Facilitating Recreation

Community Sporting Design

by

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In Fulfillment of the
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0.0 Pretext: Author's Declaration

AUTHORS DECLARATION

I hereby declare that I am the sole author of this thesis. This is a true copy of the thesis including any required final revisions as accepted by my examiners.

I understand that my thesis may be made electronically available to the public.

0.0 Pretext: Abstract

ABSTRACT

In our current architectural discourse of sporting design in Canada, we tailor our sports facilities to harness the energy of the masses, to watch the World's elite compete on an Olympic or an international scale. The vast majority of the population are however, not elite athletes, but everyday participants engaging in athletics, community and sporting culture. With a significant rise in obesity levels[1] in Canada, and the decline in participation in organized sport[2], focusing on physically engaging the majority of the population is rapidly becoming a greater priority.

This thesis will examine the relationship between architecture and sporting facilities in two parts: A) what are the spatial typologies that define recreation and sporting facilities? Building on the results of part A, part B will determine what proportion of these spatial typologies will promote growth amongst users.

Part A will be developed through the summation of current sport sociology research, architectural research, and planning studies, all focused on sport and recreation facilities. Part B occurs once comprehensive spatial categories are established. These categories will be used to analyse a series of recreation facilities that will be dissected based on the individual and group spatial typologies. Patterns arising from this dissection will be cross-referenced to growth or decline rates at each facility; determining whether specific spatial patterns promote or discourage growth. Furthermore, these patterns will be cross-referenced again with survey data from participants of these facilities to confirm the strength of the correlations. Sailing programs in Alberta and surrounding areas will act as a case study for the type of facility being examined. This 3-part study will display the relative success or failure of the inclusion or exclusion of typological elements[3].

Afterwards, these results will be presented, and then summarized in a design guideline. The guideline is aimed at informing architects, planners and program planners about the types and proportions of core programmatic elements that help make a recreation facility successful. Finally, this guide will be applied to an existing facility as a trial run, and the results, limitations and conclusions will be documented.

The aim of this thesis is to inform everyday sport and recreation design by providing a design guideline focused on defining the core components of these facilities, and in what proportion they are necessary to have higher levels of growth and retention amongst their user base.

1 Navaneelan Tanya, Teresa Janz "Adjusting the scales: Obesity in the Candian population after correcting for respondent bias" (2014) Catalogue No. 82-624-X

2 Unknown, "Sport Participation 2010" Her Majesty the Queen in Right of Canada (2013) Catalogue No. CH24-1/2012E-PDF

3 Refers to "Physical Activity Relationships (PAR)" (Koski, 2008) and "Alternative sport programmes and social inclusion in Norway" (Skille, 2006)

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0.0 Pretext: Author's Declaration

DEDICATION

I would like to dedicate this thesis to the Glenmore Sailing School and the Staff who make the program possible.

Thank you for an endless source of inspiration for this thesis, and in my life.

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0.0 Pretext: Preface

PREFACE

This thesis is in response to the lack of theoretical literature regarding grassroots sporting facility design. When I started the thesis process I intended on designing a sporting facility that would help include users who would normally not get a chance to participate in sport. However, I couldn't find any theory regarding this topic. In response my thesis' intention was to a higher level of understanding about the important factors that make affect sporting facilities.

This Architecture thesis began in September 2014, and has taken a little over 3 years to complete. My thesis journey has had some bumps along the way including an injury that halted my progress for 10 months in November 2014. This process of recovery was slow, but also shed light on the importance of providing opportunities for users to participate at sporting facilities, without being involved in physical activity.

The thesis has taken an interdisciplinary approach to researching the subject of recreation facility design and has not been a linear process. A lot of effort was put into understanding adjacent fields of research. This interdisciplinary approach is a reflection of real world processes. In most business environments professionals work with a variety of other team members, each with their own specialized skills and talents; without this diversity these teams would not be as effective. My thesis mimics these patterns in it's approach to research and design.

The structure of this thesis is different from typical architectural theses.. The thesis incorporates a series of different research methodologies to establish a theoretical understanding of sporting facilities, and then applies these lessons to the built environment through an analysis and design guideline. This guide is meant to assist architects and designers, and the structure of the thesis is set up so the research can be updated and built upon.

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1.0 Background Content

1.0 INTRODUCTION

How to make Sporting Facilities more Successful

When I started writing this thesis the intention was to design a sporting facility that catered to high rates of participation amongst users. This meant creating a facility that was inclusive, that had something for everyone, helped people learn and kept people in an athletic community. After multiple attempts to understand the theory behind sporting design more comprehensively, I realized sport facility design was relatively undeveloped and uninformed by spatially driven research. There was significant research about stadiums and world class sporting arenas, but very little addressing the recreation needs of everyday people. I was at a cross roads; do I design a facility that I believe excels in catering to users, and attempts to comprehensively post-rationalize my approach to sport and recreation architecture? Or do I attempt to legitimize sporting design through a comprehensive research process to quantitatively and qualitatively define elements that had an impact on the effectiveness of a facility.

In my experiences at sporting facilities, I had seen wonderful facilities tailored to families and the community, engaging not just the immediate athletic population, but their families, friends and even their less athletically oriented companions. I had also been witness to facilities that focused purely on athletic pursuits; these facilities functioned well in providing for high-level performance based users, but functioned less effectively in addressing the needs of the athlete's families and support systems. Having grown up in Canada, I had many friends who had played hockey at very high levels of competition. I've seen classmates progress from local arenas to national championships and professional leagues. Behind each of these athletes there was a supportive family, a supportive team and a supportive community. I used to hear horror stories from friend's parents traveling hours to tournaments, only to stay at a hotel an hour commute from the rink, and to finally to sit in a cold arena at 5:00am. I thought, why don't these facilities cater to not only the players, but also to the friends, family and support personnel? Wouldn't this sport be impossible without the parents driving their kids to practice in the morning? Shouldn't we at least get them access to a warm breakfast and hot coffee?

When I worked as an architecture intern in Amsterdam, my questions were finally answered. When playing on an architecture futsal (soccer but in indoor gyms) team, our games were always played at these small community gyms scattered consistently throughout the Dutch capital. These gyms were never spectacular, they didn't have the grandeur or the expensive finishes I was accustomed to in Canada, but they also possessed a character I had never experienced either. These gyms felt like little homes away from home for sporting hobbyists; they had team rooms packed with trophies and debriefing equipment, they had a bar and restaurant inside the actual facility with a privileged large window facing the fields, they had conference rooms for team building and usually even a tiny workout space with gym equipment. Undoubtedly I had to experience this first hand; and after a crochet and a pint of beer I realized that this had been the athletic experience I had been looking for. After competing in various sports, from local to national levels in Canada, what had been missing all that time was this integrated opportunity to be involved in a sport from multiple perspectives. These tiny Dutch facilities weren't glamorous, but they catered to everyone involved in the sport. Even the families that came to watch children, parents or other friends compete had a good time in a comfortable environment. Coaches could debrief their athletes, fans could watch and older sporting enthusiasts had a place to congregate.

Needless to say when I was confronted with the opportunity to either design a facility, or to help designers re-create that experience from that small Dutch field, I chose the latter.

Figure 1.01. Dutch Archicup Soccer Team.

Categories, Goals and Objectives

The goal of this thesis is to create an elevated understanding of sport, and sporting design from a comprehensive perspective; a perspective that examines these facilities with a wider lens, able to capture a more complete spectrum of participants, interests and opportunities that accompany athletic facilities. This type of approach encourages an interdisciplinary attitude towards thinking about the processes and factors that we commonly associate with sporting facilities. Architecture, planning and sport sociology all present different perspectives on facility design, and together, provide a more complete understanding of the factors necessary for success. After comprehensively understanding these intertwined disciplines, the goal is to integrate the strengths and research of all three fields into a tangible framework for assisting design specialists in the production of facilities. The framework should address the needs of entire athletic communities, rather than just the athletes.

There are two fundamental objectives of this thesis:

1. Identify categories of spatial typologies that effectively define sporting facilities.
2. To understand and define what the implications of these spatial categories are on the design process of our built sporting facilities.

The first objective; identify spatial categories; will breakdown what categories of spatial elements have a significant impact on the success or failure of recreation facilities. This approach will incorporate the research from architecture, sport sociology and planning disciplines in order to create a comprehensive understanding of the subject. The second objective takes these newly defined spatial categories, and develops our understanding of what the specific implications of these categories have on design processes.

To address these two objectives, two successive questions must then be asked:

1. How can architectural, planning and sport sociology research regarding our recreation environments, develop a set of spatial categories that define our sporting facilities?
2. What proportion of these spatial typologies will promote growth amongst users?

The first question defines the three fields of research that will be included in this thesis. These fields of research will be incorporated into a basic categorical understanding of recreation facilities. All the research collected in this stage of the thesis is secondary, and assists in forming an interdisciplinary picture of the current research on recreation environments.
The second question uses the spatial categories, developed in question 1, and uses them as a basis for the primary research in the thesis. Having defined spatial categories allows for the evaluation of existing facilities, and the effectiveness of these different components. If the spatial categories can be measured for effectiveness, then this knowledge can help create a framework for designers to re-create similar levels of success at other facilities.

A Personal History of Sailing

In 1998, my parents enrolled me in a sailing summer camp at the Glenmore Sailing School. I was exposed to a world of boats, wind, waves, water, lifetime friends and a community that is still active today. After spending summer after summer of learning how boats functioned with my friends, I started competing when I was 14 and coaching when I was 16. From that point on, I spent my whole summer sailing on a tiny reservoir in the middle of Calgary. My life revolved around sailing, whether it was planning lessons for coaching, practicing for the next race, or spending time with my new friends and co-workers. By 19, I was sailing competitively across parts of the country, traveling

to competitions in the prairies and on the coast. Though I never achieved some of the sensational results my teammates had, my eyes had been opened to just how different sailing could look across Canada. Clubs and programs were big and small. Some had fancy facilities, and others looked like delapitated cottages donated by members. There was always a common thread between all of these places; the community. The people at these programs were always more than accommodating, they were always friendly and loved being part of the sport. I only would find out at the end of the trip that the people serving lunches, dinners and making sure everyone was comfortable didn't even sail; they were usually just the partner of someone who did. I always wondered how these people could be so dedicated to their club, season after season, without ever even sailing? When I was much older one of my 'sailing moms' explained to me that they just enjoyed being in the atmosphere and cooking for everyone, that was enough for them.

When I was 21 I took a break from the sport to pursue architecture and complete my obligatory summer terms in Cambridge. I had competed for the past 4 summers and was eager to see what else was in the world. After I graduated from architecture school I spent my summers back at the Glenmore Sailing School. This time my role was a program coordinator and head instructor. This was at a time of decline for the school. All of my childhood coaches had moved on, and despite the attempts of my co-workers, the program was suffering from an increasing level of dissatisfaction and lack of enthusiasm. I was constantly busy; I worked with every single staff member on redeveloping the whole program, came up with strategies to replace boats, created competitive streams for students, worked with other city departments developing advertising and growth plans so the program would thrive, bringing in experts for staff training, and tried to re-invigorate the community with the same sense of passion that had been so infectious more than a decade before. As I started my Masters of Architecture, I continued working on the program, squeezing in planning sessions at Christmas and taking time off in order to build the program to a level of excellence. In the process I was also a member of the board of directors for Alberta Sailing during 2016. We worked with numerous clubs around the province to help facilitate sailing, and provide support so that these clubs could continue to function. During this time I was also a learning facilitator in the sport of sailing. The short version is I would teach other coaches how to coach. After an initial season of this, I quickly re-wrote the curriculum for coaches, and overhauled instructor course structures so certification was more attainable for a new perspective instructor.

Figure 1.02. Sailing on the Glenmore Reservior in 2008.

During my time at the University of Waterloo, I have been involved at varying capacities, with the sailing communities in Alberta and Canada. I admit to being close to the people that my thesis would so readily impact, and do not pretend to be impervious to the potential bias that would accompany such a relationship. Though there is a risk of bias, the connection that I have been so privileged to have with the sailing community has driven the core of my thesis, and hopefully has helped me understand some of the nuances that would be so important to be aware of during my research.

Contextualizing Sailing

Figure 1.03. A lateen rigged felucca, mimicking the style of ancient Greek boats.

Figure 1.04. Medal Race in the 470 class sailboat at the Rio Olympics.

Figure 1.05. Athletes competting at the 39 Trofeo S.A.R. Princesa Sofia.

The sport of sailing has deep cultural roots in most societies. People have been sailing for thousands of years, whether traveling to oceans in the pacific, or traveling across a lake. Traditionally boats were constructed usually of wood or steel and were typically used for travel, trade, or military purposes. Sailing now looks dramatically different than it's historic predecessors. Boats are made of fiberglass, and the come in all shapes and sizes. Typically sailboats are now used for pleasure or competition; weekend trips around the lake, or training as a competitive athlete. The sport of sailing is an understated one. Most people's impressions of sailors are of people wearing white suits, with blue stripes and scarves. However the sport of sailing is one that involves peak physical fitness, complex strategic and geographic knowledge, an implicit understanding of hydrodynamics and have the ability to integrate all of this into action and performance. Sailing has been part of the Olympics since the first modern day Olympiad in 1896. Typically the types of boats used in the Olympics are mostly dinghy style boats. Dinghies are small craft, usually under 20 feet without a weight on the bottom of the boat, allowing for the boats to be incredibly agile, but also athletically intensive. Every year the Olympic classes of sailboat are re-evaluated; older, slower models of boats are excluded from the games, faster and more popular classes are then included. Looking outside of Olympic classes, there are a huge number of widely sponsored sailing events on larger sailboats, such the Americas Cup, or the Volvo Ocean Race. These races attract hundreds of millions of dollars in sponsorship money, going to the construction and maintenance of these boats, the salaries of professional sailors and their support staff. The boats in these races are 60 or more feet long, reach speeds as high as 80km/h, or are built for long trips of 30 days or more between continents. On a more local level, national and provincial organizations are responsible for maintaining the momentum behind athlete and sport development for Canada. Sail Canada, the national governing body, receives federal funding to develop athletes, programs, clubs and coaching staff in order to produce high performance athletes for the summer Olympic Games cycles.

Sailing is a large sport, requires high levels of athletic prowess, and considerable amounts of training. Athletes can train their whole lives, and some of the world's greatest sailors only reach there peak in their 40s, when they can finally integrate athleticism and intellect into a synchronized package. Though it is not the most popular sport, sailing is an effective tool for battling obesity and health issues associated with inactivity; it is a physically demanding sport, but also appeals to user groups who enjoy the integration of cerebral practices and athletic pursuits.

Personal Experience

Between 2013 and 2016 I was the Head Instructor and unofficial program coordinator for the Glenmore Sailing School. During my time managing the program, I learned about the extensive and complex multi-faceted approach that was needed in order to operate the sailing program effectively. The program needed constant work and maintenance throughout the season, making sure that every single class was filled, that there were enough instructors to teach all of the students, that we had enough boats to teach all of the students and that there was enough teaching space to house everyone on a rainy day. A good relationship had to be fostered with the 25+ staff working at the sailing school. Trust had to be developed. The staff needed to feel like they were valuable, that they were treated with respect and compensated well enough to afford their lifestyles. The boats required constant maintenance and upkeep. A well-organized plan had to be established to have routine maintenance on these performance craft without investing large sums of money into professional grade equipment. The Glenmore Sailing School is also owned by the City of Calgary, and is part of a larger bureaucracy. This could be beneficial in that the amount of resources potentially able to be tapped into was massive; the drawbacks were the almost insurmountable amount of red tape and bureaucratic politics that could occur. This took skill to navigate, extensive knowledge of the system to control, and personal tact to engage with the people. The Alberta Sailing Association controlled the membership of the Sailing School to the provincial organization, but more importantly managed the certification of new potential staff. Being a high turnover business in terms of staffing, a constant stream of new instructors was always needed. If the provincial association had a blip in organization, or their certification programs became inaccessible, the Sailing School would suffer due to staff shortages. Integrating all of these factors could be strenuous and very difficult, and making changes and improvements required calculated approaches and effective timing. Above this, the building needed to be used effectively to facilitate all of these activities. As a managing entity, my approach had to be broad enough to have a clear vision for facility and program, specific enough that individual instructors and staff were able to understand how it would affect their work, be flexible enough to adapt to unforeseen situations, and have clear examples about how this approach had worked in the past.

Figure 1.06. The Glenmore Sailing School Staff in 2015.

Figure 1.07. Coaching at Newell Sailing Club in May, 2016.

Understanding Sporting Facilities

Having this experience made me realize how complex operating one of these organizations actually was. When designing these facilities as architects, we see them as a mixture of programmatic elements, and theoretical relationships between types of space. We operate from an often-simplified perspective of spatial understanding while in reality these facilities are maelstroms of activity. The current version of architectural theory does not effectively address the gaps between theoretical knowledge of space and practical use by people. To bridge this gap, the theoretical understanding of sporting space needs to be augmented by a comprehensive spectrum of knowledge, typically adjacent to the architectural practice. Currently there is no standardized methodology on how to bridge the gap from theory to practice within the architectural discourse. A theoretical understanding of a design theory is a critical starting point for professionals to have at the beginning of a project. Possessing a base of knowledge about the general undercurrents and macro behavioral patterns of users is important when first approaching a design problem. Architectural theoretical models must begin to reflect the complexities of the management, planning and sociological factors that influence the usage of facilities if they are ever to be sufficiently applicable to design. These theoretical models cannot adopt the traditional patterns of pure spatial understanding, but need to incorporate a multi-disciplinary approach if they intend to fill the gap between theory and practice.

Thesis Approach

There is a breadth of knowledge in sport sociology and planning when addressing issues of sporting space. Though some of this information is quite specific, the range of research is broad and comprehensive. Much like managing a facility with multiple facets, the theoretical understanding that informs how we design sporting space must also become multi-faceted.
The approach of this thesis attempts to comprehensively fill this gap between architectural theory and the practical application in sporting facility design. This approach took a multi-step process, forming the structure of the thesis:

Chapter 1. Understanding the current state of architectural theory, practice and explore initial underlying patterns.

Chapter 2. Do an in-depth research analysis of the current state of sport sociology, planning and architectural research regarding built sporting environments. Summarize and re-classify this information into understandable categories.

Chapter 3. Apply theoretical knowledge developed in chapter 2 to a spatial framework, applicable to built environments. This framework contains categories of individual spatial typologies.

Chapter 4. Use the hybridized theoretical framework developed in chapter 3 to study the proportions of these spatial categories at a number of sailing clubs used as case studies. These proportions will be linked to growth or decline user statistics provided by every sailing program in the province.

Chapter 5. Examine the patterns developed through primary research and cross-reference them to a human participant survey that mimics the same categories developed in chapter 3. Create a guidebook of the spatial categories and their recommended proportionality based on the patterns seen in chapter 4. Apply this guide as a test subject to an existing site.

Chapter 6. Discuss the findings of this process, their effectiveness, potential limitations, biases, conclusions and further opportunities for research and development.

1.1 INDUCTIVE VS DEDUCTIVE REASONING

The Application of Different Research Methodologies

To answer my multi-question thesis statement I needed to incorporate different research and reasoning methodologies in order to tackle the complex sequence of challenges associated with a two-question approach. The interdisciplinary nature of my thesis required the use of both inductive and deductive reasoning techniques. Each technique provides a different way of thinking about a problem, something particularly useful when having an interdisciplinary approach.

Inductive reasoning is the collection of specific truths or conclusions, and using these specific conclusions you come to a general consensus. For example, if it's snowing at my house, and snowing at my neighbour's house, and snowing at my brother's house, it must be snowing at everyone's house. This methodology has its strengths, but can also come to conclusions that are too broad or inclusive. Deductive reasoning follows a reverse flow in logic. It begins with a general truth and then applies it to specific examples.[1] For example, all animals have fur or hair, dogs are animals, and therefore dogs have fur or hair. This type of logic can also suffer from inaccuracies because it doesn't account for exceptions or extenuating circumstance. Utilizing both methodologies allows for a system of checks and balances, in order to make sure the correlations begin to represent causality.

Different stages of my thesis use different methodologies of reasoning in order to confirm or dispute patterns established previously:

> *Chapter 2 and 3: T*he literature review collects a series of inductive pieces of secondary research, mostly pertaining to sport sociology literature. Each research paper proves that a singular or multiple types of spatial typologies are effective in

1 Jackson , Cathryn. The difference between inductive and deductive reasoning. in Study.com [database online]. 2017 [cited November/10 2017]. Available from http://study.com/academy/lesson/inductive-and-deductive-reasoning.html (accessed November 10th, 2017).

making a facility have higher rates of participation. Chapter 3 collects these typologies and creates a hybridized framework. Using inductive reasoning, if all of these individual spatial typologies make a sporting facility successful, a facility containing these elements would also be successful.

Chapter 4: The research section uses deductive reasoning to test the hybridized framework from chapter 3. This is tested through multiple case studies. It starts by knowing which facilities are growing and which ones are declining, then mapping the spatial categories from chapter three onto every club. By looking at the patterns created by the growing and declining facilities, it can then be concluded that the proportions of spatial categories at successful clubs can make other programs successful as well if they mimic the patterns determined earlier.

Chapter 5: The design analysis and guidebook employ inductive reasoning. The successful spatial patterns are cross-referenced with survey results. The survey's questions are representational of the same categories used to analyze each facility, but was tested using a questionnaire, rather than site analysis.
If the survey produces the same pattern as the site analysis, then those patterns could be established as viable causalities for facility growth.

By using alternating research methodologies; spatial patterns seen in one section could be established or refuted in the next. This process is not easy and can be heavily time consuming, however I wanted to use it because it allowed for a comprehensive investigation of spatial patterns in the built environment.

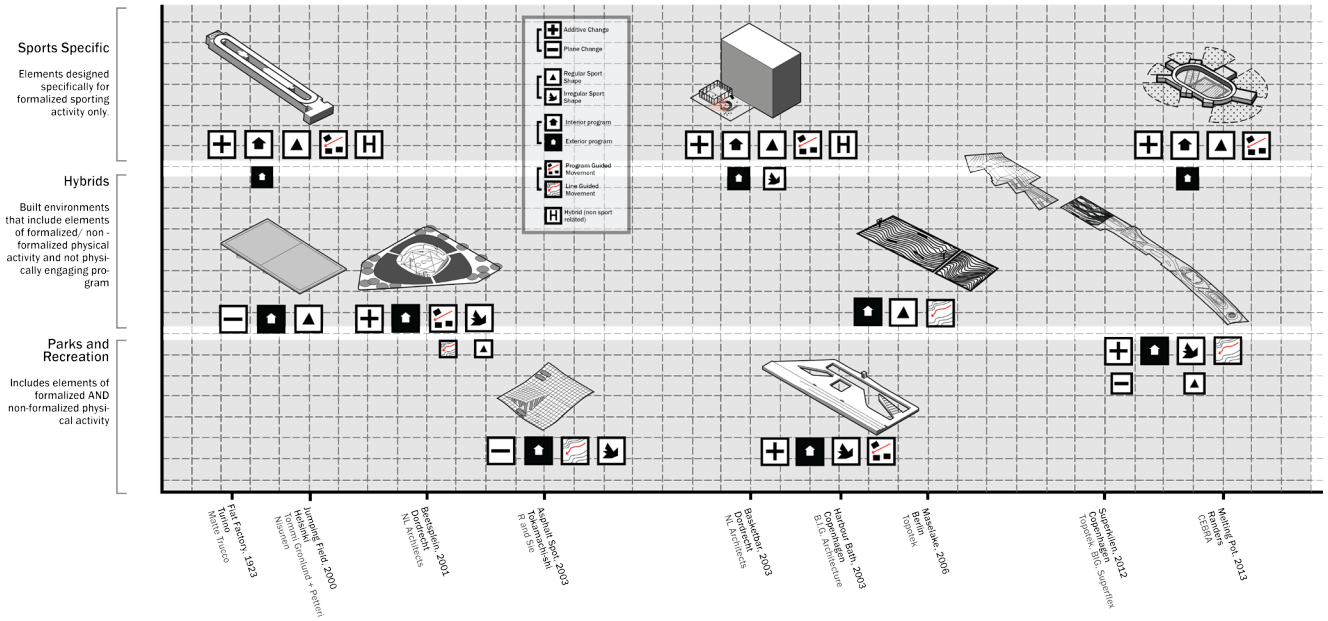
1.2 PRECEDENT CATEGORIZATION

Beginning to Understand Spatial Typologies

Precedent studies allow for a comprehensive understanding of hybridized facilities, but lack specificity and definition. To gain this specificity, the precedents needed to be analyzed for their spatial typologies, categories, similarities and differences. The following chart attempts to categorize these precedents based on a number of similar factors extracted from the 9 precedents that were examined. The following patterns were observed:

Overall Facility Patterns:
Sport Specific Patterns – These facilities were designed to serve formalized sporting purposes only. Other programmatic needs were not taken into consideration.
Hybrid Patterns – These facilities had a mixture of athletic and social spatial typologies.
Parks and Recreation - These facilities had formal and non-formal physical activity space, but typically lacked any sort of social spatial typology. In addition these facilities were located in public areas, such as green spaces or parks.

Individual Spatial Patterns:
Additive vs. Plane Change - This typology refers to the grading of the facility. If the facility rises on average higher than the ground grading, but still exists as a singular plane then it is classified as additive; but if the surface undulates, shifts, or is otherwise not parallel to the ground, then it is classified as a plane change.
Regular vs. Irregular Sport Shape - This classification documents if the playing surfaces at the facility are typical to standard competition or if they have unconventional geometry. If a facility has a standardized sporting field, it is classified as having regular sport shape. If a facility has a sporting field that could not be used for competition due to its irregular geometry, then it is classified as having irregular sport shape.
Interior vs. Exterior Program - This typology is quite straightforward, it categorizes spaces for sport as either exterior or interior. A facility is branded as one or the other based on which typology has more area.
Program vs. Line Guided Movement - Every facility has paths of intended movement for users. This movement can be guided through two different methodologies: Spaces that manage circulation through functional elements are classified as having *program-guided movement*. Facilities that have lines or a visual system to guide a user are classified as having *line-guided movement*.



Precedent Categorization Study

Figure 1.31. An initial categorical approach to understanding the elements that make up a sporting facility.

Hybrid Classification - If a facility has more than one purpose then it has a *hybrid* classification. This is different from the hybrid category under *Overall Sporting Facility* because this classification looks at different types of program. The *Overall Sporting Facility* category refers to needing a specific mixture of sporting and non-sporting programmatic elements.

Conclusions

This initial attempt at understanding different classifications of a sporting facility raises questions about designers understanding of these spaces. How does research classify these facilities? Is there a more complete list of elements that can be used to better dissect a sporting facility and if that information was available, what are those categories based on? A categorical understanding of components of sporting facilities begs the question, are all of these categories important and how to do they affect the amount of use facility use?

1.3 CONCLUSIONS

A Summary of Analyses

This chapter of the thesis contains a series of overarching studies attempting to understand what spatial elements are critical to an athletic facilities success. Though these studies were specifically inconclusive, generally, they provided an overview of critical concepts that will inform a more in-depth analysis of spatial elements presented in chapter two.

Architectural Case Studies (see appendix 1.1)
These case studies provided the preliminary understanding of sporting facilities. The studies outline constructed or designed facilities that have unconventional approaches to athletic space. The vast majority of facilities would always pair primary physical activity with secondary ones. These secondary activities do not necessarily have to be athletic; they could be socially or commercially based, but were always tailored to be complimentary to the main athletic event at the facility. This study begins to create an understanding of what spatial elements can be effectively paired with athletic ones.

Categorization of Case Studies
The categorization system was an attempt to classify different elements of sporting facilities. Though this graphical analysis could not correlate any specific effects, it began to break down the elements that make up a facility. The categories were specific to only the included case studies, so the analysis is quite limited in it's abilities. In this study, the shortfalls are more telling than its successes; the study could not create a comprehensive spectrum of spatial typologies, correlate what elements effected participation rates, and it struggled to create categories of classification because their were so many elements. These shortcomings greatly assist in forming the literature review because each brings light to how important a comprehensive list of typologies are, and that the spatial typologies must be based on evidence that correlate to a facility effectiveness.

Understanding Obesity and Correlations to Clustering of Service Facilities (see appendix 1.1)
Obesity is one of the primary motivators in attempting to make sporting facilities more effective; but in order for the thesis to move forward, it needed to be preliminarily understood that obesity rates may be effected by sporting facility composition. By mapping four Canadian cities, two above and two below the average obesity rate, correlations between obesity rates and clustered sport and service facilities could be observed. This study has its limitations; there is no additional primary or secondary research to confirm whether or not these correlations have a basis in causality. The only justification for mapping

this clustering pattern is when the study is paired with its background research[1], where the beginnings of stronger correlations can be seen.

Sport Space Typologies (see appendix 1.1)
Mapping and modeling individual sport space allowed for the understanding of activities with similar surface needs, as well as the effectiveness of different formal sporting activities to include participants. Sporting spaces that had similar surface typologies could be clustered together, or even occupy the same space through painting lines for different uses.
This study was fairly limited in it's effectiveness. Although the idea of pairing activities based on surface had interesting potential, surface typology has little or no correlation to increases in the inclusion of participants in any secondary research found. Though this could become a critical factor if identified in the literature review, the current lack of research does not support this.

Sport Typology Categorization and Trends (see appendix 1.1)
Although surface typologies were not an effective organizing methodology for sporting facilities, this study attempts to understand why different types of sport have become more or less popular in recent years. The idea of lifestyle sports, Koski's adapted facility clustering and complimentary spatial pairings; begin to identify a larger trend of non-sport related typologies having effects on participation rates at sporting facilities. Though these studies cannot provide concrete answers, they will inform the direction of the literature review, and potential patterns that may emerge from a comprehensive study of research regarding recreation space.

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1 In 'Physical Activity Relationship' (2008), Koski, P justifies the use of four basic categories that when used in conjunction, foster more participation in sport; personal physical activity, following of physical culture, production in physical culture and consumption of meanings of physical culture.

2.0 Literature Review

2.0 LITERATURE REVIEW

A Review of Evidence Regarding Environmental Factors having Sociological Effects in a Recreation Context

Abstract
There is a large portion of sociological research regarding the effects of built environments on recreation and leisure communities. A trend amongst sport sociology research is that there has been a significant shift in the way people perceive, operate and function within an athletic community. These changes have been commonly associated with a shift in societies social priorities; transitioning from a community oriented perspective, to one of an individual[1]. Much of the research in this field attempts to understand and mitigate this social problem through the examination of the physical environment.

Introduction
There has been a significant field of research developed, examining how environmental factors affect participation in physical activity. However, the scope of much of this work is too narrow in order to have significant relevance when looking to be used into in planning, architecture, policy making and by recreation professionals[2]. There has been horizontal expansion in the typology of Leisure and built environment research, making the field of research broad and inclusive of multiple social, environmental and leisure related areas. However, there is little unifying, coherent theory[3], making it difficult to integrate an approach into practice[4].
There is growing consensus that the root cause of this scattered approach to leisure and the physical environment is occurring due to a shift of societal values. Societies focus has gone from the community to the individual.[1,5,6,7]
Though physical activity has been studied extensively from a leisure, health science and urbanism perspective; the field of architecture has suffered from a lack of research about if the built environment can influence physical activity.[5,8] There is currently a wide variety of architectural theory to choose from, but much of it does not have a basis in research, or is not specific enough about how the built environment affects physical activity. There are preliminary studies examining how our built environment influences

1 Koski, Pasi. *Physical Activity Relationship (PAR)*. International Review for the Sociology of Sport 43, (2008, 2008): 151-152-163.

2 Koski, Pasi. Assessing the Sociology of Sport: On N+1 and the Cultural Approach. International Review for the Sociology of Sport 4, no. 5 (2014): 502-503-506.

3 Transportation Research Board. Does the Built Environment Influence Physical Activity? Transportation Research Board Special Report, no. 282 (2005)

4 Dunn, Diana. Urban Recreation Research: An Overview. Leisure Sciences 3, no. 1 (2009, 1980): 25-26-57.

5 Polanyi, Karl. The Great Transformation. (1944) (2014)

6 Berman, Marshall. All that is Solid Melts into Air. United States: Marshall Berman, 1982, 1988.

7 Lyons, Kevin and Rylee Dionigi. "Transcending Emotional Community: A Qualititative Examination of Older Adults and Masters' Sports Participation." Leisure Sciences 29, no. 4 (2007, 2007): 375-376-389.

8 Canter, David. The Psychology of Place. The Architectural Press Ltd: London (1977)

physical activity, however they are relatively inconclusive.[5,9,10]
The purpose of this literature review is to summarize the research and theory of both Leisure Studies and Architecture from opposing ends of the spectrum, and then isolate specific gaps that would be suitable for further study. Specifically this review aims to answer the following questions: A) what is the current state of Architectural Research regarding how the built environment can influence physical activity?

The literature review consists of three sub-categories: Shifting Social Organizational and Societal Priorities, Social and Cultural Inclusion Through Sport and Leisure Opportunities, and Non-Sport Related Supporting Typologies + Activities and Increased Levels of Inclusion.

9 Andersen, Rasmus. Activating Architecture and Urban Planning, 2011.

10 Valle, Daniel and Vincent Kompier. Sport in the City 2013.

2.1 SPORT SOCIOLOGY THEORY RELATING TO THE BUILT ENVIRONMENT

There is a breadth of leisure science research measuring the effects of the built environment on the social benefits of sport and physical activity.[11] Kaczynski and Henderson summarize the current and historical evolution of leisure and health science research regarding physical activity through a comprehensive literature review. In their paper, they summarize the 4 eras as physiological studies, epidemiological studies and recognizing the effects of physical activity, and marketing and management interventions to promote physical activity. The original eras of research had relatively indirect or vague connections to the built environment and architecture. The 4th era of study overlapped with much of the work done studying the built environment from a planning and design perspective. The US Transportation and Research Board (2005) wrote a comprehensive review of the current research pertaining to the built environment supported by a similar framework of era structures.[22] There have been multiple calls for further in depth research, in particular, effects of the built environment.[22,12,13,14] With leisure and health sciences rapidly approaching the practical worlds of architecture, urban design and planning, the relevance of architectural research will have immediate, and scientifically relevant implications to it's own field, and that of leisure science.

Methodology

To understand the current field of research, a large variety of peer reviewed journal articles relating to physical activity and the built environment were examined. Much of the literature seen would be considered 2nd or 3rd generation leisure and health science research; relating physical activity to health benefits or promotion of physical activity through sociology, un-relatable to the built environment. In order to produce thorough results, three databases were consulted: *Francis and Taylor, Sage Publications* and *Avery Journals*. The Boolean search bar was repeated in each of the search engines to make sure that consistent journal articles were produced amongst all of the databases searched. Only peer-reviewed articles were included in this search. The Boolean string was "(Physical Activity) AND (accessibility) OR (Architecture) OR (Design) AND (Research)." In these three databases this Boolean search string produced 573 articles. The aim of this portion of the literature review is to understand comprehensively the current field of research, so no exclusions were made in terms of quantitative, qualitative, reviews,

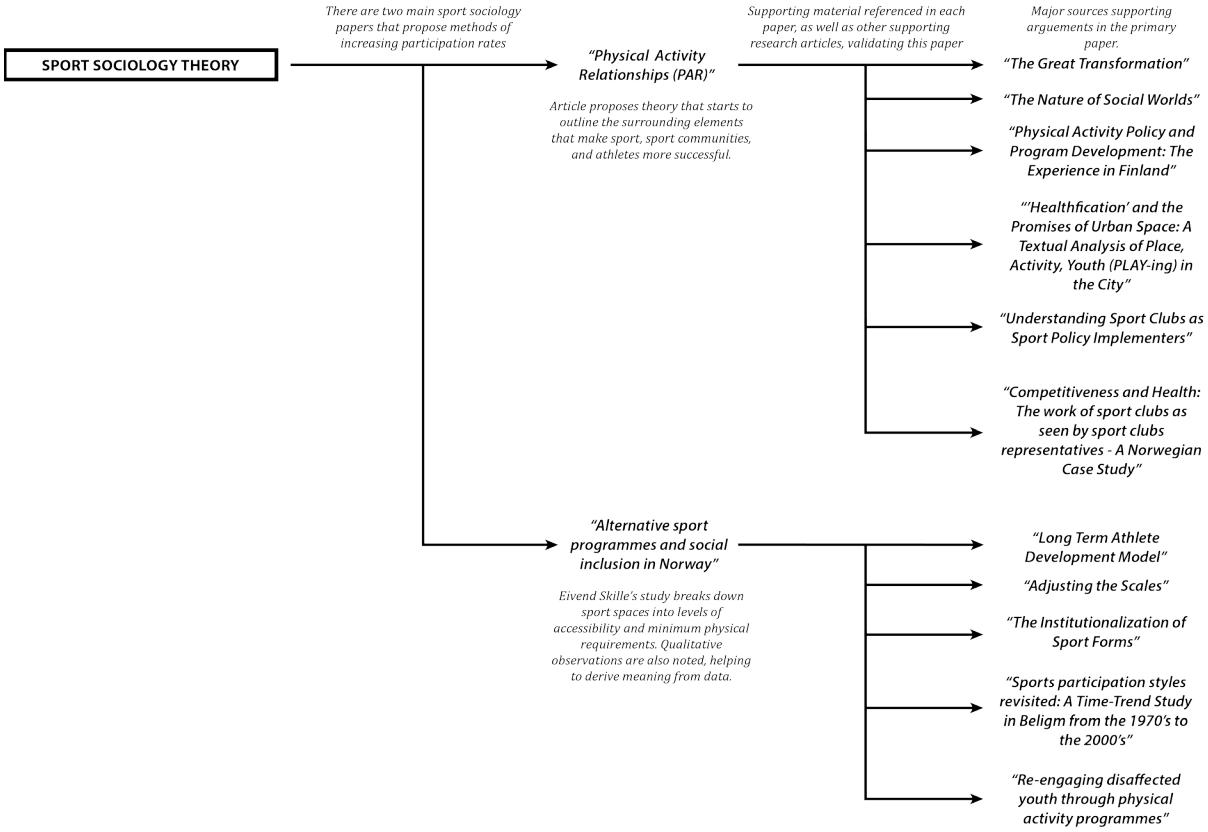
11 Kaczynski, Andrew and Henderson, Karla. Environmental Correlates of Physical Activity: A Review of Evidence about Parks and Recreation. Leisure Sciences (2007)

12 Gratton, Chris, and Ian P. Henry. 2001. Sport in the city.

13 Transportation Research Board. Does the Built Environment Influence Physical Activity? Transportation Research Board Special Report, no. 282 (2005)

14 Dunn, Diana. "Urban Recreation Research: An Overview." Leisure Sciences 3, no. 1 (2009, 1980): 25-26-57.

or commentaries type articles, every typology was deemed acceptable. Much of the content however did not include any information regarding the relationship between the physical environment and physical activity. From these 573 results, they were sorted and only 21 articles commented on the relationship between environment and physical activity. As a sorting methodology, any articles directly relating or immediately identifiable with spatial structure, built environment, involvement, inclusion, site, participation, urban environments, built environments, urban planning, architecture, planning were included.



Sport Sociology Theory Regarding Sporting Environments, *Figure 2.01*
There are two main categories of sport sociology theory, followed by several texts supporting each argument.

Results

Figure A2.01 in Appendix 2 provides brief summaries of the primary and secondary based research that was accepted for this review. Of the 21 articles, 13 of them included elements of specific research or derivation of primary results from other studies. *Figure A2.02* in appendix 2 identifies the 8 remaining articles as reviews, summaries, or critical critiques of the current research regarding how various categories of the built environment affect physical activity. Both tables summarize methodologies, synthesize research, repeated sources and referenced experts. In addition *Figure A2.01* in appendix 2 includes an additional column of identifying the primary variable in the study. Of the 21 reviewed articles, 19 of them reported a positive relationship between environment and physical activity. 1 Article specified that there is not enough research currently to come to specific conclusions about the built environment, and the final article did not make substantive correlations to environment. For the purpose of this research, many of the summaries of research have been described through qualitative means. The

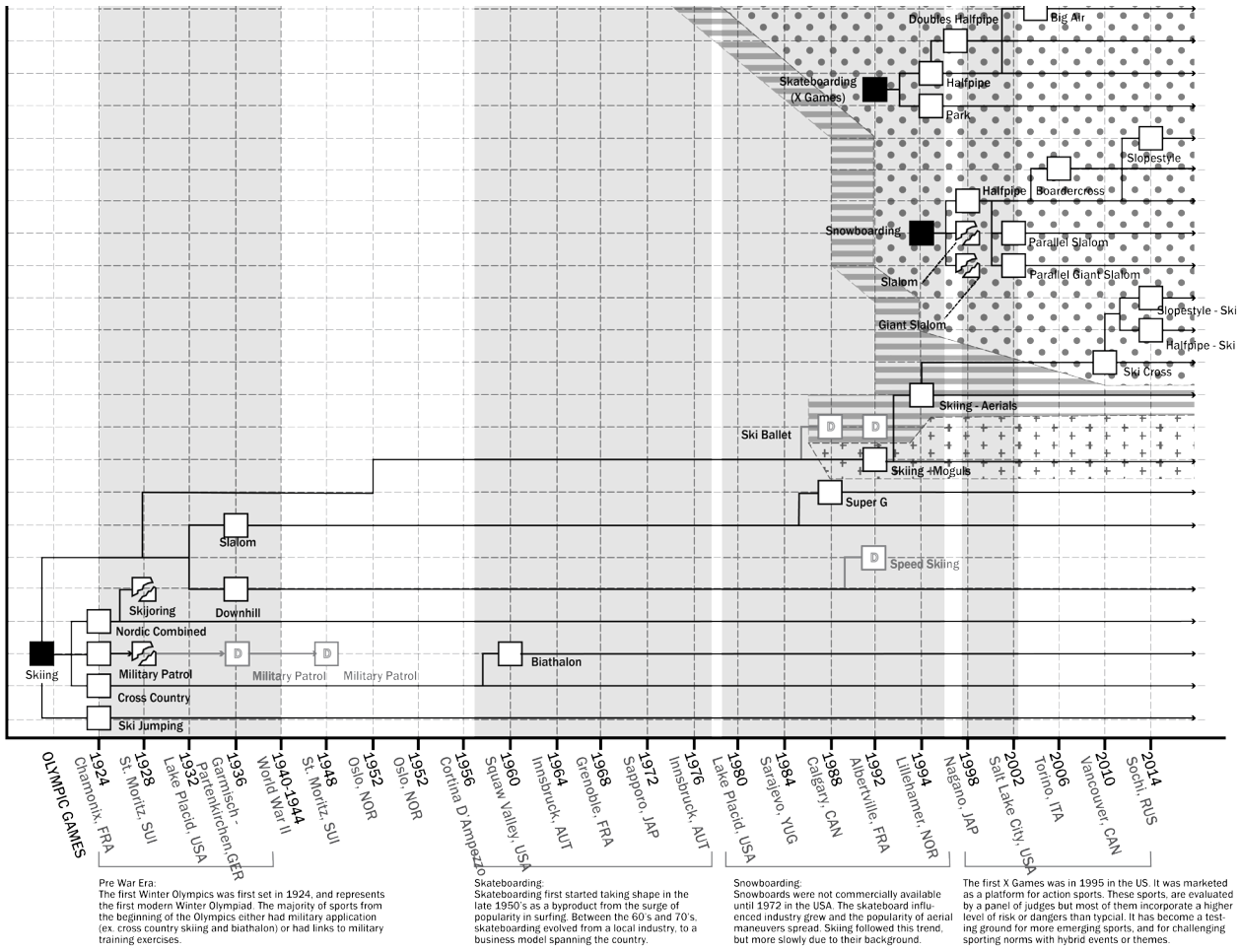
transition between a quantitative result and a qualitative description occurred only if the author deemed that their measured results were significant and of merit. *Figure A2.03* in appendix 2 contains various sources from recommendations of professionals and experts in the field of architecture, as well as initial broad search methodologies in the *Tri-University Network,* and within *Sage Publications.*
The decision to include articles exterior to the search boolean's on databases was made because the information was relevant to the understanding of the effects of environment on social conditions in sport. The inclusion of additional information like this may seem counter-intuitive, especially compared to the precision of database queries; however, the opposite option is to ignore information, research and theoretical material, which is relevant to the topic.

Social and Cultural Inclusion Through Sport and Leisure Opportunities
The second subsection addresses the effectiveness of our leisure environments in relation to their ability to be inclusive of multiple social groups. There is a broad range of theory and research defining the problem of social and cultural inclusion within leisure opportunities. At the macro end of the research, the spectrum of inhibitors to physical activity can be categorized into three specific groups, interpersonal, intrapersonal and structural.[15] Many of the inter- and intra-personal factors can be associated with a lack of appropriate programmatic opportunities for ethnic or social minorities at specific facilities.[16] Inadvertently the catering to the majority of the population, may actually create more social boundaries due to the fact that some of these marginalized group's needs lie at the periphery of the programmatic offerings of facilities. This can stem significantly from the facility design, where leisure spaces are organized democratically, or in other words for the needs of the majority[17].

15 Alexandris, Konstantinos and Bob Carroll. "An Analysis of Leisure Constraints Based on Different Recreational Sport Participation Levels: Results from a Study in Greece." Leisure Sciences 19, no. 1 (2009, 1997): 1-2-15.

16 Allison, Maria and Dan Hibbler. "Organizational Barriers to Inclusion: Perspectives from the Recreation Professional." Leisure Sciences 26, no. 3 (2010, 2004): 261-262-280.

17 Jun, Jinhee, Gerard Kyle, Theodorakis Vlachopoulous, James Absher, and William Hammitt. "Reassessing the Structure of Enduring Leisure Involvement." Leisure Sciences 34, no. 1 (2012, 2012): 1-2-18.



Evolution of Winter Sporting Typologies, *Figure 1.39*
These tables summarize each sport sociology paper that was relevant to physical activity environments.

Structured Leisure Opportunity

Any increase in leisure opportunity correlates directly to the increased participation of higher socio-economic groups.[18] Minority users, who are typically low frequency users, are more engaged by opportunities that require less skill components, and a more structured setting to have equivalent rates of participation. Whether that structured setting comes from the built environment or coaching,[37,19,20] both systems are effective tools for inclusion. Hierarchy of opportunity and making leisure more or less accessible is derived from identity theory. More structured environments provide higher levels of identity reinforcement for users who have less personal association with a specific leisure activity. The less a user is adept in a specific ability, the more structure is needed to support them. The more adept a user, the more abstract and unstructured the leisure opportunities they can pursue.[36] This effect is also demonstrated in the qualitative analysis of the evolution of BMX cycling[21] as well as in figure 1.39, illustrating the peripheral expansion of major sport typologies in the last 50 years.

18 Skille, Eivind and Ivan Waddington. "Alternative Sport Programmes and Social Inclusion in Norway." North West Counties Physical Education Association 12, no. 3 (2006, 2006): 251-252-271.

19 Jun, Jinhee, Gerard Kyle, Theodorakis Vlachopoulous, James Absher, and William Hammitt. "Reassessing the Structure of Enduring Leisure Involvement." Leisure Sciences 34, no. 1 (2012, 2012): 1-2-18.

20 Kelly, John. "Outdoor Recreation Participation: A Comparative Analysis." Leisure Sciences 3, no. 2 (2009, 1980): 129-130-154.

21 Corte, Ugo. "A Refinement of Collaborative Circles Theory: Resource Mobilization and Innovation in an Emerging Sport." Social Psychology Quarterly 76, no. 1 (2013, 2013): 25-26-51.

This leads to the institutionalization of sporting forms; public opportunities for involvement in sports by everyday means. The contrast between participation rates in institutionalized sports versus non-institutionalized sport is stark; typically participation rates can vary as much as 40% between typologies of various populations.[22,23]

Though the research is still in it's infancy, studies have indicated that facility plays a very important role in promoting opportunities for user groups who are either a minority or an at risk population.[42] Gobster (2007) does a re-examination of trail usage data, examining various user amenities, both built and natural, in non-coached activities. High intensity or frequent users tended to use trails that were less groomed, and had less physical amenities. Conversely, groups of users who had lower levels of intensity and frequency tended to use trails that were more physically defined, and had higher amounts of amenities.[24] Increased numbers of amenities and more defined physical activity space promotes inclusion amongst low intensity and casual user groups. Data also suggests that casual user and low intensity participants typically belong to marginalized ethnic, cultural or gender based groups. So to increase the amount of usage for at risk groups, increased amenities and higher quality physical activity space continue to lead the charge in promoting inclusion.[43]

Non-Sport Related Typologies + Activities and Increased Levels of Inclusion

This section details current research relating to elements within social and built environments that affect the levels of participation in sport and leisure activities. There are many environmental elements that effect participation rates in sport, but many are not directly related to physical activity.[43,25,26,27,28] For example, not every member of a sporting club may be interested in playing the sport. Many participants are interested in different activities or elements[29] like socializing, event planning, management, family support, spectating, etc. The field of research isn't hugely developed and there are calls for more thorough, interdisciplinary research.[30,31] There is a broad range of work starting to outline the extents of elements that can influence participation.

There have been many attempts to create theoretical frameworks to understand the spectrum of factors that affect the success of sporting facilities. Recreation, tourism and leisure management have viewed the problem from a sociological perspective; evaluating facilities by social, environmental and managerial conditions or using a theory called the Recreation Opportunity Spectrum.[32]

22 Pearson, Kent. "The Institutionalization of Sport Forms." Sage Publications (: 51-52-60).

23 Skille, Eivind and Ivan Waddington. "Alternative Sport Programmes and Social Inclusion in Norway." North West Counties Physical Education Association 12, no. 3 (2006, 2006): 251-252-271.

24 Gobster, Paul. "Recreation and Leisure Research from an Active Living Perspective: Taking a Second Look at Urban Trail use Data." Leisure Sciences 27, no. 5 (2007, 2005): 367-368-383.

25 Galloway, Shayne. "Recreation Specializiation among New Zealand River Recreation Users: A Multiactivity Study of Motivation and Site Preference." Leisure Sciences 34, no. 3 (2012, 2012): 256-257-271.

26 Kaltenborn, Bjorn. "Nature of Place Attachment: A Study among Recreation Homeowners in Southern Norway." Leisure Sciences 19, no. 3 (2009, 1997): 175-176-189.

27 Kemperman, Astrid and Harry Timmermans. "Children's Recreational Physical Activity." Leisure Sciences 33, no. 3 (2011, 2011): 183-184-204.

28 Kim, Seong-il and Daniel Fesenmaier. "Evaluating Spatial Structure Effects in Recreation Travel." Leisure Sciences 12, no. 4 (2009, 1990): 367-368-381.

29 Koski, Pasi. 2008. Physical activity relationship (PAR). International Review for the Sociology of Sport 43 (2): 151,151-163.

30 Henderson, Karla and Deborah Bialeschki. "Leisure and Active Lifestyles: Research Reflections." Leisure Sciences Sciences 27, no. 5 (2007, 2005): 355-356-365.

31 Romsa, Gerald. "Recreation Research and Planning in the Federal Republic of Germany: A Commentary." Leisure Sciences 3, no. 3 (2009, 1980): 257-258-275.

32 Manning, Robert. "Diversity in a Democracy: Expanding the Recreation Opportunity Spectrum." Leisure Sciences 7, no. 4 (2009, 1985): 377-378-399.

Current Leisure Social Theory

The main text that emerged with a solidified theoretical framework was Koski's *'Physical Activity Relationship (PAR)'* (2008). Koski develops the concept of Physical Activity Relationship (PAR), which differs from typical theoretical leisure organization patterns because PAR emphasizes how social organization effects environmental organization. This is not typical, because most theories developed organize social space through environment, opposite to what PAR suggests. In Manning's 'Diversity in a Democracy (2009) he refers to the "Recreation Opportunity Spectrum" which categorizes sport, social, environmental and management factors.[51] Plainly put, Koski would be asking "what makes social environments successful in a sporting context?" compared to "what makes sporting environments successful in a social context?" Koski develops a 4 tiered framework composed of:

1. *Personal Physical Activity*
2. *Following of Physical Culture*
3. *Production in Physical Culture*
4. *Consumption of Meanings of Physical Culture*

The breadth of this argument is developed through the analysis of a shift in social contexts in the Western World; an argument consistent within many other positions in leisure research, and examined in this literature review in an earlier section. Koski's theory is the only paper to consider participation in physical activity as a component of a successful sporting environment, while much of the other research labels physical activity as the primary component of success.[51] Koski's work is theoretical in nature, and lacks sufficient research and development to solidify his theory. However, it is potentially an avenue that could be very fruitful due to its inclusion of so many social elements seen in other research, as well as it's alternative theoretical approach.

2.2 CURRENT ARCHITECTURAL THEORY REGARDING PHYSICAL ACTIVITY SPACE

Currently there is a very limited amount of architectural theory and research regarding successful grassroots sporting architecture. Though there are many texts supporting the development of high-end sporting facilities, tailored for elite-level athletes; this approach does not benefit the majority of the public, and can leave facilities underused or abandoned.[1] There is a lack of general architectural research that uses a scientific basis, making the fields breadth of knowledge expand horizontally, with little vertical movement. Much of the Health and leisure research pertains to the built environment and the linkage is quite clear. This section outlines emerging trends recorded from both health science research regarding the built environment, and current architectural theory and research patterns.

Place attachment theory appears to summarize the vast majority of current research. Current research has corresponding elements in architectural and leisure science, reinforcing its ability to act as an baseline model and guiding further research in both fields.

Methodology

The Avery and Tri-City University databases were searched with the boolean phrase '(psychology of place) AND (environment)', these sources were further refined to include only peer-reviewed material. This material is found in Table 2.04 in appendix 1.2 included below. Other material was recommended by professors, or referenced in articles and is included in 2.03 in appendix 1.2. Multiple search Booleans were performed in the Tri-City Database for a preliminary understanding of the field of research including '(Sport) AND (Architecture)' and '(Leisure) AND (Architecture)' but the vast majority of source material included in these search results was not peer reviewed, and had little research based discussion. Relevant material found in these searches is included in table 2.03's (in appendix 2) summary of materials.

1 Gratton, Chris, and Ian P. Henry. 2001. Sport in the city.

Results

The search Booleans produced 18 results, which were refined to only 3 articles. The other 15 articles did not have any relevance to environment or place, and were either reviews, unrelated, or regarding technology. The limited research trends found in architectural specific databases can be seen in figure 2.04 in appendix 2. Relevant material by various sources (refer to figure 2.03), and leisure research pertaining to the built environment can be seen in figure 2.01 and 2.02 in appendix 2.

2.3 OUTCOMES AND CONCLUSIONS

Interdisciplinary Research + Design to Fully Understand the Applications of the Spectrum of Research

The call for interdisciplinary research within the field of physical activity and leisure related environments is significant.[33,34,35,36,37,38] It is a well-known fact that research from an architectural and health science perspective, regarding leisure space, is limited. Though there is development towards creating a critical mass of research, there is still a lack of a cohesive framework defining the complete spectrum.[67,62] German planners regionally use and develop attractivity models to accurately identify, quantify and compare various factors involved in planning leisure environments.[65] What is interesting about these factors is that they are composed of environmental and social components, creating a cross-disciplinary set. Similarly other studies used methodologies of evaluation that started to span social and environmental factors.[39,40] These studies have positive correlations, identifying that both sets are influential in the success of recreation sites and facilities, while studies pertaining specifically only to one set of elements tend to lack in scope and are indeterminate in their findings.[41] The repetition of the concept of "place" was a continuing theme throughout many of the more interdisciplinary articles, mentioning potential frameworks for understanding the effectiveness of 'place' based design.[42,43,44,45] Overall, the research advocates for interdisciplinary approaches to the design of our leisure facilities. Current interdisciplinary work involves both social and environmental factors in various decision-making processes.

Typological Categorizations of Leisure Space

In the literature examined, there was an emergence of source material specifically related to the categorization of urban recreation typologies based on physical and sociological attributes. There

33 Koski, Pasi. "Assessing the Sociology of Sport: On N+1 and the Cultural Approach." International Review for the Sociology of Sport 4, no. 5 (2014): 502-503-506.

34 Kemperman, Astrid and Harry Timmermans. "Children's Recreational Physical Activity." Leisure Sciences 33, no. 3 (2011, 2011): 183-184-204.

35 Allison, Maria and Dan Hibbler. "Organizational Barriers to Inclusion: Perspectives from the Recreation Professional." Leisure Sciences 26, no. 3 (2010, 2004): 261-262-280.

36 Romsa, Gerald. "Recreation Research and Planning in the Federal Republic of Germany: A Commentary." Leisure Sciences 3, no. 3 (2009, 1980): 257-258-275.

37 Dunn, Diana. "Urban Recreation Research: An Overview." Leisure Sciences 3, no. 1 (2009, 1980): 25-26-57.

38 Lee, Chanam and Anna Moudon, Physical Activity and Environment Research in the Health Field: Implications for Urban and Trasnportation Planing Practce and Research. Sage Publications, (2004).

39 Galloway, Shayne. "Recreation Specialization among New Zealand River Recreation Users: A Multiactivity Study of Motivation and Site Preference." Leisure Sciences 34, no. 3 (2012, 2012): 256-257-271.

40 Kaltenborn, Bjorn. "Nature of Place Attachment: A Study among Recreation Homeowners in Southern Norway." Leisure Sciences 19, no. 3 (2009, 1997): 175-176-189.

41 Kelly, John. "Outdoor Recreation Participation: A Comparative Analysis." Leisure Sciences 3, no. 2 (2009, 1980): 129-130-154.

42 Canter, David. The Psychology of Place. The Architectural Press Ltd: London (1977)

43 Kaltenborn, Bjorn. "Nature of Place Attachment: A Study among Recreation Homeowners in Southern Norway." Leisure Sciences 19, no. 3 (2009, 1997): 175-176-189.

44 Stedman, Richard. "Toward a Social Psychology of Place: Predicting Behavior from Place-Based Cognitions, Attitude, and Identity." Environment and Behaviour 34, no. 5 (2002, 2002): 561-562-581.

45 Stedman, Richard. "Is it really just a Social Construction?: The Contribution of the Physical Environment to Sense of Place." Society and Natural Resources 16, (2003, 2003): 671-672-685.

was a range of categorization systems in quality and execution. There were 4 studies that produced tangible models for categorization. 2 of these sources; *Diversity in a Democracy Expanding the Recreation Opportunity Spectrum ROS* and *Recreation Research and Planning in the Federal Republic of Germany: A Commentary* both are heavily based on research and used verbal description systems for spatial categorization and strategy. The other 2 sources; *Sport in the City* and A*ctivating Architecture and Urban Planning* were based on case study research, but had a visual strategy of implementation. The following will discuss the pros and cons of each system and then suggest a course of action based on these findings.

Explanation of the Conceptualization of Space

The leisure spaces that people live and dwell in are complex by nature; they are the culmination of a huge variety of factors, within both the physical and social realm. Sports leisure research examines elements that can be statistically analyzed, compared to architectural research that only documents elements that can be visually observed. Each has strengths and weaknesses.

Summary and Analysis of Techniques

The sport leisure research papers both used similar techniques in the categorization of leisure opportunities. *Recreation Opportunity Spectrum (ROS)* and Attractivity Modeling both evaluated physical environments using very similar common criteria: Nature/natural factors, physical/managerial factors, and social factors. These factors have different names, but the components evaluated in each source are very similar. Natural factors are typically non-built, environmental components like parks and green spaces. Social factors exist between people, but physical environments can help or hinder interactions. Physical and managerial factors contribute to the operation of the facility, whether they are office spaces, or roadways.[46] The Architectural typological research used similar techniques to categorize elements each article deemed to be important. *Sport in the City* and *Activating Architecture and Urban Planning* had both identified planning and spatial factors. *Sport in the City* had an additional social factor, examining organization and policy implementation in conjunction to the two spatial typologies. Planning and spatial factors both examine the built environment, and categorize elements into effective macro and micro design strategies. Organization and policy implementation contained social elements, not immediately relatable to the built environment.

The two systems of categorization had a significant amount of overlap. When both systems are evaluated using the recreation opportunity spectrum, both social and physical factors were found to be in common, while only leisure research papers evaluated nature specific opportunities.

Practical Application of these Elements

The Architectural guides to recreation space were not supported by research. The typologies in these guides were developed through the analysis of various case studies. Though these typologies are accurate in categorizing the spaces found in their case studies, their applicability is limited to the space that they examined. Assuming that the architectural guidelines are accurate, they would represent a much more in-depth categorization system for Management/Physical components within combinatory ROS or Attractivity models. This basis for high levels of practicality could sponsor similar development in the categorization systems for natural and social features, promoting a much more balanced and applicable model of examination. The leisure research could also inform the architectural research. This would provide other facets of natural and social environments to evaluate. A cross pollination of research provides evidence to support the architectural categorization system, as well as potentially refine some of the current streams of analysis.

46 Clark, Roger N and George Stankey. The Recreation Opportunity Spectrum: A Framework for Planning, Management and Research. The U.S. Department of Agriculture and Forest Services. Oregon. (1979)

Conclusion

The lack of knowledge on how to maintain leisure within the shifting context of modernity has significantly impacted the design of our sporting facilities. Current research from a health science perspective has done significant work in understanding the social frameworks that can help foster more productive leisure environments. Environments of inclusion through sport have been concluded to encourage these factors. This research is still within its developing stages, and will need further work to establish a better understanding of factors influencing social behavior in active environments. Figure 2.06 shows the overlap between much of the research.

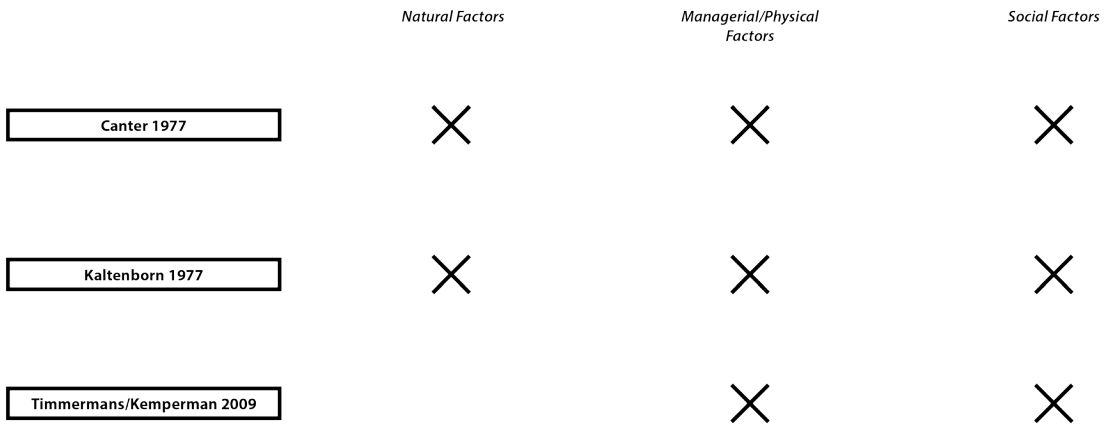


Figure 2.06. Overlapping organizational formats between major research papers.

The architectural scope of research concerning leisure space is also fairly limited in nature. Multiple calls for cross-disciplinary work have been made because much of the research, whether leisure or architectural, is inapplicable due to the relative lack of scope. David Canter's place attachment theory (1977) provides a basis for future research in the built environment. Its categorization of social, natural and physical environments is inclusive of factors represented in research papers of smaller and larger scope. The 3 environments mentioned in place attachment theory, represent positive factors, which correlate in almost all of the quantifiable research examined within this review. Many of the papers reviewed did not examine all three of these environmental themes, but their correlations fell usually within 2/3 of these categories. Further research should be done within these three categories because the applicability to practice in design and programming is currently relatively high.

The gaps between architectural and health science research is considerable but representable. This being said, the definition of the built environment is very thorough, but lacks significant methodological based research to support conjectures. Further research should encompass a much broader spectrum of physical components that influence the way we interact with our sporting environments. None of the previously mentioned theories are able to identify a comprehensive range of spatial characteristics, and only develop the research within a narrow scope.

3.0 Hybridizing Methodology

3.0 HYBRIDIZING METHODOLOGY

Introduction
The literature review outlined the current understanding of how the built environment affects sporting participation. Architectural research summarizes built environments, but sport sociology research defines them. Much of the sport sociology research varies, and there is no unified direction. Chapter 3's intention is to unify all the relevant theory and research from the literature review into a hybridized framework that is relevant to built environments.

Identifying the Gaps
There are gaps in the research between architecture and sport sociology's understanding of how the built environment influences the success of sport facilities. To summarize, architectural research does a good job of thematically categorizing built elements, but does not to identify the elements that play a critical role in a facilities success. Social science has two categories: Qualitative and Quantitative understandings of spatial elements. The Quantitative research begins to identify individual elements that are critical to a facilities success, but fail to express these successes within a broader framework. The qualitative research defines a broader framework, but cannot determine which individual elements are critical.
These two fields compliment each other. Architecture provides a thematic 'big picture' understanding of how built elements work together, while social science research identifies the individual components. Once hybridized, these two fields of research provide a significantly more comprehensive understanding of sporting facilities, and how the physical environment can influence their success.

The literature review provided a comprehensive understanding of how to understand sporting environments from a variety of viewpoints. The following is a list of headings summarizes the range of topics within the literature review.

Social and Cultural Inclusion Through Sport
Structured Leisure Opportunity
Non-Sport Related Typologies + Activities and Increased Levels of Inclusion
Current Leisure Social Theory
Current Architectural Theory
Interdisciplinary Research
Typological Categorizations of Leisure Space
Current Architectural Theory Regarding Psychological Effects of Space

There is a level of richness embodied in all of the research represented above, but only the topics in bold will be developed further in the thesis. These specific themes were selected because they are immediately relevant to the built environment and have been observed to influence higher levels of participation and retention amongst users. These categories will be placed in three specific groups:

Quantitative Sport Sociology Research regarding the Physical Environment
Social and Cultural Inclusion Through Sport
Structured Leisure Opportunity
Non-Sport Related Typologies + Activities and Increased Levels of Inclusion

Qualitative Sport Sociology Research regarding the Physical Environment
Non-Sport Related Typologies + Activities and Increased Levels of Inclusion
Typological Categorizations of Leisure Space

Architectural Research and Typology Development
Typological Categorizations of Leisure Space
Current Architectural Theory

Objectives and Summary
The objectives of this section are:

A) *Define the three areas of research being utilized from the literature review*
B) *Reference and explain the adaptation of this research into a practical framework for each section*
C) *Combine each of these adapted sections in order to create a hybridized list of physical elements. In order to do this, diagrams will have assigned corresponding written components.*

The quantitative and architecture sections describe the specific factors that will eventually be included in the hybridized framework. The qualitative section explains why diversifying spatial typologies in our sporting facilities is important for the sake of inclusion. These two sections are both dissected using a 6-stage methodology. This was necessary to understand which subcategories overlapped with others to reduce redundancy. The following is a summary of each section:

Stage 1, Research Papers: The four main research papers are listed and broken into two groups; infrastructurally organized research and socially organized research.

Stage 2, Categorical Breakdown: Each paper consists of 3 to 5 main categories of infrastructural or social organization. Infrastructurally organized papers list subcategories. *Physical Activity Relationship (PAR)* lists social factors of organization.

Stage 3, Application of Spatial Relevance: In order for *Physical Activity Relationship (PAR)* to be a spatial strategy, it needed the application of additional research (please see section above: Socially Driven Strategies). With this application, spatial patterns could be derived from the four social factors. Only major categories are retained for infrastructural strategies in order to simplify the hybridization of factors.

Stage 4, Hybridization of major Categories: Major categories from both infrastructurally and socially organized research papers are combined to eliminate redundancy, and create a hybridized framework for understanding. Individual categories are grouped under each of the new overarching titles.

Stage 5, Sorting of spatial strategies: All of the subcategories associated with the new overarching spatial categories are listed, sorted for redundancy, removed for a lack of application to the physical environment, or modified to be spatially applicable.

Stage 6, Finalized Listings: Stage 6 consists of the refined elements within each of the new categories of the hybridized spatial strategy. This is by any means not complete, but provides what compiled lists of strategies to categorize physical activity and recreation environments currently associated with sport sociology research.

3.1 QUANTITATIVE SPORT SOCIOLOGY RESEARCH

Understanding The Big Picture

Quantitative sport sociology research identifies amounts of space, defined by a typological model, with finite precision. There are two categories that emerged from the literature review: Space defined by activity (infrastructurally guided) and activity defined by space (socially guided. There were a total of 4 papers that provided typological systems or Attractivity models.) Three of the papers are infrastructurally driven, while the remaining paper was socially driven.

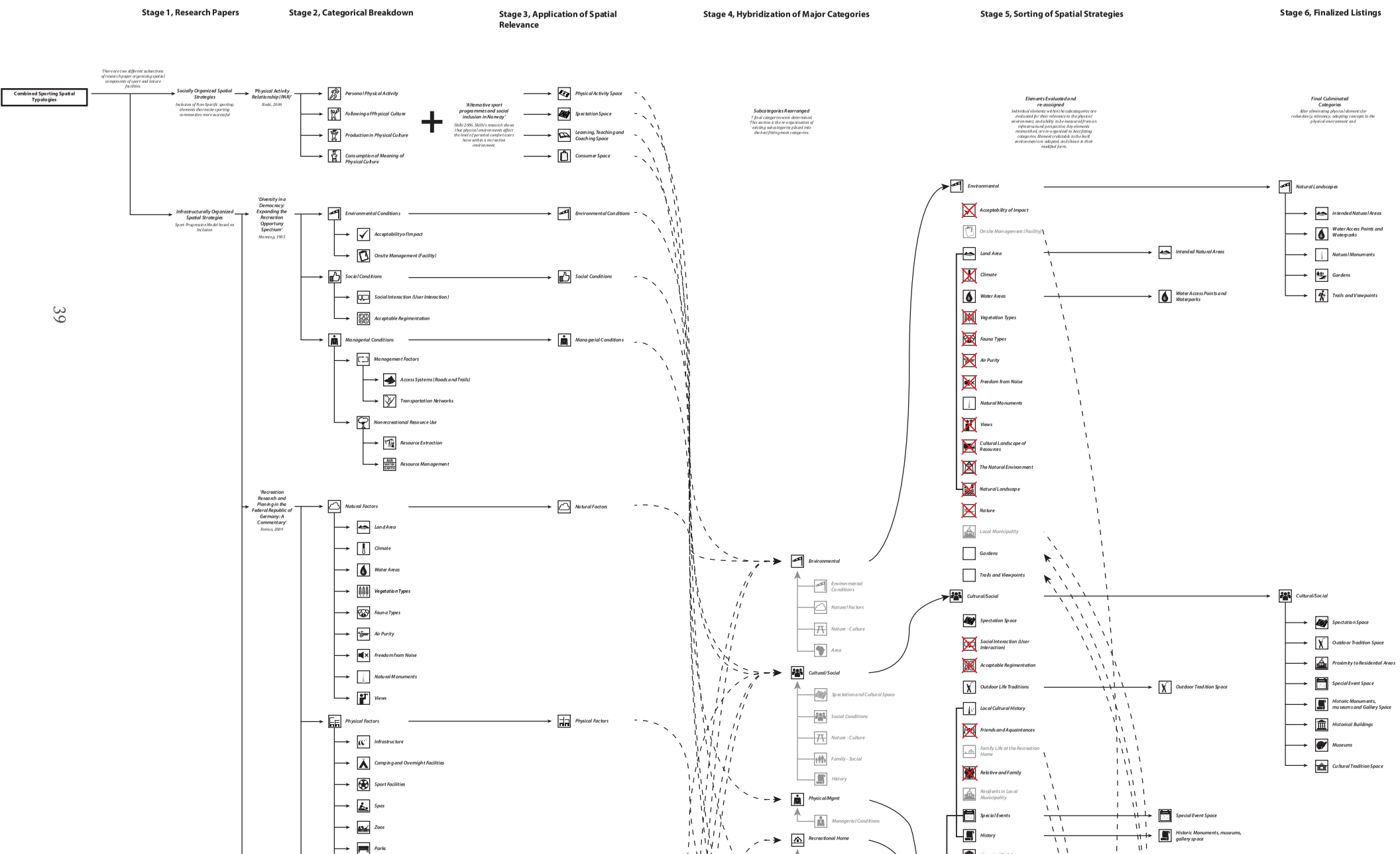
Stage 1 and 2: Research Papers and Categorical Breakdown

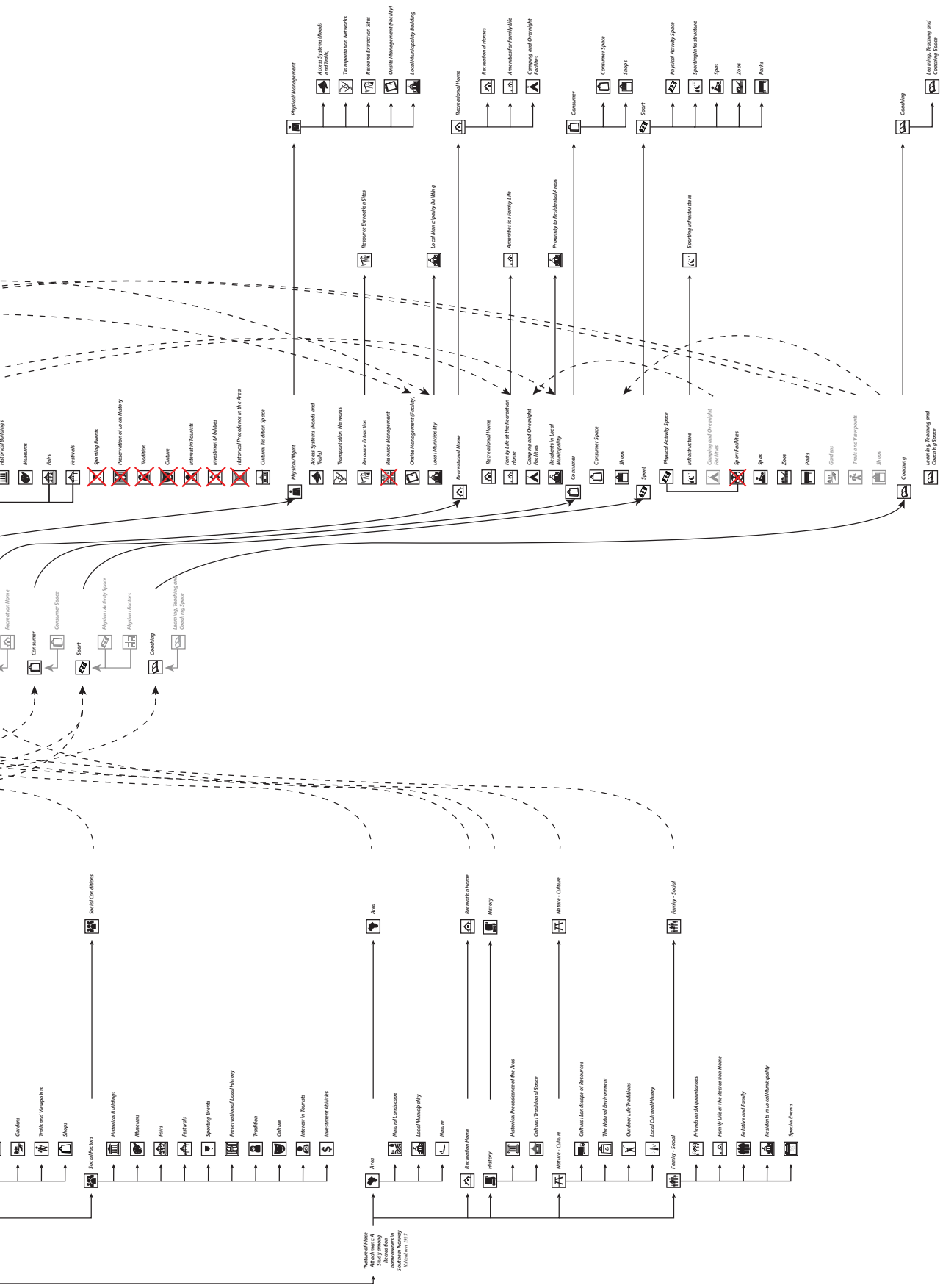
Infrastructurally Driven Strategies

All three of these strategies have common elements before even looking at the content. All three are based on research, and each has been used within a practical field of application. Each system has had a varied level of success, but there have also been suggestions for making these models more comprehensive[1]. Many of the models are too specific, and lack the flexibility to provide diversity. Others are too general, having a broad conceptual framework that is too open to provide any sort of real guidance. However, the theoretical framework from each of the papers provides a different perspective on what factors are important to the build environment. All the papers stem from relatively the same position, with many of the factors being consistent amongst all three. By understanding how each typological system defines their individual factors, they can be compared for similarities and differences. See figure A3.01 in appendix 3 for a summarized comparison of the papers, and figures 3.03-3.05 for a complete visual summary of the spatial typologies created in this section. The following papers were examined throughout this section:

Koski, Pasi. *Physical Activity Relationship (PAR)*, (2008)
Manning, Robert E. *Diversity in a Democracy: Expanding the Recreation Opportunity Spectrum,* (2009)
Romsa, Gerald H. *Recreation Research and Planning in the Federal Republic of Germany: A Commentary,* (1980)

1 Manning, Robert E, Diversity in a democracy: expanding the recreation Opportunity Spectrum, Leisure Sciences, 7:4, 384, DOI: 10.1080/01490408509512132


Stage 1, Research Papers
Stage 2, Categorical Breakdown
Stage 3, Application of Spatial Relevance
Stage 4, Hybridization of Major Categories
Stage 5, Sorting of Spatial Strategies
Stage 6, Finalized Listings
Combined Sporting Spatial Typologies
There are two different subsections of research paper organizing spatial components of sport and leisure facilities.
Socially Organized Spatial Strategies
Inclusion of Non-Specific sporting elements that make sporting communities more successful
'Physical Activity Relationship (PAR)'
Kraft, 2006
Personal Physical Activity
Following of Physical Culture
Production in Physical Culture
Consumption of Meaning of Physical Culture
'Alternative sport programmes and social inclusion in Norway'
Skille 2006. Skille's research shows that physical environments affect the level of personal comfort users have within a recreation environment.
Physical Activity Space
Spectation Space
Learning, Teaching and Coaching Space
Consumer Space
Infrastructurally Organized Spatial Strategies
Sport Programs in Model based on Inclusion
'Diversity in a Democracy: Expanding the Recreation Opportuny Spectrum'
Manning, 1985
Environmental Conditions
Acceptability of Impact
Onsite Management (Facility)
Social Conditions
Social Interaction (User Interaction)
Acceptable Regimentation
Managerial Conditions
Management Factors
Access Systems (Roads and Trails)
Transportation Networks
Non-recreational Resource Use
Resource Extraction
Resource Management
Environmental Conditions
Social Conditions
Managerial Conditions
'Recreation Research and Planning in the Federal Republic of Germany: A Commentary'
Romza, 2009
Natural Factors
Land Area
Climate
Water Areas
Vegetation Types
Fauna Types
Air Purity
Freedom from Noise
Natural Monuments
Views
Physical Factors
Infrastructure
Camping and Overnight Facilities
Sport Facilities
Spas
Zoos
Parks
Natural Factors
Physical Factors
Subcategories Rearranged
Final categories were determined. This section is the re-organization of existing sub-categories placed into the best fitting main categories.
Environmental
Environmental Conditions
Natural Factors
Nature - Culture
Area
Cultural/Social
Spectation and Cultural Space
Social Conditions
Nature - Culture
Family - Social
History
Physical/Mgmt
Managerial Conditions
Recreational Home
Elements Evaluated and re-assigned
Individual elements within the subcategories are evaluated for their relevance to the physical environment, and ability to be measured from an infrastructural perspective. Any elements mismatched, are re-organized to best fitting categories. Elements relatable to the built environment are adopted, and shown in their modified form.
Environmental
Acceptability of Impact
Onsite Management (Facility)
Land Area
Climate
Water Areas
Vegetation Types
Fauna Types
Air Purity
Freedom from Noise
Natural Monuments
Views
Cultural Landscape of Resources
The Natural Environment
Natural Landscape
Nature
Local Municipality
Gardens
Trails and Viewpoints
Cultural/Social
Spectation Space
Social Interaction (User Interaction)
Acceptable Regimentation
Outdoor Life Traditions
Local Cultural History
Friends and Aquaintances
Family Life at the Recreation Home
Relative and Family
Residents in Local Municipality
Special Events
History
Intended Natural Areas
Water Access Points and Waterparks
Outdoor Tradition Space
Special Event Space
Historic Monuments, museums, gallery space
Final Culminated Categories
After eliminating physical elements for redundancy, relevancy, adapting concepts to the physical environment and
Natural Landscapes
Intended Natural Areas
Water Access Points and Waterparks
Natural Monuments
Gardens
Trails and Viewpoints
Cultural/Social
Spectation Space
Outdoor Tradition Space
Proximity to Residential Areas
Special Event Space
Historic Monuments, museums and Gallery Space
Historical Buildings
Museums
Cultural Tradition Space



Quantitative Sport Sociology Diagram

Figure 3.01, A comprehensive diagram explaining how spatial strategies from various sources are organized, revised, edited and reformatted.

Kaltenborn, Bjorn P. *Nature of Place Attachment. A Study Among Recreation Homeowners in Southern Norway* (1997)

Socially Driven Strategies

Physical Activity Relationship (PAR), defines successful sporting activities through social factors, not infrastructural ones. While 3 of the main research papers are defined infrastructurally, PAR's factors are social defined. *Physical Activity Relationship (PAR)* does not explicitly define space from a social perspective, but addresses different categories of social activity that directly relate to physical activity. There is significant research correlating non-sporting related activity to the participation in physical activity.[2,3,4,5,6] Facility and our built environment plays a role in this higher level of accessibility. Skille and Waddington do a comprehensive survey of Norwegian youth participation in a variety of physical activity settings, grouping statistics together based on gender and high or low socio-economic status. One of their pre-emptive findings was this:

> *'… Commercial training centres are more popular among females than among males. It may be significant in this regard that commercial fitness centres are normally run on very formal lines, and they often have quite strict codes governing participants' behavior, including the use of offensive language, and sometimes dress codes, all of which appear designed to ensure that the sensitivities of all users of the facility, but perhaps especially the sensitivities of less 'robust' users such as some women, are not offended, and that all users – and perhaps, again, especially, those who are less 'robust' – can exercise in a situation in which they feel both physically and psychologically secure. This situation, we suggest, may not be found anything like the same degree in the open sport hall[7], where the relative absence of adult control has facilitated the development of distinctively masculine culture which is unwelcoming to young females'*[8]

Skille's research suggests that environments that formalize interactions between individuals at sporting facilities will make them more appealing and attractive, especially to users who do not effectively conform to the qualities of a traditional masculine culture. In contrast, when an environment of little social control is established, the levels of inclusion and participation decrease. This makes the issue of inclusion and participation in sport a built environment problem, not just something that can be addressed from a programming standpoint.

Skille's research compliments Koski's very effectively; Skille justifies designing space for social effectiveness and legitimizes it through research, while Koski's PAR defines what kind of social factors

2 Gobster, Paul. Recreation and Leisure Research from an Active Living Perspective: Taking a Second Look at Urban Trail use Data. Leisure Sciences 27, no.5 (2007,2005): 367-368-383

3 Galloway, Shayne. "Recreation Specialization among New Zealand River Recreation Users: A Multiactivity Study of Motivation and Site Preference." Leisure Sciences 34, no. 3 (2012, 2012): 256-257-271.

4 Kaltenborn, Bjorn. "Nature of Place Attachment: A Study among Recreation Homeowners in Southern Norway." Leisure Sciences 19, no. 3 (2009, 1997): 175-176-189.

5 Kemperman, Astrid and Harry Timmermans. "Children's Recreational Physical Activity." Leisure Sciences 33, no. 3 (2011, 2011): 183-184-204.

6 Kim, Seong-il and Daniel Fesenmaier. "Evaluating Spatial Structure Effects in Recreation Travel." Leisure Sciences 12, no. 4 (2009, 1990): 367-368-381.

7 In Alternative sport programmes and social inclusion in Norway, Skille and Waddington study 3 different activities with increasing amounts of coaching structure attached to them. Open Sport Hall is the activity time without any formal structure, equipment is left out for use in a gym, and there is no coaching support or organization.

8 Skille, Eivind A, Ivan Waddington, Alternative sport programmes and social inclusion in Norway, European Physical Education Review 2006, Volume 12 (3) 265-266, DOI: 10.1177/1356336X06069273

should be considered in order to make sport successful. Skille's argument justifies PAR for an equal level of analysis to the 3 other studies primarily examining infrastructural factors on participation rates.

Stage 3: Application of Spatial Relevance

PAR and its Four Categories

Physical Activity Relationship (PAR) was not written as a typological system for spatial understanding; in order to find the parallel spatial features that correspond to *PAR*, it needs to be dissected into four sections. By understanding the implications of the intended activity, spatial qualities can be assigned that would assist in realizing the initial intentions[9]. This is a method of association used to define the spatial qualities relevant to Koski's social elements.

In order to give spatial qualities to all of *PAR's* sections (see list below) we must take the following steps:

1) *Define the type of Activity*
2) *Determine what the intended outcome of the activity was*
3) *Define spatial features that help realize the intended outcome of step 2.*

PAR's four sections are:

Personal Physical Activity
Following of Physical Culture
Production in Physical Culture
Consumption of Meaning of Physical Culture

Personal Physical Activity

Personal physical activity is the first section of *PAR* and probably the simplest. This consists of activities for physical recreation.[10] Koski describes personal physical activity using intention of the participant. The intention of the user should match the result of the activity. For example, Bob would like to go for a run. The activity is running, and bob wants to run a distance. Bob now needs a space that is conducive to running, like a track, park or pathway. By linking user activity to intention, and then intention to suitable space, the 4 categories in *PAR* can be related to the physical environment.

