

Feasibility Study of the Regeneration of Lot's Ait



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Abstract

The purpose of this project was to conduct a feasibility study for the London Borough of Hounslow Council to identify the market, technical and organizational, financial, and social components of regenerating the island Lot's Ait. The project team investigated the impact and feasibility of creating a boating skills academy, implementing watersports, and creating an incubator space. We conducted interviews with stakeholders, distributed a boating skills survey, and conducted an on-site analysis of the island in order to make a recommendation to the Council. The information gathered will aid the Council in facilitating a regeneration project on the island that will have the maximum social and economic return.

Acknowledgements

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Executive Summary

Introduction

Our project goal is to conduct a feasibility study of the regeneration of Lot's Ait through the creation of a boating skills academy, implementation of watersports, and creation of incubator spaces. Lot's Ait is a small island located on the River Thames. Our sponsor is the Hounslow Council who has determined three goals for the project: to grow business in the area, increase skill level, and regenerate the overall borough. To reach these goals we conducted a feasibility study for the regeneration of the island that investigates the four components of feasibility including the market, technical and organizational requirements, financial aspects, and social impact. The project team also made recommendations to the Council based on our findings.

Background

Hounslow is one of the outer boroughs of London and is the 18th largest borough. It stretches from central London in the east to Heathrow Airport in the west (Hounslow Council, 2017). The Hounslow borough is divided into five major areas, one being the ward Brentford. Brentford is a historic port town located on the River Thames. Its usage as a port town is a result of the Grand Union Canal intersecting with the River Thames, an area that has heavy boat traffic. The River Thames is significant to London and the borough and is the focus of many regeneration projects happening nearby.

Regeneration is increasingly important to the Hounslow Council and they consider various projects that will benefit the community. The regeneration department has goals in place to improve the Borough which include to encourage the growth of businesses, increase overall skill level, and provide community infrastructure to the borough. Regeneration is defined as a set of activities that reverses economic, social, and physical decline and it should secure long-term change in a community by increasing employment and moving community individuals from dependence to independence.

The boating industry has a large impact on the United Kingdom economy and is growing annually. In the United Kingdom, the super yacht and small commercial marine industry alone

have direct revenues of £3 billion and overall contributes £6.2 billion to the GDP of the UK (British Marine, 2016a). London specifically has significant boat usage on its rivers, with almost 5,000 boats utilizing the waterways in 2010 (Canal and River Trust, 2017). Many boaters do not have skills to repair their boats and thus use boat repairs shop like John's Boat Works. This company is located on the island of Lot's Ait in the Borough of Hounslow. The business sees the opportunity to teach boating skills and wants to create a boating skills academy.

As an island nation, watersports are also prevalent in the UK both along the coasts and on the country's rivers. In 2015, 3.2 million adults in the UK participated in a boating or watersport activity totaling nearly 19 million boating trips and using one million watercrafts (British Marine, 2016a). Watersports include sailing, paddleboarding, kayaking, yacht cruising, and spending leisure time on the beach. Active360 is a company in London dedicated to stand-up paddleboarding (SUP) and watersports skills training. SUP is the fastest growing watersport in the world and Active360 is at the forefront of developing SUP in London (Think360 Sports Ltd, 2011). Active 360 currently has four locations along the Thames and sees potential in creating another location on Lot's Ait to teach and increase participation in watersports.

The number of businesses in Hounslow grew by 20% and the number of people employed in the Borough increased by 12% from 2009 to 2014 (Hounslow Council, 2017). Small businesses make up most of the businesses within the Borough. Furthermore, with a growth of 23% from 2011 to 2014, Hounslow has the highest growth of micro businesses in all of West London. One way to further progress the growth of small businesses is with business incubators, which are an effective way of enhancing the success of startups. Some benefits of being part of an incubator include possibilities for funding, more affordable resources and equipment, and better public relations and advertising for their business. Currently, there are 300 incubators in the UK, which support about 12,000 businesses in total (De'Lacey, 2014). Craft-focused incubators integrate people's business skills with their unique craft talents. In addition, they build upon traditional skills that have been passed down through the generations and keep these skills alive (Hatch, 2017).

