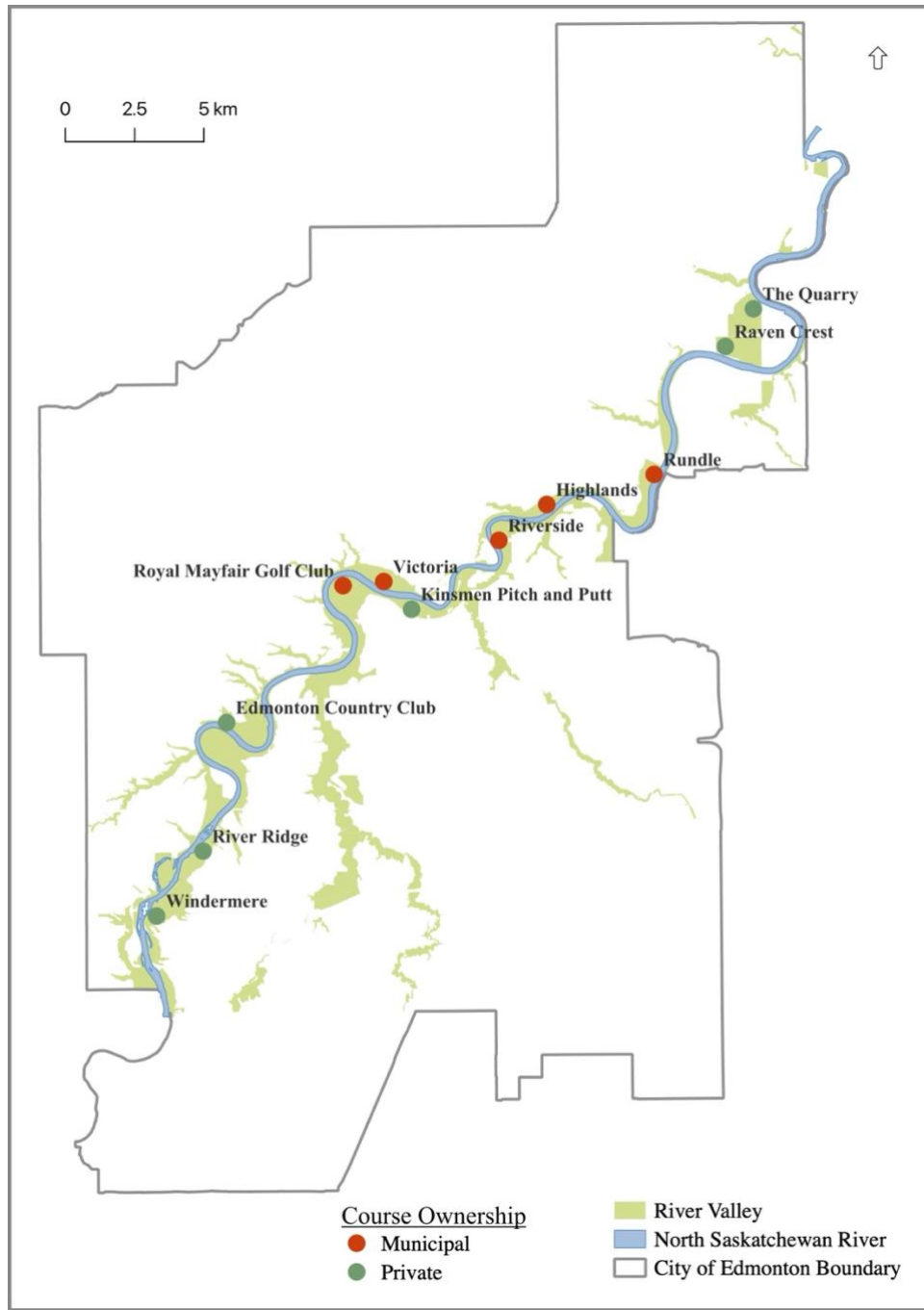


Figure 8: Map of golf courses located within the river valley in City of Edmonton

Additionally, Jagare Ridge, and Mill Woods golf course are situated within or immediately adjacent to ravines within the river valley system (see Figure 8), and combined account for an additional 287 hectares. When the land area of these three courses is added to the

land area of the 11 courses in the main valley, the total land area occupied by golf courses within the river valley system is 980 ha, or 20.42% ($980/4799*100$).