Following of Physical Culture

Following physical culture can most easily be described as spectator sport or 'concerned with the following of others' activities'[11]. This type of spectating is not limited to personally witnessing activities, but includes spectating via TV, Internet, newspaper and other types of media. Spectating has a range. External shape is at one end and internal essence is at the other[12]. External shape of sport refers to understanding what a sport may look like, while understanding internal essence pertains to the rules,

9 In David Canter's Psychology of Place (1977), they examine the impact of how patterns of spatial association affect users. Doing a study of a salesman superimposed with different backgrounds, they measure people's responses to the salesman, unaware of the photo manipulation. The findings of the study are that 'our expectations are a result of patterns of commonly occurring actions, and in turn give rise to actions which fit in those patterns.' (p.121, Psychology of Place, Canter D, 1977). By understanding the intended effects of our activity, we can use the spatial environment to influence users to behave in a specific fashion.

10 Koski, Pasi. Physical Activity Relationship (PAR) Sage Publications, 2008. p.158

11 Koski, Pasi. Physical Activity Relationship (PAR), Sage Publications, 2008. p.158

12 External shape is a concept developed by Sociologist Kalevi Heinilä in 1986, in conjunction with the concept of internal essence. External shape is the general understanding of a sporting event, without knowing the rules or formal regulations. Internal essence is the regulation, rules and/or limitations of a specific sport, which give events and performance meaning due to having a basis of comparison and restriction.

regulations and restrictions associated with the sport or activity. The intention of the activity is to observe patterns and behaviors that match the internal essence and external shape of the sport at hand. Environmentally, space that contributes, aids or enhances the ability of the user to observe sporting patterns would be considered congruent to the aims of Koski's social typology.

Production of Physical Activities

Production of physical activities refers to the organization and logistical components that are required to produce *PAR's* first and second elements. '*Producers of physical activities are, for example, parents who organize physical activities for their children or other active person who gather groups for activities… without producers the organized physical activities do not exist."*[13] This can be a broadly interpreted section, and can also include *'many different roles such as administrative positions or as instructors."*[14] The activity is organizing and facilitating events, and the intent of this action is to provide spectators the opportunity to participate. From an architectural perspective, there is a range of spaces that would be complimentary to the intent of these activities. Specific teaching or learning space would assist with instructors, while effective office, storage and maintenance spaces are also relevant.

Consumption of the Meanings of Physical Activity

The final section of *PAR* refers to the *'consumption of sport goods and services'*[15] Koski refers to the broader penetration of cultural iconography throughout society and how it is influenced by physical activity and sport. Sport has become an element that defines society as a collective in many countries. The activities mentioned by Koski are the procurement of goods and services in direct or indirect relationship to the influence of sport. The intention of this activity is to associate with sport through materiality. To assist consumers to become associated with sport through material procurement; effective shopping, branding and opportunities for association using spatial strategies would be productive.

Stage 4: Hybridization of Major Categories

Combining Spatial Sporting Typologies

There is a wealth of knowledge contained within each of the 4 mentioned studies. Each study begins to unpack a typological set that defines a successful recreation space[16]. Each study takes place in a different location, and looks at slightly different factors. Each of these studies are done within a specific country, and factors that are applicable due to the cultural, geographic, and climactic conditions may not be as important or relevant to each other. Each country also has a different government. Government policy around sport and leisure varies dramatically, and therefore each strategy will reflect different factors. By collecting the typological lists and combining this broad array of factors, we can start to have a more comprehensive understanding of spatial typologies within the built environments of our sport and leisure facilities. Figure A3.02 in appendix 3 is a breakdown of each of the infrastructurally driven social science research papers, and a description of each of the subcategories described.

13 Koski, Physical Activity Relationship (PAR), 159
14 Pasi Koski, Physical Activity Relationship (PAR) (Sage Publications, 2008), 159
15 Koski, *Physical Activity Relastionship (PAR),* 159
16 Physical Activity Relationship (PAR) is applicable as a spatial typological methodology when Koski's social framework from Alternative Sport Programmes and Inclusion (Eivend, 2006) is applied spatially.

Afterwards the categories were grouped based on title and similarity in definition. If there was a discrepancy as to which group the category should be placed, the description of the category became the defining element rather then the title.

7 Point Strategy
The outcome of the hybridization of this theoretical material is a 7-point strategy. Figure A3.02 in appendix 3 lists each paper and the spatial typologies derived from them. This combines the theoretical methodology from the 4 studies in order to create a framework to define successful elements of the built environment. It is still unclear how much and in what proportion these elements need to be established in our sporting facilities, but it begins to outline the core elements defining inclusive physical activity environments. The 7 categories are as follows:

1. Natural Landscapes
Elements that are defined within this category are focused on directly or indirectly experiencing landscape or natural environments. This could include grasslands, forests and waterpark areas. Recreational features bordering on natural and artificial were included in this category because the intention of the recreation space is to emphasize the natural environment and being outdoors. Viewpoints were also included in this category for similar reasoning.

2. Cultural/Social
The social and cultural category will include any physical environment that's primary emphasis is to encourage socialization, either on a group or individual basis. This includes event, ritual and tradition space.

3. Physical/Management
The physical and management category includes a broad range of space. The physical component includes any sort of roads, trails or networks that are intended primarily for access. This is in contrast to trails included in the environmental section; where the trails are meant for recreational activity. The management component includes a portion of the facility that is dedicated to maintenance, administration or upkeep.

4. Recreation Home
This category covers homes, campsites or other spatial typologies that allow for users to stay within close proximity of the main site. This can include normal homes that are within close proximity of a recreational facility.

5. Consumer
Consumer space is any sort of space that allows for the purchase of goods within the facility, or payment point for services. This includes retail shops; pro shops and any area where items related to the main recreation activity can be purchased.

6. Sport
This category is probably the most obvious of any of the 7 criteria listed. This includes any space dedicated to sport, recreation or physical activity. This can also include recreation space that is unrelated to the main athletic focus of the facility (ex. A workout room is supplementary program to a soccer facility).

Figure 3.02, A comprehensive list of categories and corresponding spatial typologies; the product of chapter 3.

7 Category Strategy and Spatial Sub-typologies

The individual spatial typologies that are the make up of each of the 7 spatial categories that define recreation space. Each typology has a description and icon.

Natural Landscapes

- ***Intended Natural Areas.*** *The category of land area was very broad, but due to its initial category, it was adapted to "intended natural areas" which would be defined as areas surrounding the site that had remained untouched and/or undeveloped.*
- ***Water Access Points and Waterparks.*** *Water areas can be quite expansive, and would scew results based on lake size. But access points and artificial waterparks are quantifiable spatial elements.*
- ***Natural Monuments.*** *Natural monuments are abnormal elements that help define a landscape. These are not normal and should be visually and/or geometrically unique.*
- ***Gardens.*** *Gardens are specifically programmed areas, and are designed with the primary intent for people to relax, and enjoy nature. Must contain groomed plant matter other then lawns or grass.*
- ***Trails and Viewpoints.*** *Trails and viewpoints are elements that have the primary function of defining a physical environment for the spectation of the natural landscape. The primary purpose of these are pedestrian recreation and travel.*
- ***Green Space.*** *Planned to be acessible within proximity to recreation areas. Do not have to be maintained by people. Must have an occupaiable grass or organic surface.*
- ***Continuous Greenspace.*** *Having accessible continuous for users at and around the site. Must have a grass or organic surface typology and maintained by people.*
- ***Scenic Viewpoints.*** *Points of observation of natural or manmade landscapes. These can be demarkated, but is not neccesary. Usually are elevated above the surrounding.*

Cultural/Social

- ***Spectation Space.*** *Space that allows users to observe a sporting activity occuring within the immediate vicinity. These must be designed, but can be natural or manmade.*
- ***Outdoor Tradition Space.*** *A Physical environment that enables outdoor traditions, either cultural, social, religious or sporting based. These spaces can be indoor or outdoor, but have specific geometries intended to serve a specific tradition.*
- ***Proximity to Residential Areas.*** *The importance of social connections are important, family or otherwise and many of these connections happen in non recreation spaces. Therefore this element was adapted.*
- ***Special Event Space.*** *A space that caters to the needs of formal gatherings, parties, events or dinners. This space can be flexible, but its main intended purpose is to accomodate these types of events.*
- ***Historic Monuments, museums and Gallery Space.*** *Local cultural history can be represented spatially through museums, historic monuments and gallery space, therefore this element was spatially adapted.*
- ***Historical Buildings.*** *Buildings that represent a specific period of architectural design or style that is not presently being used. These buildings are typically older. The intended purpose of these buildings are typically for display and tourist reasons.*
- ***Museums.*** *Museums are spaces that gather and display artifacts. They can be formal, state sponsored museums but they can also be small portions of a facility.*
- ***Cultural Tradition Space.*** *Space that assists and/or is occupied for human activity that holds cultural significance, relevant to the immediate geography or anthropologic history of the area.*
- ***Social Meeting Place. This space contains*** *Benches, seating, temporary or permanent gathering space in order to primarily facilitate formal or informal social and cultural gatherings.*
- ***Small Niche/Pause Points.*** *Small benches, niches, or outcroppings that encourage temporary occupation by a small number of people.*
- ***Simple Shelter.*** *These shelters protect from rain, and the elements, while allowing for sunlight and fresh air.*
- ***Informal Public Space.*** *Public square, parks, or any public gathering area allowing active expression*

Physical/Management

- ***Access Systems (Roads and Trails).*** *This category represents any sort of network of physical access systems that allow access, either by car, bike or on foot. These pathways be manmade or natural, The primary purpose of these networks are transportation, not recreational purposes.*
- ***Transportation Networks.*** *Transportation networks allow goods and services to be provided to facilities in a bulk or large quantity shipment.*
- ***Resource Extraction Sites.*** *These sites don't relate immediately to usage or the sport. They act as a secondary source of revenue, secondary site access, or a tourist attraction.*
- ***Onsite Management (Facility).*** *Space that is dedicated to the management of a facility. This can include maintenance, administrative, or storage space for a facility.*
- ***Local Municipality Building.*** *Local municipalities can play supporting or direct roles in managing an area, park, field, beach, lake or partial areas of any of the areas listed above. Therefore having a municipality spatially present can impact a facility.*
- ***Trails and Pedestrian Pathways.*** *Helps to connect green spaces and other points of interest with pedestrian walkways. These can be formal or informal public pathways that connect spaces together, or create a network of pathways.*

Recreational Home

- ***Recreational Homes.*** *Areas of homes that are in the immediate proximity of the recreation facilities. These homes can be of primary or secondary residence.*
- ***Amenities for Family Life.*** *On-site resources that allow families to stay at the facility for extended periods of time. This can include the following areas: Laundy, Kitchen, Lounge, Library, Bathrooms, Showers etc.*
- ***Camping and Overnight Facilites.*** *Space that directly allow user groups to stay overnight at a facility for temporary periods. This can constitute campgrounds, rental rooms, cottages or any facility that partially or completely facilitates overnight occupation.*
- ***Proximity to Residential Areas.*** *Residential areas that are close to recreational areas allow for a select group of participants to have easy access to facilities. If designed effectively, these local populations can constitute a large portion of longterm facility users.*

Consumer

- ***Consumer Space.*** *Spaces that are dedicated to consumerism. Any retail or food service space constitutes 'consumer space".*
- ***Shops.*** *Shops define physical environments, and their primary purpose is to sales of goods.*

Sport

- ***Physical Activity Space.*** *Physical activity space is any space that is specifically designed for recreation or sporting activities, either formal or informal. This can include interior and exterior space.*
- ***Sporting Infrastructure.*** *Sporting infrastructure is space or spatial elements that supports the sporting activities emphasized at the facility. This can include changerooms, showers or other facilities that make the activity possible.*
- ***Spas.*** *Spas are facilities have specific program dedicated to the recovery and relaxation of users. Facilities vary in composition and program.*
- ***Zoos.*** *Zoo spaces constitute areas where animals, foreign and local, are kept for public spectation. Facilities are comprised of open air and built areas for different species.*
- ***Parks.*** *Park areas include multiple benched areas, recreation areas including swings, slides, casual climbing areas, playgrounds and other user-driven outdoor leisure space.*
- ***Large Sporting Fields.*** *Outdoor public fields within 400m of the facility. These sites should be accessible to both public and private users. These fields are formalized, and have some demarkation to determine the type of sport.*
- ***Adapted Sport Space.*** *Sporting space that does not follow typical dimensions due to spatial disparity compared to formalized sporting space. These spaces are still designed for a specific activity, just with a specific change or deformity to the sporting field.*

Coaching

- ***Learning, Teaching and Coaching Space.*** *Dedicated space designated for teaching lessons. These areas can have special allocation for storage of teaching aids, teaching specific spaces such as whiteboards, smartboards, computer areas or large scale models as teaching aids.*

7. Coaching
The coaching category includes any space that has a primary goal of learning, teaching or coaching. These learning environments can be directly related to the primary athletic focus of the facility, or can be a general use learning facility.

Figure 3.02 explains the individual spatial typologies that are contained in each of the 7 categories.
By having an established set of criteria we can begin to document sporting space to understand the proportion of elements that make them more successful.

Stage 5: Sorting of Spatial Strategies

Process and Intention
Stage 5 was to re-organize individual spatial elements that had been defined in each individual research paper. The purpose of this was to make these elements match their overarching categories more appropriately, remove elements that were not defined spatially, remove elements that we not relevant, and adapt theoretical elements so they were spatially applicable. The intention of this section was to create consistently defined spatial elements that could be categorized using the system developed in stage 4: Hybridization of Major Categories.

Removal of Elements
Each research paper had multiple elements, and some of them were not applicable to a built environment. Elements were evaluated for their ability to have a spatial component that would reflect the intention of activity. Not all elements were able to do this. Many socially and environmentally oriented elements suffered from a lack of specificity. These elements are undoubtedly important, but could not be accurately represented spatially. When an individual element from a research paper did not have a clear spatial counterpart, it was removed and not placed in 1 of the 7 categories.

Adaptation of Elements
Many theoretical elements from individual research papers had spatial counterparts. These theoretical elements were adapted it had an action, value or circumstance that had a corresponding spatial element. This way, space can represent not only activities, but also the values that they embody.

Re-organization of Elements
Many elements, adapted or originals; needed re-organization to fit the new categories. Elements were matched to the best possible overarching categories, based on their new descriptions. There were multiple duplicate elements, which is rational considering each classification system has been looking at the same thing. When duplicate, or very similar spatial elements were found, the categories were merged into one another.

Stage 6: Finalized Listings
The end result of the process is 7 solidified categories with individual spatial elements being reorganized, distributed, removed and adapted into these new categories. This system does not necessarily include all spatial elements that can be considered, for there are always new typologies of space being developed, but provide a basis for evaluating our sport and leisure facilities. Table 3.03 in appendix 3 shows the individual development of and justification of each spatial element.

Limitations of Hybridizing Theory

The 7 point hybridized strategy is not perfect and has a series of flaws attached to it. By combining theoretical frameworks from a broad variety of sources, it allows for higher levels of comprehensive evaluation. However, all four papers could have missed spatial elements that prove fundamental to successful sporting facilities. The socially driven strategies lack comprehensive research and supporting papers to provide a thoroughly developed strategy. Koski's paper does provide a unique perspective into successful social modeling for participants and athletes, but more research with similar outcomes would bolster the legitimacy of Koski's work. The infrastructurally driven strategies have a significantly richer field of research to pull from, and many of their theoretical models have significant amounts of research associated with them. Their diversity provides a good, broad basis of variables to incorporate, but because each study is at a different scale and for a different region of the Western World; not all factors may be relevant to the scale of the built environment.

The hybridized list of 7 categories provides a much more comprehensive model of understanding our sporting environments, but still does not help us understand the proportion or amounts of these spaces needed in our built environments.

Further Research

The hybridized theory described above allows us to understand what elements effect our built environment, but it doesn't let us understand their relationship to one another, particularly in terms of quantities and proportions. Without this information, we won't know what kind of combinations makes these facilities successful. Architectural research suffers from the same problem. Architectural research is very rich in terms of categorical understandings of space, but also lacks the ability to give us insight into how much of each element is needed. To begin to answer this, a series of sailing clubs from the same region, used as case studies, will be analyzed and will begin to unpack the quantitative spatial patterns between the individual categories. Each club will be spatially analyzed using the 7 categories developed, and data will be compared to the levels of participation and retention amongst club participants.

3.2 QUALITATIVE SPORT SOCIOLOGY

Moving from Theory to Practice

Qualitative sport sociology research identifies key patterns within sporting environments that encourage increased participation of users. In the previous section *Quantitative Sport Sociology Research*, specific environmental categories were identified that play a positive role in increasing sport participation. This section starts to unpack why a more structured environment can be so impactful to increasing inclusion and participation. This concept does not just apply to the justification of the 7 elements recognized in

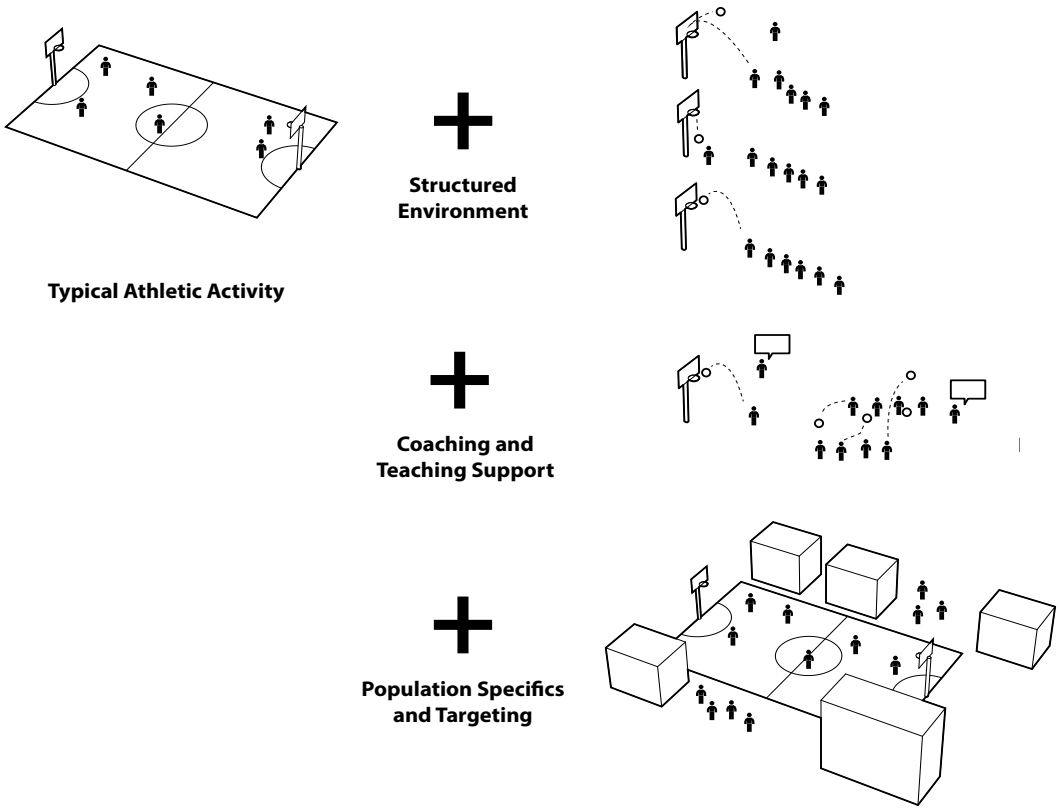


Figure 3.03, How athletic activity can be augmented by a few simple factors.

the previous section, but also how each of those individual elements is organized on a smaller scale.

More Structure means more Inclusion

Current research indicates that environments influence the way we perceive them. In David Canter's *Psychology of Place* (1973) Canter explains in detail how the physical environment can influence people's perception of safety, type of activity, and even how they perceive others who they interact with.[17]

Now that it has been identified that environment does influence how people use space, it needs to be established what makes sporting spaces more or less conducive to participation and retention of participants. *In Alternative sport programmes and social inclusion in Norway* (2006) Eivind Skille does a study attempting to understand how different categories of activity affect levels of participation. There were three specific categories in the study, with declining amounts of structure. Participants would control activities and there would be no formal coaching or organization. Participants were categorized into four groups: Academic males, Academic females, Vocational males and vocational females. In descending order, these groups were categorized from least at risk to most at risk of not participating in physical activity.[18] The findings were that category 1 and category 2 activities had approximately a 60% participation rate amongst the general population, and had 40-60% participation rates with at risk populations (anything except Academic boys).[19] This was in contrast to category 3, which had a drop in participation. Only approximately 15% of the population participated in drop in activities. It is easy to conclude that these more structured activities were much more attractive to users than unstructured ones.

Why does Increased Structure Provide Increased Inclusion?

There are many conjectures about why a more structured environment yields more participation, especially amongst at risk groups in sporting communities. Skille allocates this disparity to gender and access to resources. Though only 15% of the population participated in category 3 activities, only 8% of total females in the study participated compared to 20% of all male participants.[20] Skille borrows Dunning's argument[21] that sport is an outlet of societies physical prowess and power, elements that are also associated with a *"masculinity-validating experience."*[22] This argument is also seen in The Institutionalization of Sport Forms where *"both surf life saving and surf board riding are replete with examples of the pressures towards athleticization of sport."*[23] Even in non-competition based sport, the move towards higher performance, and more formalized activity is becoming a trend. As a sport becomes

17 Psychology of Place, 1973 pgs. 120-121 Canter explains the how the conception of place can create self-fulfilling prophecies. "Our expectations are a result of patterns of commonly occurring actions, and in turn give rise to actions which fit in with those patterns. This is the reason why the conceptual systems, on one hand are so powerful, and on the other hand are so intertwined with concepts of actions." (Canter, 1973, p.121) Canter makes the connection that spatial patterns influence our expectations, which determine how people will act in those environments.

18 Skille, Eivind A, Ivan Waddington, Alternative sport programmes and social inclusion in Norway, European Physical Education Review 2006, Volume 12 (3) 256, DOI: 10.1177/1356336X06069273

19 Skille, Waddington, Alternative sport programmes and social inclusion in Norway, European Physical Education Review 2006, Volume 12 (3) 256, DOI: 10.1177/1356336X06069273

20 Skille, Waddington, Alternative sport programmes and social inclusion in Norway, European Physical Education Review 2006, Volume 12 (3) 260, DOI: 10.1177/1356336X06069273.

21 Skille, Waddington, Alternative sport programmes and social inclusion in Norway, European Physical Education Review 2006, Volume 12 (3) Dunning argues that sport in Great Britain was developed in the 18th and 19th centuries to isolate physical forms of violence and promote stricter self-discipline. Due to this isolation of physical violence, specific forms of physical dominance can govern sport. The consequence of this governance is that less physically dominant individuals will shy away from this type of activity.

22 Skille, Waddington, Alternative sport programmes and social inclusion in Norway, European Physical Education Review 2006, Volume 12 (3) p. 260

23 Pearson, Kent, Institutionalism of Sport Forms, 1979 DOI: https://doi.org/10.1177/101269027901400103, p. 55

more competitive, less and less people are able to access it due to financial restriction and inability to compete. Increased structure is one method that mitigates athleticization. If sport is associated with non-competitive elements, like specific environmental conditions or self-expression[24] then masculinity-validating experiences can also be minimized. This observation by both Pearson and Dunning is congruent to the quantitative sport sociology research. Both the quantitative and qualitative research supports the inclusion of space that is not immediately related to the primary athletic activity.

Application to the Built Environment

After establishing that more structured opportunity allows for higher levels of inclusion, we need to understand how this applies to the built environment. More specific design will allow for environments to be better tailored, providing a definitive experience for a group of people, aiding in the inclusion of more participants. Recent research has indicated that having a striated approach to leisure and skill development is conducive to retaining a large portion of participants. Urban trail data and research suggest that beginner activity areas should contain higher levels of non-sport related amenities in order to make the experience more attractive for non-sporting related reasoning.[25] Figure 3.03 is a visualization of how the built environment can provide non-sport specific amenity relief at various stages of athletic development.

24 Kent, Institutionalism of Sport Forms, 1979, p. 55

25 Gobster, H Paul, Recreation and Leisure Research from an Active Living Perspective: Taking a Second Look at Urban Trail Use data, (Leisure Sciences, 27:367-383, 2005)

3.3 ARCHITECTURAL RESEARCH

There is an array of architectural literature and theory regarding how the built environment affects sport and recreation facilities, however much of this literature is not supported through research, and at most provides a theoretical framework lacking in substantiation. Many of the more theoretical models have a level of abstraction that makes it difficult for them to be applicable to real world design strategies. There is a piece of literature that is very effective at categorizing athletic space. This, in combination with a research based approach, allows for a 'best of both worlds' scenario: providing the relevance of a categorical system based on case study, and the proven effectiveness of a research based approach.

Stage 1: Research Papers

Current Field of Research
All the research papers that had categorization systems were included in this portion of the analysis. Architectural research around sport facility effectiveness is rather limited; therefore only 1 paper was included. The one paper was structured, and had an approach to categorize design methods of sport and recreation facilities. *Activating Architecture and Urban Planning's* categorization methodologies are based on the physical identification of elements and planning strategies specific to athletic environments.

Activating Architecture and Urban Planning
Activating Architecture and Urban Planning is a strategic methodology developed by Rasmus Anderson at the Centre for Sports and Architecture in Denmark. The strategy is developed in two stages: The first stage recognizes planning an area or space. It is broken into 3 steps: Mapping, Programming and Impact. Their categorization system corresponds to this, recognizing and identifying themes within Mapping and Programming categories. These analyses are based on visual identification of patterns emerging from current sport and recreation environments. This is an effective strategy in terms of categorization, but without having any corresponding data, elements identified do not necessarily correspond to a successful environment; they correspond to elements currently being employed in built projects. The second stage of the strategy is a classification system of public space. Rene Kural gathers a series of precedents, identifies public elements and then makes suggestions for spatial improvements. Similar to the first half of the strategy, the lack of evidence supporting the assumed failures or successes of the spaces makes assumptions about the spaces hard to support.

Limitations and Strengths
The limitations to this piece of literature is that it lacks a level of research based assumptions, specifically looking at strategies that work and do not work within the built environment. The tools identified do correspond to patterns and spaces found in the built environment, giving these spatial tools a level of grounding. The architectural research does a great job of identifying spatial patterns and common elements, but fails to identify how they effect user participation.

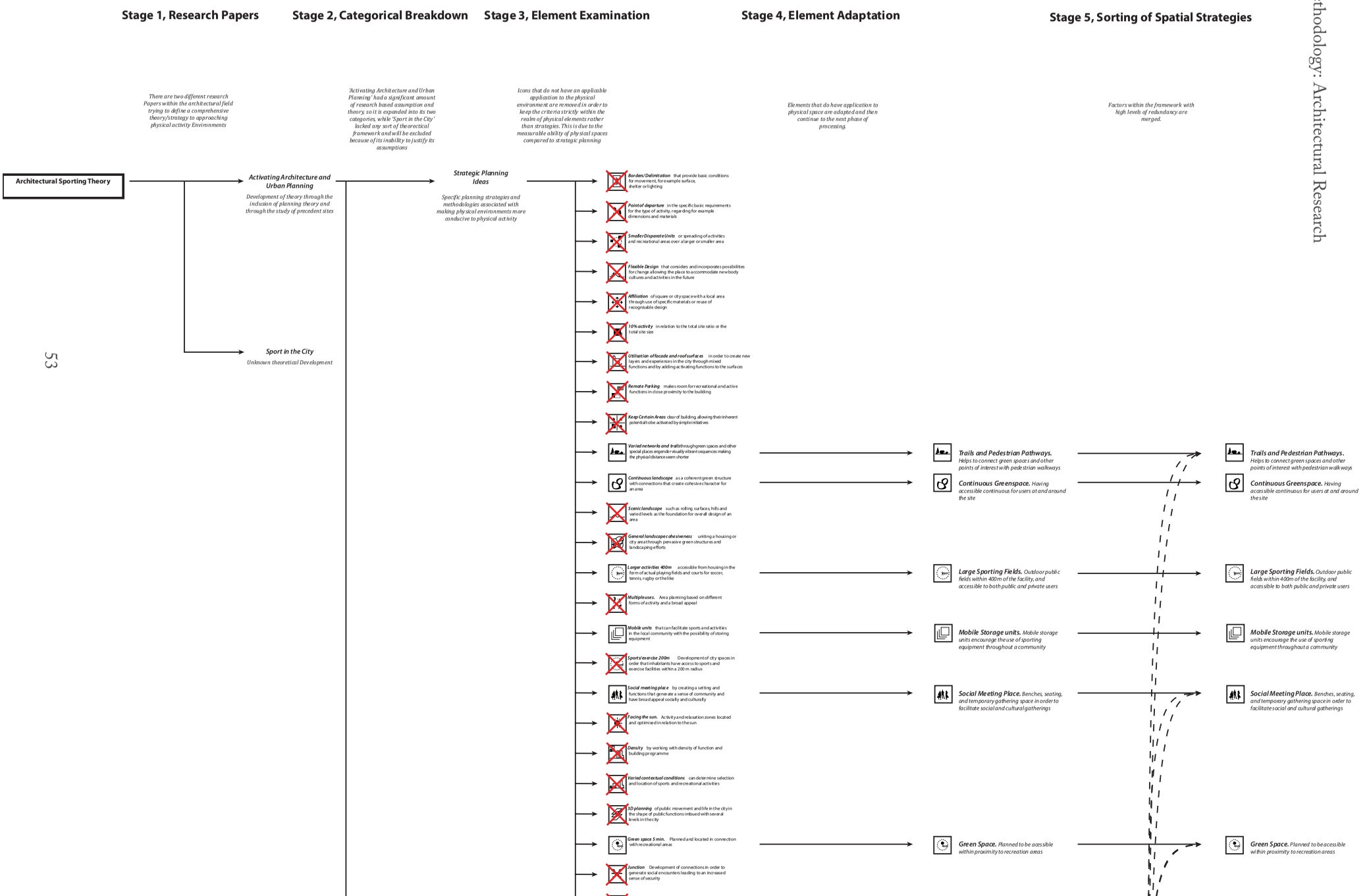
Stage 2: Categorical Breakdown
Rene Kural's Sport in the City was the only remaining research paper, so the categorization of spatial elements mimics same framework outlined in his research. There are two main fields, strategic planning ideas and specific qualitative ideas. Strategic Planning Ideas are concepts taken from the field of planning and identified on an individual basis, while Specific qualitative ideas represent spatial conditions that are "conducive to physical activity and sport."[26] Many elements between the two categories are quite similar, but the two fields are kept separate in this stage of analysis in order to allow for individual adaptation later. The adaptation process could yield different spatial elements, even though strategies and spatial components initially may represent very similar ideas. Refer to figure 3.04.

Stage 3: Element Examination
All of the elements listed under the two categories were laid out with descriptions. Each element was examined for their relevance to the physical environment, needing to have spatial qualities in the description or inferred through the title. The second responding characteristic looked for was how those spatial qualities were intended to affect people's interactions. At this stage, elements were categorized into being kept, being adapted or being removed. This sorting method is identical to the one used for sport sociology components. Elements that did not have a specific spatial quality and/or did not have any direct social implication were removed. Elements that had both a spatial description and social implication were kept and included in the final categorization system.

Stage 4: Element Adaptation
Elements that were not previously removed or kept were adapted to define a specific spatial quality and its corresponding social implication. These elements were adapted by understanding the primary social implication and then adapted to the most relatable spatial typology that would achieve this.

Stage 5: Sorting of Spatial Strategies
Once all the elements were sorted and adapted, any duplicates were removed. Duplicates could also be elements that described only half of another element, as some elements are more inclusive then others. Some categories had more than 1 duplicate element, but they were still only given a singular icon. See figure 3.04 for a complete visual representation of stages 1-5, and table A3.04 in appendix 3 for individual element breakdowns.

26 Valle, Daniel Casa; Kompier, Vincent, Sport in the City, (www.sportinthecity.net, 2013) p. 18


Stage 1, Research Papers
Stage 2, Categorical Breakdown
Stage 3, Element Examination
Stage 4, Element Adaptation
Stage 5, Sorting of Spatial Strategies
There are two different research Papers within the architectural field trying to define a comprehensive theory/strategy to approaching physical activity Environments
'Activating Architecture and Urban Planning' had a significant amount of research based assumption and theory, so it is expanded into its two categories, while 'Sport in the City' lacked any sort of theorectical framework and will be excluded because of its inability to justify its assumptions
Icons that do not have an applicable application to the physical environment are removed in order to keep the criteria strictly within the realm of physical elements rather than strategies. This is due to the measurable ability of physical spaces compared to strategic planning
Elements that do have application to physical space are adapted and then continue to the next phase of processing.
Factors within the framework with high levels of redundancy are merged.
Architectural Sporting Theory
Activating Architecture and Urban Planning
Development of theory through the inclusion of planning theory and through the study of precedent sites
Sport in the City
Unknown theoretical Development
Strategic Planning Ideas
Specific planning strategies and methodologies associated with making physical environments more conducive to physical activity
Borders/Delimitation that provide basic conditions for movement, for example surface, shelter or lighting
Point of departure in the specific basic requirements for the type of activity, regarding for example dimensions and materials
Smaller/Dispersed Units or spreading of activities and recreational areas over a larger or smaller area
Flexible Design that considers and incorporates possibilities for change allowing the place to accommodate new body cultures and activities in the future
Affiliation of square or city space with a local area through use of specific materials or reuse of recognisable design
10% activity in relation to the total site ratio or the total site size
Utilisation of facade and roof surfaces in order to create new layers and experiences in the city through mixed functions and by adding activating functions to the surfaces
Remote Parking makes room for recreational and active functions in close proximity to the building
Keep Certain Areas clear of building, allowing their inherent potential to be activated by simple initiatives
Varied networks and trails through green spaces and other special places engender visually vibrant sequences making the physical distance seem shorter
Continuous landscape as a coherent green structure with connections that create cohesive character for an area
Scenic landscape such as rolling surfaces, hills and varied levels as the foundation for overall design of an area
General landscape cohesiveness uniting a housing or city area through pervasive green structures and landscaping efforts
Larger activities 400m accessible from housing in the form of actual playing fields and courts for soccer, tennis, rugby or the like
Multipleuses. Area planning based on different forms of activity and a broad appeal
Mobile units that can facilitate sports and activities in the local community with the possibility of storing equipment
Sports'exercise 200m Development of city spaces in order that inhabitants have access to sports and exercise facilities within a 200 m radius
Social meeting place by creating a setting and functions that generate a sense of community and have broad appeal socially and culturally
Facing the sun. Activity and relaxation zones located and optimised in relation to the sun
Density by working with density of function and building programme
Varied contextual conditions can determine selection and location of sports and recreational activities
3D planning of public movement and life in the city in the shape of public functions imbued with several levels in the city
Green space 5 min. Planned and located in connection with recreational areas
Junction Development of connections in order to generate social encounters leading to an increased sense of security
Trails and Pedestrian Pathways. Helps to connect green spaces and other points of interest with pedestrian walkways
Continuous Greenspace. Having accessible continuous for users at and around the site
Large Sporting Fields. Outdoor public fields within 400m of the facility, and accessible to both public and private users
Mobile Storage units. Mobile storage units encourage the use of sporting equipment throughout a community
Social Meeting Place. Benches, seating, and temporary gathering space in order to facilitate social and cultural gatherings
Green Space. Planned to be acessible within proximity to recreation areas
Trails and Pedestrian Pathways. Helps to connect green spaces and other points of interest with pedestrian walkways
Continuous Greenspace. Having accessible continuous for users at and around the site
Large Sporting Fields. Outdoor public fields within 400m of the facility, and accessible to both public and private users
Mobile Storage units. Mobile storage units encourage the use of sporting equipment throughout a community
Social Meeting Place. Benches, seating, and temporary gathering space in order to facilitate social and cultural gatherings
Green Space. Planned to be acessible within proximity to recreation areas

Architectural Research Identified Spatial Categories

Figure 3.04, A diagram visually explaining the exploration of the architectural typologies contained within the relevant research.

3.4 COMBINING ARCHITECTURAL AND QUANTITATIVE RESEARCH

There is significant understanding to be gained by combining architectural and quantitative sport sociology research. The Architectural research's strength is in its environmental identification and categorization of spatial elements, while it lacks how these elements affect participation. Quantitative sport sociology research is effective in identifying how spatial elements affect participation, but is weaker in identifying a comprehensive spectrum of spatial elements. By combining the two categories of research we are able to strengthen the weaknesses of the corresponding research.

Stage 1: Refined Strategies

The first step of hybridizing the architectural and sport sociology categorization systems is to lay out each strategy and their governing section. This includes keeping each element within their existing category. It allows for a qualitative and quantitative evaluation of the remaining elements.

Stage 2: Continued Hybridization

The sport sociology elements are broken into 7 different categories. This categorization system was kept for many reasons: it is much more specific than the architectural categories, it is a hybrid version of the categorization system based on multiple research articles of system organization, and these studies were done on government funded systems. After this decision was made, each architectural element was assigned to a category defined by the hybridized sport sociology theory. For clarity, these categories appear in grey in stage 2 and stage 3 of figure 3.05.

Stage 3: Final Categorized Elements

These are the finalized elements from both hybridized sport sociology theory and architectural models. The categories are derived from hybridized sport sociology research, and the individual elements within each of these categories have been supplemented by the inclusion of architectural ones.

Next Steps

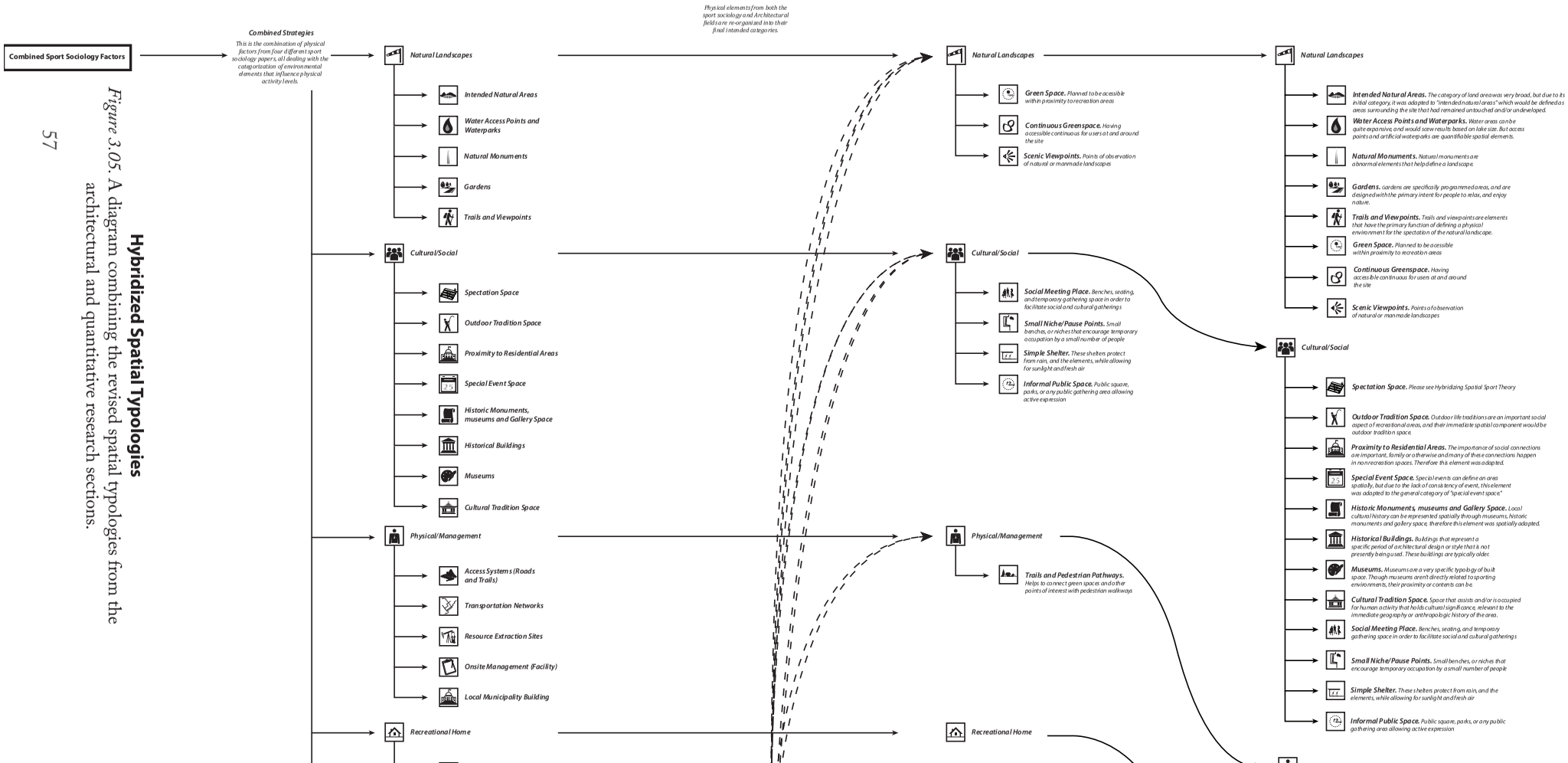
By capitalizing on the two complimentary theoretical frameworks strengths, we can create a symbiotically strong model for identifying elements that positively impact participation and retention at sport and recreation facilities. The lack of centralized theory between architecture and sport sociology research allowed for the inability of the two professions to communicate in similar language. With a hybridized

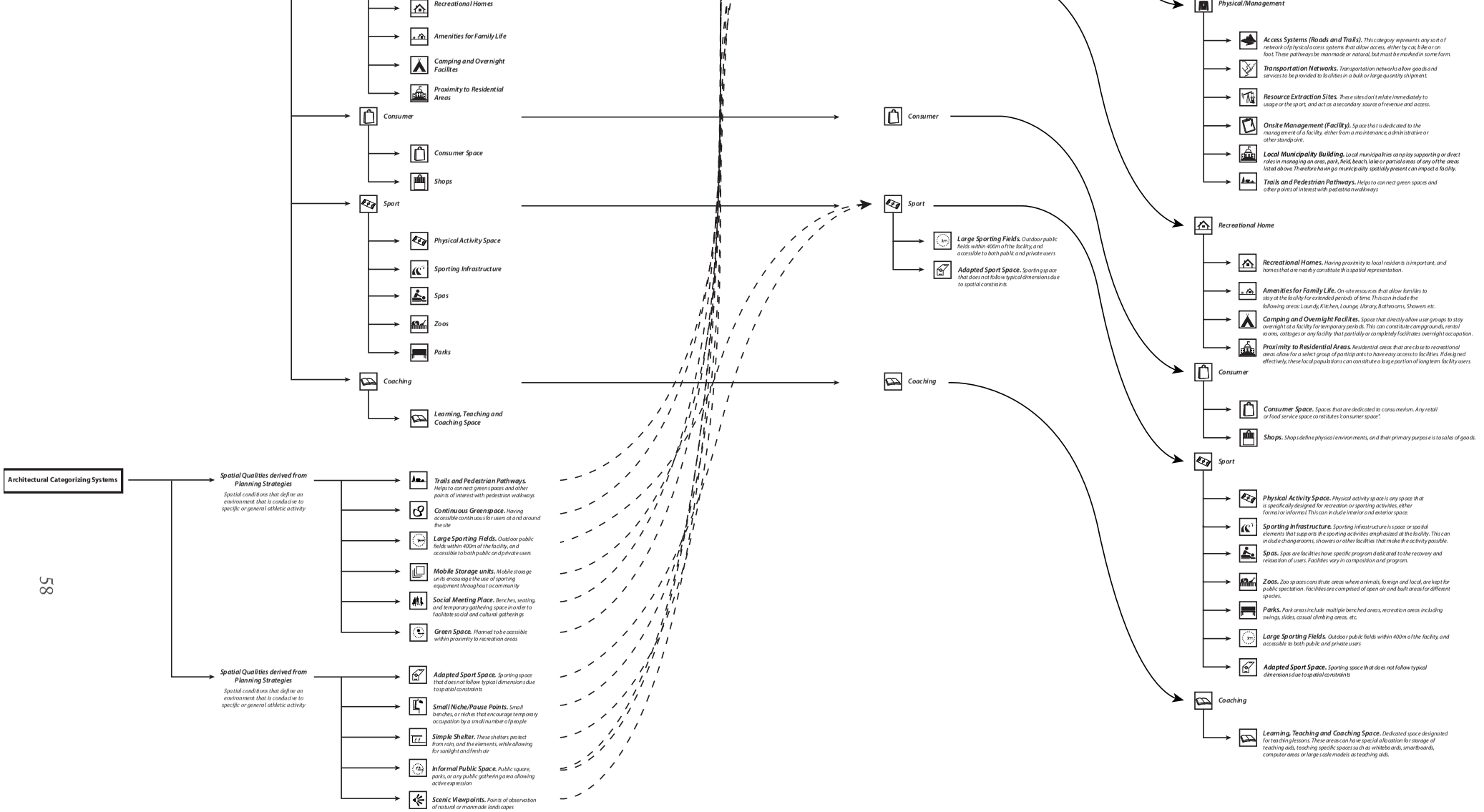
theoretical model defining the core of sporting facilities, the hope is to bring sociological research and architectural application together in a union of progress.

After extensively documenting 14 sailing clubs from across the province of Alberta, the intention is to evaluate each of these sailing clubs using the 7-category model outlined above, to classify and measure how much space is allocated to each category. Afterwards, using data collected from participation and retention data from each club; patterns will be able to be extracted as to what proportion of space corresponds to high levels of participation and retention. This will give us a better understanding of what makes sporting clubs, and specifically sailing clubs more successful in terms of their physical environments. For the visual combination of architectural and spatial sociology typological elements, see figure 3.05.

Hybridized Spatial Typologies

Figure 3.05. A diagram combining the revised spatial typologies from the architectural and quantitative research sections.




Recreational Homes
Amenities for Family Life
Camping and Overnight Facilites
Proximity to Residential Areas
Consumer
Consumer Space
Shops
Sport
Physical Activity Space
Sporting Infrastructure
Spas
Zoos
Parks
Coaching
Learning, Teaching and Coaching Space
Consumer
Sport
Large Sporting Fields. Outdoor public fields within 400m of the facility, and accessible to both public and private users
Adapted Sport Space. Sporting space that does not follow typical dimensions due to spatial constraints
Coaching
Physical/Management
Access Systems (Roads and Trails). This category represents any sort of network of physical access systems that allow access, either by car, bike or on foot. These pathways be manmade or natural, but must be marked in some form.
Transportation Networks. Transportation networks allow goods and services to be provided to facilities in a bulk or large quantity shipment.
Resource Extraction Sites. These sites don't relate immediately to usage or the sport, and act as a secondary source of revenue and access.
Onsite Management (Facility). Space that is dedicated to the management of a facility, either from a maintenance, administrative or other standpoint.
Local Municipality Building. Local municipalities can play supporting or direct roles in managing an area, park, field, beach, lake or partial areas of any of the areas listed above. Therefore having a municipality spatially present can impact a facility.
Trails and Pedestrian Pathways. Helps to connect green spaces and other points of interest with pedestrian walkways
Recreational Home
Recreational Homes. Having proximity to local residents is important, and homes that are nearby constitute this spatial representation.
Amenities for Family Life. On-site resources that allow families to stay at the facility for extended periods of time. This can include the following areas: Laundy, Kitchen, Lounge, Library, Bathrooms, Showers etc.
Camping and Overnight Facilites. Space that directly allow user groups to stay overnight at a facility for temporary periods. This can constitute campgrounds, rental rooms, cottages or any facility that partially or completely facilitates overnight occupation.
Proximity to Residential Areas. Residential areas that are close to recreational areas allow for a select group of participants to have easy access to facilities. If designed effectively, these local populations can constitute a large portion of long term facility users.
Consumer
Consumer Space. Spaces that are dedicated to consumerism. Any retail or food service space constitutes 'consumer space'.
Shops. Shops define physical environments, and their primary purpose is to sales of goods.
Sport
Physical Activity Space. Physical activity space is any space that is specifically designed for recreation or sporting activities, either formal or informal. This can include interior and exterior space.
Sporting Infrastructure. Sporting infrastructure is space or spatial elements that supports the sporting activities emphasized at the facility. This can include change rooms, showers or other facilities that make the activity possible.
Spas. Spas are facilities have specific program dedicated to the recovery and relaxation of users. Facilities vary in composition and program.
Zoos. Zoo spaces constitute areas where animals, foreign and local, are kept for public spectation. Facilities are comprised of open air and built areas for different species.
Parks. Park areas include multiple benched areas, recreation areas including swings, slides, casual climbing areas, etc.
Large Sporting Fields. Outdoor public fields within 400m of the facility, and accessible to both public and private users
Adapted Sport Space. Sporting space that does not follow typical dimensions due to spatial constraints
Coaching
Learning, Teaching and Coaching Space. Dedicated space designated for teaching lessons. These areas can have special allocation for storage of teaching aids, teaching specific spaces such as whiteboards, smartboards, computer areas or large scale models as teaching aids.
Architectural Categorizing Systems
Spatial Qualities derived from Planning Strategies
Spatial conditions that define an environment that is conducive to specific or general athletic activity
Trails and Pedestrian Pathways. Helps to connect green spaces and other points of interest with pedestrian walkways
Continuous Greenspace. Having accessible continuous for users at and around the site
Large Sporting Fields. Outdoor public fields within 400m of the facility, and accessible to both public and private users
Mobile Storage units. Mobile storage units encourage the use of sporting equipment throughout a community
Social Meeting Place. Benches, seating, and temporary gathering space in order to facilitate social and cultural gatherings
Green Space. Planned to be acessible within proximity to recreation areas
Spatial Qualities derived from Planning Strategies
Spatial conditions that define an environment that is conducive to specific or general athletic activity
Adapted Sport Space. Sporting space that does not follow typical dimensions due to spatial constraints
Small Niche/Pause Points. Small benches, or niches that encourage temporary occupation by a small number of people
Simple Shelter. These shelters protect from rain, and the elements, while allowing for sunlight and fresh air
Informal Public Space. Public square, parks, or any public gathering area allowing active expression
Scenic Viewpoints. Points of observation of natural or manmade landscapes

4.0 Research and Documentation

4.0 METHODOLOGY OF TESTING

Inclusion as a Metric for Success

The architectural discourse of sporting design in Canada tends to focus on the glamour of athletics and their corresponding facilities. Facilities are tailored to harness the energy of the masses, to watch the world's elite compete on an international stage.
However, with every Olympian, there is an Olympic proportion of development. Sporting facilities greatly reflect societies interest in the elite, but there is less focus on the development of the beginner and the everyday participant. What makes sporting facilities successful? To answer that we need to address what makes sports successful first.

What defines success in sport? Often times the answer is to focus on the success of elite athletes. But with growing levels of health issues related to lack of physical activity[1] and a dwindling amount of participation in sport and recreation programs,[1] attitudes are starting to shift towards creating inclusionary programs focused on lifelong physical recreational practices.

The research methodology in this thesis is not typical to architectural, planning or sports sociology fields. It uses an interdisciplinary methodology, utilizing techniques from each field to define different elements and to form a comprehensive understanding of the effects of different spatial typologies on sporting facilities.

In Chapter 3, secondary research was utilized in order to produce a hybridized theoretical model of categories and individual typologies that were applicable to the built environment. Chapter 3 created an understanding of what categories, and the accompanying types of space define sporting facilities. The goal of chapter 4 is to start the research process that will define what proportion of these categories and spatial typologies are effective in promoting higher rates of participation and retention amongst users.

This is a multi-stage research process. Each stage incorporates different research, alternating between inductive and deductive reasoning techniques. The stages are:

> ***1. Document all 14 clubs***. This stage consists of visiting every club and recording dimensions of the buildings, the site and recording the typologies of each space.

1 Unknown, "Sport Participation 2010" Her Majesty the Queen in Right of Canada (2013) Catalogue No. CH24-1/2012E-PDF

2. 3D Models of space. Using the information collected from the site excursions, GIS and Google data, each club is re-created in a digital model format. Spaces are mapped out and measured while being grouped into 1 or more of the 7 typological categories developed in chapter 3. Due to the scale of exterior space vs. built space, this documentation process was done at 3 scales in order to create comparable information. These scales were:

> *i) The Built Environment.* Any space that has an enclosed area was considered part of this category.
> *ii) Direct Scale (The immediate Site).* Any space that is on the immediate site owned by the facility that is not classified in category 1 was deemed to be part of the direct scale.
> *iii) Indirect Scale (Surrounding Area).* Any space, built or unbuilt, within 300m of the main facility that does not fall under the classification of category 1 or 2 is considered to be part of the Indirect Scale.

3. Participation Mappings. The participation mappings are visualizations of participation and retention data for the 2015 and 2016 sailing seasons. If a club reported an increase in membership OR participant number, then the club was designated as growing or successful. If a club reported a decrease in membership OR participation, then the club was deemed declining or unsuccessful.

4. Research Survey. The participants from all 14 clubs were given a survey to complete. The survey questions were based on the same categories that were used to evaluate sailing club's spatial distributions. By using the same basis of analysis, but having two different methodologies, it becomes much easier to confirm whether spatial patterns correlating to successful growth at sailing facilities are causation.

The end result is unedited, individual accounts of spatial patterns, participation rates, and survey data that have a common thread of analysis for sailing programs. These findings will then be synthesized in Chapter 5.

Sites Examined

The vast majority of sailing programs documented in this thesis are from the province of Alberta. Sailing programs in different provinces may have different priorities due to cultural, geographic or meteorological differences that occur across the country. The only two exceptions were Sail Sandpoint (Seattle) because it was the only program in the region that was of similar scale as the Glenmore Sailing School, and Great Slave Lake Sailing Club (Yellowknife, NWT) because of it's close proximity to the province of Alberta. Due to the geographic removal of the Great Slave Lake Sailing Club, the site itself could not be visited, and its documentation was based on site photos, GIS data, and Google Maps.

The following 14 sailing clubs were documented:

Cooking lake Sailing Club, Cooking Lake, Alberta
Calgary Yacht Club, Chestermere, Alberta
Disabled Sailing Association of Alberta, Calgary, Alberta
Edmonton Yacht Club, Seba Beach, Alberta

Great Slave lake Sailing Club, Yellowknife, NWT
Glenmore Sailing club, Calgary, Alberta
Itaska Yacht Club, Summer Village of Itaska Beach, Alberta
Ma-Me-O Sailing Club, Summer Village of Ma-Me-O Beach, Alberta
Newell Sailing Club, Lake Newell, Alberta
Sail Sandpoint, Seattle, Washington
Sunshine Bay Sailing Club, Lake Wabamun, Alberta
Sylvan Lake Yacht Club, Sylvan Lake, Alberta
Wabamun Sailing Club, Wabamun, Alberta

The participation data from each club was gathered by contacting the administrative team for each club, and requesting the data from senior club officials or responsible members.

By measuring different typological categories of space at three different scales, understanding the participation and retention rates at each club, and then surveying sailing populations on the premise of understanding their personal priorities in relation to their built environments, we begin to form a much more comprehensive understanding of the relationship between spatial typologies, participation and user motivations.

4.1 PHOTOGRAPHIC DOCUMENTATION

Qualities of Space

This section of the thesis is the photographic and verbal documentation of each sailing club visited. Some of the images have dimensions drawn onto them, which were a mixture of measurements, extrapolations from satellite imagery, and site measurements. These photographs inform the dimensions of the digitally modeled clubs, and the categorical assignment of each space.

The series of photographs are also a qualitative documentation of each sailing club. Though some of these factors are too subtle to be accounted for in the analysis featured in this thesis, they are still worth recording and acknowledging.
Prairie sailing clubs have never been the biggest clubs, nor the flashiest. They do not have the best equipment, have the most resources, or have the biggest membership bases. What these clubs lack in financial capital or recorded size is made up in their character, and their unique reflection of the mixture of nautical tradition and western Canadian prairie influence. Each site has a specific description of their individual parts, and of the spatial quality of the program.

Prairie clubs are as simple and complex as they sound. They are prairie sailing clubs. They enjoy a unique middle ground between the white walls and proper exteriors of traditional nautical buildings; and the cozy simplicity of prairie hospitality. Different clubs fall on the spectrum between these two extremes, and have unique blends of the two typologies.
The nautical tradition of sailing clubs emerges in the architecture in the form of traditional decorative elements and finishes; white walls, wood floors, exposed roof timbers and minimalism. Prairie architectural styles embody the mid-century modern and prairie modern movements. The mid-century modern style can be described simply as simple organic decorative features, with a simple structural rationalism. This style typically contains a large amount of wood, especially in furniture pieces. Prairie modern overlaps with mid-century modern in many categories: The use of wood is critical, simple structural rationality in built components, expansive windows to landscape views, and shallow but simple pitched roofs.
Throughout the documentation of these sailing clubs there were very strong instances of these styles being expressed multiple times, especially through the roof proportions of the facilities. Many sites had one to two single pitch roofs informing the shape of the building. From a design perspective this allowed one of the sides of the building to open up to more light, or in many cases a more accessible view of the waterfront and beach. For this reason many of the club's organization focused on having most of the picturesque program between the clubhouse and the waterfront. Organizing their site like this enriched the already often-expansive views these clubs were privy to. Many sailing clubs do favour their waterfront views compared to a street or town view, however the use of the prairie modern style to

further accentuate this quality of the clubs is a good blend of the two styles.
The interiors of these clubs created a far higher range of variability in terms of which stylistic influence the architecture leant towards. Clubs like Sylvan Lake Sailing Club or Calgary Yacht Club prioritized their nautical heritage over more geographically influential styles both from an exterior and interior perspective. These clubs maintained a feeling of minimalism, cleanliness and a colour palette restricted to whites, blues and natural wood tones. These clubs also reduced the feeling of compression within their facilities; the white, blue and wood tones loan themselves to the open feeling of being on a boat or ship, usually furthering this likeness with exposed wood structure.

The clubs that had an atmosphere of compression strayed further from these nautical stylistic palettes then the former set of clubs. They would inherit a more compression-like sensation; that the spaces were always small and compact, especially in comparison to their landscapes. This spatial compression allows for other benefits; coziness in English, hygge in Danish and Gezellig in Dutch all express the same warm and safe feeling created by physical space. Facilities like the Newell Sailing Club and Sunshine Bay Sailing Club created very gezellig atmospheres through their use of soft earthy tones, soft materials such as carpets and wallpapers. Structural elements are typically covered, and textured false ceilings are employed. Additional decorative elements in the space were common occurrence: photos, paintings, models, plaques, and burgees are just a few examples of adding decorative objects to a space to increase its level of comfort.

The third type of facility fell right in the middle of the pack. These facilities were a mixture of prairie modern and nautical styles. They had a really unique feel to them. They weren't as cluttered as clubs that adopted a more comfortable and homelike space, but didn't have the clean and minimal style of the more nautically traditional facilities. Sites like the Glenmore Sailing School and the Edmonton Yacht club in particular took on these mixtures of characteristics. The Glenmore Sailing School's original building was well kept and leant towards a nautical tradition. The walls were white, the floor was a deep blue and the exposed roof rafters were composite wood beams intricately organized. This facilities mixture of qualities occurred when you considered the rest of the site's built facility. The storage sheds and other buildings were much more eclectic. They were a bit more cluttered and much more utilitarian. Posters, functional equipment storage and photographs lined the walls of these spaces. So half of the facility was much more nautically presentable, while the other half was representative of a comfortable facility. The Edmonton Yacht Club had a different mixture; instead of having individual components that fell in either category, the spaces were a genuine mix of the two. Spaces may have had originally been intended to conform to nautical themes; but over time they had been adapted to better suit members more personal needs of space.

Urban clubs typically have leaned towards a more nautically themed space, while rural clubs focus more on created a compressed and comfortable atmosphere. This pattern of different style likely arises from the reduced spatial demands on urban clubs, while rural facilities need a far greater number and variety of spaces in order to accommodate users with overnight and long-term usage needs. Urban clubs need to appeal to a large range of people, so stylistically they need to be specific and formal in their architectural approach. In people's minds, they need their program to become synonymous with the activities it provides. The better a facility can conform to nautical architectural themes, the better it can be identified as a sailing program. The following photographic documentation is companied by first hand accounts of the experiential nature of each club. Each was documented from a first person perspective to gain intimate insight into the club's ambience.

4.2 FACILITY DATA

Analytical diagrams of facility statistics

Mapping each club is second step of research, after visiting each club and collecting raw data. The basic measurements and photographic documentation was cross-referenced with Google maps satellite data, and GIS open source data. Maps and buildings were then remodeled using AutoCAD and Rhino digital tools, and then spaces were categorized using the 7-category system development in chapter 3.

In each series of images, the first image is the overall site map. On this map it has all the spatial categories represented at the direct and indirect site scales. Space that is mapped with a solid colour is at the direct scale. Space that is mapped with a light hatch is at the indirect scale. The next spread begins with the breakdown of the amounts of spatial categories at these two scales. Each circle indicates 50m^2 of area. Solid circles are representative of the direct site scale, and hollow circles are representative of the indirect site scale.

The next piece of information is the user participation and retention data. The data was always supplied in two components: Membership rates and the number of students in various levels of learning. When a club was able to supply multiple years of this data, a club could be measured to be growing or declining. The second page of analysis for each club is a mapping of the facility at the built scale. Each circle indicates 50m^2 of area allocated to this spatial category.