Objectives and Methods

We defined feasibility in three components: market issues, technical and organizational requirements, and financial overview. From these components we investigated the social effect on stakeholders. A market issue is the area of a feasibility study to address potential market opportunities. If there is demand then a venture can be pursued. Technical and organizational requirements deal with the logistics of technical and organizational aspects including infrastructure, government regulations, and environmental constraints. Lastly, financial overview includes economic sustainability and funding. The social value is analysed in terms of the effects of the three components and looks at the opinions of stakeholders. To achieve these goals and determine feasibility the project team has identified the following objectives:

1. To evaluate the need for a boating skills academy by looking at the relationship between boating and the boroughs of London
2. To evaluate the potential for incubators to further encourage the growth of small businesses in order to promote craft skills
3. To identify constraints and impacts
 - a. of creating a boating skills academy on Lot's Ait in Hounslow
 - b. of implementing watersports and relocating the pontoon from Kew Bridge to Lot's Ait
 - c. of the creation of additional incubator spaces on Lot's Ait
4. To offer recommendations for future study
 - a. into a boating skills academy
 - b. into implementing watersports and the relocation of a pontoon for watersports theory training
 - c. the creation of additional incubator spaces on Lot's Ait
 - d. other options for the regeneration of the island

Over the course of the project we conducted interviews with a variety of people and groups including: members of the Hounslow Council; stakeholders of the island, pontoon, watersports training, and incubators; other boating skills academies and other incubators; and

external funders. We also attended a regeneration summit and listened to a series of presentations about regeneration in Hounslow, with time for discussion at the end. We performed an on-site evaluation of Lot's Ait and the pontoon at Kew Bridge, and supplemented that information with GIS maps. Lastly, we distributed a boating survey to determine the skill level of boaters in the area and the interest in a boating skills academy.

Findings and Discussion

The findings are a result of analysing themes and key issues defined in interviews, analysing quantitative survey data, and completing an on-site and GIS analysis of the island and surrounding area. The following infographic shows a visual summary of the findings.

**LOT'S AIT
FEASIBILITY
STUDY FINDINGS**

RESULTS FROM DATA ANALYSIS

Results from interviews, a survey, and an on-site analysis.

We identified five themes: environment, economic, social, regeneration and planning regulations.



1 ENVIRONMENT

A portion of the island is a Nature Conservation Area and must remain untouched. An protected species of snails lives in the ivy.

The island is on the Tidal Thames and there are ten-foot tides twice a day. The island floods a few times a year.

2 SOCIAL

Craft and boating skills are declining in the United Kingdom. The Hounslow Council has goals to increase the skill level and close the skills gap.

There were 5,000 boats spotted on London's waterways in 2016 and many Londoners have moved onto houseboats. Brentford specifically has a rich boating culture and 65% of 193 survey respondents have interest in a boat maintenance skills academy.

Stand-up paddleboarding is the fastest growing watersport in the world and over 3,000 people went paddleboarding with Active 360 last year.



The social impact and reach a project has on the community must be closely examined.

3 ECONOMICS



Since 2000 there has been a 2.0 million increase in private sector businesses in the UK



There is a successful guitar maker on the island that needs 3x more space



The International Boatbuilding Training College would host a satellite academy on the island



The relocation of the pontoon would cost approximately £40,000



The GLA and Brentford Community Sports Trust are potential funders

4 REGENERATION



Brentford

There is a rise in residential housing by private developers. A large development is the Ballymore Scheme.

The new Brentford Football Club stadium is being built.

The GLA is regenerating the high street and increasing walkability.

Lot's Ait

Lot's Ait remained untouched for 30 years until 2011.

A portion of the island was regenerated by a boat building and repair business. An abandoned building still sits on the island.

A footbridge was added in 2013 for improved island accessibility.

5 PLANNING REGULATIONS



In 2015 there was a single storey expansion granted for a workshop space on Lot's Ait. For any more construction to occur on the island the Nature Conservation Area needs to be redefined and Port of London Authority permission must be given for an equipment barge.

The Section 106 requirement of local developers could be fulfilled on the island to create a community impact.

