

# The Evaluation of Potential Expansion Sites for Kaicycle



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**WPI**

# The Evaluation of Potential Expansion Sites for Kaicycle

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*This report represents work of one or more WPI undergraduate students submitted to the faculty as evidence of a degree requirement. WPI routinely publishes these reports on its web site without editorial or peer review.*

## Abstract

Kaicycle, an urban farm in Wellington Aotearoa, is looking to expand their farm to an additional site. We evaluated various potential sites in Wellington in order to suggest 4 potential sites to expand to. This was done primarily through archival research, observations and interviews to interpret local policies, identify land, and understand local perception. We found that many promising potential sites were regulated by the WCC such that if Kaicycle were to modify their business structure they would have a much easier time acquiring land. Alternatively, privately owned sites were also evaluated. We identified Sisters of Compassion, Crawford Green, Houghton Valley School, and Elliot Park as the best potential sites for Kaicycle to expand too.

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# Executive Summary

## Introduction

Opportunities created by urban farming are bringing food security and local pathways for fresh produce to Wellington. This movement has taken off globally with pockets of urban agriculture innovation in most major cities. Kaicycle's mission is to improve access to fresh farm products and assist the local community by collecting organic waste from the residents of Wellington and turning it into nutrient-dense soil through regenerative hua-parakore practices. The vegetables they sell in weekly subscription boxes benefit from the rich healthy soil. Our project aimed to suggest three to four potential sites where Kaicycle could expand their operations.

One of the biggest challenges Kaicycle faces is identifying urban land for farming. The farm operates near the heart of Wellington, which is densely populated and built across terraces along the coastline. The regulations created by the Wellington City Council (WCC) create both hurdles and opportunities for expanding urban farming in Wellington. The WCC has recently shown support for urban farming but also strict guidelines. The Wellington Town Belt Act (WTBA) is a strong example of a barrier established by the WCC. Over 521 hectares of land in Wellington are held in trust by the City Council. This makes it difficult for Kaicycle to get Town Belt land. The potential sites that we looked into are either privately owned or WCC reserve land. The reserve land is managed less rigorously than the town belt land providing a more significant opportunity for Kaicycles expansion.

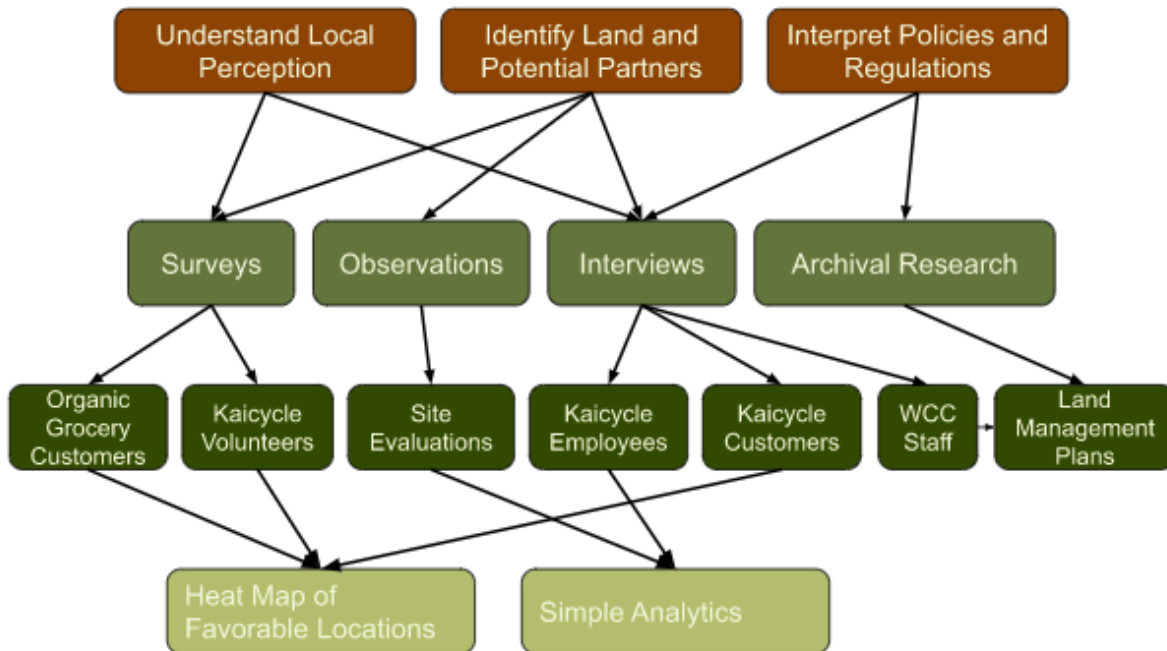
## Objectives and Methods

In order to achieve our goal of suggesting 3-4 sites for kaicycle to expand to, we created three objectives, each with their own methods.

The objectives are:

- **Interpreting local policies and regulations**
- **Identifying land and potential partners**
- **Understanding local perceptions and awareness of community farming initiatives**

Below is a flowchart showing the relationship between our objectives, methods, and goals. The top layer with the objectives is connected to the methods used to achieve the objective. The methods are connected to how they were completed in the third layer, and finally, the bottom layer shows how everything came together to create the heat map of favorable locations and the simple analytics.



*Objectives, Methods, and Goals Relationship*

Before we started the search for potential sections of land, we needed to interpret local policies and regulations. To achieve this objective, we interviewed several Wellington City Council members and executive members of other urban farming initiatives to fully understand the restrictions and challenges of running such initiatives.

From the data collected during interviews, we started searching for land using Google Earth. This preliminary search led to 43 possible locations. Looking for specific land characteristics and areas, we narrowed the search to 11 potential sites to investigate further in person. Our challenges during this process included weather restrictions and inaccurate data from Google Earth since the most recent map was from 2018. In order to start in person evaluations, we obtained a checklist of priorities from employees, volunteers, and customers. We used priority lists provided by Kaicycle executives and other urban farm executives to determine which priorities were more important. With a final priority list of nine characteristics, we assigned a weight value to each of the priorities. Using this list along with information about each site, we were able to rank the sites to see which would be most suitable for Kaicycles' expansion

In addition to the characteristics of the potential sites, we needed to understand local perception and awareness of community farming initiatives. We accomplished this by creating a heat map representing favorable locations concerning population, density, and willingness to

travel. We obtained the information recorded to generate the heat map by surveying local organic and grocery store customers. Once the heat map was completed, we overlaid the four prioritized sites with Google Earth, providing a clear picture of location favorability.

## Analysis of Data

Our interviews with WCC staff offered insight into the regulations surrounding the reserve land in Wellington. We interviewed Rachel McLellan from the Parks and Recreation Department and Kate Brown, a WCC planner. They suggested that the suburban reserve management plan would be a significant roadblock to expanding to WCC reserve land. Rachel McLellan and Kate Brown said that if Kaicycle wants to expand to reserve land, they must change their business model to represent a community garden better. Kaicycle is not-for-profit, but Rachel McLellan and Kate Brown explained that the transaction involved in the vegetable boxes was problematic despite this. **Any business model based around financial transactions using reserve land will need help convincing the WCC that they are a community garden.** If Kaicycle removes the sale of vegetable boxes, the loss of sales would need to be made up for through other revenue streams, separate from the WCC's perception of a community farm. For example, other activities, such as selling their compost on an independent, privately owned site, are still allowed.

We scored all the sites of interest, whether or not they were reserve or private land using simple analytics. The simple analytics left us with **four sites, each scoring a 38 out of 45**, further narrowing down the search. After applying the heat map of favorable locations, we ranked the remaining four sites resulting in the Sisters of Compassion ranking first, followed by Crawford green, Elliot park, and Lower Houghton Valley School.

The Sisters of Compassion group teaches, nurses, and provides homes for children, the sick, and the elderly in Aotearoa and the South Pacific. Their private land has been used for many activities such as gardening, beekeeping, and a Marae for a local Māori tribe. **This land offers a good opportunity for partnership.** The only drawback is that the potential area presents a sunlight issue due to the surrounding trees. Also, near the site is an old pool and pool house, which could serve as the structure Kaicycle needs.

**Crawford green is a large section of land owned by the City Council**, acting as a community recreational park. In the corner of the field is a children's daycare center which can also present opportunities for a partnership and provides an existing structure, one of the characteristics on the checklist. The only issue being the daycare is private and will provide little

help with storage. The park is a typical hangout for locals and receives plenty of visitors daily, allowing Kaicycle more public visibility.

Elliot Park is similar to Crawford green as both are reserve land and serve as community parks for anyone to use. Elliot Park is much quieter and less commonly used than other sites we have visited, which can help when applying for a lease from City Council. While the site is flat, Elliot Park is located on top of a hill which introduces challenges for ease of access. As it is a park, bus access is right around the corner. **Elliot Park was also labeled as a "Potential for a community garden and/or urban agriculture site alongside informal play space" in sector 5 of the suburban reserves management plan** (*Plans, Policies and Bylaws - Suburban Reserves Management Plan - Wellington City Council, n.d.*).

The Lower Houghton Valley School site is located on reserve land. The school is adjacent to the proposed land and presents an opportunity for partnership. The land being part of the town reserve adds complications, but creating a relationship with the school can make the application more appealing to the City Council. Upon visiting the site, we observed it is overgrown and likely not maintained like the other reserve sites.

Based on our project's research and observations, we have identified four potential sites for Kaicycle to expand to by addressing each of our objectives and interpreting the results. These sites include **Sisters of Compassion, Crawford Green, Houghton Valley School Land, and Elliot Park**. We also recommend, based on our results, that **Kaicycle further investigate a different business model** to better represent the City Council's definition of a community garden if they decide to move forward with council reserve land.