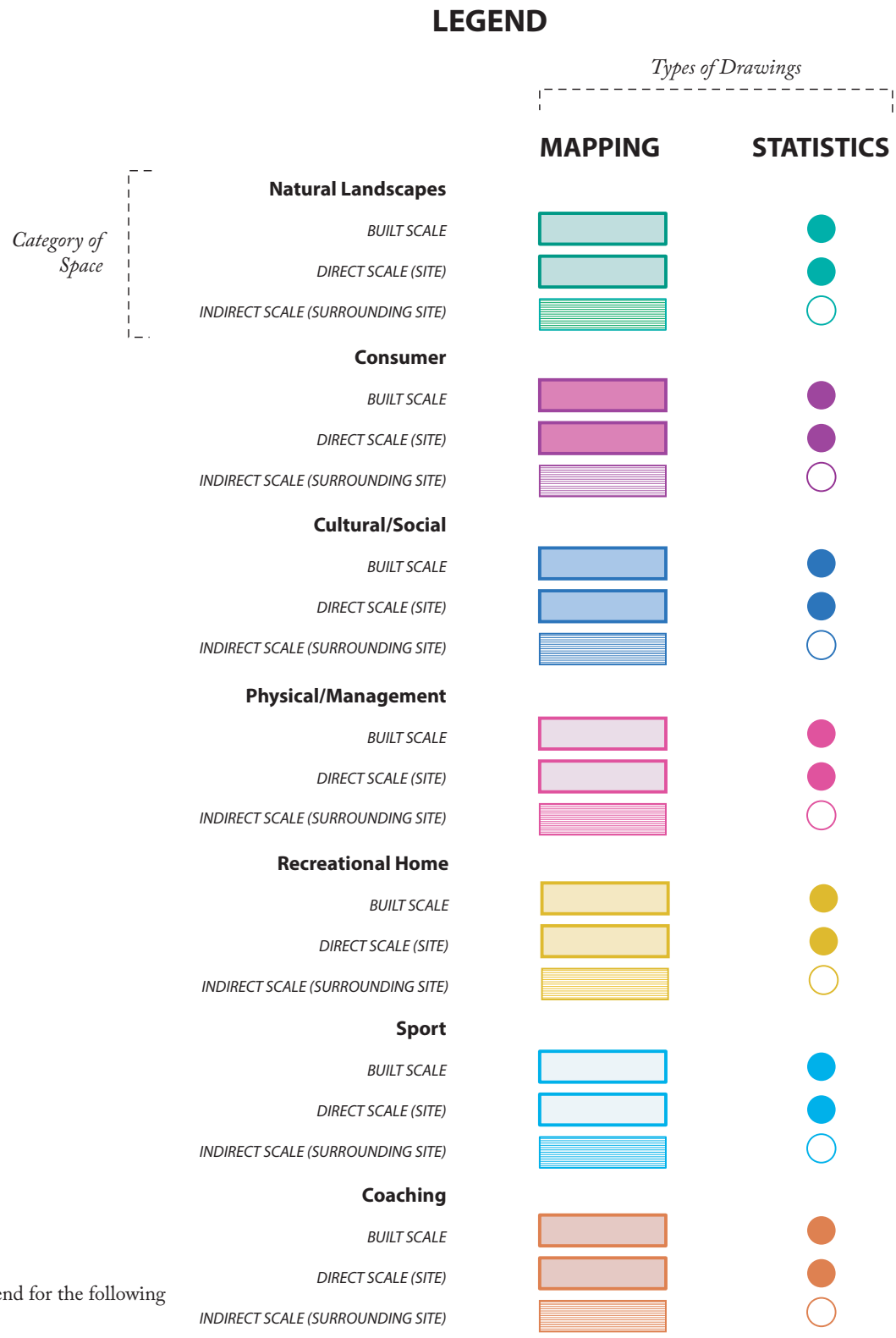


Figure 4.01. Legend for the following Mappings

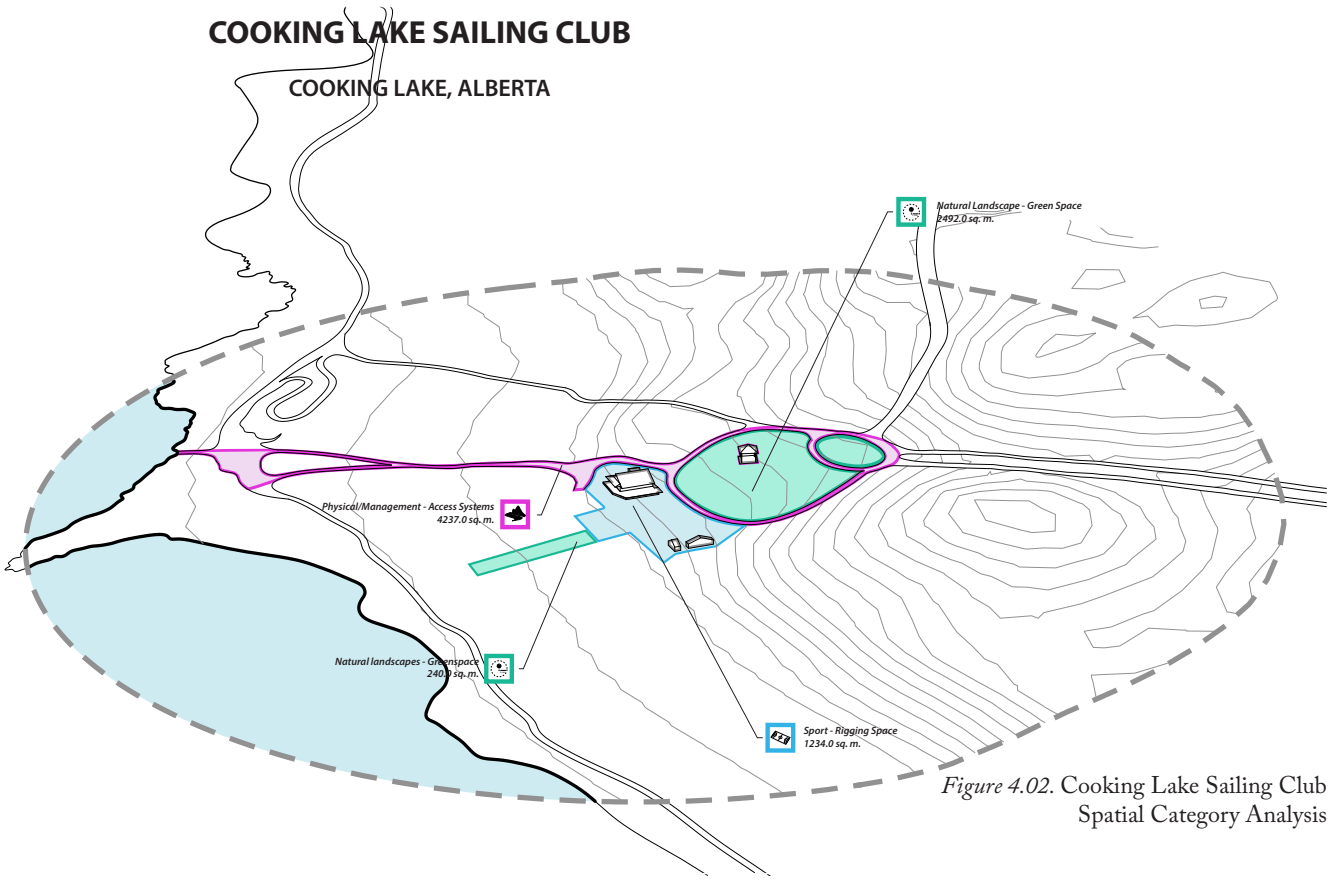


Figure 4.02. Cooking Lake Sailing Club Spatial Category Analysis

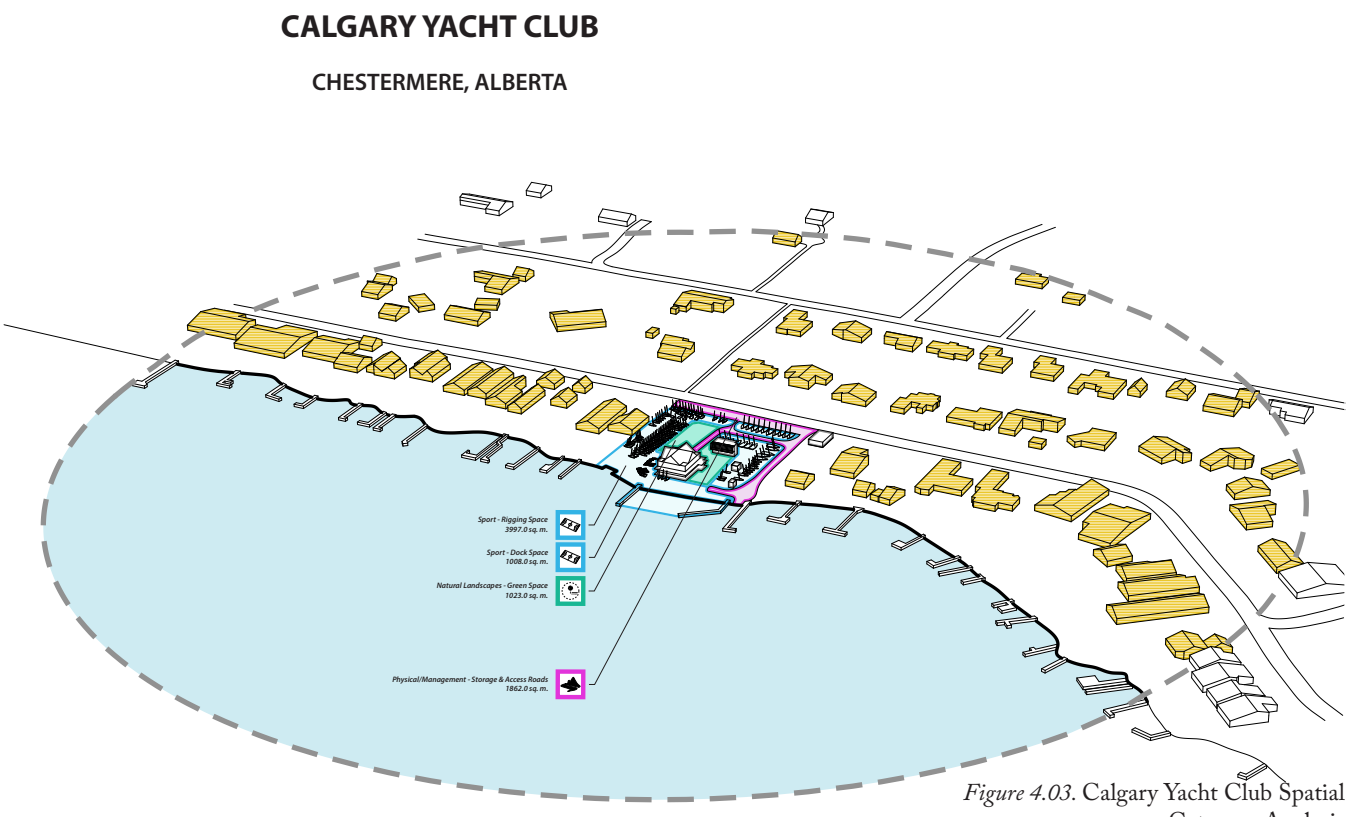


Figure 4.03. Calgary Yacht Club Spatial Category Analysis

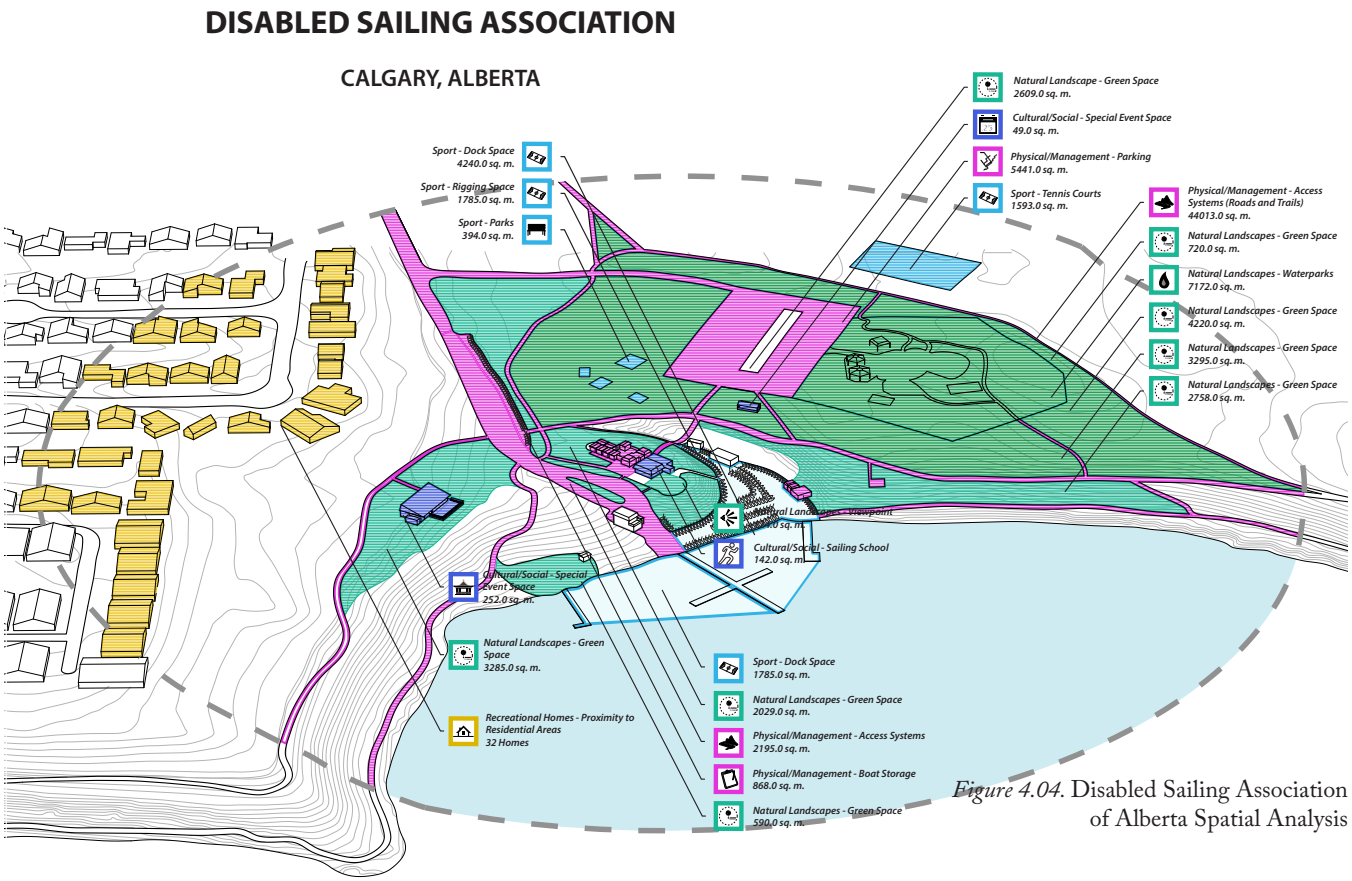


Figure 4.04. Disabled Sailing Association of Alberta Spatial Analysis

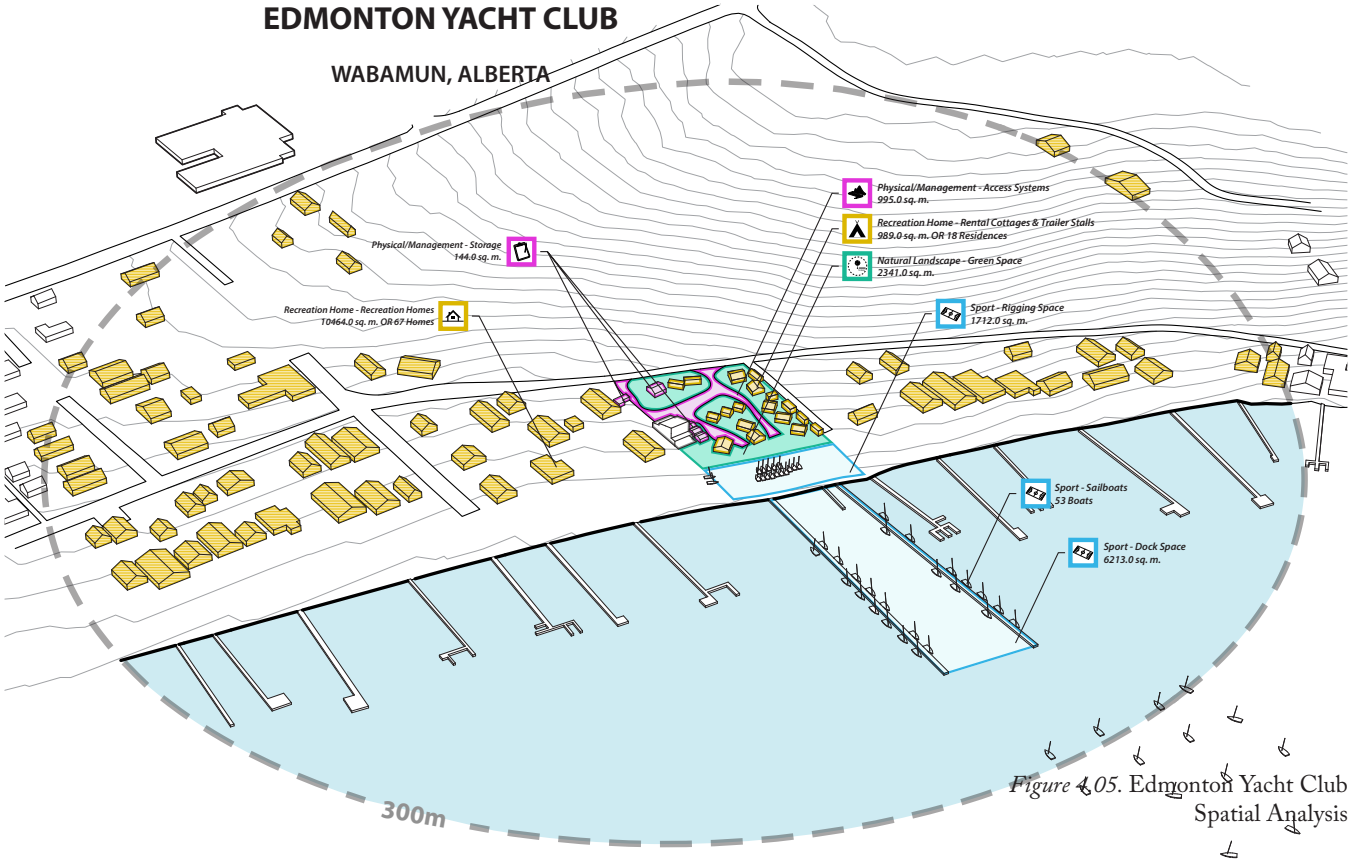


Figure 4.05. Edmonton Yacht Club Spatial Analysis

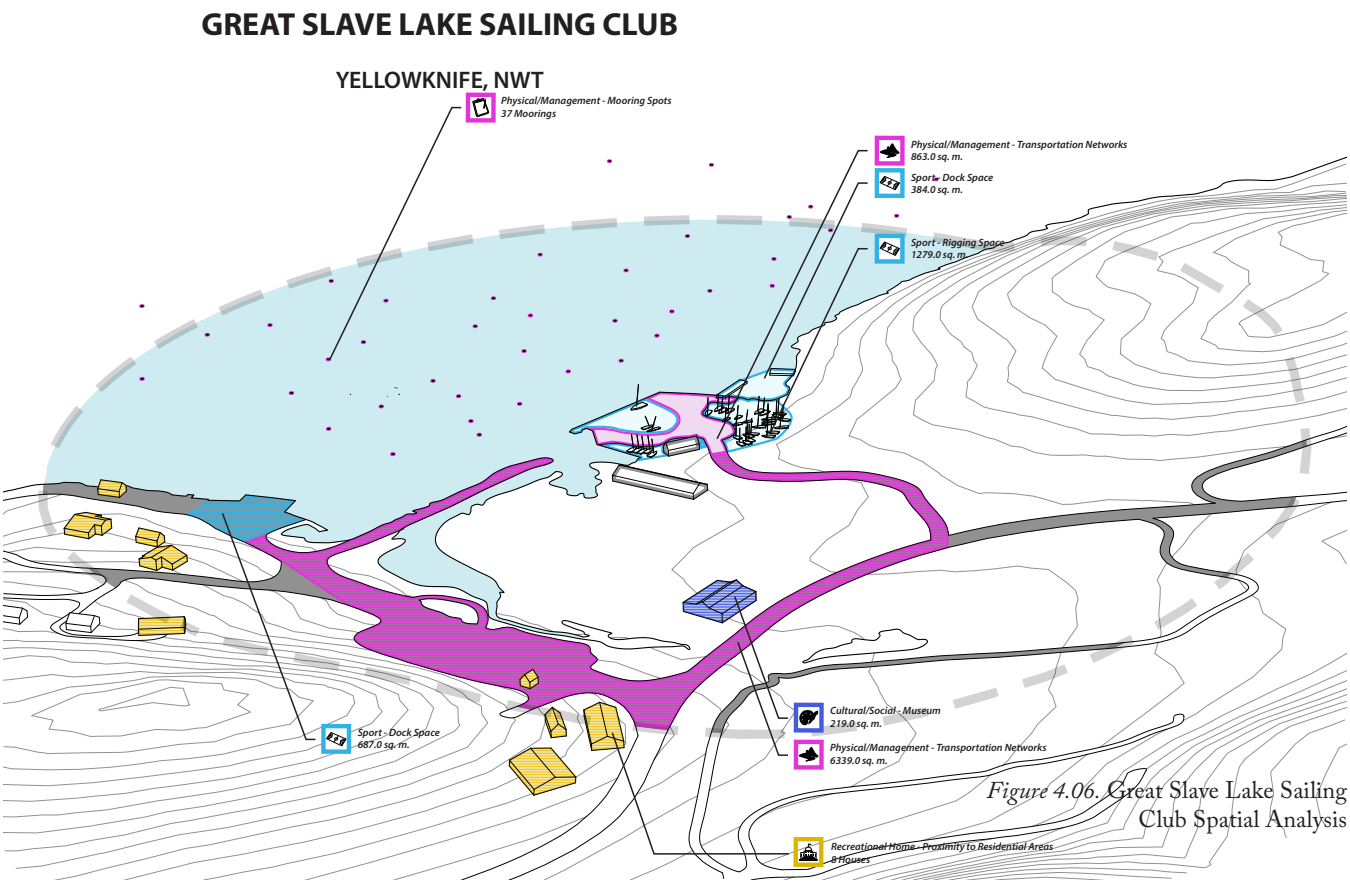


Figure 4.06. Great Slave Lake Sailing Club Spatial Analysis

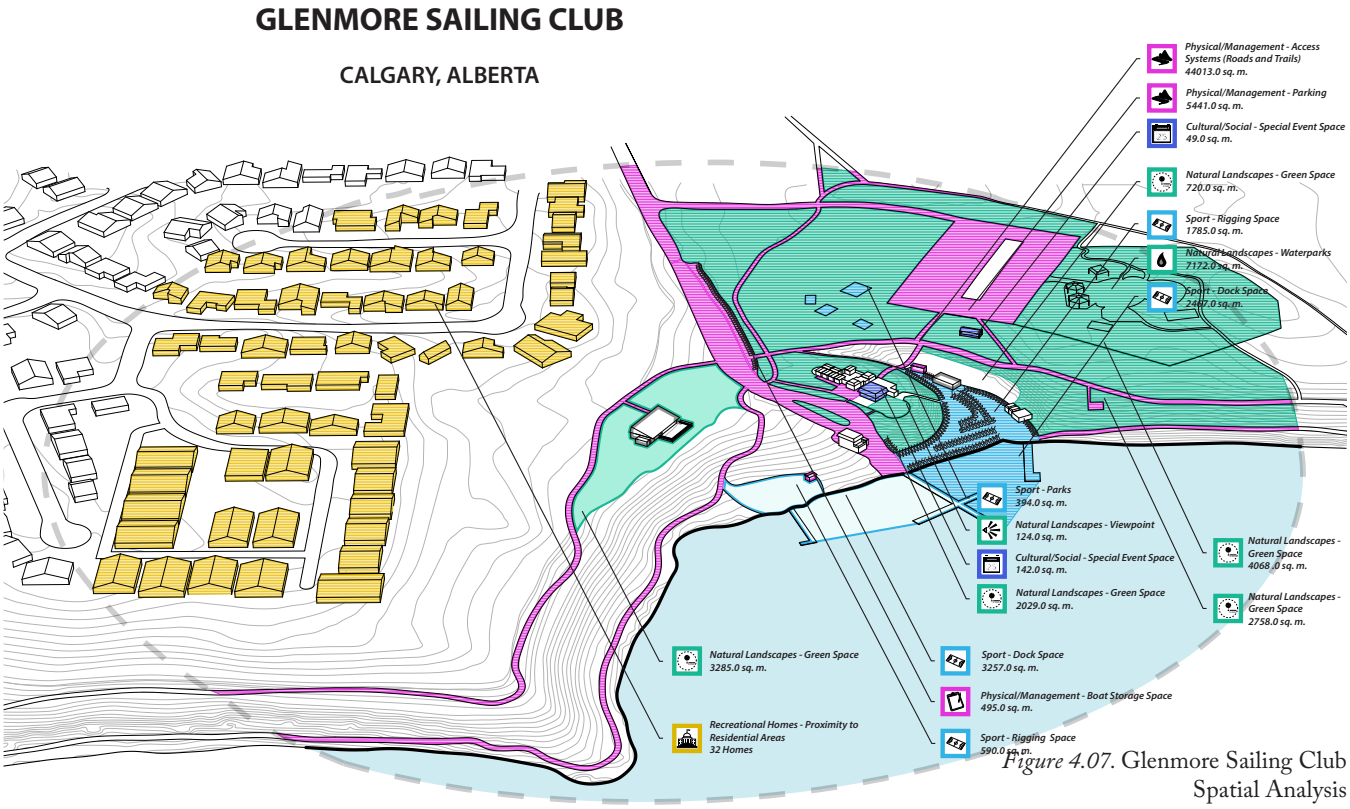


Figure 4.07. Glenmore Sailing Club Spatial Analysis

GLENMORE SAILING SCHOOL

CALGARY, ALBERTA

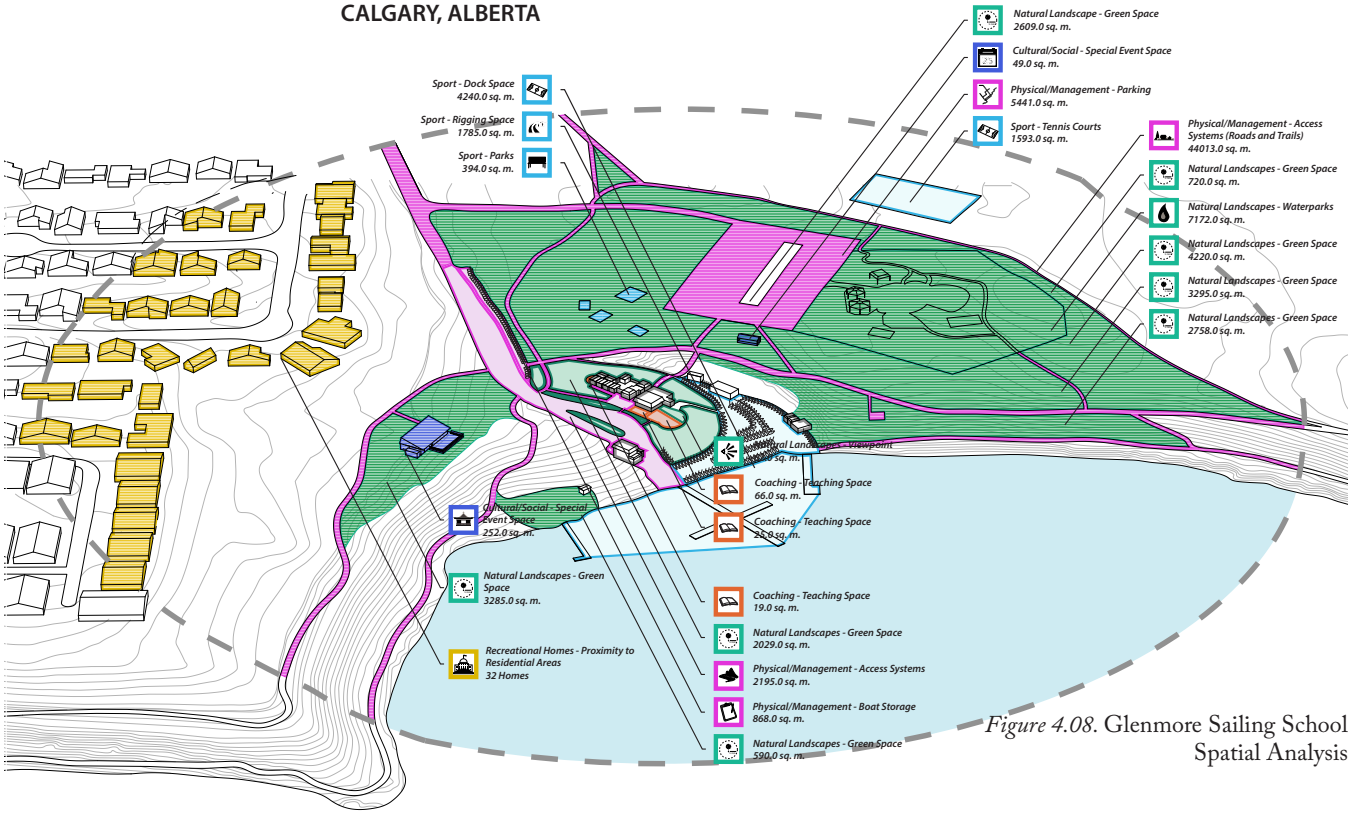


Figure 4.08. Glenmore Sailing School Spatial Analysis

ITASKA YACHT CLUB

SUMMER VILLAGE OF ITASKA BEACH, ALBERTA

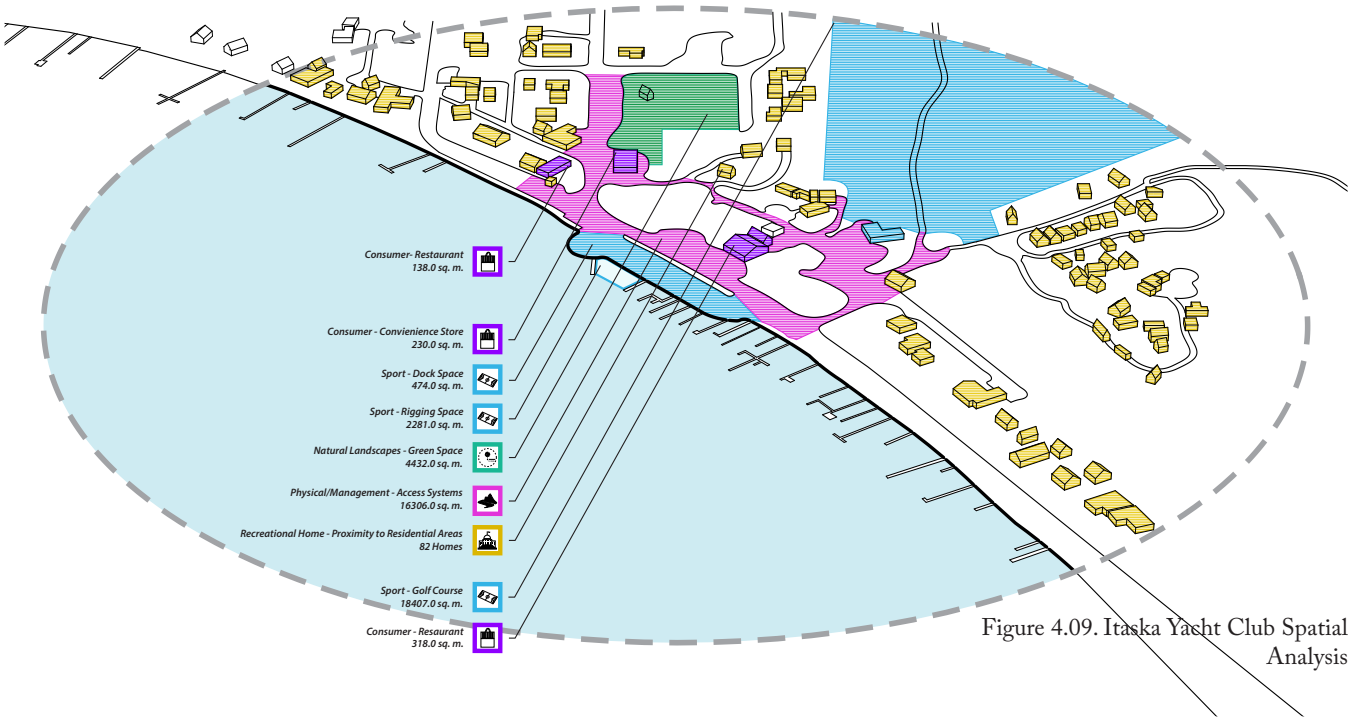


Figure 4.09. Itaska Yacht Club Spatial Analysis

Figure 4.10. Ma-Me-O Sailing Club Spatial Analysis

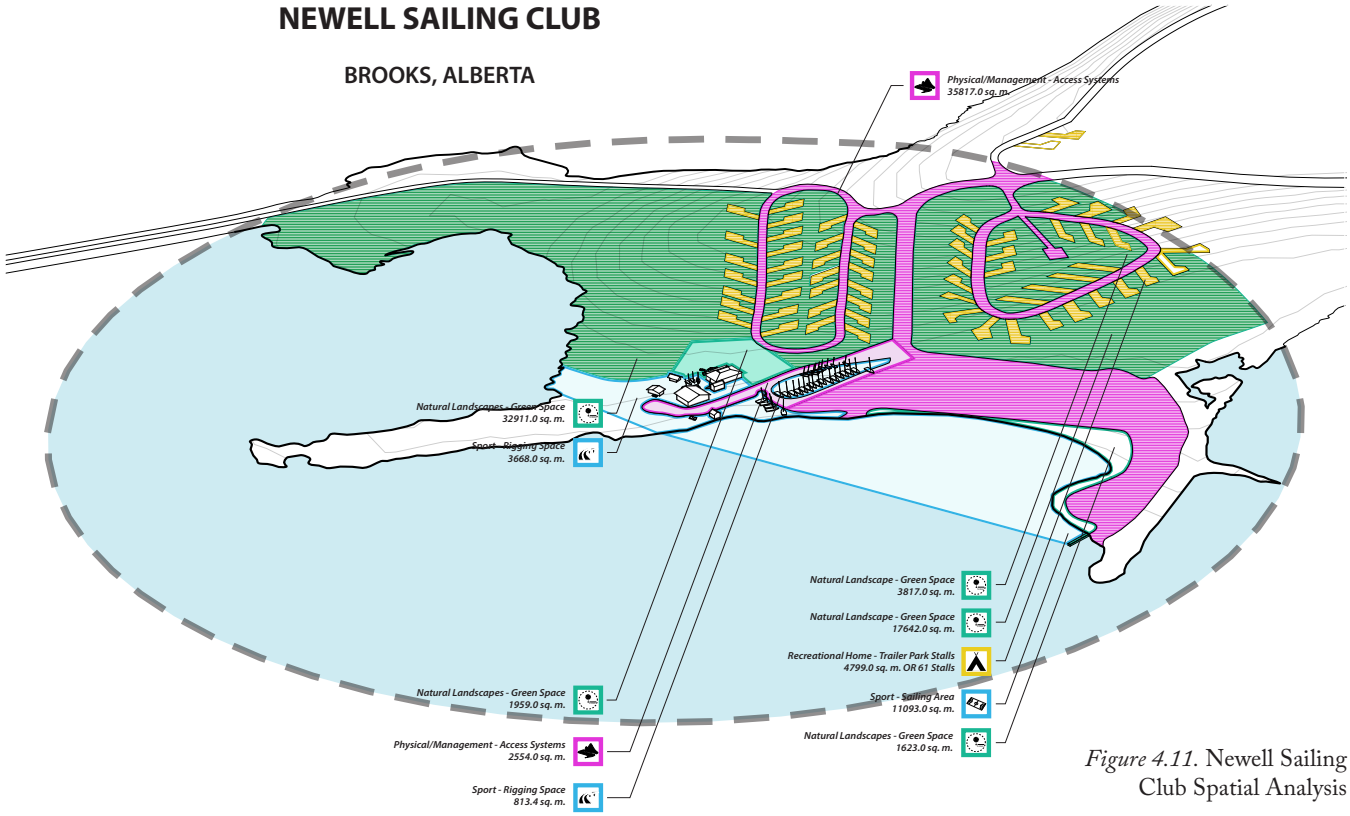


Figure 4.11. Newell Sailing Club Spatial Analysis

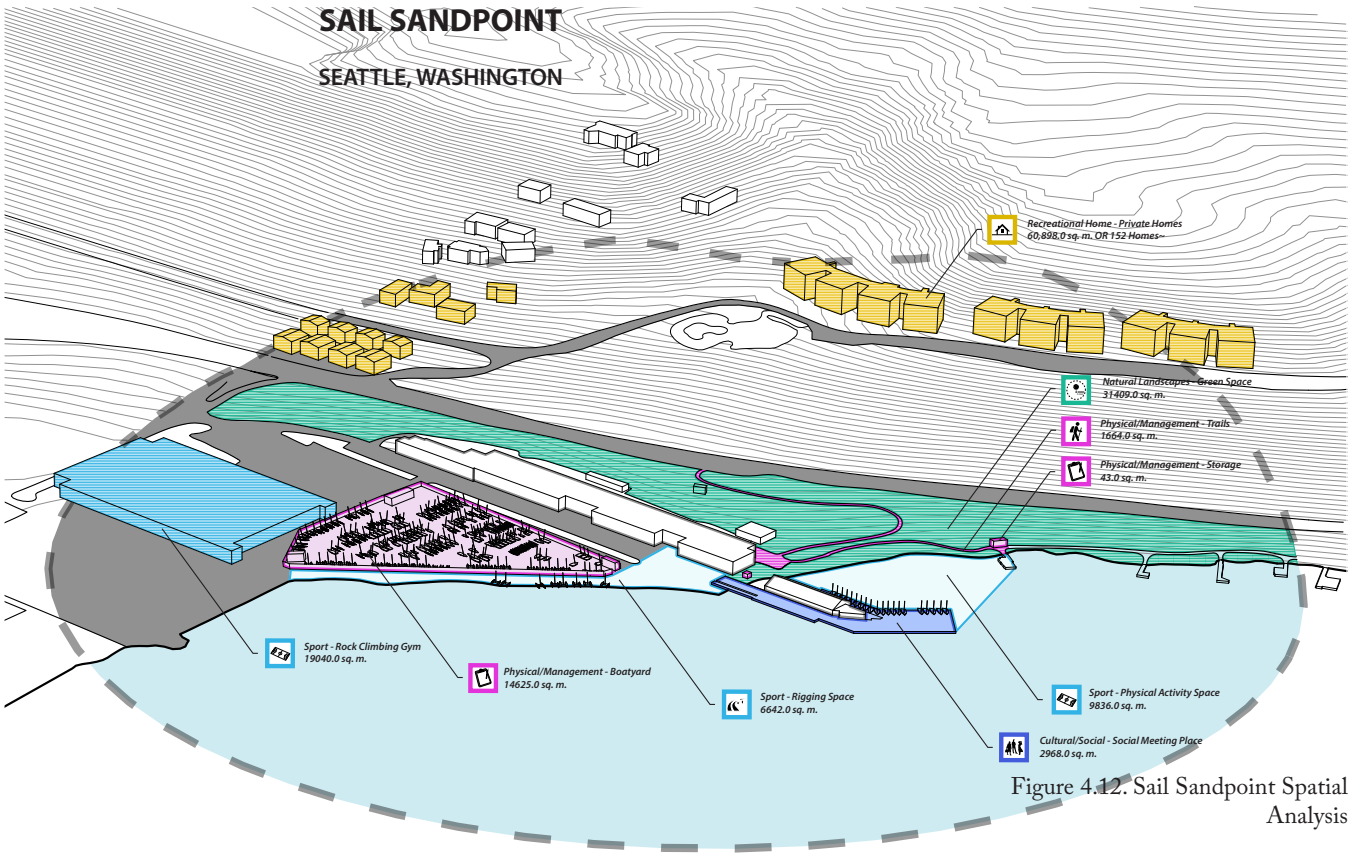


Figure 4.12. Sail Sandpoint Spatial Analysis

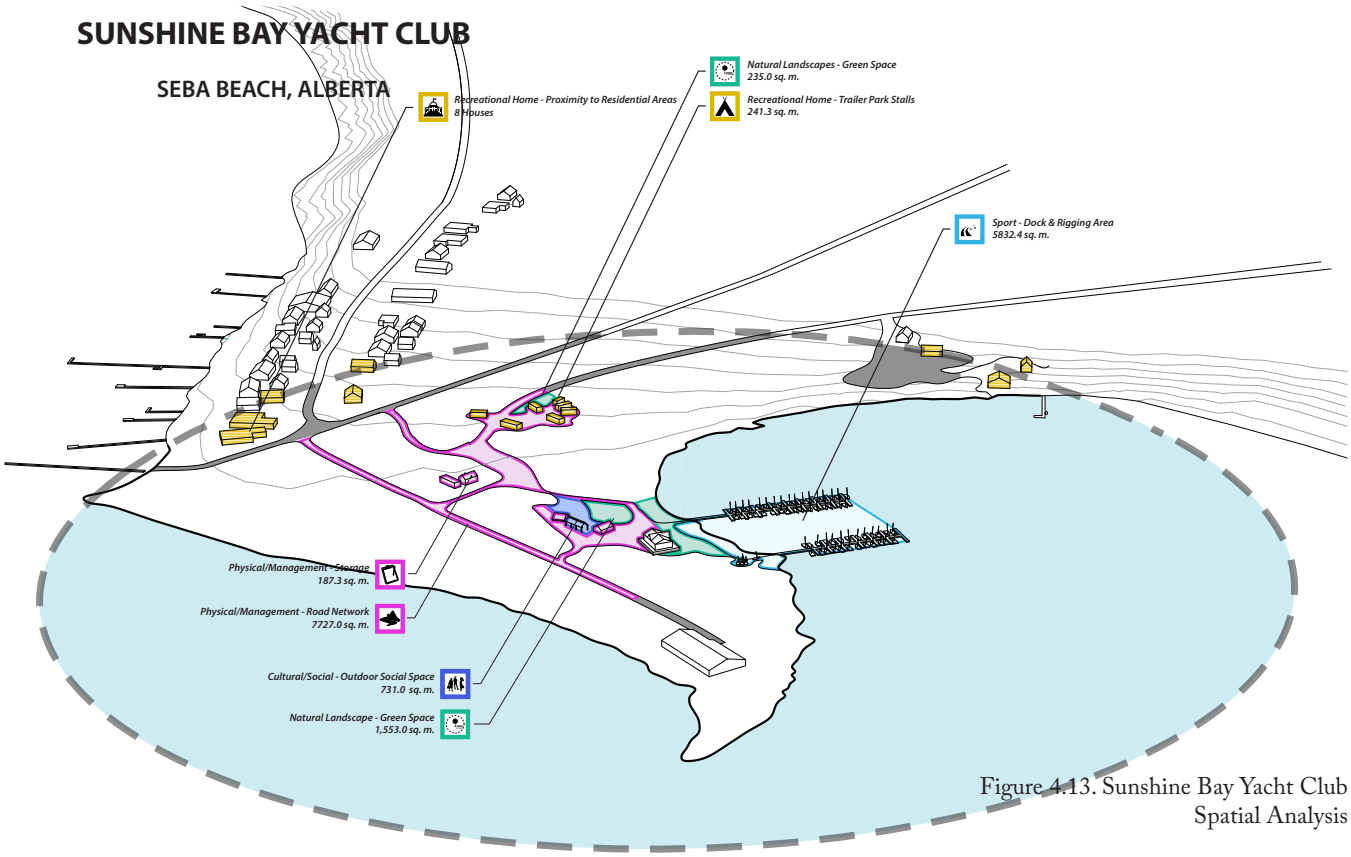


Figure 4.13. Sunshine Bay Yacht Club Spatial Analysis

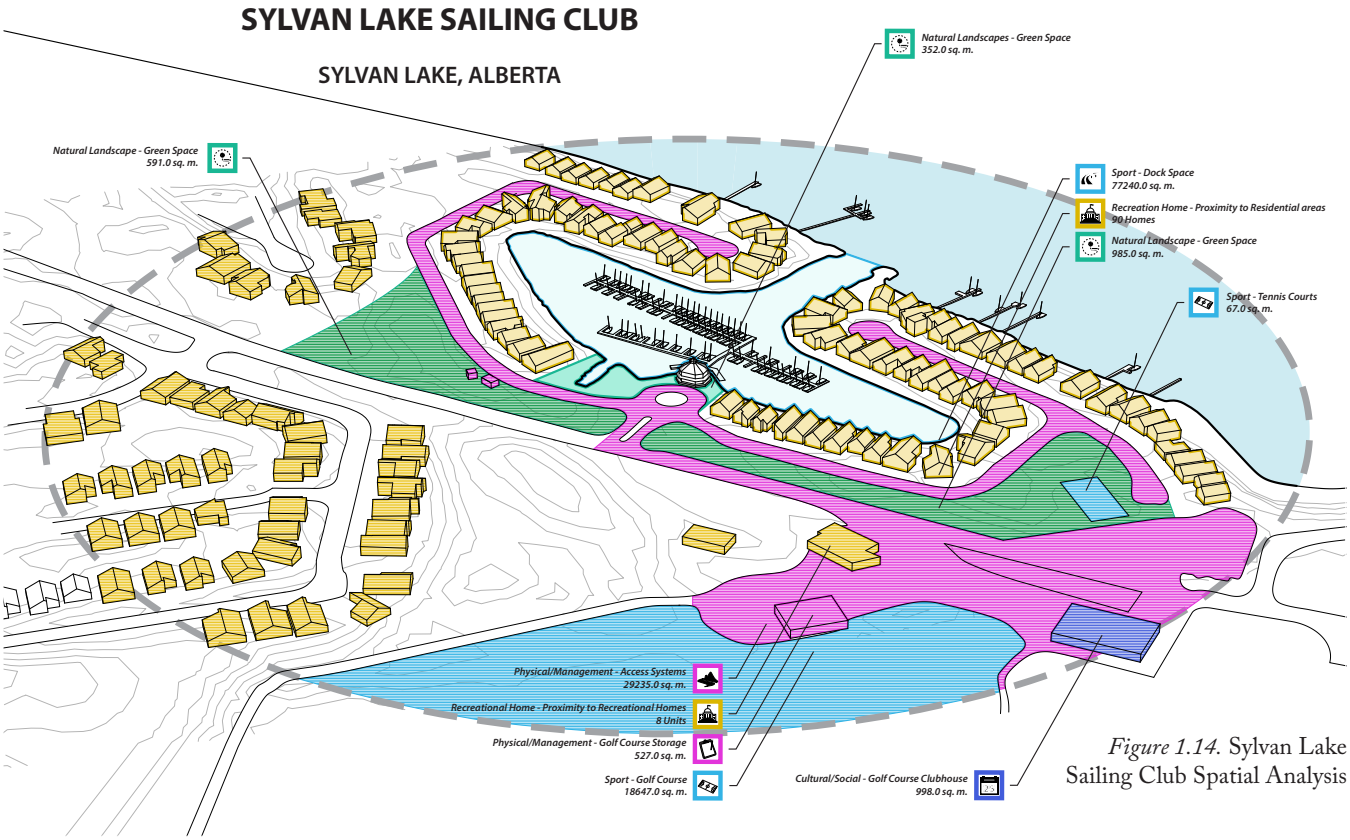


Figure 1.14. Sylvan Lake Sailing Club Spatial Analysis

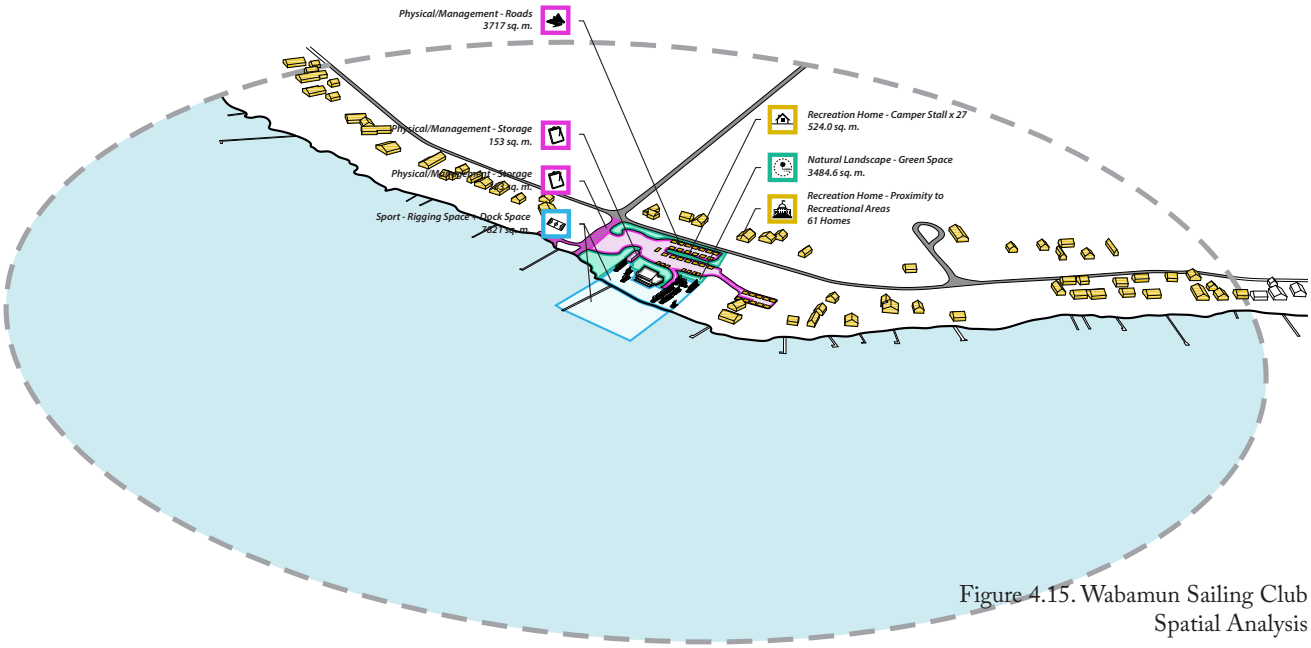


Figure 4.15. Wabamun Sailing Club Spatial Analysis

Cooking Lake Sailing Club - Participation Data

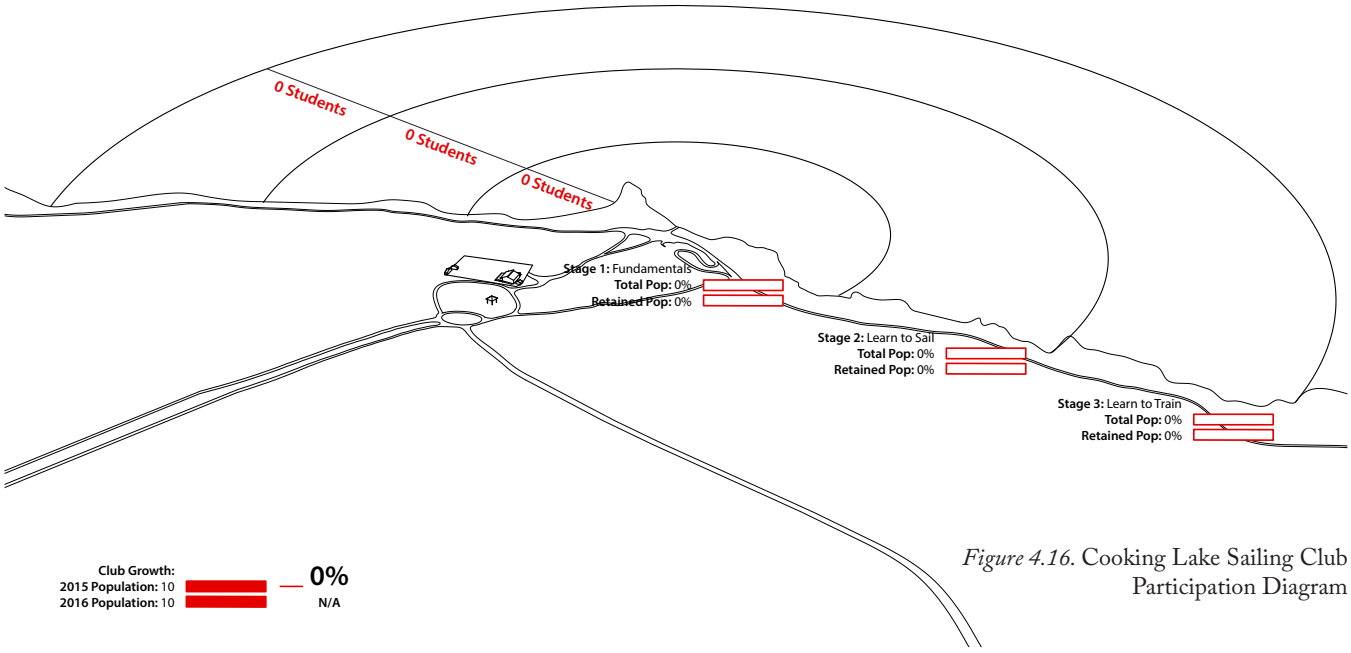


Figure 4.16. Cooking Lake Sailing Club Participation Diagram

Calgary Yacht Club - Participation Data

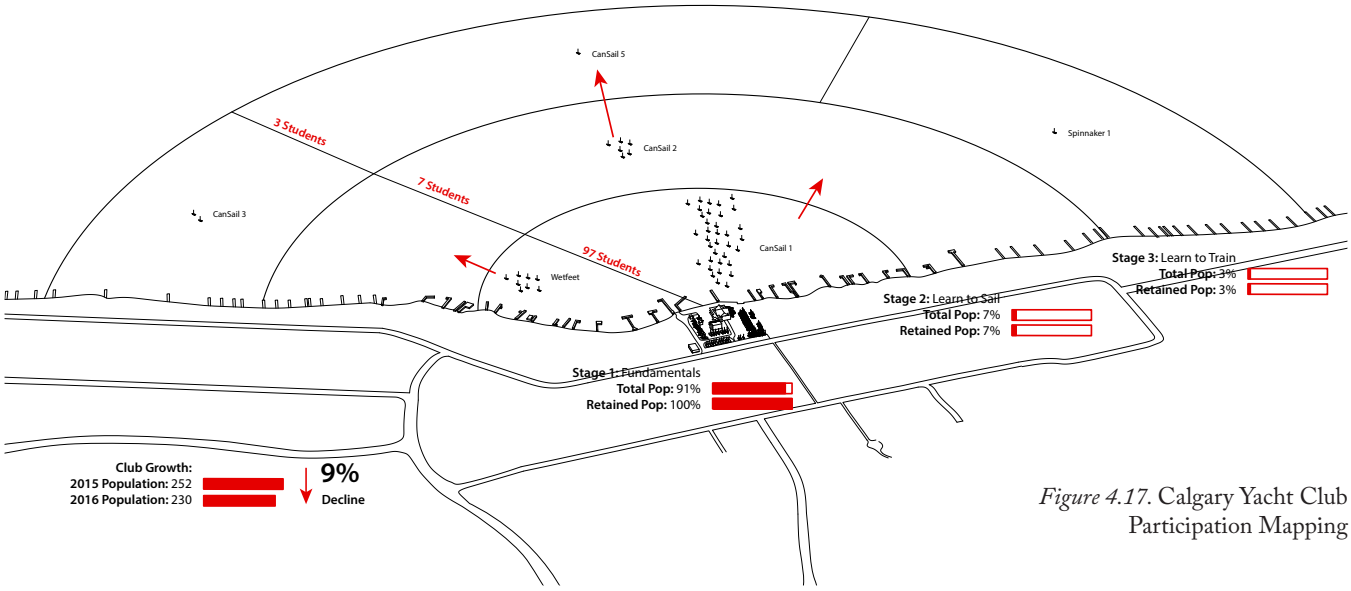


Figure 4.17. Calgary Yacht Club Participation Mapping

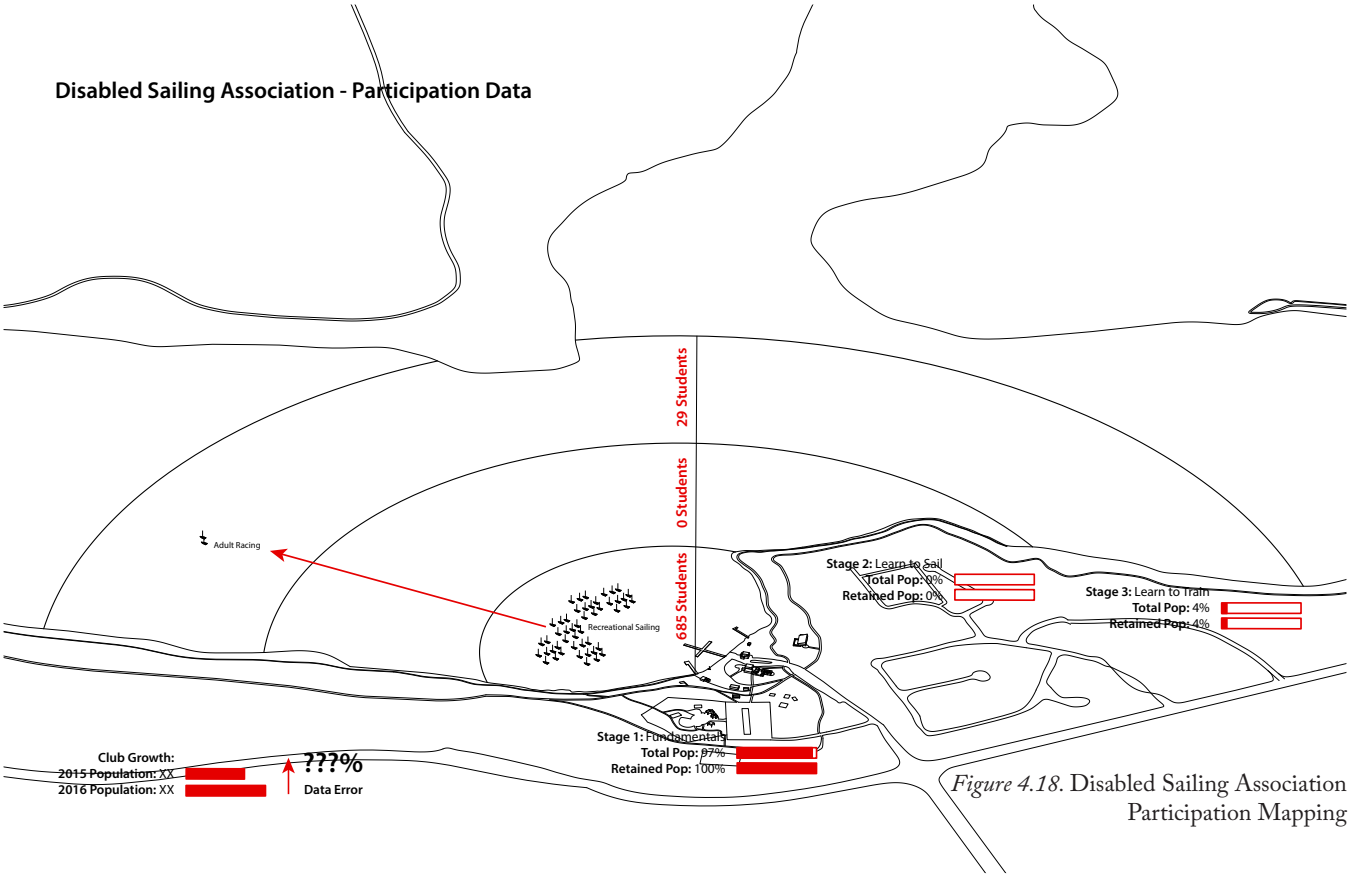


Figure 4.18. Disabled Sailing Association Participation Mapping

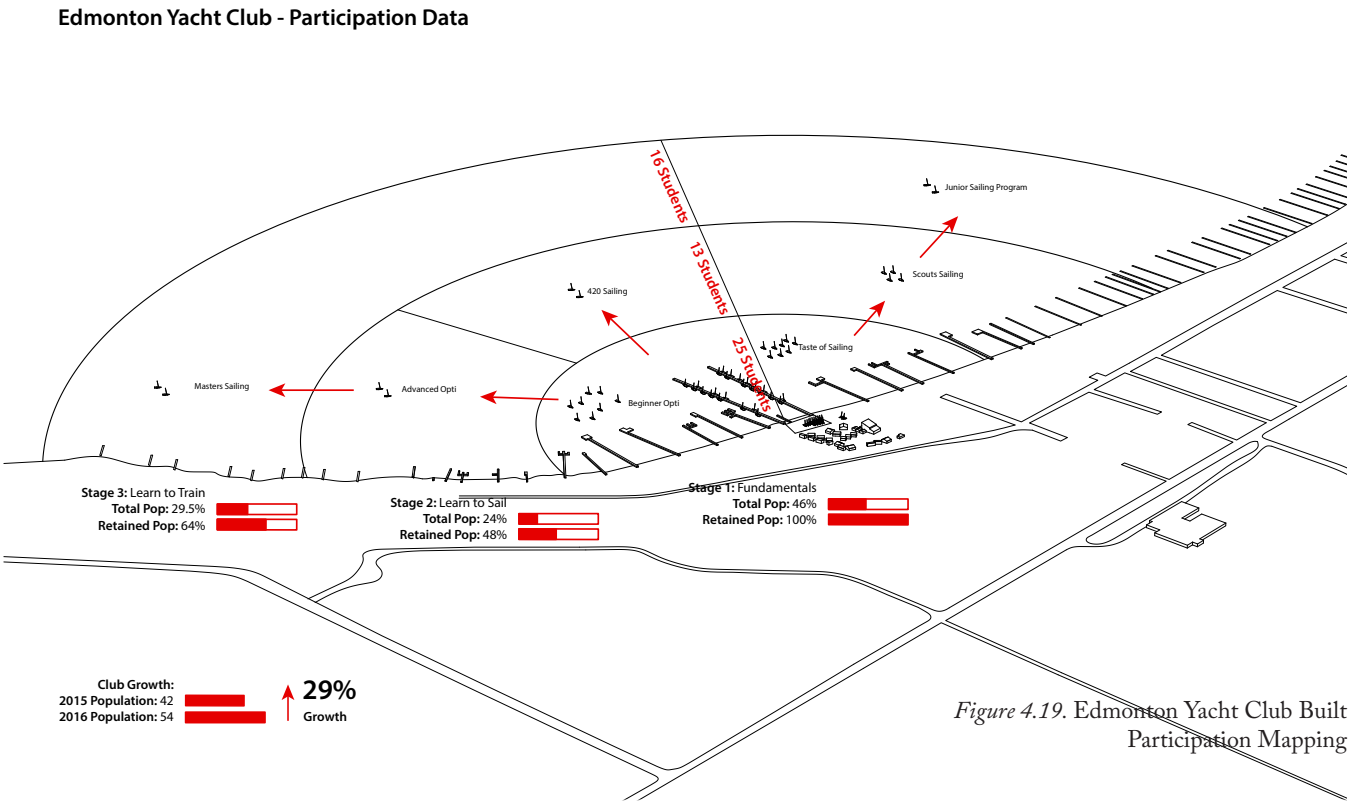


Figure 4.19. Edmonton Yacht Club Built Participation Mapping

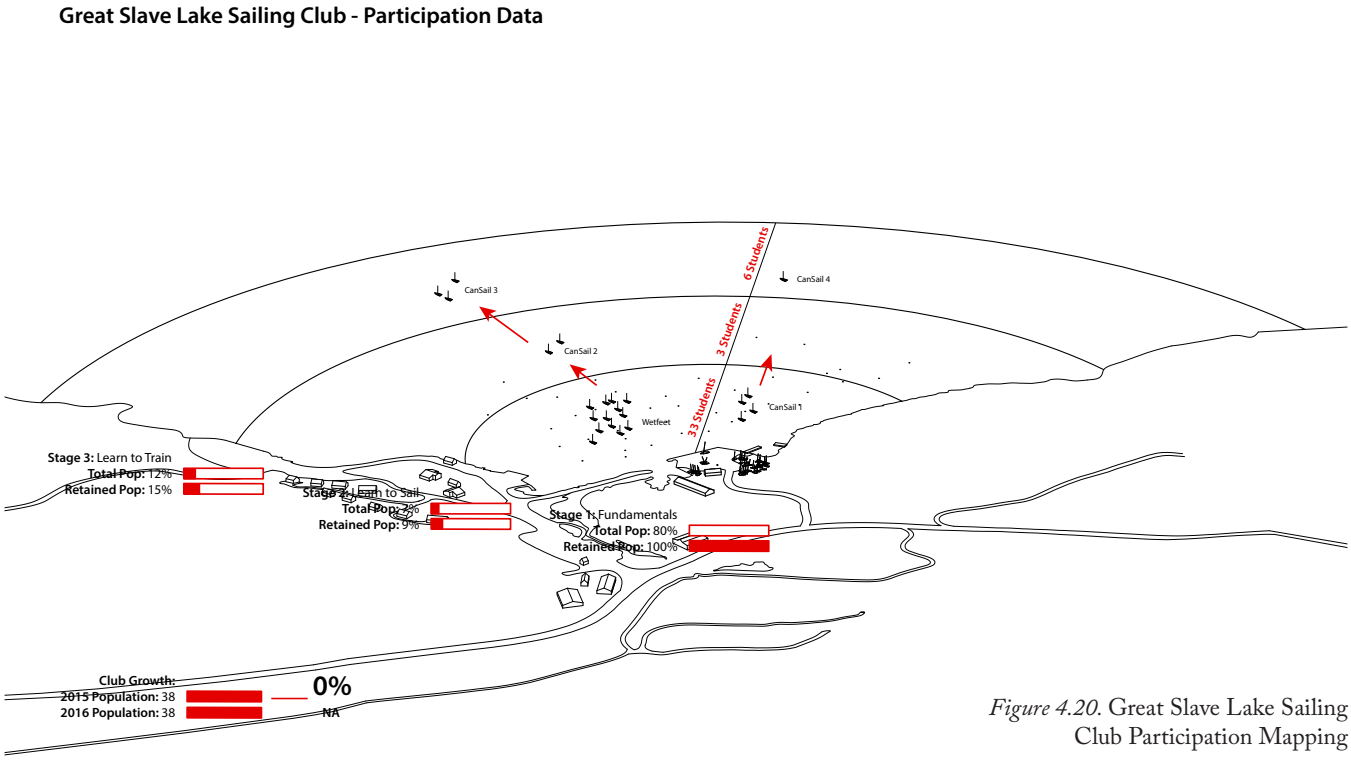


Figure 4.20. Great Slave Lake Sailing Club Participation Mapping

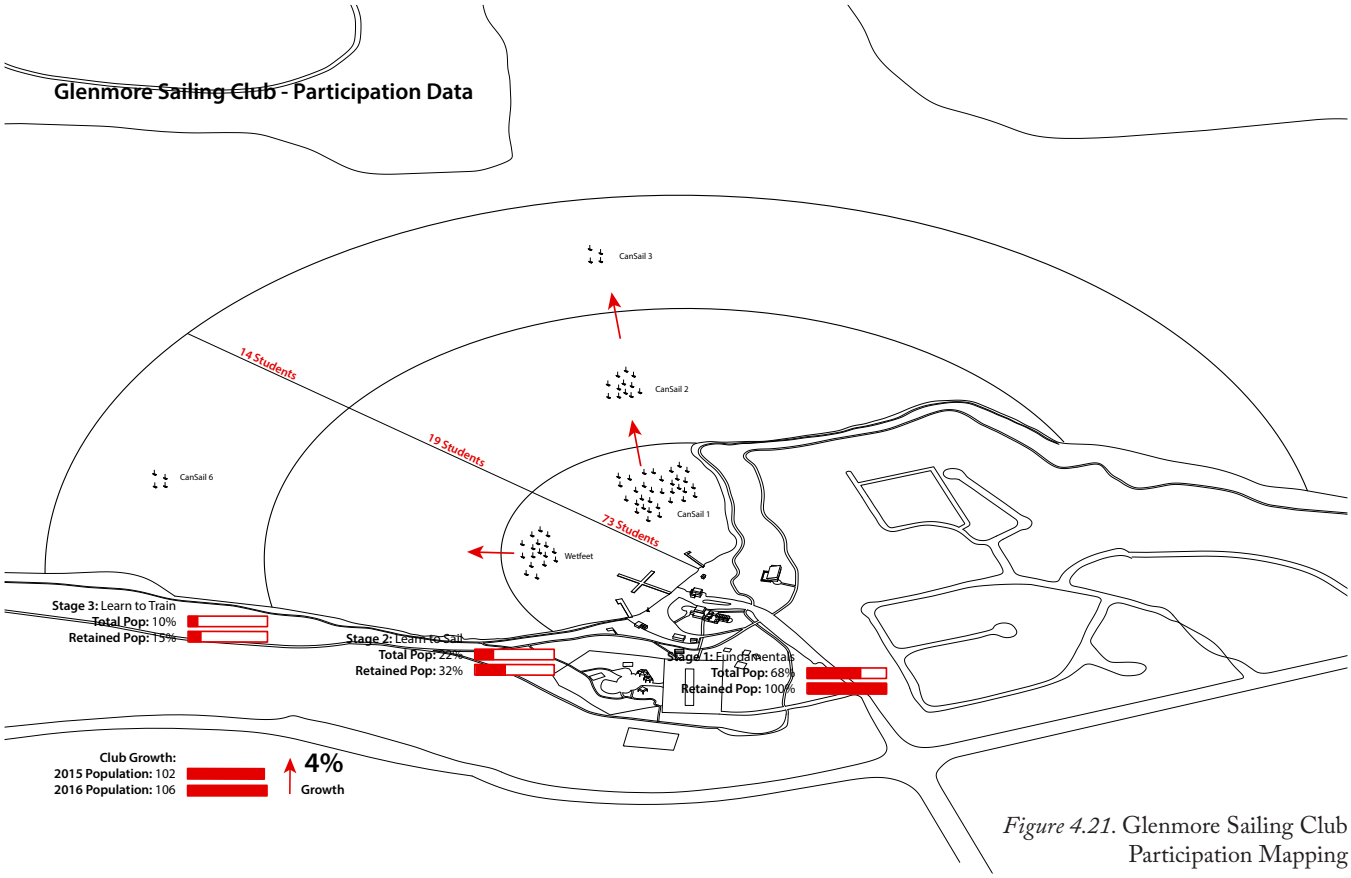


Figure 4.21. Glenmore Sailing Club Participation Mapping

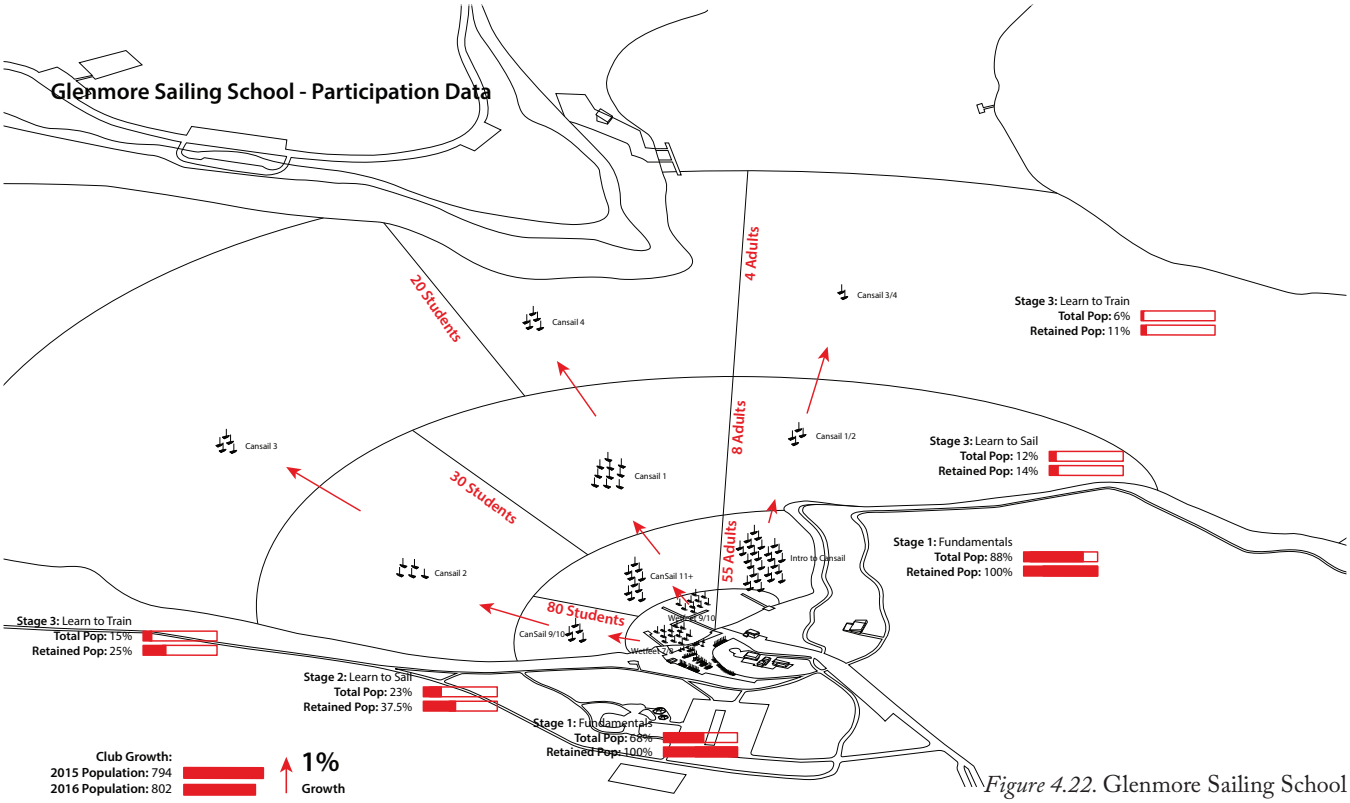


Figure 4.22. Glenmore Sailing School Participation Mapping

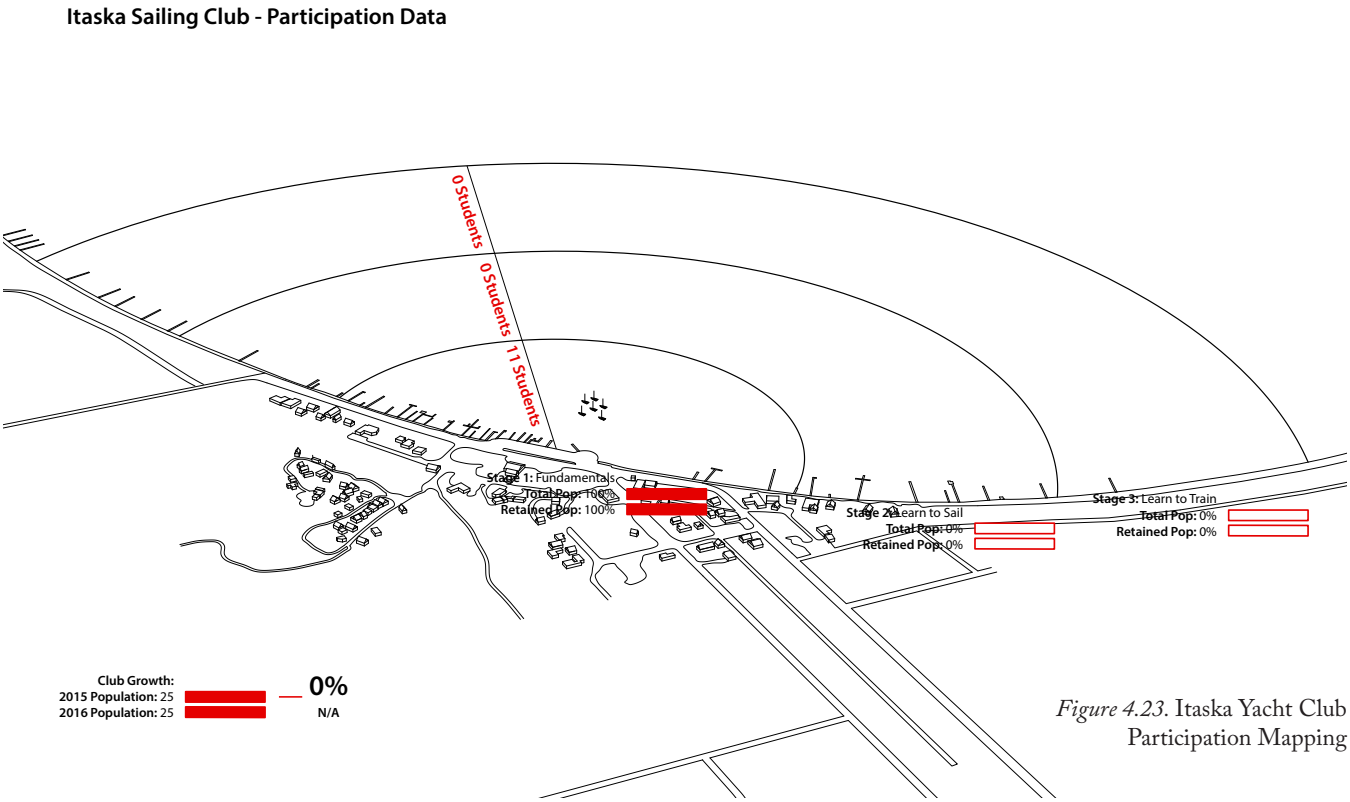
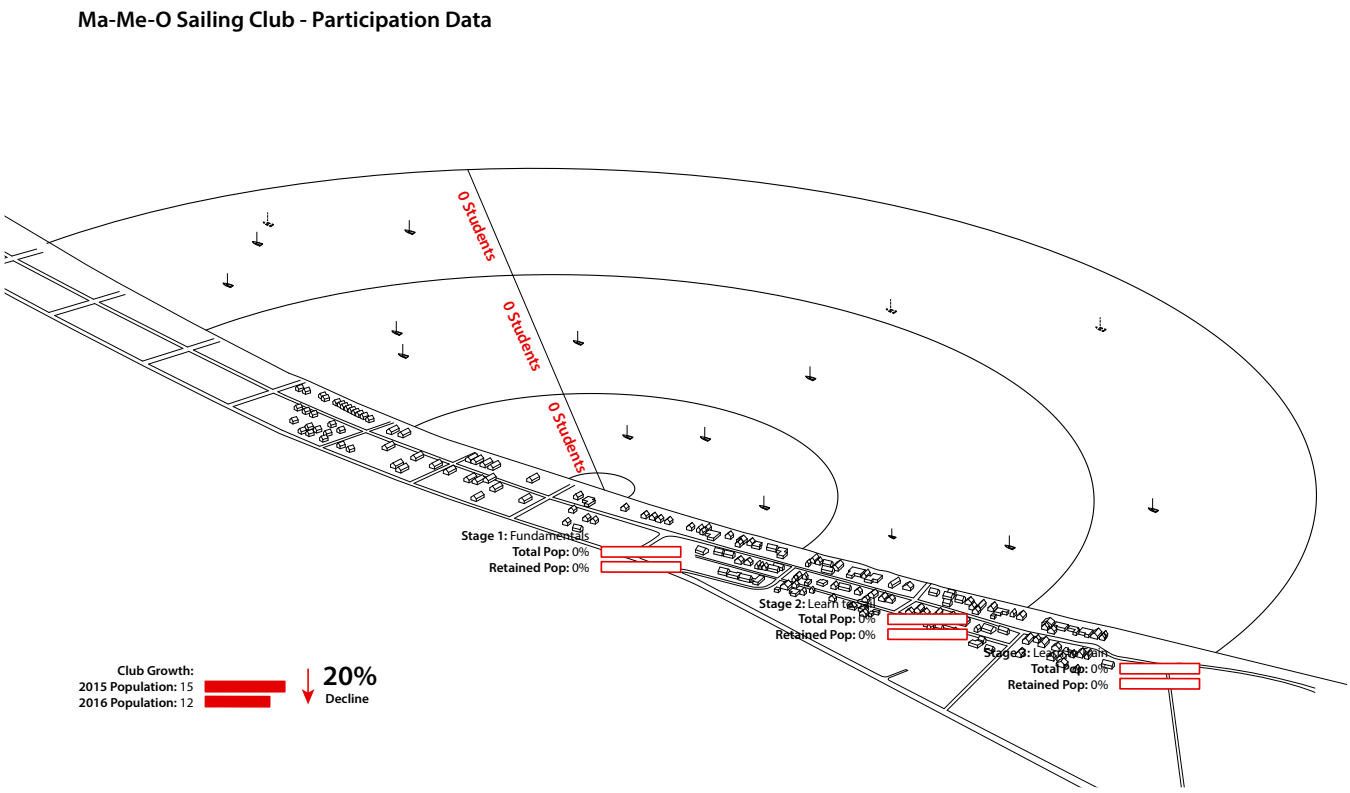


Figure 4.23. Itaska Yacht Club Participation Mapping

Figure 4.24. Ma-Me-O Sailing Club Participation Mapping



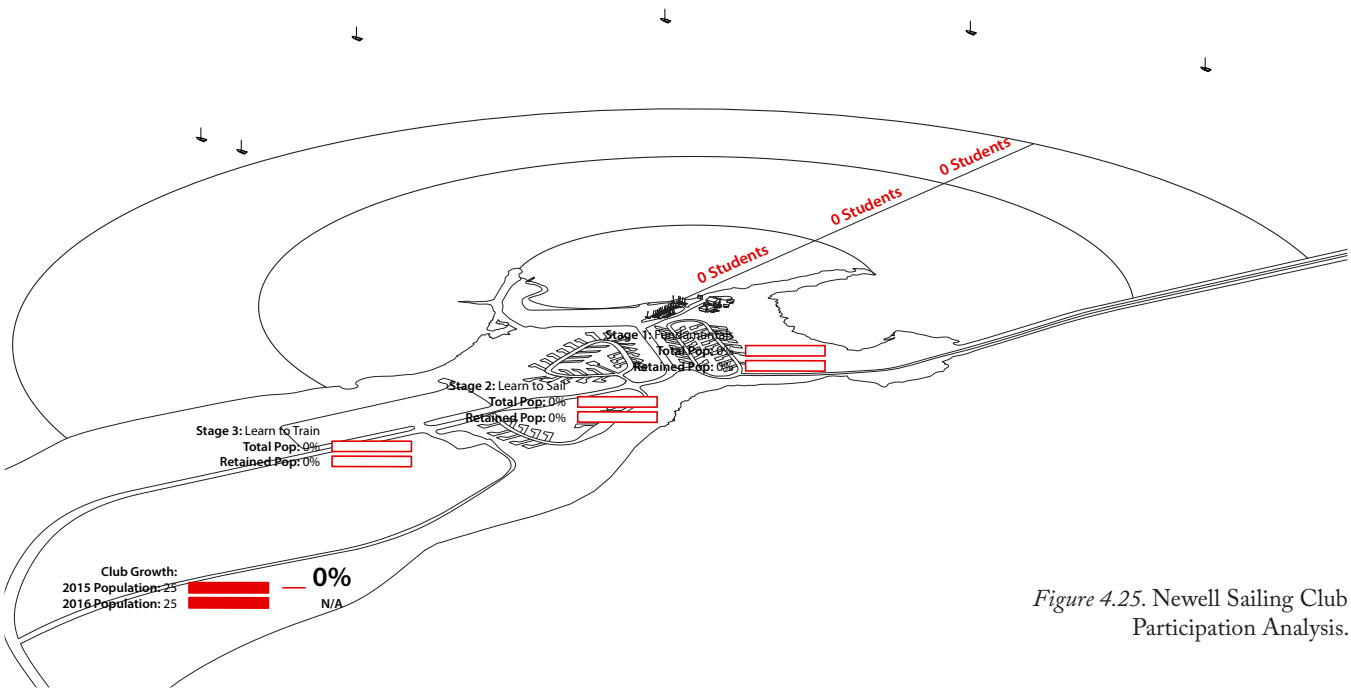


Figure 4.25. Newell Sailing Club Participation Analysis.

Sail Sandpoint - Participation Data

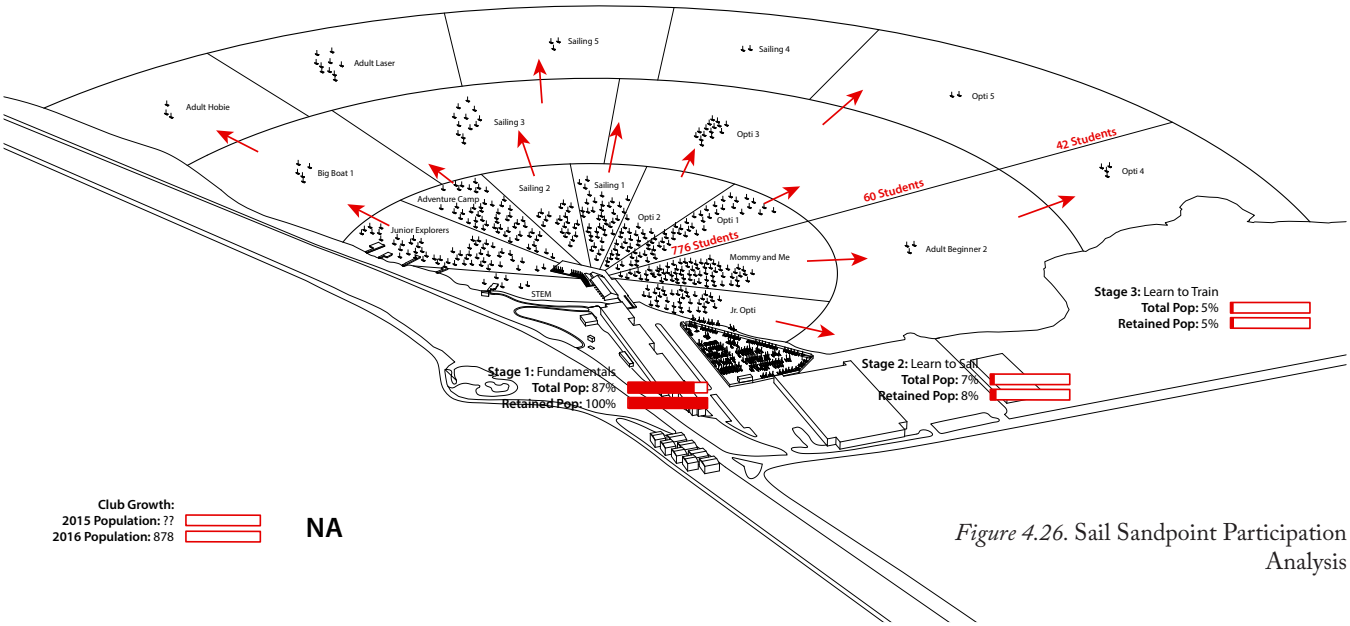


Figure 4.26. Sail Sandpoint Participation Analysis

Sunshine Bay Sailing Club - Participation Data

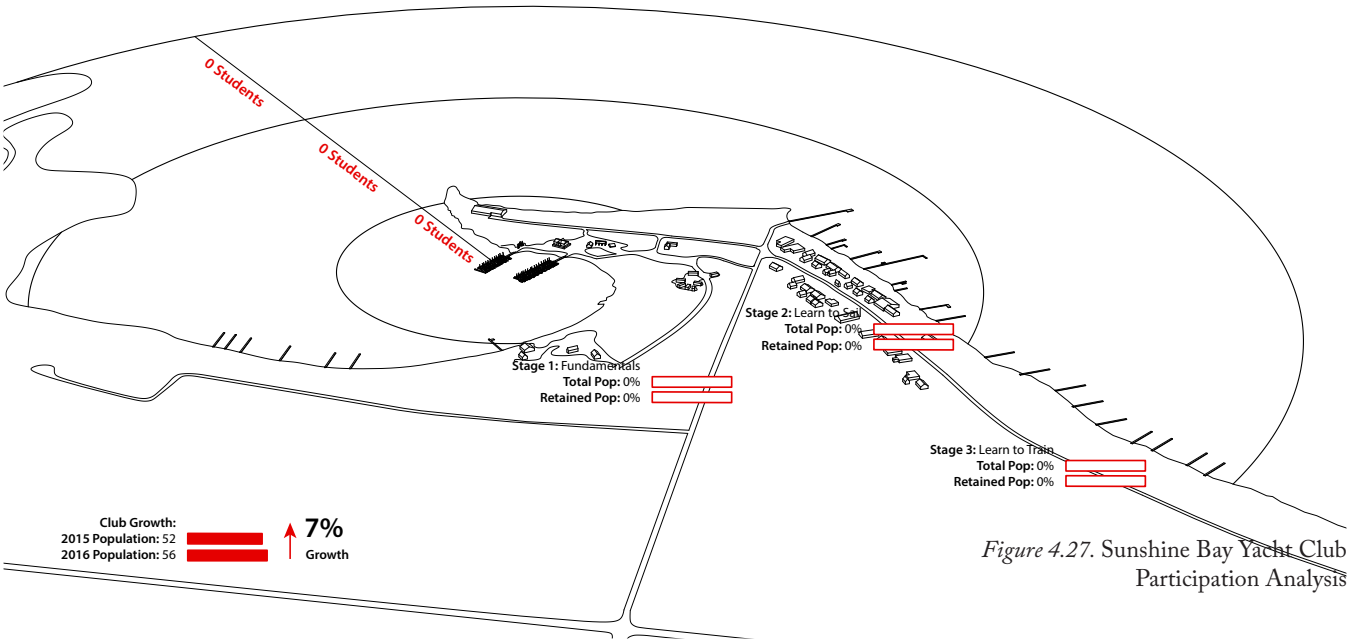


Figure 4.27. Sunshine Bay Yacht Club Participation Analysis

Sylvan Lake Sailing Club - Participation Data

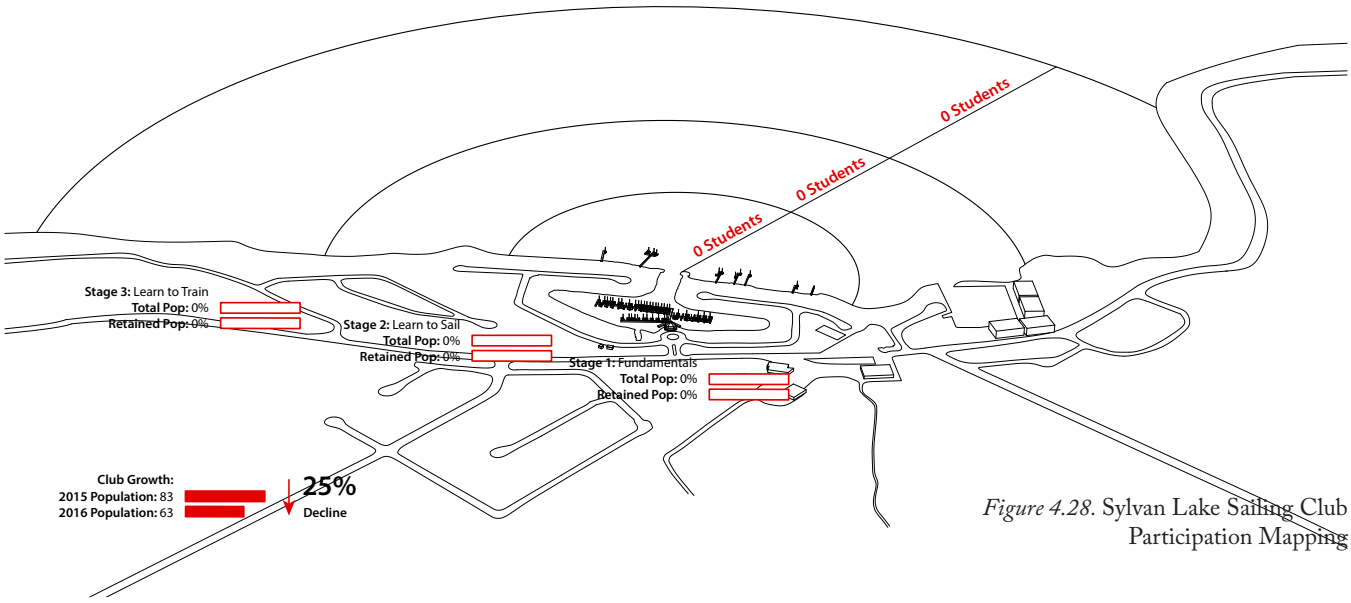


Figure 4.28. Sylvan Lake Sailing Club Participation Mapping

Wabamun Sailing Club - Participation Data

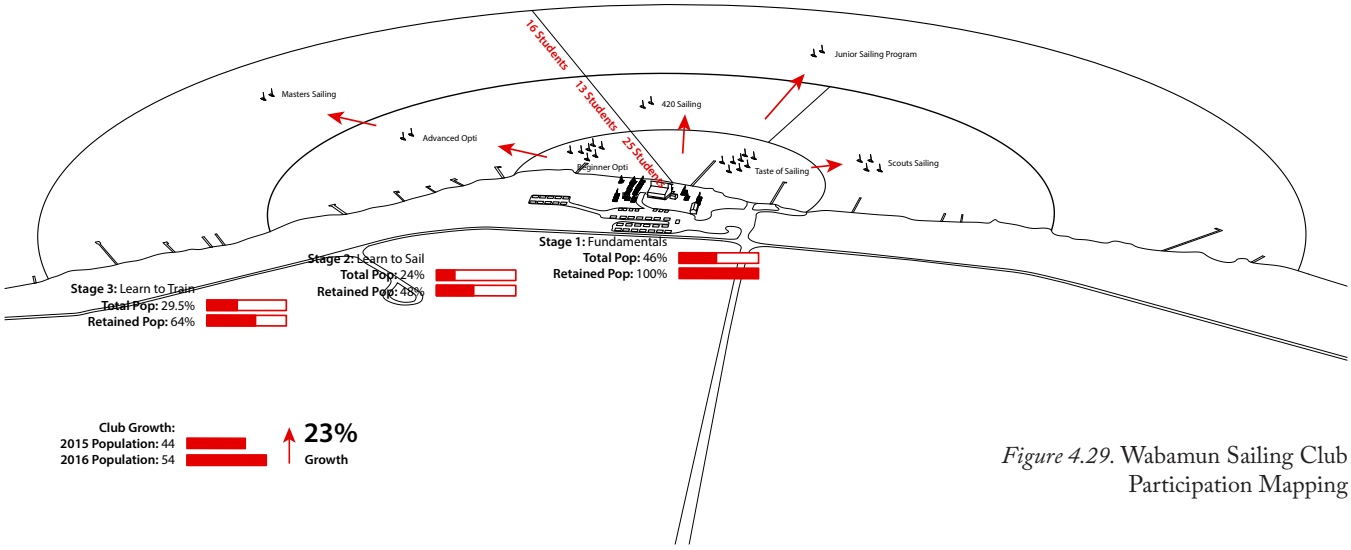
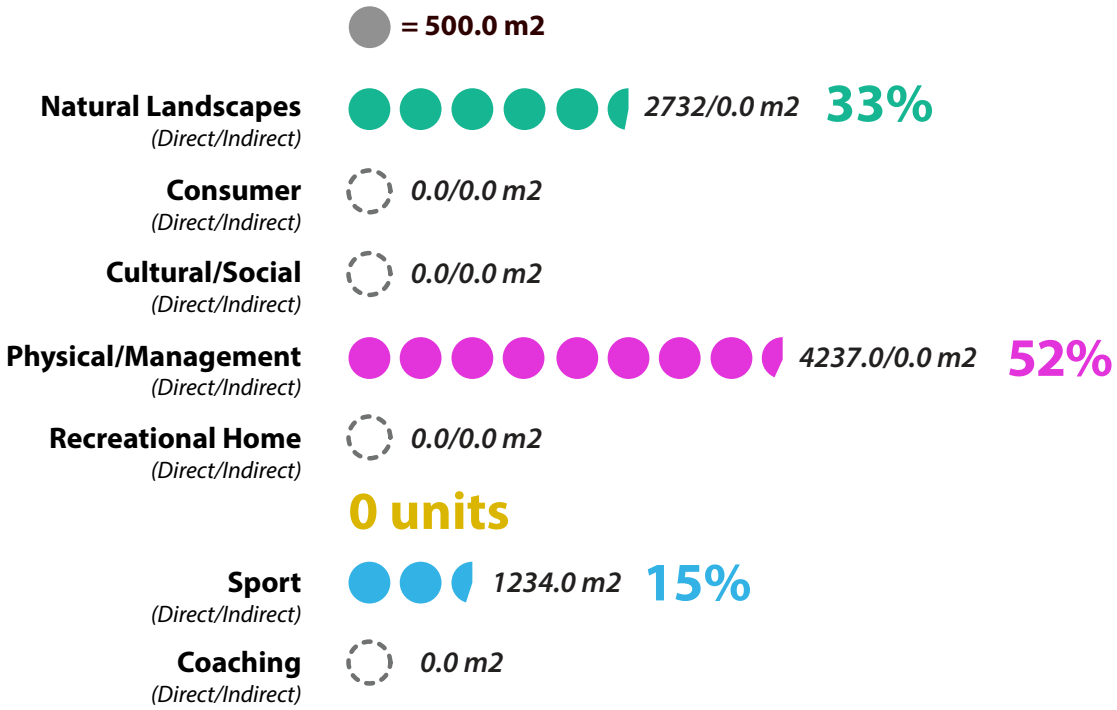


Figure 4.29. Wabamun Sailing Club Participation Mapping

Cooking Lake Sailing Club: Immediate and Surrounding Site Typological Analysis



Cooking Lake Sailing Club: Membership and Retention Statistics 2016

Membership Rates: **0% Growth (Minimum club membership; 10 or less, for 2015 and 2016**

Student Retention : **No student participation**

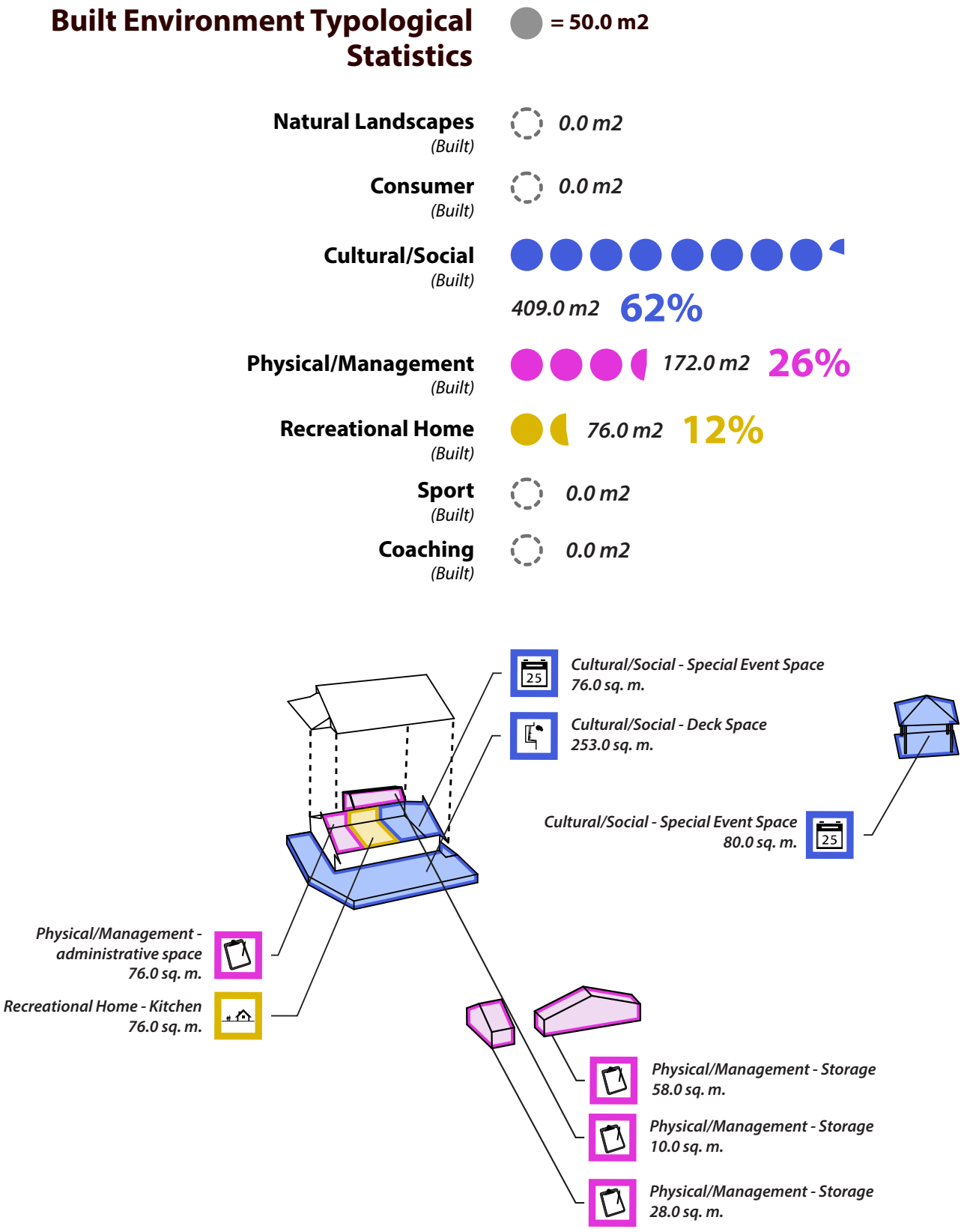
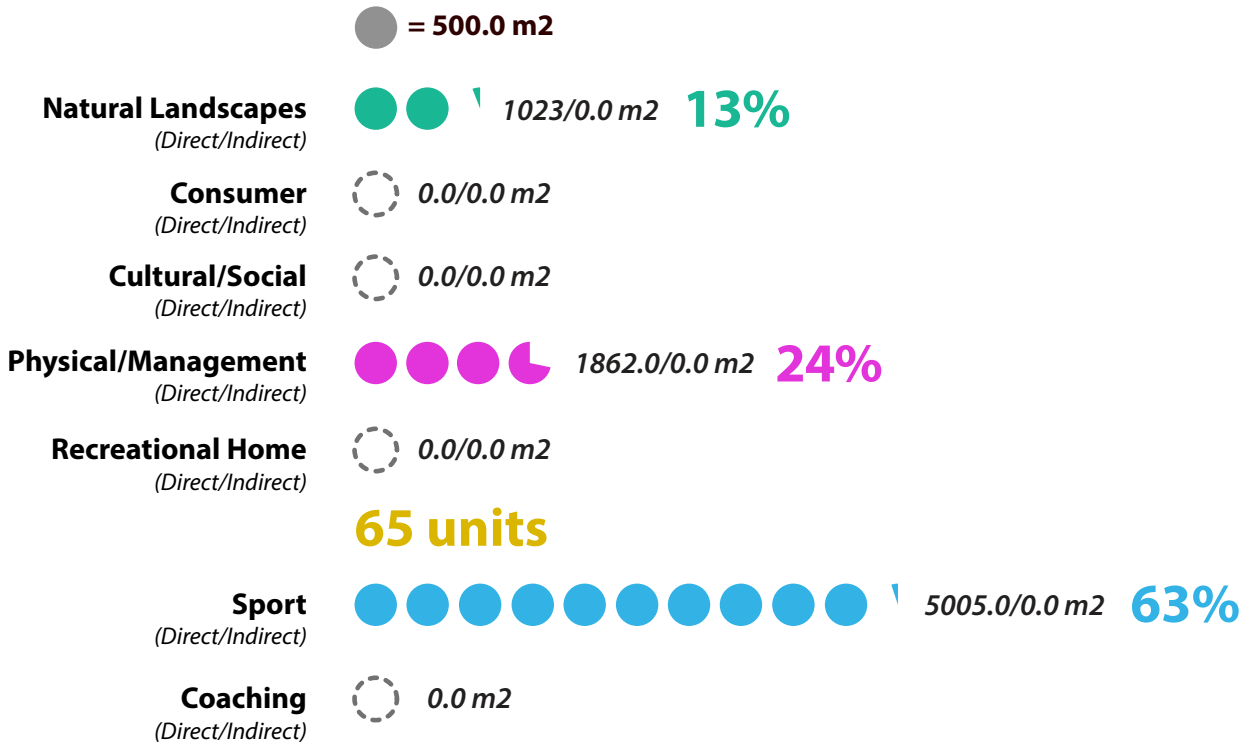


Figure 4.30. Cooking Lake Built Facility Analysis.

Calgary Yacht Club: Immediate and Surrounding Site Typological Analysis



Calgary Yacht Club: Membership and Retention Statistics 2016

Membership Rates:	**9% Decline 230 Members (2016), 252 Members (2015)**		
Student Retention 2015:	**Stage 1, Fundamentals: 58.**	**75% of Total Pop.**	**100% Retent.**
	Stage 2, Learn to Sail: 11.	**14% of Total Pop.**	**19% Retent.**
	Stage 3, Learn to Train: 8.	**10.5% of Total Pop.**	**14% Retent.**
Student Retention 2016:	**Stage 1, Fundamentals: 97.**	**91% of Total Pop.**	**100% Retent.**
	Stage 2, Learn to Sail: 7.	**7% of Total Pop.**	**7% Retent.**
	Stage 3, Learn to Train: 3.	**3% of Total Pop.**	**3% Retent.**

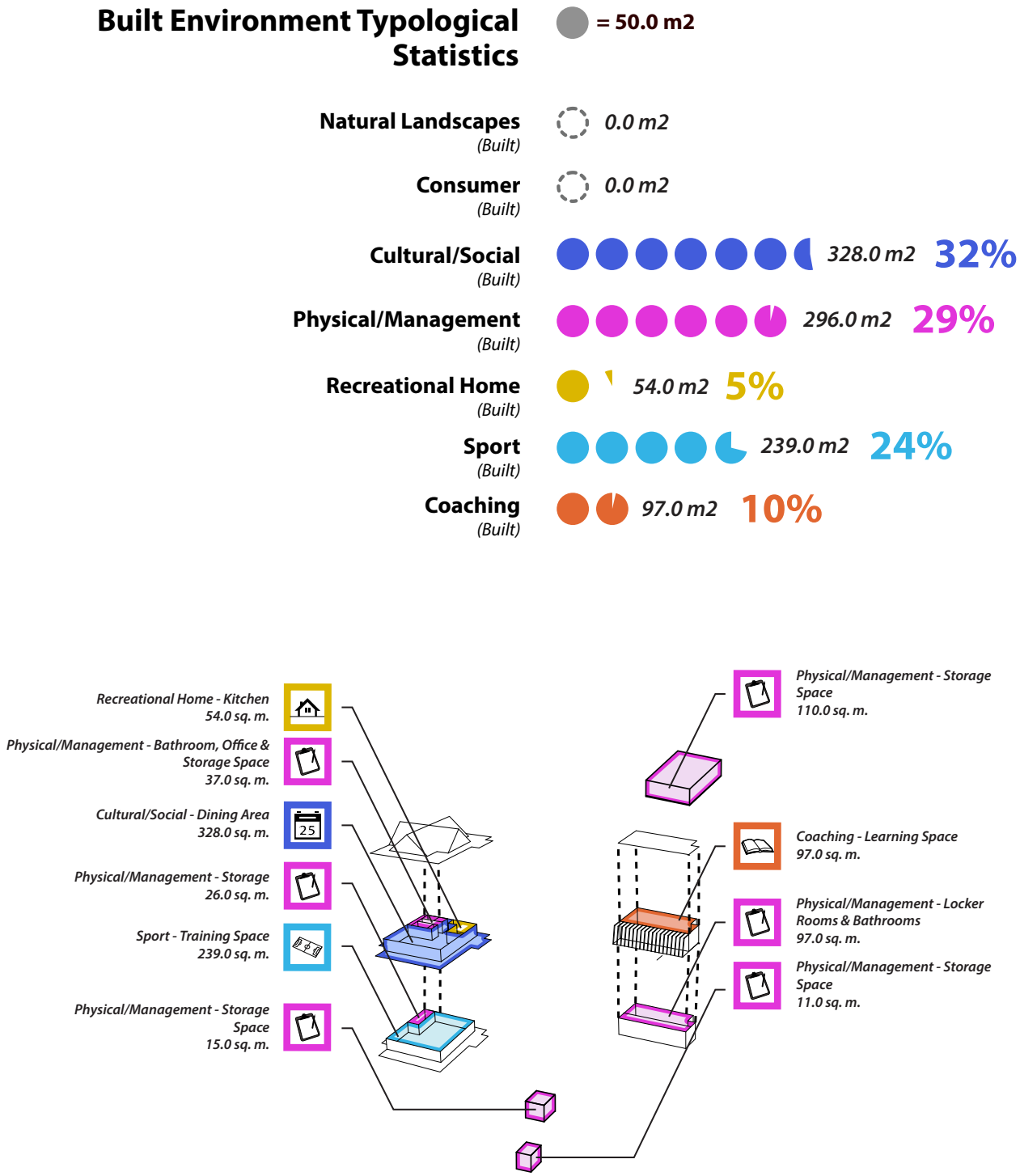
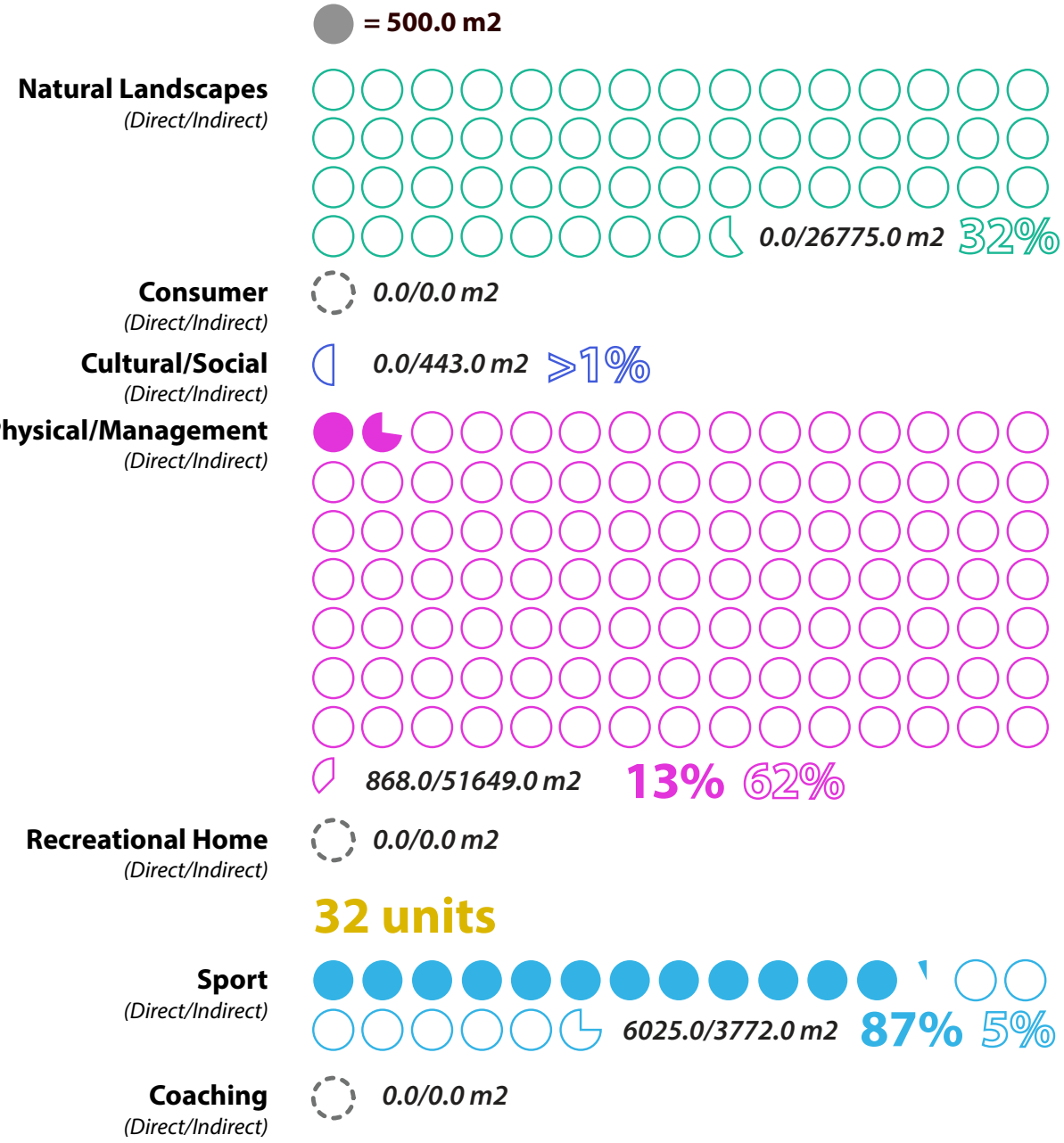


Figure 4.31. Calgary Yacht Club Built Spatial Analysis.