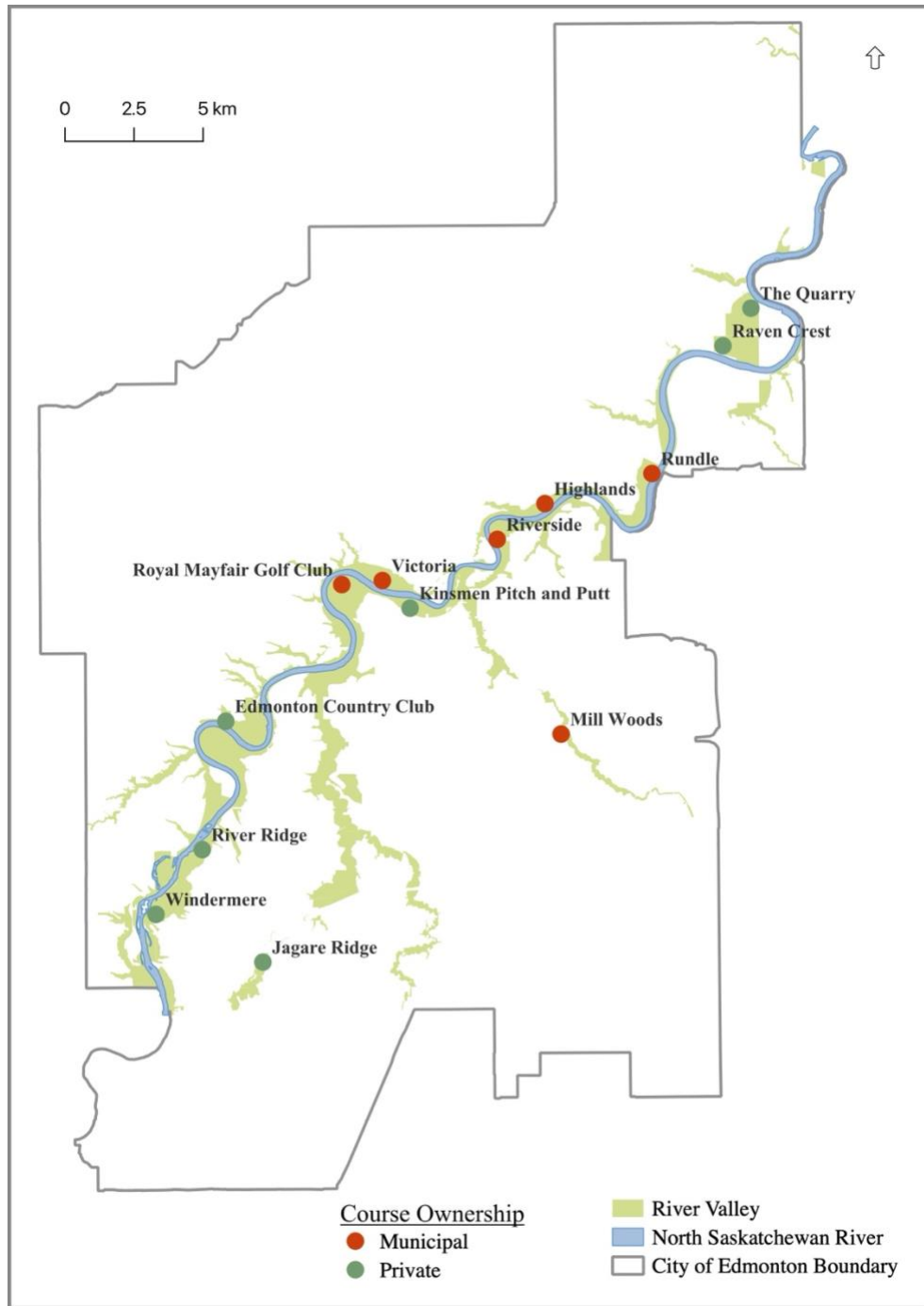


Figure 9: Map of river valley land and ravines occupied by golf courses in Edmonton.

Appendix 1: Data Sources

All maps created for this project were projected in NAD27 / Alberta 3TM ref merid 114 W.

| Dataset | Owner | Access | Source |
|--|------------------|---------------|-------------------------------------|
| City of Edmonton – Neighbourhoods and Wards | City of Edmonton | Public | City of Edmonton – Open Data (2024) |
| City of Edmonton – Hydrographic Features | City of Edmonton | Public | City of Edmonton – Open Data (2023) |
| Edmonton and area golf courses | Google Maps | Public | Google My Maps (2023) |
| City of Edmonton – Corporate Boundary (current) | City of Edmonton | Public | City of Edmonton – Open Data (2019) |
| City of Edmonton- Zoning Bylaw Geographical Data | City of Edmonton | Public | City of Edmonton – Open Data (2024) |

Table 3. Data and sources used in creating the map products.