# Chapter 1: Introduction

Opportunities created by urban farming are bringing food security and local pathways for fresh produce to Wellington. This movement has taken off globally, with pockets of urban agriculture innovation in most major cities like Singapore, which use unused sections of residential and community buildings as green spaces (Vancouver, n.d.). In Wellington, Kaicycle is an urban farm specializing in food production located in the heart of Newtown (Te Whanganui-a-Ta). Kaicycle's mission is to improve access to farm products and assist the local community by collecting organic waste from the residents of Wellington and turning it into nutrient-dense soil through regenerative hua-parakore practices. That same soil is used on their plot to grow the vegetables they sell in weekly subscription boxes and occasionally at farmer's markets.

While its current business model is working, Kaicycle would like to expand in terms of both awareness and space. One of the biggest challenges Kaicycle faces is identifying urban land for farming. The farm operates near the heart of Wellington, which is densely populated and built across terraces along the coastline. Available space to expand their farming operations is limited. Furthermore, the farm needs certain site conditions for their crops. The Wellington City Council (WCC) regulations create hurdles and opportunities for expanding urban farming in Wellington. Overall, the WCC has recently shown support for urban farming. In 2022 the WCC partnered with the Victoria University of Wellington to analyze the legal barriers to urban farming in Wellington. The paper from the Victoria University of Wellington helps highlight obstacles and a few potential opportunities, but further evaluation is still needed to find potential sites for Kaicycle. The Wellington Town Belt Act (WTBA) is an example of a barrier established by the WCC. Over 521 hectares of land in Wellington are held in trust by the City Council and managed so that Kaicycle cannot expand to town belt land. The potential sites to expand to in this project are either privately owned or WCC reserve land. The reserve land is managed less rigorously than the town belt land providing a more significant opportunity for Kaicycles expansion.

The challenge of urban farming includes addressing factors such as financial sustainability, local governance, and the physical infrastructure of the site location. Economic sustainability must be considered when expanding to new sites, as new sites may offer different financial challenges or opportunities. Local governance can be either supportive or prohibitive, and physical infrastructure helps support more activities at the farm. This project aimed to enable Kaicycle to expand its operations sustainably within the City of Wellington, keeping factors like these in mind. This was done by suggesting four sites for Kaicycle to expand to. We identified three objectives to meet this goal. The first objective, understanding local policies and

regulations, helped us know what legally restricted urban gardening in Wellington. The second objective, identifying land and potential partners, is where we identified potential sites. Finally, objective three, understanding local perceptions and awareness of Kaicycle, helped narrow down the number of sites. We completed our objectives through archival research, semi-structured interviews, surveys, and observations. Meeting these objectives ensured we provided Kaicycle with four suitable sites to expand to. This paper will explain relevant background literature, the methods used to achieve our objectives, the results of our work, and corresponding conclusions and recommendations.

## Chapter 2: Literature Review

Aotearoa has a history of cultivation and food production, as practiced first by Māori communities (Hond et al., 2019, p. 45). These practices lead communities to source local fresh food to meet their standards. This concept has reemerged in the growing mission of sustainable urban farming and composting. Aotearoa is home to over 5 million citizens who contribute 157,000 tons of food waste worth \$1.16 billion annually. Several companies across Aotearoa are working towards decreasing the amount of food and compost put to waste annually. The nation's capital, Wellington, is home to half a million citizens contributing 30,000 tons of waste.

As a cultural hub, Wellington is home to many museums and festivals, making it a good location for an innovative, community-based food and composting initiative. Although the culture welcomes urban farming concepts, several policies enforced by the Wellington City Council (WCC) restrict land usage, proving problematic in the search for usable land. In 2019, the WCC hired AECOM, a local engineering consulting firm, to research how to aid in developing an urban growth strategy. This research focused on identifying issues and opportunities around embedding sustainable food into the city's land use and urban form as it grows (Council, 2018, p.6). In the report *Sustainable Food Opportunities for Wellington*, AECOM found that "land availability has been identified as a key barrier to the growth of cultivation initiatives in Wellington." (Council, 2018, p.19). The report produced by AECOM presents Kaicycle with an opportunity as it strives to expand its operation and outreach to be a successful model for urban farming.

Currently, Kaicycle only has one farm site totaling just under  $\frac{1}{4}$  acre located on WCC reserve land (See Figure 1). Reserve land is primarily parks and green space regulated by the WCC. They wish to become self-sufficient and not rely heavily on the WCC for grants or land. This section reviews background information surrounding challenges, potential opportunities, stakeholders, and case studies related to factors impacting the project.



Figure 1: Bird's eye view of Kaicycle and its surroundings (image credit: Google Earth)

## 2.1: Challenges Associated with Urban Farming and Composting in Aotearoa

Farmable land in Wellington is scarce due to the city's topography and increasing commercial and residential stressors. In addition, it is expected that 80,000 people will move to Wellington by 2049 (Council, 2018, p.14). Since the city plans to intensify existing residential areas to sustain this increase, potential farmland may be lost to housing.

Other limiting factors include government policies; the Town Belt Act is one example of a policy restricting land use. Introduced in 2016, and subsequent Town Belt Management Plan was implemented in 2018 by the WCC. The Town Belt includes just over 521 hectares held in trust under the WTBA (Wellington Town Belt Act). The trust gives the WCC full legal authority over the town belt, including regulating activities in this greenspace. The town belt land is primarily used for sports fields and other recreational activities. However, some circumstances allow businesses to operate in these areas, such as if the action is temporary or if they are a form of public recreation that will not require any permanent structure (*Wellington Town Belt Act 2016 No 1, Local Act 18 Business Activities – New Zealand Legislation*, n.d.). In addition, while the Wellington City Council has the authority to grant leases and licenses to operate a business on the Town Belt, they are limited to leasing 8 hectares of land simultaneously to conserve the land. This limits the potential land for Kaicycle to expand (See Figure 2 below).



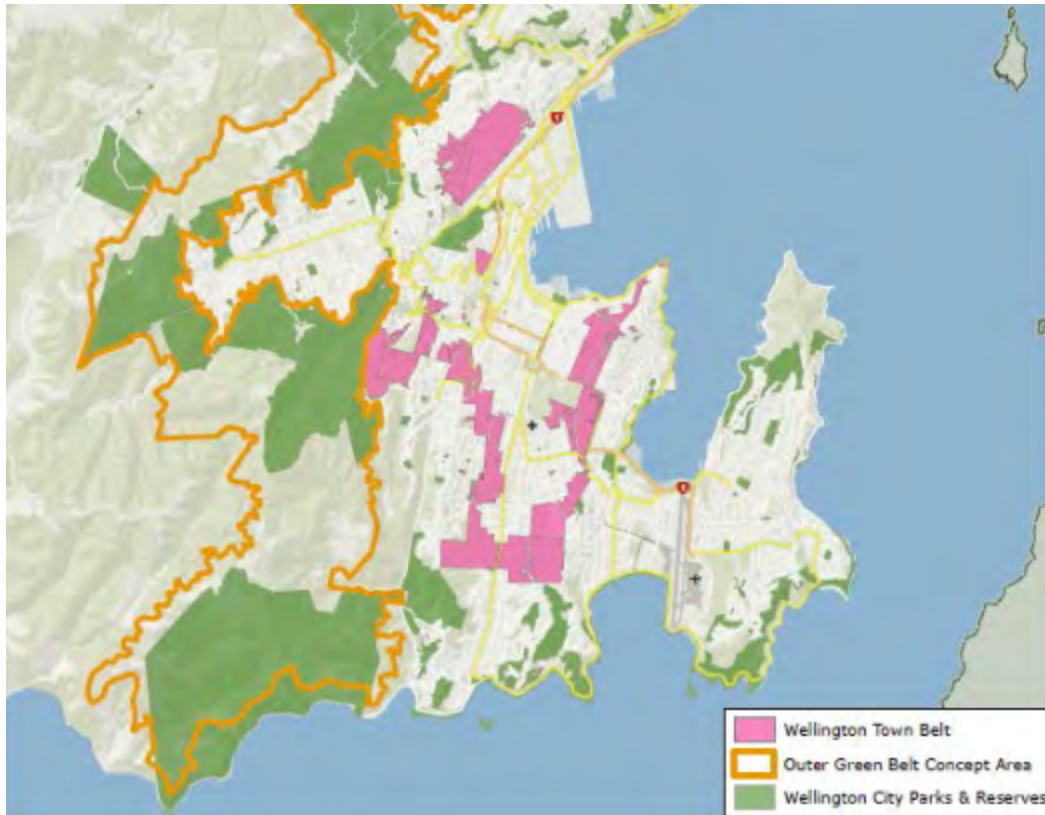


Figure 2: The Town Belt Act land in pink takes up a large amount of potential space (Council, n.d.)

Environmental factors for urban farming range from the weather to the consideration of natural disasters and climate change. The report produced by AECOM outlines the environmental challenges further contributing to the diminishment of farmable land. Located on several fault lines, The City of Wellington is at risk of experiencing a medium to significant seismic event that could lead to further loss of adequate farming land (Council, 2018, p.14). Kaicycle's current site sits in a valley and experiences excessive shade, which slows the decomposition of the compost and reduces how much light the plants receive. From an interview with a volunteer at Kaicycle, we learned that "although the site is not ideal, the weather is definitely interesting, windy, shaded by the town belt, and they get plenty of rain, they manage to grow most things" (Smith, "Kaicycle Urban Farm More than Just Sustainable Farming", 2021).