Disabled Sailing Association: Immediate and Surrounding Site Typological Analysis



Disabled Sailing Association: Membership and Retention Statistics 2016

Membership Rates: **79% Decline 279 Members (2015) 58 Members (2016)**

Student Retention 2016:	**Stage 1, Fundamentals: 685.**	**96% of Total Pop.**	**100% Retent.**
	Stage 2, Learn to Sail: 0.	**0% of Total Pop.**	**0% Retent.**
	Stage 3, Learn to Train: 29.	**4% of Total Pop.**	**4% Retent.**

Built Environment Typological Statistics

= 50.0 m2

Natural Landscapes *(Built)* — *0.0 m2*

Consumer *(Built)* — *0.0 m2*

Cultural/Social *(Built)* — *0.0 m2*

Physical/Management *(Built)* — *28.0 m2* **33%**

Recreational Home *(Built)* — *0.0 m2*

Sport *(Built)* — *0.0 m2*

Coaching *(Built)* — *57.0 m2* **66%**

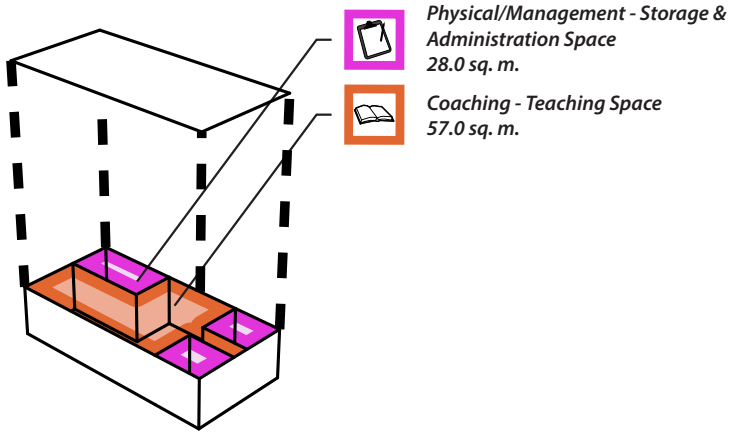
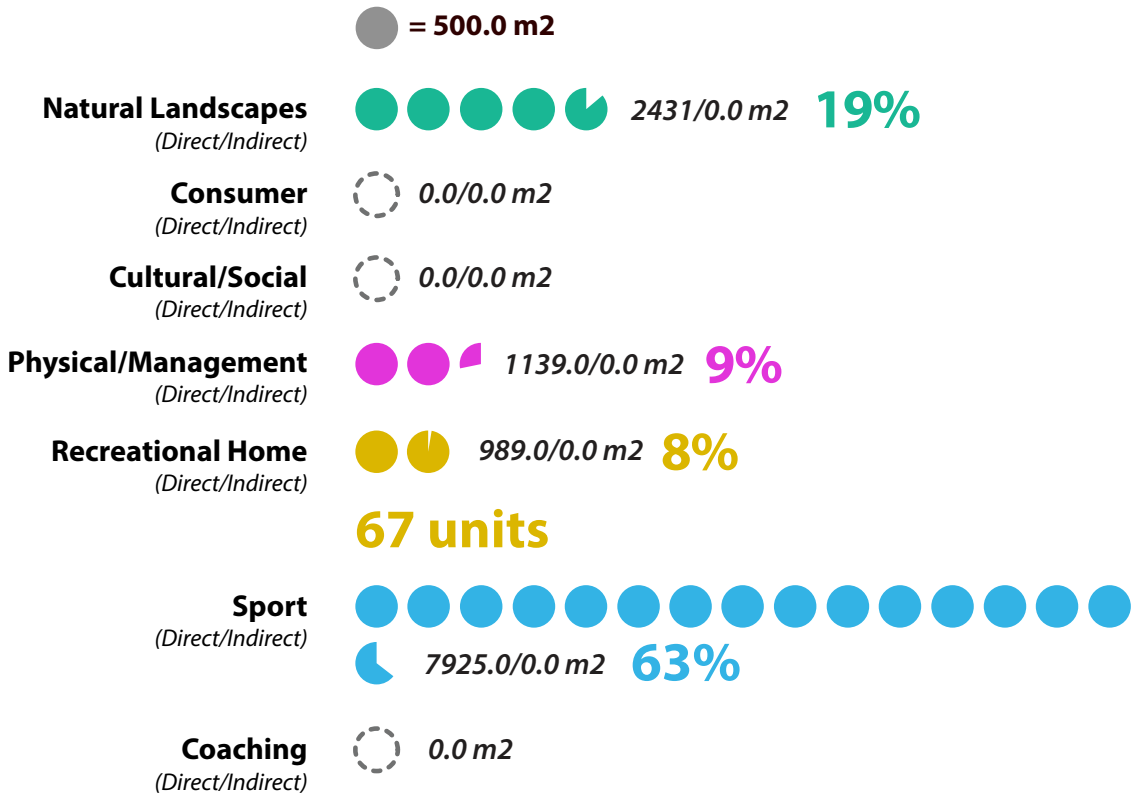


Figure 4.32. Disabled Sailing Association Built Spatial Analysis

Edmonton Yacht Club: Immediate and Surrounding Site Typological Analysis



Edmonton Yacht Club: Membership and Retention Statistics 2016

Membership Rates:	**45 Members (2016)**		
Student Retention 2015:	**Stage 1, Fundamentals: 38.**	**86% of Total Pop.**	**100% Retent.**
	Stage 2, Learn to Sail: 0.	**0% of Total Pop.**	**0% Retent.**
	Stage 3, Learn to Train: 4.	**9.5% of Total Pop.**	**N/A**
Student Retention 2016:	**Stage 1, Fundamentals: 25.**	**46% of Total Pop.**	**100% Retent.**
	Stage 2, Learn to Sail: 13.	**24% of Total Pop.**	**48% Retent.**
	Stage 3, Learn to Train: 16.	**29. 5% of Total Pop.**	**123% Retent.**

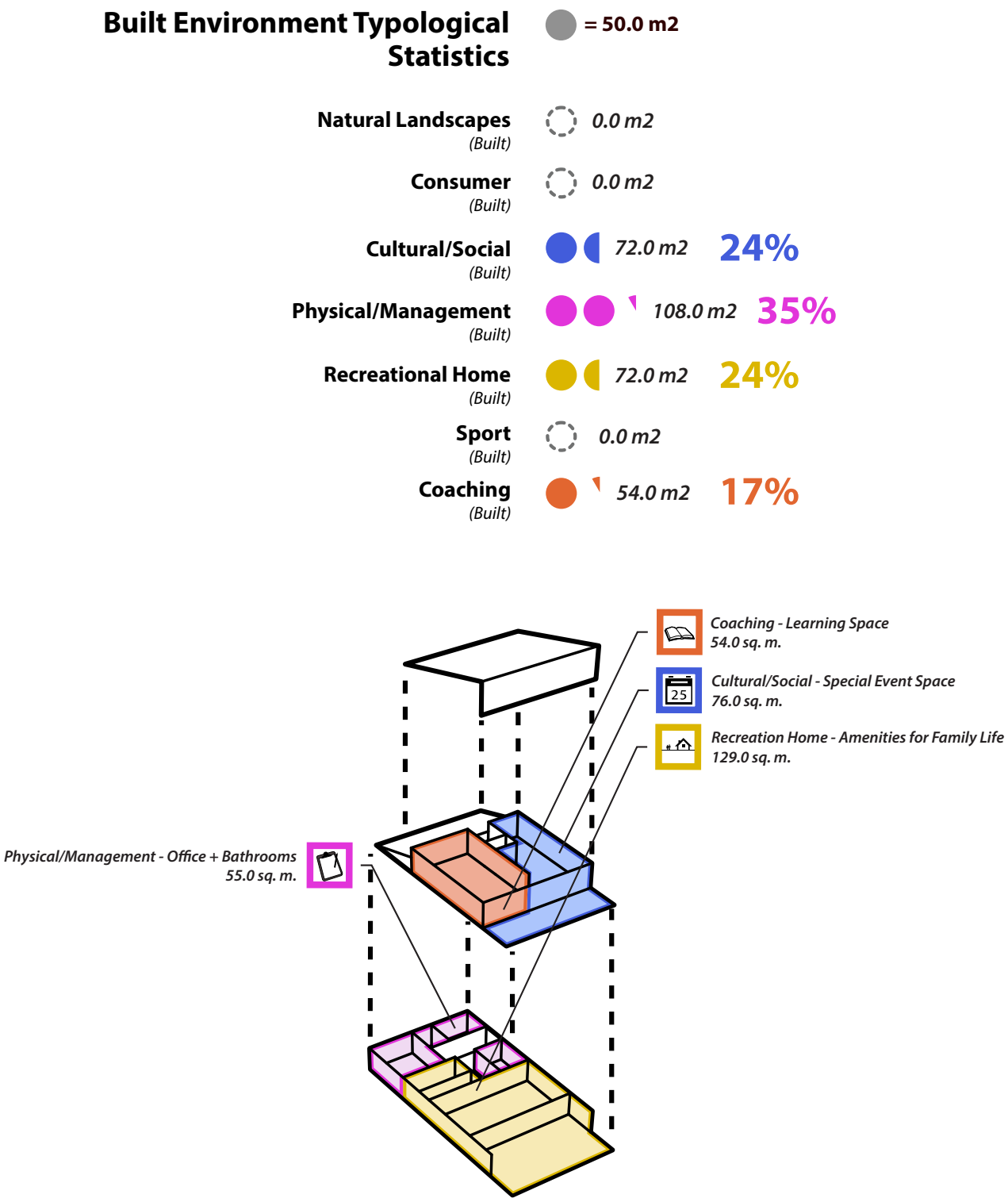
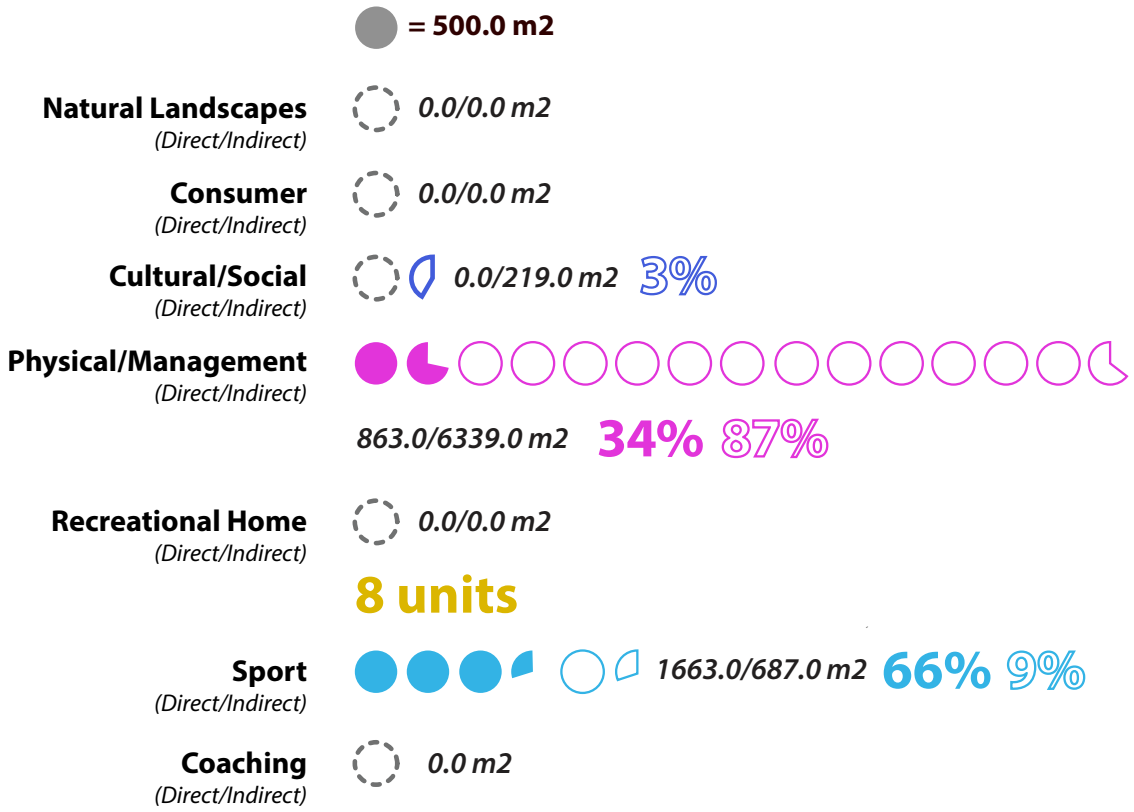


Figure 4.33. Edmonton Yacht Club Built Spatial Analysis

Great Slave Lake Sailing Club: Immediate and Surrounding Site Typological Analysis



Great Slave Lake Sailing Club: Membership and Retention Statistics 2016

Membership Rates:	**75 Members (2016)**		
Student Retention 2015:	**Stage 1, Fundamentals: 30.**	**79% of Total Pop.**	**100% Retent.**
	Stage 2, Learn to Sail: 1.	**3% of Total Pop.**	**3% Retent.**
	Stage 3, Learn to Train: 7.	**18% of Total Pop.**	**23% Retent.**
Student Retention 2016:	**Stage 1, Fundamentals: 33.**	**80% of Total Pop.**	**100% Retent.**
	Stage 2, Learn to Sail: 3.	**7% of Total Pop.**	**9% Retent.**
	Stage 3, Learn to Train: 5.	**12% of Total Pop.**	**15% Retent.**

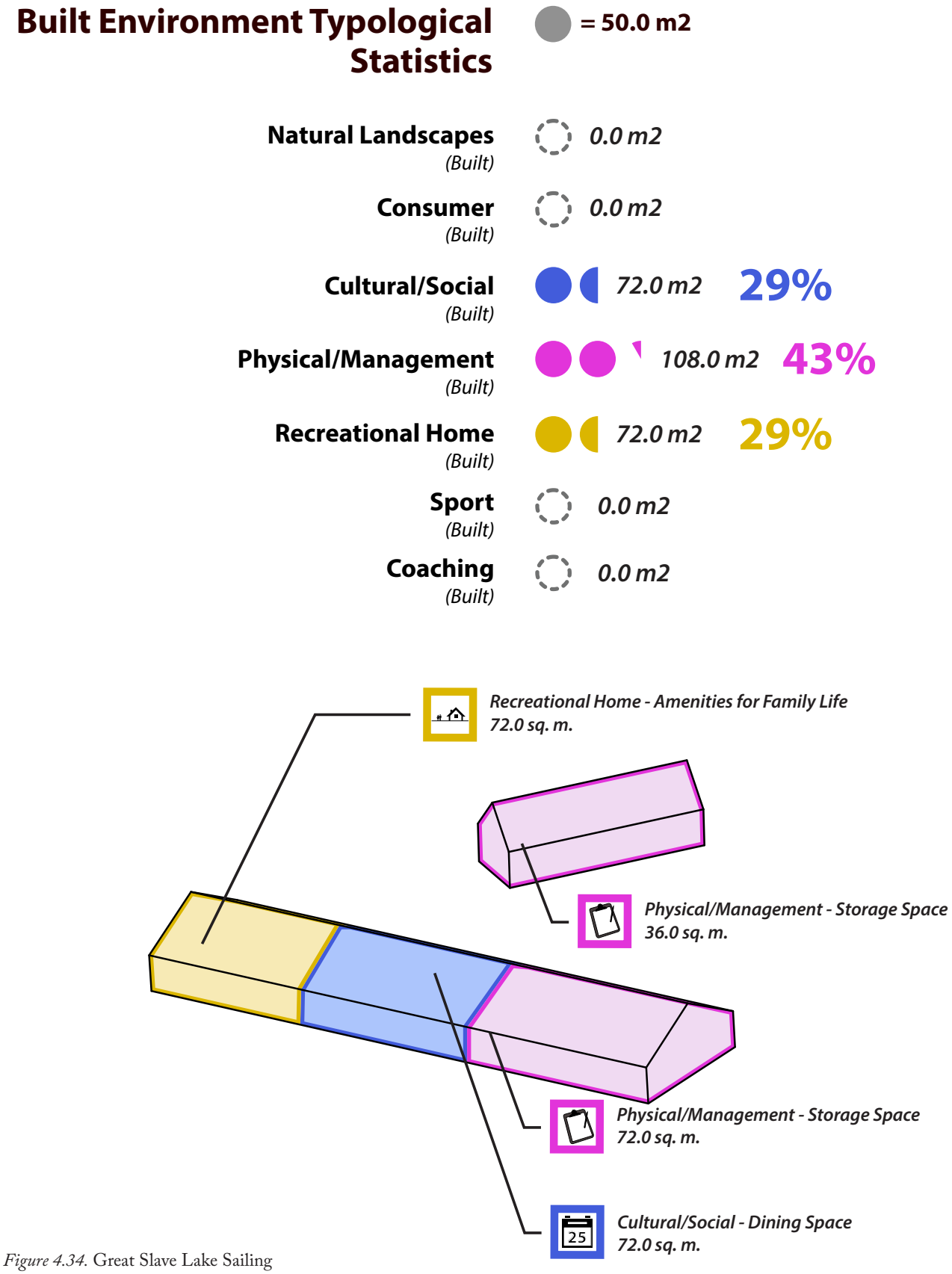
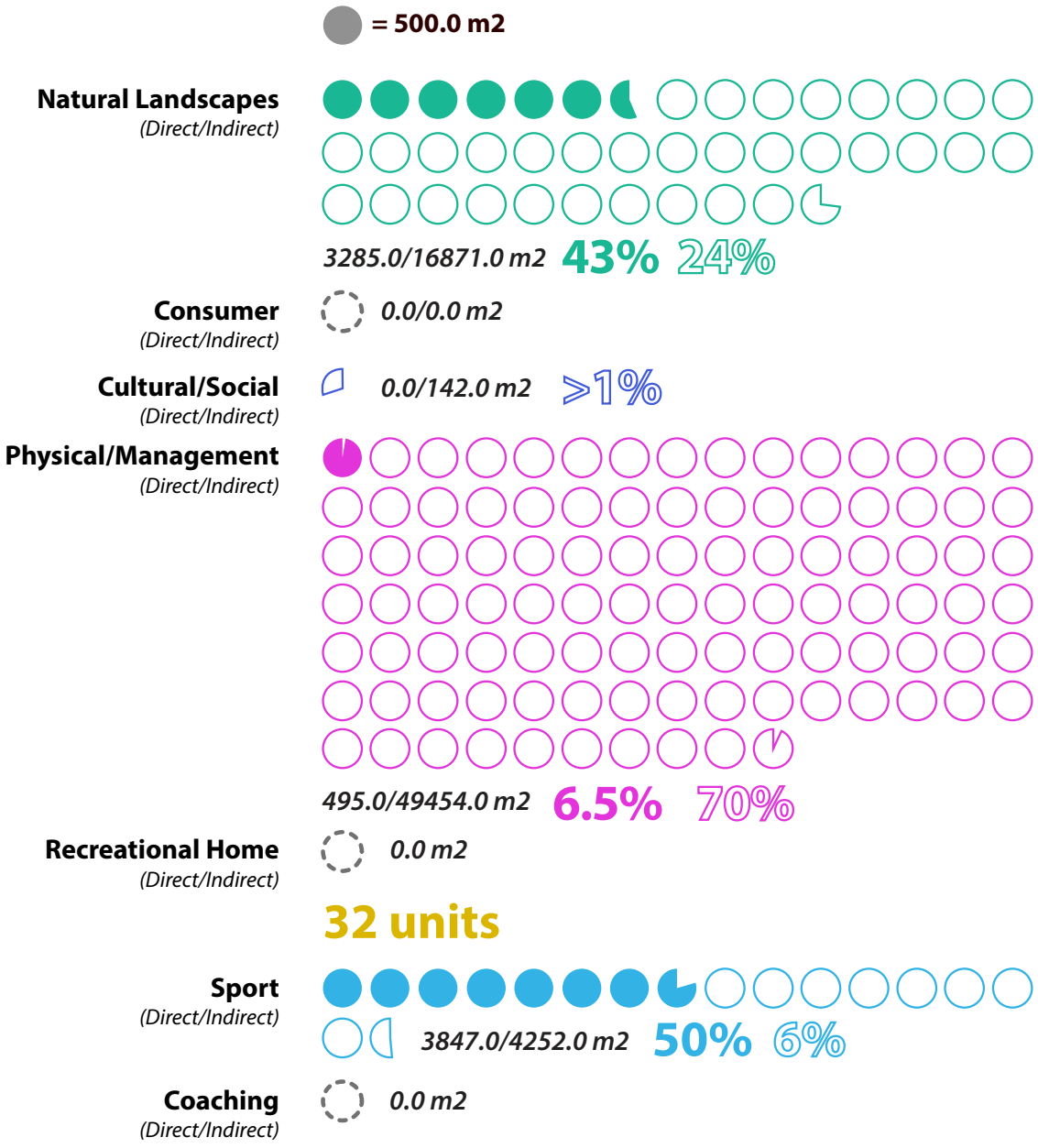


Figure 4.34. Great Slave Lake Sailing Club Built Spatial Analysis

Glenmore Sailing Club: Immediate and Surrounding Site Typological Analysis



Glenmore Sailing Club: Membership and Retention Statistics 2016

Membership Rates:	**45 Members (2016)**		
Student Retention 2015:	**Stage 1, Fundamentals: 69.**	**68% of Total Pop.**	**100% Retent.**
	Stage 2, Learn to Sail: 22.	**22% of Total Pop.**	**32% Retent.**
	Stage 3, Learn to Train: 10.	**9.5% of Total Pop.**	**15% Retent.**
Student Retention 2016:	**Stage 1, Fundamentals: 76.**	**46% of Total Pop.**	**100% Retent.**
	Stage 2, Learn to Sail: 19.	**24% of Total Pop.**	**25% Retent.**
	Stage 3, Learn to Train: 14.	**29. 5% of Total Pop.**	**18% Retent.**

Built Environment Typological Statistics

= 50.0 m2

Natural Landscapes *(Built)* — *0.0 m2*

Consumer *(Built)* — *0.0 m2*

Cultural/Social *(Built)* — *291.0 m2* **60%**

Physical/Management *(Built)* — *164.0 m2* **34%**

Recreational Home *(Built)* — *31.0 m2* **6%**

Sport *(Built)* — *0.0 m2*

Coaching *(Built)* — *0.0 m2*

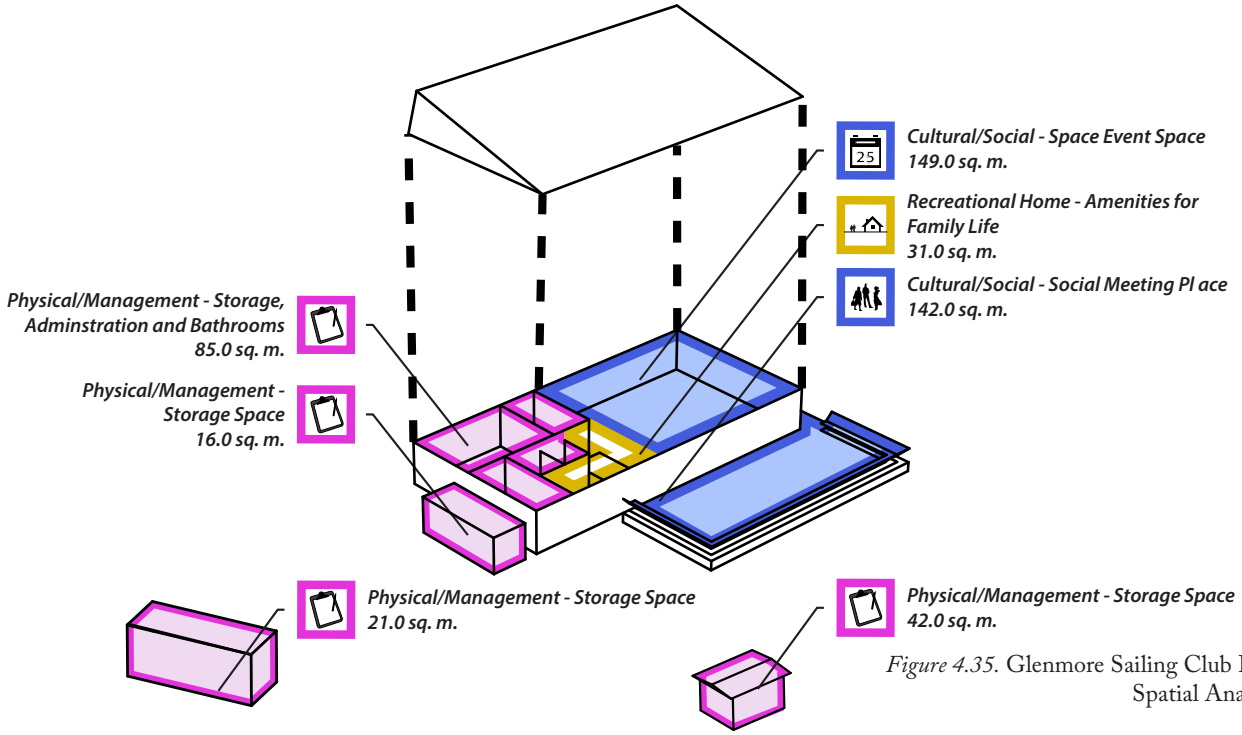
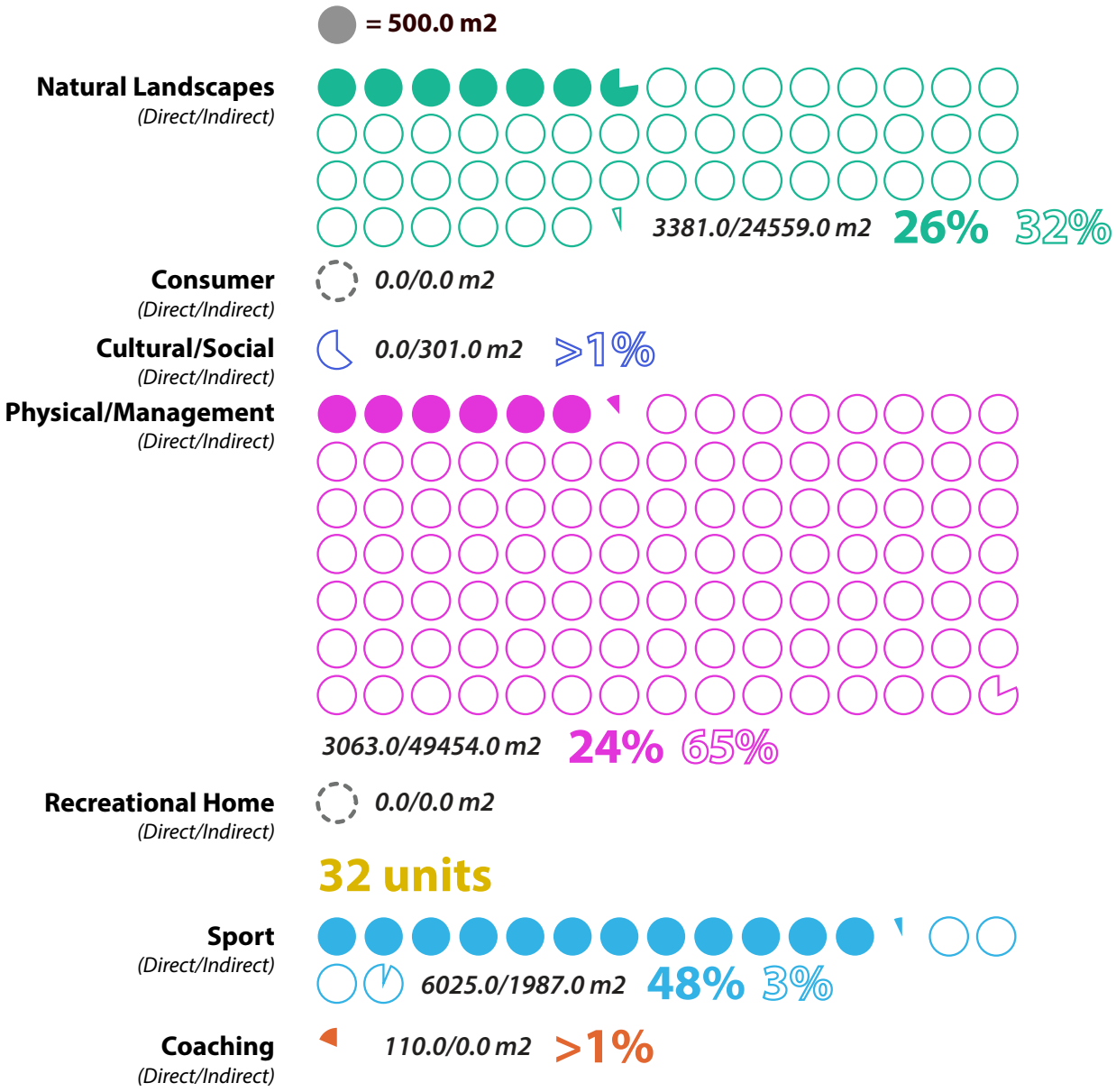


Figure 4.35. Glenmore Sailing Club Built Spatial Analysis

Glenmore Sailing School: Immediate and Surrounding Site Typological Analysis



Glenmore Sailing School: Membership and Retention Statistics 2016

Membership Rates:	**N/A**		
Student Retention 2015:	**Stage 1, Fundamentals: 488.**	**70% of Total Pop.**	**100% Retent.**
	Stage 2, Learn to Sail: 150.	**22% of Total Pop.**	**30% Retent.**
	Stage 3, Learn to Train: 53.	**8% of Total Pop.**	**11% Retent.**
Student Retention 2016:	**Stage 1, Fundamentals: 533.**	**74% of Total Pop.**	**100% Retent.**
	Stage 2, Learn to Sail: 126.	**17% of Total Pop.**	**25% Retent.**
	Stage 3, Learn to Train: 62.	**8. 5% of Total Pop.**	**12% Retent.**

Built Environment Typological Statistics

= 50.0 m2

Natural Landscapes *(Built)* — *0.0 m2*

Consumer *(Built)* — *0.0 m2*

Cultural/Social *(Built)* — *0.0 m2*

Physical/Management *(Built)* — *435.0 m2* **75%**

Recreational Home *(Built)* — *8.0 m2* **1.5%**

Sport *(Built)* — *0.0 m2*

Coaching *(Built)* — *135.0 m2* **23.5%**

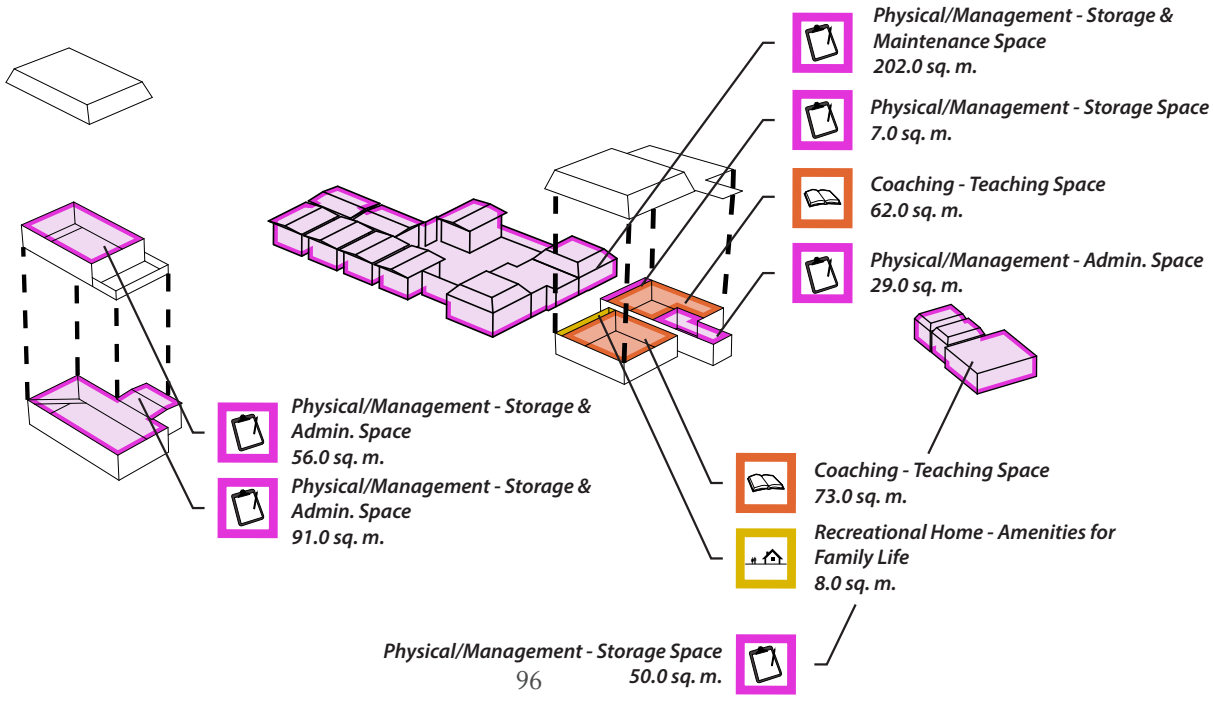
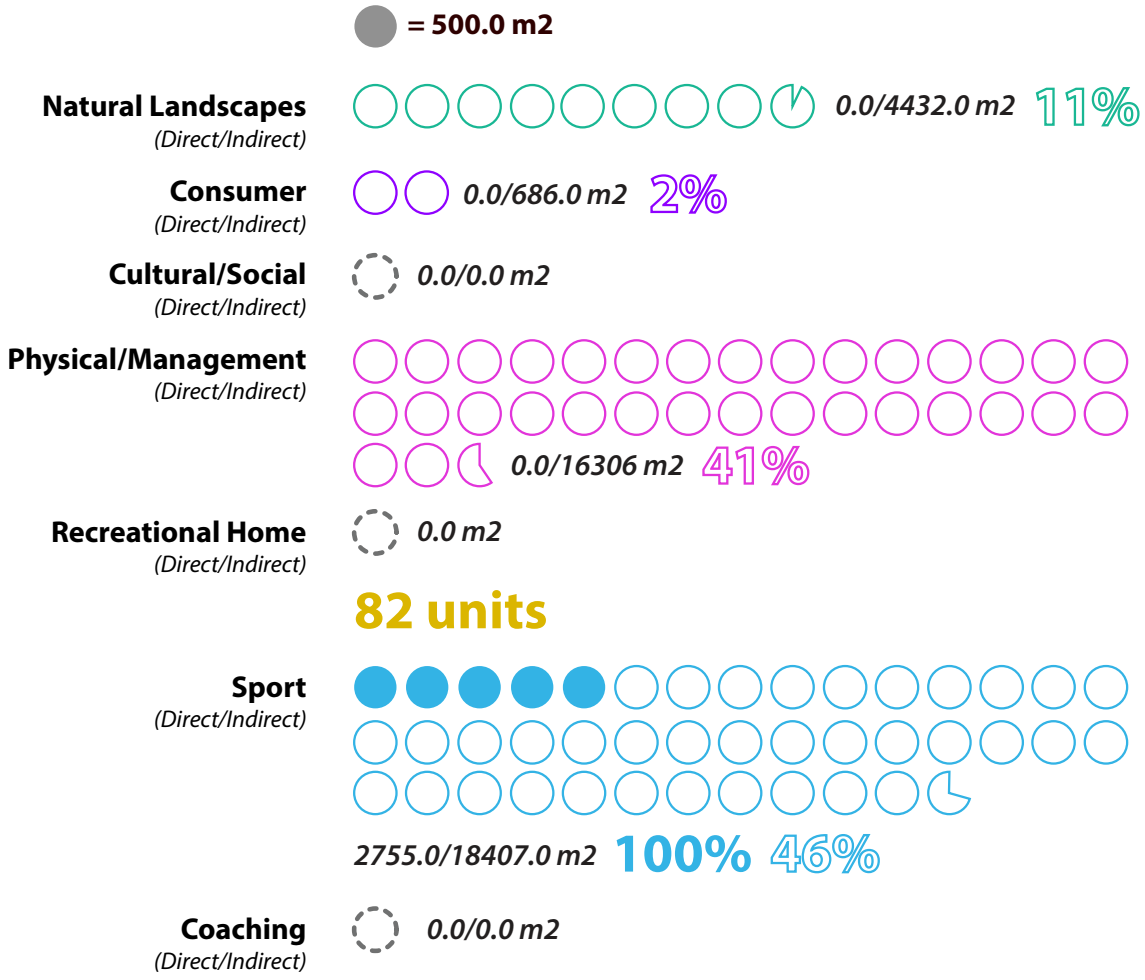


Figure 4.36. Glenmore Sailing School Built Spatial Analysis

Itaska Yacht Club: Immediate and Surrounding Site Typological Analysis



Itaska Yacht Club: Membership and Retention Statistics 2016

Membership Rates:	**0% Growth (25 Members 2015, 25 members 2016)**		
Student Retention 2015:	**None Recorded**		
Student Retention 2016:	**Stage 1, Fundamentals: 11.**	**100% of Total Pop.**	**100% Retent.**
	Stage 2, Learn to Sail: 0.	**0% of Total Pop.**	**0% Retent.**
	Stage 3, Learn to Train: 0.	**0% of Total Pop.**	**0% Retent.**

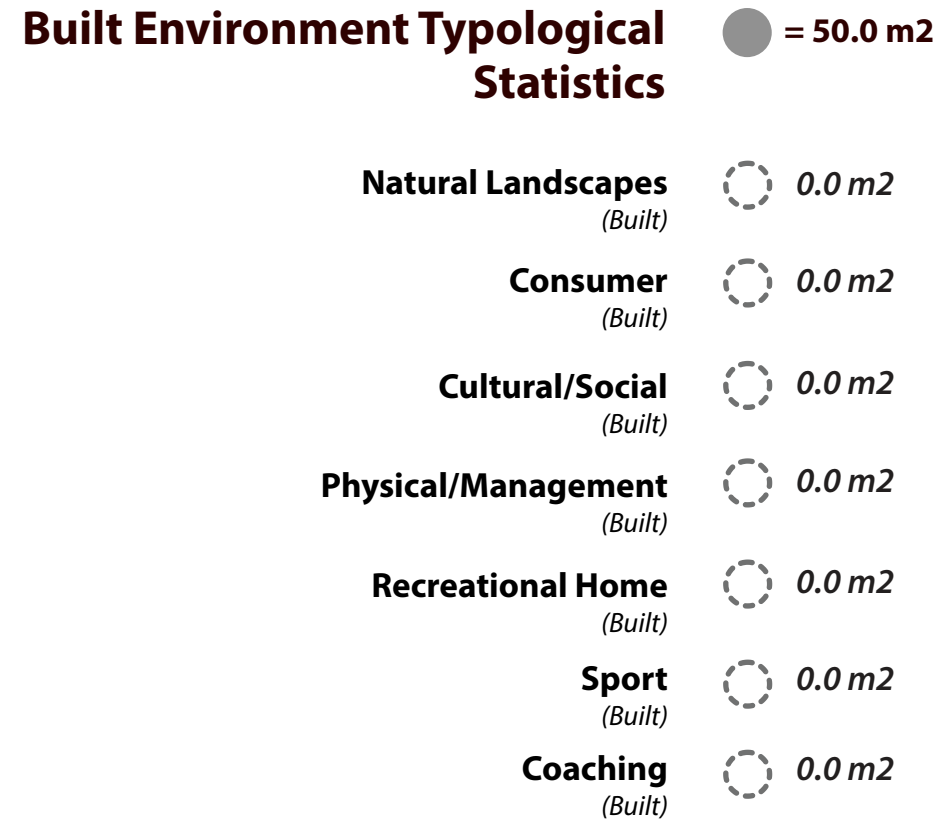
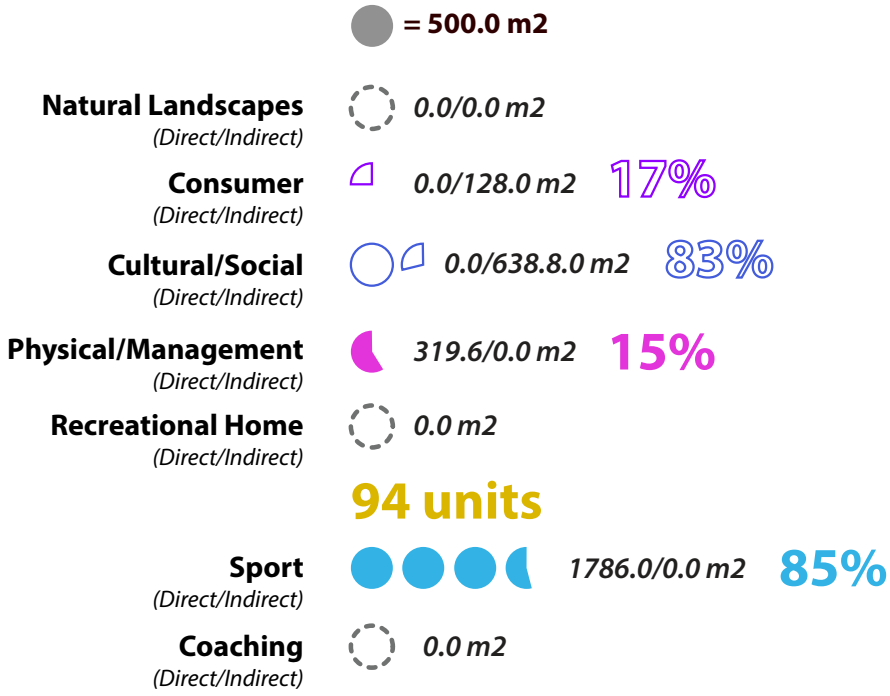


Figure 4.37. Itaska Yacht Club Built Spatial Analysis

Ma Me O Sailing Club: Immediate and Surrounding Site Typological Analysis



Ma Me O Sailing Club: Membership and Retention Statistics 2015 - 2016

Membership Rates: **20% Decrease (15 members in 2015, 12 members in 2016)**

Student Retention: **No Formal courses offered**

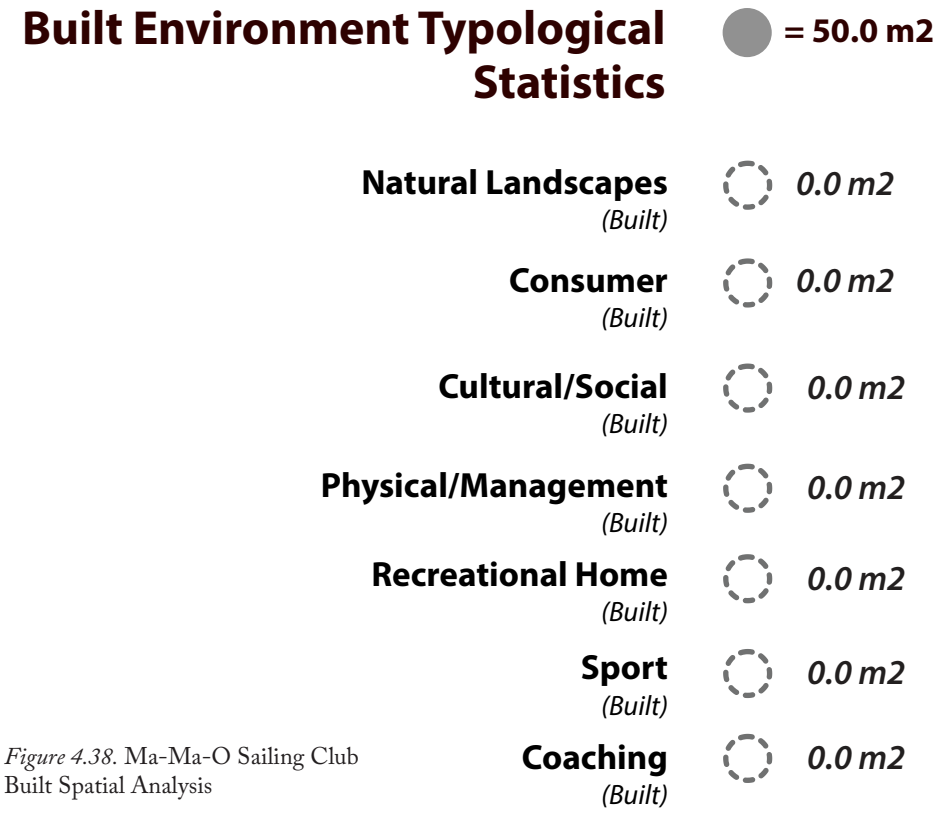
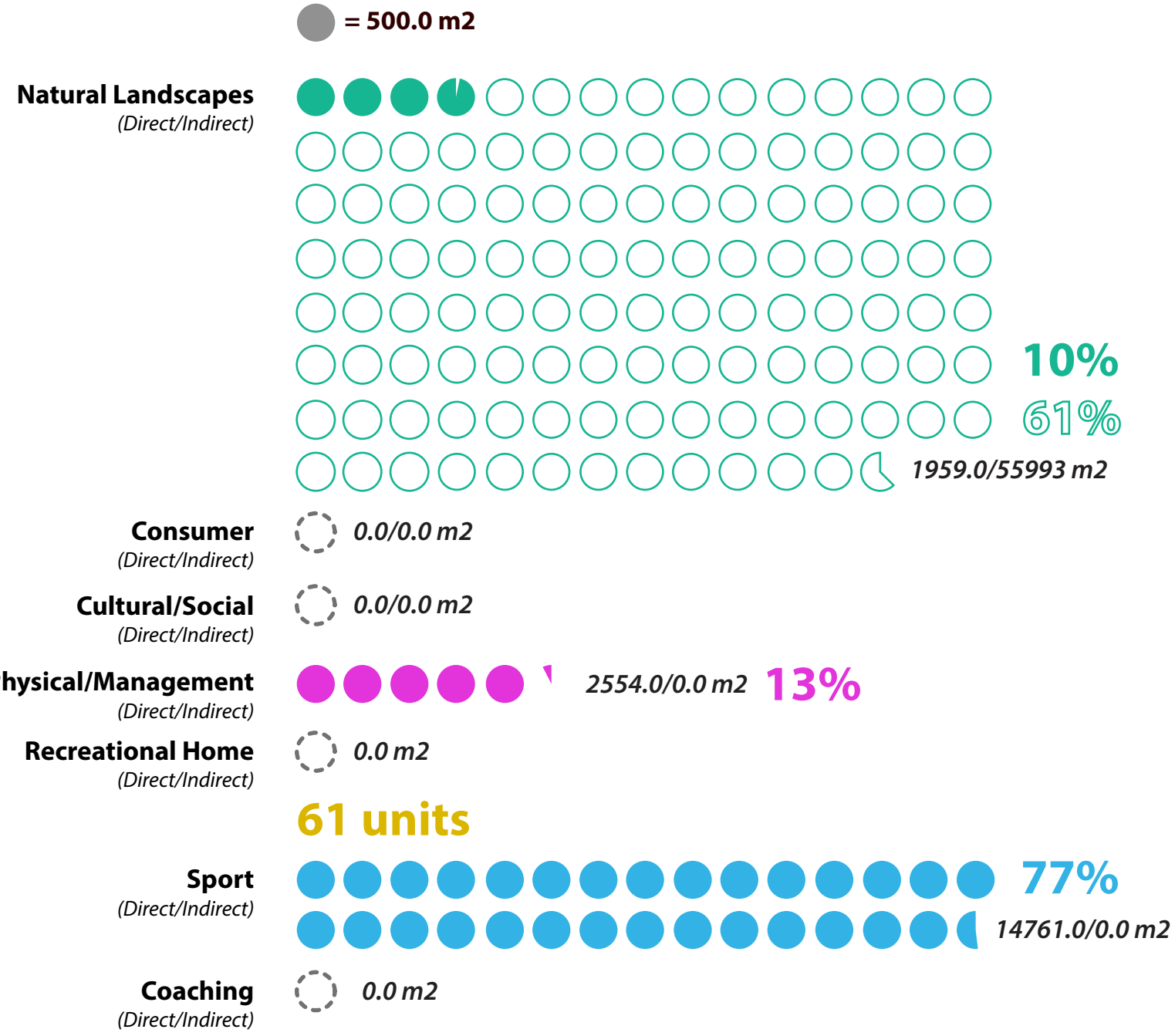


Figure 4.38. Ma-Ma-O Sailing Club Built Spatial Analysis

Newell Sailing Club: Immediate and Surrounding Site Typological Analysis



Newell Sailing Club: Membership and Retention Statistics 2015 - 2016

Membership Rates: **0% Growth (25 Members in 2015, and 25 members in 2016)**

Student Retention: **No Formal courses offered**

Built Environment Typological Statistics

= 50.0 m2

Natural Landscapes *(Built)* — *0.0 m2*

Consumer *(Built)* — *0.0 m2*

Cultural/Social *(Built)* — *138.8 m2* **46%**

Physical/Management *(Built)* — *161.0 m2* **54%**

Recreational Home *(Built)* — *20.8 m2* **7%**

Sport *(Built)* — *0.0 m2*

Coaching *(Built)* — *0.0 m2*

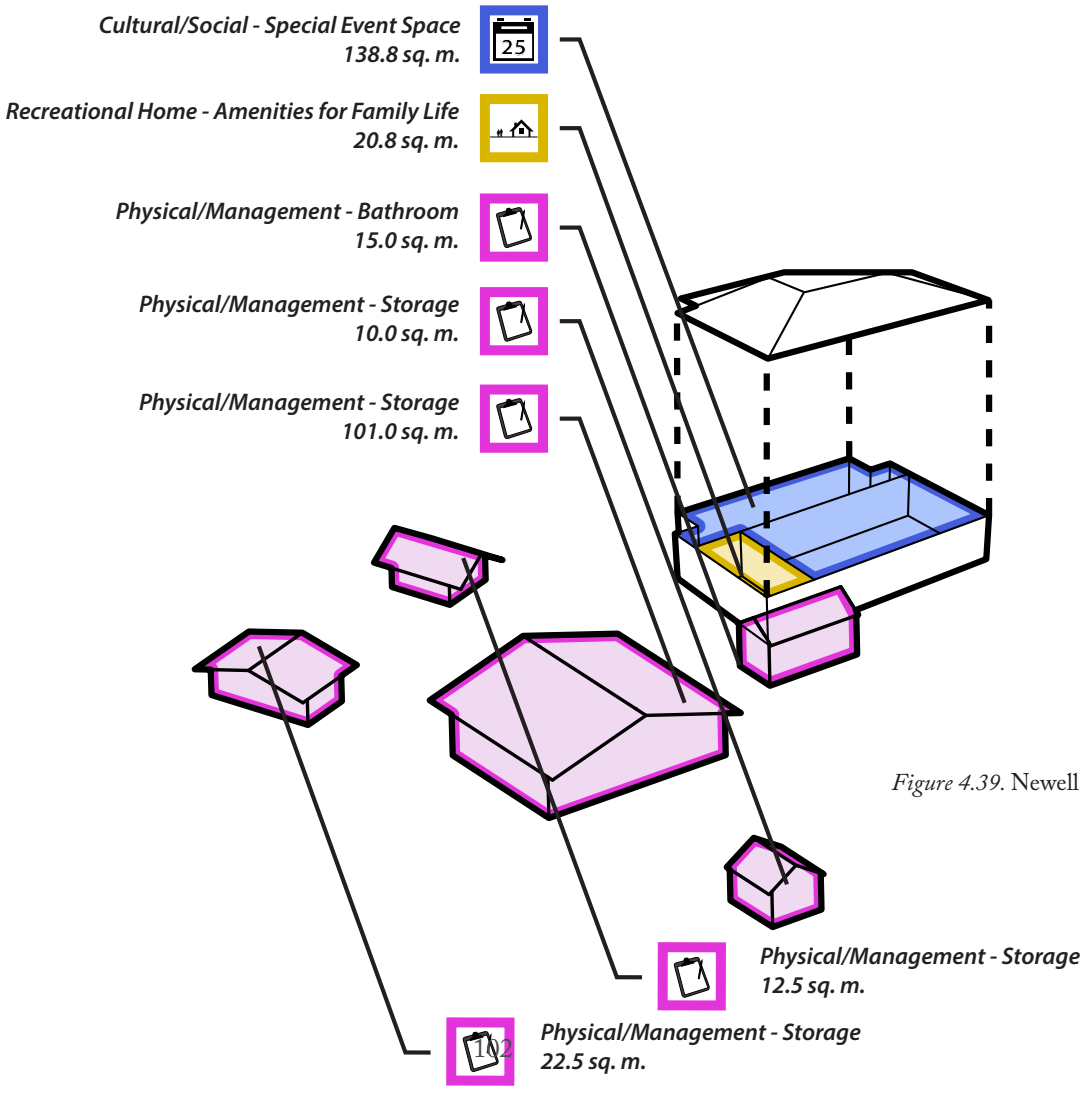
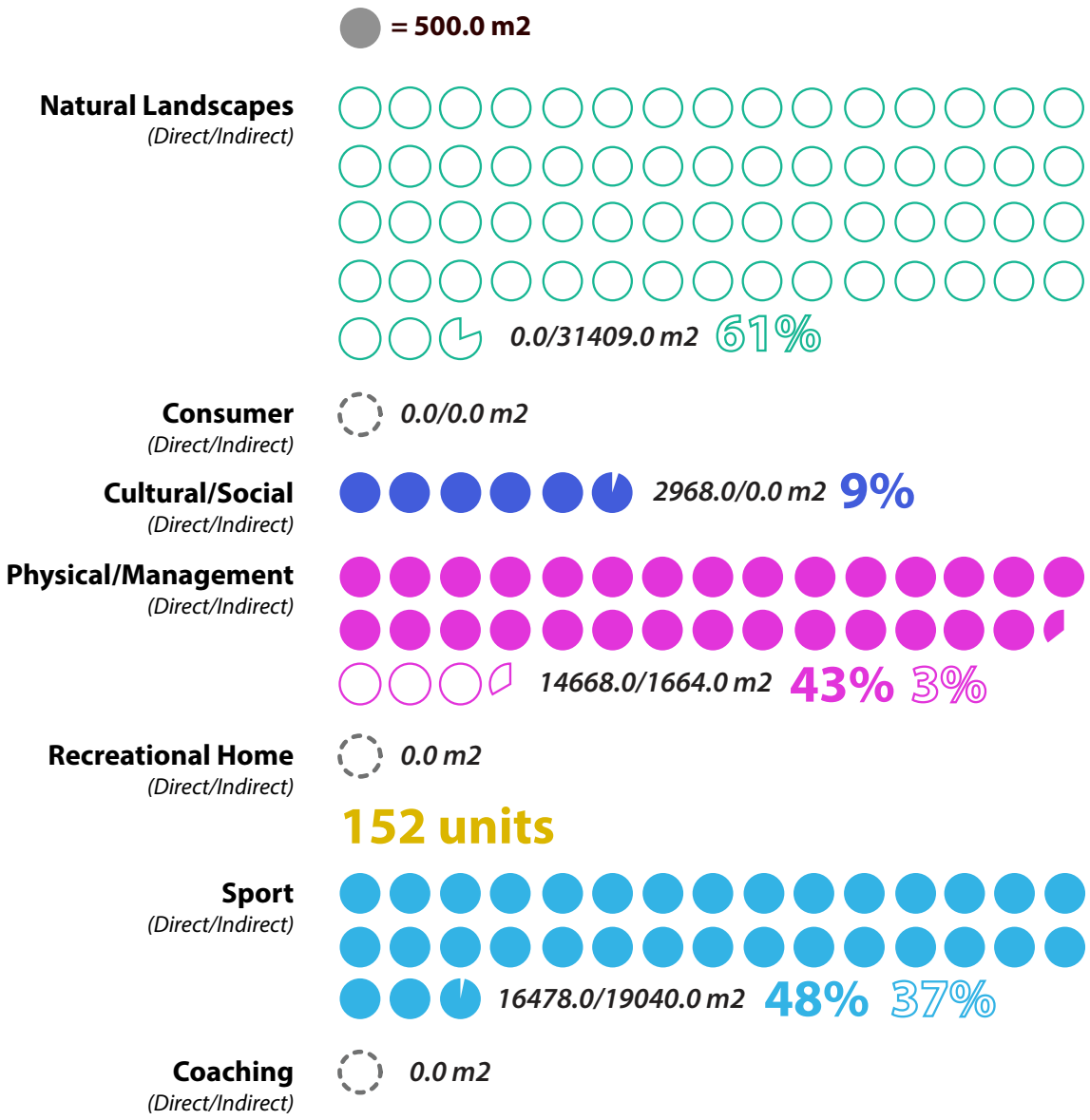


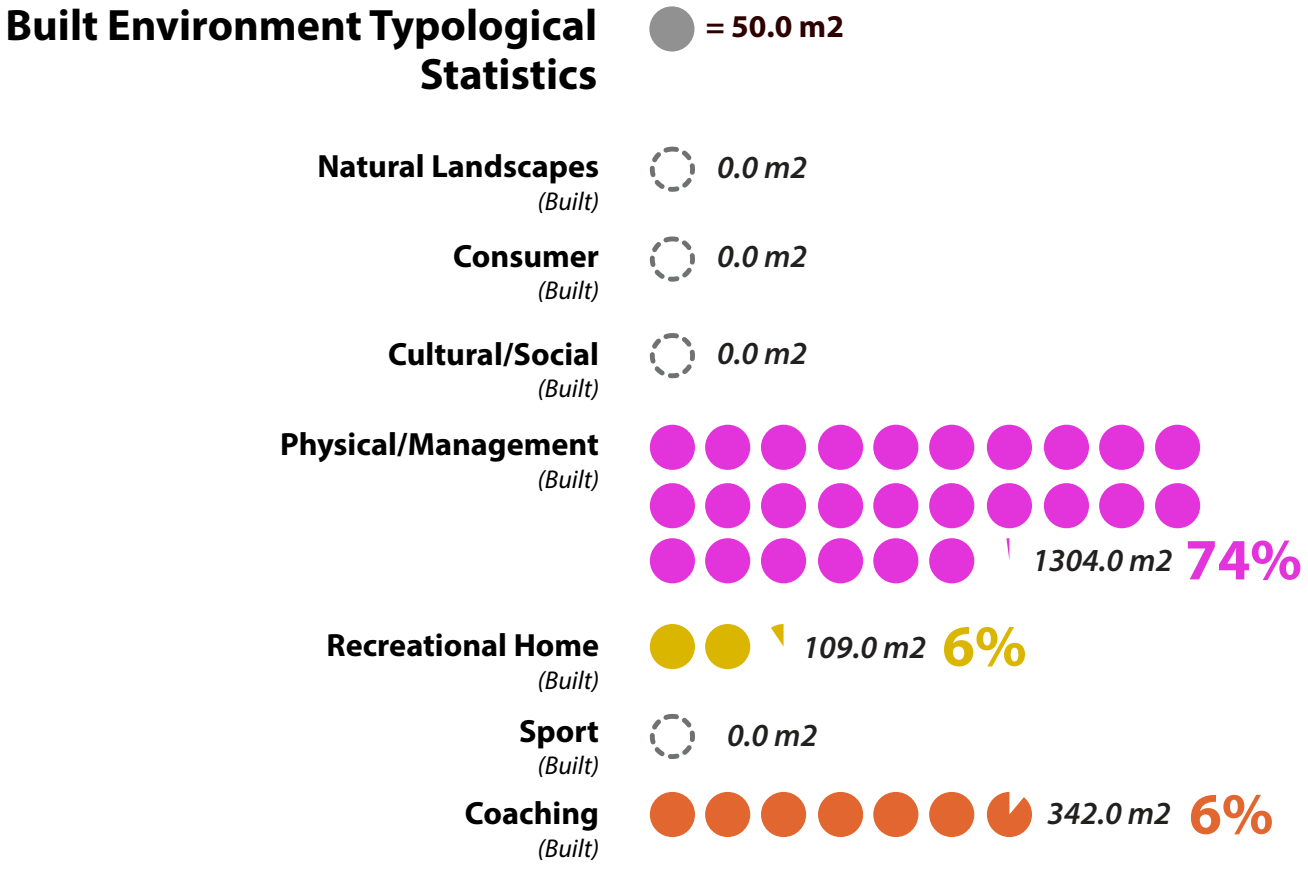
Figure 4.39. Newell Sailing Club Built Spatial Analysis

Sail Sandpoint: Immediate and Surrounding Site Typological Analysis



Sail Sandpoint: Membership and Retention Statistics 2016

Membership Rates:	**No Membership (Public Program)**		
Student Retention:	**Stage 1, Fundamentals: 776.**	**87% of Total Pop.**	**100% Retent.**
	Stage 2, Learn to Sail: 60.	**7% of Total Pop.**	**8% Retent.**
	Stage 3, Learn to Train: 42.	**46. 5% of Total Pop.**	**5% Retent.**



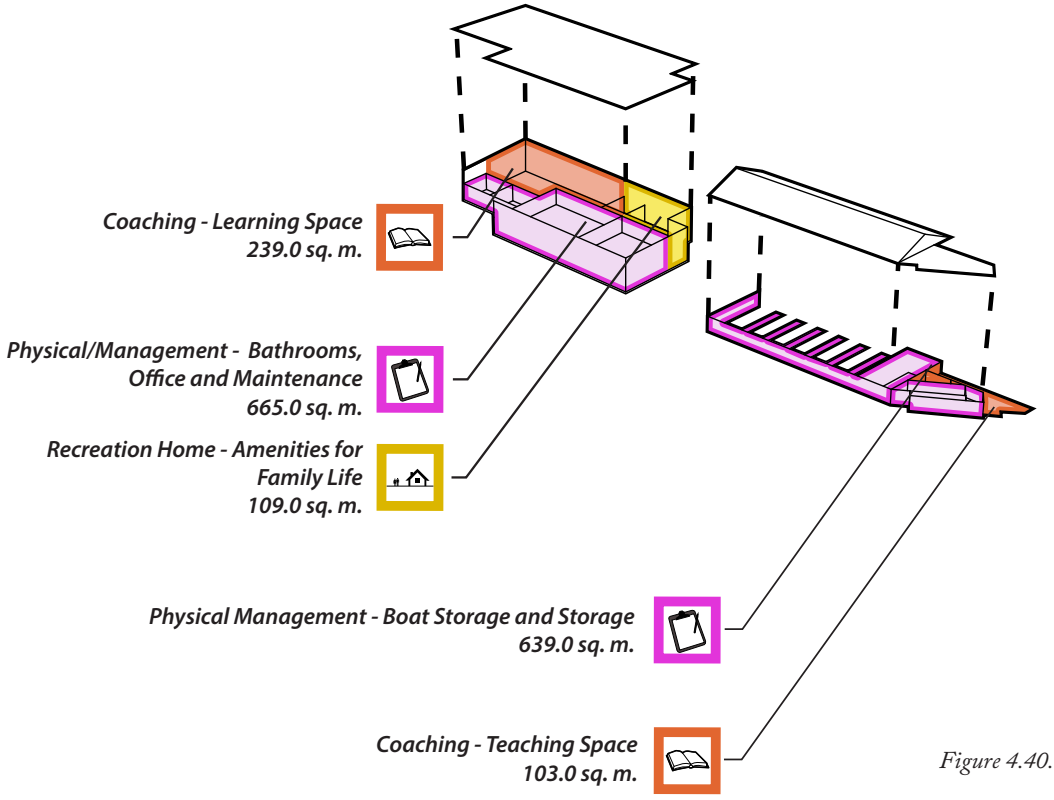
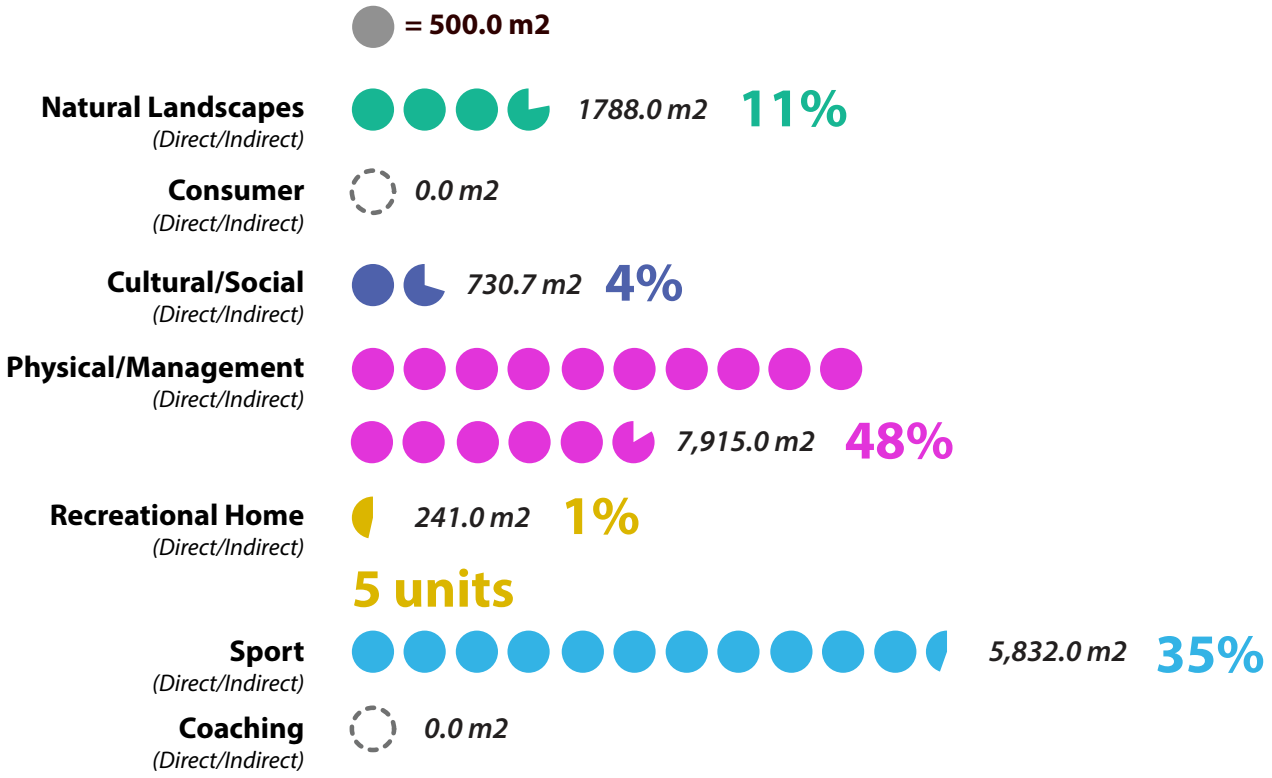


Figure 4.40. Sail Sandpoint Built Spatial Analysis

Sunshine Bay: Immediate and Surrounding Site Typological Analysis



Sunshine Bay: Membership and Retention Statistics 2015 - 2016

Membership Rates: **7% Increase in Membership (52 to 56 Members)**

Student Retention: **No Formal courses offered**

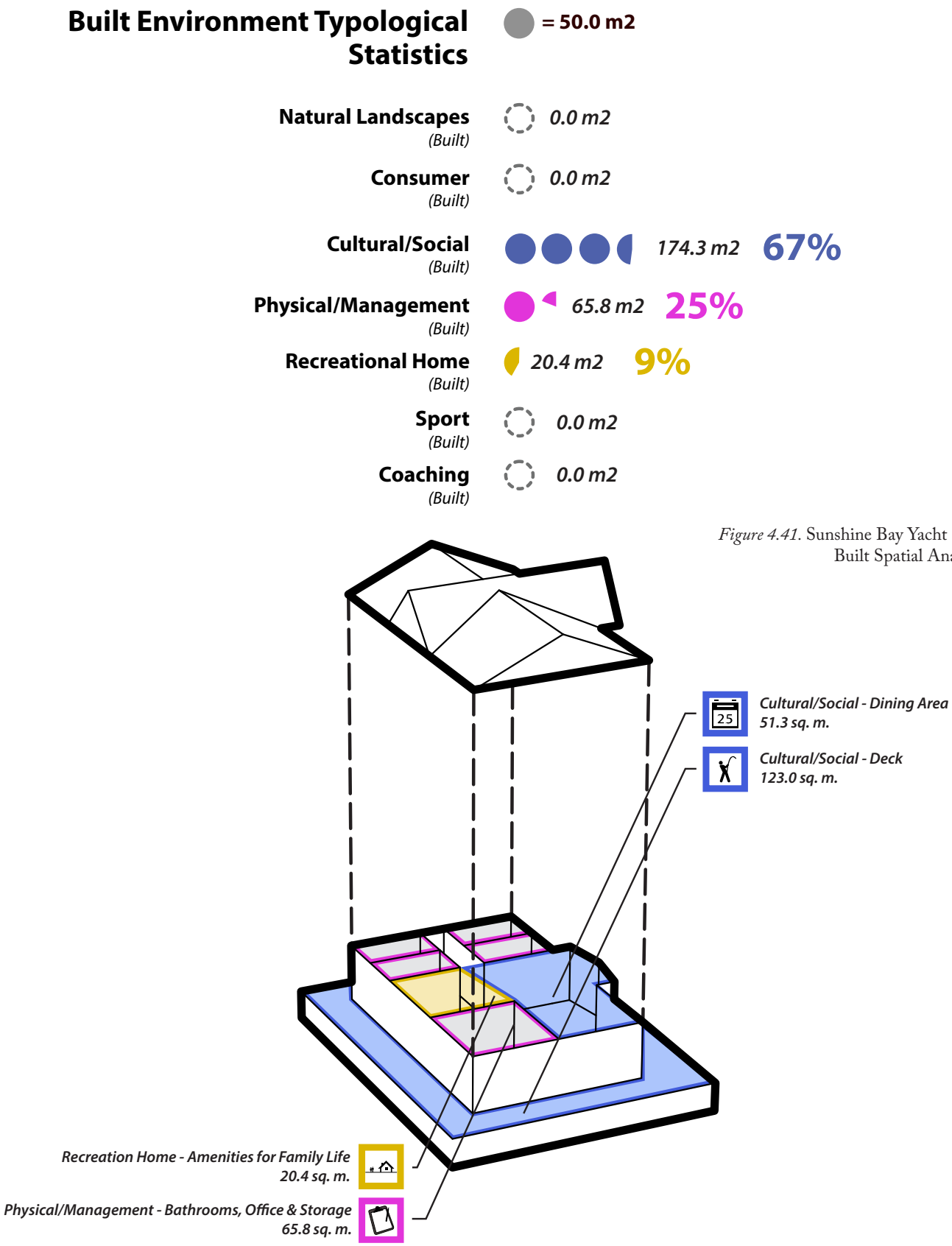
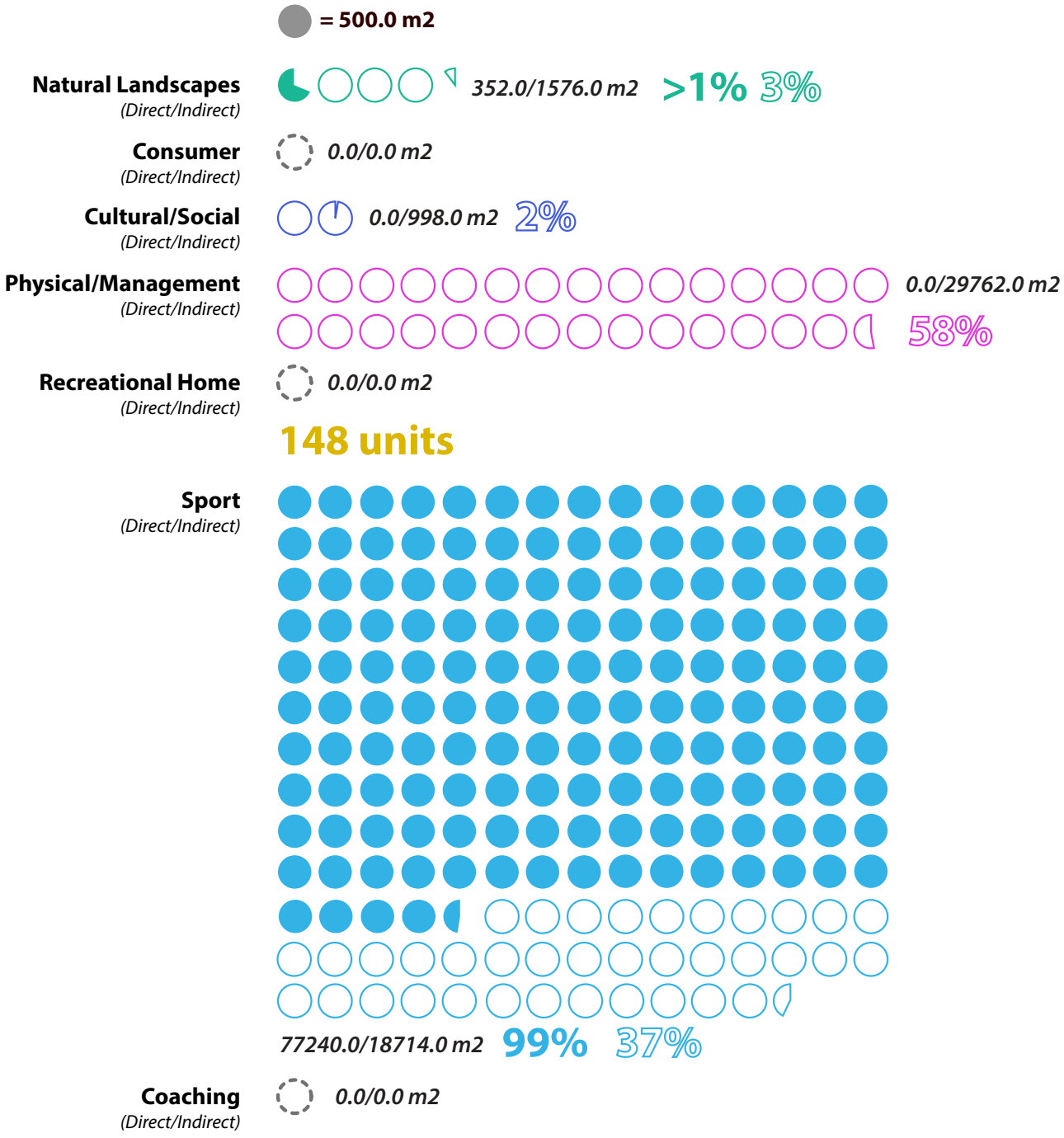


Figure 4.41. Sunshine Bay Yacht Club Built Spatial Analysis

Sylvan Lake Sailing Club: Immediate and Surrounding Site Typological Analysis



Sylvan Lake Sailing Club: Membership and Retention Statistics 2016

Membership Rates: **83 Members (2015), 63 Members (2016) 24% Decline in Membership**

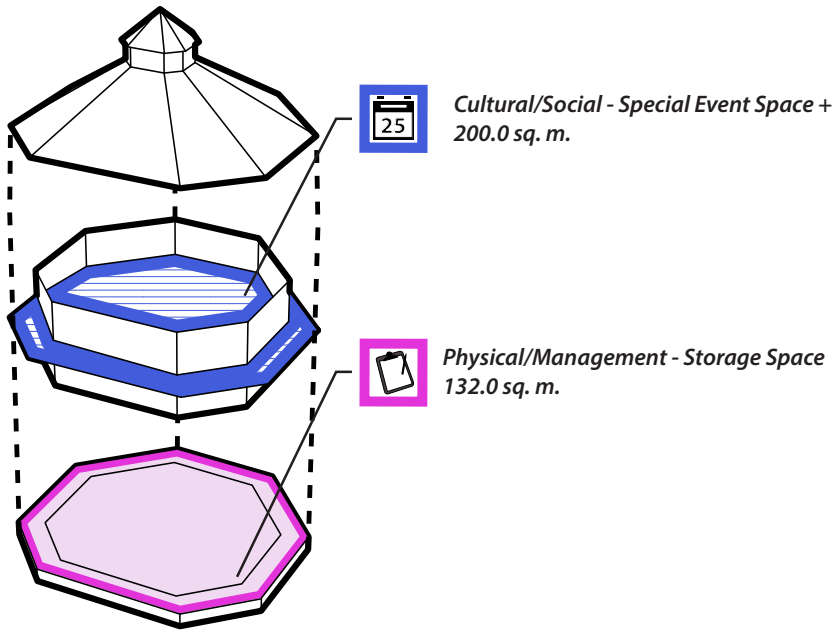
Student Retention: **No formal programs offered.**

Built Environment Typological Statistics

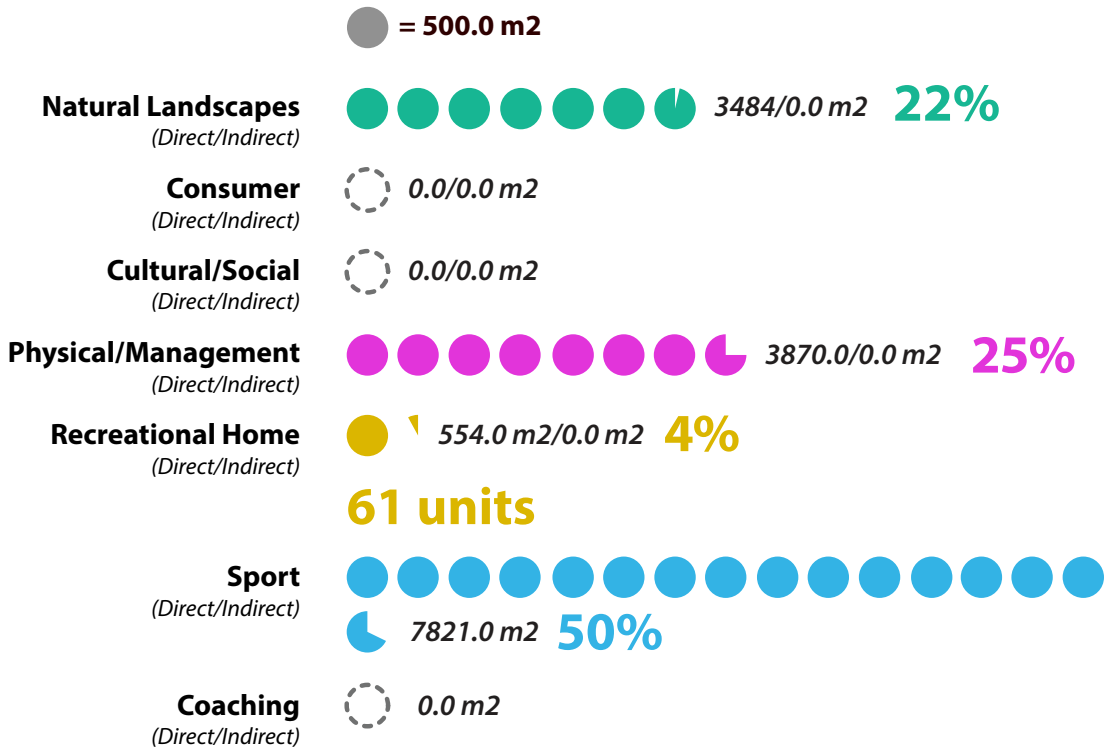
= 50.0 m2

Natural Landscapes *(Built)*	*0.0 m2*	
Consumer *(Built)*	*0.0 m2*	
Cultural/Social *(Built)*	*200.0 m2*	**60%**
Physical/Management *(Built)*	*132.0 m2*	**40%**
Recreational Home *(Built)*	*0.0 m2*	
Sport *(Built)*	*0.0 m2*	
Coaching *(Built)*	*0.0 m2*	

Figure 4.42. Sylvan Lake Sailing Club Built Spatial Analysis



Wabamun Sailing Club: Immediate and Surrounding Site Typological Analysis



Wabamun Sailing Club: Membership and Retention Statistics 2016

Membership Rates:	**XXX**		
Student Retention 2015:	**Stage 1, Fundamentals: 38.**	**86% of Total Pop.**	**100% Retent.**
	Stage 2, Learn to Sail: 0.	**0% of Total Pop.**	**0% Retent.**
	Stage 3, Learn to Train: 6.	**13.5% of Total Pop.**	**N/A**
Student Retention 2016:	**Stage 1, Fundamentals: 25.**	**46% of Total Pop.**	**100% Retent.**
	Stage 2, Learn to Sail: 13.	**24% of Total Pop.**	**48% Retent.**
	Stage 3, Learn to Train: 16.	**29. 5% of Total Pop.**	**123% Retent.**

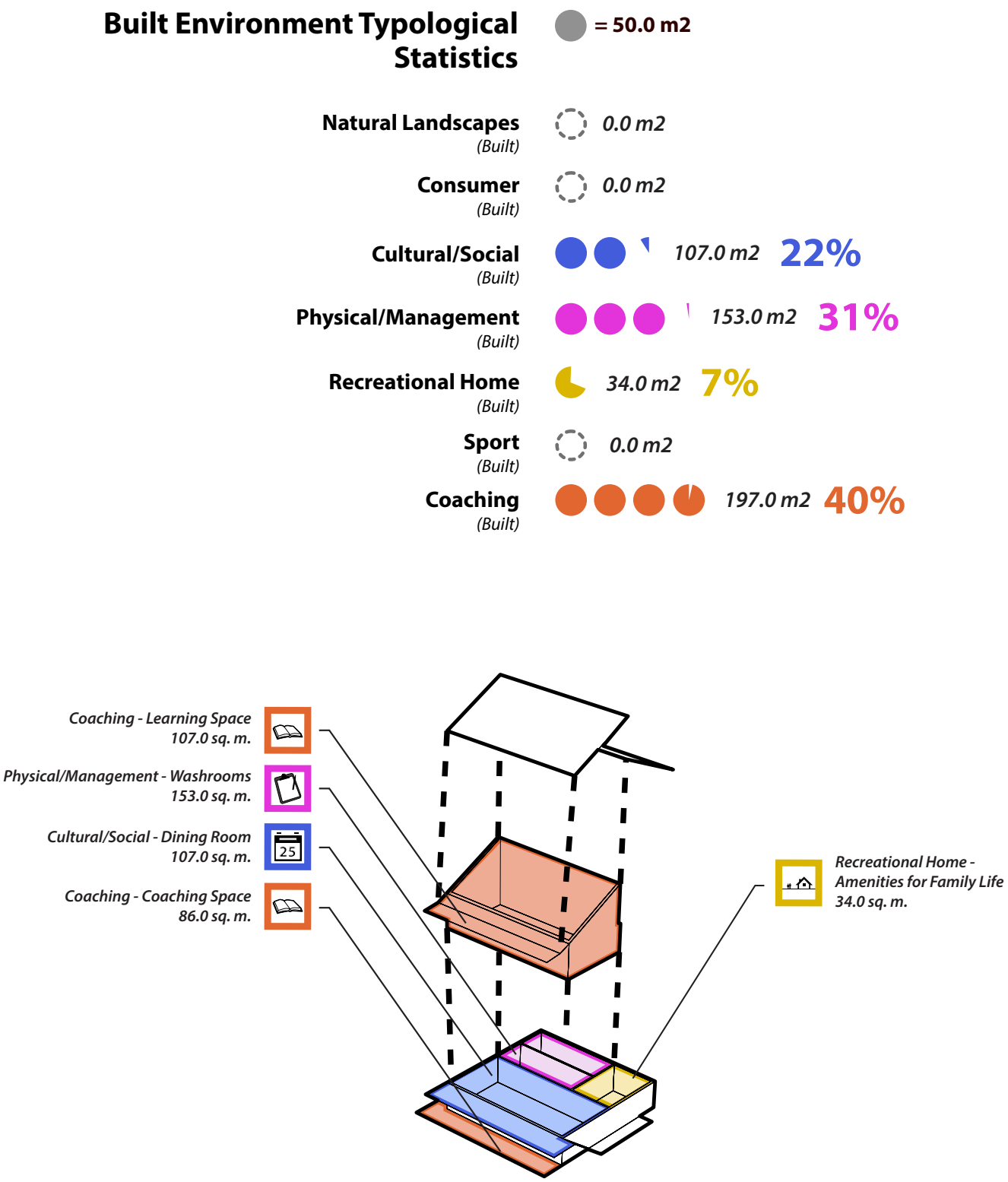


Figure 4.43. Wabamun Sailing Club Built Spatial Analysis

4.3 SURVEY RESULTS

The survey done in this thesis was a 21-question analysis based on the seven spatial categories that had emerged out of chapter 3. Three questions are allocated to each category.

The survey was sent to every Commodore and Vice Commodore to be distributed to the membership of each sailing club. Reminder emails were sent out to these individuals 1-2 weeks after initial surveys were distributed. Corresponding demographic questions were also distributed in order to understand the specific populations that the survey results represented. The questions are based on a likert scale of 5, #1 being strongly disagree, #3 being neutral, while #5 being strongly agree. The following spatial categories correspond to the following series of questions. Ranges of results for the group of question is also included:

Social/Cultural Space. **Questions 1 through 3.**
65-73% (70% average) of respondents agreed or strongly agreed that social/cultural activities at a facility are personally important

Coaching Space. **Questions 4 through 6.**
64-73% (67% average) of respondents agreed or strongly agreed that coaching activities at a facility are personally important.