Discussion and Recommendations

Despite golf courses occupying so much land in Edmonton, the City of Edmonton Bylaws do not clearly define golf as a land use or identify rules that apply to their use and operation. As Edmonton continues to grow and develop, urban planners and policymakers need to address the absence of a guiding bylaw. The role of golf courses in the city's overall land use planning needs to be reconsidered. This could involve discussions about the preservation of green spaces, and the environmental impact of golf course maintenance. Given the proximity of many golf courses to the North Saskatchewan River, there needs to be enforceable compliance with the already existing Tree management policy, Climate-resilient Edmonton and integrated pest management policy, and contaminated land and water policy to ensure that there is no harm done to the ecosystems of the river valley.

The analysis illustrates that golf courses occupy over a fifth of the prime river valley land and ravine systems. Their impact on the river valley's ecosystems needs to be considered. Included in the river valley and ravine systems are all six municipally-owned courses, with a total land area of 364 ha. This land is public property, but during golf season it is available only to those playing the sport, whether members of the public (three city-operated courses plus Mill Woods) or private members (Royal Mayfair and Highlands). According to the KPMG report (2021), while the City continually strives to offer a wide range of affordable golf experiences to support the advancement of quality active living for all residents, it is noted that golf players who primarily tend to be men in the privileged class of society do not rely upon the City for such experiences. Corinne states that "Golf remains a men's sport: 77% of golfers are men and golf courses that allow women often restrict the days and times when women can play..." (2023, para 4). Hence, there is potential for adaptive reuse of golf course land for other purposes such as

parks or other sports which are equally accessible for all genders, age groups and people with special needs to help realize the City of Edmonton's goal of active mobility for all. In a similar vein, when Ottawa closed its only municipal course, "Their rationale noted that their residents did not rely solely on the municipal provision of golf experiences as an explicitly required recreation service and that Ottawa's participation in the market did not appear to impact access or affordability of golf experiences for its residents (KPMG, 2021 pg. 8)."

Municipally-owned golf courses in the river valley and ravine systems are unlikely to be re-used for residential purposes, given the environmental sensitivity of the land and its value for public recreation. Nevertheless, it is interesting to note that the 364 ha could, in theory, provide space for over 10,000 new housing units (even at a *minimum* density of 35 dwelling units per residential hectare) (Bengford, 2017). Private courses away from this area could be re-developed for residential uses. With the desperate need for affordable housing in Edmonton, with every 1 in 7 households or approximately 50,000 households in core housing need, according to the City of Edmonton (2022), the amount of land (public and private) dedicated to one sport should be questioned. Underperforming golf courses could be excellent sites to repurpose for other community needs such as affordable housing or parks. With additional housing, the city would benefit from the additional property taxes raised. With additional park space, the city could pursue its goals of supporting active recreation and involvement in sports activities for greater numbers of members of the public (e.g., by providing trails, fields, and sporting options that use less space, such as soccer or tennis). While there is a decline in the golf sport there (KPMG, 2021) there are other sports such as cricket that are experiencing a rise in the number of players in Edmonton (Sousa, 2023). Unfortunately, due to space constraints, the matches are being capped per season (Sousa, 2023).

Private golf clubs like Royal Mayfair and Highlands leased on public land are some of the examples in Edmonton. This report highlights that there many risks associated with privatizing or leasing golf courses to third parties, as these contractors get a great deal for their leasing opportunity and often charge their members hefty fees making profits on their investments, thereby, neglecting public good—which is often the primary motive of the city for providing recreation services. Although their lease agreements date back several decades, I suggest that leases must be transparent and include the costs and the parties present. They should be openly accessible to have discussions for the public good. There must be some renegotiation done to the lease agreements. Based on the GIS analysis and findings, I suggest that municipally-owned golf courses which are underperforming should either be repurposed for other active sports or allow open access to the public. The ultimate goal should be to see the public land taken by golf courses revert to the public as a part of the River Valley parks system, easements, or used by another inclusive sport which is open to everybody in the city. The private lands further away from the river valley could be repurposed for housing.

Limitations

Due to time constraints and lack of data availability, I couldn't work on the following areas:

- Calculate the potential run-off of the golf courses with slope and elevation to analyze the infiltration capacity of fertilizers, herbicides and pesticides into the soil and the water.
- The impact golf courses have on the biodiversity loss in the river valley.

These study areas by themselves can potentially be research projects conducted in future.

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