Wellington City Council provides much of the funding for Kaicycle's operations and the site they currently cultivate on. WCC recently gave Kaicycle a \$100,000 grant to expand its composting operation to a larger commercial area this year. Kaicycle hopes this will help them become more self-sufficient since most of their income comes from the composting side of the business. The income Kaicycle receives from collecting food scraps for compost is put back into

the operation to make it financially neutral. In contrast, the urban farming side of the company could be more economically positive, partly due to the small size of their current farm site. The challenge of land availability can be closely related to the financial difficulties that urban farms face. Finding a way to profit from urban farming and composting is a common challenge among urban farms, as insufficient land affects the number of crops harvested each week.

## 2.2: Potential Land Opportunities in Wellington

Urban farm sites must satisfy farming requirements for production. In Kaicycle's case, there are spiritual requirements as well. Kaicycle follows Hua Parakore principles representing genealogical connections, spirituality, authority, enlightenment, the natural world, and life force, increasing the site requirements. To follow these principles, for example, a new site with sewage pipes running underneath would not be viable. Regarding farming requirements, the future site needs as much sunlight as possible and running water to irrigate the plants and wash the vegetables after harvesting. Wellington's hilly topography also creates the challenge of needing relatively flat or terraced land for farming. The soil quality is another potential hurdle for an urban farm, although Kaicycle can remedy this with high-quality compost, which they also produce. Nevertheless, there is an opportunity to explore these challenges with unorthodox solutions such as using fungi to clean soil.

The Kaicycle farm in Newtown is relatively close to central Wellington, with the land being WCC reserve land. Due to the WCC regulations, Kaicycle cannot build permanent structures. However, they have a storage container and a lean-to for processing the vegetables. While Kaicycle recently secured an industrial site for their composting program, they would also like to expand their farming plots in Wellington. Their operations are currently at maximum use, as seen by the crowded beds of produce in Figure 3 below.



Figure 3: The Kaicycle 1/4 acre farm site. (Kaicycle, n.d.)

Since Kaicycle is at the forefront of a wave of community-based farming in Wellington, they can learn from strategies in use worldwide that have tapped into private residential land for urban production. For example, a university student in Toronto created City Seed Farms, a community-based urban farming initiative that uses backyards in a suburban zone to cultivate vegetables. Homeowners receive a weekly basket of vegetables in exchange for using their land. According to City Seeds owner Erica Lemieux, most homeowners were satisfied with that deal and continued collaborating with City Seed Farms in subsequent years (Wekerle & Classens, 2015). As with Kaicycle, City Seed Farms uses bicycles as their primary mode of transport. This opens up the potential for identifying additional land and partners in Wellington.

When looking for a suitable neighborhood in Wellington, some key factors are the density and average household income (Kaicycle, n.d.). City Seed Farms and other Urban farming initiatives can be used as a reference for density and average household income. For example, Junction Triangle, a neighborhood where City Seed Farms has found success, has a density of 5,442 people per square kilometer and an average income of \$73,720 (Statistics Canada, 2016). A similar area in Wellington would be desirable for expansion into using suburban areas for farming. This model also bodes well for sharing land with private residents and businesses, as it has been done successfully at City Seed Farms and can present many opportunities for partnerships with Kaicycle given the community and stakeholders involved.

## 2.3: Stakeholders and Partners

The three main stakeholders considered in this project are the WCC, partners, and customers. Kaicycle relies heavily on the Wellington City Council's funding and land provision support. Due to Wellington City Council's involvement with Kaicycle, they are a vital stakeholder. The WCC also spends resources researching and supporting a sustainable culture in Wellington. Examples of the city's involvement in sustainability on the WCC website include composting guides, initiatives raising money for research, and research reports that have been made public. Finally, Wellington City Council's stake in the project is evident as they have a more significant but related interest in the city's overall sustainability. The connection between WCC and Kaicycle has been vital for continuation of their urban farming initiative.

Kaicycle is also known for their earth-aware practices, which have helped them build positive partnerships within the community. In addition to Wellington City Council, they have several other local businesses and progressive philanthropic foundations among their supporters. For example, they often give excess produce to Kaibosh, a food rescue organization in Wellington. These connections with other community groups help create publicity for Kaicycle to reach out to new people in nearby communities.

With community involvement being taken into consideration, we must consider the distance between the customers and any current or future location of Kaicycle as the customers are a large piece of the stakeholder community. The location must be close to the city for easy access to drop off waste for compost and pick up vegetables. The new site should be a reasonable distance from their current site to diversify Kaicycle's customer base of their vegetable baskets. Between the compost and vegetable/salad box pickup, Kaicycle currently has around 220 loyal customers that pay for their services weekly (Smith, 2021). Many of them commute by cycling or walking. Because of the close customer base, a new site should also be close to potential new customers. Ideally, Kaicycle's new site should diversify its client base and attract new customers.

On top of identifying the distance and outreach to customers and the local community, a bonus aspect kaicycle is looking for is a new partnership with community based organizations as an opportunity for site expansion. For the potential sites that may provide partnerships, these partners are key stakeholders. Community-based organizations may also help increase the number of customers. The key groups to consider partnering include schools, churches, and retirement homes. These groups may have excess land that they would be willing to share with



Kaicycle as they would benefit from having a farm on their site as it could be integrated into their community activities.

Well-Fed and Edible Earth are an example of an existing partnership between an urban farm and a community-based organization. Wellfed is a non-profit based on bringing nutritious meals to those in need in their community, and Edible Earth is an urban farm in Porirua. They have given out 10,760 free meals in their six years of business, fed 66,000 hungry citizens, and spent over 20,000 hours volunteering (*Facts & Figures*, n.d.). Through their partnership, each organization gains critical resources from one another. Kaicycle looks to use the relationship between Well fed and Edible Earth as a model structure when considering future expansion opportunities.

## 2.4: Learning from Case Studies

Kaicycle's vision for urban farming can benefit from the work of small sustainable farms worldwide. For example, the Vancouver Food Strategy in Canada has helped many cities reach an advanced urban farming system, focusing on areas like food production, waste, access, and distribution in recent years. These newly implemented policies and strategies in Vancouver have led to a 40% increase in food production, 22,000 new community members getting involved with urban farming, over 200,000 tons of food waste removed from landfills, and 80% of these outcomes developing in just the past four years (Vancouver, n.d.). However, the biggest challenge for our project will be overcoming land-use conflicts, as there is only so much land available for farming in urban areas.

Sydney and Melbourne have solved similar urban food program challenges in recent years. In this case, the Australian cities tracked the land best fit for farming through sustainability mapping, which used a grid of the city and color-coded areas based on the most conflict and most minor conflict. Through a different route, Singapore recently implemented a "sharing the ground level" policy which reallocated unused sections of residential and community buildings as green spaces by implementing garden boxes in vacant areas (Vancouver, n.d.). The green spaces interestingly included railing, roofs, and even hallways uncommonly used by the public. These methods have helped generate community involvement and communication to continue building on these ideas into the future.

In another relatively recent case study by Harvard Food Law and Policy Clinic, students reflected on the policies required to start an urban farming business. The case study provides a step-by-step guidebook featuring the factors to consider when starting a less than a 1-acre farm in a city. These factors include site information, general design review, locations, protection

areas, wildlife, and composting. When considering site information and locations, according to the study, one must consult the zoning land map to understand how wildlife may be affected in the process (Urban Agriculture in Boston, 2014). The wildlife aspect refers to the trees, animals, and other plants that may already inhabit the land. Zoning of the land also dramatically affects the general design review, as one must start a farming unit with a landscaping design for the farm itself.

When referring to our project with Kaicycle, it will be vital to understand the type of landscape they are looking for and the land required to support their ideal site design. Although our project involves little composting, it is still essential to consider the subject when considering the location of a new site. Urban Farming sites must have access to composting and a secure delivery method. Finally, researching existing policies about urban farming will go a long way when trying to avoid bumps in the road. Understanding why specific policies are in place will help significantly in finding strategies to overcome the barriers and provide a healthy game plan to all stakeholders involved with the project.

## 2.5: Summary

Our literature review found that many of the challenges that Kaicycle faces are consistent with those of similar urban farm initiatives worldwide. Even with the strong support of Wellington's City Council, historical laws and acts that are put in place by local governmental agencies can become roadblocks to Kaicycle's goal of expansion. They hope their operation and outreach become a successful and independent urban farming model through expansion. With other models around the world thriving, we see opportunities for the future of Kaicycle, especially with our help in providing a path for upcoming processes as they look to expand.

# Chapter 3: Methodology

This project aimed to identify three to four plots of land enabling Kaicycle to expand its operations sustainably within Wellington.

We achieved this by:

- Interpreting local policies and regulations
- Identifying land and potential partners
- Understanding local perceptions and awareness of community farming initiatives

An overview of the objectives and methods used to achieve them is shown in Figure 4. The top layer with the objectives is connected to the methods used to achieve the objective. The methods are connected to how they were completed in the third layer, and finally, the bottom layer shows how everything came together to create the heat map of favorable locations and the simple analytics. This chapter presents how archival research, observations, surveys, and interviews enabled us to complete these objectives.