FEASIBILITY

The following findings helped define the feasibility of the creation of a boating skills academy, implementation of watersports, and addition of a craft-focused incubator.

Regeneration of Lot's Ait

In terms of the market for regeneration, we determined there is a rise in regeneration in Brentford, specifically on the Brentford High Street and waterfront areas. Our research showed that the regeneration of Lot's Ait would continue the snowball effect of regeneration and have a positive impact on the entire borough. There are many technical and organizational requirements with a project on Lot's Ait. The island could be regenerated to satisfy the Section 106¹ requirement of local private developers, which would reduce expenses and planning complexity for the landowner. PLA permission is also required to do any construction and the Nature Conservation Area on the island needs to be redefined, which could cause time delays. Financially there is already permission for a single story expansion, and additional space on the island could be utilised. Using all the space on the island would maximise profit, however further study will be needed into space requirements and types of buildings needed to implement the projects. Overall, any regeneration of the island will get the community involved and engaged in the history of it. The island has been inaccessible for many years and currently is only accessible to those visiting John's Boat Works, thus regeneration of the island would involve the community and bring more foot traffic to the island. There are mixed views from stakeholders about the regeneration: the Council, John's Boat Works, landlord, and GLA all see different potentials that would have social and economic returns.

Boating Skills Academy

Our boating skills survey showed the demand for a boating skills academy. Over 60% of the 128 respondents have some interest in an academy. In addition to this many parties we interviewed mentioned a need for the growth of boating and craft skills within both the Borough and London. Organizationally we identified a potential host of a satellite academy who has an

¹ Section 106 is a mechanism that requires developers to provide for the community with any implementation of a project

existing class structure. The space for the academy and necessary equipment will need further research. Financially, we found the Greater London Authority would be interested in funding the academy. Further research into the economic sustainability of the academy will be needed. Socially the skills academy would have a big benefit: it would close the skills gap, create jobs, and reverse the decline in boating culture in Brentford, and thus benefit the community. The opinions of the Council, the island landlord, and John's Boat Works must be integrated in order for the implementation of a skills academy to be possible.

Implementation of Watersports

In Hounslow and London there is a market for watersports in terms of both recreation and tourism. The implementation of watersports on the island would bring foot traffic to it and make it more accessible to residents. There is currently a pontoon at Kew Bridge that could be relocated to the island, however the implementation of watersports on the island is not contingent on moving it. This pontoon has safety and accessibility issues at its current location and could be used more effectively at Lot's Ait. Moving this pontoon or creating a new launch pad at the island would need PLA permission and could be expensive. The tides play a factor in the functionality of the pontoon and would need to be explored further. We identified a potential funder to move the pontoon and maintain it, the Brentford Community Sports Trust. We also found that watersports on the island would bring in funding from rentable space and classes and would create more activities to do in the Borough and attract residents and visitors alike. There are many stakeholders involved in both the relocation of the pontoon and implementation of watersports and their viewpoints would have to be examined before any further steps are taken.

Craft-Focused Incubators

Through our research we found that there is a significant skills gap in craft skills. A craft-focused incubator would help residents improve their skill level, give them the opportunity to teach skills to others, and create a collaborative learning environment. There is also a demand for space in London that people can use to pursue their hobbies and small businesses. We identified several businesses who would use this space however more research needs to be done to identify others. Also, John's Boat Works already has an incubator space and provides tools and equipment to the small-businesses. Other small-businesses could use these tools, and additional

equipment would be needed if more businesses were added. The incubator space would also be more enticing to rent than other spaces as it is a cheap start-up space and there would be a strong community built around it. There is also a successful craft-focused incubator called the Blackhorse Workshop that could be a case study for the incubator on the island. The GLA funds this existing incubator and said in an interview they would be interested in funding a similar project on Lot’s Ait. The Council, landlord, and John’s Boat Works are all interested in this project and the community could see significant benefit from this project.

Considerations

We determined three individual scenarios for the island: the creation of a boating skills academy, implementation of watersports on Lot’s Ait, and creation of a craft-focused incubator space. For each scenario we used our feasibility findings. The scenarios could be realized individually on the island, or combined. The figure below shows the possible combinations of these scenarios.