Sporting Space. **Questions 7 through 9.**
83-87% (86% average) of respondents agreed or strongly agreed that sporting activities at a facility are personally important.

Consumer Space. **Questions 10 through 12.**
26-73% (55% average) of respondents agreed or strongly agreed that consumer activities at a facility are personally important.

Recreation Home Space. **Questions 13-15.**
45-70% (53% average) of respondents agreed or strongly agreed that Recreation Home activities at a facility are personally important.

Natural Landscape Space. Questions 16-18.
80-93% (87% average) of respondents agreed or strongly agreed that the natural landscape at a facility are personally important.

Physical/Management Space. Questions 19-21
90-100% (94% average) of respondents agreed or strongly agreed Physical/Management Space at a facility are personally important.

A Note on the Collected Data
The participation in the survey was lower then initially speculated (30 participants filled out the survey completely, 1 filled it out partially), but still had significant enough participation to be deemed as effective. Patterns and correlations determined by the survey are not invalid, but may need additional study in order to confirm their accuracy.

4.4 CUMULATIVE GROWTH/DECLINE STATISTICS

How to know if a Club is Growing or Declining?

This section of the thesis determines what proportion of these spatial categories correlates to a more successful program. Each facility was contacted and asked for their participation data for the 2015 and 2016 sailing seasons. This data included:

Membership Rates
Beginner program enrollment rates
Intermediate program enrollment rates
Advanced program enrollment rates

Sometimes the data sets that were supplied were incomplete. Sometimes a facility may only provide the number of members for 2015, but it would provide all of the enrollment rates for 2015 and 2016. To evaluate whether or not a sailing club was successful, it needed to be evaluated on whether it had grown. There are two statistics to measure whether a club had grown. Club membership and the clubs total student enrollment can be measured.[1] Either one will represent growth/decline. Having both is better, but one is good as well. If a club has a growing membership rate, but declining student rate, then at least the number of members is growing. If a club has a declining membership rate, but an increasing student rate, then there is an increasing opportunity to retain more and more members as students graduate from the program.
Clubs are then categorized as declining if they have both statistics are shrinking from the 2015-2016 seasons. Clubs are labeled as declining if the membership statistic has not changed and there is no student enrollment. This is due to the fact that clubs must register for a minimum of 10 or 25 participants if their membership is too small[2], therefore these minimum recorded membership numbers are often higher than in reality. In addition, without any student population, the program will often not grow, as most students become members of these programs.

The following chart[3] summarizes the categorization of clubs based on their growth or decline rates, and what it was labeled as during this study. Spatial patterns that were deemed as *"growing"* impact the final recommendations of this thesis. Conversely, spatial patterns associated with clubs that were declining, are also spatial categories that should be avoided. Furthermore, clubs are labeled as rural or urban, furthering the amount of geographic specificity the thesis can provide.

1 Edmonton Yacht Club and Wabamun Sailing Club share a coaching program called Northern Alberta College. This organization ran programs out of both facilities. There statistics were therefore blended. All statistics that could not be reasonably assigned to one site were divided in half and allocated evenly for statistical analysis.

2 Fie Hulsker, Alberta Sailing Association, 2016

3 Sail Sandpoint only reported student rates for 2016. Due to the program being one of the largest in the country, yet privately owned. Because of these factors, it is assumed that Sail Sandpoint has experienced growth, and it categorized as such.

	Rural/Urban	2015	2016	Growth/Decline	Designation
Cooking Lake Sailing Club					
TOTAL MEMBERSHIP	*RURAL*	*10*	*10*	0% —	**Decline**
TOTAL STUDENTS		*N/A*	*N/A*	N/A —	
Calgary Yacht Club					
TOTAL MEMBERSHIP	*URBAN*	*252*	*230*	-9% ↓	**Growth**
TOTAL STUDENTS		*77*	*107*	+39% ↑	
Disabled Sailing Association					
TOTAL MEMBERSHIP	*URBAN*	*279*	*58*	-79% ↓	**Decline**
TOTAL STUDENTS		*N/A*	*714*	N/A —	
Edmonton Yacht Club					
TOTAL MEMBERSHIP	*URBAN*	*42*	*54*	+29% ↑	**Growth**
TOTAL STUDENTS		*42*	*52*	+19% ↑	
Great Slave Lake Sailing Club					
TOTAL MEMBERSHIP	*URBAN*	*N/A*	*72*	N/A —	**Growth**
TOTAL STUDENTS		*38*	*42*	+11% ↑	
Glenmore Sailing Club					
TOTAL MEMBERSHIP	*URBAN*	*N/A*	*45*	N/A —	**Growth**
TOTAL STUDENTS		*102*	*106*	+4% ↑	
Glenmore Sailing School					
TOTAL MEMBERSHIP	*URBAN*	*N/A*	*N/A*	N/A —	**Growth**
TOTAL STUDENTS		*794*	*802*	+1% ↑	
Itaska Yacht Club					
TOTAL MEMBERSHIP	*RURAL*	*25*	*25*	0% —	**Decline**
TOTAL STUDENTS		*N/A*	*N/A*	N/A —	
Ma-Me-O Sailing Club					
TOTAL MEMBERSHIP	*RURAL*	*15*	*12*	-20% ↓	**Decline**
TOTAL STUDENTS		*N/A*	*N/A*	N/A —	
Newell Sailing Club					
TOTAL MEMBERSHIP	*RURAL*	*25*	*25*	0% —	**Decline**
TOTAL STUDENTS		*N/A*	*N/A*	N/A —	
Sail Sandpoint[3]					
TOTAL MEMBERSHIP	*URBAN*	*N/A*	*N/A*	N/A —	**Growth**
TOTAL STUDENTS		*N/A*	*878*	Unknown ?	
Sunshine Bay Sailing Club					
TOTAL MEMBERSHIP	*RURAL*	*52*	*56*	+7% ↑	**Growth**
TOTAL STUDENTS		*N/A*	*N/A*	N/A —	
Sylvan Lake Sailing Club					
TOTAL MEMBERSHIP	*URBAN*	*83*	*63*	-24% ↓	**Decline**
TOTAL STUDENTS		*N/A*	*N/A*	N/A —	
Wabamun Sailing Club					
TOTAL MEMBERSHIP	*RURAL*	*N/A*	*N/A*	N/A —	**Growth**
TOTAL STUDENTS		*44*	*54*	+23% ↑	

Growth/Decline Statistical Summary *Figure 4.180*
A summary of the growth and decline statistics from the 14 sailing clubs studied.

5.0 Design Methodologies

5.0 FINDINGS

Section 5.0 presents the summary of conclusions from the primary research conducted in chapter 4. This is presented through a diagrammatic representation of the spatial strategies confirmed through multiple research methodologies.
Section 5.1 contains a design guideline that makes proportional spatial suggestions for existing facilities based on the results of the collected research. This guideline also provides programmatic suggestions for individual spatial typologies.
Section 5.2 is an application of the design guideline on the existing facility of the Glenmore Sailing School. Testing this guideline is imperative in understanding its effectiveness, limitations and areas of improvement.

Process
To recognize the correlations between growth statistics the proportionality of spatial categories documented at each sailing program, a set of sorting and checking was used to establish and confirm correlation. First the clubs were divided into successful and unsuccessful groups based on their growth or decline statistics. Second, the successful clubs were divided into rural and urban typologies based on if the club was based in an urban environment or not. Third, each club was examined based on category for similarities in amounts of each category and types of space. If half or more of the successful clubs had a similar amount of space allocated to a category then this pattern was further compared to the unsuccessful clubs to see if the pattern existed at the other programs as well. If they only existed in the successful category of club and not the unsuccessful, then the pattern was compared to the survey results in that same category. If all three of these methodologies confirmed the pattern, then it was included as a correlation within this thesis.

Summary of Findings
After an extensive research process, patterns recognized from the spatial categories can be confirmed or disputed using the survey data collected. Because the survey questions were based on the same categories used to analyses each club spatially, the results can be compared to see if they correlate.
Explained in the figure 5.01, whenever there was a spatial pattern recognized, it was cross-referenced against the survey information to declare whether the patterns were unrelated correlations, or basis of causality.
Overall, most of the survey results corresponded to spatial patterns recognized in the mappings. Physical/Management, Sport and Natural Landscape categories had high levels of importance indicated in the survey (87-93%). Coaching and Social/Cultural categories had strong levels of importance (67-70%). Consumer and Recreation home were deemed as moderately important, having a 53-55% of respondents agreeing that these activities were important.
There were 27 patterns seen in the sailing club mappings that were reinforced by the survey results. These 27 patterns span across the 7 categories and the 3 scales that the clubs were analyzed at. For a complete list of patterns, see figure 5.01. The following is a summary of the spatial patterns in each category:

Natural Landscape
Green space was one of the most common elements within the immediate site vicinity of clubs. These spaces are flexible. They provide programs the opportunity to spill out onto the lawn for special events, whether they are concerts, dinners or awards ceremonies. At the indirect scale,

trail networks were hugely included in successful sites. These trails to run throughout major park systems, connecting recreational spaces together. Trails connect pedestrian recreation users together, allowing for higher amounts of exposure, and easier access. Trail rich areas have been deemed important in other studies,[1] so these assumptions are consistent.

Consumer Space

This category of study is one of the most challenging based on the results of both the survey and spatial mappings. The spatial mappings had no observable patterns of consumer space at any of the three examined scales. The survey results had an average moderate correlation, but the range of result was very high. Though theoretically the consumer spatial category is important, this study did not show any correlation to it.

Cultural/Social Space

This type of space had a series of very positive correlations between it's spatial inclusion and growth rates of clubs. Much of the place attachment and socially based research correlates social space to improving the amount of participation in programs.[2] Social space provides opportunity for non-athletic participants to still be engaged at a facility. The most interesting pattern however, was that if there was another social or sporting facility within 300m of the club, there were higher rates of participation. Though there is limited secondary research to support this pairing, it is conjectured that participants travel between the two programs, and the facilities work symbiotically, taking advantage of space the other may not have.

Physical/Management Space

Physical/Management space has a broad range of individual typologies so some patterns were very intuitive, while others were not. Intuitively, inclusion of roads and access points correlated with facility success. Surprisingly, on average 39% of built urban environments were designated to this spatial category. Most of the spaces included were administrative, storage and maintenance typologies. This indicates that these facilities do require a lot of behind the scenes upkeep in order for them to function successfully.

Recreational Home Space

This category of space includes immediate long or short-term stay sites, like campgrounds and rental cottages, but also includes the amenities that accompany these spaces. Rural sites dedicated almost one fifth of their built environments to this category, while urban sites had only one twentieth. This pattern not only shows the importance of this category, but also of the different spatial needs from urban vs. rural facility typologies.

Sport Space

This space is obviously important to a recreation facilities success. Due to the nature of sailing clubs however, most of this space is not built, which makes it hard for the results of this category to be applicable to indoor sport. From a site perspective, 30-60% of an outdoor facility should be dedicated to sporting space. Any more than this and a site does not allocate enough space to other categories. Any less, and there isn't enough emphasis on athletic pursuits.

Coaching Space

This category did not have any groundbreaking results, but reinforced the idea that designated teaching space is critical to a recreation facilities' success.

1 Baran, Perver K. et al. Park Use Among Youth and Adults: Examination of Individual, Social, and Urban Form Factors. (2014, 2012) Sage Publications.

2 Koski's Physical Activity Relationship (PAR) (2008), Skille's Alternative Sport Programmes and Social Inclusion in Norway (2006) and Kaltenborn's Nature of Place Attachment: A Study Among Recreation Homeowners in Southern Norway (2009) all mention the importance of social space as a critical element in partnership with sport.

	NATURAL LANDSCAPE	CONSUMER	CULTURAL SOCIAL
BUILT	• No immediate Correlations	• No immediate Correlations	• 7/8 Successful clubs had a built component dedicated to cultural/social purposes — CONFIRMED • Rural clubs designated between 72-175m² or 107m² on average — 107 m² dedicated to rural cultural space — CONFIRMED • Rural clubs had approx. 38% of their built environments dedicated to Cultural/Social space — (rural) 38% of Built — CONFIRMED • Urban clubs designated between 35-325m² or 218m² on average — 218 m² dedicated to urban cultural space — CONFIRMED • 7/8 Successful clubs had a built component dedicated to cultural/social purposes — CONFIRMED • Urban clubs had approx. 46% of their built environments dedicated to Cultural/Social space — (urban) 46% of Built — CONFIRMED
DIRECT	• 11-43% (22% ave.) was designated per successful site — 22% of site — CONFIRMED • 6/8 Successful sites contain immediate green space — CONFIRMED • 4/6 Unsuccessful clubs had no immediate greenspace on their site — CONFIRMED	• No immediate Correlations	• No immediate Correlations
INDIRECT	• 9/15 clubs had recreational trail networks running throughout their sites — CONFIRMED • 6/8 Successful sites had some form of recreational trail network — CONFIRMED	• No immediate Correlations	• No immediate Correlations
SURVEY	**93%** agreed that it is important to that the program is located in an aesthetcally pleasing environment **80%** agreed that the beauty of the environment is important to the sport of sailing **87%** of participants agreed that a quality natural environment was important in deciding to participate at your local club	**73%** of participants were neutral or disagreed that they would purchase sailing product representing a sailing team **66%** of participants believed it was important to rent or purchase high quality sailing equipment **73%** agreed they would purchase tickets as a spectator to a major sailing event	**65%** of participants agreed it is important to attend social events at their sailing program **74%** of participants agreed that it is important to attend the corresponding dinner to a sailing competition **73%** of participants agreed that meeting people of similar interest was a key motivation for their participation

Summary of Correlated Findings *Figure 5.01*
A summary of the patterns derived from the spatial analysis, then confirmed or refuted using survey result data.

PHYSICAL MANAGEMENT	RECREATIONAL HOME		SPORT	COACHING
(urban) 39% of Built • Successful clubs had on average 39% of their built environment dedicated to physical or management space **CONFIRMED**	(urban) 5% of Built • Urban clubs had 1.5-6% or 4.5% on average of their built environment dedicated recreat. home category **CONFIRMED**	• 7/8 successful clubs included some % of their facility to the recreational home typology **CONFIRMED**	• Only 1/14 sites had any built sport facility (considered a building) **DISPUTED**	• 5/8 successful sites had build, dedicated coaching space **CONFIRMED**
ALL • All clubs had multiple separated storage facilities on-site **CONFIRMED**	(rural) 19% of Built • Rural clubs had 7-28% of their built environ. dedicated to this category **CONFIRMED**	>5% • Unsuccessful clubs had little to no space dedicated to recreational home amenities **CONFIRMED**		• 3/4 urban sites had dedicated coaching space, averaging 13% **CONFIRMED**
27% of Site • Successful sites on average had 27% of their immediate site dedicated to physical/mgmt. **CONFIRMED**	• 3/4 Rural clubs had some sort of site specific amenity dedicated specifically to camping usage **CONFIRMED**			
• No immediate Correlations	• No immediate Correlations		30-65% of site • On successful sites, 30-65% of the site was sport related **CONFIRMED** 70-100% of site • On unsuccessful sites, 70-100% of the site was sport related **CONFIRMED**	• No immediate Correlations
• No immediate Correlations	• The amount of recreational homes around the site did not impact participation **DISPUTED**		• 5/8 Successful facilities had a cultural or sport facility within 300m **CONFIRMED** • 3/4 successful urban sites had another sport facility in its vicinity **CONFIRMED** • 2/4 successful rural sites had another sport amenity or facility within its vicinity **CONFIRMED**	• No immediate Correlations
80% agreed having a facility that can be used for multiple functions is important to you. **93%** agreed that having a well kept facility was important to them **100%** agreed that good access to the site and facility was important	**70%** agreed that having their recreational home close to their cottage is important to them **55%** disagreed or were neutral that most of their friends were engaged by their close recreational area **55%** disagreed or were neutral that most of their life is centred around their recreation home area		**100%** agreed the actual activity of sailing at a recreation or competitive level is important to them **93%** agreed sailing regularly is an important element of the sport **97%** of participants agreed being a competent sailor was something they valued	**65%** of participants agreed it is important to attend social events at their sailing program **74%** of participants agreed that it is important to attend the corresponding dinner to a sailing competition **73%** of participants agreed that meeting people of similar interest was a key motivation for their participation

RURAL VS. URBAN TYPOLOGIES

A qualitative Reasoning into the Differing Demands of Facilities

When examining the correlations established in the summary of findings, there were two patterns that started to emerge that wasn't accounted for graphically. The correlations came from rural club typologies, and one came from urban club typologies. Why was this occurring? What were the fundamental differences between these two typologies and how were they contributing to different types of facilities?

Spending a lot of time in the sailing community, the differences between these two typologies can be subtle, or large. Rural clubs in Alberta are usually situated just outside of small towns, surrounded by prairies in almost every direction. When you drive to these facilities, you can't usually see the lakes in the distance, in contrast to the generally flat topology of the landscape. When you get to the sailing club it is not what one would first imagine a yachting facility. You drive up, usually on gravel or an unevenly paved road, to facilities that look like conglomerations of cottages or a larger oversized cottage entrenched in a lightly wooded area, along the shore of a lake. The construction of these facilities are pretty basic, they look as if grandparents and their friends had labored to build a modest facility but with great personal investment. Finishes, trims and styles of the materials are basic, usually made of wood, but have the air of sincerity and care. The people all seem to know each other; they sit out on the patios and decks, having lunch or enjoying a beverage in the midday sun, and are immediately welcoming on your approach. No one is dressed fancily. There are older participants who have obviously made some significant investment in the facility, and younger families enjoying a weekend away. The insides of these facilities are a reflection of the people outside. The finishes are simple, but well kept and well used, much like a kijiji ad describing used goods as 'loved thoroughly.'
Rural facilities have the aroma of community; they are built by the people, for the people and loved by the people. They do not need contemporary style or modern space, but there is a great demand to serve the everyday needs of basic users who treat the facility like a second home. Environmentally, these facilities are much more focused towards spatial typologies defined within the recreation home and cultural/social categories. Users need spaces that provide a place to eat with their families, get ready for activities, cook dinner for their kids, and then read a book or enjoy a beverage in the evening.

Urban clubs had the same unique feel, but catering to a very different set of demands. Urban clubs come in a variety of different shapes and forms. Some of them seem like they do cater to a more conventional idea of what a yachting facility should in fact be like; clean white walls, trophies lining the tops of shelves, beautiful wooden floors and nautical themed decoration. Others feel like rural prairie clubs transported into cities, like a miniature escape from the bustle of the downtown. And many clubs hit somewhere in the middle; a mixture of exciting nouveau nautical tradition, and sleepy cottage comfort.

Urban clubs typically have a much higher proportion of their facility dedicated to social activities. With their program being in an urban environment, most users would rather go home and sleep in their own beds rather than camp out on grass lawns. Those adventurous types are then also restricted by city bylaws that stop you from camping in public parks. This leaves a lot more space for social events, weddings, movies, lectures and other types of community activities. These facilities also have a lot more physical/management and coaching space. Because these facilities don't focus on providing a comprehensive experience for their users, the focus shifts to a larger quantity of participants. This means more lessons, and more programs; which leads to having a larger administrative arm to tackle some of these challenges.

Neither typology is better than one another; they just have a different set of needs based on a complex set of variables that influence how they run and operate their facility. Having an invested understanding in how the factors that influence these facilities is crucial to providing meaningful solutions to a facilities woes, rather than addressing surface deep criteria with generic design solutions. Much like most of life, the needs of a sporting facility are complex and effectively addressing them are equally as complex. By approaching these the design of these facilities from a much more multi-faceted perspective, our approach as design professionals can be much more rigorous, heart felt, and have lasting impacts on the facilities, but much more importantly, on the people that we are working with.

5.1 IMPLICATIONS OF ANALYSIS

The following analyses are the patterns derived from the analytical documentation of 14 sailing clubs, presented using the 7-category approach. The following diagrams use the Glenmore Sailing School as a case study to identify and showcase spatial patterns that have been proven effective at producing higher rates of participation and retention of users. In these diagrams, program has not been added to show any deficiencies. The intention of these drawings is to identify what clubs are currently doing that produce better participation results.

The 7-category approach is a spatial categorization system developed in this thesis from a multitude of resources and research. Each of the 7 categories contains individual spatial typologies, seen in figure 5.02, that summarize the qualities of each of the spaces. See chapter 3 for a complete breakdown of the development and categorization of each of these spatial typologies.

After highlighting existing successful spatial patterns, the analysis makes recommendations for complimentary spatial typologies that partner well with current facility configurations. The intention is to not only highlight what spatial typologies are successful within each category, but what other spatial entities compliment the already existing facility. Finally the analysis begins to highlight select activities that would incorporate the use of existing facilities, or how to utilize suggested complimentary spatial typologies.

7 Category Strategy and Spatial Sub-typologies

The individual spatial typologies that are the make up of each of the 7 spatial categories that define recreation space. Each typology has a description and icon.

Natural Landscapes

- ***Intended Natural Areas.*** *The category of land area was very broad, but due to its initial category, it was adapted to "intended natural areas" which would be defined as areas surrounding the site that had remained untouched and/or undeveloped.*
- ***Water Access Points and Waterparks.*** *Water areas can be quite expansive, and would scew results based on lake size. But access points and artificial waterparks are quantifiable spatial elements.*
- ***Natural Monuments.*** *Natural monuments are abnormal elements that help define a landscape. These are not normal and should be visually and/or geometrically unique.*
- ***Gardens.*** *Gardens are specifically programmed areas, and are designed with the primary intent for people to relax, and enjoy nature. Must contain groomed plant matter other then lawns or grass.*
- ***Trails and Viewpoints.*** *Trails and viewpoints are elements that have the primary function of defining a physical environment for the spectation of the natural landscape. The primary purpose of these are pedestrian recreation and travel.*
- ***Green Space.*** *Planned to be acessible within proximity to recreation areas. Do not have to be maintained by people. Must have an occupaiable grass or organic surface.*
- ***Continuous Greenspace.*** *Having accessible continuous for users at and around the site. Must have a grass or organic surface typology and maintained by people.*
- ***Scenic Viewpoints.*** *Points of observation of natural or manmade landscapes. These can be demarkated, but is not neccesary. Usually are elevated above the surrounding.*

Cultural/Social

- ***Spectation Space.*** *Space that allows users to observe a sporting activity occuring within the immediate vicinity. These must be designed, but can be natural or manmade.*
- ***Outdoor Tradition Space.*** *A Physical environment that enables outdoor traditions, either cultural, social, religious or sporting based. These spaces can be indoor or outdoor, but have specific geometries intended to serve a specific tradition.*
- ***Proximity to Residential Areas.*** *The importance of social connections are important, family or otherwise and many of these connections happen in non recreation spaces. Therefore this element was adapted.*
- ***Special Event Space.*** *A space that caters to the needs of formal gatherings, parties, events or dinners. This space can be flexible, but its main intended purpose is to accomodate these types of events.*
- ***Historic Monuments, museums and Gallery Space.*** *Local cultural history can be represented spatially through museums, historic monuments and gallery space, therefore this element was spatially adapted.*
- ***Historical Buildings.*** *Buildings that represent a specific period of architectural design or style that is not presently being used. These buildings are typically older. The intended purpose of these buildings are typically for display and tourist reasons.*
- ***Museums.*** *Museums are spaces that gather and display artifacts. They can be formal, state sponsored museums but they can also be small portions of a facility.*
- ***Cultural Tradition Space.*** *Space that assists and/or is occupied for human activity that holds cultural significance, relevant to the immediate geography or anthropologic history of the area.*
- ***Social Meeting Place. This space contains*** *Benches, seating, temporary or permanent gathering space in order to primarily facilitate formal or informal social and cultural gatherings.*
- ***Small Niche/Pause Points.*** *Small benches, niches, or outcroppings that encourage temporary occupation by a small number of people.*
- ***Simple Shelter.*** *These shelters protect from rain, and the elements, while allowing for sunlight and fresh air.*
- ***Informal Public Space.*** *Public square, parks, or any public gathering area allowing active expression*

Physical/Management

- ***Access Systems (Roads and Trails).*** *This category represents any sort of network of physical access systems that allow access, either by car, bike or on foot. These pathways be manmade or natural, The primary purpose of these networks are transportation, not recreational purposes.*
- ***Transportation Networks.*** *Transportation networks allow goods and services to be provided to facilities in a bulk or large quantity shipment.*
- ***Resource Extraction Sites.*** *These sites don't relate immediately to usage or the sport. They act as a secondary source of revenue, secondary site access, or a tourist attraction.*
- ***Onsite Management (Facility).*** *Space that is dedicated to the management of a facility. This can include maintenance, administrative, or storage space for a facility.*
- ***Local Municipality Building.*** *Local municipalities can play supporting or direct roles in managing an area, park, field, beach, lake or partial areas of any of the areas listed above. Therefore having a municipality spatially present can impact a facility.*
- ***Trails and Pedestrian Pathways.*** *Helps to connect green spaces and other points of interest with pedestrian walkways. These can be formal or informal public pathways that connect spaces together, or create a network of pathways.*

Recreational Home

- ***Recreational Homes.*** *Areas of homes that are in the immediate proximity of the recreation facilities. These homes can be of primary or secondary residence.*
- ***Amenities for Family Life.*** *On-site resources that allow families to stay at the facility for extended periods of time. This can include the following areas: Laundy, Kitchen, Lounge, Library, Bathrooms, Showers etc.*
- ***Camping and Overnight Facilites.*** *Space that directly allow user groups to stay overnight at a facility for temporary periods. This can constitute campgrounds, rental rooms, cottages or any facility that partially or completely facilitates overnight occupation.*
- ***Proximity to Residential Areas.*** *Residential areas that are close to recreational areas allow for a select group of participants to have easy access to facilities. If designed effectively, these local populations can constitute a large portion of longterm facility users.*

Consumer

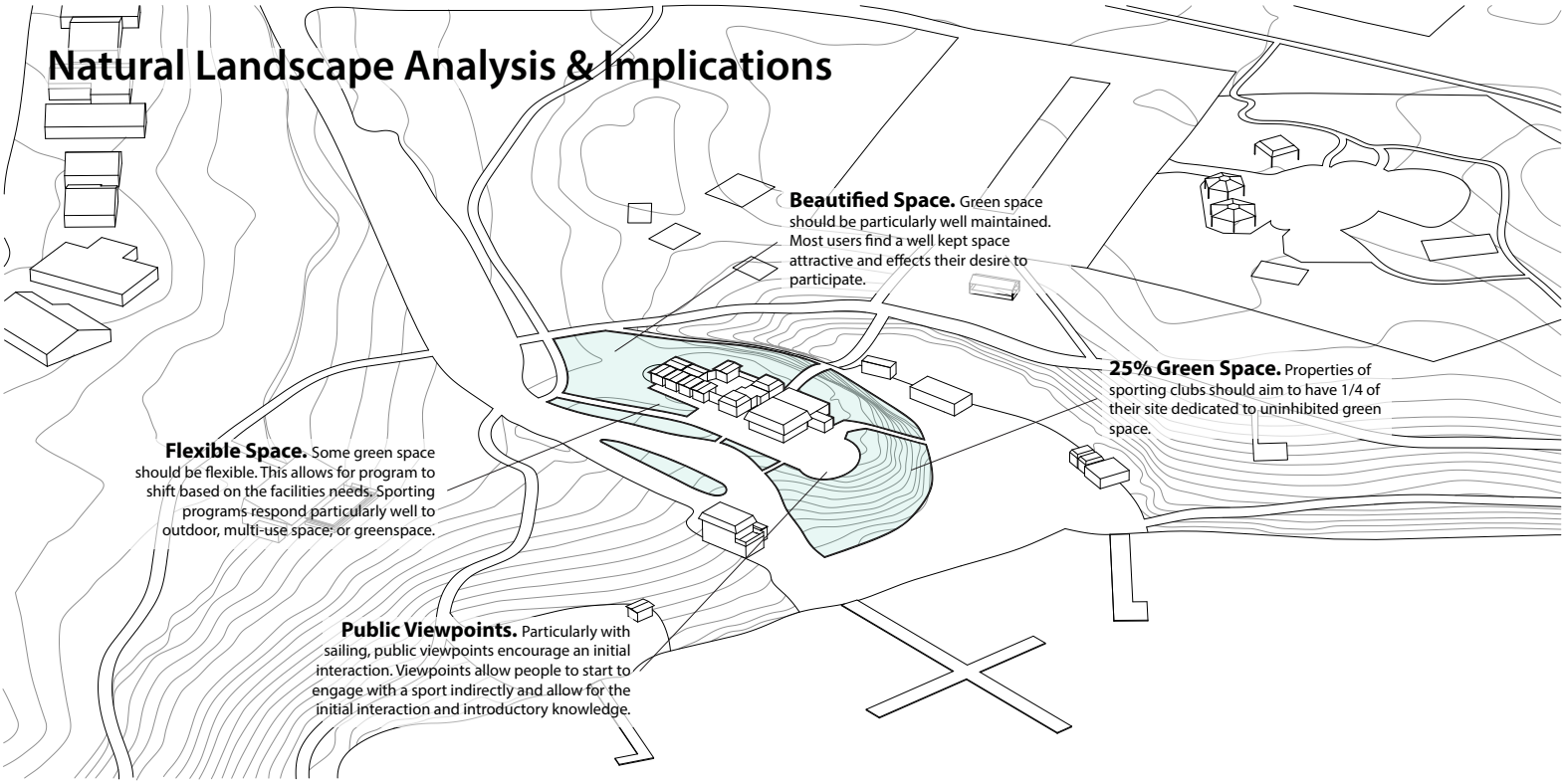
- ***Consumer Space.*** *Spaces that are dedicated to consumerism. Any retail or food service space constitutes 'consumer space".*
- ***Shops.*** *Shops define physical environments, and their primary purpose is to sales of goods.*

Sport

- ***Physical Activity Space.*** *Physical activity space is any space that is specifically designed for recreation or sporting activities, either formal or informal. This can include interior and exterior space.*
- ***Sporting Infrastructure.*** *Sporting infrastructure is space or spatial elements that supports the sporting activities emphasized at the facility. This can include changerooms, showers or other facilities that make the activity possible.*
- ***Spas.*** *Spas are facilities have specific program dedicated to the recovery and relaxation of users. Facilities vary in composition and program.*
- ***Zoos.*** *Zoo spaces constitute areas where animals, foreign and local, are kept for public spectation. Facilities are comprised of open air and built areas for different species.*
- ***Parks.*** *Park areas include multiple benched areas, recreation areas including swings, slides, casual climbing areas, playgrounds and other user-driven outdoor leisure space.*
- ***Large Sporting Fields.*** *Outdoor public fields within 400m of the facility. These sites should be accessible to both public and private users. These fields are formalized, and have some demarkation to determine the type of sport.*
- ***Adapted Sport Space.*** *Sporting space that does not follow typical dimensions due to spatial disparity compared to formalized sporting space. These spaces are still designed for a specific activity, just with a specific change or deformity to the sporting field.*

Coaching

- ***Learning, Teaching and Coaching Space.*** *Dedicated space designated for teaching lessons. These areas can have special allocation for storage of teaching aids, teaching specific spaces such as whiteboards, smartboards, computer areas or large scale models as teaching aids.*



Findings.

25% Green Space: Successful clubs (those that reported participant or retention growth) had on average 22% of their properties dedicated to intentional greenspace. Greenspace is defined as a spatial area that is able to be occupied by humans and used for recreational activities, and the surface typology is some sort of green or occupiable organic substrate. This space does not have to be intentional, as it could be a field or natural area, not maintained by people.
Intentional Green Space: 75% of successful sites had immediate greenspace on their property. Intentional green space allows for clubs to have flexible programmatic space, creating opportunities for temporarily disproportionate activities on site favouring a specific typology of activity and it's corresponding space. These spaces must be maintained consistently by people to qualify for this category.
Green Space is Important to the Vitality Clubs: 2/3 of unsuccessful sites did not have immediate greenspace on site. This result further reinforces the concept that having Green Space, and Intended natural Areas to provide a positive first impression with members of the public.
Participant Survey: 80-92% of survey participants agreed or strongly agreed that greenspace was an important element to the sport of sailing.
Conclusions: Green Space and Intentional Natural Areas are integral to the success of a successful sailing club. Based on the positioning of intended green spaces at the clubs included in this study and gathered data, green space plays an introductory role to members of the public who are not familiar with the activities of the site and provide the first impression of potential new users.
Limitations: Further research is required to apply these lessons to other types of sporting clubs, but the initial indication of the examined sailing clubs points in that direction. A second survey would assist in understanding the specific functions of how green space is used in conjunction to other spaces at the club.

Operational Implications.

Flexible Greenspace. Larger, flexible greenspace allows for multiple types of program to become or and less active when neccesary. This means that the operations of the facility need to make sure to start to highlight activities that could not normally be accomodated just using dedicated facility. The following are the spatial typologies and potential activites that would capitalize on flexible greenspace:

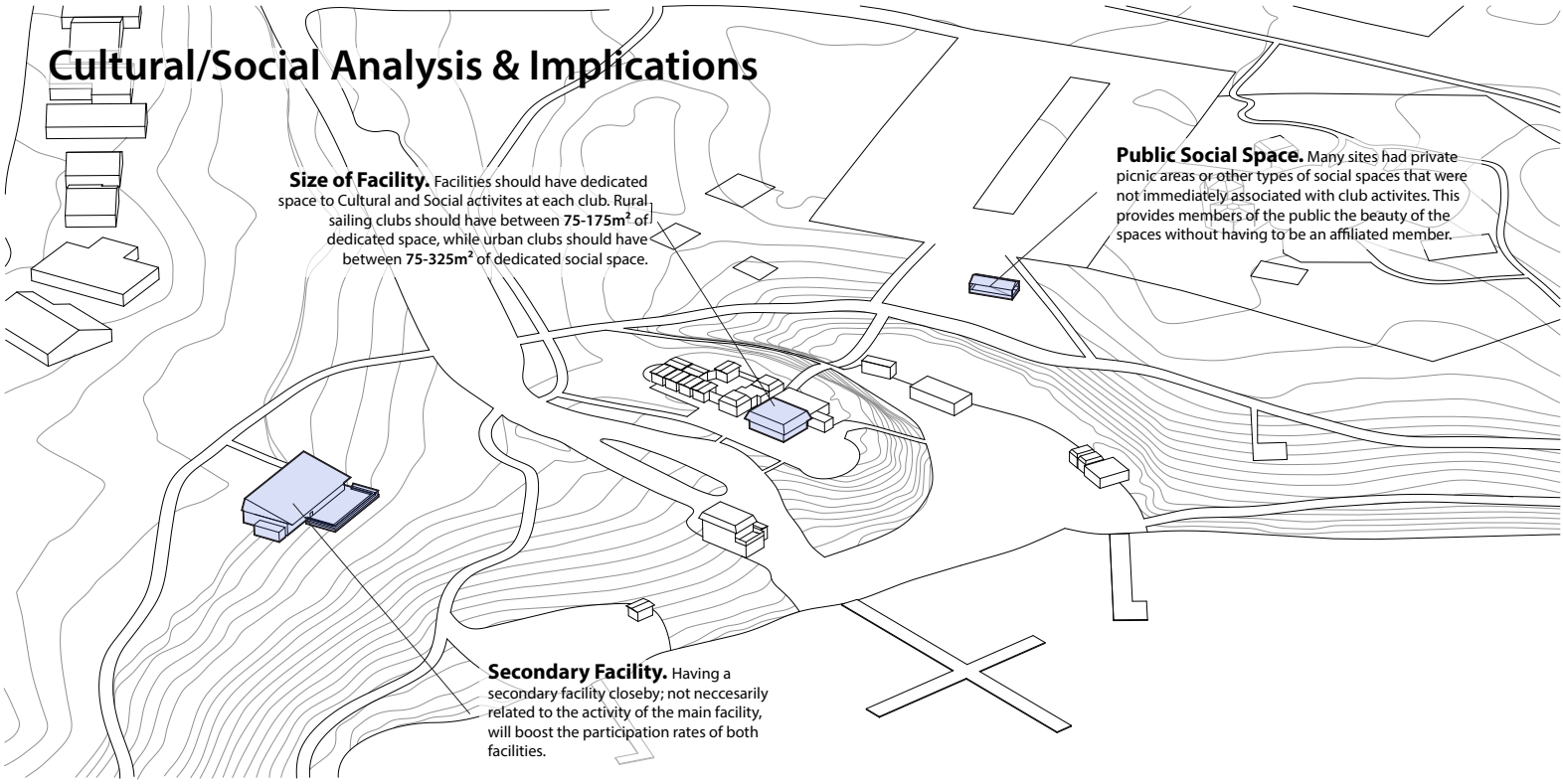
Consumer: *Sport specific equipment sale and expo.*
Cultural/Social: *Anniversary events, Awards events, Family Fridays or Other social events.*
Sport: *Learn to sail events, Public sailing events, Sailing Competitions, High School and local Sailing Competitions.*

Beautified Greenspace: Beautified greenspace creates a positive initial public interaction with the facility. When members of the public not familiarized with the facility of the activities that it take part in see a well maintained site, their is an immediate appreciation and curiosity for the activity and site itself. It is a cordial greeting or a pleasant handshake. Unfamiliar users will not be able to fully appreciate the activities that take place at said facility, but well maintained and beautified greenspaces are universally appreciated and at least noteworthy elements, that leave members of the public a curious inclination to expore the surroundings, and the sport. The following are spatial elements that help the public have an initial positive interaction with the site:

Public Viewpoints: *Specific areas where the activities on-site can be comfortably observed.*
Effective Advertising and Signage: *Signage will help members of the public understand what the site is used for and how to interact with it.*
Benches and Sitting Areas: *Areas for people to sit down and rest allows the public to observe on-site activities without directly engaging.*
Picnic Areas: *These areas allow for additional public social engagement and observation of site on-site activities.*

Natural Landscape Analysis *Figure 5.03*
Diagramming spatial patterns, complimentary programmatic and spatial elements for the Natural Landscape Category.

Cultural/Social Analysis & Implications



Findings.

Size of Facility. There were two findings for the average size of space dedicated to social/cultural activites; one designation for rural clubs and one designation for urban clubs. Rural club size ranged between 75m² and 175m², averaging 107m². The urban clubs had a much larger range of dedicated social space; between 35m² and 328m². At times it was difficult to differentiate if a space was used for social/cultural purposes or if it was used for coaching. Many times it was used for both. If a space was split 50/50 in usage, then its area was divided, otherwise the activity that took precedence in that space determined it's typological definition.
Secondary Facilities. 5/8 facilities with growth in either retention or participants had a secondary facility within 300m. In most circumstances the facilities within the immediate vicinity of each other had some sort of informal relationship to share facilities, have reciporicals or not to have overlapping activities. Although the pattern of just having adjacent facilites proves correlation, the reciporical relationships between clubs begins to show causality between effective programs and clustering facilities.
Inclusion of Cultural/Social Space. 7/8 successful programs had some sort of space on site dedicated to culturla/social activities.
Survey Indications Represent mid-range Causality. Survey results indicate that 61% of all users find social events to be important or very important, and when asked about specific events within the Alberta Sailing community, 73-75% of survey participants said it was important or very important to attend.

Operational Implications.

Size of Facility. The sizes of recommended space between rural and urban sailing clubs differs by 100m2 but the implications of having additional cultural/social space is the same in both scenarios. Sailing clubs need to host events; both specific and non-specific, to the sport of sailing in order to ensure maximum engagement from all interested parties. Seen in areas that have more amenities for casual users, which includes social space are more effective in engaging larger numbers of the public. Some of the suggested social events include:

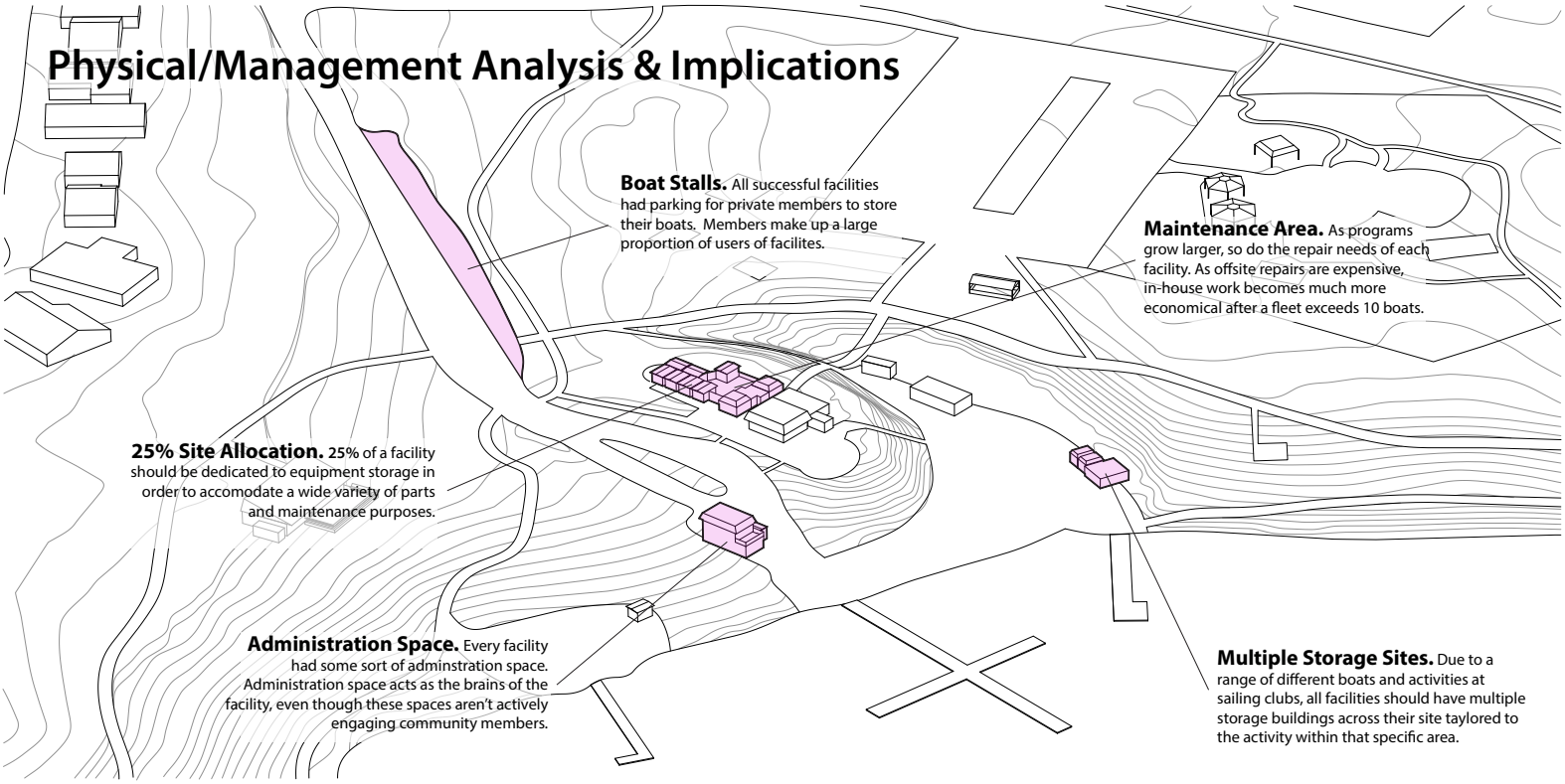
Lectures and Special Presentations
Friday Night Socials
Family Social Nights
Weekly Television or movie sceenings of sport specific activities

As many clubs do not meet the required amount of social space, it is encouraged that programs also increase the amount of corresponding activities associated with dedicated social space. Survey results showed the majority of users agreed or strongly agreed that social events were important. Programs need to continue to diversify the range of opporunities for people to participate in socially based activities.

Secondary Facilities. Having a secondary facility closeby will effect the what kind of activities your facility will provide. If the facility closeby is focuses on a different sport, then complimentary usage of both facilities based on need can be negotiated. This can be particularly helpful if one facility has social space that the other does not. This way borrowing each others facilities can work to both parties advantage. If the facilities and/or activities are more similar than the overlap becomes an area of negotiation. Programs can either make sure to match each other, as so there is equal opportunity at either facility. If both facilities are smaller then the two facilities can split the type and number of activities proportionately.
Public Social Space. These facilities are independently operated from the rest of the facility and don't require any additional organization other than potential booking systems and regular maintenance and cleaning.

Social/Cultural Analysis *Figure 5.04*
Diagramming spatial patterns, complimentary programmatic and spatial elements for the Social/Cultural Category.

Physical/Management Analysis & Implications



Findings.

Multiple Storage Sites. On all successful facilities there were multiple equipment storage units placed throughout the site for different types of boats and their various equipment needs.
25% Site Allocation Rule. Successful sites had on average 27% of their built environment allocated to on-site storage while unsuccessful sites had on average 13%. 25% refers to the direct environment and built environment scales of space at these programs. Facilities tended to have a large amount of variation in the percentage of dedicated storage space in their built environment compared to their direct site. Some cases had a balanced approach, with both percentages being within 10% of the average, while other programs would dedicate up to 75% of one scale to storage, and have the other drastically under the average amount.
Maintenance Area. Maintenance areas recommendations were kept fairly open because the recorded fleet sizes of each facility were approximate. Facilities had varying sizes of maintenance facility depending on how big the fleet was. Boats damaged were typically at a ratio of 1:10 to 1:15, with smaller sailing programs having the less damage and larger programs having more.

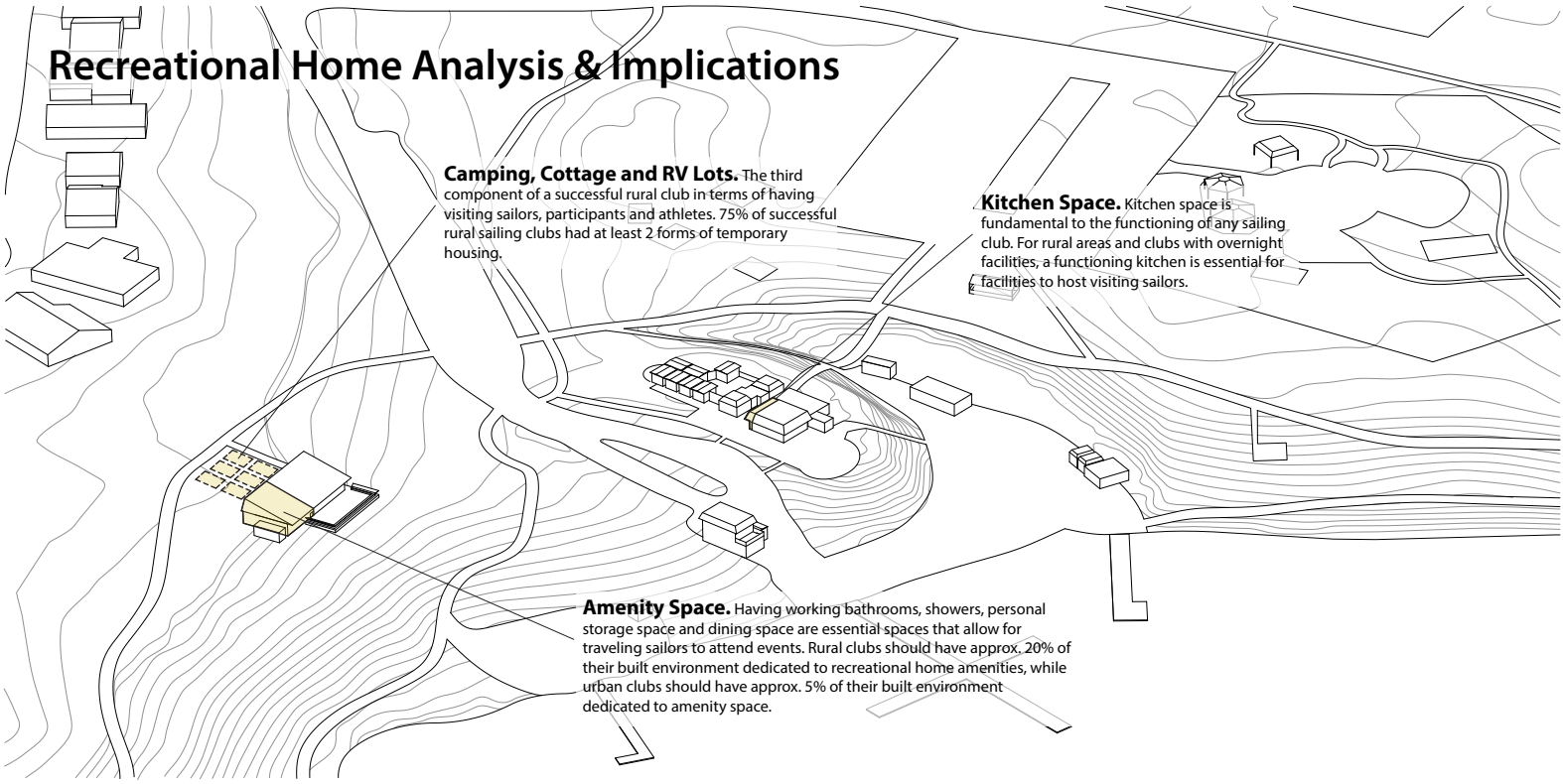
Operational Implications.

Multiple Storage Sites. On all the examined sites there were multiple storage areas for parts and equipment. Having this sort of storage system implies that there are multiple types of boats, which all need individual storage opportunities. There is also usually one main maintenance and storage area, for larger parts and repairs that are too big to be executed where the boats are stored.
25% Site Allocation. Having 25% of the built site dedicated to storage, maintenance and administration gives a big boost to programs. Programs that had more space allocated to to site management were typically more succcessful. The following list are the different categories of built space that fall underneath physical/management:

Administration Space
Staff Room
Cleaning Area
Equipment Storage
Maintenance Space
Main Office
Adminstrative Storage

Physical/Management space is at the heart of any facility. Though it may not seem it has primary importance (it doesn't directly affect how many participants there are) it can seem unimportant, but the storage, administrative and maintenance capacities of any facility will curtail growth from any other typology of activity. Physical/Management space represents the preporatory ability of any site, without it; activities wouldn't be able to organize the neccesary administrative, staff or equipment needs neccesary.
Administrative Space. Most successful facilities had some sort of spatial allocation for administrative space. The larger the facility, the more administrative space is required. With additional administrative space, this also can give the administration a staff room. Typically these become neccesary when there are between 5-10 staff members, but they have been built for as little as 3 staff members. These spaces usually allow for the staff to take more ownership over the facility, as they have a specific space to organize. Staff coordination can play an explicit role in activity control at any program, and helps to mitigate any unforseen situation that may arise.
Maintenance Area. Maintenance areas only become neccesary after fleet sizes start to exceed 10 boats. At this point a facility can designate a small area for repairs and repair material/equipment storage. The ratio of damaged to working boats ranges between 1:10 and 1:15 depending on the care/skill/program/instructor ability each facility has. Spatial allocations should be made to accomodate this number of damaged boats. Typically fibreglass technicians can work on 2-4 boats at any given time, and staff allocations for maintenance staff should be accounted for based on these compounding ratios.
Boat Stalls. These stalls are designated for rental and private usage only. Storage is one of the number one methods to attract people to become club members and have higher levels of engagement at the facility in question. These areas almost always seem to be full no matter the security, or type of storage. Based on the type of storage that you have at your facility (kayaks, canoes, sailboats, etc) your social activities should be tailored to target the audiences that you are engaging through storage methodologies.

Physical/Management Analysis *Figure 5.05*
Diagramming spatial patterns, complimentary programmatic and spatial elements for the Physical/Management Category.



Findings.

Size of Amenity Space. (Rural Clubs) Successful Rural clubs allotted on between 7-29% of their built environments to recreational home needs, or 18.5% average.
Size of Amenity Space. (Urban Clubs) Successful Urban clubs allotted significantly less space to recreational home amenities due to their user base being in majority within a commutable distance to the site of the program. Successful urban clubs had between 1.5-6% of their built environment dedicated to amenity space (including kitchen space). The recommended amount for urban clubs however is still 5% of their built environment. This is due to the fact that successful urban clubs that had minimal amounts of dedicated amenity space suffered from a general lack of public social activities, between 75-90% of surveyed club members prioritized social activities, and that 44% of surveyed members agreed that much of their life surrounded their recreational area.
Camping, Cottage and RV Lots. 3/4 Successful rural clubs had some sort of specific spatial allocation on site for users who needed acommodations. Though the range of facility differed, all these clubs had some sort of area that would accommodate users that needed overnight accomodation. After looking at the types of activities offered at these clubs, many of them relied on out-of-town users to fill their programs.
Unsuccessful Clubs. Unsuccessful clubs offered little to not recreational home amenities at their facilities, reinforcing all points above.

Operational Implications.

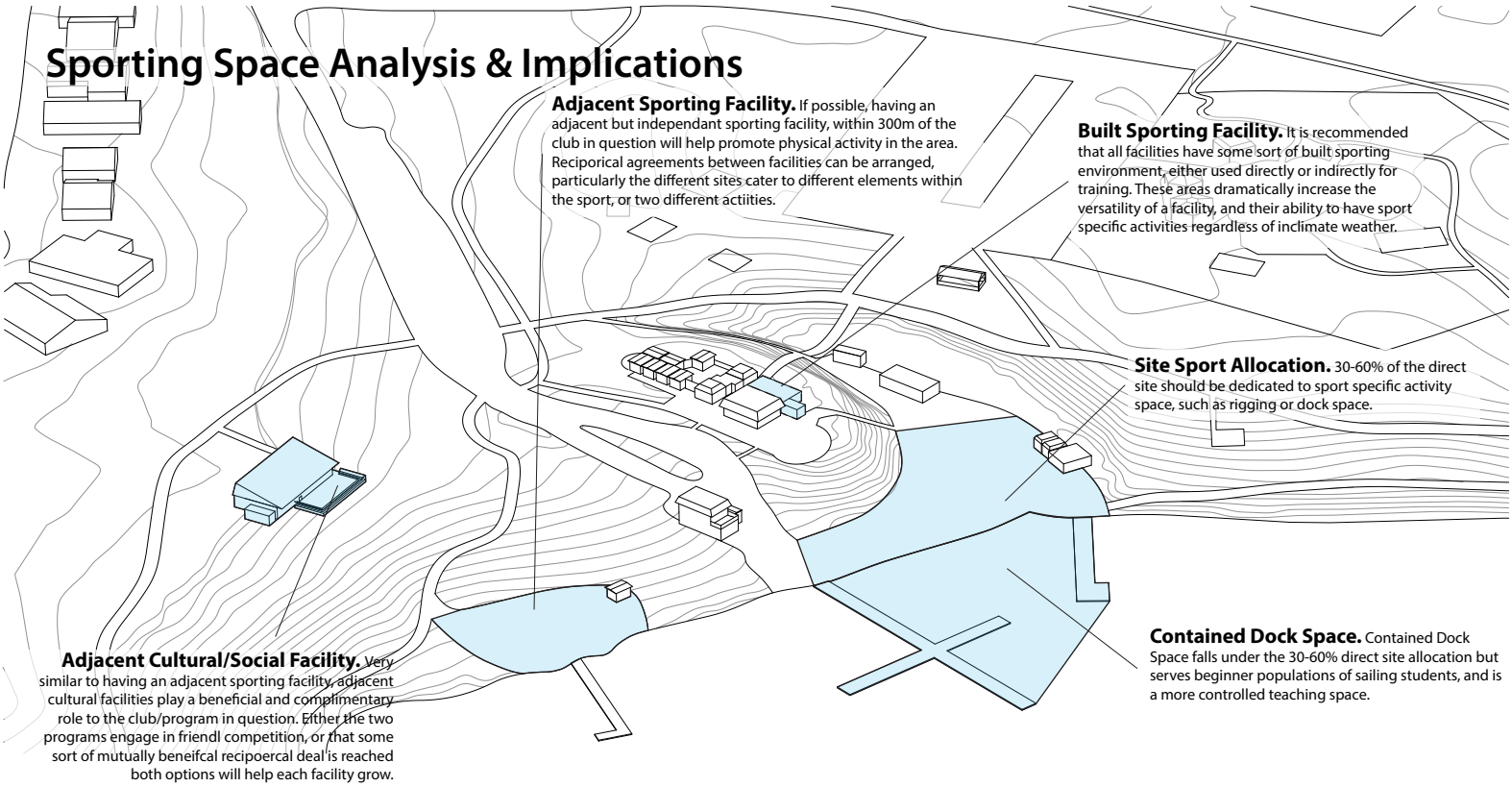
Amenity Space. Including amenity space within a facility will change how the facility operates. The inclusion of more amenity space will start to open clubs to new membership. Amenity creates opporunity for a different type of user group. It opens up opportunity for retirees and families to have semi-permanent vacation home space, but also to traveling competitors , athletes and people looking to for a temporary sailing experience. Amenity space addresses allow for user groups that have supplimentary spatial needs to use the site. These users also occupy the site for different time periods then a user that lives nearby. Users with trailer homes may occupy the site for weeks or even months, family groups may come for a week at a time, and competitive users typically stay for 2-4 days. If you can understand when different user groups prioritize activity, administrators can schedule activities to be the most attractive to all users involved. One user group may prioritize daytime activity, but if you can isolate a user group that prioritizes evening activity, and provide them the facilities neccesary for their participation, you can create a more time and cost effective useage of your facility. Amenity spaces at both a rural and urban site, enable to following typical user groups:

Senior/Retiree Populations (occupying sites from 2-10 weeks approximately)
Family Sailing Vacations (3 days to 2 weeks)
Competitive Sailors (2 days to 1 week)
Comprehensive Staff Usage of Facility (Entire Season)

Kitchen Space. Kitchen space is the third and most basic element within the category of recreational homes. In conjunction with the other two elements, kitchen space enables temporal users to occupy the site and take part in activities. Kitchen space at both rural and urban sites also provides opportunities for clubs to host social events involving food. This element of a facility greatly expands its ability to offer non-sport specific activities. These social events are not just catered to temporal user groups, but also local users. Typical activities specifically enabled by kitchen space are:

Dinners (Awards Nights, or Celebrations)
Catered Events
Weddings or Private Parties
Multi-Day Sailing Events
Full Day Training Events

Recreational Home Analysis *Figure 5.06*
Diagramming spatial patterns, complimentary programmatic and spatial elements for the Recreational Home Category.



Findings.

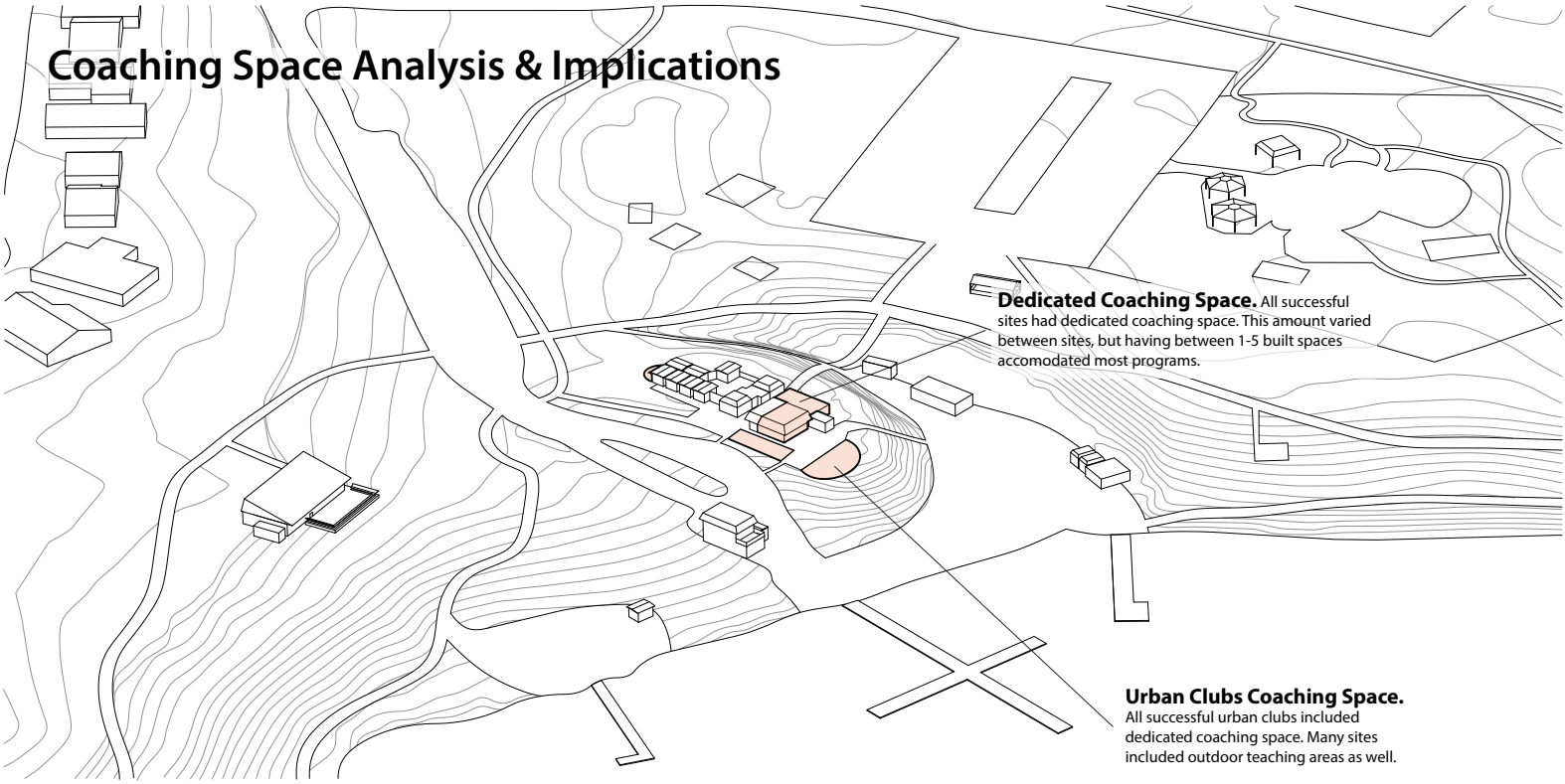
Built Sporting Facility. Only 1/4 sites had any built sporting environment due to sailings specific outdoor nature. This being, cross training facilities are widely utilized at multiple other sporting facilities. The sailing clubs examined could then be: A) not developed competiviely enough to need cross training facilities, facilities closeby provide the neccesary facilities required for cross training, and dedicated space would be redundant, or that the clubs simply have not capitalized on the demand for cross training facility.
Site Sport Allocation. On successful sites 30-65% of the site was sport related, however on unsuccessful sites, 77-100% of the site was dedicated to sport. The implications of this is that sporting activity and in turn sporting space is critical to a successful facility, but must be balanced with the other typologies of space.
Adjacent Sporting Facilities. 3/4 successful urban clubs had an adjacent sporting facility within 300m of the club's site. Only 2/4 successful urban clubs however had adjacent sporting facilities. In rural scenarios clustering facilities may be more difficult due to a lack of density, so findings are somewhat inconclusive for rural programs, but urban programs definitely benefit from an adjacent facility. This being said, when taking looking at all successful site culmulatively, 5/8 successful sites had an adjacent sporting facility.

Operational Implications.

Built Sporting Facility. Having a built facility on-site may be counter intuitive to the sport of sailing, but it provides opportunity for cross training when the weather is not cooperating. The operational implications to having facility like this is that a more competitive program can be offered to the public or membership. Training facility also allows another level of learning breakdown for students, which leads to additional retention. There is no specific percentage or area recommendation, only that a space dedicated to this function be included on site.
Site Sport Allocation. Having 30-60% of the site dedicated to sport specific activity may seem not enough, or too much in some respects, but this significant but not overwhelming proportion of space allows the focus of the facility to be sport, while having enough remaining space for additional activity typologies. The program should respond by making sure they have enough course offerings, equipment, staff and maintenance allocations to make sure that this space is continously occupied during evening, weekend and daytime activity periods. It is important to note that small increases to site activity space, (ex. 5-10 extra boats) can cascade other soft resource demands (ex. 3 new classes, 60 new students and 6 instructors).
Contained Dock Space. Contained dock space still falls under the 30-60% site allocation, but this space plays a crucial role in facilitating effective teaching of sailing students. This 'in-between' space provides a semi sheltered area for new sailing students to learn. From a coaching perspective, spaces like these help control younger or less experienced sailing classes, and inevitably improve the quality of program quality. These spaces are easily created, but have to be adequitely planned for in terms of site access, and user friendly design.
Adjacent Sporting Facility. Adjacent sporting facility functions very similarly to an adjacent cultural facility. The two facilities should be within 300m of each other. If both facility serve the same sport, they should either create a sort of friendly competition. If both facilities serve the same sport but lack sufficient spatial requirements to facilitate all activity typologies, they should come to a reciporical agreement for sharing each others facility. If the two facilities serve different sports or purposes, cross-over periods, cross training, promotion of each others activites and reciporical use agreements should all be pursued.

Sporting Space Analysis *Figure 5.07*
Diagramming spatial patterns, complimentary programmatic and spatial elements for the Sporting Space Category.

Coaching Space Analysis & Implications



Findings.

Dedicated Coaching Space. 6/8 successful sailing programs had some form of dedicated coaching space, while only 1/4 unsuccessful programs had any coaching space. Survey results indicate coaching very strongly correlates to a successful program, with 82-86% of participants either agreeing or strongly agreeing with a need for good coaching resources.
Urban Clubs Coaching Space. 4/4 successful urban programs had dedicated coaching space. Again the reasons behind this can be associated with urban clubs relying on coaching specific revenue programs, while rural clubs can default to recreationally based activities and spatial typologies. Though this attitude is to the detriment of both rural and urban sites (both types of sites should diversify into all typologies of space) it does define the difference in sources of income.

Operational Implications.

Dedicated Coaching Space. Dedicated Coaching Space is undeniably important to the success of sailing clubs at both rural and urban sites. Statistical data and survey results both strongly support the use and development of these spaces. These spaces will force a program to offer sailing lessons in general. It also allows space to become multi-function, with the potential use for conferences or meetings. Though it may be easy to take offering courses for granted, many unsuccessful programs did not offer any programs for people to learn formally about the sport. Including this space within a built environment will force programs to run sailing courses which will promote growth. The implication of learn to sail activites will imply that clubs have sufficient staff, equipment, storage facilities and maintenance competences.
Urban Clubs Coaching Space. Particularly with urban clubs, coaching was essential. This is due to the fact that rural clubs can cater (sometimes exclusively) to recreational home user groups, and sailing activities become secondary. Urban clubs will often deem recreational home activity and spatial typologies as secondary and are left to focus on competitive and learn to sail activities. These factors emphasize an increased demand for teaching space in urban clubs. Rural clubs, because of their potential dependance on non-sailing related activities should particularly emphasize the need for dedicated coaching space.

Physical/Management Analysis *Figure 5.08*
Diagramming spatial patterns, complimentary programmatic and spatial elements for the Physical/Management Category.

5.2 DESIGN GUIDE

Typologies of Space

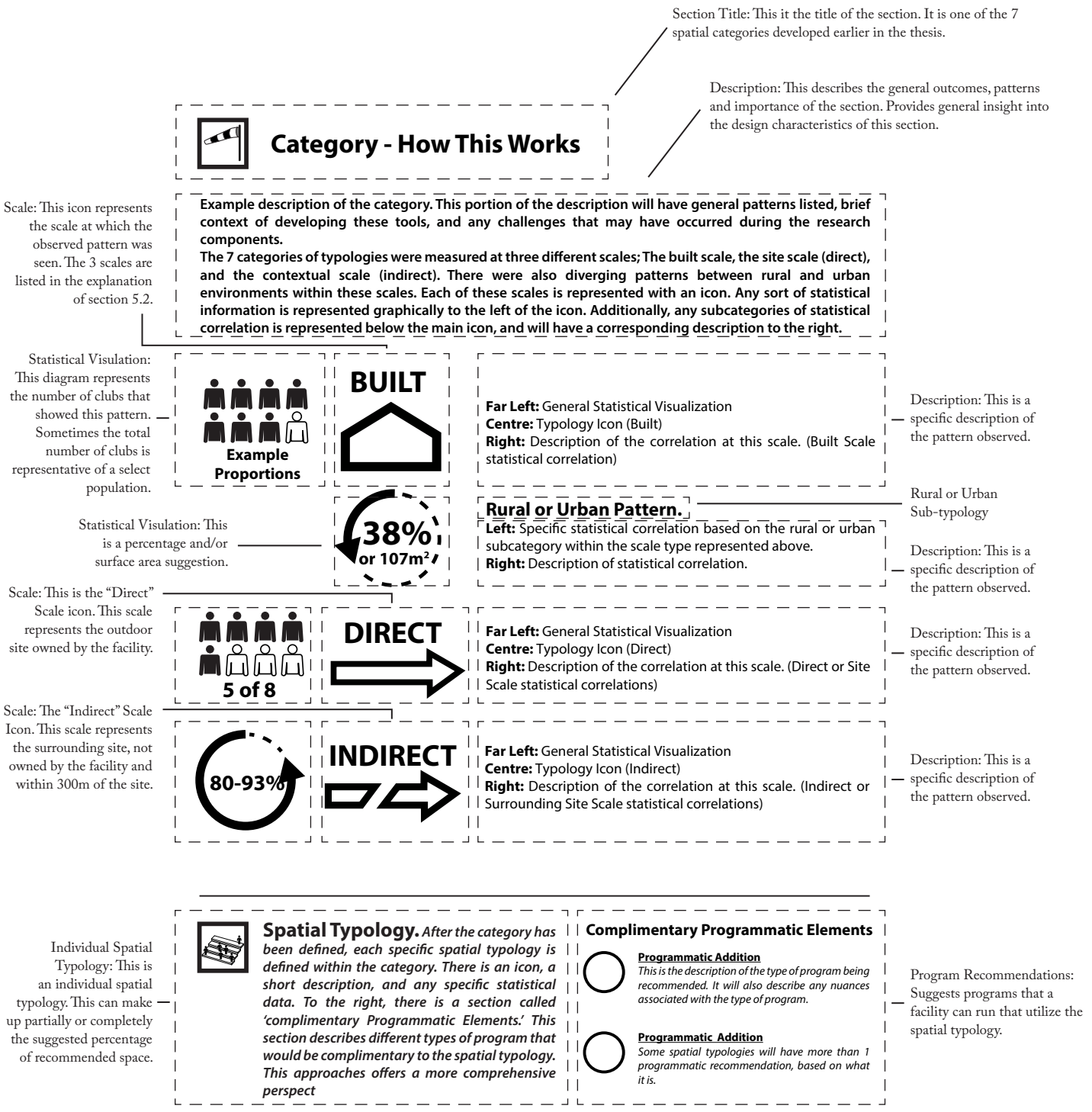
This design guide is meant to assist designers, urban planners, and facility managers better understand the spatial tools available to them to shape and influence their programs. The following guide lists multiple categories of individual spatial typologies. Each of these spatial typologies has an effect on participant retention, participant growth, facility maintenance, equipment needs and staffing demands. This guide shows designers and other relevant parties what those correlations are, so that they can better understand the cause-and-effect relationship between facility design and it's effects in corresponding areas.

The guide has been created using participant data gathered from 15 sailing clubs, the majority in the province of Alberta. Each sailing facility was then modeled, and spaces were defined by the categoric system derived from the hybridized research of sport sociologists, planners and architects. Correlations were then made between types and amounts of different spatial typologies and participation/retention data. These patterns were then confirmed or refuted by a survey of users from each of these clubs. The survey format was based on the same categoric system used to document each club, but was used to define whether or not these patterns consistent with user's opinions.

The end result is a Design guide for sporting facilities, currently specific to sailing programs. The guide allows the user to understand the effect of including different types of physical facility; how it will effect their users, equipment and if their are any deficiencies in their current program. The guide also offers a qualitative understanding of the effects of these spaces. How will it effect the public perception of the facility? Does not including a specific type of space affect staff detrimentally? Are there types of specific program that are complimentary to individual spatial typologies?

This guide contains 7 categories of spatial typology, including statistical information regarding the qualitative and quantitative correlations between program and that subcategory. Each spatial typology has a verbal description, illustration, and description of it's qualitative effects on a sailing club's programmatic, equipment and staff functionalities. Each spatial category will address the built environment, the site of the facility (direct relationship) and/or the surrounding site and facilities (indirect relationship).

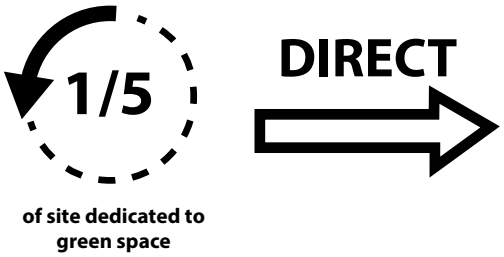
The design guide makes reference to proportions of space recommended for sporting facilities to adhere to. These recommendations do not have to hit each proportion with pinpoint accuracy, but are meant to be rough suggestions for the amount of space dedicated to each category. If this methodology were to be applied, an inaccuracy of spatial distribution within 1/10 would not be hugely detrimental to the success of the building.



Design Guide Explanation *Figure 5.09*
Diagram explaining what each part of the design guideline means.

Category - Natural Landscapes

Green space is an integral part of recreation facilities and particularly sailing clubs. 80-90% of the population feel that having a beautiful natural environment is an important element to a sailing club. There are multiple types of green space, affecting users from mostly direct and indirect site scales, as there are few green spaces contained within the built environments of sporting facilities. The effectiveness of greenspace lies in it's flexibility and universal appeal. Greenspace can be rapidly adopted by other spatial typologies in the event that more space is needed. By itself, greenspace is universally appreciated and attracts interest from a broad range of users, providing an inclusive tool to attract attention, especially if the greenspace is public. The elements included within the natural Landscapes category can all be either directly or indirectly related to the site.



of site dedicated to green space

6 out of 8 sailing cliubs that reported growth statistics had green space on their facility. On average 1/5 of a facilities site was dedicated to green space.

value greenspace around their facility

4/5 of participants highly value greenspace at their sailing clubs. People generally tend to have a strong association with greenspace and natural environments to sailing, so placing the facility adjacent, in conjunction or integrated into greenspace takes advantage of this demographic.

Water Access Points and Waterparks. ***This includes launch ramps into lakes, rivers and waterparks. Water features are very attractive, especially in the summer months and can attract very large crowds. These facilities need to have effective parking, transportation and secondary consumer facilities to be successful. Storage facilities for boat launches close-by make for successful areas***

Complimentary Programmatic Elements

Restaurants and Eateries
A wide range of consumer options make waterpark areas more effective. Users are always looking for food and refreshments are variety of service levels.

Public Parking and Acces
Public waterparks typically suffer from a lack of access. These facilities should have a focused amount of public transit options available as well as ample parking for users.

Natural Monuments. ***Any sort of monument within a natural area, whether man-made or natural are worth mentioning. Having effective trail systems, seating areas and signage all contribute to successful use of these elements within the natural landscape.***

Complimentary Programmatic Elements

Park Seating
This is fairly rudimentary, but effective park seating can promote the observation and usage of these areas.

Historic walks or tours
Having organized occasional nature walks for users can promote appreciation of these monuments. These organized walks can be particularly effective in public locations and on adjacent sites.

Multiple Monuments/Art Installations
Creating a 'critical mass' of installation art and monuments is important showcasing art.

Gardens. ***Gardens are artificially organized areas of plants and trees, organized to be aesthetically pleasing to users. These areas can be used for picnics, viewing, quiet contemplation or sitting areas. They require a high amount of maintenance for upkeep, but their visual quality is so high that they may be worthwhile.***

Complimentary Programmatic Elements

Event Rentals
Gardens make beautiful venues for weddings and other special events throughout the year. This can make the area sought after, well known and a source of revenue.

Restaurants and Viewpoints
Many public gardens are also accompanied by eating establishments. This is important as many people will look for a facility that they can admire the gardens without having to circulate the entire distance.

Trails and Viewpoints. ***This category includes bike trails, running trails, informal trails, formal and informal viewpoints. These features can form complex networks of recreational and business transportation. Viewpoints allow for designers to highlight specific moments along the trail. They can showcase a specific vantage point, or simply a nice field. Trails become the glue that tie a natural area together. They allow ease of transportation (or not) between different points of interest. Effective trail and viewpoint systems are critical to a succcessful recreation facility.***

Complimentary Programmatic Elements

Nature Walks
Local facilities can host local nature walks throughout the park with a expert guide. This promotes the use of these areas and links the natural environment to the built one.

Public Meal Events
Having public BBQs or pancake breakfasts are great within park and trail systems. These events not only encourage usership, but provide exposure to user groups not typically engaged in sporting facilities.

Green Space. ***Intentional green space is a grassed area that is occupiable by pedestrians. These spaces should be within a 5 minute walking vicinity of a facility and can be either on facility grounds or in an adjacent park. These spaces are hyper durable and provide a flexible component to any recreation facility. These spaces can temporarily transform into other spatial typologies for a specific event. On average successful sailing clubs had on average 22% of their exterior facility dedicated to green space.***

Complimentary Programmatic Elements

Public Meal Events
Having public BBQs or pancake breakfasts are great within park and trail systems. These events not only encourage usership, but provide exposure to user groups not typically engaged in sporting facilities.

Public Parking and Access
Public waterparks typically suffer from a lack of access. These facilities should have a focused amount of public transit options available as well as ample parking for users.

Continous Greenspace. ***Having greenspace connected throughout a site allows for users to flow around the site effectively. It gives users an area that they feel comfortable walking on while being on the site.***

Complimentary Programmatic Elements

Park Seating
Park seating can go a long way in terms of making casual users more comfortable. This allows for pause points within the green space.

Public Meal Events
Having public BBQs or pancake breakfasts are great within park and trail systems. These events not only encourage usership, but provide exposure to user groups not typically engaged in sporting facilities.

Public Parking and Access
Public waterparks typically suffer from a lack of access. These facilities should have a focused amount of public transit options available as well as ample parking for users.

Scenic Viewpoints. ***These viewpoints highlight natural or manmade landscapes along a trail. These points can be very useful if trying to highlight a specific area, or a vantage point. When used in conjunction with trails***

Complimentary Programmatic Elements

Event Rentals
If large enough scenic viewpoints can be rented out in conjunction with park space for events such as weddings or family events.

Other Monuments or Public Art
Having a series of public art installations and/or scenic points within a walkable distance of other monuments allows for users to tour a series of these elements. The area then becomes known for this.

Intended Natural Areas. ***This category includes exterior spaces to the facility that have not been altered to increase or ease human engagement with them. These areas have had their unadultered qualities intentionally preserved to best promote wild flora and fauna. 80-90% of the population believes that beautiful natural areas are of key importance to an effective sailing site.***

Complimentary Programmatic Elements

Nature Walks
Nature walks are a great programmatic element that engage more pensive users of a natural area. Having experts make observations about a natural area attracts attention and allows for users to gain new appreciation.

Yoga in the Park
Having organized park activities can allow for natural areas to be utilized in a fashion that is appropriate the the maintenance of the area. It promotes usage while controling the amount of human interference into the surrounding landscape.

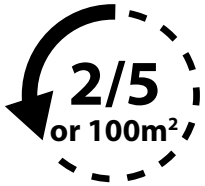
Category - Cultural/Social

This category includes any sort of designed spatial typology that actively promotes social or cultural activities through the use of the space. Cultural and social space are key contributors to including more types of users at a facility. Unlike the category of Natural Landscapes, Cultural/Social space is typically much more specific to an activity, rather than providing a flexible space that can adopt different functionalities for the program.

7 of 8 successful programs had dedicated built space

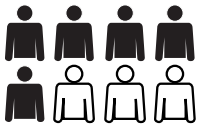
BUILT

7 out of 8 successful sailing club had a built component of their facility dedicated to cultural and/or social purposes at the club. These came in the form of recreation rooms, bars, and dancing halls.



Rural Clubs. These clubs designated less space on average than urban clubs, allocating or 100m² 2/5 to this typology. This phenomenon can be attributed to less social emphasis and more of an amenity based approach.

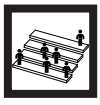
Urban Clubs. Urban clubs differ from rural ones because overnight accomodations are typically not needed. In order to attract more users, a focus on social activity is usually of a higher priority. On average, successful urban sailing clubs allocated 200 m² or 1/2 to this typology.



5 of 8 Facilities were in proximity to another facility

DIRECT

5 out of 8 successful sailing clubs had a cultural or sporting facility within a 300m distance of the facility. This means that there was another facility close by. This concept of clustering facilities can also be seen in obesity demographics, where cities with lower rates of obesity have social and recreational facilities clustered together. The justficiation behind this type of thinking is that clustering provides more opportunities for users to be involved in activity. The more diversity in activity, the more users you'll attract.



Spectation Space. ***Spectation space is any designed element that allows users to view a sporting, recreation, social or cultural event. This can include bleachers, seating, or outdoor seating areas. Many participants in sports are spectators, and creating viable opportunities for these users to spectate will encourage more participation.***

Complimentary Programmatic Elements

Restaurants and Eateries
Consumer options for spectators is important. Spectator space typically benefits from easy access eating establishments, rather than dine-in options.

Public Parking and Access
Spectator space typically requires a large number of spectators, so effective parking; enough for spectators, participants, officials and everyday users is an important speculation in the programmatic allocations of a facility.

Outdoor Tradition Space. ***Some outdoor life traditions require specific spatial features, like fishing huts or indigenous meetings. If a recreational activity requires a specific space, then this is it's designation.***

Complimentary Programmatic Elements

Formal Programming
These spaces have very specific usages, so administrative forces should create formal programs and lessons on how to use the space and participate in the activity effectively.

Historic walks or tours
Having specific spaces like these can also be showcasing features when doing site and park tours. These facilities may have uses not understood by the general public, and can be highlighted during a tour.

Proximity to Residential Areas. ***Many social connections to communities would not be possible without immediate proximity to them. Many user groups are composed of the residents in the immediate area. Pairing recreation facilities with residential areas allows this relationship to occur.***

Complimentary Programmatic Elements

Trails and Viewpoints
Trails help connect these residential areas with recreational ones. Having direct, pedestrian trails only encourgages more use by local residents.

Special Event Space. ***This typology of space allows facilities to have an area to host special events. This area can be outside or inside, but allows for large dinners, charity gatherings, or even weddings. When recreation facilities are paired with scenic or picturesque settings, these facilities greatly benefit from special event space.***

Complimentary Programmatic Elements

Restaurants and Eateries
With many special events, there is a dining component included. With a dining facility included or nearby the facility can make special event space even more attractive.

Event Space Rentals
If you have special event space, having the ability to rent this facility creates a significant amount of income, creates many positive opportunities for public relations and typically takes a low amount of administrative engagement.

Historic Monuments, Museums and Gallery Space. ***These types of spaces are typically enclosed, separate facilities from recreational spaces. Clustering museum and recreation spaces allows for casual users to engage in a variety of activities within a small area.***

Complimentary Programmatic Elements

Reciporical Agreements
Reciporical agreements between recreation and historic facilities creates opportunities for user groups to cross contaminate.

Trail Networks
Having effective public pedestrian trail networks between different publically accessible facilities allows for higher rates of awareness and use between clustered facilities.

Historical Buildings. ***These buildings represent an architectural style that is currently not in general production. These buildings are typically older and have some sort of heritage designation. In conjunction with local art and natural monuments, clustering these typologies of space can create local attractions on recreation sites.***

Complimentary Programmatic Elements

Park Seating
This is fairly rudimentary, but effective park seating can promote the observation and usage of these areas.

Historic walks or tours
Having organized occasional nature walks for users can promote appreciation of these monuments. These organized walks can be particularly effective in public locations and on adjacent sites.

Multiple Monuments/Art Installations
Creating a 'critical mass' of installation art and monuments is important showcasing art.

Museums. ***Museums are a very specific typology of space. Though this type of space isn't usually related to recreation activities, if clustered effectively with other recreational sites and connected with pedestrians paths, they can assist in creating vibrancy within a recreation community.***

Complimentary Programmatic Elements

Reciporical Programs
Gardens make beautiful venues for weddings and other special events throughout the year. This can make the area sought after, well known and a source of revenue.

Public Gardens
When these facilities are paired with public gardens, it allows for a facility to have interior and exterior displays.

Cultural Tradition Space. ***These spaces assist in activities that are specific to a cultural or social practice, typically associated but not limited to ethnographic activities. These spaces are representative of the culture that they are representing, and can include historic or museum space specific to the culture of exploration.***

Complimentary Programmatic Elements

Reciporical Programs
Cultural facilities make great reciporical partners due to the their expertise and comprehensive understanding

Public Tours
Having an expert guide users through a particular part of the facility allows a directed understanding of the facility's specific uses, and it's historic precedence.

Social Gathering Space. ***Intentional green space is a grassed area that is occupiable by pedestrians. These spaces should be within a 5 minute walking vicinity of a facility and can be either on facility grounds or in an adjacent park. These spaces are hyper durable and provide a flexible component to any recreation facility. These spaces can temporarily transform into other spatial typologies for a specific event. On average successful sailing clubs had on average 22% of their exterior facility dedicated to green space.***

Complimentary Programmatic Elements

Public Meal Events
Having public BBQs or pancake breakfasts are great within park and trail systems. These events not only encourage usership, but provide exposure to user groups not typically engaged in sporting facilities.

Public Parking and Access
Public waterparks typically suffer from a lack of access. These facilities should have a focused amount of public transit options available as well as ample parking for users.

Small Niche/Pause Points. ***Small benches, detours off of the main pathways, small gardens of any space that allows for temporary occupation. These spaces encourage use by pedestrians that would not otherwise stop***

Complimentary Programmatic Elements

Connecting Greenspace
Having other effective greenspace for pedestrians to pause at promotes a wider use of greenspace activity throughout a larger area.

Trail Networks
Trail networks are the lifelines between these pedestrian based areas. Trail networks determine which elements are linked, over how much distance and what amenities are included (or not) within the system.

Simple Shelter. ***These spaces protect users from rain and the elements while still be open to sunlight and fresh air. These are typically partial enclosures for temporary waiting areas such as bus stations but can also be placed on walking paths to provide temporary shelter for pedestrians.***

Complimentary Programmatic Elements

Trails and Viewpoints
Trails help connect these residential areas with recreational ones. Having direct, pedestrian trails only encourgages more use by local residents.