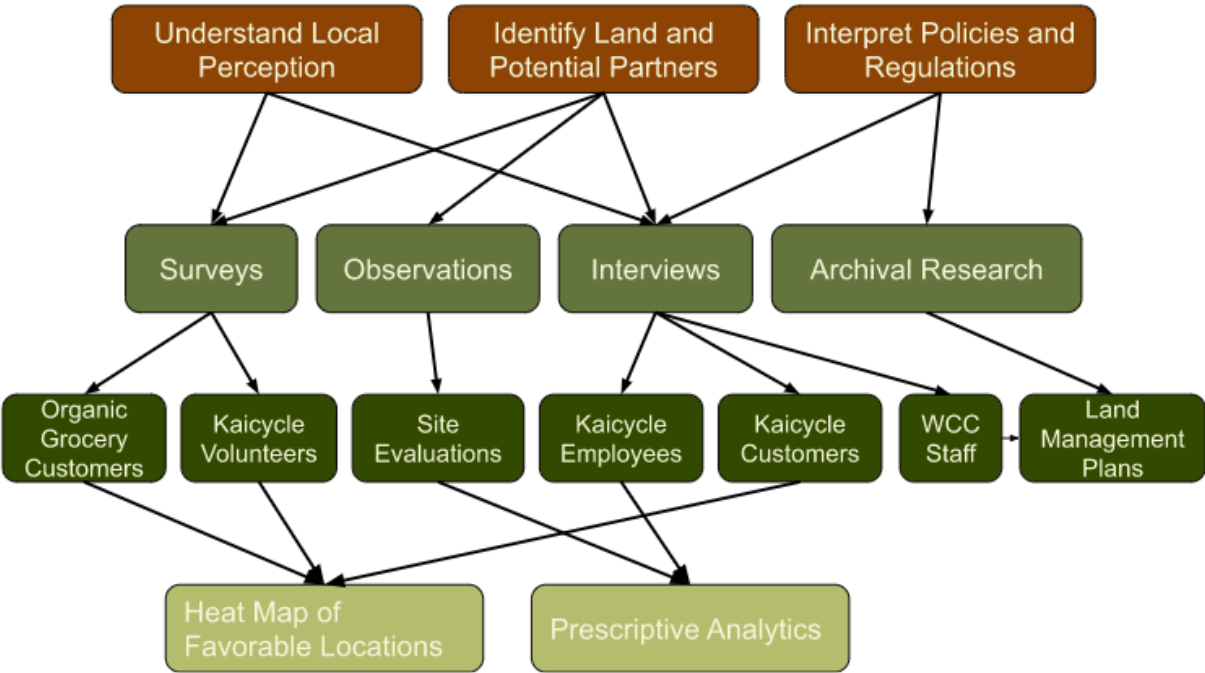


Figure 4: Objectives, Methods, and Goals Relationship

### 3.1: Interpret Local Policies and Regulations

We studied local policies and regulations through archival research and semi-structured interviews to understand the barriers around urban farming in Wellington. This section will detail how we conducted archival research and interviews with WCC staff and other experts.

First, we conducted archival research to better understand the local policies and regulations that may impede Kaicycle's plans for expansion. We collected information about the Wellington Town Belt Act (WTBA) and its subsequent Management Plan. This information was primarily compiled by reading the WTBA and the following management plan, which can be found on the WCC website.

Second, we interviewed WCC staff working with Community Services. These interviews aimed to gain knowledge regarding potential local government hurdles for Kaicycle, refine our understanding of the land leasing process, and understand potential opportunities the WCC had for Kaicycle. Specifically, we interviewed two WCC Staff, Vondy Thornton, and Morgan Fitzgerald. Both work with the Community Services team, which has worked with Kaicycle in the past, and have a good relationship and understanding of the organization. These interview questions can be found in Appendix A.

Furthermore, we interviewed Rachel McLellan and Kate Brown, who work with the Parks and Recreation team. We learned more about leasing town belt and reserve land and what topics go into the decision. This interview provided information on how the Parks and Recreation team interprets critical documents regulating WCC land. Insights from this interview led us to more archival research reading the Suburban Reserve Management Plan to understand potential site restrictions. One potential challenge while scheduling WCC Staff interviews was that many were on holiday (vacation) during our time in Aotearoa. As a result, we held 25 interviews in person and three over zoom. The questions for these interviews can be found in Appendix B.

### 3.2: Identify Land and Potential Partners

To achieve objective two, we identified land and potential partners by gathering a list of priorities for potential land, identifying potential sites, and evaluating them accordingly. This section will detail how we used observations, interviews, and mapping to identify potential land and partners.

We volunteered to help with the harvest at the Kaicycle farm seven times. This gave us time to observe and interact with members of the Kaicycle team and volunteers to understand

what it takes to run the farm. In addition, we discussed their current site's ongoing limitations, including poor soil, lack of sunlight, and infrastructure. The information collected helped refine our search criteria for land in Wellington. These questions are found in Appendices C & D.

Identifying suitable land encompassed various factors, including but not limited to access to water, appropriate terrain, sunlight, and suitability for growing. We acquired this knowledge through open-ended surveys where executive employees of Kaicycle and other urban farms in the area could list their priorities of land characteristics from most important to least important. The lists used are in Appendices E, F, & G.

We interviewed other initiatives and groups, such as the Edible Earth Urban Farm in Porirua and Commun Unity in Lower Hutt. These interviews helped us understand the qualities of a thriving urban farm site and improved our understanding of our research. The questions we asked these companies can be found in Appendix H.

We used Google Earth as our primary method to identify businesses, churches, schools, organizations, and private landowners with available land that may be suitable for Kaicycle's needs. Unfortunately, the Google Earth images for Wellington were last taken in 2018, so some sites were different than expected. Finally, a heat map of favorable locations was created on Google Earth using survey results outside grocery stores. This survey can be found in Appendix I.

We interviewed the past farm manager of Kaicycle, Sheldon Levet, about his experience looking to expand Kaicycle to land in Houghton Valley. This interview provided insight into what Kaicycle is looking for. Unfortunately, the Houghton Valley proposal Sheldon made lost traction due to regulations. The land in question was part of WCC reserves with restrictions regarding business operations. Sheldon advised us that it would be challenging to expand to WTBA land and moderately tricky on reserve land.

Data pointing to potential land opportunities were marked on Google Earth and presented for each parcel. Then, we assigned each specification a weight value using the list of constraints compiled from Kaicycles employees' priorities. Next, we optimized the most advantageous using Excel and a simple prescriptive analytics process. Finally, the areas with the highest score were looked into more in-depth and recommended to Kaicycle.

### 3.3: Understand Local Perceptions and Awareness of Community Farming Initiatives

We surveyed the opinions and commuting habits of current and potential new customers to help further narrow down potential sites. This section will go into detail concerning how we understand perception and involvement.

We surveyed existing Kaicycle customers to determine how far they travel to pick up their baskets and the quality of their experience with Kaicycle. We gave this survey as customers picked up their baskets and sent them to them through Kaicycle's social media. Kaicycle's dependency on its local community is significant, so we must understand how its current customers interact with them. Therefore, we considered this information when looking at potential sites. The survey can be found in Appendix J.

We surveyed Wellington residents using a convenience sample around potential hubs for future customers, like grocery stores around Wellington. We better understood how far customers were willing to travel to the farm site and the perception of urban farming in different areas around Wellington after these surveys. Then the data was analyzed and used in our site search. These questions can be found in Appendix I. Key stakeholder groups of current customers and residents needed to be understood to make an informed decision regarding a site location.

To summarize, in order to identify the most suitable sites for expansion for kaicycle, we addressed our three objectives: interpreting local policies and regulations, identifying land and potential partners, and understanding local perceptions and awareness of community farming initiatives. We achieved this through interviews, surveys, observations, and archival research. With the information obtained through these methods we began analyzing the data helping us to narrow down the search for potential sites.

# Chapter 4: Results and Analysis

In this section, we will present our findings from interviewing 16 customers, four City Council members, four Kaicycle employees, surveying 16 volunteers, performing 12 site observations, and how we used simple prescriptive analytics to find and display our results. The first section presents insight into surveys and interviews addressing objective one, interpreting local policies and regulations. The second and third section highlights work done with Google Earth and prescriptive analytics addressing objective two, identifying land and potential partners. The final section summarizes our work by surveying potential customers and creating a heat map of favorable locations to narrow our search further addressing objective three, understanding local perceptions and awareness of community farming initiatives.

## 4.1: Findings From Interviews and Surveys With WCC Staff and Kaicycle

By interviewing Kaicycle customers and volunteers, we better understood how Kaicycle operates and what they need in an expansion. In addition, we captured how volunteers and customers heard about Kaicycle in surveys and interviews. Figure 5 shows that most volunteers and customers (57%) heard about Kaicycle through word of mouth.

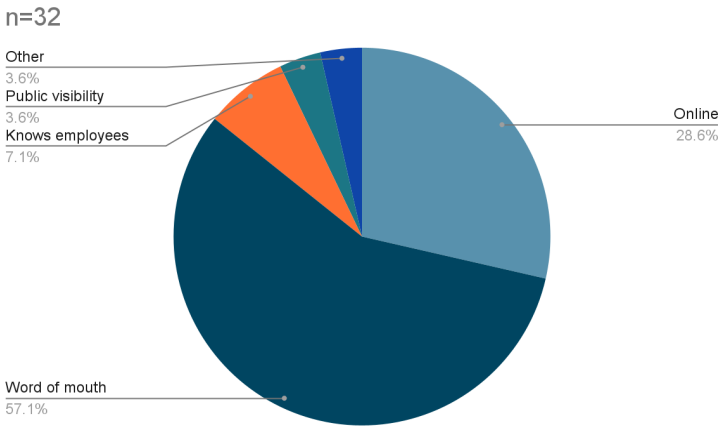


Figure 5: Different ways customers and volunteers became involved with Kaicycle.