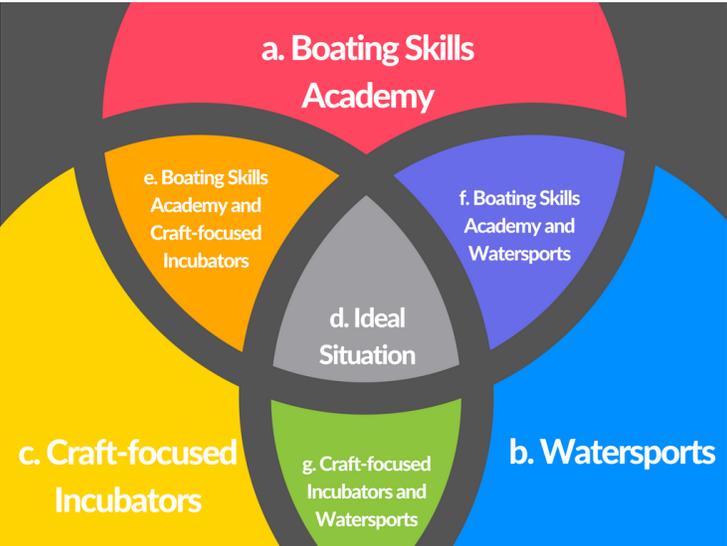


Figure 1: Venn Diagram of Scenarios

Our final recommendation is to look further into the feasibility of each scenario, specifically Scenario D, the “Ideal Situation”. This scenario would include watersports, a boating skills academy, and craft-focused incubators. The boating skills academy and incubators could share a workshop space. Logistically this could work because the skills academy could use the

space at night and the incubators could use it during the day. The business incubator personnel could teach the classes at the skills academy. Also, there would be a shared meeting room that could function as a classroom setting for the academy. The watersports training could also use this space and would have a pontoon or dock to launch from. This would bring in the most profit but space-wise could prove to be difficult. We also identified other directions for future research from ideas given to us that we did not have time to research. This report will serve as a baseline feasibility study for the Hounslow Council to do further research based on our considerations.

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2.3 Hounslow.....	PD, MH
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Chapter 1: Introduction

As of 2017, the London Borough of Hounslow is home to 276,200 people and is one of the capital's largest boroughs. It covers 35 square miles and stretches from Chiswick in the east to Heathrow Airport in the west. Brentford is a ward of Hounslow and is located at the junction of two major waterways, the River Thames and the Grand Union Canal. The intersection of these waterways has high boat traffic, important historical character, and a rich waterside environment. Some waterside areas have been redeveloped for housing and commercial usage, while other areas still provide for traditional uses such as boatyards, moorings, and industry.

There are several private businesses regenerating the area by creating large-scale residential housing, mixed-use spaces, and commercial space. Regeneration is vital to community development and introducing positive change in terms of infrastructure, economy, leisure opportunities, and other problems specific to the area. Plans are developed to stop various forms of decline within communities and improve daily life of citizens. There is a recent emphasis on regeneration in Brentford, which is being addressed by both the private and public sector. The goals of these regeneration projects are to enhance the overall area to make it a place where people would want to live and visit rather than just drive through.

Lot's Ait is an island in Brentford that has been the topic of regeneration in the past and presently. In 2011 the company John's Boat Works regenerated an abandoned boatyard on the island Lot's Ait for boatbuilding and repair. Currently on the island there are also two craft-focused small businesses utilizing an incubator space. John's Boat Works leases the space to the small businesses, lends out tools and equipment, and provides advice when needed. A pontoon is currently located less than a mile away from the island at Kew Bridge, which is used for water sports and specifically stand-up paddleboarding. Stand-up paddleboarding is the fastest growing watersport in the world and attracts residents and tourists alike.

The Hounslow Council sees potential for further regeneration of Lot's Ait and has tasked us to research into the feasibility of creating a boating skills academy on the island, relocating a pontoon for watersports, and creating additional craft-focused incubators on the island. Boating skills refer to boat maintenance and repair skills. They have identified three goals: to grow business in the area, increase skill level, and regenerate the overall Borough.