Informal Public Space. ***Informal public space can be any space that allows gatherings and informal expressive activities. These spaces differ from formalized public areas based on levels of maintenance.***

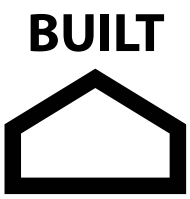
Complimentary Programmatic Elements

Trails and Viewpoints
Trails help connect these residential areas with recreational ones. Having direct, pedestrian trails only encourgages more use by local residents.

Category - Physical/Management

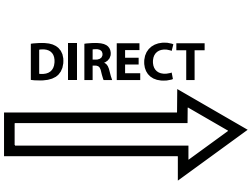
This category is based around on the facilities that support the behind the scenes elements of a recreation facility. For these facilities to function effectively, there are numerous factors that go into their success: Proper administrative space, transportation networks set up so people can get to the facility effective, amounts of parking determine how many users can be at the facility at any given time, etc. These spaces are classified as any typology of space that immediately supports the facilities main activities, but those activities do not actually take place in that space. There are spatial typologies that do not fall within the formalized list of found here, but they are still categorized as physical/management.

Facilities dedicated 2/5 of their built area to this typology



Successful sailing facilities boasted an average of 2/5 of their built environment dedicated to administrative and management services of a facility. Successful club proportions ranged from 25-75%, with the majority of clubs ranging in the 30-40% area. Conversly, unsuccessful clubs had on average 19% of their facility dedicated to management and administrative space, with the majority of clubs ranging in the 20% area.

Facilities dedicated 25% of their built area to this typology



Successful sailing clubs all included some sort of physical management space, but the average amount of the space totaled 1/4 of their total site was dedicated to this typology. These facilities were typically classified as maintenance facilities, boat storage, road access to boat storage and pedestrian pathways connecting these facilities.

Access Systems. *This category includes trails, roads, dirt trails and launching points for any sort of sporting facility/sailing program. These systems are classified differently than a cultural/social typology because they spaces allow access to a facility, while a trail found in the cultural/social typology are circulatory for users within a park system.*

Complimentary Programmatic Elements

Effective Signage

Recreation facilities, particularly water sport facilities can be confusing due to the specifics of launch spaces, and later storage. It is important to have effective signage to indicate these spaces, how to access them, and where to park afterwards.

Transportation Networks.

Transportation networks allow goods and services to be transported in large quantities to facilities. This can include roadways but also rail and light rail systems. Understanding your transportation network allows for you to capitalize on benefits to the system, but also plan for it's limitations.

Complimentary Programmatic Elements

Mass Transit Solutions
Organizing with local authorities to make sure that mass transit is specifically servicing your facility can make huge changes in its ability to attract patrons.

Parking Areas
Depending on the type of network you have, there may be a demand for parking close to your facility. Having effective parking can seriously impact the usership of your facility.

Effective Signage
With mutliple transportation networks, finding a mode of transportation can sometimes be confusing. Having effective signage where different transport solutions, facilities and attractions increase usership.

Resource Extraction Sites.

These sites don't add anything specific to the facility itself, but they do allow for secondary sources of income if the resource extraction points are on the property.

Complimentary Programmatic Elements

Tours
Though these facilities can seem unrelated, many patrons will be curious as to the functionality of these sites. Having occasional tours of these facilities can be very captivating for users.

Effective Signage
While these spaces arent' typically occupiable, having effective signage and explanation still allows these sites to become attractions for pedestrian traffic.

Onsite Management (Facility).

This is the broadest category in the physical/management typology. It can include storage areas, maintenance areas, administrative area or anything else that would be pertinent in the maintenance and management of the facility.

Complimentary Programmatic Elements

Effective Signage
Many users will want to sign up for programs when they are able to experience a facility first hand. Having effective signage directing potential students to places of registration and information can make all the difference.

Consumer/Spectator Space
With users coming to a facility for administrative reasons, it often provides an opportunity for people to pause. Having consumer/spectator space allows for users to observe the physical activities from a comfortable space.

Local Municipality Building.

Municipality buildings can play an important role within recreation. Many municipalities are assigned the task of maintaining fields, parks, pathways or other public recreation facilities. Having access to your municipal government building can have impacts on other facilities.

Complimentary Programmatic Elements

Reciporical Agreements
Reciporical agreements between recreation and municipal facilities creates opportunities for user groups to cross contaminate.

Trail Tours
Trails tours around municipal government buildings can create interesting walks, bikes or opportunities to admire these architectural works.

Trails and Pedestrian Pathways. ***These pathways are specific to pedestrian and cyclist use. They can be forms of leisure themselves, providing scenic routes through parks and greenspaces. These pathways can also connect features together, whether they are consumer, recreational or social elements.***

Complimentary Programmatic Elements

Park Seating
This is fairly rudimentary, but effective park seating can promote the observation and usage of these areas.

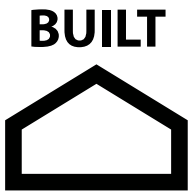
Races
Having races hosted at nearby recreation facilities allows for increased exposure to new user groups. These races are highly visible from a community perspective and provide effective advertisement.

Park Program
Offering programs that take place in the park is an effective way to increase the amount of programming that occurs in the space. This can include fitness classes or yoga.

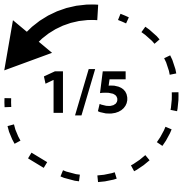
Category - Recreational Home

The category of recreational home constitutes a variety of spatial typologies, but their similar thread is that they all, directly or indirectly, encourage overnight or short term occupations at the indicated site. This can include campsites, trailer parks, rental cabins and all of the facilities that play assistive roles in making these afformentioned activities possible or more comfortable. These typology is important to the sport of sailing if the club being analysed falls within the rural overall typology. Many users have to travel long distances to get to the facility and often will stay for extended periods of time in order to make their trip worthwhile. This means that their sailing (or other sporting) venue must also provide amenities and opportunities typical to those when vacationing or camping. Urban typology clubs must also include some sort of amenity space. While this is significantly lessened, traveling users are commonplace in the sport of sailing.

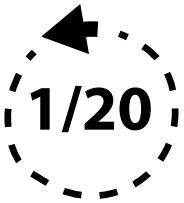
7 of 8 successful programs had dedicated built space



There is a significant difference in this spatial typology based on if the club falls into a rural or urban category. The two categories have very different requirements in terms of this typology of space. 7/8 successful clubs included some percentage of this typology in their facility.

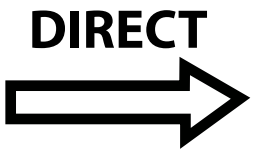


Rural Clubs. Successful rural clubs had between 7-29% of their built environments committed to the recreational home typology of space. On average, a facility within a rural environment should 1/5 of their built facility committed to the recreational home typology.



Urban Clubs. Successful urban clubs had a much lower rate of their built environment committed to the recreational home typology than its rural counterpart. 1.5-7% of successful urban clubs built environments were dedicated to the recreational home typology.

3 of 4 successful rural programs had site dedicated to the



Rural Clubs. 3 out of 4 rural clubs had some portion of their facility dedicated to specifically to recreational camping area. In Alberta there is a trend that at least some sailing vacationers will camp during a visit to a rural club. Successful clubs designated on average 1/20 of their immediate site to this recreational home usage, usually in the form of camp sites, or RV spots.

Amenities for Family Life. ***One, if not the most important typology within this spatial category is Amenities for Family Life. This can include any space that would assist in a short term stay at a campground or trailerpark. These facilities are fundamental in the success of rural clubs because they allow users to stay longer periods of time than they normally would be able (ex. Ability to do laundry, cook food, connect to the internet, etc). The longer you can extend a user's trip, the longer they can participate at the facility.***

Complimentary Programmatic Elements

Online Camping Reservation Systems
The 2nd component to this typology is camping and overnight facilities. Having effective booking systems makes sure sites are full.

Event Coordination
For specical events, having an administrative organizer figure out potluck assignments, to who is bringing tents and if anyone needs extra supplies helps include 1st time users and participants unsure/unable to initially participate.

Effective Cleaning and Maintenance
The comfort of many users is tied to how well the facility is kept, especially in terms of accessible amenities.

Camping and Overnight Facilities.
Camping and overnight facilities are a critical typology and a counterpart to Amenities for Family life. Facilities must successfully estimate how much of each type of overnight facility is needed, and then have an proportionate, corresponding amount of the Amenities for Family Life typology. This typology can include campsites, trailer stalls, rentable cabins and any other facility that provides sleeping accomodations for users.

Complimentary Programmatic Elements

Effective Online Reservation Systems
These facilities are fundamental in the operation of rural recreation and sailing clubs but need to be easily and cheaply bookable by users.

Amenity Accessibility
Amenities need to be placed within close proximity to overnight facilities. No one wants to walk across an entire facility to go to the bathroom.

Proximity to Residential Areas.
Many previous studies have shown that proximity to residential areas promotes local user group participation. This trend was not seen in this study, but the logic behind the typology is still sound. Having a facility close to a residential area allows for easy access from local users. Some properties are developed with the specific intention for the buyers to be involved with the corresponding recreation facility. When a facility can coordinate with residential developers, communities can be effectively built around a recreation or sailing facility.

Complimentary Programmatic Elements

Trail Networks
Having local pedestrian pathways connecting residential and club facilities are effective at promoting foot traffic to recreation sites.

Special Events
Particularly applicable in rural environments, having special events, dinners, potlucks, boardgame nights, etc (anything that uses the club as a social hub) is highly successful. Small towns and rural environments don't have many opportunities for enterainment so having a special event generally has high rates of participation.

Recreational Homes. ***Recreational homes and private properties make up this typology of space. Studies have shown that local property owners, particularly in rural environments make up the majority of users of rural recreation and sailing clubs. Though this study was unable to determine a connection between participation and recreational homes, the logic regarding the inclusion of this typology remains sound.***

Complimentary Programmatic Elements

Trail Networks
Having local pedestrian pathways connecting residential and club facilities are effective at promoting foot traffic to recreation sites.

Special Events
Particularly applicable in rural environments, having special events, dinners, potlucks, boardgame nights, etc (anything that uses the club as a social hub) is highly successful. Small towns and rural environments don't have many opportunities for enterainment so having a special event generally has high rates of

Category - Consumer Space

The category of consumer space represents all opportunities within a 300m radius of the facility to spend money on amenities, food, consumer goods, etc. These goods/services can be sold at the facility as well as 3rd party vendors in the immediate surrounding area. These spaces didn't have any correlations solidified within this study, but previous studies have shown a correlation between accessible consumer space and attracting additional users.

Consumer Space. ***This spatial typology is supported by numerous theoretical frameworks that include the need for western society to have opportunities for consumerism. This typology includes any space that incorporates the selling of goods and services. This can be embeded within the recreation facility itself, grocery stores, or services like doctors, physiotherapists or councillors.***

Complimentary Programmatic Elements

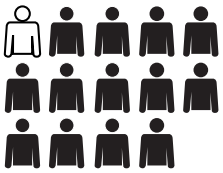
Reciporical Agreements
Creating reciporical agreements with local businesses creates partnerships that can be mutually beneficial. It also these 3rd parties to become more involved at the sailing or recreation facility. Reciporical agreements are good for both businesses and help each other to thrive.

Shops. ***This typology is very similar to 'Consumer Space' but only applies to retailers selling goods. These spaces can still be embedded within a recreation facility.***

Reciporical Agreements
Creating reciporical agreements with local businesses creates partnerships that can be mutually beneficial. It also these 3rd parties to become more involved at the sailing or recreation facility. Reciporical agreements are good for both businesses and help each other to thrive.

Category - Sport

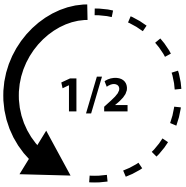
This category is central to defining sailing and recreation facilities. It is at the centre of this guide and is the typical focus of most users of these facilities. This category is comprised of a large number of sport or recreation specific elements that help define a facility. The sporting typology also includes areas like parks, zoos and spas where physical activity and wellness can be self directed. Sporting space doesn't have to be directly related to the primary function of the facility. Many types of physical activities are complimentary to one another, and the user groups will participate in one or more of the activities offered.



1 in 14 clubs had add. sport space

BUILT

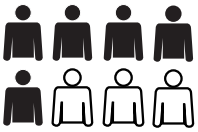
Only 1 of 14 surveyed sailing clubs included a built sporting environment. There are numerous studies suggesting that hybridized programmatic content is highly applicable. Having indoor facilities in Canada is also important; outdoor facilities only function about 6 months of the year and enclosed facility compliments this well.



Sporting space Allocation

DIRECT

There are some really interesting statistics regarding the facilities' site and sporting area. On successful sites 30-65% of the site was used for sporting related activities excluding bodies of water outside protected dock areas. Unsuccessful sites had a range of 77-100% of their site dedicated to sporting area. Statistically speaking, having on average 47.5% of your site dedicated to sporting activities is an effective proportion. More than this, and you start to risk excluding other typological categories of space that are just as important. This statistic also suggests that ratios of all 7 of these categories is important, not any one typology specifically.



5 out of 8 had Secondary Sport or Cultural Facility

INDIRECT

The indirect relationships around a sporting facility play an important role in the success of a facility. Adjacent facilities can bring new users through reciporical agreements and advertising at each others facilities. Other sporting clubs will have users that are typically athletic, therefore their interests may span into your facilities activities if they are informed about the program. 5/8 successful facilities had a sporting of cultural facility within a 300m radius.

3 out of 4 had Secondary facility in proximity

Urban Clubs. 3 out of 4 successful urban clubs had a secondary sporting facility within a 300m vicinity of the primary facility. The correlation between partnered recreation facilities in the urban context and successful participation rates is high.

2 out of 4 had Secondary facility in proximity

Rural Clubs. 2 out of 4 successful rural clubs had a secondar facility within a 300m vicinity of the primary facility. The correlation is not as strong as in urban areas, but combined with the successes had overall, there is still a strong recommendation for clustering recreation facilities.

Physical Activity Space. ***Physical activity space is any space that is specifically designed for recreation or sporting activities, either formal or informal. This can include interior and exterior space. Physical activity space is critical to sporting facilities to operate, and is typically the main focus of a facility.***

Complimentary Programmatic Elements

Beginner Lessons or Coaching
Having effective programs for beginners of all ages is paramount. On average 75% of all participants were beginners, and the lowest amount of beginner participants was still 46%.

Plans for Retention
Planning for retention of students begins with understanding how a student progresses. Give a student enough opportunities to get better steadily, and retention will increase.

Secondary Physical Activity Space
Having complimentary, but unrelated secondary physical activity space can provide opportunities for fun retreats for students and attracts a secondary population that can become interested in the primary activity of the facility.

Sporting Infrastructure. *Sporting infrastructure is space or spatial elements that supports the sporting activities emphasized at the facility. This can include changerooms, showers or other facilities that make the activity possible.*

Complimentary Programmatic Elements

Facility Advertisement
Advertisements for the facility should include showcasing the sporting infrastructure that the facility has available. Well equipped facilities are always attractive to user groups

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Spas. ***Spas are facilities that have programmatic elements dedicated to the recovery and relaxation of users, either indepenedantly or by spa staff. These facilities are secondary in nature to physical activity, but deal with the direct repercussions of being involved in sport and recreation.***

Complimentary Programmatic Elements

Duel Programs
Many people attend sporting facilities to be involved in the sport, but creating packages where they are able to enjoy the sport and then the spa facility can be attractive to users as well.

Singular Use
Having a spa facility will also attract many users who do not have specific interest in participating in the facilities main sporting activities. This should be accomodated for with spa access separate from any athletic participation.

Zoos. *Zoo spaces constitute areas where animals, foreign and local, are kept for public spectation. Facilities are comprised of open air and built areas for different species.*

Complimentary Programmatic Elements

Reciporical Agreements
Reciporical agreements between recreation and municipal facilities creates opportunities for user groups to cross contaminate.

Trail Tours
Trails tours around municipal government buildings can create interesting walks, bikes or opportunities to admire these architectural works.

Parks. ***The parks typological definition includes areas with multiple benches, swings, jungle gyms, casual climbing areas, etc. These areas facilitate independant recreation, and can have high rates of usership, especially when they are planned in conjunction with formal recreation opportunities.***

Complimentary Programmatic Elements

Facility Integration into Programming
When parks are built within the vicinity of a recreation or sailing facility, these elements can be utilized for occasional usage.

Park Tours
Having formal park tours and including these areas within the tour increases public awareness of these facilities.

Special Events
Renting these spaces out, or having public special events is another way to take advantage of these facilites while bringing awareness to their existence.

Large Sporting Fields. *These facilities include any outdoor public fields within 400m of the facility and are both privately and publically accessible. These fields can be singular or multi-use.*

Complimentary Programmatic Elements

Public Sporting Event
Hosting large scale competitions or sporting events is a great way to attract attention from nearby and spectator user groups. It also provides an opportunity to highlight local talent and facility.

Field Rental
Renting fields to private sports leagues is an effective way to generate revenue for a facility within minimal amounts or organizational effort.

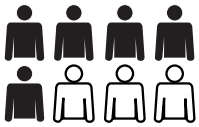
Adapted Sport Space. ***These sporting spaces are not in a typical configuration compared to usual facilities used within standard competition. These facilities are still able to be utilized, just in a non-competitive perspective.***

Complimentary Programmatic Elements

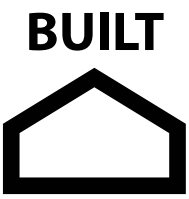
Special Events
Because these fields have unique characteristics, having specialized competitions can make for fun opportunities for users to be engaged in a friendly manner.

Category - Coaching

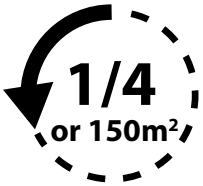
Coaching space is the adjacent typology to sport. This type of space is solely dedicated to teaching and coaching activities. This can mean that the space is equipped with teaching aids, chalk boards, white boards, smart boards, tvs, desks, chairs, benches, projectors etc. The way these spaces are organized in conjunction to other spaces in the facility will also play a role to how these spaces are used. Observation/teaching areas are great tools to watch sporting activities from a learning environment.



5 of 8 Clubs had coaching space at the built scale.



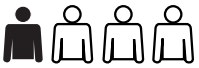
Coaching space is mostly found within the built environment due to the sensitive nature of some teaching aids. 5 out of 8 succesful sailing clubs included some form of coaching space within their built environment.



General Patterns. Successful rural and urban clubs had on average 27% or (147m²) of their built environments dedicated to coaching space. There was a range of results were from 6-66%. The reason for including the square metre amount was that clubs started to having a similar amount of coaching space, even though some clubs were much larger than others. In addition, 70% of surveyed users agreed or strongly agreed that coaching was an important element to sailing programs.

3 of 4 successful urban clubs had dedicated coaching space

Urban Clubs. 3 out of 4 successful urban sailing clubs had some sort of dedicated coaching space within the built environment. This is a strong correlation, and coaching space should be highly prioritized. On average, urban facilities designated 1/10 to this scale and caetgory.



1 of 4 unsuccessful programs had coaching space

Unsuccessful Clubs. Only 1 out of 4 unsuccessful sailing clubs had dedicated coaching space within their built environment.

Learning, Teaching and Coaching Space.

These spaces are dedicated to creating a positive and effective learning environment. They can be in a variety of shapes and sizes, but any space that has the intent of being a learning area is designated under this typology.

Complimentary Programmatic Elements

Seminars, lectures and workshops
Though many programs have teachable components, these spaces are not always utilized. By having classroom based programs like seminars and workshops, these spaces can continue to be used most effectively from an administrative perspective.

Space Rentals
Other 3rd party groups, are always looking for rentable space for events as well as private training and private classes. Renting out a space on a day to day basis allows extra revenue while maintaining scheduling flexibility.

5.3 APPLICATION OF DESIGN GUIDE

The design guideline was developed to be applied to sports and sailing facilities in order for them to better utilize their space, and maximize their opportunities to retain participants and attract new ones.

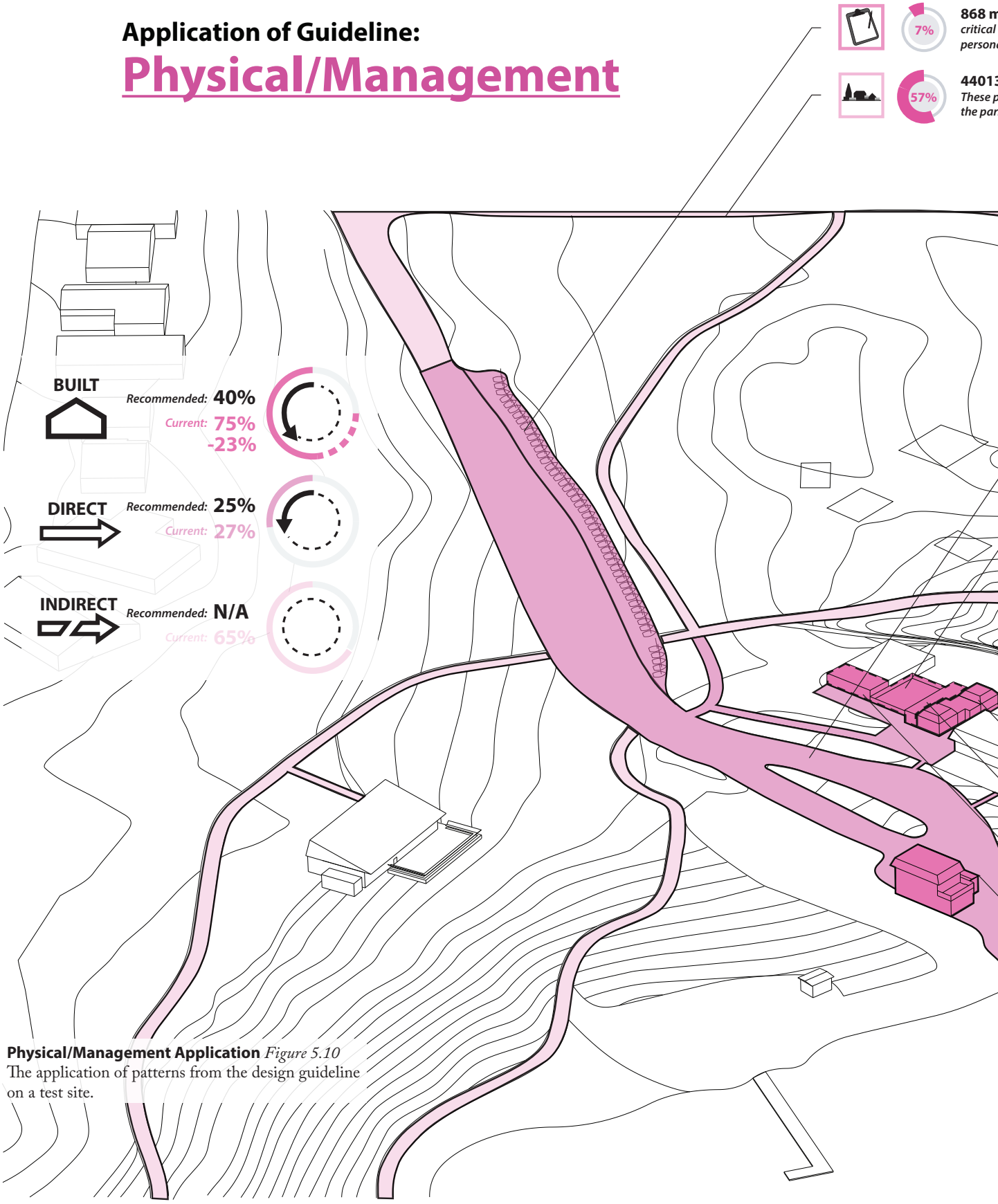
This section focuses on applying the guide to a specific facility, the Glenmore Sailing School in Calgary, AB. The facility and program will be examined from the perspective of the design guideline, understanding the facilities current spatial allocations, category by category. These quantities of spaces will be compared to what is recommended in the design guide. Quantitative and qualitative suggestions from the guide will be applied to the facility in a quick design activity.

Once this check-and-apply process has been completed for all 7 categories at all three scales of intervention the recommendations will be evaluated from an comprehensive architectural perspective on if these recommendations make sense, and if they are appropriate for the facility. Its important to do a double check of the recommendations of the guide. These recommendations were created through a series of analyses of sport and sailing information, but its important that the recommendations also create tangible suggestions for facilities.

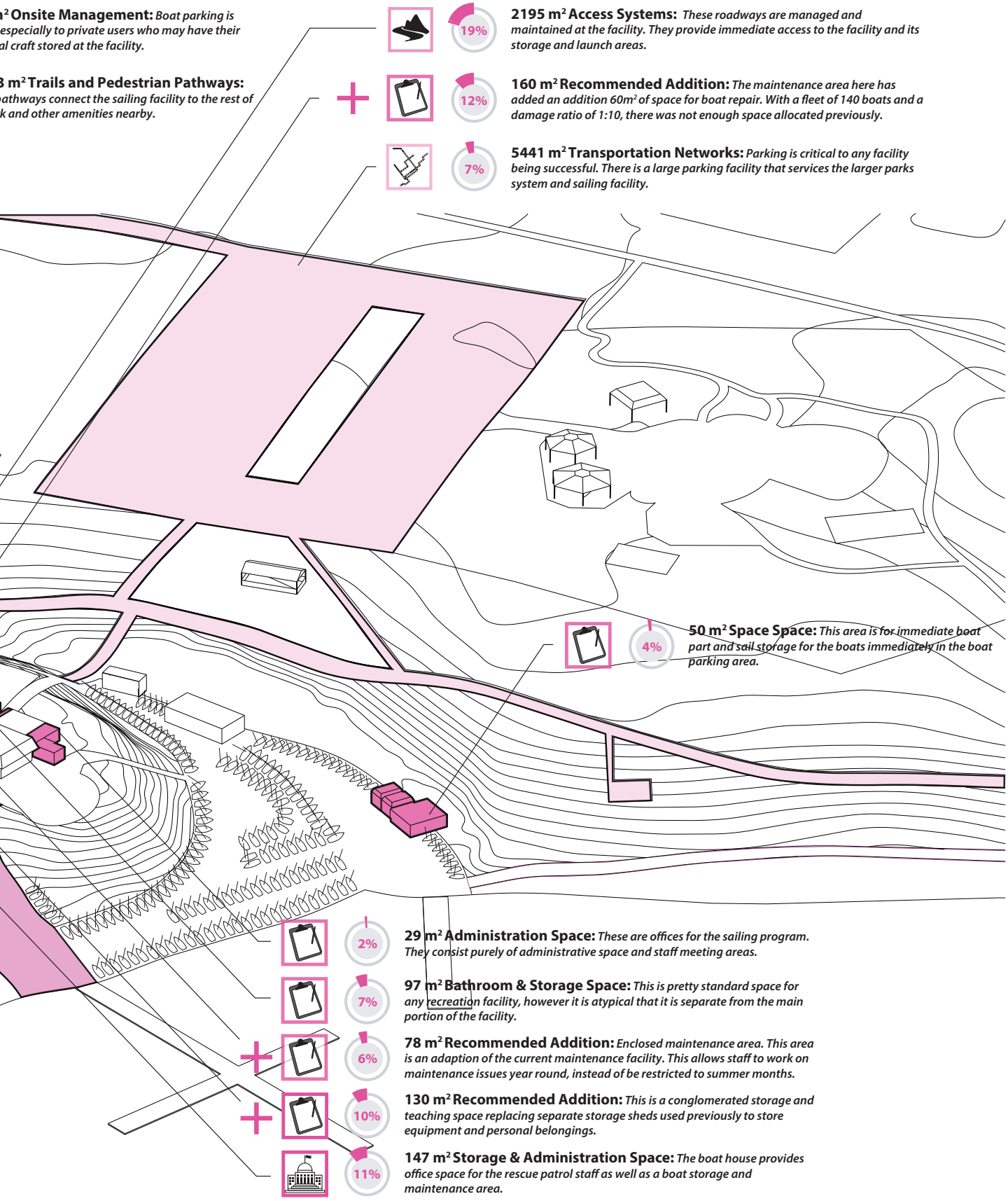
Due to the personal relevancy of the Glenmore Sailing School, it would be easy to understand how these suggestions will be applicable (or not) to the site and facility.

The application of the design guide has two specific parts; analysis and application.

The analysis quantifies each spatial category at 3 scales: Built, Direct and Indirect. A light to dark colour scheme will represent these scales in the visual analysis.



Physical/Management Application *Figure 5.10*
The application of patterns from the design guideline on a test site.



m² Onsite Management: *Boat parking is especially to private users who may have their al craft stored at the facility.*

3 m² Trails and Pedestrian Pathways: *athways connect the sailing facility to the rest of k and other amenities nearby.*

19% **2195 m² Access Systems:** *These roadways are managed and maintained at the facility. They provide immediate access to the facility and its storage and launch areas.*

\+ 12% **160 m² Recommended Addition:** *The maintenance area here has added an addition 60m² of space for boat repair. With a fleet of 140 boats and a damage ratio of 1:10, there was not enough space allocated previously.*

7% **5441 m² Transportation Networks:** *Parking is critical to any facility being successful. There is a large parking facility that services the larger parks system and sailing facility.*

4% **50 m² Space Space:** *This area is for immediate boat part and sail storage for the boats immediately in the boat parking area.*

2% **29 m² Administration Space:** *These are offices for the sailing program. They consist purely of administrative space and staff meeting areas.*

7% **97 m² Bathroom & Storage Space:** *This is pretty standard space for any recreation facility, however it is atypical that it is separate from the main portion of the facility.*

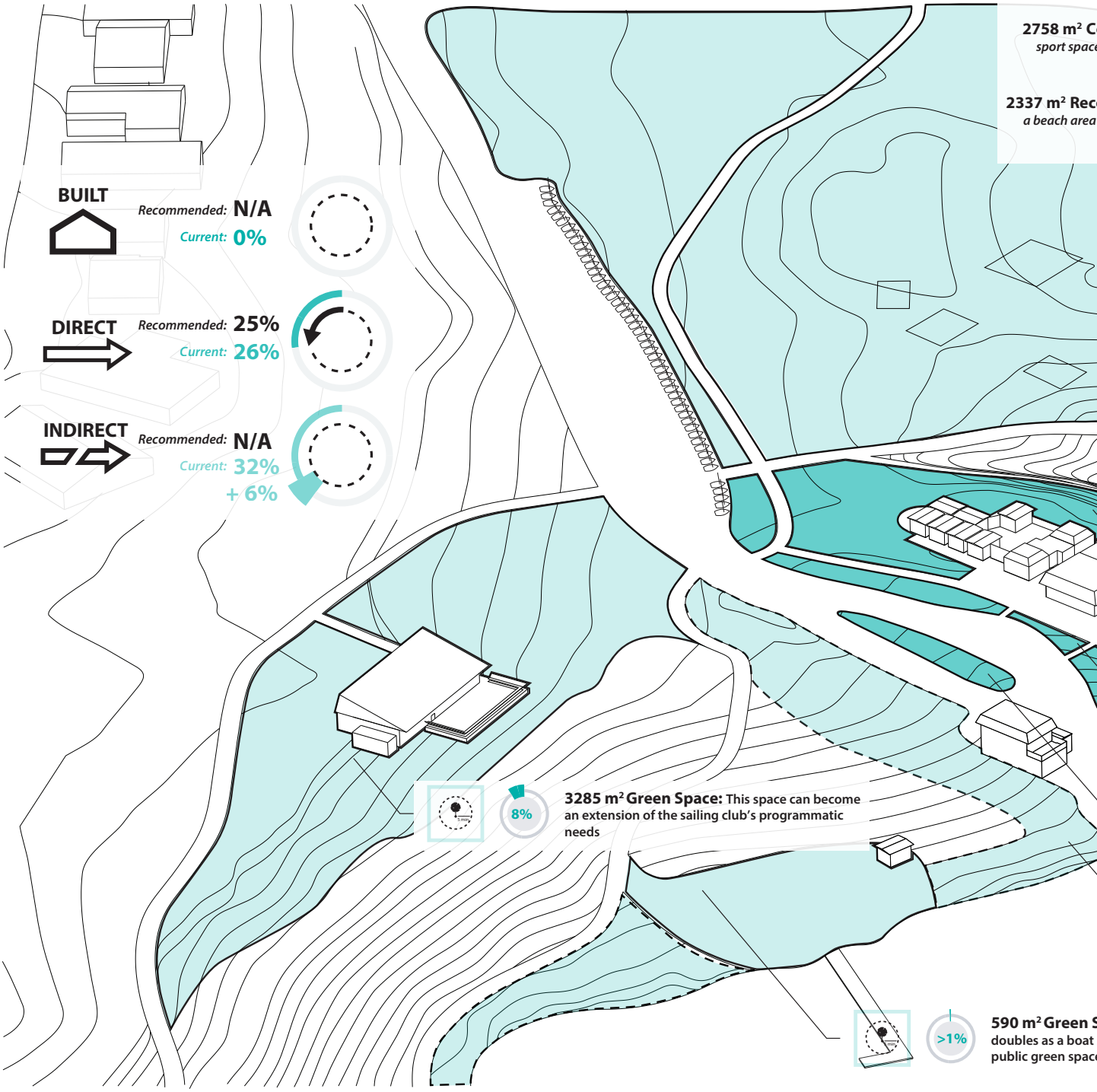
\+ 6% **78 m² Recommended Addition:** *Enclosed maintenance area. This area is an adaption of the current maintenance facility. This allows staff to work on maintenance issues year round, instead of be restricted to summer months.*

\+ 10% **130 m² Recommended Addition:** *This is a conglomerated storage and teaching space replacing separate storage sheds used previously to store equipment and personal belongings.*

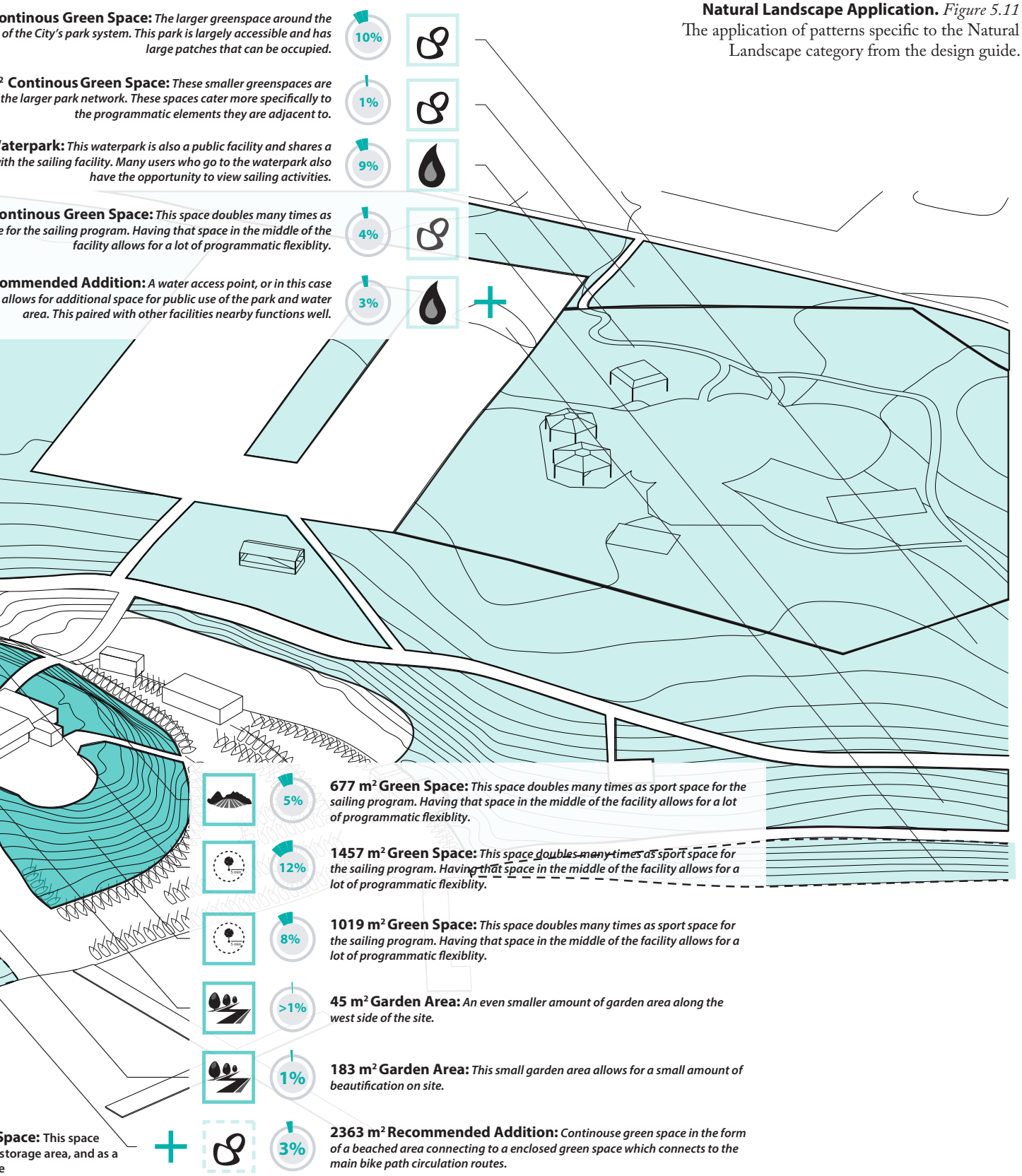
11% **147 m² Storage & Administration Space:** *The boat house provides office space for the rescue patrol staff as well as a boat storage and maintenance area.*

Application of Guideline:

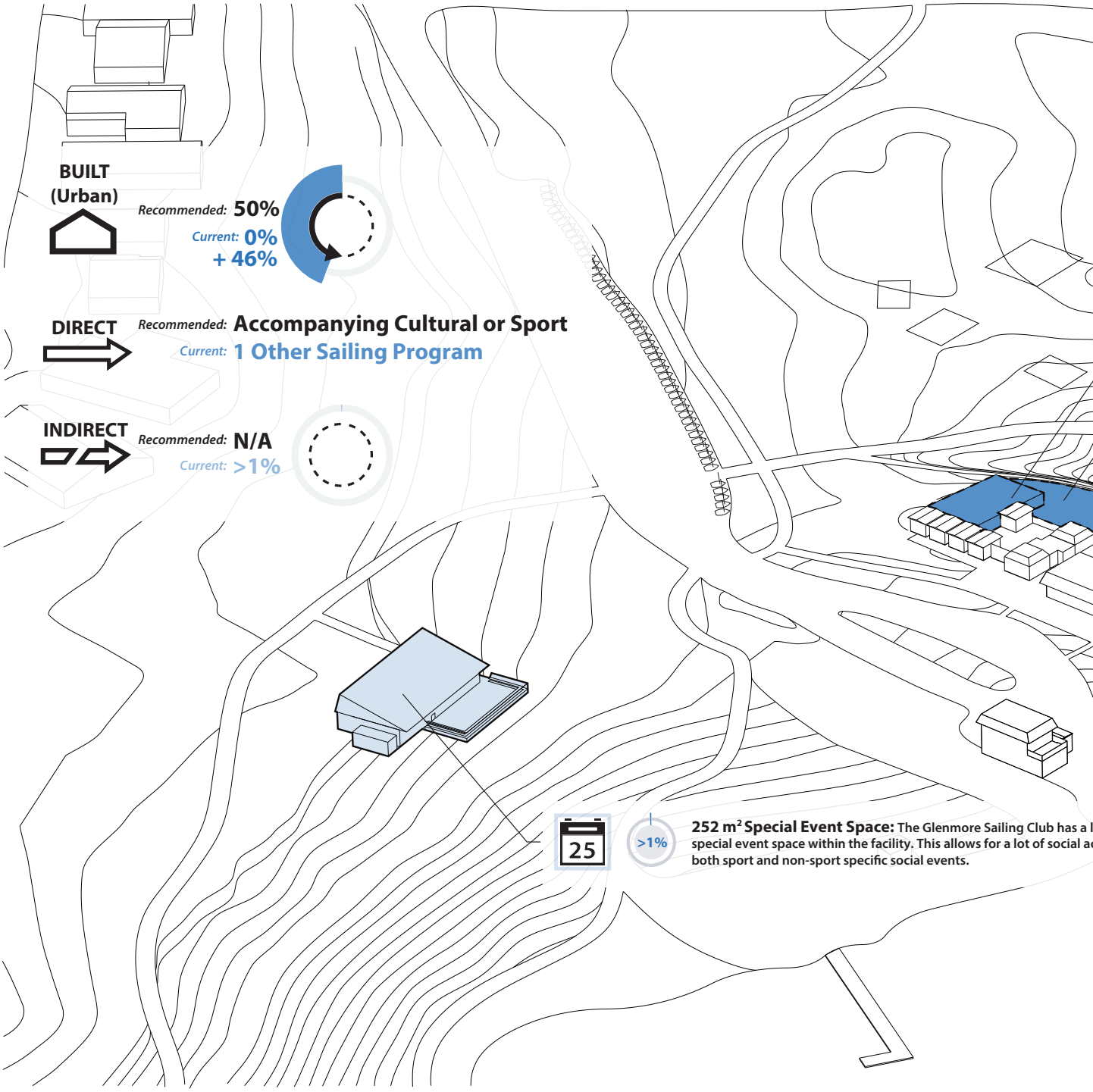
Natural Landscape

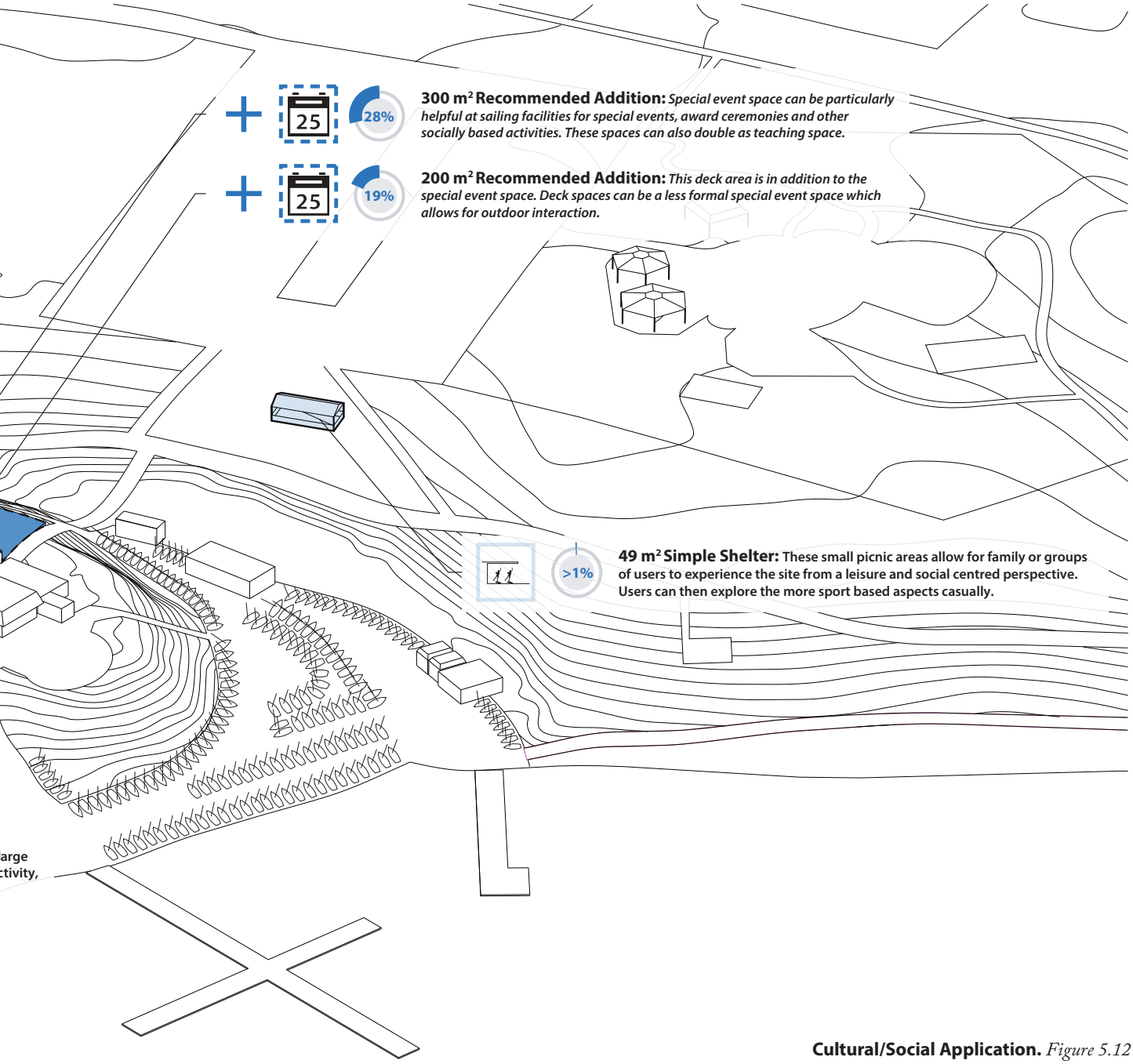


Natural Landscape Application. *Figure 5.11*
The application of patterns specific to the Natural Landscape category from the design guide.



Application of Guideline:
Cultural/Social

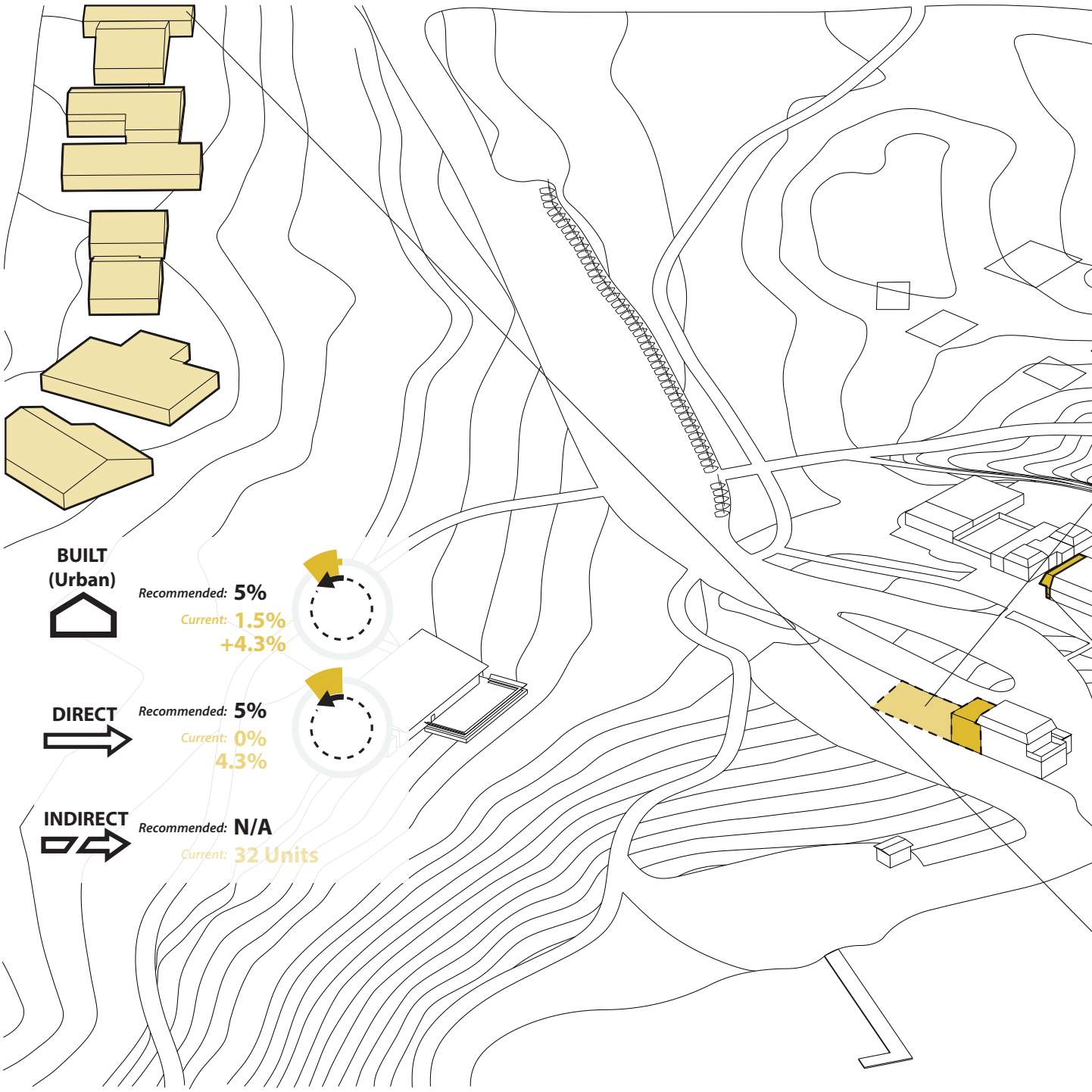


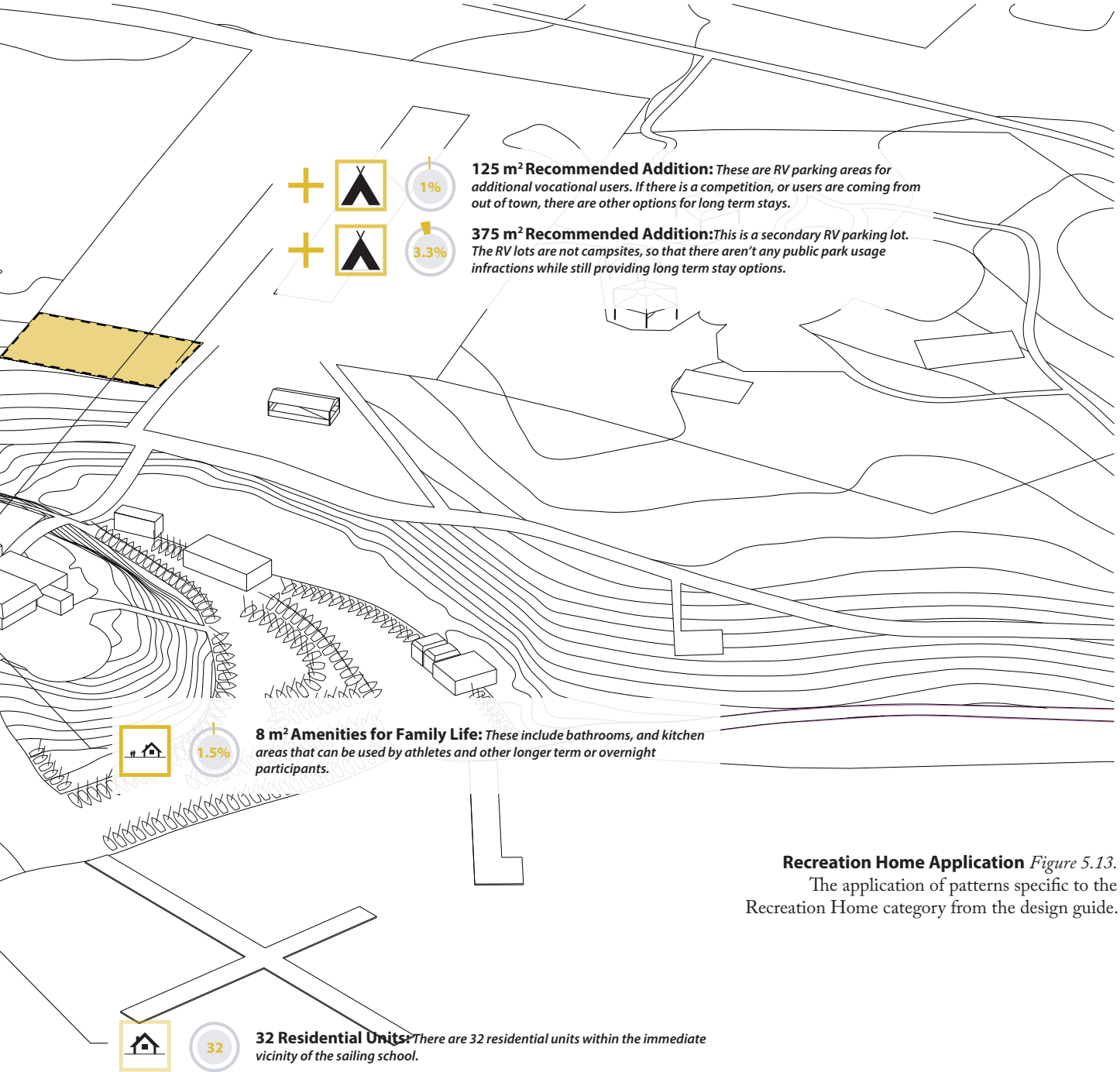


Cultural/Social Application. *Figure 5.12*
The application of patterns specific to the Cultural/ Social category from the design guide.

Application of Guideline:

Recreation Home

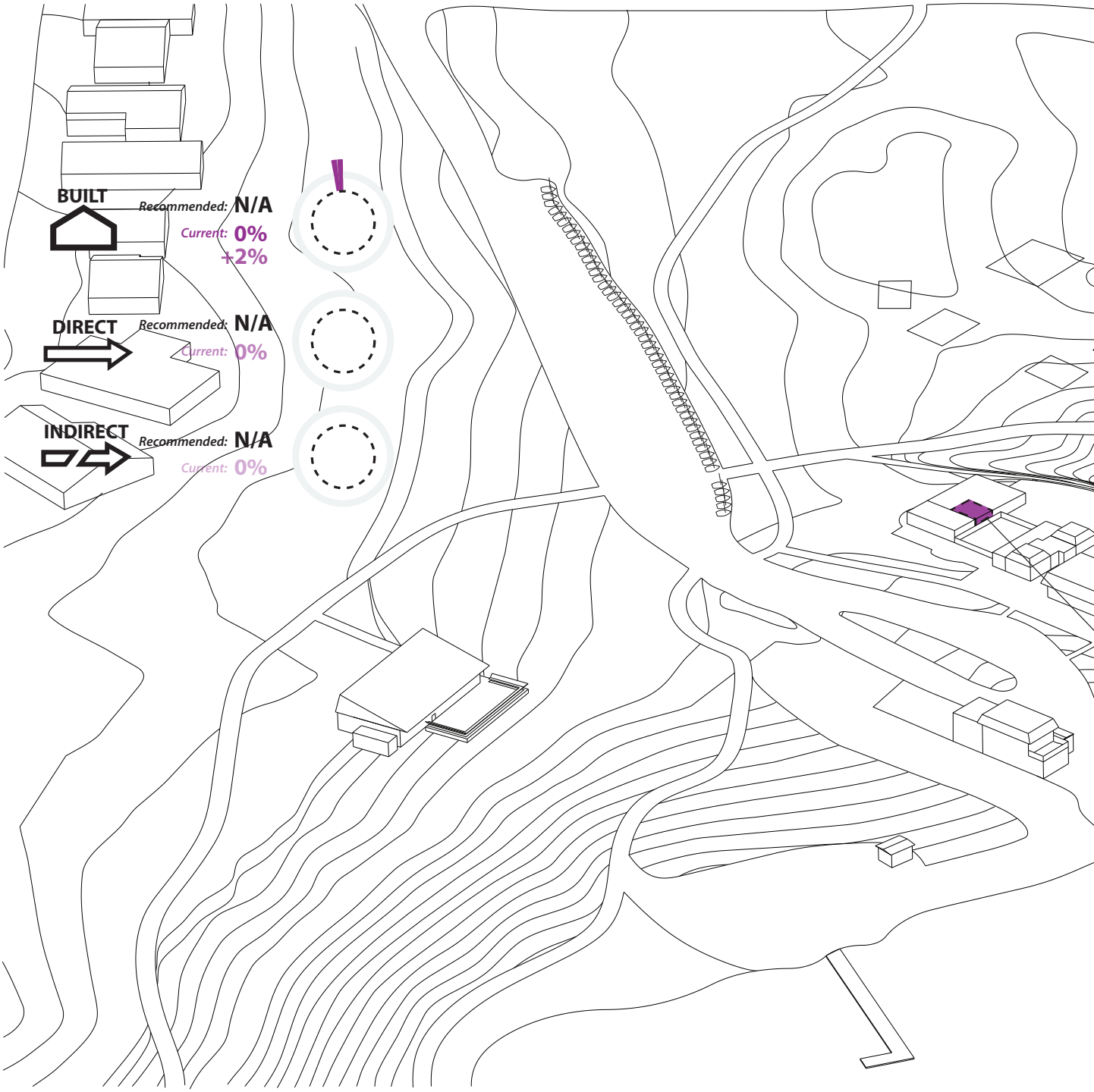


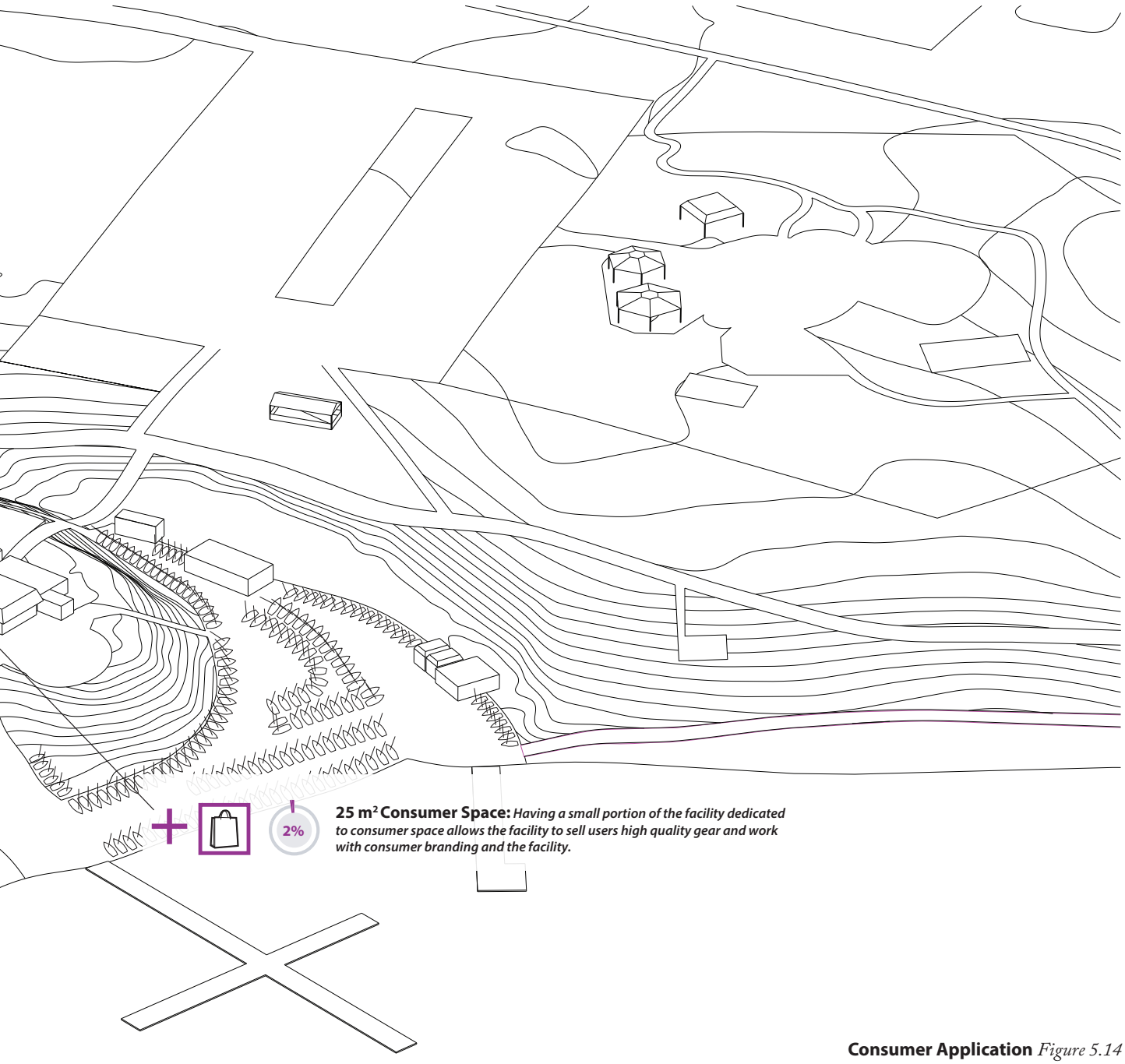


Recreation Home Application *Figure 5.13.* The application of patterns specific to the Recreation Home category from the design guide.

Application of Guideline:

Consumer Space

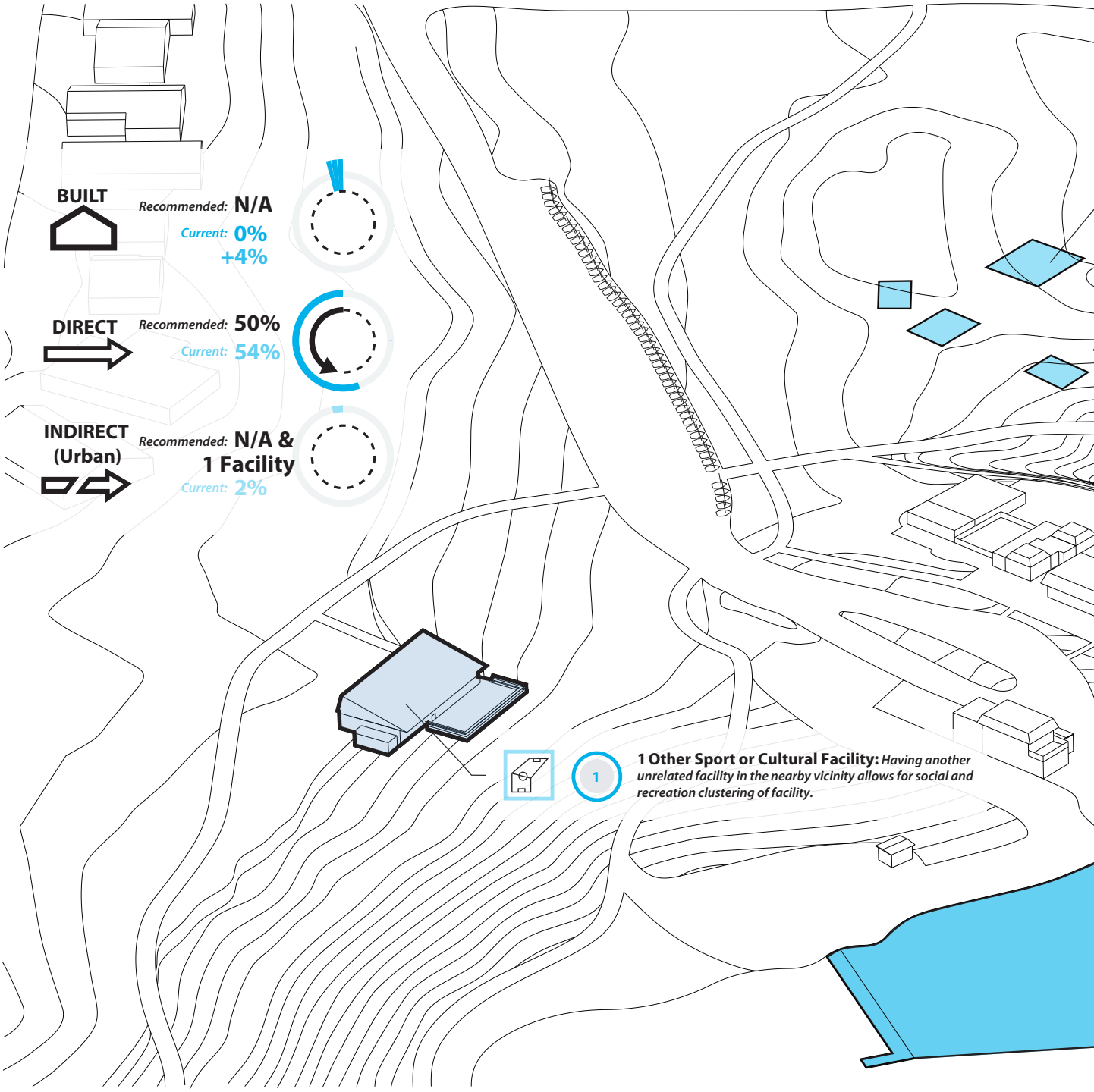




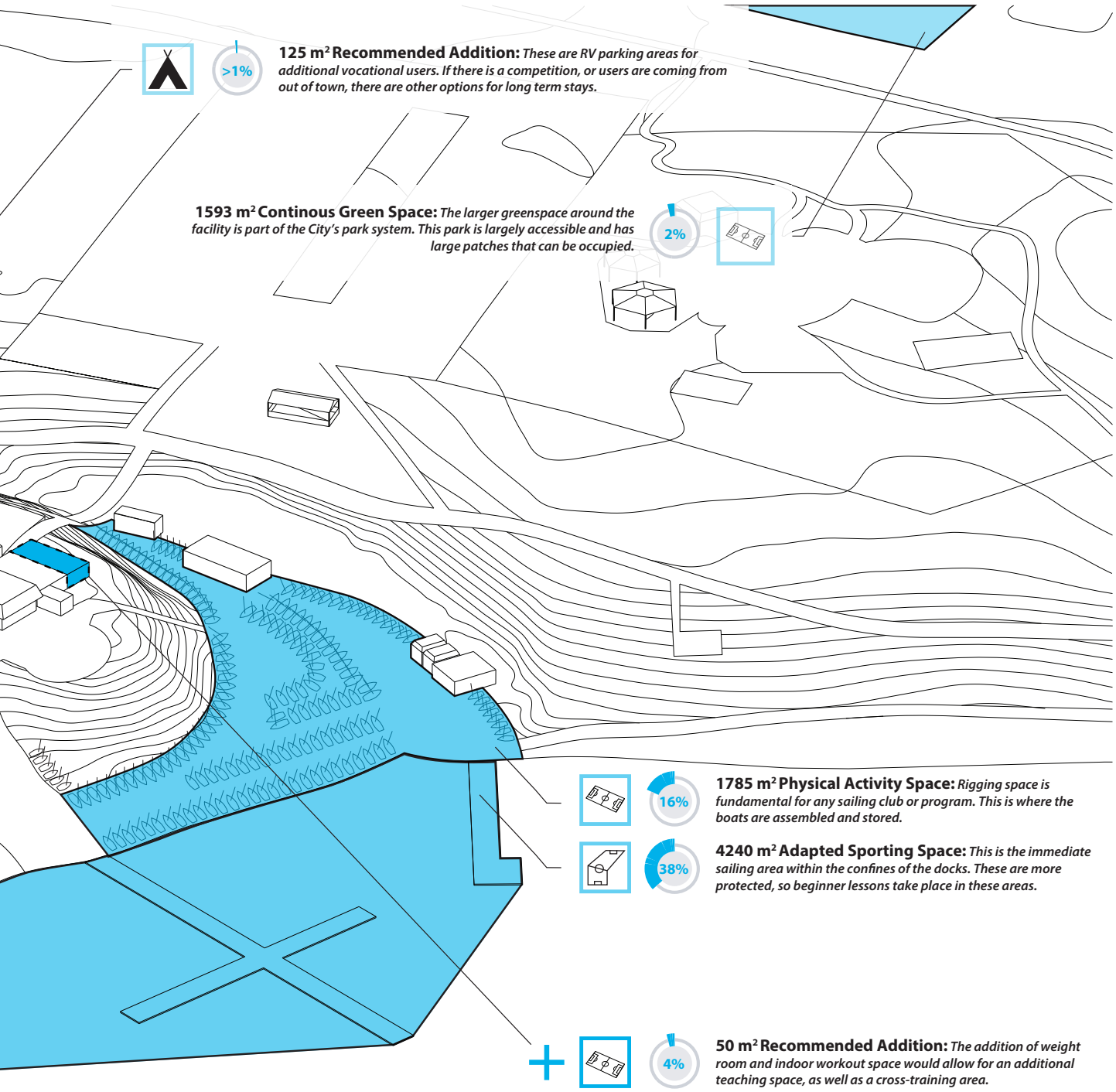
Consumer Application *Figure 5.14*
The application of patterns specific to the Recreation Home category from the design guide.

Application of Guideline:

Sport Space

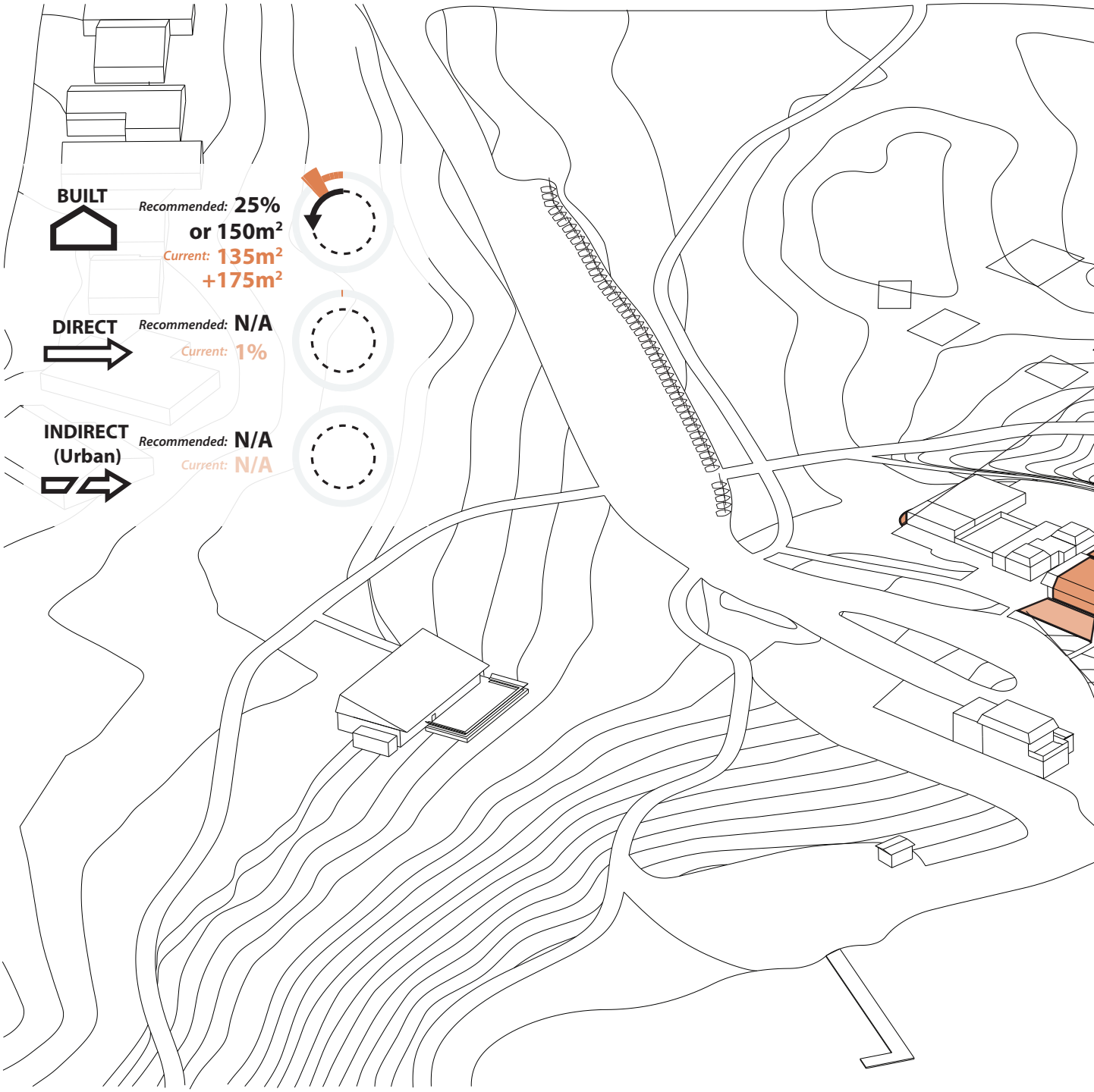


Sport Application *Figure 5.15*
The application of patterns specific to the Sport category from the design guide.

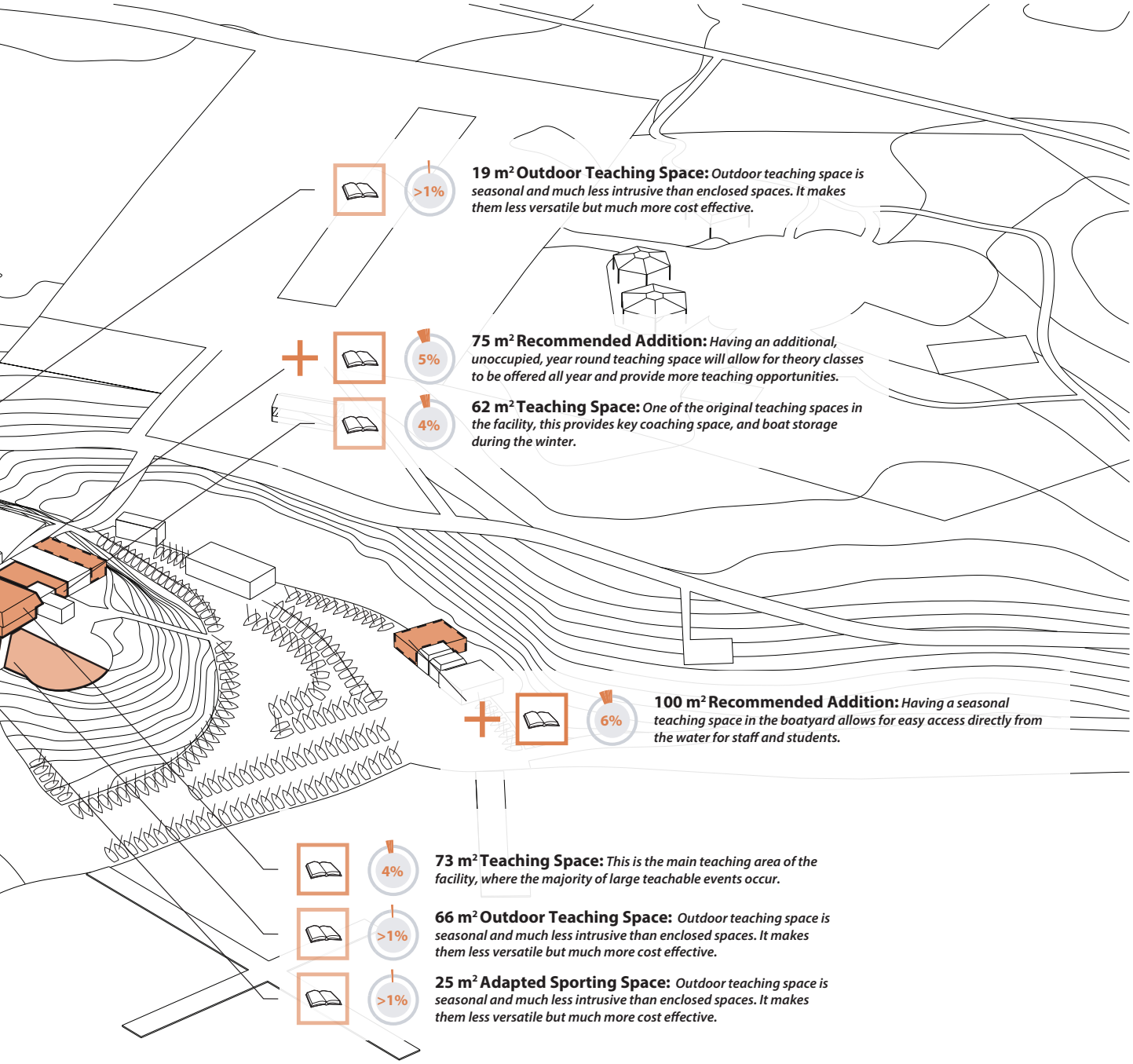


Application of Guideline:

Coaching Space

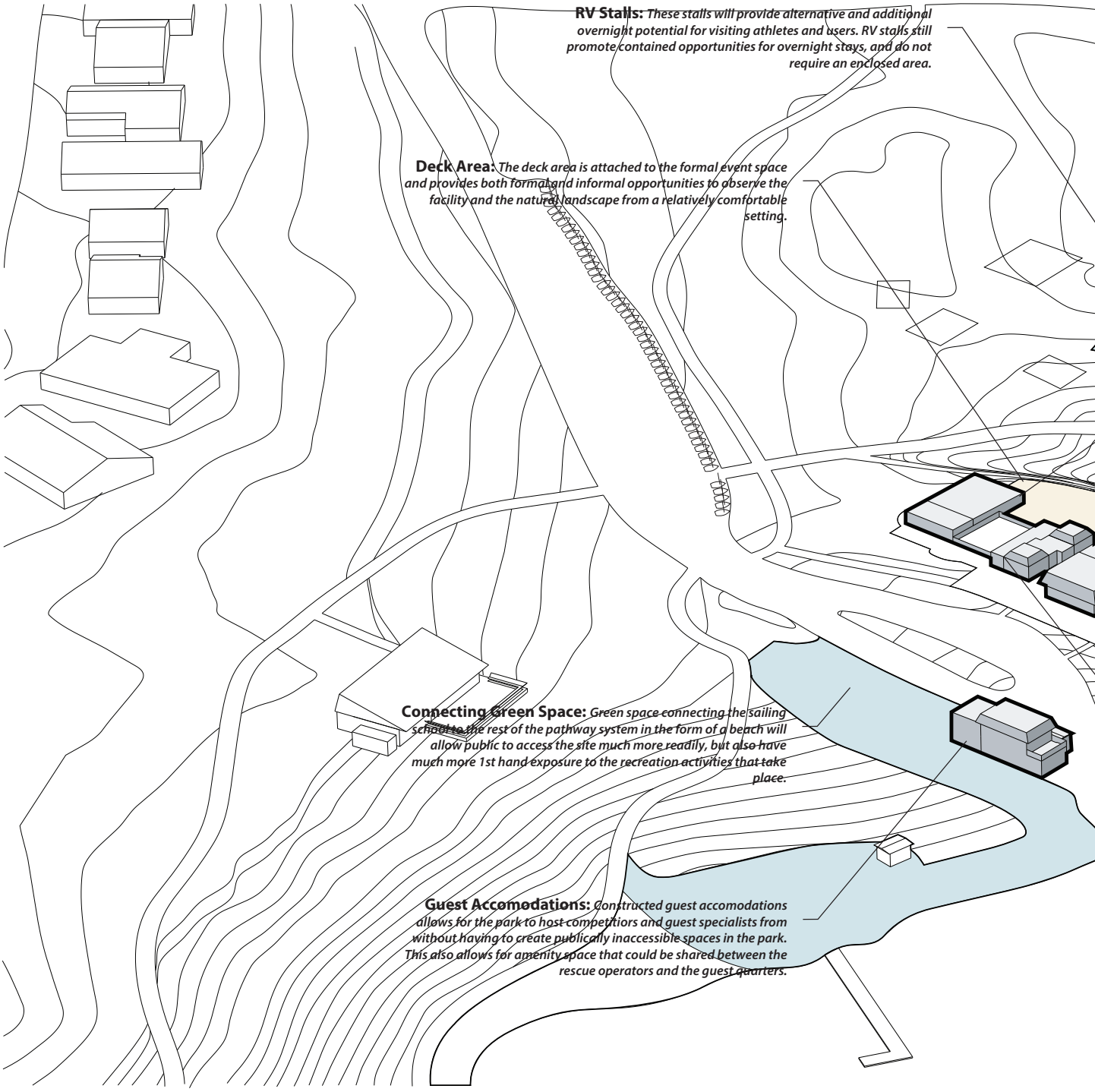


Coaching Application *Figure 5.16*
The application of patterns specific to the Coaching category from the design guide.

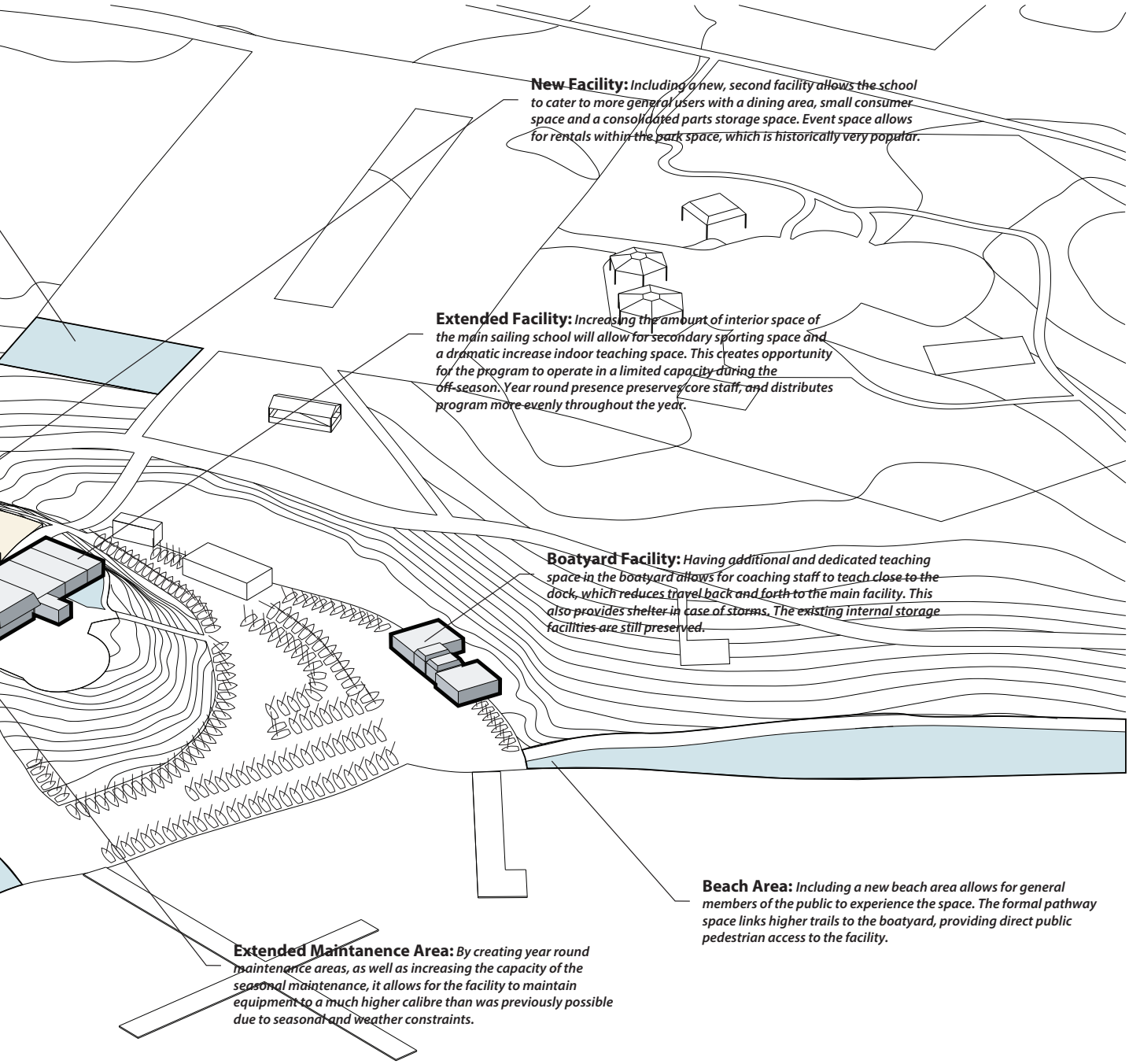


Application of Guideline:

Augmented Facility



Summary of Application *Figure 5.17*
This is the summary of all 7 categories being applied to the site, complete with complimentary programmatic elements, recommended proportions of space at all 3 scales, and the corresponding measurements of all these changes.



6.0 Conclusions

6.0 INTERDISCIPLINARY METHODOLOGY

The Challenges in Working in between Disciplines

One of the largest challenges that I encountered when writing this thesis was how to work in an interdisciplinary methodology that touches in the fields of Planning, Sport Sociology and Architecture. The approach that I took to my thesis was an extensive one; working in an interdisciplinary methodology required considering multiple perspectives on the same topic. The beginning entailed becoming immersed in the common research rhetoric of each field.

Understanding each professions background research helped to identify how it shaped current perspectives on sport and recreation space. This also allowed the identification of potential shortcomings each field may encounter.

Having a willingness to learn and work with another profession's methodology, practice and jargon also created a supplemental understanding of each. Sometimes the subtleties of how each profession represented themselves explained more than their research.

Identifying the strengths and weaknesses of each profession's methodologies created a web of tools that could be used interchangeably to tackle different parts of a complex problem. Instead of trying to force a square peg through a circle hole, I could mold the peg into the shape it needed to be.

One of the largest challenges that I faced was that the end result, would not resemble any archetypal thesis of any of these professions. This does not seem daunting initially, as research can sometimes lead to unanticipated outcomes, but it does mean that a specific 'finish line' or 'end product' may be significantly harder to identify.

The final challenge was, after immersing myself into the intricacy of three different professions, was how to rise to the surface of all of the research, techniques, methodologies move the thesis towards being responsive to the people it was intended for, rather than becoming responsive to a profession.

Understanding Three Professions

Initially, my thesis seemed very daunting. I knew I wanted to understand how to make sporting facilities more tailored towards users, but with a range of different professions and methodologies within each one, how could you choose a single approach, especially when many seemed incomplete or just a piece of the puzzle. The decision was attempt to understand all of it, and then create a new approach picking and choosing the best methodologies from each one.

I started with the three main fields that dealt with physical activity space; architecture, sport sociology and planning. Architecture understood sporting space through a series of spatial typologies; categorizing them into designable features and elements targeted at specific populations. Attending architecture school, I really appreciated this approach, but I also was troubled that many of the typologies, though very detailed in their descriptions, were relatively untested. Some literature even contradicted the use of different spatial elements in different environments. The architectural research was great at categorizing space, but lacked the ability to decipher which elements were really working and which ones weren't.
Next was sport sociology. I decided that if I couldn't figure out what made sporting architecture successful, I could at least understand what made sport successful, and then bridge the gap between a theoretical environment and a physical one. I was greatly surprised at the depth, variety and specificity of the research about what made sport successful. I narrowed my approach to only include journal articles that either had immediate consequences for the built environment, or dealt with it directly. Otherwise I would be reading about sports sociology for the rest of my thesis career. After summarizing, sifting and grouping 40-50 journal articles I realized that the sports sociology literature was incredibly effective at determining if an activity was effective or not, and what it should be paired with to get optimal results. The downside to this was that not all of these activities had been immediately paired with physical space, and that journal articles only worked with individual activities, rather than groups or categories.
Planning literature was a mixed bag. It had a mixture of commentary on different categorical systems to organize leisure space, but also had research driven methodologies for determining if certain activities were the driving force of a successful facility. I liked the approach that planning literature used; it dabbled in a bit of everything. This was also it's weakness. There wasn't significant enough research in prioritization of activities, programmatic elements, or spatial categories to create a clear view of the picture, nor was there enough specificity to create a breadth of research about leisure facilities.