Acquiring customers and volunteers through word of mouth is one of Kaicycle's strengths. This could be capitalized on by finding new sites close to community groups which could help get more involvement through word of mouth. Figure 5 shows that only 1 out of 32 people became involved due to public visibility. With a new site, there is the opportunity for Kaicycle to get even more involvement through public visibility if they can secure a location closer to a commonly used road where they can place signage. Figure 5 also showed that online



was the second most common way people heard about Kaicycle. This mainly was through search terms like community farms and vegetable boxes. We also asked the customers and volunteers how far they traveled to get to Kaicycle, which was critical to know when creating the heat map of favorable locations to narrow our final sites further. This survey taught us that people's average distance to the farm was 2.57km.

Interviews and surveys with Kaicycle employees, volunteers, and customers were data coded to establish essential characteristics in an urban farm site. Next, we created a checklist for visiting each site from these lists and interviews, as shown in Table 1 below. We later used this checklist to decide which sites to look into further.

Characteristic	Yes	No
1000 <sup>2</sup> Meters		
Flat Land		
Clean Soil		
Access to Water		
Access to Electricity		
Existing Structure		
Potential Partners		
8 Hours of Sunlight		
Good Drainage		
Vehicle Access		
Neither on a hill/in a valley		
Options for Storage		

Table 1: Blank Site Visit Checklist

Morgan Fitzgerald and Vondy Thornton from the community services team at the WCC stressed the importance of the Resources Management Act (RMA). The RMA aims to "promote the sustainable management of natural and physical resources" within Aotearoa (Resource Management Act, 1991). Each territorial authority, such as cities like Wellington, must create a

district plan to "achieve the sustainable management purpose of the Resource Management Act" (*District Plans • Environment Guide*, n.d.). The Wellington district plan created in the year 2000 is under review, with a new proposed plan that started in 2017. Figure 6 shows the progress made towards a 2025 implementation of the proposed district plan (*Plans, Policies and Bylaws - District Plan Review Timeline - Wellington City Council*, n.d.).

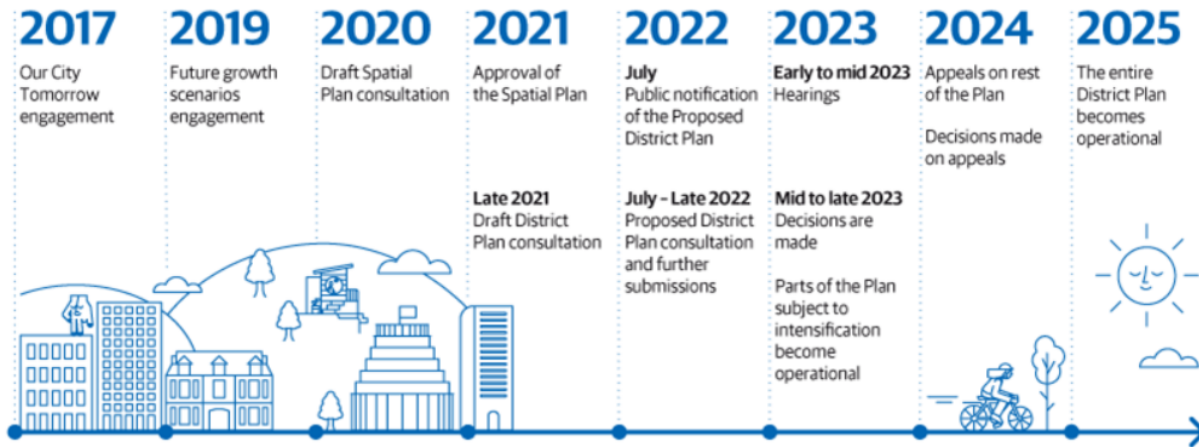


Figure 6: Implementation timeline for the District Plan (See in text citation)

The district plan is one of the documents that the Parks and Recreation department upholds. A key finding from our interview with Morgan Fitzgerald and Vondy Thornton was that we needed to talk to Rachel McLellan from the Parks and Recreation Department and Kate Brown, a WCC planner. Rachel McLellan and Kate Brown suggested that the city reserve land regulations would pose the most significant hurdle for Kaicycle. Most parks and public green spaces in Wellington are categorized as reserve land controlled through the suburban reserves management plan. There are eight different sectors of reserve land, each with its own management rules. The reserve land can be seen in figure 7 below. The sector plans describe critical sites, and potential future uses. For example, in sector 6, we noticed that the plan recommends the current site Kaicycle occupies to be "Assessed for suitability for a community garden and orchard" in 2015 (*Plans, Policies and Bylaws - Suburban Reserves Management Plan - Wellington City Council*, n.d.). This is how Kaicycle was able to get a hold of reserve land. We also evaluated sites suggested in the reserve management plan using Google Earth.

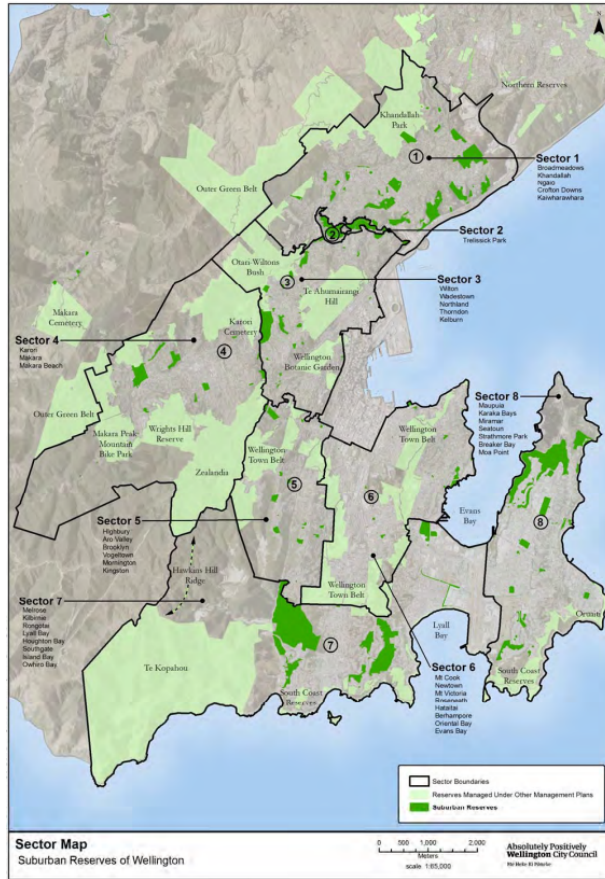


Figure 7: Sector Map of Reserve land (See in text citation)

While the suburban reserve management plan promotes the usage of reserve land for community gardens, it is difficult for Kaicycle to acquire reserve land due to the definition of community gardens. The critical finding during our interview with Rachel McLellan and Kate Brown was that the financial transaction involved with selling Kaicycle's vegetable and salad boxes makes them closer to a commercial operation than a community garden. Rachel McLellan and Kate Brown said that if Kaicycle wants to expand to reserve land, they must change their business model to represent a community garden better. Section 4.4.7 of the suburban reserves management plan says that "community gardens and orchards must be not-for-profit" (*Plans, Policies and Bylaws - Suburban Reserves Management Plan - Wellington City Council, n.d.*). Kaicycle is not-for-profit, but Rachel McLellan and Kate Brown explained that the transaction involved in the vegetable boxes was problematic despite this. Any business model based around financial transactions using reserve land will need help convincing the WCC that they are a community garden. If Kaicycle removed the sale of vegetable boxes, the loss of sales would need to be made up for through other revenue streams, separate from the WCC's perception of a

community farm. For example, other activities, such as selling their compost on an independent, privately owned site, are still allowed.

#### 4.2: Identifying Potential Sites Using Google Earth and Site Visits

Using Google Earth, we identified multiple potential sites and pinned each location. We found potential sites for open green spaces around community groups such as schools and churches. Phoebe, council members, and volunteers also recommended additional sites. After identifying nearly 40 sites, we narrowed the search to the size and location of the ideal customer base. The ideal sections measured roughly 1000 m<sup>2</sup> and were in densely populated areas. From this, we prioritized twelve sections of land we believed most suitable and conducted observations in person. The priority sites are highlighted in red, while blue represents unused sections of land owned by the City Council, green and yellow being school land, and purple being church properties, as seen in figure 8.

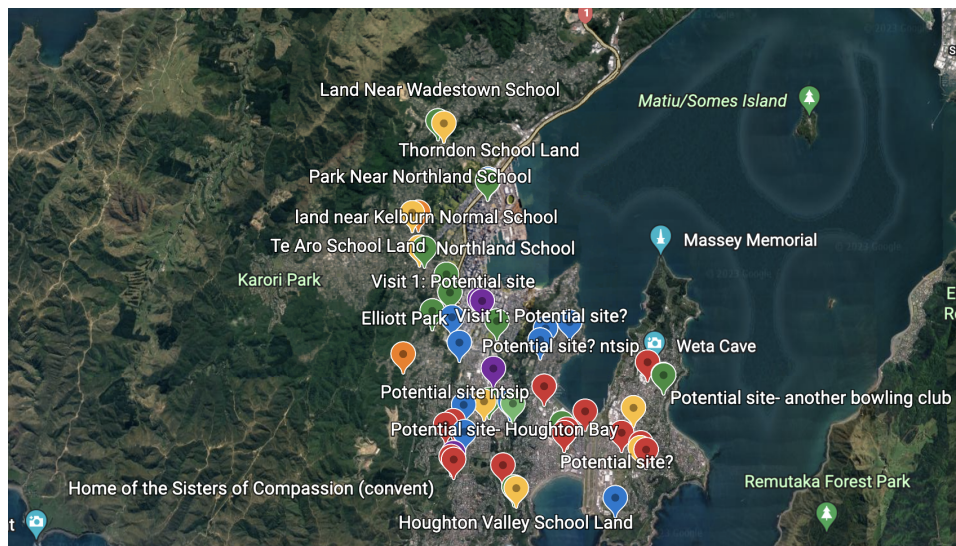


Figure 8: Screenshot of our color-coded Google Earth identifying sites of interest (Google Earth, n.d.)