To help the Hounslow Council develop a plan to regenerate Lot's Ait, we set out the following goal for this project: to look into the regeneration of Lot's Ait by assessing the feasibility of creating a boating skills academy, relocating a pontoon for watersports skills training, and creating additional craft-focused incubators, and to make recommendations to stakeholders based on our findings. Feasibility is defined by three components: market, technical and organizational requirements, and financial overview. The social value of projects and a stakeholder analysis was then completed. To achieve our goals and analyse feasibility the project team identified these four objectives: 1) To evaluate the need for a boating skills academy by looking at the relationship between boating and the boroughs of London, 2) To evaluate the potential for incubators to further progress the growth of small businesses in order to promote craft skills, 3) To identify constraints and impacts of: a) creating a boating skills academy on Lot's Ait in Hounslow b) of relocating the pontoon from Kew Bridge to Lot's Ait and c) the creation of additional incubator spaces and 4) Offer recommendations for future study: a) into a boating skills academy b) into the relocation of a pontoon for watersports skills training c) the creation of additional incubator spaces, and d) other options for the regeneration of the island. The Council has not yet looked into the feasibility of the projects proposed other than preliminary research and background information about the boating culture. Additionally, the views of the many stakeholders were not explored in depth by the Council prior to our project and are an important aspect of feasibility.

We conducted interviews with numerous Hounslow Council staff, island stakeholders, boating stakeholders, an existing boating skills academy, watersport stakeholders, incubator stakeholders, and potential funders. The interviews helped us understand the many points of view of the project tasks and provided us with qualitative and quantitative data. We also conducted surveys with local residents of Hounslow and did an on-site evaluation of Lot's Ait and the pontoon at Kew Bridge. The boating survey provided information as to how often residents boat, the demographic of boaters, the skills they have, and the interest in a boating

skills academy. All the information we obtained was analyzed to assist in providing a recommendation for further study. This is a preliminary effort to identify constraints of regenerating Lot's Ait in the Borough of Hounslow.

Chapter 2: Background

2.0 Introduction

Currently in London, there are a variety of regeneration plans being implemented by municipalities to revitalize waterfront areas on the Thames. The relationship between London, the River Thames, and its canals has been highly influential in the city since its creation in AD 43. The opportunities the river offered to London helped it thrive as a city of trade, commerce, and industry. In addition, the city's location in the British Isles made it well situated for travel. To this day, London has significant boat usage on its rivers, with almost 5,000 boats utilizing the waterways in 2010 (Canal and River Trust, 2017). The boating industry is one of the more profitable industries in London and continues to grow each year. The heavy usage of rivers and boats led to the demand for boating skills, necessary for reparation and maintenance of boats. However, there are few skills academies located in London or the United Kingdom that teach these skills, despite the growing industry. Likewise, craft skills in the United Kingdom are declining despite the fact that there are employment opportunities in this field.

John's Boat Works is a boat repair shop, located in the Borough of Hounslow, which sees the opportunity to teach boating skills and wants to create a boating skills academy. Also on the island are a guitar repair shop and a bi-plane wing maker. John's Boat Works serves as an incubator space providing the small businesses with space and equipment. Furthermore, the number of small businesses in the UK is on the rise and this example shows the benefits of a shared workspace. The company and incubators are situated on an island at the intersection of the Grand Union Canal and the River Thames. The island Lot's Ait sees heavy boat traffic from London and the United Kingdom each year. This location opens opportunities to teach skills to many citizens of the United Kingdom. Hounslow's residents themselves are very active in boating culture: many live on houseboats, boat for leisure, or are a part of the boating industry.

Additionally, there has been a rise in stand-up paddleboarding in the United Kingdom, which is considered a recreational activity and brings tourism to the riverside communities.

Hounslow's nautical history is displayed in many forms throughout the Borough, and is an important aspect of the Borough's heritage and economy. The Borough has also introduced many plans to regenerate the area, including adding residential housing and commercial spaces. This chapter discusses the Hounslow Council, its regeneration plan to promote growth in the economy, manufacturing, small business, and the positive impact the plan will have on the Borough. Background information about the boating, skills, and business in the United Kingdom, the River Thames in London, and Hounslow are discussed, as well as the specific planning goals for Lot's Ait.