The solution was to identify the strengths and weaknesses of each approach: Architecture did a great job of cataloging and categorizing space, but did little to link it back the rates of participation by its users. Conversely, sport sociology did a great job at understanding the individual effects of spaces on its users, but lacked a common thread that would group these spaces together. Planning had a good understanding how to move elements from a theoretical realm to a physical realm, but hadn't had the specificity or the general understanding to have two basins to move between.

A Willingness to Learn

The idea to immerse yourself in three professions so you can understand one topic makes for an ideal approach to learning, but in reality takes a lot of time and effort. My education thus far has almost been purely from the lens of an Architect, so my efforts were directed to understanding the basic perspectives of Planners and Sports Sociologists. I began by enrolling in electives that were from these adjacent professions. I was enrolled in regional economic development and environmental planning theory both offered by the department of planning. My final elective was local economic development, offered by the department of environment. These courses were very different from the architectural discourse that is typically presented. They approached development from the understanding of individual processes that make up a larger picture. Many of them research grounded, had prescriptive approaches to solve specific problems. These courses did not have the open discourse that Architecture was privy to, but there was always the acknowledgment that other fields were developing complimentary research to theirs.
Seeing three different professions was beneficial to my thesis because it allowed me to see the same problems and challenges being tackled from different perspectives. Different fields of research highlighted things that others could not, and the rhetoric was the same for the other two. It also helped me realize that there was a huge depth of knowledge between the three professions, and if it could be utilized in a united framework then the outcomes would certainly have an increased depth to them.

Finish Lines

A unique challenge of working from an interdisciplinary perspective is that the end result doesn't really resemble what is typically produced from the core of any one of the professions. The benefits of interdisciplinary work also become it's restraints, the final product must still be relevant enough to one or more professions to be utilized, but must also incorporate research and methodologies from all three. In this thesis, the unifying direction of the research was to inform a design guide; a document able to help designers make informed decisions about spatial organizations, utilizing the research from as many sources as possible in an effective, fluid approach. It is important to recognize that every bit of research has its own end game or agenda; it is trying to solve a problem or provide knowledge that will somehow make a situation or circumstance better. By having an 'end game' by focusing on the creation of an informative guide, it allowed for the gathering of comprehensive research, but then tailoring it so it is suitable for design professionals to utilize.

6.1 ANSWERING QUESTIONS

An Inward looking Evaluation of the Thesis Process

At the beginning of the thesis I had posed two research questions that informed the process, research, analysis and implementation of the work. Those two questions were:

> *1. To identify categories of spatial typologies that effectively define sporting facilities.*
> *2. To understand and define what the implications of these spatial categories are on the design process of our built sporting facilities.*

Chapters 2 and 3 of the thesis dealt specifically with question 1. They went into detail about what the current state of research is in the three fields of interest; Sports Sociology, Planning and Architecture, and their work regarding recreation and sporting space.
Chapter 4; research and chapter 5; design methodologies, addressed the question of the implications of spatial categories on our sporting environments. These chapters did this by evaluating a group of facilities using these categories, measuring their effectiveness, and then creating a guide to re-apply the lessons learned from this process. Like any development process, it is critical to re-evaluate the methodologies used, in order to identify shortcomings or opportunities for improvement. Section 6.1 looks at how effective this process was at answering the two research questions posed at the beginning of the thesis.

Identifying Spatial Categories
To understand how effective the process of creating spatial categories relevant to sporting facilities, its important to understand the individual steps that created them.
The second chapter of this thesis is the literature review. It's format is adopted from a science or social science approach. The literature review's purpose was to collect all the current, relevant research regarding sport and the built environment from the disciplines of Sport Sociology, Planning and Architecture. The analysis gathered secondary research from 3 journal databases as well as any other recommended research. Research was only kept if it had been peer reviewed, and had relevance, directly or indirectly, to the built environment. After all the secondary research had been summarized, it was then re-categorized into groups of similar topic. These groups of topics were summarized and suggestions were made as to how the research could be utilized later.
This process was quite long and cumbersome in terms of workload, however it provided a very solid basis of information regarding the topic. From a scientific perspective, a literature review must use 2 or more databases if a comprehensive summary is to be achieved. The reason why this is important is because the literature then represents common consensus within that field. One of the serious pitfalls

of basing work on only select sources is that there may be research that exists that actively contradicts yours, if this happens it starts to discredit the work that you have accomplished. To make sure that the information is current, and relatively no contradictions exist, an in-depth literature review is the best way to ensure this result. Without doing this, it becomes difficult to know if the research being produced will assist in moving the professions discourse vertically[1] or if it just causing the research to expand horizontally[2]. Because so much of architectural theory and research is not based on others work, the horizontal expanse of knowledge has become massive, and very little vertical progression has occurred, especially in regards to understanding physical activity space. It was a conscience decision to move the thesis in a more vertical stream. To this effect, the literature review was very successful in its purpose.

The third chapter, *Hybridizing Methodology*, is specifically meant to adapt the contents of the literature review into a matrix of spatial elements, all specifically relevant to the built sporting environments. In this chapter, research articles with spatial typologies or typologies readily adaptable to the built environment were selected within each discipline. Then each individual typology was evaluated for its effectiveness to be representative of a spatial environment. As a result, typologies were removed, adapted or kept based on their effectiveness. This process occurred for sports sociology separately, and architecture and planning together in two graphs. The final diagram is a combination of the end result of the initial two. The diagram removes any additional redundancies, and then places the individual spatial typologies into categories, informed by information from the literature review. Chapter 3 is an incredibly effective section of the thesis. While the literature review (chapter 2) can be somewhat boring, cumbersome and removed from the subject of sporting facilities, chapter 3 creates the much needed linkages between a comprehensive theoretical understanding of sporting facilities to a simplified spatial framework for analysis.

Research and Design methodologies (chapters 4 and 5 respectively) take the suitably adapted secondary research from chapters 2 and 3 and use it to inform a primary research methodology aimed at understanding the specific proportions and elements that can contribute to a successful sporting facility. The research that took place was quite comprehensive. Documenting 14 sailing programs across a province took months of weekend analysis, coordination and cooperation with club members, and an organizational approach that could handle collecting all of the information. Approaching the documentation of each club from a photographic perspective was helpful because photographs could capture an abundance of information, intended or otherwise. This allowed for the flexibility of information, long after the sites had been visited. Though only some measurements were made on site visits, having photographs meant that other dimensions could be extrapolated using scaling methodologies. Survey information was adequately collected through Google surveys, which collected, stored and organized data in raw and processed versions, making it simple to gather effectively. The survey distribution did not have the same effectiveness. Surveys were distributed through the commodores of every sailing facility; but inevitably if a Commodore did not distribute the digital survey, then they would not be completed. This shortcoming created a lower than expected level of participation amongst survey results, and additional research is needed to confirm the patterns established using that information. The survey could have been distributed more effectively through personal contact when documenting each site. Brochures, leaflets and even presentations could have been made about the importance of participation.

The design methodologies chapter is fairly effective at integrating the multiple data sources collected in the primary research detailed in chapter 4. The chapter uses a variety of diagrammatic approaches

1 Vertical research refers to building on the current facts and knowledge of other researchers. Vertical research allows for knowledge to grow and progress, allowing current research to become the cornerstone in the future development of knowledge.

2 Horizontal research refers to creating complimentary research that is not building upon current research. Horizontal research is built upon past research, but contests current beliefs and knowledge. This is not negative, as some current theory may not account for all factors, or may be falsely representing correlation with incorrect causality.

to cross-reference different sources of research in order to adequately confirm or dispute correlation-causality relationships between participation rates and categories of spatial typologies. The analysis and guide provide an in depth review and presentation of the confirmed correlations earlier in the chapter. The analysis and guide achieve the following outcomes:

- Label current spatial patterns that are effective on a real site
- Suggest complimentary spatial typologies that would increase the effectiveness of a current facility
- Suggests proportions of different spatial typologies at 3 scales that make sporting facilities successful
- Group, identify and describe individual spatial typologies
- Suggest complimentary programmatic offerings that could accompany a specific spatial typology
- A user friendly methodology of providing an in depth guide to designing effective sporting facilities

The analysis and guide are employed to do a trial run on an existing facility, the Glenmore Sailing School. This trial run approach effectively demonstrates the implementation of the design analysis and guide. It evaluates the site on a category-to-category basis, adding or removing pieces of program in order to make the site more effective.
To measure the effectiveness of how well question 2 was answered would need an alternative proposed framework for designing sporting facilities. Because this does not currently exist, it makes it difficult to evaluate the design analysis and guide's effectiveness. However, because there have been no previous attempts to integrate interdisciplinary research into a multi-part research, analysis and guide for sporting facilities, it is safe to say that any development progresses our knowledge of sporting facility design. The analysis and guide addresses all patterns established within the breadth of the thesis, and provides further conjecture and insight into categories surrounding the spatial typology analysis and guide[3].

The design guide as a spatial tool provided a high-level, general evaluation of the spatial effectiveness of a specific program. There are two categories that raise concern about the specificity of the design guide; the data that informed the guide and the spatial typologies included in each category.
The spatial proportions of the design guide are solely informed by data collected from sailing programs across Alberta, which raises a number of additional questions that need to be addressed:

Can the guide be applied to other sporting facilities, or just sailing programs?
Currently, the information in the design guide is most accurately applied to sailing programs. The proportions that it recommends are based on 14 sailing programs, mostly in Alberta. The more sailing programs that could be surveyed, the more accuracy could be contained in the design guide. It is impossible without more research, whether the specific patterns from sailing programs can be applied to other sporting facilities as well. The facilities were all analyzed using the 7-category strategy, which has no bias towards any one type of facility, and that the patterns derived do not give any indication that they would be inapplicable to other types of facilities as well. Though other sporting typologies have a different set of spatial needs, all sports share the same 7 categories of needs, and therefore the study begins to address the proportions of those categories. To richen the study, additional sailing and non-sailing programs could be documented and cross-referenced; this way spatial similarities between two or more typologies of sport could be derived.

3 Surrounding categories around the analysis and guide include: Program and course offerings, individual typological pairings, ranges of effective proportions and the beginnings of the differentiating needs between urban and rural sporting facility classifications.

Do other factors influence the success of these sporting facilities? And how were they included in the study?
It is very well known that there is a huge range of factors that influence the success of sporting facilities whether it is access, or the economy, or the way the facility is being run, they all have a huge impact on whether or not the facility functions successfully. To mitigate and average this, the study included all programs across the province instead of just a handful. Some facilities were better run than others, and the study chose to have a larger sample size in order to mitigate the varying degrees of administrative and economic effect on the facilities, beginning to isolate spatial qualities of the programs. Programs were also surveyed almost exclusively in Alberta, removing any larger geographic bias that could occur due to the economy; generally speaking the economy will be similar across the province, but incomparable across the nation. All sailing programs in Canada are governed by Sail Canada, the national governing body. This body regulates staff, instructors, training, program and curriculum, reducing the amount of administrative bias that can occur. There will always be human variability in terms of administrative performance, but the programs are regulated and standardized to a degree that is approved and guided by Sport Canada, which is responsible for the development and funding of many of our Olympic athletes. The inclusion of multiple other facilities would be an effective way of mitigating administrative bias, but would have to be large in scale in order to mitigate the economic bias that would then occur by surveying programs in different geographic regions of Canada.

How does associating facility success with growth patterns give an accurate picture of a successful sporting facility?
Typically there are problems with just looking at growth rates to establish if a program is doing well or not. There is also retention of users, as well as volunteer and membership rates; these are all important factors. However due to the Statistics Canada Report in 2010, organized sport participation has declined 17% in the past 18 years. Without a strong basis of initial participation, retention rates are assumed to continue to decline. This is why rates of growth in participants is the primary metric that was used to measure programs success. In addition to rates of overall decline, almost all sports with the exception of soccer continue to have declining participation rates[4]. Though a facility could be at the capacity in terms of participation, the likelihood of this based on the Stats Canada research[4], the relative obscurity and generally observed decline of the sport of sailing make it highly unlikely that any of these facilities have an 'at capacity' status and are unable to grow.

What is the relevance of the spatial categories and typologies if they are generic to all sports and not to sailing specifically?
The categories were developed in a literature review; beginning with all relevant research informing how physical environments can affect participation at recreation/sports facilities. The intention of this thesis was not to create a specific guide for sailing, but to provide recommendations of the proportionality of key spatial categories in these facilities. This approach does sacrifice specificity for applicability; if this guide were designed just for sailing programs, then the spatial typologies would cater specifically to the needs of these facilities. However, due to the realization of the decline in sport, not just in sailing, but in all sports in Canada, I wanted the patterns identified in this thesis to be as applicable to as many sports as possible, which meant using universally appropriate spatial categories and typologies.

Would individual guides for each sport be then more applicable then a general one for all sports?
This question can't be answered effectively without more research and repeating the study for other sports. Only after repeating this and comparing the results, would it be appropriate to determine whether specified spatial typologies are more effective in providing facility design guidance, or if the recommendations are universally applicable across different sport typologies.

4 Canada Heritage. Sport Participation 2010: Her Majesty the Queen in Right of Canada, 2013.

6.2 FURTHER RESEARCH APPLICATION

The research produced in this thesis has at least partial relevancy to the 3 disciplines that it worked within. Each field has different directions of research that could be pursued, building on the material developed in this thesis.

Sports Sociology

The biggest inference to sports sociology is it can effect how physical environments are designed. Though the disconnection between the two fields can be expansive, there are opportunities for connection between Humanities and Architecture from a research standpoint. How could other sport sociology concepts inform the way space is designed? Is there any other emerging research that would further deepen our understanding of how sporting environments perform?

Planning

The field of planning provided many of the methodologies for bridging the gap between Architecture and Sport Sociology, and this thesis is a comprehensive example of this working effectively. Could this approach of integrating science or humanities based research work for other typologies of elements of design? Could comprehensive design strategies be created for other typologies of space using the same interdisciplinary methodology?

Architecture

There are a number of ways that the architectural discourse could further the research presented in this thesis. There could be multiple design studies, using the analysis and guide to further 'test drive' it to isolate elements that may not be effective, and suggest further areas of research that would increase the effectiveness of the guide.

Could this research process be repeated for other sports, and then averaged with the results of this thesis, creating a much more balanced analysis and design guide? There would be multiple opportunities to do the research, and would create a multitude of interdisciplinary opportunities for architects to be the integrators of different types of methodologies and research.

Furthermore, are there any other opportunities for Architecture to sit in the middle of two other disciplines that would benefit from interdisciplinary research? As designers, we are exposed to numerous other disciplines and have a rudimentary understanding of how these fields work. With this in mind, there are inevitably many other opportunities for research to be combined with a practical, spatial application.

6.3 BIAS AND LIMITATIONS

Research Limitations
The thesis' case studies were sailing clubs in Alberta. By choosing facilities that by majority are in the same place, any sort of cultural bias can be removed. However, these patterns have only been tested in the province of Alberta, and within the sport of sailing. There is the potential that sailing programs in difference provinces would have different proportions of spatial categories, and that different sports would also have different spatial configurations that optimizes their facilities performance. The patterns derived in this thesis are still applicable, however it should be included that these spatial patterns are currently specific to sailing, and may not respond to other sports as effectively.
Future research on this topic could go in two directions; it could work to develop an overall guide, averaging the results of multiple different types of facilities, or it could create individual guides for different sports.

Patterns are Derived from Current Configurations
The patterns described in this thesis are patterns derived from the examination of multiple sailing clubs in Alberta. These patterns can only perpetuate the successes had by the whole of the sailing clubs examined. There is the possibility that other configurations do exist that could be more successful. This being said, because the vast majority of programs in Alberta were documented, it is unlikely that a different spatial configuration of a sailing club could produce more effective results within the context of the province.

Scope
14 Sailing programs in Alberta, the North West Territories, and in Seattle Washington were examined. This proportion of clubs in the northwestern region of Canada and the United States is relatively small, and the study would benefit from the examination of a larger scope of sailing clubs. This would take a considerable increase in the amount of man-hours and resources needed to document additional clubs.

Club Growth
The primary research and documentation only recorded the 2015 and 2016 sailing seasons participation and retention data. The data for the year's prior was unfortunately too difficult to obtain. There are many possibilities without significant data from year's prior. A program could have had significant growth resulting from a significant renovation, and then their participation rates leveled out after reaching capacity. This could have occurred before the 2015 season, and therefore growth would not be recorded. Typically, continuous growth has been a standard metric for recognizing if a service industry business is

successful, but discrete growth patterns do also exist.[1]

Economic Trends

This thesis does not take into account the economic trends that could be affecting club participation across Alberta. Due to a reduction in oil prices in late 2015, the Alberta economy has been affected dramatically.[2] The thesis will have recorded the province during a period of economic growth, as well as economic decline. To have more accurate results, a 4-year period from 2013-2017 would be more effective.

The Definition of Participation

In this thesis, participation was recorded as users taking part in formal sailing classes and activities offered by various sailing programs. These numbers do not include casual users, visiting users, users who were involved in an informal capacity and users who rented the facility for non-sailing related purposed. These populations are estimated to be relatively small and would only have a limited impact on the results of the study.

Organizational Differences of Different Programs

There are three different types of organizations for sailing programs: Public, Private and not-for-profit organizations. Each of these organization types has different goals, both in engaging the community and providing opportunities for engagement. Sailing organizations may or may not gauge their success based on the number of formal participants or members that they engage every season. However it is assumed that the vast majority of recreation programs in general benefit from significant participation of both public and private members.

Sources of Bias

One of the biggest sources of bias this thesis, and that I have personally is my extensive experience working at the Glenmore Sailing School, Alberta Sailing Association and the Glenmore Sailing Club. I have had many positive experiences within these communities, and had financial gain from all of them. Currently I am not associated with any of these organizations, and though my previous experiences inevitably affect the way I perceive these programs, I have no immediate benefit from favouring a specific program.

Similarly, I have also visited the vast majority of sailing programs documented in this thesis, which have made personal impressions on me. Though these personal impressions may be positive or negative, I again do not stand to have immediate financial gain by creating a biased conclusion.

1 Better Explained. Understanding discrete vs. continous growth. in Better Explained [database online]. Unknown, Unknown [cited November/2017 2017]. Available from https://betterexplained.com/articles/understanding-discrete-vs-continuous-growth/ (accessed November 28,, 2017).

2 Government of Alberta. Economic results. in Government of Alberta [database online]. 2016 [cited November/2017 2017]. Available from http://www.albertacanada.com/business/overview/economic-results.aspx.

6.4 CONCLUSIONS

To understand the effectiveness of this thesis, the re-examination of the two thesis questions presented at the beginning of the process is a good starting point. Those two questions were:

> *1. How can architectural, planning and sport sociology research regarding our recreation environments, develop a set of spatial categories that define our sporting facilities?*
> *2. What proportion of these spatial typologies will promote growth amongst users?*

The 7-category strategy was this thesis' answer to question 1. It was a mixture of different research types in order to create a more comprehensive approach to understanding the critical spatial elements involving sporting space. However, this strategy goes beyond an architectural understanding of a facility. It acknowledges that spatial demands are not the only things that influence sporting facilities' use. Social, cultural, environmental, athletic, administrative and consumer factors all contribute to the complex list of requirements that a building must provide.

It may or may not be intuitive, but broadening the focus of sport facility design can have lasting human impact. Sporting communities and the needs of the individuals who compose them are complex. Physical environments have the ability to acknowledge this social complexity. They can have a lasting impact on the way people interact with each other and their built environments. The 7-category strategy is not just a way to make sport facility design more effective, but is also a strategy to more effectively engage a broader spectrum of human needs. As the dialogue of architectural design regarding sporting space continues to expand, so does the range of complexity that the design process can incorporate. This includes the response and acknowledgment of research from other fields of study. This information has greatly improved the effectiveness of the 7-category strategy, allowing it to be responsive to a range of social, organizational and environmental factors.

The process that determined the 7-category strategy is just as important as the final product. This is important when looking at the development of our design strategies long-term sustainability. New research about how humans operate recreationally is available every day, and will continue to expand the present consensus of knowledge. The 7-category strategy can continue to be improved and modified. By following a repeatable process in its development, it can continue to incorporate new research and become increasingly accurate; ever improving our ability to design these spaces effectively. The question of whether the 7-category strategy should be specific to individual sport or remain general and applicable to a wide array of activities still remains in question; though current research has been fairly general in its applicability, specificity may bring a level of clarity to design processes not reached previously.

The second question was answered with a design analysis and guideline system. These tools allow for a broader understanding of individual spatial typologies that effect the built environment, and in what proportion and combination are they effective. The tools created a solidified framework to evaluate these environments; categorizing space based on typology and defining the scales that we examine recreation facilities. This is important because previously there was no guide to understanding these types of space. The spaces were thoroughly documented, but no type of space was given priority, so it became impossible to understand what the effects of the inclusion or exclusion of any space was. The design guide is meant to be continuously developed and modified based on new information and research. When new research does emerge, individual components of the guide can be modified, rather then having to re-evaluate the entire system. The design guide moves theoretical knowledge into a practical environment. Though this thesis was able to provide two examples of correlation of the patterns recognized in the design guide, further and more robust research, particularly in surrounding factors in question will assist in strengthening the correlations observed in this thesis.

It is important that this thesis addressed the main programmatic elements of a facility, and was careful to not begin to overlap with the design process as much as possible. Every facility has a unique set of challenges it must respond to. This thesis' intent was not to create a prescriptive process of facility design, but address the core needs that inform recreation facility usage. This leaves enough room for design to address the unique needs every facility has, but informs basic spatial relationships and formal program composition. The perspectives of both sport sociology and planning/design were critical in defining these relationships. From a social perspective; how do people function within recreation environments? What elements, physical or social, influence their behaviours, and in what directions? Planning and Architecture look at it from the opposite perspective; how does space affect the way people function in it? And how can designers use space to change the way people function? The answer is both perspectives matter. By approaching design from both ends of the spectrum, it allows for sport sociologists and designers to triangulate cause-effect relationships, instigated by social programming and built environments much more effectively.

Though interdisciplinary work creates a confusing and presently unguided approach to research and development, the dividends of successful processes provide a level of understanding not previously reached from a single perspective. Design professionals should continue to work with adjacent researchers and professionals to continue to provide more comprehensive solutions to our spatial demands. This will not only increase the effectiveness of architectural solutions, but broaden the scope of other professions. This thesis is a recommendation in increasing the complexity of our understanding of built sporting space. Though an increase in intricacy, the ever-growing understanding of human needs warrants a much more comprehensive approach to addressing them.

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A1.0 Appendix (Background Content)

A1.1 Precedents

A1.2 Canadian Obesity Rates

A1.3 Sporting Evolution Mapping

A1.1 PRECEDENTS

The initial precedent studies were selected through recommendation and personal knowledge of exceptional sporting facilities around the world.
The analysis was designed to isolate elements that make them successful or not. Each facility was scrutinized based on program, circulation and it's placement within the urban environment. Each of these elements are important in determining if a facility is going to work well or not.

Program mapping allows Architects and researchers to understand the composition of each facility. What elements are combined within the facility, and what relation do they have to each other?

Circulation is the movement patterns of people throughout a space. Understanding how people move helps to understand how the space is used and if it's being utilized effectively. Circulation diagrams aren't meant to be a scientific scrutiny of movement, but more of a snapshot of how a facility could be used in a specific instance.

Location plays a critical role in a facilities success. A good facility can be placed in an area without access, parking or local transportation and be become derelict. Urban planning and strategic placement of a building can play a critical role in how successful it can be.

These elements together give a comprehensive understanding of each of these buildings and isolate key details that allow them to function effectively.

Maselake Sports Park, Berlin

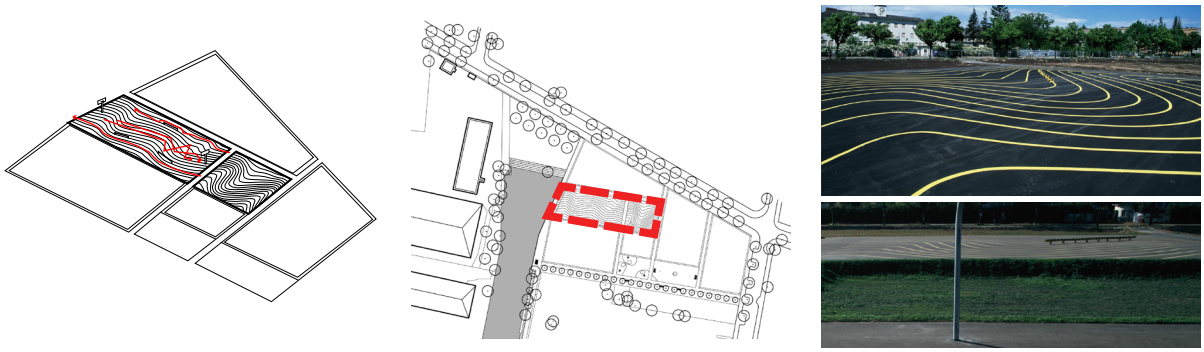


Figure A1.01 (Left), Figure A1.02(Centre), Figure A1.03 (Right Below) and Figure A1.04 (Right Above)
Images describing the spatial qualities and potential pedestrian pathways of Maselake Sports Park, Berlin.

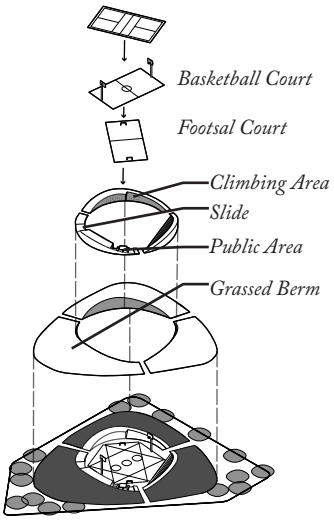
The Maselake Sport Park is a really simple intervention in Berlin's urban landscape. The interest in Maselake comes from the illusion of movement from the shape of the lines. Though the actual site is quite simple, the usage of paved lines with a few simple elements makes the spaces quite dynamic. The oscillating lines challenges the idea of what a typical court, field, arena or play area are bound by.

Jumping Field, Helsinki

Figure A1.05 (Left), Figure A1.06 (Centre Top), Figure A1.07 (Centre Bottom Left), Figure A1.08 (Centre Bottom Right) and Figure A1.09 (Right)
Diagrammatic and photographic documentation of the Jumping Field, Helsinki, Finland.

The Jumping Field was an installation in Helsinki in 2000. It was constructed from a steel frame and artificial grass turf on top, the defining feature was that there were nine truck springs placed evenly underneath the surface of the platform, elevating it slightly. This condition made the surface completely unstable but challenged the conventional idea of a playing field on multiple planes of reference. Many times when people try create innovation on surface typologies they think a lot about the actual surface material, or very specific areas where the surface mutates dramatically. The Jumping Field uses conventional surface materials, and makes changes to the general area quite subtly, but the results are much more dramatic then it's subtle appearance.

Beetsplein Playground, Dordrecht



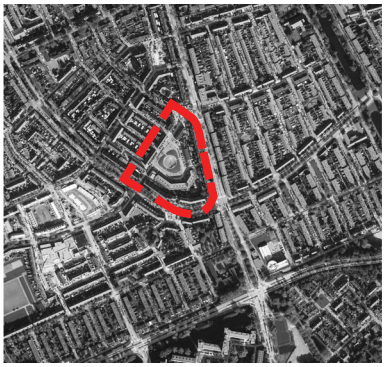
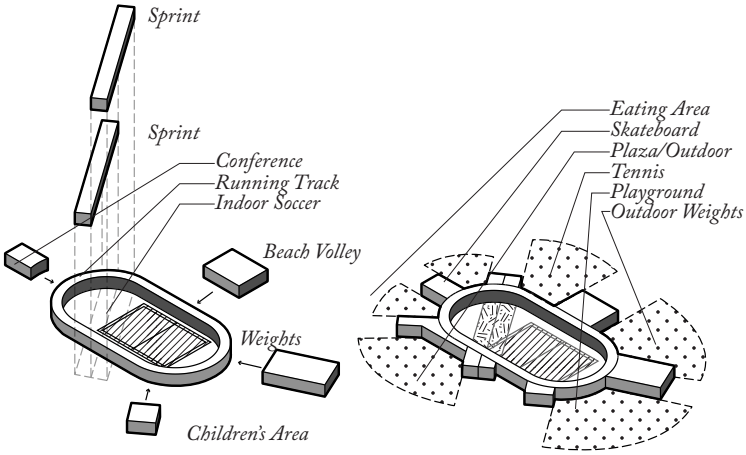


Figure A1.10 (Left), Figure A1.11 (Centre) and Figure A1.12 (Right)
Axonometric, photographic and birds eye documentation of the site.

Beetsplein is located in Dordrecht, Netherlands and is a public park created for multiple uses within the same area. The use and overlapping of sport pitch demarcations is very interesting, much like a gymnasium which can accommodate dozens of types of activities because of the many overlapping lines, Beetsplein approaches line overlap in a new light. The overall shape of the lines also influences the shape of the surrounding green space and orange ring. While the demarcated lines determine formalized "performance" sports, the orange ring represents "judgment" sports. Though not as cleverly done, there are many opportunities of overlap between different sport equipment to provide new opportunities for engagement.

Melting Pot, Randers



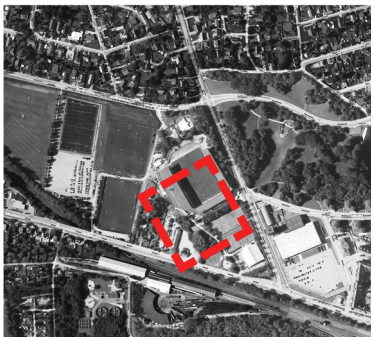


Figure A1.13 (Left), Figure A1.14 (Right Top) and Figure A1.15 (Right Below)
A large exploded axonometric drawing of the facility, site photos and experiential renderings.

The Melting pot was a competition done in 2013 by the Danish firm CEBRA. The project takes multiple programmatic elements specific to sports field design and overlaps similar program together so the fields take on different properties as a result. Hatched zones represent these hybrid exterior spaces, which are reactive to the adjacent sports program on the interior of the building.

Superkilen, Copenhagen

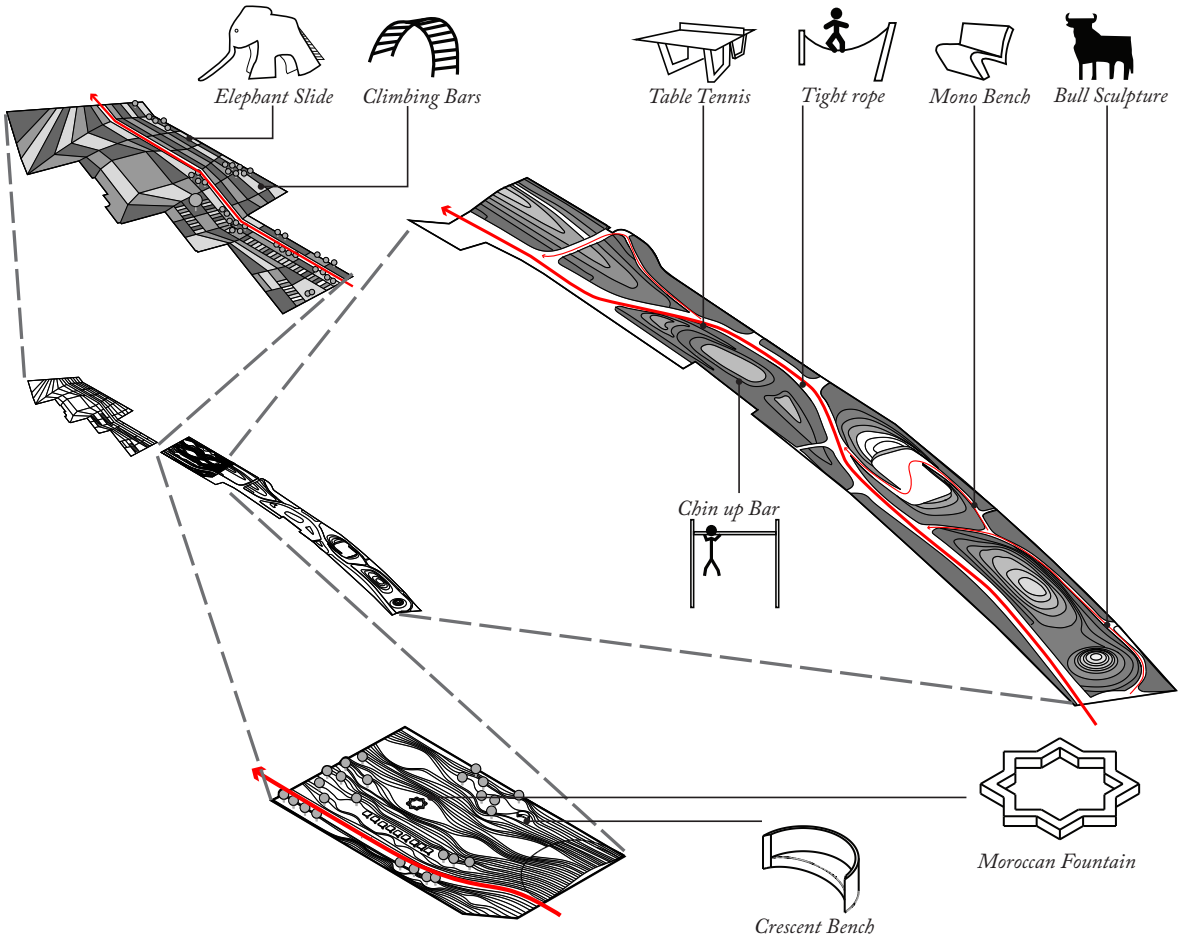


Figure A1.16 (Above)
An exploded diagram of Superkilen's multi-program park.

Superkilen is a landscape design project taken on by architects BIG, Landscape firm TOPOTEK and artists SUPERFLEX. Superkilen is a very interesting project for a variety of reasons. Superkilen was first meant as a public park in one of Copenhagen's more poor suburban areas. Superkilen makes attempts to merge and collide different programmatic elements having to do with sports facilities, using both built objects and two dimensional line diagrams to segregate and challenge the idea of facility typologies. Finally the park is also a collision of multiple religious and ethnic backgrounds, coming together as a cultural mosaic, representing the minorities in the neighbourhood.
The project attempts merge multiple pieces of program. Physical segregation would have helped define program without isolating it visually. There are three parts of the project, the red square, the black market and green space.

Copenhagen Harbour Bath, Copenhagen

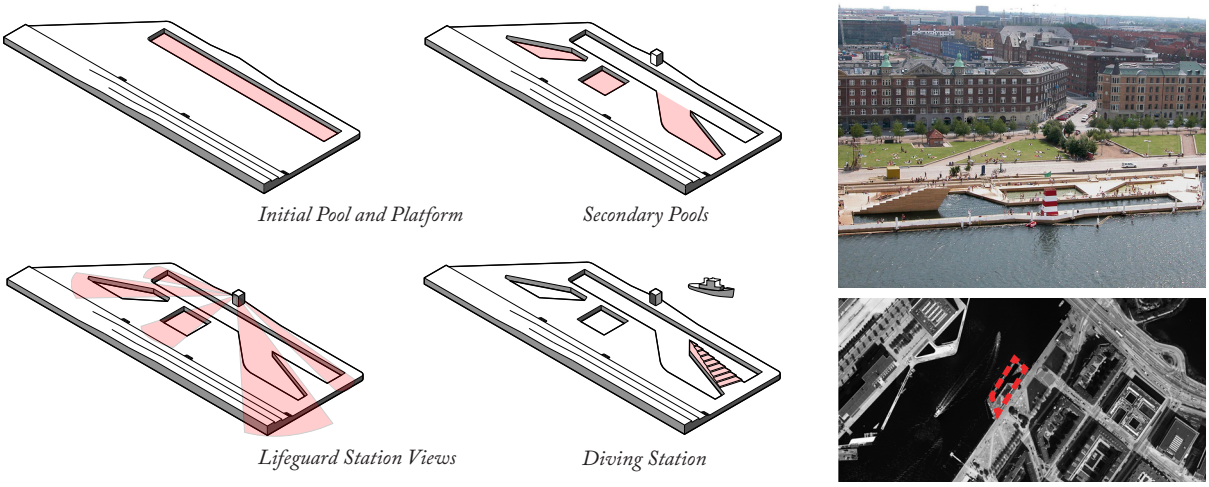


Figure A1.17 (Left), Figure A1.18 (Right Top) and Figure A1.19 (Right Below)
4 Axonometric drawings explaining different functions and Aerial documentation.

The Copenhagen Harbour bath was designed by PLOT architects (now BIG and JDS) and was meant to revitalize Copenhagen's waterfront by taking advantage of the newly (2003) swim-able condition of the water in the harbour. The program isn't meant to be that of a swimming pool, where the main function is athleticism, but a public bath where the focus is social, play and recreation.

Basketbar, Utrecht

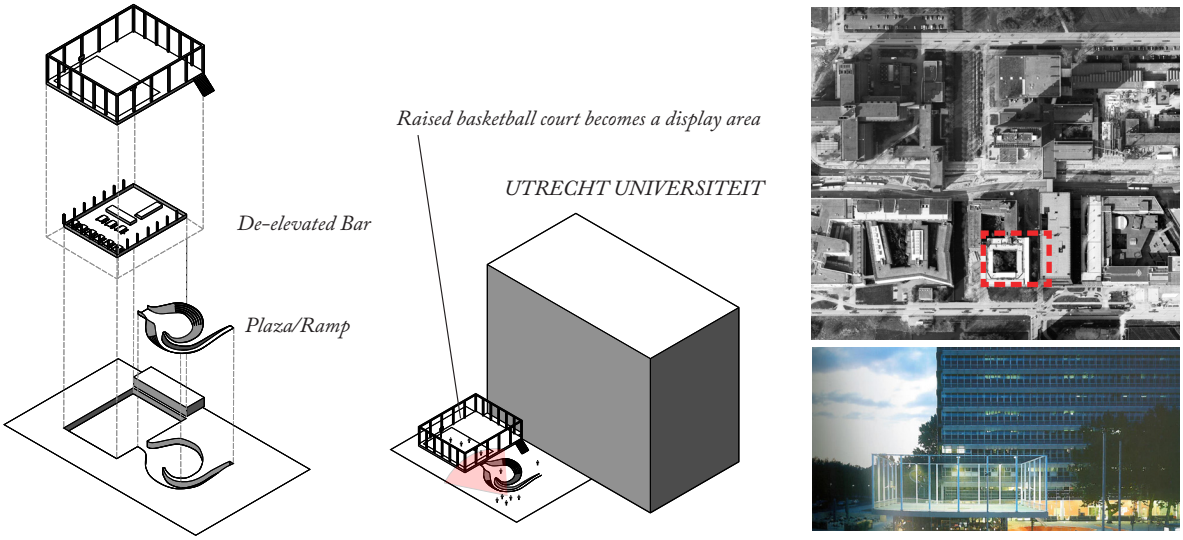


Figure A1.20 (Left), Figure A1.21 (Centre) Figure A1.22 (Right Above) Figure A1.23 (Right Below)
An exploded axonometric, site diagrams, and photographic documentation show the integrative features of Basketbar.

Basketbar was built in Utrecht by NL architects. The project was initially conceived due to the campus' restrictive policies regarding student housing. This created demand for a social/bar space. This project is interesting because it has multiple programs integrated together, but they do not all have immediate relevance to a sports specific nature. This mixture however allows for new possibilities when the two programs are hybridized, allowing for new uses, both athletic and social to occur.

A1.2 Canadian Obesity Rates

Understanding the rise of obesity, and some Potential Correlation

Obesity has been on the rise in Canada for the past 20 years[1] with current levels reaching 25% of the population[2]. However this rate varies across the country, city to city[2]. Physical activity has obvious connections to health and wellness and with conventional sporting participation decreasing[1] its rational to start examining if there is a connection between how we plan our cities in terms of our sporting facilities, and rates of obesity. This isn't inherently mapping each stadium in every city, but starting to examine local, grassroots sporting facilities that engage at a community level.

The relative amount of data and information regarding grassroots specific sporting architecture is fairly limited. The corresponding field of sport sociology is fairly well endowed however, with a multitude of sporting research and case studies done around programming, facilitation and participation of the population. There is significant urban design research[3] [4] regarding this field as well. Pasi Koski, a known Finnish sport sociologist, comments on the state of sport sociology research, that "sociology [is] drifting to the margins of societal discussion and the narrow arena of sociologists' internecine interests."[5] He advocates for a new approach; ""N+1" ideal[y] drive[s] multidisciplinary engagement that bridges common schisms in micro, meso, and macro level[s]."[6] By applying theoretical sociology and urban design frameworks to architecture, there is the potential for multidisciplinary gains where another discipline may have run into its boundaries. The following mappings do just this.

Not all frameworks from other fields fit into the context of architecture and the built environment, so finding studies and theories that are applicable can be challenging, or potentially unfruitful. Pasi Koski theorizes in *Physical Activity Relationship (PAR)* (2008) that our current personal relationships with sport are optimized with four categories in relation to physical activity: Personal physical activity, following of physical culture, production in physical culture and consumption of meanings of physical culture. These terms are not immediately recognizable to an architect's vocabulary, but can be unpacked and redefined within the framework of our built environment. By utilizing Koski's sport sociology theory architecturally, it creates the basis for the analysis of our buildings, sites and communities. To test this idea of N+1[7] cross contamination of sociology, architecture and urban planning, the following

1 Canada Heritage. Sport Participation 2010 Her Majesty the Queen in Right of Canada, 2013
2 Navanleen, Tanya, Teresa Janz, "Adjusting the Scales" Statistics Canada Catalogue No. 82-623-x (2014)
3 Gratton, Chris and Ian Henry "Sport in the city" Taylor & Francis e-Library (2001) New York
4 Humphrey, Nancy P. and Carrie I. Szlyk, "Does the built environment Influence Physical Activity?" Transportation Research Board, (2005) Washington, US
5 Koski, Pasi "Assessing the sociology of sport: On N+1 and the cultural approach," Sage Publications on behalf of the International Sociology of Sport Association, (2015) http://irs.sagepub.com/content/50/4-5/502.full.pdf+html pg.502
6 Koski, Pasi "Assessing the sociology of sport: On N+1 and the cultural approach," Sage Publications on behalf of the International Sociology of Sport Association, (2015) http://irs.sagepub.com/content/50/4-5/502.full.pdf+html pg.502
7 Koski, Pasi "Assessing the sociology of sport: On N+1 and the cultural approach," Sage Publications on behalf of the International Sociology of Sport Association, (2015) http://irs.sagepub.com/content/50/4-5/502.full.pdf+html

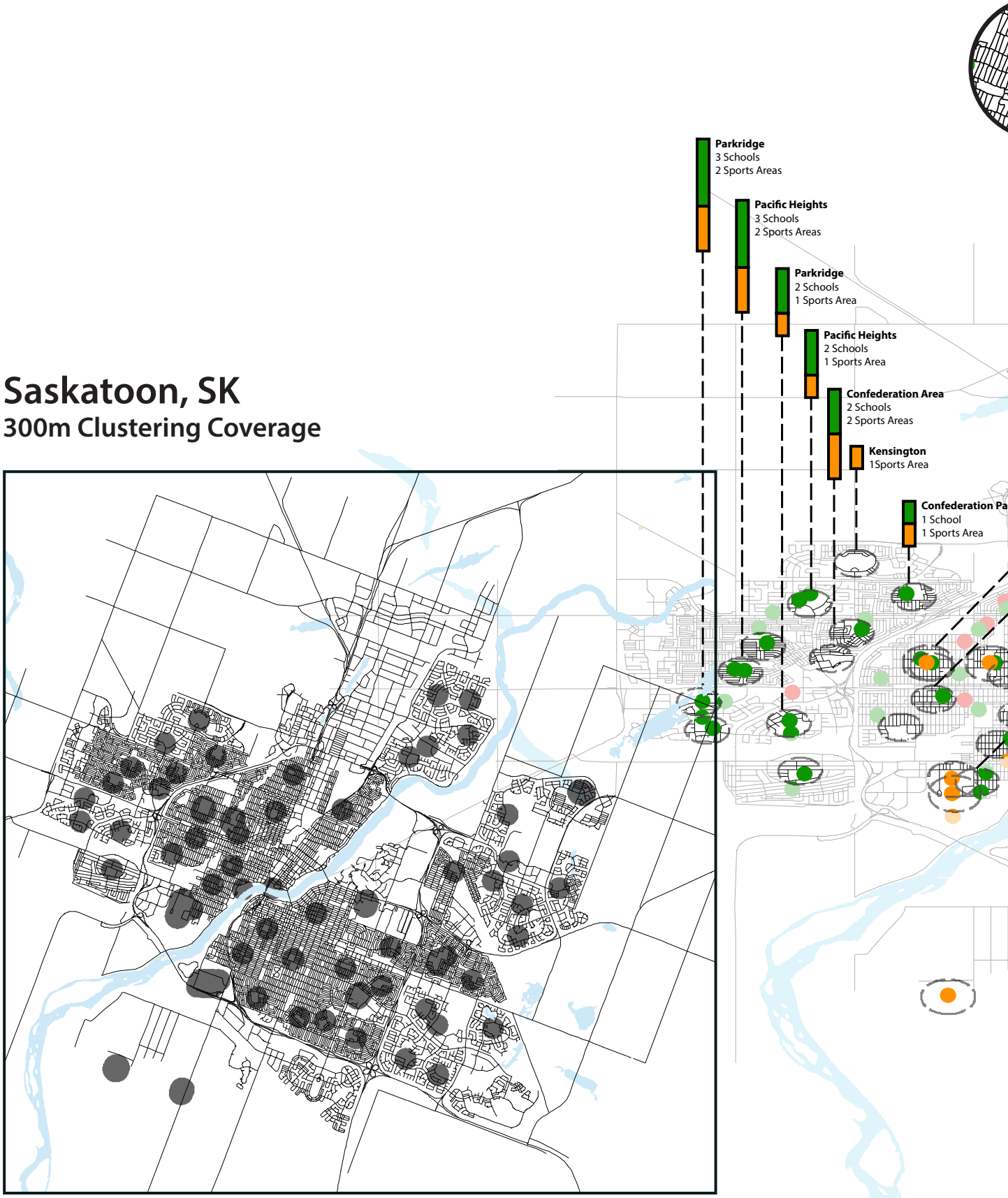
mappings were produced to see if the crossover effect would be applicable.

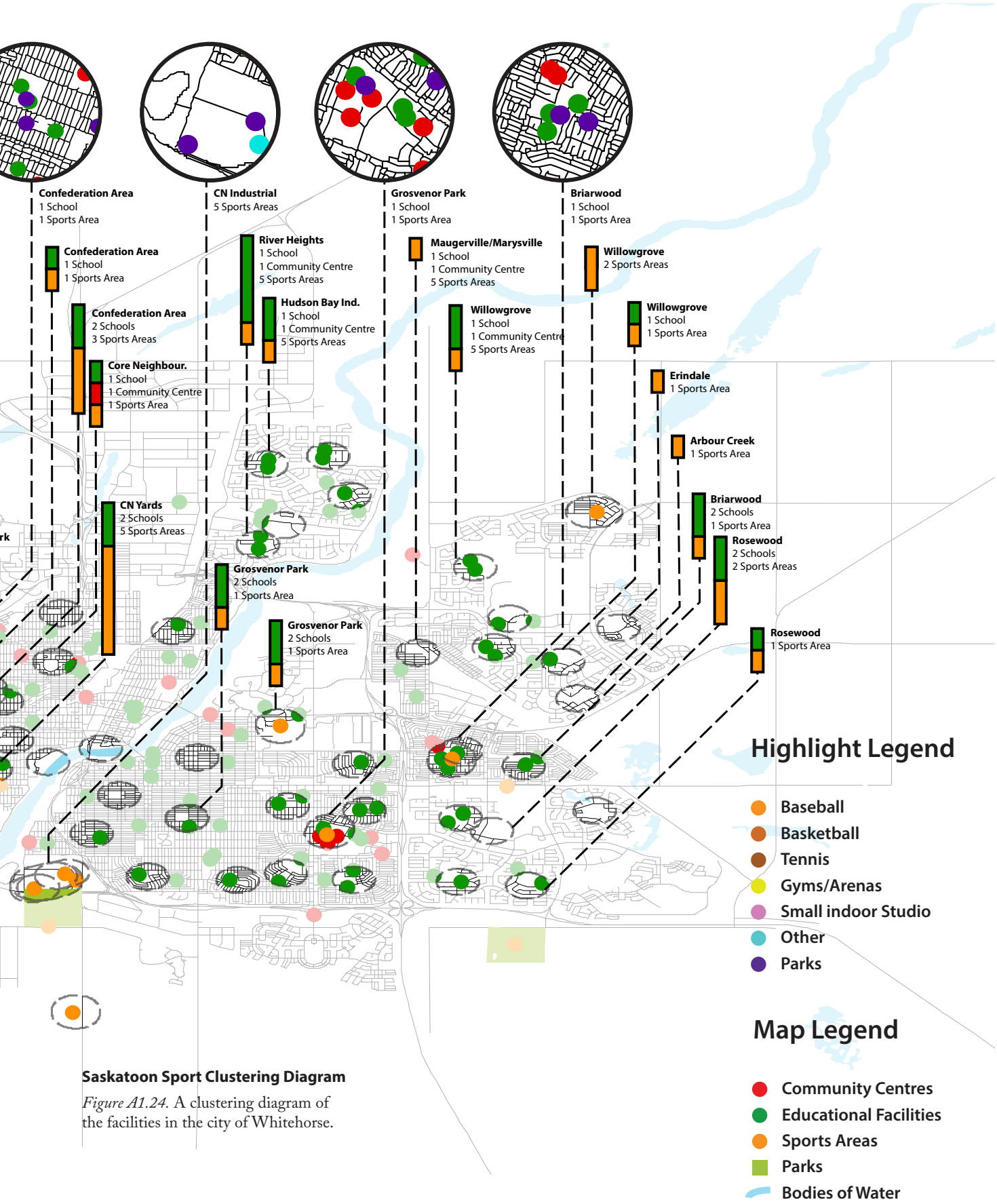
There are multiple positive hybridized sporting environments[8] in Europe, though their specific roots of success continue to be relatively undefined[9]. Many or all elements of Koski's PAR are included within many European sporting facilities. In Canada, many facilities only contain one of the desired elements. Within a Canadian context, individual built environments would prove unfertile if examined through Koski's PAR; however, within a relative area could there be a clustering effect of these individual elements? Based on obesity statistics[10], four Canadian cities were selected; two above the obesity average and two below. Saskatoon and Whitehorse were above the national obesity average, while Calgary and Fredericton were below the average. See figures A1.24-A.127.

Koski's four elements of PAR were then assigned to specific public and private elements throughout the urban landscape. *Personal physical activity was* associated with any formalized sporting area, whether interior or exterior. *Production in physical culture* was re-interpreted as coaching or organizational space such as schools or gymnasiums. Community centres were assigned to the second principle of Koski's PAR, the *following of physical culture*, following the guiding assumption that these areas could be used for the viewing of organized sport, as well of social functions relating to a sporting activity. *Consumption of meanings of physical culture* was interpreted as retail space, but was excluded due to a lack of data.
With any series of assumptions comes inherent risk and lack of accuracy, but provides a ballpark understanding of a concept or idea. The four cities were evaluated using the elements of PAR in the following mappings. Physical activity space, teaching space, consumer space and cultural space were assigned to various areas and buildings based on their functionality. A 300m ring was drawn around each facility; any other facilities within these rings created a cluster. The composition of the cluster is represented in the bar graphs tagging each cluster.

The result was that the diversity of the sporting clusters, as well as the inclusion of some or all of the elements of PAR correlated to the obesity rates in the corresponding cities. Correlation does not necessarily mean causality, multiple assumptions have been made and other external factors have not been included; however, these mappings do start to unpack the legitimacy of Koski's PAR and its applicability to the realm of architecture and urban design. In addition, the mappings also label the specific facilities nested within each element of Koski's PAR, starting to dissect the specific spatial elements that could be included within each category.

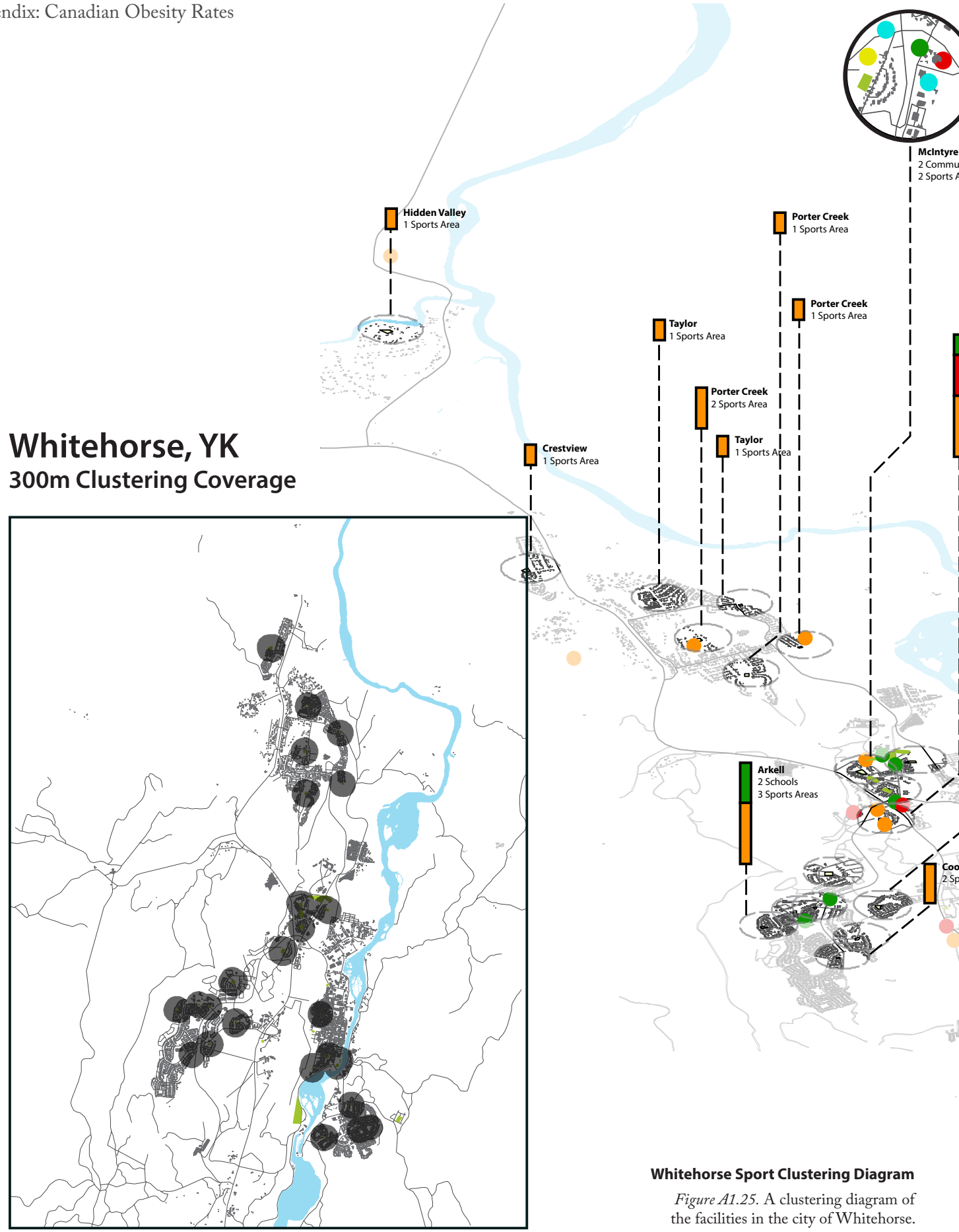
8 Andersen, Rasmus B. "Activating Architecture and urban planning," The Sports Federation of Denmark, (2011) Copenhagen, DK
9 Humphrey, Nancy P. and Carrie I. Szlyk, "Does the built environment Influence Physical Activity?" Transportation Research Board, (2005) Washington, US pg.225
10 Navanleen, Tanya, Teresa Janz, "Adjusting the Scales" Statistics Canada Catalogue No. 82-623-x (2014)


Saskatoon, SK
300m Clustering Coverage
Parkridge
3 Schools
2 Sports Areas
Pacific Heights
3 Schools
2 Sports Areas
Parkridge
2 Schools
1 Sports Area
Pacific Heights
2 Schools
1 Sports Area
Confederation Area
2 Schools
2 Sports Areas
Kensington
1Sports Area
Confederation Pa
1 School
1 Sports Area



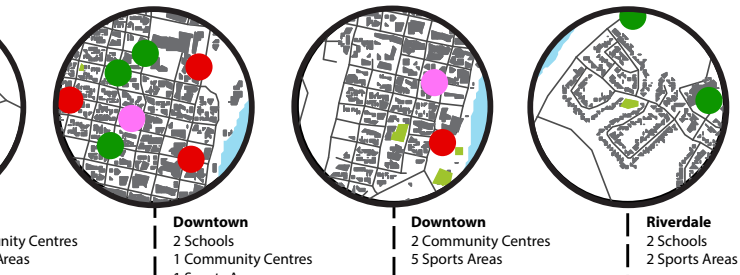
Saskatoon Sport Clustering Diagram

Figure A1.24. A clustering diagram of the facilities in the city of Whitehorse.



Whitehorse Sport Clustering Diagram

Figure A1.25. A clustering diagram of the facilities in the city of Whitehorse.



Downtown
2 Schools
1 Community Centres
1 Sports Area

Downtown
2 Community Centres
5 Sports Areas

Riverdale
2 Schools
2 Sports Areas

Granger
1 School
1 Sports Area

Granger
1 Sports Area

Riverdale
2 Schools
1 Community Centre
3 Sports Areas

Canyon Crescent
1 Sports Area

Mary Lake
1 Sports Area

Mary Lake
1 Sports Area

Cowley Creek
1 Sports Area

Cowley Creek
1 Sports Area

Cowley Creek
1 Sports Area

Highlight Legend

- Baseball
- Basketball
- Tennis
- Gyms/Arenas
- Small indoor Studio
- Other
- Parks

Map Legend

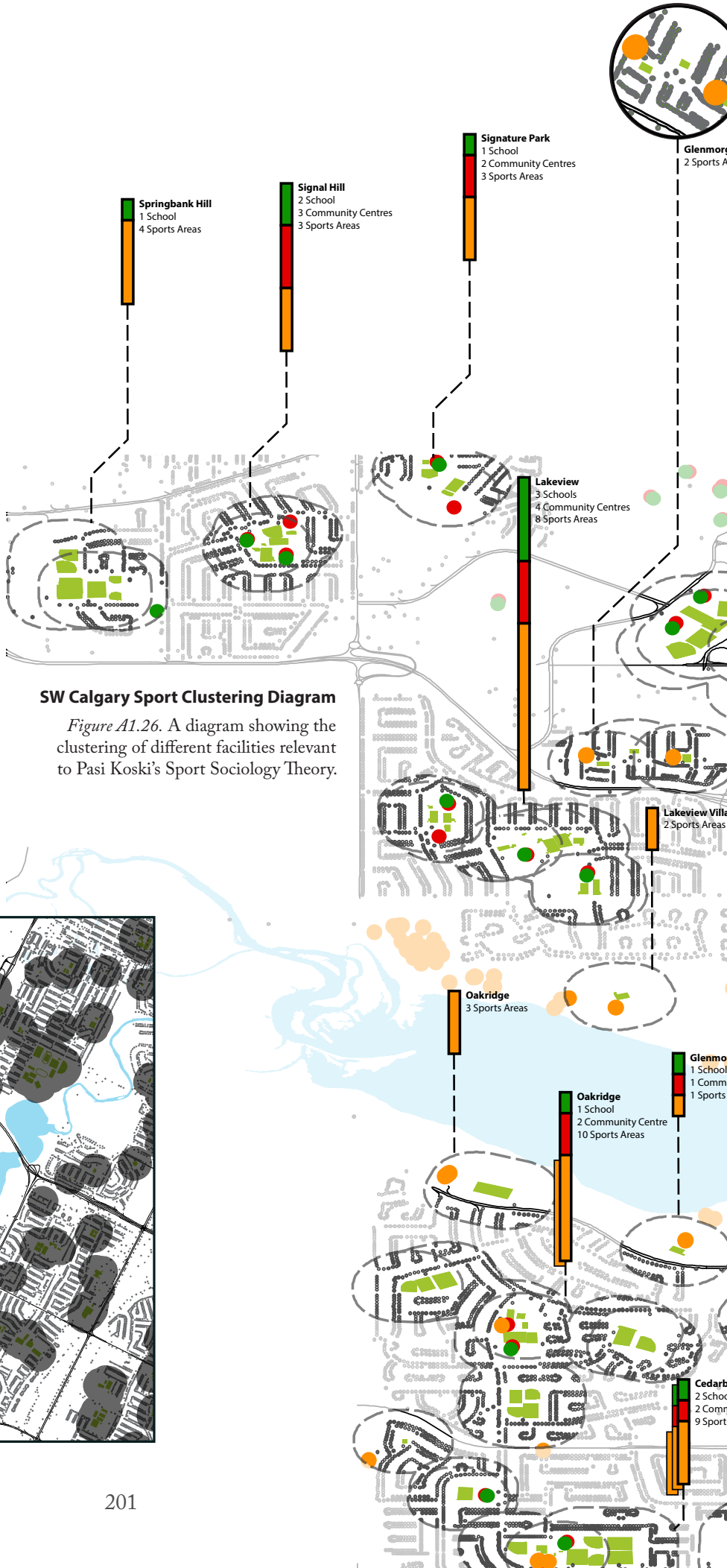
- Community Centres
- Educational Facilities
- Sports Areas
- Parks
- Bodies of Water

Highlight Legend

- Baseball
- Basketball
- Tennis
- Gyms/Arenas
- Small indoor Studio
- Other
- Parks

Map Legend

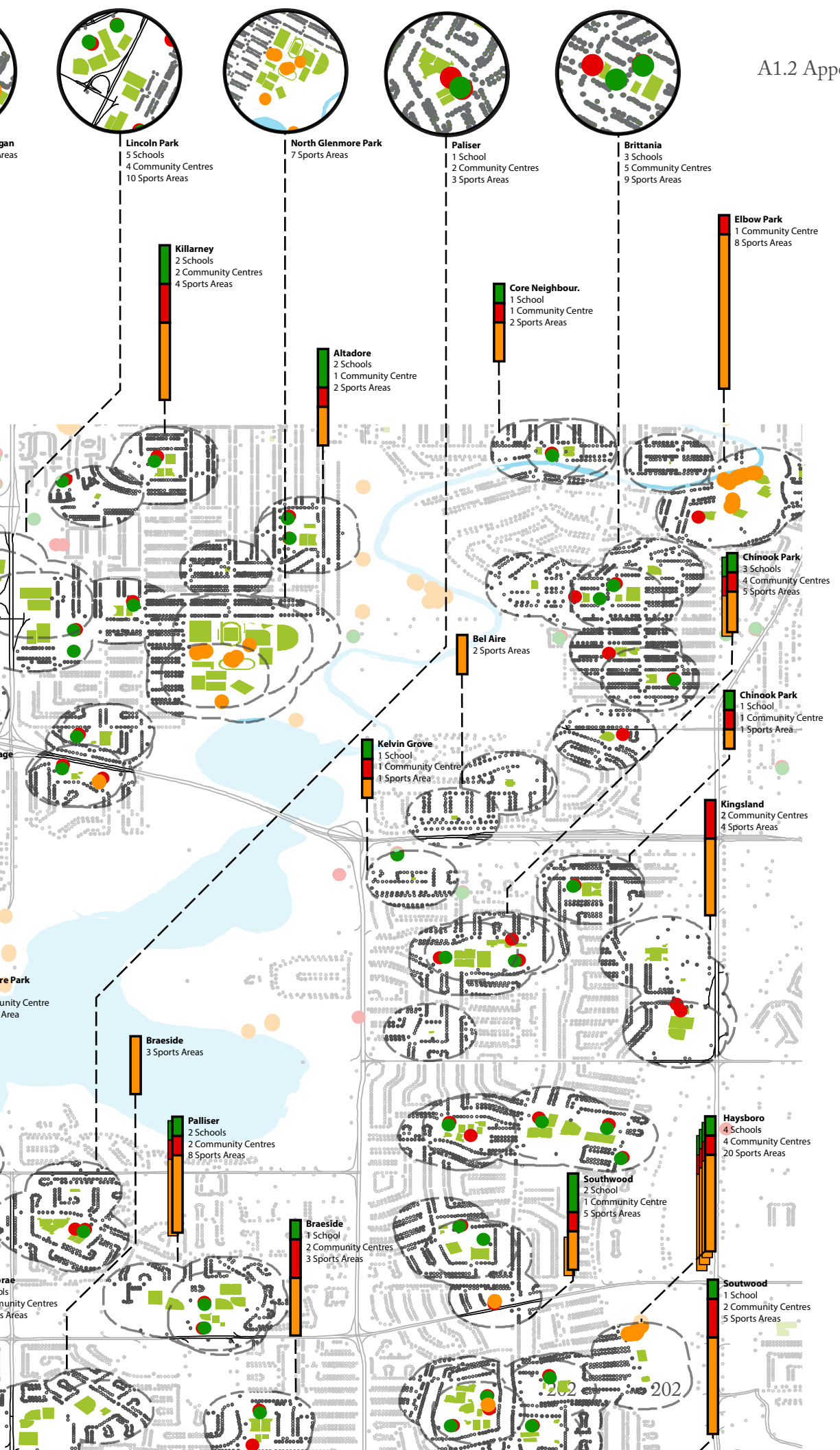
- Community Centres
- Educational Facilities
- Sports Areas
- Parks
- Bodies of Water



SW Calgary Sport Clustering Diagram

Figure A1.26. A diagram showing the clustering of different facilities relevant to Pasi Koski's Sport Sociology Theory.

SW Calgary, AB
300m Clustering Coverage


Lincoln Park
5 Schools
4 Community Centres
10 Sports Areas
North Glenmore Park
7 Sports Areas
Paliser
1 School
2 Community Centres
3 Sports Areas
Brittania
3 Schools
5 Community Centres
9 Sports Areas
Killarney
2 Schools
2 Community Centres
4 Sports Areas
Altadore
2 Schools
1 Community Centre
2 Sports Areas
Core Neighbour.
1 School
1 Community Centre
2 Sports Areas
Elbow Park
1 Community Centre
8 Sports Areas
Chinook Park
3 Schools
4 Community Centres
5 Sports Areas
Bel Aire
2 Sports Areas
Chinook Park
1 School
1 Community Centre
1 Sports Area
Kelvin Grove
1 School
1 Community Centre
1 Sports Area
Kingsland
2 Community Centres
4 Sports Areas
Braeside
3 Sports Areas
Palliser
2 Schools
2 Community Centres
8 Sports Areas
Haysboro
4 Schools
4 Community Centres
20 Sports Areas
Southwood
2 School
1 Community Centre
5 Sports Areas
Braeside
1 School
2 Community Centres
3 Sports Areas
Soutwood
1 School
2 Community Centres
5 Sports Areas

202

Sporting Clusters

Highlight Legend

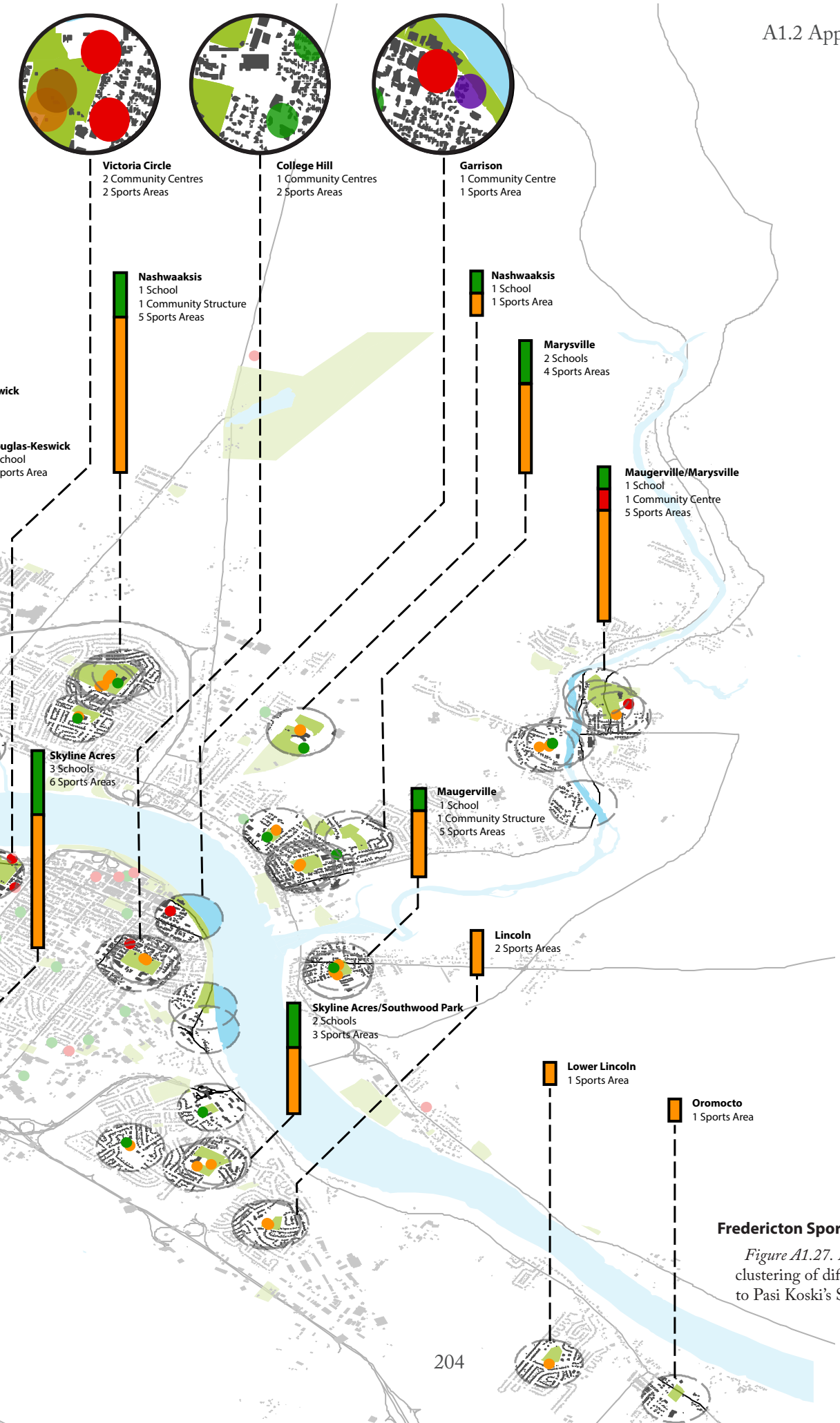
- Baseball
- Basketball
- Tennis
- Gyms/Arenas
- Small indoor Studio
- Other
- Parks

Map Legend

- Community Centres
- Educational Facilities
- Sports Areas
- Parks
- Bodies of Water

Fredericton, NB

300m Clustering Coverage

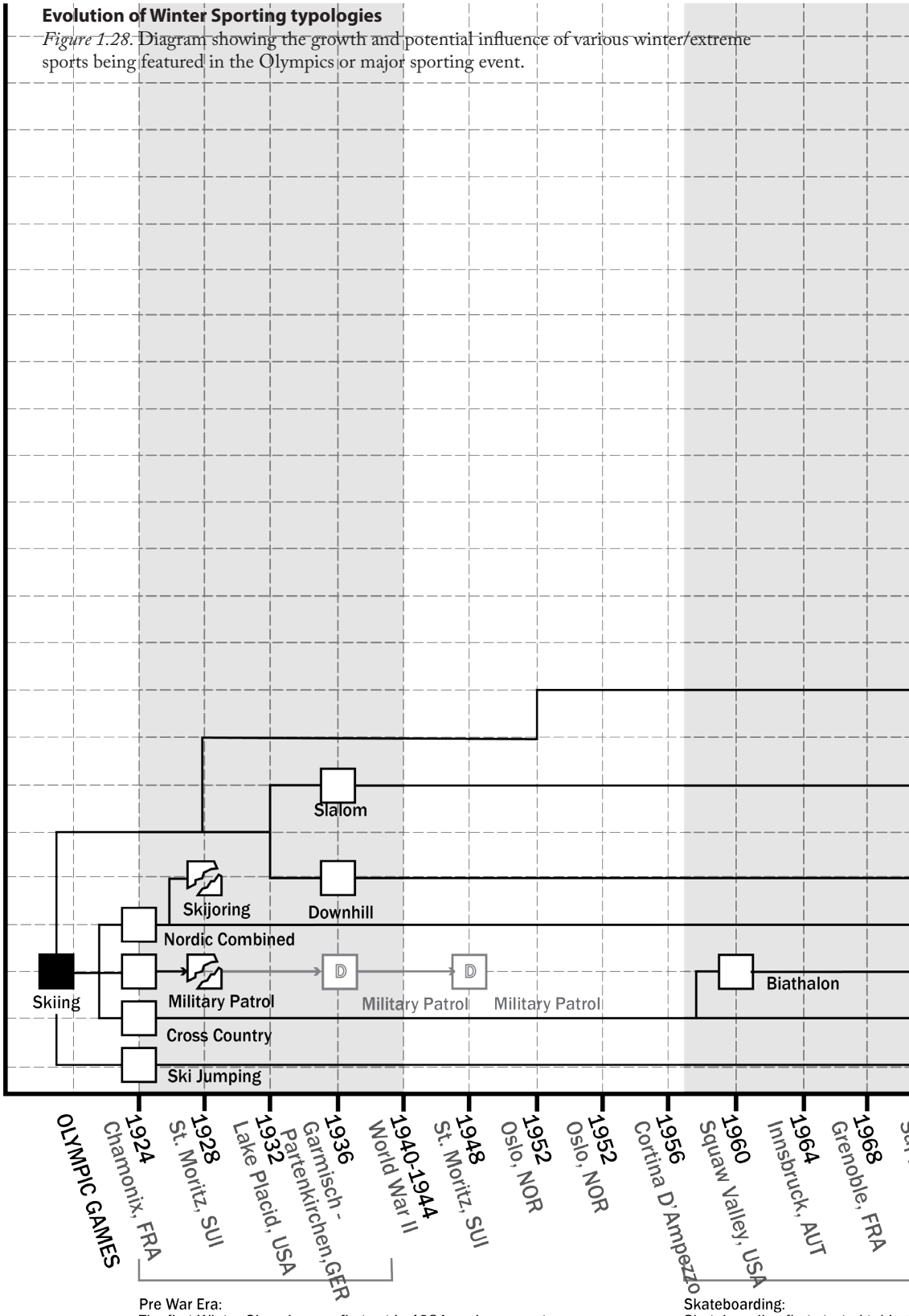


Fredericton Sport Clustering Diagram

Figure A1.27. A diagram showing the clustering of different facilities relevant to Pasi Koski's Sport Sociology Theory.

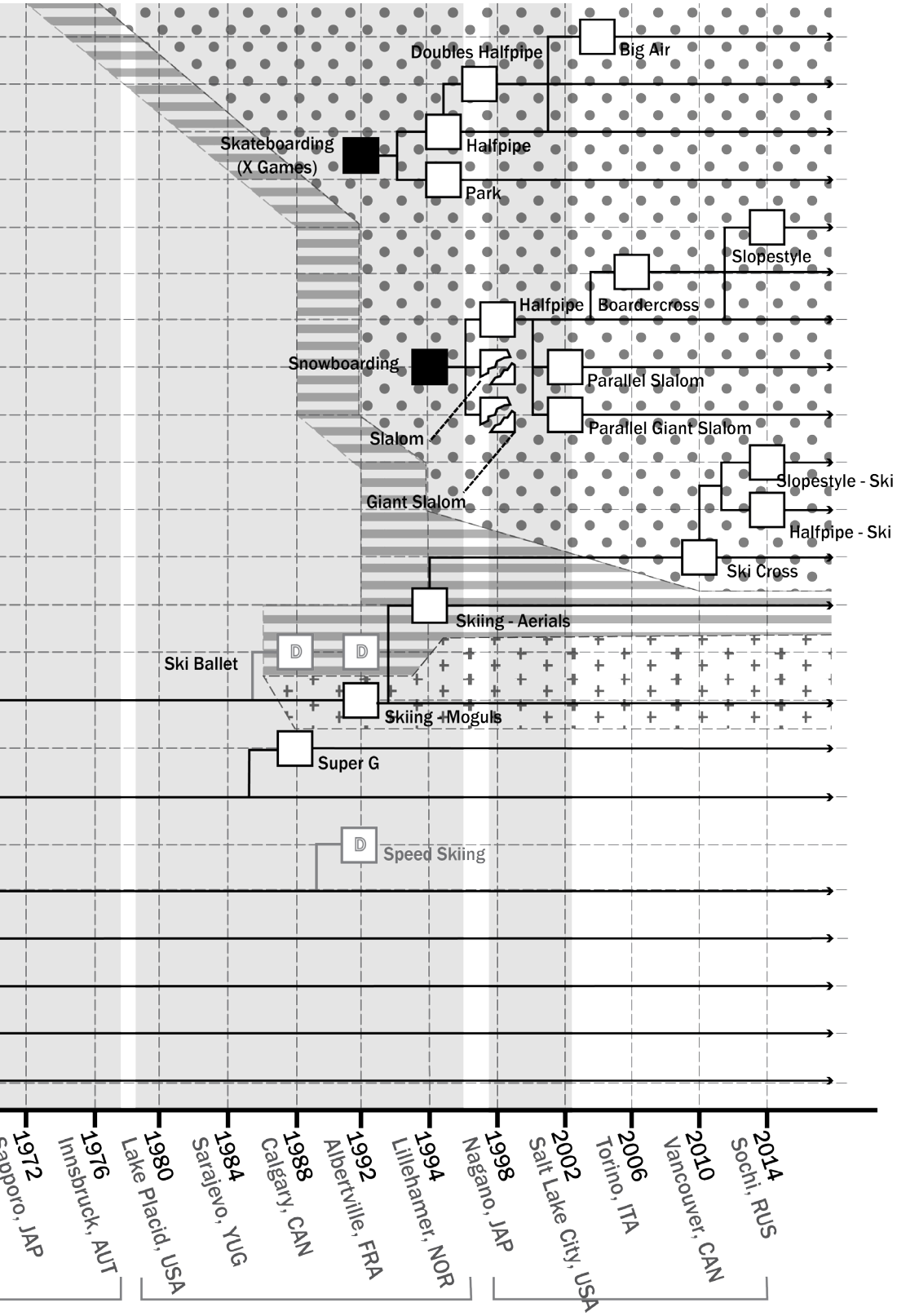
Evolution of Winter Sporting typologies

Figure 1.28. Diagram showing the growth and potential influence of various winter/extreme sports being featured in the Olympics or major sporting event.



Pre War Era:
The first Winter Olympics was first set in 1924, and represents the first modern Winter Olympiad. The majority of sports from the beginning of the Olympics either had military application (ex. cross country skiing and biathalon) or had links to military training exercises.

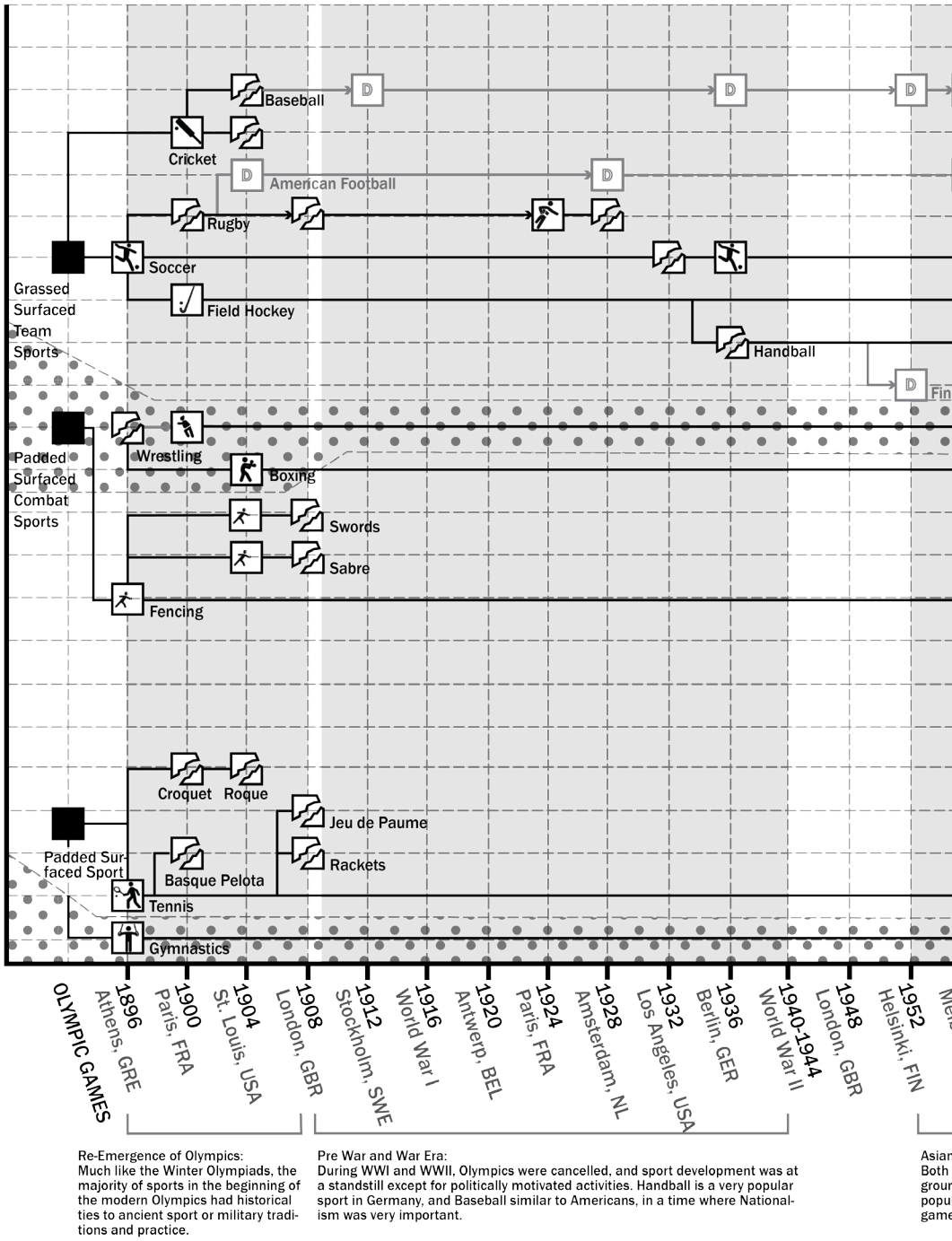
Skateboarding:
Skateboarding first started taking
late 1950's as a byproduct from t
popularity in surfing. Between the
skateboarding evolved from a loca
business model spanning the cou

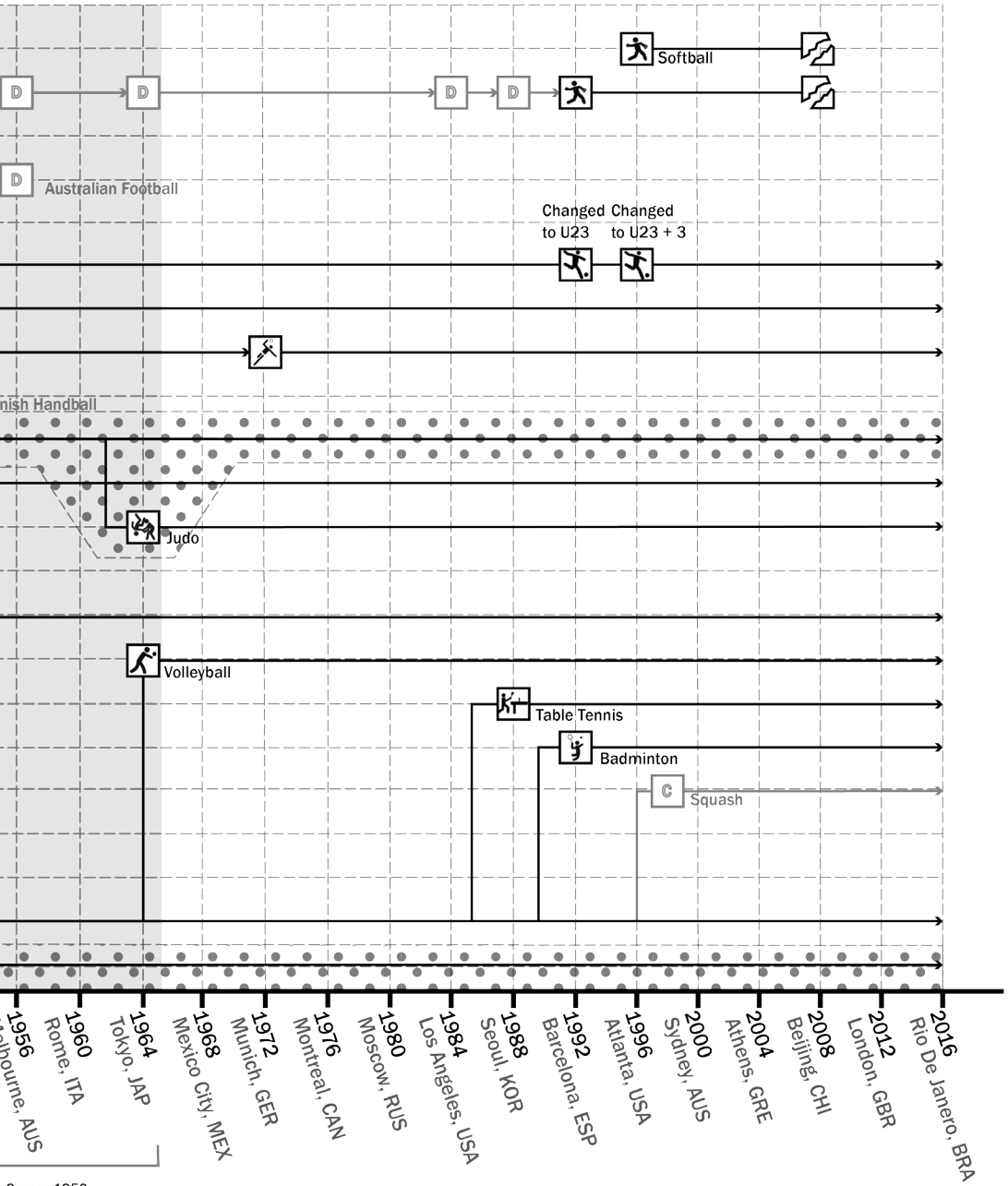


shape in the
he surge of
60's and 70's,
al industry, to a
ntry.