To narrow down the number of potential sites, we used a checklist with desired characteristics of a new site for Kaicycle. Next, we determined characteristics through data coding interviews with Kaicycle executive employees, volunteers, customers, and leading members of other urban farming initiatives in Wellington. Finally, we assessed each site on a binary basis; either the site had the characteristic or did not, as seen in tables 2 & 3 below. This checklist made it easier to compare locations.

Characteristic/ Site	Crawford Green	Sisters of Compassion	Elliott Park	Houghton Valley School	Airport Land
1000 <sup>2</sup> Meters					
Flat Land					
Clean Soil					
Access to Water					
Access to Electricity					
Existing Structure					
Potential Partners					
8 Hours of Sunlight					
Good Drainage					
Vehicle Access					
Neither on a hill/in a valley					
Options for Storage					

Characteristic/ Site	Miramar Bowling Club	Kahurangi School	Kilbirnie Rec. Center	Strathmore Ave	Sinclair Shotput
1000 <sup>2</sup> Meters	Green	Green	Green	Red	Green
Flat Land	Green	Red	Green	Green	Green
Clean Soil	Red	Green	Green	Red	Green
Access to Water	Green	Green	Green	Green	Red
Access to Electricity	Green	Green	Green	Green	Red
Existing Structure	Green	Green	Green	Red	Red
Potential Partners	Green	Green	Green	Red	Red
8 Hours of Sunlight	Green	Green	Green	Green	Green
Good Drainage	Red	Green	Green	Red	Green
Vehicle Access	Green	Green	Green	Green	Green
Neither on a hill/in a valley	Green	Red	Green	Green	Red
Options for Storage	Green	Green	Green	Red	Red

Tables 2 & 3: Complete Site Visit Checklists



The results of the on-site checklist are similar to the final grading of the sites. However, differences in the checklist and final grading can be seen as we also considered whether or not the site has the opportunity for Kaicycle to develop it in the future. In addition, we eliminated some sites for other reasons found in section 4.4. The following sites met the most priorities from the checklist. How we graded these sites can be found in section 4.5.

### 4.3: Sites to be Considered

This section will cover the top four recommended sites that we arrived at and other unique qualities they have that were not addressed by the priority list.

#### **Crawford Green**

Crawford green is a large section of land owned by the City Council, acting as a community recreational park. In the corner of the field is a children's daycare center which can also present opportunities for a partnership and provides an existing structure, one of the characteristics on the checklist. The only issue being the daycare is private and will provide little help with storage. The park is a typical hangout for locals and receives plenty of visitors daily, allowing Kaicycle more public visibility.

#### **Sisters of Compassion**

The Sisters of Compassion group teaches, nurses, and provides homes for children, the sick, and the elderly in Aotearoa and the South Pacific. Their private land has been used for many activities such as gardening, beekeeping, and a Marae for a local Māori tribe. This land offers clean, usable land and a vast opportunity for partnership. The only drawbacks are that the potential area presents a possible sunlight issue due to the surrounding trees. Also, near the site is an old pool and pool house, which could serve as the structure Kaicycle needs.

## **Elliott Park**

Elliott Park is similar to Crawford green as both are reserve land and serve as community parks for anyone to use. Elliot park is much quieter and less commonly used than other sites we have visited, which can help when applying for a lease from City Council. While the site is flat, Elliot park is located on top of a hill which introduces challenges for ease of access. As it is a park, bus access is right around the corner. Elliott Park was also labeled as a "Potential for a community garden and/or urban agriculture site alongside informal play space" in sector 5 of the suburban reserves management plan (*Plans, Policies and Bylaws - Suburban Reserves Management Plan - Wellington City Council, n.d.*).

## **Houghton Valley School Land**

The lower Houghton Valley School site is currently located on reserve land. The school is adjacent to the proposed land and presents an opportunity for partnership. The land being part of the town reserve adds complications, but creating a relationship with the school can make the application more appealing to the City Council. Upon visiting the site, we observed it is overgrown and likely not maintained like the other reserve sites.

### **4.4: Eliminated Sites**

This section will detail why we eliminated some sites and other details that the priority list did not address.

## **Airport Land**

This site is reserve land bordering the fence on the airport's west side. The land is not used and is suitable for growing vegetables. The drawback is the noise from the airport and the need for more population within a few blocks. This site also has an interesting plateau landscape at different elevations. Upon visiting the site, we also observed multiple traps for rodents that could cause future issues.

## **Miramar Bowling Club**

The Miramar Bowling Club has a series of three playing fields, two currently being used, the third one overgrown. The bowling club is a private institution that presents the potential for partnership. The club has a building with multiple conference rooms and a dining room/bar area. The rooms have the potential to be used as a community engagement room for classes and seminars hosted by Kaicycle. The issue with this site is that it is likely to have been sprayed with

pesticides and heavily compacted during its time as a bowling green. This could be remedied through various methods but would take time and resources to fix.

### **Kahurangi School**

This site is the school's land located next to their basketball court. From Google Earth, this site looked promising with good land and potential for partnerships, but once we were on site we found that the topography could have been better for farming. It had a 45-degree slope which would make farming very difficult. Moreover, during recess the kids were using the entire grass area, leading us to think the school would be very unlikely to give up that land.

### **Kilbirnie Recreation Center**

In the past, this reserve land site was frequently used as an overflow car park right next to the recreational center. However, the council wanted to receive more use out of the land, leading them to generate a master plan. Unfortunately, in the master plan they will be spending around 3 million dollars to install a brand new skate park which will take up the entirety of the lot, making it hard to reserve any space for an urban farm.

### **Strathmore Avenue**

This private site near the Kahurangi School is an example of Google Earth and outdated maps causing simple mistakes. This site appeared as a promising three-lot opening with plenty of available land, access to water, and electricity. However, apartments were already constructed when we showed up for a site review, leaving no land to open an urban farm.

### **Sinclair Park Shotput Field**

Sheldon Levet brought this council reserve land to our attention in our interview. While the site met many requirements, Sheldon had written a proposal to turn this land into an urban farm/community garden in 2020. City Council denied this proposal, and upon interviewing Rachel McLellan and Kate Brown, we learned that the proposal was quite extravagant and resembled a market garden rather than a community-based garden. With that said, a landfill underneath complicates this site even more.

## 4.5: Simple Analytics to Narrow Down the Search

After asking for land priority lists from the community manager and farm manager of Kaicycle, Phoebe Ball, and Thomas, we asked another urban farm manager, Jess, to send us the same. These can be found in appendices E, F, and G. We then data-coded their lists and looked for common themes and words. Finally, we proceeded to average all of the lists together in order to create an optimal final priority list. Before using it, we sent it back to Kaicycle executives and had them make final changes to the list. Once received back, the final priority list is shown in table 4 below.

<b>A) 8 hrs of sunlight</b>
<b>B) Access to water</b>
<b>C) Flat/usable land</b>
<b>D) Accessable by vehical</b>
<b>E) About 1000m<sup>2</sup></b>
<b>F) Exsisting structure/ability for permanant structure</b>
<b>G) Quality soil</b>
<b>H) Electricity</b>
<b>I) Good drainage</b>

Table 4: Final Land Priority List

We put the data from the site visit checklist into the final priority list to evaluate whether the site currently has the characteristic/priority and if Kaicycle could add the characteristic. The value 0 was set equal to the site not having the priority, 1 meaning it does, and 0.5 meaning it has the opportunity for Kaicycle to develop it further to meet the particular priority. We then reverse-weighted the list meaning priority one was worth nine points, and priority nine was worth one point. Table 5, seen below is a small example of the rating system.

Site	Airport land	Elliot Park	Sinclair park shotput field	Houghton Valley School Land
(9 pts) 8 hrs of sunlight	1	1	1	1
(8 pts) Access to water	1	0.5	0	0.5
(7 pts) Flat/usable land	0.5	1	1	1
(6 pts) Accessable by vehical	1	1	1	1
(5 pts) About 1000m^2	1	1	1	1
(4 pts) Exsisting structure/ability for permanant structure	0	0.5	0	0.5
(3 pts) Quality soil	0.5	1	0	1
(2 pts) Electricity	0.5	0.5	0	0.5
(1 pts) Good drainage	1	1	0.5	1

Table 5: Rating System Example

We used simple analytics to show the sum of each score for each site. The sites with higher scores are more likely to benefit Kaicycle in its expansion. With this system, we moved Crawford Green, Elliot Park, Houghton Valley School Land, and Sisters of compassion to the top of our list. The maximum score for each site was 45, and all four of these sites tied for the highest at 38 points. This can be seen in table 6 below.

Crawford Green	Airport land	Elliot Park	Sinclair park shotput field	Houghton Valley School Land	Sisters of Compassion
9	9	9	9	9	4.5
4	8	4	0	4	8
7	3.5	7	7	7	7
6	6	6	6	6	6
5	5	5	5	5	2.5
2	0	2	0	2	4
3	1.5	3	0	3	3
1	1	1	0	1	2
1	1	1	0.5	1	1
<b>38</b>	<b>35</b>	<b>38</b>	<b>27.5</b>	<b>38</b>	<b>38</b>

Table 6: Example of Total Ranking of sites

#### 4.6: Heat Map of Favorable Locations

After conducting the simple analytics process, we could see which sites yielded more favorable scores. Using this information and considering the average distance the current customers and volunteers travel, 2.57 km, we identified grocery stores within that distance. This led us to Common Sense Kilbirnie and Pac'N Save (highlighted with the blue info icon on the heat map). Next, we conducted surveys using a convenience sample to determine if there would be customers and volunteers in the surrounding area of the new site. The data collected in these surveys included how the individual currently sources their vegetables, how far they would be willing to travel to the site and their interest in a delivery service. This survey can be found in Appendix I.

To develop the heat map of favorable locations, we also collected the street they lived on or a surrounding street if that was more comfortable. From these interviews, we determined that the potential new customers would be willing to travel about 3.5-4 km to pick up a veggie basket from a new site shown by the map's yellow region in figure 10. We also asked each individual to name a street close to them, which provided us with information on where people were most interested in organic shopping (represented by a red pin with a house icon on the heat map). This information allowed us to further identify Crawford Green as the site closest to the highest amount of interest, followed by the land at Houghton Valley School and Sisters of Compassion. Despite Elliot Park being within the radius we determined people were willing to travel to the site, it became an outlier after completing this analysis as the number of people from that area was much fewer. However, due to the qualities of the land at Elliot Park, it will still be suggested despite being in an area with less interest in organic shopping. Finally, we highlighted the four prioritized sites in purple with a star icon on the heat map, as seen in figure 9 below.

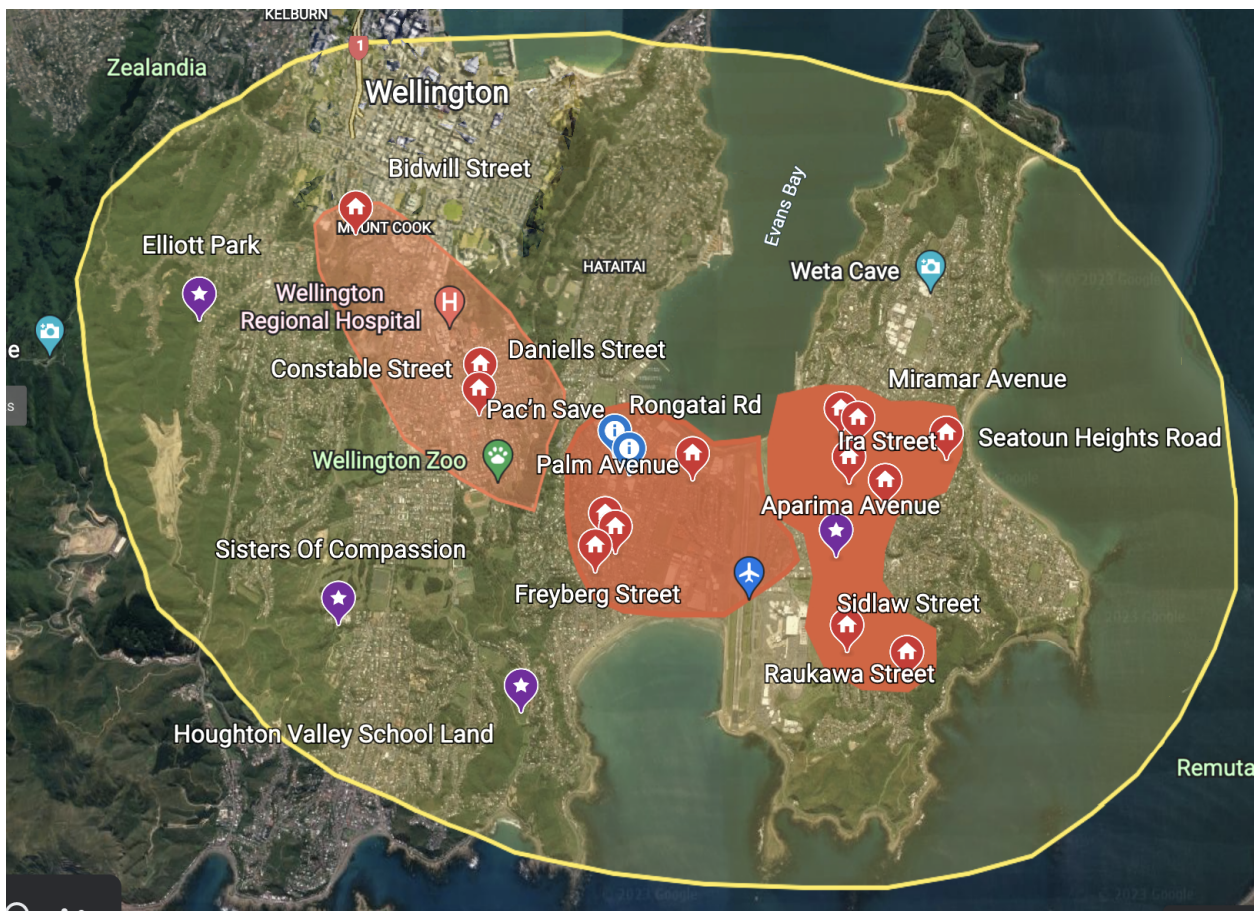


Figure 9: Heat map showing distance customers would travel and areas of most interest in organic shopping (Google Earth, n.d.)



## Chapter 5: Recommendations and Conclusion

This section overviews our formulated recommendations using our objectives and methods. The limitations and challenges of the project are also further explained. Finally, recommendations for future projects are made based on our experiences working to find new sites.

### 5.1: Recommendations

Based on the research and observations from our project, we have identified four potential sites for Kaicycle to expand to by addressing each of our objectives and interpreting the results. These sites include **Crawford Green, Sisters of Compassion, Houghton Valley School Land**, and **Elliot Park**. We also recommend, based on our results that **Kaicycle further investigates a different business model** to better represent the City Council's definition of a community garden if they decide to move forward with council reserve land. Below is a description of each site and the factors we considered to suggest these sites.

#### **Sisters of Compassion-**

Sisters of Compassion scored 38/45 from the simple analytics and was the second most favorable location within the heat map. This site is secluded from the assiduity of city life allowing for uninterrupted farming. Sisters of Compassion is a private organization so efforts to secure the land would be simpler hopefully. This is one of the few sites that can form a two-way partnership for future use and is not limited to a lease from the city council. With this site, Kaicycle can continue using a CSA business model selling veggie boxes to customers. Considering our findings, we recommend the Sisters of Compassion land as the most suitable for Kaicycle.

#### **Crawford Green-**

Crawford Green scored 38/45 using simple analytics and is a favorable location inside the heat map. Plenty of land is available, and it currently serves as a community park with a daycare adjacent to the field. The daycare can also serve as a community partnership allowing Kaicycle to engage with the community through the use of the infrastructure occupying the corner of the field. The site would be easier to secure through a lease with a change in business model by Kaicycle as it is council reserve land. Crawford Green is our second-best recommendation for Kaicycle despite it being in the most favorable location, it is reserve land and will be more difficult for them to secure.



### **Houghton Valley School Land-**

Houghton Valley School has a section of land directly below the school yard scoring a 38/45, and is similar in location to Sisters of Compassion, making it a favorable location on the heat map. The land is WCC reserve land which also conflicts with Kaicycle's business model. If Kaicycle can adjust its CSA model, this land provides opportunities for partnerships with the school and carrying out community classes/sessions. Additionally, there is a small parking lot adjacent to the site. According to Parks and Rec., the site is unused now and would be an excellent fit for an urban farming initiative. We also recommend the Houghton Valley School land as there is a significant opportunity for partnership and community involvement. Since the site is on reserve land, we did not rank it higher as obtaining it would be more difficult.

### **Elliot Park-**

While Elliot park scored 38/45, it was the least favorable site on the heat map. The park is solely a community hangout and is under council reserve. Once again, Kaicycle's current business structure must be altered to secure the land. Assuming that Kaicycle met council standards requirements for a community garden, this site would be easily secured for multiple years since it is labeled as a potential urban farm site in the suburban reserves management plan. Despite Elliot Park being furthest from the favorable areas we found that being labeled as a potential urban farm site adds value and potential, warranting a recommendation.

## **5.2: Conclusion**

Wellington City Council has been trying to create a more sustainable, equitable, healthy, and resilient food system for all citizens of Wellington because "The food system ties into the economic, environmental, cultural, and social health of the city" (*Sustainable Living - Wellington's Sustainable Food Initiative - Wellington City Council*, n.d.). This has been a long-going initiative to find ways to improve the food system in Wellington. The overall goal of this research and our project was to propose 3-4 sites in the Wellington area for Kaicycle to expand its urban farming operations.

We devised three objectives and methods to gather data to identify and propose the most suitable sites. The objectives were to interpret policies and regulations, identify land and potential partners, and understand local perceptions. First, we used archival research and interviews with WCC employees to interpret policies and regulations in Wellington. We gathered data through surveys and interviews with Kaicycle customers and employees to identify land and potential partners. We used this to develop a general list of priorities that suggested what sites

should have. We proceeded to use this list to carry out potential site evaluations. Using our final averaged priority list, we ranked each site saying it met the priority, it could in the future, or the site could not. We used simple analytics to narrow down our suggested sites to four. These sites included Elliot Park, Sisters of Compassion, Crawford Green, and Houghton Valley School. We then conducted interviews around these four potential sites at grocery stores to understand local perceptions of urban farming. Using the data collected, we created a heat map of favorable locations that shows the areas more likely to increase Kaicycle's customer and volunteer base. This last factor allowed us to reorder the four potential sites from best to worst resulting in Sisters of Compassion being the best, followed by Crawford Green, Houghton Valley School, and Elliot Park.