Snowboarding:
Snowboards were not commercially available until 1972 in the USA. The skateboard influenced industry grew and the popularity of aerial maneuvers spread. Skiing followed this trend, but more slowly due to their background.

The first X Games was in 1995 in the US. It was marketed as a platform for action sports. These sports, are evaluated by a panel of judges but most of them incorporate a higher level of risk or dangers than typcial. It has become a testing ground for more emerging sports, and for challenging sporting norms with hybrid events or themes.


Baseball
Cricket
American Football
Rugby
Soccer
Field Hockey
Handball
Grassed Surfaced Team Sports
Wrestling
Boxing
Swords
Sabre
Fencing
Padded Surfaced Combat Sports
Croquet
Roque
Jeu de Paume
Rackets
Basque Pelota
Tennis
Gymnastics
Padded Surfaced Sport
OLYMPIC GAMES
1896 Athens, GRE
1900 Paris, FRA
1904 St. Louis, USA
1908 London, GBR
1912 Stockholm, SWE
1916 World War I
1920 Antwerp, BEL
1924 Paris, FRA
1928 Amsterdam, NL
1932 Los Angeles, USA
1936 Berlin, GER
1940-1944 World War II
1948 London, GBR
1952 Helsinki, FIN
Re-Emergence of Olympics:
Much like the Winter Olympiads, the majority of sports in the beginning of the modern Olympics had historical ties to ancient sport or military traditions and practice.
Pre War and War Era:
During WWI and WWII, Olympics were cancelled, and sport development was at a standstill except for politically motivated activities. Handball is a very popular sport in Germany, and Baseball similar to Americans, in a time where Nationalism was very important.



Games 1950:
of these events provided staging
nds for less popular sports, but were
lar in other parts of the world. The Asian
es promoted racquet sport growth.

Evolution of Summer Sporting typologies

Figure 1.29. Diagram showing the linear growth and potential influence of various summer sports being featured in the Olympics or major sporting event.

A2.0 Appendix (Literature Review)

TABLE 1: JOURNAL ARTICLES BASED ON PRIMARY OR SECONDARY RESEARCH

Author and Date	Article Name	Research Methodology	Synthesis of Findings	Independent Variable	Expert Source(s)
1. Alexandris and Carroll, 1997	An Analysis of Leisure Constraints Based on different Recreational Sport Participation Levels: Results from a Study in Greece	Household Surveysin Greece. 300 sent out 51% returned. Then went door to door to 5 areas of the city x60 participants and gave them questionaires. Answers were categorized and given specific grouping factors. 70% people between 18-35.	A) Time and Facility were the highest inhibitators B) Non Participants are significantly more constrainted C) Perception of Constraint decreases with more participation. Theory of Crawford Gudby. The heirarchal approach of Intrapersonal, Interpersonal and Structure Constraints seems to govern these effects.	Participation in a series of sporting activities in specific groupings.	Crawford and Godby
2. Kemperman and Timmermans, 2011	Children's Recreational Physical Activity	Surveying 4,293 random schoolage participants Primary school in the Netherlands.	Percieved Safety is a huge factor. Mixed Use Planning is Important in residential neighbourhood. Social Environments outweights Physical ones, meaning that the social quality of the space is more important than the actual physical quaility. Quality of Physical Activity Opportunities IE facilities also plays a large role.	Surey of Activity: Shopping, General Leisure, Social, Cultural, Community, Club, Sport, Walking, and Service. Derived Land use Data	Sallis
3. Kim and Fesenmaier 2009	Evaluating Spatial Structure Effects in Recreation Travel	Testing Recreation Travel times to State parks in Texas	Trip length correlates specifically to the attractivenss of recreation facilities. When facilities are clustered, and the trip distance is short, it negatively affects the participation, but the farther the trip distance to the facility is, the more attractice clustering becomes. Opportunity modeling provides transferability between disciplines and areas.	Calibration of Coefficients to represent attactiveness versus distance of park	Fesemeiser, Smith and hanson
4. Kaltenborn, 2009	Nature of place attachment: A study among recreation homeowners in Southern Norway	405 Recreational homeowners were contacted and mailed a survey. 250 questionaires were returned.	Area and Nature is the key driver of place attachment. This being said there is a complex network of elements that cause place attachment to occur, including the built environment vs nature, and nature vs social. These all are intertwined with each other. It provides a heirarchical list of elements that are important when determining elements of place attachment.	Series of Questions based on Place attachment Scale and a Place attribute Scale	Williams
5. Allison and Hibbler, 2010	Organization Barriers to Inclusion: Perspectives from the Recreation Professional	Interviewed 19 Recreation Professionals, some who were part of marginalized social or cultural groups	That many recreation professionals and their associatiions, by catering to the majority they unintentionally exclude minority groups.	Interviewed with semi-structured questions. Topics: Experience, training, Philosophy toward diversity, barriers for access, strategies for demographics, initiatives and programs	Allison and Orbe
6. Kelly, 2009	Outdoor Recreation Participation: A Comparative Analysis	Telephone Survey 1977. 4029 participants were questioned about 30 activities	Demographic to participation rate analysis is drstically undeveloped model, and does not provide an accurate model for prediction of participation.	Types of Activities questioned about	None observed
7. Jun et al. 2012	Reassessing the Structure of Enduring Leisure Involvement	Individual Surveys of Camping participants. 424 cases. 260 greek questionnaires were filled out	Identity Theory. Recreation Opportunity Spectrum is here reinforced within the context of self verification through participation and association with an activity. By providing opportunities (and facilities) that respond to "hetergenous" demands within the market place. "Experiences occurring within developed contexts are most often sough by those with lower degrees of involement wheras those occusing in pristine backcountry settings are typically sought by those with higher degrees of involvment. AKA More specific facility needs for more basic user groups	Surveys included 15 questions within 5 different elements of involvement: Attraction, Centrality, Social Bonding, Identity Affirmation, and Identity Expression	Swann, Burke, Tully, Stryker

TABLE 1: JOURNAL ARTICLES BASED ON PRIMARY OR SECONDARY RESEARCH

Author and Date	Article Name	Research Methodology	Synthesis of Findings	Independent Variable	Expert Source(s)
8. Gobster, 2007	Recreation and Leisure Research from an Active Living Perspective: Taking a second look at Urban Trail Use Data	Re-assessment of two previous set of data observing trail useage by participants. 5, 496 Users observed in 151 periods of observation. Users were evaluated on age, intensity	Higher Activity Users were by themselves, lower activity users weere in groups. Typically lower activity groups occupied around amenities, and functioned during more mean times in the day. Higher Activity levels functioned at lower. Ethnic groups typically functioned homogonously. Weather was also a huge factor. Many lower activity users would not use trails while inclement weather.	Trail Population Survey Data. Based on: Intensity, skill, Activity, Race, Group Size, Dog	Sallis
9. Galloway 2012	Recreation Specialization Among New Zealand River Recreation Users: A Multi-activity study of Motivation and Site Preference	Initially 1,600 people were asked via email to respond to a survey. 813 individuals provide partial or complete data. 358 Whitwater Kayakers, 170 multisport racers, 285 Fisherman	They found that White water kayaking and multi sport racing share many of the same site conditions suitable for each others sport, while fishing did not. They used a 9 variable method to study and compare sports. Skill sets often be the determining factor between two sports selecting similar sites. Safety is also another significant factor in determining site location and drawing similiarities between the two.	Survey based on: Skill level, participation, Lifestyle/commitment Self Rating System of Expertise. Visits per month.	None observed
10. Lyons and Dionigi, 2007	Transcending Emotional Community: A Quality Examination of Older Alduts and Masters Sport Participation	110 interviews with a masters aged sporting group for a multi sport event. Interviews lasted from 5-30 minutes.	**"treat community like a context, and less like an experience"** proves that masters sports provide a much needed relief from the isolation that more adults seem to encounter in their day to day live. The expierence of communtiy can manifest istelf through enduring involvement	Really interesting technique of collecting catch phrases and similar words throughout all typologies of research became the focus of the technique	Dionigi, Mcmillan and Chavis
11. Rhodes and Dean, 2009	Understanding Physical Inactivity: Prediction of Four Sedentary Leisure Behaviors	206 Random address participants returned the questionaire. 174 undergraduate education students were surveyed. Gender, age, occupational status and income were recorded, but not correlated.	Hi Access and ease of use allow for sedentary lifestyle motivators to be very attractive to the general population.	Survey included 4 sedentary behaviors, on a 5pt scale.	None observed
12. Koohsari et al. 2014	Using Space Syntax to assess the Built Envornment for Physical Activity: Applications to Research on Parks and Public Open Spaces	They compared Space syntax to other methods of examining leisure space	Spatial Syntax only looks at the proximity of amenities to each other rather than levels of attractivness of different opportunities. Space syntax does a very good job of studying the proximity of spaces based not only on linear distance but on visual accessibility and number of turns required to get to an area.	Space Syntax vs topological methodology. Qualitiative evaluation of both systems.	Hillier
13. Liu, 2008	Sport and Social Inclusion: Evidence from the Perforamnce of Public leisure Facilities	350 questionaires each at 408 facilities.	Currently with the programmatic and facility access in the UK, it is feasible to obtain satisfactory participation rates in 11-19yr old minority category, but not 60+ category. Social inequality lies at the heart of the problem.	Facilities were evaluated for typology of space, size, management style and location compared to social class.	Gratton, Collins

Journal Articles Based on Primary Research

Figure A2.01. Summaries of Journal Articles

TABLE 2: JOURNAL ARTICLES BASED ON THEORY, QUALITATIVE ANALYSIS OR LITERATURE REVIEWS

Author and Date	Article Name	Research Methodology/Approach	Synthesis of Findings	Expert Source(s)
1. Manning, 2009	Diversity in a Democracy: Expanding the Recreation Opportunity Spectrum	Defence of the Recreation Opportunity Spectrum	That ROS and Diversity frameworks would be very effective tools if liberally applied to sporting facilities, communities and neighbourhood planning models.	None observed
2. Henderson and Bialeschki, 2007	Leisure and Active Lifestyles: Research Reflections	Literature Review	Strength of place attachment, and what elements cause place attachment (physical, architectural, leisure).	Sallis
3. Romsa, 2009	Recreation Research and planning in the Federal Republic of Germany: A Commentary	Development of an Attractibilty Model	Attractivity models while largely being developed are incomplete and do not describe the entire spectrum of variables relating to recreation sites. Through the staggering of school holidays, economics of recreational vacation has been dispered so there is a larger variety of opportunity for recreation. Many elements seem subjective to site, and population.	Becker
4. Johnson and Glover, 2013	Understanding Urban Public Space in a Leisure Context	Qualitative Analysis	An interesting beginning of the understanding of how public space can be exclusive or inclusive. Outlining 4 typologies of Urban space based on ownership and accessibility to broaden the conceptual understanding of the topic.	None observed
5. Dunn, 2009	Urban Recreation Research: An Overview	Summary and review of the current research in the field of urban recreation research	That there is a general lack of evidence supported theories to work on creating cities with sustainable amounts of parks and recreation opportunities. There isn't currently enough research to create a model that can help describe what is going on in cities that have a lack, or excess amount of parks and recreation opportunities because there are so many variable.	None observed
6. Corte, 2013	A Refinement of Collaborative Circles Theory: Resource Mobilization and Innovation in an Emerging Sport	Qualitative Analysis based on observation and knowledge of the sport.	More of an evaluatory framework looking at BMX biking. It doesn't come to any specific conclusions about how things work however. It just discuesses and defines small portions and trends within the sport. This is interesting within the context of BMX, but doesn't really apply to other sports, or theoretically our broad understanding of how sport works.	Farrells
7. Griggs, 2011	Ethnographic Study of Alternative Sports by Alternative Means: List Mining as a Method of Data Collection	Qualitative Analysis based on observation and knowledge of the sport.	Data mining is a difficult tool to use because of the ethical implications of qualitative research. In addition, the speed of technology development makes it hard for research techniques involving technology to stay relevant.	None observed
8. Lee and Moudon, 2004	Physical Activity and Environment Research in the Health Field: Implications for Urban and Trasnportation Planing Practce and Research	This is a summary of all of the quantitative research in the field regarding biking and walking, active and passive transportation and its relationship to having fit and health communities and populations.	Increasing walking and biking will help people get more fit, it circumvents the lack of "time" for physical activity. The addition of infrastructure needs to be implemented in addition to current infrastructure. A current lack of a theoretical framework hurts the field and doesn't help to define what elements create a more cohesive structure for active living infrastructure.	Sallis

Journal Articles Based on Theory

Figure A2.02. Summaries of Journal Articles

TABLE 3: RECOMMENDED OR BASIC JOURNAL ARTICLES, BOOKS OR REFERENCES

Author and Date	Article Name	Research Methodology/Approach	Synthesis of Findings	Expert Source(s)
1. Anderson, Rasmus 2009	Activating Architecture and Urban Planning	Case Study: 50 specific built environments were evaluated and categorized based on a variety of research and previous precedents.	A Categorical system of referencing different elements within the built environment based on emerging trends from these 50 urban recreation spaces.	None observed
2. Skille and Waddington, 2006	Alternative Sport Programmes and Social Inclusion in Norway	Observation, and quantitative measurement of participants in different sporting scenarios.	A really interesting study, based on looking at different groups which are more or less at risk for typical levels of physical activities, compared to different typologies of sporting activity, based on a changing amount of intensity, and type of activity. It found that less intense activity and sport focused more on sensation versus performance were more successful in inclusion. None risk groups always benefit from increased program ranges. Then used qualititative observations to understand the results in a larger social patterns: Reduction of competition provides inclusion.	Hanson
3. Koski, 2015	Assessing the Sociology of Sport: On N+1 ad the Cultural Approach	NA - Commentary on Research	That the relative short scope of leisure research has led to the inapplicability of leisure research within a practical setting. Further interdisciplinary work is recommeneded in order to make research more effective and applicable.	Sorokin, Galtung
4. Borgers et al. 2015	Sports Participation Styles Revisited: A time-trend study in Belgium from the 1970s to the 2000s	Looking at groups and subgroups of populations of adults through assumed survey (95 boys and 131 girls) and there participation in a variety of sporting activities.	There are two specific groups of activity, performance and participation oriented activities, both providing different typologies activity. 5 groups were established as trends: Traditional Team, Traditional Individual, Local-Recreation, Physical Health and Fitness, Lifestyle Sports	Scheerder
5. Kidder, 2008	Appropriating the City: Space, Theory and Bike Messengers	Discussion and observation with Bike Messengers over a 5 year time period.	Space matters in determining the spatial use patterns for bike messengers and skateboarders. Further spatial pattern used is recommended.	Lefebvre
6. Certeau, 1984	The Practice of Everday Life	NA - Theoretical Book on Spatial Usage	Certeau discusses the formative power of the vectors of people, and how their movements spatialize the city. This theory is applicable to all occupants within the city including those belonging to the genre of alternative sport. This alternative framework of movement and the interpretation of the city could provide critical insights to new spatial organizations within architectural and urban contexts.	None Observed
7.Wooyeal and Bell, 2004	Citizenship and State-Sponsored Physical Education: Ancient Greece and Ancient China	Historical Research through existing text.	This article argues that emphasis on citizenship through state sponsored physical education fosters a high level of concern for the state by participants, and in contrast, the lack of emphasis creates a lack of concern. Examining soldier training, physical education and corresponding attitudes fostered in Ancient Greece and Ancient China tests this theory of politicization or non-material attachment through physical activity.	Dongkyu
8. Skille, 2010	Competiveness and health: The Work of Sports Clubs as seen by Sport Clubs Representatives - a Norwegian Case Study	interviews of recreation volunteers, the consultation of primary research involving participation data in different types of sports clubs.	This article examines what sports club's vested interests and directions are within a club context and what values they promote. This is compared to what state sponsored sport directives are and how they differ. Overall the article suggests that successful club rhetoric's focus on participation and experience rather than achievement or health goals.	Ken, Campbell
9. Traganou, 2012	Foreword: Design Histories of the Olympic Games	NA - Commentary	The emerging design trends surrounding the Olympic Games. 3 Categories: Long term Facility Usage, City Gentrification, Modern discourses in the Olympics	None observed

Recommended Journal Articles

Figure A2.03. Summaries of Journal Articles

TABLE 3: RECOMMENDED OR BASIC JOURNAL ARTICLES, BOOKS OR REFERENCES

Author and Date	Article Name	Research Methodology/Approach	Synthesis of Findings	Expert Source(s)
10. Statistic Canada, 2013	Directly measured physical activity of Canadian adults, 2007 to 2011	Canadian Health Measures Survey 2007-2011	Regular physical activity is recommended for adults, the majority of adults are not physically active during the day, few adults met physical activity guidelines and obesity is related to physical activity levels.	CHMS
11. Lin and Ting, 2014	Does Built Environment Matter to Early Adolescents Physical Activity?	International Physical Activity Questionnaire IPAQ 2010-2011	Relatable built environments to physical activity. Attributes of physical environments and accessibility to these environments are very important to making sure they are successful	Loon and Frank
12. Humphrey and Szlyk, 2005	Does the Built Environment influence Physical Activity?	NA - Commentary on Research	There research provides hard evidence depicting a clear relationship between health and physical activity, but it also makes suggestions for promotion of physical activity at a multitude of scales.	None observed
13. Dalziel, 2011	The economic and Social value of Sport and recreation to New Zealand	NA - Commentary and collection of various Research	Though qualitative studies are sometimes limited in what theoretical projections they are able to make, the guide explicitly demonstrates the high value placed in physical activity in New Zealand.	None observed
14. Kaczynski and Henderson, 2007	Environmental Correlates of Physical Activity: A Review of Evidence about Parks and Recreation	Literature Review of quantitative leisure and health science research.	The complexity of the problem is quite large, because leisure involves so many different variables. The lack of partnership and collaborations has created barriers to effective research. A preliminairy understanding of this problem has been established, but it is a largely developing field.	Sallis
15. Skille, 2005	Individuality or Cultural Reproduction?	Primary research based on observation, 812 questionaires and quantitative measurement of participants in Oslo's Sport City Programme.	Comments on the Sport City Program put in place in Norway to provide alternative less committal sporting opportunities for less privileged youth. The alternative sport opportunities differ from traditional ones based on time commitments, independent vs. team activities, and sensation vs. performance opportunities. The study concluded that providing these opportunities reproduced many of the same participation patterns found in traditional sport, but had less stratification of participants.	Smith, Sallis
16. Kent, 1979	The Institutionalization of Sport Forms	NA - Qualitative Analysis of the current status of athleticism	Speaks to the institutionalization of non-traditional sports by commercial or media corporations. Compares and contrasts play-sports versus athletic-sport subcultures. Specific points made: Pressure to institutionalize will occur once a sport becomes popular enough, either internally or externally, usually due to safety concerns.	Loy, Pearson
17. Sport Canada, 2015	An Introduction to Physical Literacy	NA - Brochure document pertaining to practical application of physical literacy writing	In point form describes the basic physical attributes needed in a variety of different sports to be "literate" in sport. Also includes a breakdown of learning and acquisition stages for these skills. No research specific support is given.	None observed
18. Ford et al. 2011	The Long-Term Athlete Development Model: Physiological Evidence and Application	NA - Summary of research relative to the claims and statements made in Long Term Athlete Development modeling	Physical Literacy models should be treated not as a rule, but as a model in progress. Many of the claims made in the model are unsubstantiated, or there is various research which contradicts the model. The model still has huge amounts of relevance, but needs further development to increase it's accuracy and applicability.	Balyi and Hamilton
19. Balyi et al. 2015	Long Term Sailor Development	NA - Prescriptive measures of the Long Term Athlete Development Model (LTAD) on the sport of sailing.	This is a very in depth and sailing specific guide to determining the needs of the sport in terms of sport specific progression. This document is an extrapolation of the LTAD model, however this means if the LTAD model is flawed then this approach could also suffer from lack of accuracy.	None observed

TABLE 3: RECOMMENDED OR BASIC JOURNAL ARTICLES, BOOKS OR REFERENCES

Author and Date	Article Name	Research Methodology/Approach	Synthesis of Findings	Expert Source(s)
20. Navaneelan and Janz, 2014	Adjusting the Scales: Obesity in the Canadian Population after correcting for responding bias	Review of obesity statistics and correcting for bias from Canadian Community Health Survey (CCHS) 2011-2012.	There is less obesity in urban city areas and British Columbia in general. Self reported data about obesity is typically lower than actual measured data.	Gorbers, Shields
21. Tjepkema, 2006	Adult Obesity	Use and Analysis of CCHS Data from the 2004 survey	Comparative Data from the US and Canada, examining obesity statistics. It shows that there has been a rise in obesity in Canada and the US.	Tremblay
22. Woolley, 2006	Freedom of the City: Contemporary Issues and Policy Influences on Children and Young People's Use of Public Open Space in England	NA - Commentary on physical activity public space in England	Public space can be very formative in the memories of the individual, especially when considering physical activity and leisure. Space can be designed for facilitate or inhibit this. Further understandings of how academic literature can be applied to policy development needs to be addressed, so that research can become applicable.	Borden, Woolley
23. Baran et al, 2014	Park Use Among Youth and Adults: Examination of Individual, Social, and Urban Form Factors	20 randomly selected parks in Durham, North Carolina. The examined amenities within the area where considered within 1/4 mile of the park. Park elements, and surrounding elements were analysed as independent variables.	Safety is a huge element in park usage. They were able to correlate different elements to different age groups for attractiveness. Cul-de-sacs are not conducive to park usage. Basketball courts were associated with boys and male usage, but not subgroups. Parks are generally more attracttive to sub-groups of populations, excluding males and boys, while shelters, walking areas and tennis courts were popular amongst women.	Frank and Loon
24. Ameel and Tani, 2012	Parkour: Creating Loose Spaces?	9 in depth interviews with traceurs in two finnish cities.	Parkour is another alternative interpretation of the cityscape. Much like skateboarding, it uses built elements for purposes other than what it was originally intended for, and it includes social and cultural elements inherent to the sport of parkour itself. This document analyses the sport of parkour in similar (but not identical) terms as Certeau, using a framework of “loose” and “tight” space to classify built environments	Koskela, Stevens
25. Koski, 2008	Physical Activity Relationship (PAR)	NA - Cumulative summary and theoretical framework of non-sport specific activity activators	They take a very interesting metaphysical approach to the dissection, theorizing that to be effectively participatory in sport and physical activity you must be involved in the cultural and social activities related to the activity. Effective participation is based on 4 fields, which has been an evolution based on modern patterns of societal development (ie. Consumerism.)	Giddens, Dunning, Deinilä, Shilling
26. Sandford et al, 2006	Re-engaging disaffected youth through physical activity programmes	NA - Review of Key Literature	The source examines the conjecture by many sporting experts that sport provides not only the inherent health benefits we are all aware of, but mental, social and psychological benefits to the athlete as well. There is a desert of literature surrounding this phenomenon, but Sandford gathers much relevant data to support this belief	DSS, DCMS, DfES,
27. Woolley and Johns, 2001	Skateboarding: The City as a Playground	NA - Qualtiative Summary of elements	Accessibility, trickability, sociability and compatibility are important factors, but this study is limited to understanding the factors due to small sample size.	Lynch, Hart, Borden
28. Valle, 2014	Sport in the City	NA - Qualitative Summary and typological Categorization of Urban Leisure space	Valle has created a guide to the typological categorization and classification of urban space through the study of case studies. General elements.	None observed
29. Gratton and Henry, 2001	Sport in the City	Summary of multiple case studies and the findings in regards to the economic and participant repercussions of sporting events, programming and policy. (300 pg book)	There is a huge range of effects that sport has on our built environments through direct and indirect effects such as economy, urban organization, and future usage of major event venues. Further analysis and synthesis is needed to create a framework to encapsulate all of these factors into a dynamic framework.	Varies based on chapter.

TABLE 3: RECOMMENDED OR BASIC JOURNAL ARTICLES, BOOKS OR REFERENCES

Author and Date	Article Name	Research Methodology/Approach	Synthesis of Findings	Expert Source(s)
30. Canadian Heritage, 2013	Sport Participation 2010	Based on Canadian Census data from 1992, 1998 and 2005.	This is in some respects; the brother study to Dalziel's The economic and social value of sport and recreation in New Zealand. Though inherently many of the research techniques will be different, they both look at a variety of similar factors dealing with obesity, participation in physical activity and sport. The studies differ in that Canada's study is aimed more towards finding causality for decline, while New Zealand's focuses on its successes.	General Social Survey, Stats Canada
31. Howell, 2013	The "Creative Class" and the Gentrifying City	NA - Author takes a specific stance on the use of urban spaces, and then supports his argument.	Many argue that skateboarding is an occupation of space, and doesn't have any social capital to exchange for usage. However it is now being used as tools for spatial gentrification and organization with its rise in popularity. This article raises the popular question of accessibility versus maintaing rigid values around sport or activity.	Borden
32. Skille, 2008	Understanding Sport Clubs as Sport Policy Implementers	NA - Examination of Sport policy implementation in Norway: theory, practice and	An interesting metaphysical analysis of sport policy implementation and the various channels that material is passed down through different organizations, and the direction of information flow.	Skille, Seippel
33. Loon and Frank, 2011	Urban Form Relationships with Youth Physical Activity: Implications for Research and Practice	NA - Synthesis of Empirical research on the relationship between youth physical activity and urban form from different disciplines, particularly for planners.	The scope of the current research is quite small, however this being said it is concluded that urban form either constains or promotes physical activity in youth. Partnerships with stakeholders including schools and public health officials will make it possible to promote greater physical activity, and refine evidence based approaches. Overall elements were: School location, zoning, street design, safety of school routes, park investment, process oriented policy, participatory planning, joint use agreements and walking school buses.	Kerr, Frank, Carver
34. Canter, 1977	The Psychology of Place	NA - A synthesis of multiple psychological studies based on understanding the basic principals of how spatial organization and design can effect the users interpretations and perceptions of space. (Book)	After a detailed analysis of current research, Canter forms a very general theory that "place" is created through the design of three specific psychological aspects that can be controlled through the physical environment. The elements are: Pjhysical Attributes, Activities, and Conception of Space.	Many Sources
35. Hall, 2014	Cities of Tomorrow	NA - Historical case study approach to understanding different approaches to City Design and the potential gains and pitfalls with the typologies of approaches in different environments. (Book)	Urban planning is a new industry and there have been many failures and successes. First, a 1 size fits all approach does not work ever. Generally speaking, bottom up collaborative interactive and publically engaging design practices have resulted in more successful urban environmental scenarios than theoretically intensive, top down approaches.	Many Sources
36. Polanyi, 1944	The Great Transformation	NA - Social Theory (Book)	Polanyi develops the dichotometric difference Gemeinschaft and Gesellschaft of community and society, and that community needed to be unraveled in order to support society.	Many Sources
37. Berman, 1982	All that is Solid Melts into Air	NA - Social Theory based on case studies, hisortical and fictional writing (Book)	Berman examines how the shifting psychological condition associated with the modernization of our built environments.	Many Sources

TABLE 4: ARCHITECTURE JOURNAL ARTICLES

Author and Date	Article Name	Research Methodology/Approach	Synthesis of Findings	Expert Source(s)
Stedman, 2003	Is it Really Just a Social Construction? The Contribution of the Physical Environment to Sense of Place	Surveyed 1000 random Villa owners in the Wisconsin lakes area. 72% return rates on surveys. Survey asked a variety of questions on a agree/disagree basis of place based observations.	Characteristics of the physical environment at the basis of meaning, either literally or acting as a mechanism in order to further the social actor to preserve meaning.	Urry
Stedman, 2002	Psychology of Place. Predicting Behavior From Place-based Cognitions, Attitude and Identity	Qualitative supporting argument for article mentioned above. Looking at same quantified data mentioned above.	This data was initially interpretted through a cognititon-attitude-identity frame, but was found to be inconclusive.	None observed

Architecture Journal Articles

Figure A2.04. Summaries of Journal Articles

A3.0 Appendix (Hybridizing Methodology)

Title	Physical Activity Relationship (PAR)	Diversity in a Democracy: Expanding the Recreation Opportunity Spectrum	Recreation research and planning in the Federal Republic of Germany: A Commentary	Nature of place attachment: a Study among recreation homeowners in Southern Norway
Author(s)	Koski, Pasi	Manning, Robert E	Romsa, Gerald H	Kaltenborn, Bjorn P
Published	International Review for the Soci	Leisure Sciences, 1985	Leisure Sciences, 2009	Leisure Sciences, 1997
Location of Study	Finland	Vermont	Germany	Southern Norway
Annotation	Koski examines the relationship of individuals "to [the] cultural ensemble of sport ensemble of sport and physical activity." Koski organizes participation in sport through sociological factors. This is a unique approach because social factors are used as the organizing framework to participation. Typically participation is seen as the organizing force for sociological factors. Organization using sociological factors allows for connections to be made to physical elements not typically associated with physical activity.	A paper defending and criticizing the use of the Recreation Opportunity Spectrum (ROS), which is a system defining different types of spaces that are important to successful recreation areas. The paper critisizes the spectrum, suggesting that it is too narrow and may inhibit diversity rather than encourage it.	With recreation activites being consumed at a much higher rate in more densely populated areas in Germany, attractivity modeling of recreation space has become a helpful tool in making sure that these spaces are as efficient and effective as possible.	This study conceptualizes place attachment theory into a series of infrastructural components. Kaltenborn identifies a series of factors that contribute to a persons long term connection to an environment.
Factors	Personal Physical Activity Following of Physical Culture Production in Physical Culture Consumption of Meanings of Physical Culture	Management Factors Nonrecreational Resource Us Onsite management Social Interaction Acceptibility of Visitor Impacts Acceptable Regimentation	Natural Factors Physical Factors Social Factors	Area Recreation Home History Nature - Culture Family - Social
Infrastructurally or Socially Driven?	Social	Infrastructure	Infrastructure	Infrastructure

Figure A3.01. A comparison between the four major papers designated as quantitative. The table compares the paper on a variety of factors.

Physical Activity Relationship (PAR)	
Personal Physical Activity	The intention of activity in relation to space is direct
Following of Physical Culture	Environmentally, space that contributes, aids or enhances the ability of the user to observe sporting patterns
Production in Physical Culture	Specific teaching or learning space would assist with instructors, while effective office, storage and maintenance spaces are also relevant.
Consumption of Meanings of Physical Culture	To assist consumers to become associated with sport through material procurement; effective shopping, branding and opportunities for association using spatial strategy would be productive

Diversity in a Democracy: Expanding the Recreation Opportunity Spectrum	
Management Factors	Access, Access systems (Roads and trails), systems of conveyance (any type of transportation network)
Nonrecreational Resource Uses	The compatibility of other facilities and resources around the site (stores, but also nature)
Onsite management	Extent, apparentness, complexity, facility
Social Interaction	How much interaction between users takes place
Acceptibility of Visitor Impacts	degree of impact, prevalence of impacts (isolated impact or widespread)
Acceptable Regimentation	Laws, regulations, guidelines and/or rules that determine acceptable actions for users.
OR	
SOCIAL FACTORS	Interaction between users, participants and staff
ENVIRONMENTAL FACTORS	The interaction with natural features within the recreation envrionment
MANAGEMENT FACTORS	Rules, guidelines, access, trail usage, storage and equipment

Recreation research and planning in the Federal Republic of Germany: A Commentary	
Natural Factors	Land Area, Climate, Water Areas, Vegetation types, fauna types, air purity, freedom from noise, nature monuments, relief (views), valleys, peaks
Physical Factors	Infrastructure, Camping, overnight facilities, sport facilities, Spas, Zoos, parks, gardens, trails and view points, shops
Social Factors	Historical buildings, museums, fairs, festivals, sporting events, interest in preservation of local history, tradition, culture, interest in tourists, investment abilities

Nature of place attachment: a Study among recreation homeowners in Southern Norway	
Area	Natural landscape, local municipality, nature
Recreation Home	Recreation home
History	Historical precedence of the area, cultural tradition space
Nature - Culture	The cultural landscape and use of resources, the natural environment, outdoor life traditions, local cultural history
Family - Social	friends and aquaintances in general, family life at the recreation home, relatives anf family, residents in local municipality, special activities

Figure A3.02. An individual description of each typology contained within the four significant research papers.

Initial Element Name	Kept, Adapted or Removed	Final Element Name	Original Source	Initial Category	Final Category	Justification of Action
Personal Physical Activity	Adapted	Physical Activity Space	*Physical Activity Relationship (PAR)*	NA	Sport	Please see *Hybridizing Spatial Sport Theory*
Following of Physical Culture	Adapted	Spectation Space	*Physical Activity Relationship (PAR)*	NA	Cultural/Social	Please see *Hybridizing Spatial Sport Theory*
Production in Physical Culture	Adapted	Learning, Teaching and Coaching Space	*Physical Activity Relationship (PAR)*	NA	Coaching	Please see *Hybridizing Spatial Sport Theory*
Consumption of Meaning of Physical Culture	Adapted	Consumer Space	*Physical Activity Relationship (PAR)*	NA	Consumer	Please see *Hybridizing Spatial Sport Theory*
Acceptability of Impact	Removed	NA	*Diversity in a Democracy*	Environmental Conditions	NA	There is no immediate spatial quality associated with the moral position of having acceptable impact. The element was not specific, it did not define whether it was talking about construction, human intervention or usage impact, making it even more difficult to define spatially.
Onsite Management (Facility)	Kept	NA	*Diversity in a Democracy*	Environmental Conditions	Physical/Management	Onsite Management's intent is to maintain the current facility, therefore it best suited the Physical/Management category after re-ogranization
Social Interaction (User Interaction)	Removed	NA	*Diversity in a Democracy*	Social Conditions	NA	Social interaction on a general level is not measurable, and isn't able to be associated with a specific spatial characteristic.
Access Systems (Roads and Trails)	Kept	NA	*Diversity in a Democracy*	Managerial Conditions	Physical/Management	The intention of these elements is provide access to the site, therefore it fits best under physical/management
Transportation Networks	Kept	NA	*Diversity in a Democracy*	Managerial Conditions	Physical/Management	Transportation network elements intention is to provide access, hence its placement in physical/management.
Resource Extraction	Adapted	Resource Extraction Sites	*Diversity in a Democracy*	Nonrecreational Resrource Use	Physical/Management	These sites don't relate immediately to usage or the sport, and act as a secondary source of revenue and access. Therefore they are best suited for physical/management.
Resource Management	Removed	NA	*Diversity in a Democracy*	Nonrecreational Resrource Use	NA	The management of resources does not have a spatial quality associated with it, therefore it was removed.
Land Area	Adapted	Intended Natural Areas	*Recreation and Research Planning in the Federal Republic of Germany*	Natural Factors	Natural Landscapes	the category of land area was very broad, but due to its initial category, it was adapted to "intended natural areas" which would be defined as areas surrounding the site that had remained untouched and/or undeveloped.
Climate	Removed	NA	*Recreation and Research Planning in the Federal Republic of Germany*	Natural Factors	NA	Climate is an important part of a sporting environment, but remained directly unquantifiable in terms of spatial elements.
Water Areas	Adapted	Water access points and Waterparks	*Recreation and Research Planning in the Federal Republic of Germany*	Natural Factors	Natural Landscapes	Water areas can be quite expansive, and would scew results based on lake size. But access points and artificial waterparks are quantifiable spatial elements.
Vegetation Types	Removed	NA	*Recreation and Research Planning in the Federal Republic of Germany*	Natural Factors	NA	Vegetation types influence the spatial quality of the built environment, but only in a supporting role. They do not define recreation environments in general.
Fauna Types	Removed	NA	*Recreation and Research Planning in the Federal Republic of Germany*	Natural Factors	NA	Much like vegetation types, fauna types influence built environments, but only from a secondary role.
Air Purity	Removed	NA	*Recreation and Research Planning in the Federal Republic of Germany*	Natural Factors	NA	Air purity cannot be defined or adapted to be a primary defining feature of built environment.
Freedom from Noise	Removed	NA	*Recreation and Research Planning in the Federal Republic of Germany*	Natural Factors	NA	Freedom from noise is an important subfactor when designing space, but isn't typically the defining characteristic to a space.
Natural Monuments	Kept	NA	*Recreation and Research Planning in the Federal Republic of Germany*	Natural Factors	Natural Landscapes	Natural monuments are abnormal elements
Views	Removed	NA	*Recreation and Research Planning in the Federal Republic of Germany*	Natural Factors	NA	Views were already included in the category "trails and viewpoints"
Infrastructure	Adapted	Sporting Infrastructure	*Recreation and Research Planning in the Federal Republic of Germany*	Physical Factors	Sport	For the purpose of defining sport and recreation environments, infrastructure was adapted to be "sporting infrastructure" Though general infrastructure is a crucial element of any facility, it doesn't function to define the primary purpose of space.
Camping and Overnight Facilities	Kept	NA	*Recreation and Research Planning in the Federal Republic of Germany*	Physical Factors	Recreational Home	Camping and overnight facilities defines a broad range of physical elements that would primarily define a space.
Sport Facilities	Removed	NA	*Recreation and Research Planning in the Federal Republic of Germany*	Physical Factors	NA	Though this is at the core of the thesis, this is too broad a category to be an effective tool for defining space.
Spas	Kept	NA	*Recreation and Research Planning in the Federal Republic of Germany*	Physical Factors	Sport	Spas are a physical activity directly related to sport, and though they are not an athletic endeavour, they still represent recreational space.
Zoos	Kept	NA	*Recreation and Research Planning in the Federal Republic of Germany*	Physical Factors	Sport	Zoos and their inherent program are recreation space, and would define the spatial qualities of an area.
Parks	Kept	NA	*Recreation and Research Planning in the Federal Republic of Germany*	Physical Factors	Sport	Parks directly define spatial patterns of recreation areas.
Gardens	Kept	NA	*Recreation and Research Planning in the Federal Republic of Germany*	Physical Factors	Natural Landscapes	Gardens are specifically programmed areas, and are designed with the primary intent for people to relax, and enjoy nature.
Trails and Viewpoints	Kept	NA	*Recreation and Research Planning in the Federal Republic of Germany*	Physical Factors	Natural Landscapes	Trails and viewpoints are elements that have the primary function of defining a physical environment for the spectation of the natural landscape.
Shops	Kept	NA	*Recreation and Research Planning in the Federal Republic of Germany*	Physical Factors	Consumer	Shops do define physical environments, and their primary purpose is to sales of goods.
Historical Buildings	Kept	NA	*Recreation and Research Planning in the Federal Republic of Germany*	Social Factors	Cultural/Social	This category is already quite definitive in terms of spatial environments.
Museums	Kept	NA	*Recreation and Research Planning in the Federal Republic of Germany*	Social Factors	Cultural/Social	Museums are a very specific typology of built space. Though museums aren't directly related to sporting environments, their proximity or contents can be.

Sport Sociology Category Analysis, *Figure A3.03.*
This table examines each individual typology from every paper, and provides rationale for it's continued use.

Initial Element Name	Kept, Adapted or Removed	Final Element Name	Original Source	Initial Category	Final Category	Justification of Action
Fairs	Adapted	Special Event Space	*Recreation and Research Planning in the Federal Republic of Germany*	Social Factors	Cultural/Social	This is cultural gathering, and fair space would be the obvious spatial association to this event, however due to the scarce occurance of fair activity, this category was amalgamated into "special events."
Festivals	Adapted	Special Event Space	*Recreation and Research Planning in the Federal Republic of Germany*	Social Factors	Cultural/Social	Festivals follow a similar pattern to fairs. Though these have an obvious corresponding spatial component, the limited occurance of such events makes having an individual category for this element restrictive. Again this category was amalgamated into "special events."
Sporting Events	Removed	NA	*Recreation and Research Planning in the Federal Republic of Germany*	Social Factors	NA	Sporting events was removed because its corresponding physical space would be sporting facilities, a spatial topic that has been widely represented by other factors.
Preservation of Local History	Removed	NA	*Recreation and Research Planning in the Federal Republic of Germany*	Social Factors	NA	The corresponding spatial pattern of preserving local history, would be historic building, a category that has already been represented.
Tradition	Removed	NA	*Recreation and Research Planning in the Federal Republic of Germany*	Social Factors	NA	The spatial category which parralels traditions, would be tradition space (ex. A Teepee for Native American celebrations). This element has already been represented in "outdoor tradition space."
Culture	Removed	NA	*Recreation and Research Planning in the Federal Republic of Germany*	Social Factors	NA	Culture is an expansive topic, and would have multiple corresponding spatial elements, which is why this is a expansive category, rather than an individual element.
Interest in Tourists	Removed	NA	*Recreation and Research Planning in the Federal Republic of Germany*	Social Factors	NA	Interest in tourists is an effective economic tool, particularly outlined in *Sport in the City* (Gratton, 2001). However, this is more of a supplimentary element, or overarching planning theme, rather than a defining spatial element.
Investment Abilities	Removed	NA	*Recreation and Research Planning in the Federal Republic of Germany*	Social Factors	NA	Investment ability in any site is important to planning and financial strategy, but plays much more of a supporting role in spatial element development, rather than
Natural Landscapes	Removed	NA	*Nature of Place Attachment*	Area	NA	Natural landscape is important, but to include any natural landscape within the vicinity of the facility could significantly scew results when attempting to represent immediate physical factors.
Local Municipality	Adapted	Local Municipality Building	*Nature of Place Attachment*	Area	Physical/Management	Local municipalities can play supporting or direct roles in managing an area, park, field, beach, lake or partial areas of any of the areas listed above. Therefore having a municipality spatially present can impact a facility.
Nature	Removed	NA	*Nature of Place Attachment*	Area	NA	Nature is a hugely broad category and therefore was removed from the table.
Historical Precedence of the Area	Removed	NA	*Nature of Place Attachment*	History	NA	Historical precedence of the area is important to consider spatially, but only plays a supporting role in defining this space, therefore this category was removed.
Cultural Traditional Space	Kept	Cultural Tradition Space	*Nature of Place Attachment*	History	Cultural/Social	Cultural tradition space is already defining space that has an immediate spatial goal.
Cultural Landscape of Resources	Removed	NA	*Nature of Place Attachment*	Nature - Culture	NA	The cultural landscape of resources is an interesting but relatively abstract. This would be difficult to adapt as a specific spatial typology and therefore was removed from the list.
The Natural Environment	Removed	NA	*Nature of Place Attachment*	Nature - Culture	NA	"The Natural Environment" is a hugely broad category and was removed for lack of specificity.
Outdoor Life Traditions	Adapted	Outdoor Tradition Space	*Nature of Place Attachment*	Nature - Culture	Cultural/Social	Outdoor life traditions are an important social aspect of recreational areas, and their immediate spatial component would be outdoor tradition space.
Local Cultural History	Adapted	Historic Monuments, museums, gallery space	*Nature of Place Attachment*	Nature - Culture	Cultural/Social	Local cultural history can be represented spatially through museums, historic monuments and gallery space, therefore this element was spatially adapted.
Friends and Aquaintances	Removed	NA	*Nature of Place Attachment*	Family - Social	NA	Social aspects are important to any recreation and physical activity site, but the broad category of friends and aquaintance represents multiple spatial components not defined, therefore this element was removed.
Family Life at the Recreation Home	Adapted	Proximity to Local Residents	*Nature of Place Attachment*	Family - Social	Recreational Home	Having proximity to local residents is important, and homes that are nearby constitute this spatial representation.
Relative and Family	Removed	NA	*Nature of Place Attachment*	Family - Social	NA	Family and relatives are important social elements, but are almost impossible to represent spatially because there are so few physical environments meant only for family and friends. In addition, this level of specificity would render the space inaccesible to the larger population. Therefore this element was removed.
Residents in local municipality	Adapted	Proximity to Local Residents	*Nature of Place Attachment*	Family - Social	Recreational Home	The importance of social connections are important, family or otherwise and many of these connections happen in non recreation spaces. Therefore this element was adapted.
Special Events	Adapted	Special Event Space	*Nature of Place Attachment*	Family - Social	Cultural/Social	Special events can define an area spatially, but due to the lack of consistency of event, this element was adapted to the general category of "special event space."

Sport Sociology Category Analysis

Figure A3.03. (Continued)

Initial Element Name	Kept, Adapted or Removed	Final Element Name	Initial Category	Final Category	Justification of Action
Borders/Demitation	Removed	NA	Strategic Planning Idea	NA	Borders are an important spatial element, but do not have a primary purpose for interacting with the public
Point of Departure	Removed	NA	Strategic Planning Idea	NA	This category is a general strategy to make sure the spatial requirements of an activity are met. This doesn't describe a specific spatial quality and was therefore removed.
Small Disparate Units	Removed	NA	Strategic Planning Idea	NA	This is a general spatial strategy, rather than a quality, and cannot be adapted to a specific spatial quality.
Flexible Design	Removed	NA	Strategic Planning Idea	NA	This is a general strategy, and doesn't have a corresponding spatial quality.
Affiliation	Removed	NA	Strategic Planning Idea	NA	This is an general aesthetic design strategy, but is ineffective and unadaptable to specific spatial qualities.
10% Activity	Removed	NA	Strategic Planning Idea	NA	This is a general strategy for planning purposes, and doesn't have specific research to support this concept, nor does it have a specific spatial quality associated with it.
Utilisation of Façade and Roof Surfaces	Removed	NA	Strategic Planning Idea	NA	This is an interesting concept, but is more of a strategic for spatial acquirement rather than spatial definition.
Remote Parking	Removed	NA	Strategic Planning Idea	NA	Great idea, but if the parking is not on site, than its spatial qualities will not be able to be documented.
Keep Certain Areas	Removed	NA	Strategic Planning Idea	NA	This is a really general planning concept, and no spatial qualities other than a lack of definition can be associated with this.
Varied Networks and Trails	Adapted	Trails and Pedestrian Pathways	Strategic Planning Idea	Physical/Management	This category was adapted specifically for pedestrian and site usage. Unlike specific access, these trails are used for recreation across the site.
Continous Landscape	Adapted	Continous Greenspace	Strategic Planning Idea	Environmental	The description of this strategy fit the spatial quality of recreation specific greenspace at a site or connected to its recreational trail system.
Scenic Landscape	Removed	NA	Strategic Planning Idea	NA	Though scenery is an important part of site, it becomes very diffifult to actively spatially describe. There is a category similar to this, called scenic viewpoints that do have a spatial quality that have the primary purpose of observing landscape.
General Landscape	Removed	NA	Strategic Planning Idea	NA	This is a planning concept, and does not have a specific spatial quality associated with it.
Larger Activities 400m	Adapted	Larger Sporting Fields	Strategic Planning Idea	Sport	The description of this planning strategy identified any sporting facility that were specific to a recreational activity, therefore it was adapted to identify any large sporting field related to the site and/or facility.
Multiple Uses	Removed	NA	Strategic Planning Idea	NA	Planning technique used to diversify an area, but doesn't have any identifiable spatial qualities.
Mobile Uses	Adapted	Mobile Storage Units	Strategic Planning Idea	Physical/Management	The spatial qualities initially described talked about the movement of equipment and largely storage, so it was adapted to mobile storage units for sport and recreation equipment.
Sports/exercise 200m	Removed	NA	Strategic Planning Idea	NA	A planning strategy used for proximity measurements of spaces and/or facilities. This does not have a spatial component and was removed.
Social Meeting Place	Kept	NA	Strategic Planning Idea	Social/Cultural	Social meeting places have a broad contextual application but still have spatial elements that have a primary goal in facilitating peoples interaction from a specific standpoint.
Facing the Sun	Removed	NA	Strategic Planning Idea	NA	Sun angle and exposure is important, but describes a supporting spatial quality, rather than a primary one.
Density	Removed	NA	Strategic Planning Idea	NA	Density is a general spatial quality, but has no primary goal of informing human interaction, therefore it was removed.
Varied Contextual Conditions	Removed	NA	Strategic Planning Idea	NA	Varied contextual conditions are important to acknowledge, but do not describe the relationship between a specific spatial quality and how it effects human interaction.
3D Planning	Removed	NA	Strategic Planning Idea	NA	This only describes a very general spatial quality, and does not associate a specific behaviour to type of organization, and therefore was removed.
Green Space 5 Minutes	Adapted	Green Space	Strategic Planning Idea	Environmental	This category had a specific spatial quality, while the proximity measurement did not have any support in terms of its development, so the definite proximity was replaced with an indefinite one.
Junction	Removed	NA	Strategic Planning Idea	NA	This describes spatial organization of various elements, rather than an individual element, therefore this category was removed.
Connections between Relevant Areas	Removed	NA	Strategic Planning Idea	NA	Mixed use space is a planning concept, but does not have specific spatial qualities associated with it
Topographical Elements	Removed	NA	Strategic Planning Idea	NA	Though this category describes spatial elements, they are so broad that a huge variety of spaces would be able to be included in this category, therefore it was removed for lack of specificity.

Architectural Research Categorization Analysis

Figure A3.04. A table categorizing and explaining the analysis of various spatial typologies from architectural sources.
(continued on next page)

Initial Element Name	Kept, Adapted or Removed	Final Element Name	Initial Category	Final Category	Justification of Action
Green Space 15 Minutes	Removed	NA	Strategic Planning Idea	NA	This distance is too far for the context of an individual facility, and has been removed for a lack of applicability of a facilitiy specific evaluatory criteria.
City Space 800m	Removed	NA	Strategic Planning Idea	NA	This category references an 800m distance to recreation facility, but does mention what needs to be at the centre of this space. In addition, there is no data suggesting 800m is the critical distance for pedestrian connection within a city context, therefore this category was removed.
Ease of Access	Removed	NA	Specific Qualitative Ideas	NA	Ease of access does not describe a specific spatial quality, but rather a level of accessibility in regard to facility.
Adaptation	Adapted	Adapted Sport Space	Specific Qualitative Ideas	Sport	This is a specific type of sporting space, whose spatial quality is not conventional, but adheres to the demands of a specific sport.
Open Welcoming Character	Removed	NA	Specific Qualitative Ideas	NA	Though the character of the space is important, there is no specific spatial quality associated with this characteristic, therefore was removed.
Small Niches	Adapted	Small Niche/Pause Points	Specific Qualitative Ideas	Social/Cultural	The description of these spaces was to facilitate micro social interactions through semi-private spaces in public areas.
Lighting	Removed	NA	Specific Qualitative Ideas	NA	This category did not describe any specific spatial qualities and was therefore removed.
Visibility	Removed	NA	Specific Qualitative Ideas	NA	This is an important spatial quality, but only defines space from a secondary perspective, rather than giving the space its primary purpose.
Dimensons	Removed	NA	Specific Qualitative Ideas	NA	The proportion of buildings to the human scale is important, but plays a secondary role in defining the spatial qualities of the area. Therefore this category was removed.
Small Spaces	Removed	NA	Specific Qualitative Ideas	NA	The activities that would occur in the small spaces were not described, nor was the relationship to how small space facilitates any type of activity.
Mixed Functions	Adapted	Mixed Cultural/Social Space	Specific Qualitative Ideas	NA	By using smaller spaces with basic functions to encourage social and cultural exchanges, it allows for the micro adaptations of space through specific programmatic adaptations.
Flexible Use	Removed	NA	Specific Qualitative Ideas	NA	Flexible space is a planning concept, but does not specifically define spatial elements, nor does it describe its effects of organizing programmatic elements in a flexible manner.
Direct Connection A-B	Removed	NA	Specific Qualitative Ideas	NA	This is a planning concept, but does not give criteria on defining how to determine relevancy between elements.
Connecting Areas	Adapted	Trails and Pedestrian Pathways	Specific Qualitative Ideas	Physical/Management	Spatial elements in this category were similar enough to the element *Trails and Pedestrian Pathways* that it was amalgamated into this category.
Play/Exercise	Adapted	Green Space	Specific Qualitative Ideas	Environmental	The description associated informal exercise with the spatial quality of green space, so this element was adapted to green space specifically.
Green Space	Kept	NA	Specific Qualitative Ideas	Environmental	The most direct element from the architectural categories, green space described a specific spatial quality. Many other categories were amalgamated into this element.
Multiple Uses	Removed	NA	Specific Qualitative Ideas	NA	This category is very similar to mixed function, but it still lacks spatial specificity about what actual qualities are needed in order to have a specific intended effect.
A Simple Shelter	Adapted	Simple Shelter	Specific Qualitative Ideas	Social/Cultural	This element directly described a spatial quality, and associated these qualities with a broad range of social qualities.
Flexible Design	Removed	NA	Specific Qualitative Ideas	NA	Flexible design is a very broad concept, and doesn't outline specific spatial qualities, or the corresponding social responses.
Scenic Nature Areas	Adapted	Scenic Viewpoints	Specific Qualitative Ideas	Environmental	Scenic viewpoints are an important environmental element, and have a very specific spatial quality.
Various Levels	Removed	NA	Specific Qualitative Ideas	NA	Various levels is a broad spatial generalization promoting terracing of space essentially. Though this can be an effective tool, this is being described more of a supplimentary design strategy to make the primary program more successful.
Social Meeting Place	Adapted	Social Meeting Place	Specific Qualitative Ideas	NA	The initial spatial elements were not clearly defined in the description, but the overall intention seemed to lean towards informal public gathering spaces.
Public Ground Floor	Removed	NA	Specific Qualitative Ideas	NA	The spatial quality of this element were described, but there was no description of a corresponding social reaction, therefore this category was removed.
Surface Graphics	Removed	NA	Specific Qualitative Ideas	NA	Surface graphics can have a huge range of effects and uses. In this instant, no specific spatial quality can be detailed, nor the corresponding responses people have to them.
Varied Street Spaces	Removed	NA		NA	Varied street spaces described their spatial characteristic as small spaces and compartments which influences pedestian traffic to move in interesting ways. The lack of specificity on both the spatial quality and corresponding social response warranted this elements removal.
Varied Surface Character	Removed	NA	Specific Qualitative Ideas	NA	
Trail Systems	Adapted	Trails and Pedestrian Pathways	Specific Qualitative Ideas	Physical/Management	
Multiple Programmes	Removed	NA	Specific Qualitative Ideas	NA	
Informal Activities 5 Minutes	Adapted	Informal Public Space	Specific Qualitative Ideas	Social/Cultural	
Recycling	Removed	NA	Specific Qualitative Ideas	NA	Recycling or reuse of spatial elements is not a specific description of a space, just a way how to use it, therefore the category was removed.

4.0 Appendix (Research and Documentation)

COOKING LAKE SAILING CLUB

Where is everyone?

I drive up the dirt road in mid summer; the sun is hot and the air is unusually sticky for the middle of Alberta. As I approach what I believe to be the sailing club, there are few signs of life. With birch tree's lining the uneven dirt road I see a dilapidated old sign to turn left. I drive down another long dirt road until I arrive at a giant round a bout. In the middle of the circle is a slightly protruding grassy mount, with a structure in the middle. The structure has a giant roof pitched metal roof encompassing it, with four massive wooden columns, one in each corner. Underneath the roof is nothing except a large brick chimney rising up from the ground and piercing the roof. On the other side of the dirt circle was the sailing club. It had a pitched roof, quite typical to the prairie style of sailing clubs seen in the Edmonton area, with a boat yard attached to its left. There was a chain-link fence around site, partially dilapidated from what I expect to be a lack of use. Inside the boat yard there is an immensely tall grass infested with mosquitos. It is almost unbearable to walk through as you can feel the small bites. After making a quick exit out of the boat yard I walk around the site trying to find an entrance. There is a mud road on the right side of the building, with a forested patch separating them. The road proves to be not navigable and I turn back. For months I had been attempting to contact anyone from the Calling Lake Sailing Club but to no avail. The leaves of the trees on the outside of the dirt circle shake in the wind and I can feel the evening breeze starting to blow in. The site feels deserted. The grass is uncut; there are no impromptu pedestrian trails across the lawn area. There are no cars, no people. I wonder if I can walk down to the water using the mud road I had previously attempted.

I walk through the shaded area, moving quickly as to avoid mosquitos. My feet sink into the mud about half a foot. Not enough to be stuck, but just enough to be dirty. I continue walking until the trees to my right transform into pussy willows and long tall grass. I get to a point in the mud road where several puddles had formed and the road expands. Several tire tracks suggest trucks attempted to get down this road, and then got stuck in the muddy terrain. Turning back again I go to look at the actual club building. For a club that looks so abandoned, the finishes are not so horrible; the powder coated metallic blue roof looks well kept, and the deck area is all unfinished wood, starting to turn silvery grey in colour. The siding of the facility mimics this robin shell blue colour of the roof. The sides that are unprotected by the large canopy are weathered, while the surfaces sheltered remain in good condition. I wonder 'who is a member of this club, where is everyone? Can you even sail on this lake?' as I walk back to the car, with my patience for mosquito bites coming to an end.

Figure A4.01. Cooking Lake Sailing Club Gate

CALGARY YACHT CLUB

Prairie Clubs Done Proper

As I drive up to the Calgary Yacht Club, I think of how ironic it is for the club to actually be situated in the town of Chestermere, an amalgamated town outside of Calgary. I drive down the highway and exit into an almost immediate suburb. I take a quick right turn and I am immediately on lakeshore drive. To my left you can see the water behind the larger houses, offset 4 or 5 carlengths from the roadway. The houses do not match at all. Each one feeling like they had been transplanted from Vancouver; there is a mix of stucco houses, vinyl siding, dark red brick, and yellow brick. One common theme however is most of them have boats, ATV's, or some other sort of recreational vehicle in front of it, and they are all in the shade of massive trees overlapping with the road. The houses to the right are a bit more conservative, though large in size and driveway; the houses have less obtrusive forms, but are still transplants from multiple other urban typologies. I know to slow down as I've been to this club several times. I see the chain link fence going from one end to another bordering the road, with a grassed area in front for parked cars and occasional after beer conversations. I park my car in the middle of the parking area and walk through the chainlink door. Boats line the fence but with enough space to see into the club. There are rows of boats, quite tightly packed on the mix of grass, dirt and gravel floor. Right in front of me is the youth building and to its right in the background is the main clubhouse. The youth building is cladded with horizontally running painted wood siding. It reminds me of a art nouveau prairie barn. There are no openings I can see facing the street but as you walk to the front, the entire first and second floor open up to the view of the water. The top floor has a cage like balcony with a great view, but a bit run down. I approach the main club, there are people walking around, friends and sailors I had met from regattas past. The main club house is well kept, with bright blue siding, a shiny white fascia and red-brown roof. The lawn all around the clubhouse is uninhibited by parked boats and feels cool under my bare feet. I walk up the right side of the club and take the stairs onto the deck. It has an amazing view out to the water. I walk inside the club and it is pretty close to what one would expect of a prairie interpretation of a proper sailing club. Deep blue walls with white finishes and ceilings, and a wonderful rich wood floor. There is a birthday party going on of a distant acquaintance as I say hello to numerous members who I've spent competed against. Nautical themed nick nacks line the wall as a jove, semi-drunk atmosphere takes over the rest of the interior. Downstairs there is a very basic training area with minimal equipment. I finally go out onto the dock to survey the club, the water and the shoreline. It feels nice to get away from the busy interior walls of the club and onto the open dock where you can see down the expanse of the lake in both directions. The party continues and spills onto the lawn of the club where people are lazing about and enjoying the view.

Figure A4.02. A view of Calgary Yacht Club's Deck

DISABLED SAILING ASSOCIATION

Alberta's only access friendly sailing program

I approach the Disabled sailing association or (DSA) building from the parking lot above it. The DSA sails on the Glenmore Reservior, the same body of water that the Glenmore Sailing School, the Glenmore Sailing Club and the nearby waterpark. Needless to say, the parking lot is full. I walk down pathway, which drops down a little bit lower than the parking lot. There is groomed rough grass everywhere. There are cyclists, joggers, dog walkers and every other type of person you can imagine on the trail in front of me. I turn right after about 20 meters onto an impromptu dirt path down another grass hill. The boatyard of the Glenmore Sailing School is in front of me and to the left is the reservoir. Its blue colour is refreshing considering I was just driving through the city 5 minutes ago. To my right is a small patch of trees where the waist height wooden fence around the boatyard terminates. It's a bit of a slew underneath where the trees are growing. The boatyard expands to the left and wraps around the hill. The boatyard is packed. You can't distinguish the Sailing School's boats from the public without a discerning eye. All you can see is hundreds of 15 foot dinghies to both sides of you. I turn right around the patch of small forest and there is the Disabled Sailing Association. Surprise, it's an all metal clad ATCO trailer. There is a beautiful wood ramp leading up to the doorway on the small end close to where I entered the boatyard. There is a deck space with a bbq littered with leaves. The trailer sits in the shade of the small forest patch so its nice and cool. There are also no boats close to the trailer and ramp, giving you a bit of a respite from the almost chaotic scene of walking through the yard. When I enter the DSA, the interior is suitable for an ATCO trailer that has been maintained with a relatively small budget. The walls and trim are plain, white but in good condition, and the two offices on each side of the doorway are in similar condition. The main area of the trailer is cluttered. The teaching space has trophies, paraphernalia, someone's lunch, a fold up table, and a tiny galley kitchen on the end. Columns protrude in the middle of the space to support the ailing ATCO roof. The space is cluttered and eclectic, potentially a symptom of too little space, and too much activity. The windows let in some light, but mostly the dim fluorescents light the space, giving it an artificial feel. It's ironic that the space feels so man-made when the trailer is sitting in one of the most picturesque parts of the city. It almost feels like a refuge from the wilderness, and the dim lighting and clutter has a grandma-bakes-bread-on-Sunday type feel.

Figure A4.03. Cooking Lake Sailing Club Gate

EDMONTON YACHT CLUB

Cottage country

Its mid august and already the weather is starting to cool down as I approach the club down its small paved road. It is confusing to find. The club is nestled into a residential area of the town, and it's exterior blends into the rest of the houses seamlessly. I drive by the club without noticing and have to turn around. The club grounds immediately create a cozy inhabitance. I drive down the short driveway into the gravel parking area in front of the club building. Greeting you at the entrance to the property is a small-forested area on one side and a small shed, most likely used for storage. The parking area is tight. There are only spots for maybe 10 tightly packed cars with grass growing through the gravel. To the left is a chain link fence with cabins and packed trailers, obscuring any sort of view of the rest of the facility. I enter the site and immediately my view opens up. There is a clear view to the water with a few boats scattered in the vicinity. A long grassed area leads to a beach and then two long docks with dozens of boat slips lining both sides of them. The air is cool, and the sun is warm; whatever sleepy sentiment was left from the town is swept away with a cool summer breeze. To my left there are a series of miniature cabins; there are 6-10 of them but they aren't too tightly packed together, and they are rotated so diagonally so there doesn't feel like there is a grid you have to adhere to in the site. I walk down to the beach; trees up to the beach area line the property line on the right, but when I arrive at the sand, the beach suddenly stretches in both directions, with dozens of docks and hundreds of boats lining the shores of the steeply curving bay. It really feels like you are enveloped in a nautical world on the prairies, which is both surreal being in land locked Alberta, and even more exciting. I enter the bottom of the sailing club where the entire ground floor has massive windows allowing for an unobstructed view to the water. The club screams of the pervasive prairie modern style that seems to define the architecture of every club in Alberta. The interior is quite bare; the dining area downstairs isn't set up right now and only the plain painted concrete block walls greet me with a galley behind. I remember many dinners, lunches and award ceremonies in this space, full of people, with tables going from one end of the space to the other. I walk into the core of the building to go upstairs. The walls are tight as they hug the staircase. There is some unknown skylight somewhere shining light into the tight double story space. It feels confusing; there must be 7 or 8 doorways all leading somewhere, and the space weaves in and out on the ground floor. I arrive on the second floor and am greeted by the bar area, a dimly lit sitting area. Across from it, with another great view of the water is the trophy/family room, full with 1970s upholstered couches, weathered trophies, old movies and books – probably for rainy days. The spaces are both tight but more home feeling then the ground floor. I finally step onto the deck after weaving through the second floor. The view opens up once again on the spacious exterior, and the entirety of the grounds are revealed; the beaches, cabins, lawn and boats can all be seen as I watch the bustle of the occasion family circulate from their cabins towards the clubhouse. There's a social on tonight, and I think everyone is ready to break out of the sleepy ambiance of the surroundings.

Figure A4.04. Edmonton Yacht Club Boatyard

The Glenmore Sailing club is just a stone's throw away from the Glenmore Sailing School, so I walk over to the club on a sunny afternoon. I have the keys to the club and I've been there countless times, so it feels more like a visit then somewhere to go and document. The front of the club has a massive lawn in front of it. It's probably larger than most other green spaces clubs have had. I On both sides of the green space, there are wooded areas, and beyond the more densely wooded area on the left, past a trail system, down a hill, there is the water. The club is a bit farther away from the dock space then most sailing programs, but the picturesque walk through the forest makes it worthwhile. I get up to the club again. The infamous prairie modern architectural style of single pitch roofs, and large glass openings to expansive views is not omitted from the GSC. On the left side facing the water, there is a large deck space with seating running along the outside. In the evenings this deck is infamous. Large parties with candles lit along the railing, littered with picnic benches, burgers and smiling faces. Its always such a contrast to see these spaces lit up with activity, and then vacant and unoccupied. The GSC exterior is much less cluttered and has less feelings of compression than most other clubs. The soft trees, paved pathways, and well kept facility all contribute to a feeling of comfort and relaxation. The ambiance should not be confused with the cozy cottage sensation so many other clubs like CYC, or EYC have on a regular basis. The club feels modern and social, with clean finishes, and an uncluttered exterior or interior. Many times it feels like a private banquet hall or country club rather than the typical sailing club. The interior reinforces this rhetoric. With a new renovation which created opportunities for wood floors, seamless details, modern windows and a bar and kitchen space suitable for any wedding or major event, the club seems in pristine condition. Trophies neatly line the top of the double height space, with clever lighting buried deep within the rafters. The hallway to the back of the facility provides access to some essential amenities in the facility including showers, but I then remembered the times of being reprimanded for walking through the clean club in wet sailing gear to get to the changing area. I walk out of the club, across the lawn, down the bike path, through the forest and to the waterfront where there is a grassy enclave with a single shed sitting at the back of the space. Lining the space are 10-12 small youth sailboats lining the grass. The area is sheltered from the wind, and has a paved pathway down to the water. The main boat storage for the club is nestled on the other side of the lake, a quick five minute drive, so the rest of the site is completely uninhibited by boat clutter. Though unconventional, it allows for a really simplified version of sailing, which seems completely accessible to the everyday public, without having to have knowledge, or even interest in sailing to enjoy the scenery, facility and atmosphere.

Figure A4.05. Interior of the Glenmore Sailing Club

GLENMORE SAILING SCHOOL

Canada's largest sailing program

I drive into south Glenmore Park where the facility is located, on my left are single boat stalls, packed with sailboats; behind it a bike path shaded by the same trees leading up the site. There is a grassed area beyond that, with forested patches. To my left there is tall grass with occasional trees, obscuring the luxury suburbs sitting in their background. As I arrive at the traffic circle a few hundred meters from the entrance of the park, the Glenmore Sailing club is on my right, the water in front of me, and the sailing school complex to my left. I park and walk up the shallow stairs to the plain of grass in front of the facilities sheds. The lawns are well kept, and the pavement is old. The sheds are utilitarian and worn; having fresh paint on old wood speaks to good maintenance but a long period of use. The walls of the sailing school are concrete with large stone aggregate in them. It speaks to the popularity of the brutalist style 30 or 40 years prior. The site up top looks like a park building. The roofs are powder coated metal, with steep pitches, supported by sturdy concrete walls. The surfaces are all asphalt or concrete, looking as if it were cast more than a decade earlier. I walk up to the front of the building where there is a large circular bench and a huge elevated view to the water. The view is expansive; it feels like the whole facility functions around this one space, this one view. Looking back on the facility there are three large garage style doors, opened up to a blue tiled floor and white painted exterior. The space is mostly empty, with a double height space inside with beautiful heavy timber joists running along the ceiling. Along the edge of the room there is a grey bulkhead with TVs, trophies and other photos hung along the inside facing inward. This space is usually used for teaching, but transforms often so everything is moveable. Outside there is an ATCO trailer, unattached but adjacent to the left of the main building. The ATCO trailer is pretty un-extraordinary. The main teaching space has a beige floor with beige walls, and blue trim. There is a mounted TV and whiteboard, but aside from that, the crumbling wall panels don't seem like they provide much support for anything permanent. At the front of the ATCO there are two tiny rooms separated by doors. They contain the staff room and the office. The staff room is full of, well staff, ready to sabotage my documentation of the space. But their presence adds to the atmosphere of a cramped room with little seating, but lots of comradery. The front office is the more respectable area of the building. Binders are organized in rows, the desk space is neat and tidy and everything looks fairly standard. Its finishes match the rest of the ATCO, but with the intention to look professional. Finally, below the flag circle is the boat yard, literally packed with hundreds of small craft. Walking through them feels more like an immersion in culture than retrieving sporting equipment. Ropes, masts, and fills your view with the enclosed reservoir in the background. Wind whistles through the masts in a high pitch squeal as rope bangs against the masts in a rhythm-less drone in the background. This sensation is encompassing, all my senses are being engaged, and I forget that I'm in the middle of a bustling city.

Figure A4.06. Glenmore Sailing School Boatyard

Itaska Yacht Club

Sailing in Rural Alberta

The Itaska Yacht Club typically sails out of cottages of members but the boats have to be launched from the closest boat ramp. When I get to the summer village of Itaska I was very surprised, the atmosphere of a sailing program wasn't there, because the club is in a transient state. The town is a sleepy one. I keep driving around trying to find something that grounds the actual town to being there, but it is a bit sprawling and I can't find the city centre. The launch area is very exposed. Though there is plenty of dock space for tying boats up, it would not be an ideal place when there was a storm, which there currently is one rolling up to the town. People are rushing around trying to get their boats out of the water and clean up as quickly as possible. A truck pulls up and tells me that I'll get a ticket for where I parked and then drive off quickly. With the storm rolling in, I photograph the rest of the site and then head for my car.

Figure A4.07. Itaska Beach

Ma-Me-O Sailing Club

The Summer Village of Ma-Me-O Beach

The Ma-Me-O Sailing club is a transient club located in the summer village of Ma-Me-O beach on Pigeon Lake, Alberta. The village is no bigger than 125 people. For the lack of population there is about a kilometer stretch of houses and beachfront property along the water, thought most of it is vacation homes and rental properties.

I can't quite tell if I have arrived in Ma-Me-O Beach; along the main road there isn't much to the right of me and I can't tell if I have entered, passed by or missed the town. I take a left turn into what seems to be a beachside community. There isn't a lot of access to the waterfront. I finally find the boat launch area and public parking space. I can imagine that this is where the majority of boats are at least put in the water and then sailed over to various members' homes depending on who is hosting the event that day. I walk down the beach; I had visited Itaska on the other side of Pigeon Lake earlier that day and the clouds seemed to be a little less dark on this side. The beach is beautiful. It is sandy and wide, and all of it is publically accessible. The houses that back onto the beach do not have any sandy property of their own, and instead sit setback from the beach. It is strange that there are so few access points to the water; and as I am walking along the beach I can't find a place to exit for another 300-400m afterwards. There are also few public amenities, just beach. I can't find a place to sit and eat, to buy something to eat, or even really a grocery store off of the beachfront. The rainstorm is a lot closer now and the beach rapidly is abandoned for dryer locations. Though it would be wonderful to sail here, I can imagine it would be incredibly difficult to be here for a long period of time here without owning property or having proper accommodations.

Figure A4.08. Ma-Me-O Beach

NEWELL SAILING CLUB

Wheat Fields and Warm Winds

As I drove to Newell, I remembered all of these great memories with so many competitors, friends, and the site that made it possible. The weather is hot as I approach the club. You have to drive through a lot of farm land to get there so there were are trees to provide any sort of shade driving along the secondary highway. As I arrive to the turnoff for Kinsbrook Park the landscape starts to change. The club is located on a peninsula with a small land bridge providing access. The long prairie grass, wheat and rapeseed fields start to fall away and are replaced with a wetland condition. To my sides I can start to see a preview of the water, and the road becomes enveloped by tall leafy trees. I approach the park gate and get waved through. The buildings on site are reminiscent of national park rest stops and toll booths; a sleek metal roof, with a stone or brick exterior. Nothing fancy, but well built and durable looking. For some reason this invokes a feeling of comfort and familiarity; this one architectural typology of building seems to be consistent throughout many national and provincial parks.

Inside the park, I keep driving along a long access road to the campsites; along it are informal playing fields, sparse trees with picnic areas underneath, parking lots, laundry and shower facilities. At the end of the island are the shaded campsites, RV lots and the sailing club's site. The club occupies the very tip of the small peninsula, so there is water on three sides of me as I put into the large parking lot. The club is empty this weekend, so I walk around with only a few onlookers. The main facility is very basic. The exterior is clad with wood siding and the same brown metallic roof found on the rest of the islands structure. The interior has old faded brown wallpaper from an earlier era, with a brown and orange speckled carpet. There are tables filling most of the room, with a small kitchen and pantry area at the back. This facility is very much like a cottage from the 1950s, basic but cozy. At the back of the building there is porch area with additional picnic tables, protected from the elements. It opens onto a giant grass field with fire pit in the centre, bordered by more tall grass and pussy willows. The rest of the site is scattered with rudimentary storage buildings for sailing and coaching equipment; the site still feels like it has an unofficial border around it created by the series of storage sheds. The facility is very basic, yet everything feels more of less organized, and there is the potential for accommodating a large number of users if needed. There is a large beach/cove area for launching boats out of with warm fine sand lining the shore. Little children are making sand castles and there is a warm, dry breeze. On the other side of the main parking area, there is a massive beach. I walk through a grassy area with a few trees and arrive. There are picnics, barbeques and dozens of families enjoying the weather. Though Kinsbrook is out of the way and modest by all means, it still provides a cozy environment for families to enjoy a day at the beach, or a casual weekend sailing.

Figure A4.09. Newell Sailing Club

SUNSHINE BAY YACHT CLUB

Lake Wabamun's Third Sailing Club

Sunshine Bay is the third sailing club on Lake Wabamun. It has no learn to sail programs and caters to solely keelboat sailors. The club is also located the furthest from the City of Edmonton. Despite these factors, the club has continued to stay afloat with numerous members and a busy social life.

When I arrive there is a large cleared area with a gravel parking lot, littered with boat trailers and cars. I see no other people. There is a small bending pathway leading away from the parking lot. All I see is greenery. As I start down the path I start to see a clearing with a series of small sheds and covered areas. The space is semi cleared with seating areas in the middle. There are a few elderly couples walking by, but the club seems empty. The facilities are worn but well kept, with paint peeling but everything very structurally intact. There are blocks of wood for cutting and the outdoor furniture has been arranged as if there had been a recent social gathering, but still no people around. I keep walking up to a boardwalk-forked pathway. The left path goes to a clearing and I see more activity. As I walk about 50 feet, the view opens up to a small clearing. In front of me there are reeds and the lake to my left, while the club is to my right, slightly obscured by a series of trees. There are people rolling a sail in front of me, and numerous others on the dock extending out from the reeds. The members are slightly hesitant but welcoming almost immediately. Because of the more obscure location of the club, they probably don't get many non-members showing up at the facility. The club is almost an imitation of a suburban home in many respects. The exterior is clad almost entirely of white vinyl siding and standard vinyl window frames.

I enter the club to be quite surprised by the décor. The club is full of objects. There is everything from other club burgees, to sailing models, to paintings. It is eclectic. I am always surprised by how at these sailing clubs eclecticism always correlates to a certain level of coziness. Though it isn't fancy, minimalist, or modern, there is a certain appeal that a tiny room can have hours of exploration and history to it. Stylistically the interior surfaces are a mix of 5 or 6 different materials; so it's obvious the club has had numerous renovations and additions. It would be great to sit here on a rainy day, or on an evening. I walk onto the docks and down the slips; most of the users here leave their boats tied to their dock slip and then sleep on it. Though this is unconventional for a prairie club where most people sleep on land, sleeping on your boat is extremely conventional for sailors on any larger body of water. The atmosphere at the Sunshine Bay Sailing Club (SBSC) was impossible to pin down. It derived its atmosphere from so many nautical and prairie themes it became hard to keep track of all of them. At the same time, the same themes as many other rural clubs still existed; it had kitchen amenities, places for people to sleep and lots of social gathering space. Maybe SBSC isn't the most conventional club, but it does provide for the needs of their sailing community.

Figure A4.10. Sunshine Bay Yacht Club

SAIL SANDPOINT

Sailing Meets Community Engagement

The facility is at the end of a small point of land protruding into Lake Washington, so I walk by the private boat storage, a local climbing gym and the rest of the facility. There is a massive amount of boat storage outside on the large paved site. It feels like it used to be an old naval base, shipyard or marine facility that catered to some sort of industry at a scale very much larger than a person. Everything is big; the buildings, the warehouses, and the access to the site are all large. Surprisingly, everything is filled in with boats, parking and people loading, unloading and socializing. The main office of the Sail Sandpoint facility is the corner office of an aluminum clad building, before stepping onto the pier, which contains the boat shelter, maintenance facilities, staff areas and program boat storage. For such a utilitarian facility, the atmosphere boasts its naval traditions. The interiors walls of all the buildings are long vertical planks of weathered wood, chalk full of maintenance and storage equipment, or lined with office supplies, computers and other various nick knacks. There is a small retail space for wetsuits and clothing, very suitable for the cold and rainy Seattle weather currently occupying the site. The boat storage and maintenance facility on the pier were a bit different, but very appropriate for a sailing facility. The buildings on the pier had wood siding, painted white at some point but in a current state of peeling. Inside the boat slip building, a bare wood interior was also present, with pigeon netting strewn across the rafters to minimize the amount of nesting birds. The corridors are narrow, even along the waters edge inside the building, spanning optimistically half a meter. As I arrive on outside again, I find the program's boat storage. There is a tiny little dock space packed with boats and people. Boats are stacked on their edges or on top of each other 3-4 boats high to accommodate all the sailors that the facility hosts regularly. Behind them the pier was full of temporary tents and cold parents watching the regatta in the background. I feel that the site is missing somewhere where people can actually congregate to warm up. It has everything else. It is almost awkward photographing everything, because unless you are getting ready to go sailing, or coming back from sailing there isn't really a designated space for you to go and stay dry. I go back down the pier, walk along the beach and find their secondary dock space. The program has gotten so large they've built another shed with boat storage on the beach and added a dock. Houses line the water, and you can see hills about two kilometers across the bay. The scene is peaceful… and slightly damp. I'm thankful that one of my friends works inside the office and I can go warm up, but

Figure A4.11. A Regatta in Pontiac Bay on Lake Washington, WA

SYLVAN LAKE SAILING CLUB

Where Sailing Meets Suburbs

I spent a large part of my childhood in Sylvan Lake growing up but I had never been to the sailing club before. The town has gotten a lot bigger since I was younger, and a lot more commercialized. When I was younger, the town existed only of small cottages and smaller homes. Life was slow, the water was cold but the beach was warm. Now the town had grown abundantly and new development and life was everywhere; a boardwalk lines the waterfront, with parks and new amenities on every corner along the main road. The sailing club is situated on the northwest end of the town, with new developments literally all around it. When I arrive there I realize the extent of the commercialization. The sailing club has an elongated oval shaped area cut out of the land for the boat slips and dock. The shoreline surrounding the entire slip area is all houses. It reminds me of houses on a golf course, the houses are just far enough set back to not be right against the fairway, but not an inch farther. It makes me think that this is what parts of Holland must feel like to sail through on a canal. The clubhouse is also dwarfed by the development; though there is a very nicely groomed traffic circle servicing the club, the green space beside the club is minimal and the clubhouse must only have a 50m^2 footprint. Inside the entire top floor is vacant. I assume its used for social events, but otherwise it's restrictive size limits it's ability to be highly flexible. There is a high amount of spatial compression on the inside of the facility, almost like being in a ship from the 1800s, the space seems utilitarian, useful, but always tight. The inside of the club has a dark stained wood floor with white trim on the walls; the formal nautical theme is almost impossible to escape. The deck that surrounds the is spacious; it is 2-3 meters wide, and allows for a fantastic view of the dock slips. The scene is almost coastal, with the high concentration of boats, and the breakwater like configuration of the suburban landscape surrounding the boat slips. Though this club lacks the prairie character I had seen previously, it's nautical impressions make up for it. In addition, it has a well laid out dock area; the club's shape is reminiscent of a lighthouse, and the clean white wood siding only contributes further to it's formal nautical theme.

Figure A4.12. The Sylvan Lake Sailing Club

WABAMUN SAILING CLUB

Home away from home

The Wabamun Sailing Club is the most popular sailing club on Lake Wabamun and has a large member body supporting it. It is located just outside the town of Wabamun and is the closest club to the City of Edmonton; only 45 minutes outside of city limits. It caters primarily to dinghy sailors, while there are a few keelboat sailors.

I drive up to the Wabamun Sailing Club with dual purpose: To document the club for my thesis, but also to coach a training camp, hosted by the Alberta Sailing Association. For most of they have only been to Wabamun a handful of times, and have never sailed outside of the city, or on a larger lake like Wabamun provides. It's evening when we arrive and I immediately walk from the parking lot, down to the lawn, looking out to lake. On the other side, there is a tiny power plant with its lights flashing in the distance and trees lining the shore. It's refreshing to be there. The stars are out, and the environment is so peaceful. There is the rustling of trees, and the lapping of water on the shore, but other than that, its silent. The clubhouse is massive, and obscures the waterfront from the parking lot. The club has the signature prairie modern roof, with a two single pitch roofs. This particular building profile is one of the more defined compared to the clubs in the province, and even the cladding is oriented to follow the diagonal edge of the roof. The parking lot extends backwards with rows of RV trailer stalls, and almost all of them are full. Families and couples come up for weeks at a time and camp out on the site. We quickly go inside the club from the front; there is a deck area leading to a set of terraced stairs and then the entrance. There are giant 6-8 foot windows on the main floor, with massive glulam beams protruding from the interior of the structure. On the other side of the glass inside there is a massive commons area. There are no tables set up currently, but this is where all the social events occur. Opposite to the glass there is one long wall with a cutout at the end of it for the galley kitchen. Inside the kitchen is massive. It is all stainless steel, and is obviously no stranger to entertaining large crowds. There is a large stair on the right of building, right in front of the stair when you enter. On the floor above, there is a massive double height social space with couches, tables and projectors. The building has obviously undergone massive renovations and the finishes are all modern and new. The ceiling is a finished yellow wood, while the front of the building has giant glass windows for unobstructed views to the lake. The Wabamun club is still just as comfortable as I remember it from previous years, it has a full range of amenities for visiting sailors, but also have a full range of people. Like most of the clubs I visited, members are more than keen to help in any way possible to make our stay more comfortable. No matter how big the double height space is, or how well the glulam beams provide an open interior, the club still feels compressed inside, especially in comparison to the vast landscape just outside the windows. For landlocked Alberta, to stand at the shore of Lake Wabamun can almost feel like the ocean.

Figure 4.102. The Wabamun Sailing Club from the Water

GLOSSARY OF TERMS

Recreation, Sport and Physical Activity Space
- These terms were used interchangeably throughout the introduction of this thesis because from a built perspective, space that is specifically designed for any of these functions can very easily be adapted for one of the other three usages. Though recreation, sport and physical activity are all very different things, from an architectural perspective, the spatial quality that accompanies these terms are very similar in nature.

Hybridized Theoretical Model
- The hybridized theoretical model refers to the information derived from the literature review and then applied to a built environment standard. This is also referenced throughout the thesis as the '7-category strategy.'

7-category Strategy
- Also know as the hybridized theoretical model, this references the spatial categories and individual typologies that were derived from the literature review and define the design guideline.

Spatial Typology
- A spatial typology is a specific formation of an area, built or unbuilt, that belongs to a specific category in the design guide, or hybridized theoretical model. These individual typologies make up each category of the '7-category strategy' and are all derived from research in the literature review.

Spatial Category
- There are 7 individual spatial categories that make up the 7-category strategy. These categories were derived in chapter 3. These 7 categories summarize the relevant spatial typologies that were also created in chapter 3 of the thesis.

Sailing Clubs
- Sailing club refers to sailing programs and their built facilities. Some of these clubs are actually publically owned and accessible to users without memberships.

Retention Rates
- These were derived from categorizing sailing programs into beginner, intermediate and advanced courses. Based on the number of students in the beginner category, retention could derived by dividing the number of participants in advanced courses by the number of users in the beginner courses and then multiplied by 100 for a percentage basis.

Participation Rates
- Participation rates were derived from total membership numbers, or if membership numbers were not available, participation rates were derived from the total number of beginner, intermediate and advanced users.

Growth/Decline Statistics
- Growth and decline statistics represent if a club had more or less participation between the 2015 and 2016 sailing seasons. Specifically, membership rates were compared. If membership rates were not applicable to the club in question, then the total numbers of participants in beginner, intermediate and advanced sailing courses were compared between the two seasons.

Sporting Environments
- Any area where sport, physical activity or physical leisure could be actively participated in through formal or informal activity.

Sail Canada
- This is the national governing body of the sport of sailing in Canada. They were previously known as the Canadian Yachting Association, and adhere to the standards dictated by Sport Canada.