There were time limitations that we ran into during the project. Interviews took much longer to schedule than anticipated, which pushed some of them further back in our schedule. Additionally, we had about five days taken from our interviews due to the cyclone that hit Aotearoa. This impacted the quality of the heat map of favorable locations. Furthermore, during our project, many people were on holiday leaving gaps in information that we had to find other ways to fill. Lastly, Google Earth was an essential portion of the project and unfortunately, the most recent map was from 2018. This led us to take more time visiting sites that no longer existed and were not worth our time.

We recommend that the next project either investigates alternative business models that suit Kaicycle's values or commences obtaining one of the suggested sites.

Based on our approach and the challenges and successes involved with completing this project, we recommend that future groups take the following steps to aid in completing their project.

- Consider other business models that suit Kaicycle's values while still following the City Council's definition of a community garden.
- Perform further in-depth research on the potential sites identified in this project.
- Anticipate whom the group wants to interview pre-arrival to help make initial contact smoother.
- Reach out to individuals about setting up interviews before getting IRB approval.
  - Create a relationship to bring about the interviews much earlier.
- Account for Google Earth being out of date and plan for that when identifying sites to visit.
- Volunteering at the farm was pivotal as it gave us more nuanced knowledge and established relationships with the employees, volunteers, and customers.

Through the completion of this project, we were able to suggest sites for Kaicycle to expand to in the future. This project did more than just that, it also provided us with experiences working as a team and collaborating with others in a professional environment. We were able to participate in morning harvest and volunteer sessions, connecting with Kaicycle customers and employees and becoming a part of the Kaicycle community. We hope that future projects are able to have a similar experience.

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# Appendices

## **Appendix A- Interview outline for Wellington City Council Staff (Focus on Town Belt)**

Goal: Understand the restrictions regarding the Town Belt Act and our options.

1. Describe our understanding and see if it is consistent with the process of approving and leasing land on the Town Belt?
  - a. How much land is currently available for lease? Plan says up to 8 hectares at a time.
2. Under 9.5.3 in the Wellington Town Belt Management Plan, it discusses community gardens and orchards using WTBA land. Do you think this is a good potential route for land expansion for Kaicycle? (show document with 9.5.3 text)
3. In your opinion what was the public's perception of the WTBA?
4. What are your thoughts on the WTBA?
5. Do you know of any available land opportunities in Wellington for an urban farm site?
6. Depending on Urban farming knowledge, go to Appendix B

## **Appendix B- Interview outline for Wellington City Council Staff**

Goal: Gain information regarding opportunities for expansion with the City Council.

1. Are you involved with the development of urban farming in Wellington, and if so to what extent?
2. Are you familiar with the current urban farming policies, and if so, to what extent?
  - a. Are there policies that support or deter Urban farming in place?
3. Do you know of or have recommendations for other council staff that might be interested in urban farming and sustainability?
4. Do you know of any available land opportunities in Wellington for an urban farm site?
5. Depending on WTBA knowledge, go to Appendix A.

### **Appendix C- Interview outline for Current Kaicycle Employees**

Goal: Gain information regarding how the current volunteers and employees interact with the farm to understand better what characteristics will be needed at a new site.

1. When did you start working with Kaicycle, and how did you start?
2. What is a general workday like for you with Kaicycle?
3. Is the land you currently use too much or too little to continue work procedures comfortably?
4. What are the most important characteristics of land used for farming, specifically Kaicycle farming?
5. What do you have/not have on this site that you would want on the new site?
6. How far do you commute to work?
7. Do you know of any available land opportunities in Wellington for an urban farm site?

### **Appendix D- Interview outline for Current Kaicycle Volunteers**

Goal: Gain information regarding how the current volunteers interact with the farm to understand better what characteristics will be needed at a new site.

1. How did you hear about Kaicycle?
2. What made you want to start Volunteering?
3. How far do you travel to Kaicycle?
  - a. What method of transportation do you use?
4. How often do you Volunteer at Kaicycle?
5. What is not on this site that you would see beneficial on a new site?
6. Do you know of any land opportunities for Kaicycle's expansion?
7. Is there anything you would like to add that wasn't asked?

## **Appendix E- Priority of land characteristics from Phoebe (Kaicycle Community Manager)**

### Farming Aspects

1. The site can be secured for at least 5 years, hopefully over 10.
2. Over 8 hours of sunlight a day
3. Avoid extreme hills, if the land is sloped, a downward slope towards the north is preferred.
4. Access to water through town supply or rain collection off of nearby roofs.
5. Ideally 1-1.5 acres, a minimum size of 1000m<sup>2</sup>
6. Neither on the top of a hill nor the bottom of a gully.
7. Accessible by vehicles
8. Electricity, either city power or potential for solar, wind, etc.
9. Good soil quality
10. Good drainage

### Community/Social Impact Aspects

1. Existing buildings to host groups, or the permission to create permanent structures.
2. Proximity to an urban population and accessibility via public transport, walking, or cycling.
3. A small number of parking spots.

## **Appendix F- Priority of land characteristics from Jess (Edible Earth Farm Manager)**

1. Soil - is contamination a potential issue? How difficult will this soil be to work with/ amend? What opportunities does this soil offer?
2. Access - how difficult/ safe is it to get yourself/ equipment/ volunteers on site?
3. Health and safety - how steep is the site? How visible will volunteers/ staff be? How exposed will you be to the elements? Will you need to store any produce on site (will a chiller be required?)
4. Water - do you have access to municipal water/ opportunities for rainwater catchment? will you need to pay for water?
5. Storage - is there a structure on site that tools can be securely stored in? Is there the ability to build a suitable storage space?
6. Sun - how many hours of sun does the site get? How will shade/ sun impact what you'd like to grow?
7. Human ecology - do people walk through the site regularly? Who would use the site and why? Will that influence your design?
8. Wind - how exposed will the site be?
9. Frost - does this site get a hard frost? Will that change what you want to grow?
10. Size - what are your goals? Are you able to grow enough to meet your financial goals?

## **Appendix G- Priority of land characteristics from Thom (Kaicycle Farm Manager)**

### **Must Haves**

1. Sunlight (8 hours)
2. Water Supply
3. Vehicle Access
4. 1000 m<sup>2</sup>

### **Priorities**

1. Power
2. Good Soil
3. Not too much slope
4. Shelter

### **Would be Nice**

1. Building with Kitchen space, bathroom, staff room, and meeting room
2. Accessibility via public transportation

## **Appendix H- Interview outline for other local initiatives**

Goal: These questions will help us better understand what an urban farm like Kaicycle should consider when expanding its horizon. From the answers to these questions, we expect to have more insight into what land sections will better fit Kaicycle and prevent as many future issues as possible.

1. What are some of the challenges involved with small urban farming within a city?
2. Are there any overarching challenges with customers?
3. Do challenges change by season?
4. How challenging was it for you to find the land you currently use?
5. What were the key characteristics you looked for when searching for land?
6. Do you know of any available land opportunities in Wellington for an urban farm site?

## **Appendix I- Survey for Wellington Residents (Around locations of interest)**

Goal: our objective with this series of questions is to understand the public perception of urban farming to map out key areas to focus on looking for land.

1. How often do you purchase fresh vegetables?
2. Do you think Wellington would benefit from having more urban farming sites producing fresh vegetables?
3. Would you be interested in paying for a weekly basket of fresh vegetables from a local urban farm?
  - a. If yes, how far would you be willing to travel to pick up the veggies?
  - b. Would you be interested in a delivery service if offered?
4. How do you dispose of your food and compost?
  - a. Are you interested in electing to dispose of your compost through local initiatives?
5. What street do you live on? Or a popular street near you? If you are comfortable sharing.
6. Is there anything else you would like to add that wasn't asked?

## **Appendix J- Survey outline for existing Kaicycle customers**

Goal: To understand the lengths the customers go to pick up veggie and salad baskets. This understanding will give us a general radius around potential land that customers will come from.

1. How long have you been a Kaicycle customer?
  - a. What led you to become a CSA customer of Kaicycle's
2. How far do you travel to pick up your basket, and what is your postcode?
3. What method of transportation do you use to pick up your basket?
4. How would you rate the quality of the food from Kaicycle? (1-10)
5. How do you feel about your experience with Kaicycle overall? (1-10)
6. Is there anything else you would like to add that wasn't asked or any suggestions for us?

### Appendix K- Proposed Timeline

Timeline	Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7
	1/11-1/18	1/18-1/25	1/25-2/1	2/1-2/8	2/8-2/15	2/15-2/22	2/22-3/1
<b>Kaicycle Farm &amp; Town Belt Exploration</b>							
<b>Archival Research</b>							
<b>Interviews</b> *See note in description							
<b>Surveys with Kaicycle Customers</b>							
<b>Analysis and Conclusion</b>							

*Chart showing Proposed timeline. \*Interviews with WCC, Kaicycle Employees/Volunteers, Consentire Employees, other local initiatives, and Residents of Wellington.*

In the first two weeks, we integrated into Kaicycle by harvesting and completing everyday jobs around the farm, sparking a great connection between WPI and Kaicycle. From weeks two to three we dug deeper to explore knowledge about the Town Belt Act along with researching other land rules and regulations. Interviews and surveys took up most of our time since they are a key factor in producing our end goal. We conducted interviews with current customers first, followed by volunteers, council staff, and potential customers near future sights. After analyzing the gathered information and data, we concluded the best (3-4) sights for expansion.



**Appendix L- Pictures of Site Observations**

**Airport Land**



**Crawford Green**



## **Sisters of Compassion**



## **Elliot Park**





## Houghton Valley School



## Miramar Bowling Green



**Kahurangi School**



**Kilbirnie Recreation Center**





**Strathmore Avenue**



**Sinclair Park Shotput Field**