2.1 Regeneration

Regeneration is a set of activities that reverses economic, social, and physical decline. It should secure long-term change in a community by increasing employment and moving community individuals from dependence to independence. Additionally, it should improve places to make them more attractive to both residents and visitors and help to unlock the potential of areas. Lastly, regeneration should deliver sustainable development that contributes to social satisfaction of residents and meets the government's goals (Allerdale Borough Council, 2017). Regeneration schemes can take years to complete and follow a project life cycle of four phases: initiation, planning, execution, and evaluation. The initiation phase begins by "defining the scope, purpose, objectives, resources, deliverables, timescales, and structures" of the project (SQA Project Management, 2017). The next step of this phase is to develop a business case, which includes several potential solutions and a cost/benefit analysis from each. A feasibility study of each solution is then carried out to ensure that the solutions are feasible and have minimal risk. The planning phase starts with the creation of a detailed project plan, which includes plans to identify resources needed, to quantify financial expenditure, to specify quality control methods, to identify risks and actions to minimise them, and to specify criteria before delivering the project. During the execution phases the team produces the deliverables while balancing issues such as time, cost, quality, risk, and communications with stakeholders. Evaluation occurs after closure of the project and involves determining the project's overall success and lessons learned (SQA Project Management, 2017).

2.1.1 Types of Regeneration

From 1870 to 1970 manufacturing played a key role in the development of the British economy and securing rising living standards. The subsequent forty years, from 1970, have witnessed a decline in the UK manufacturing sector, which unbalanced the UK economy. The world economy and Britain's economy suffered a major shock in the early 1970s with the emergence of stagflation, high levels of inflation alongside high levels of unemployment (Kitson, 2014). There was also a major push in this time for reduced social intervention. In the 1980s Britain had a big housing bubble called the Lawson boom, with house prices rising by 25% in 1988. The bust that followed the Lawson boom was "long and painful... interest rates were raised to 15% and unemployment doubled to hit 3 million" people (Elliot, 2014). The market began to recover in the 1990s until another housing bubble hit Britain during the post-war period. The 2007 financial crash brought this bubble to an end (Elliot, 2014). However, many communities have been blighted by unemployment, a lack of housing, and social improvements and are still feeling the effects of the past several decades. Regeneration attempts to reverse this decline through the creation of programmes, policies, and the implementation of new projects. A passage from a booklet title *Urban Regeneration* published in 1995 by the Central Office for Information explains the reasons for the need for regeneration.

"In recent decades, many urban areas of Britain have experienced considerable difficulties leading to economic decline and social problems. The weakening or disappearance of traditional industries, the relocation of employers to greenfield sites, high unemployment, crime and vandalism, poor housing and low incomes have all taken their toll on what were once some of the most prosperous and thriving parts of the country."

The booklet outlines measures taken by national and local governments to tackle urban issues (HMSO, 1995). There are different types of regeneration used including economic regeneration, cultural regeneration, environmental regeneration, and governance regeneration. Economic regeneration provides funding for infrastructure, creates new job opportunities, employability, and skills for local people, attracts private investment, and encourages regeneration-building projects. Environmental projects focus on the re-use of land and buildings while protecting existing green space and protected areas. Governance regeneration encourages

neighbourhood strategies, ensures local people feel engaged and have a stake in the urban planning and decision-making process, and reflects the priorities of local people when developing project ideas and community services. Lastly, cultural regeneration promotes a culture of enterprise and innovation, provides education facilities, and improves public services all while integrating the culture of the community (Institution of Civil Engineers, 2017).

Regeneration also can occur through a law called Section 106. Section 106 is a mechanism in London which makes a development proposal acceptable through developer contributions. The proposal is only acceptable if it has a positive community impact through the completion of a project. This project could range from the creation of low-income housing to the improved access of watersports or other recreational activities. Section 106 can restrict development or use of land in a specified way, require specific operations or activities be carried out on the land, require the land to be used in a specific way, or require a sum to be paid to the authority or GLA. If Section 106 is not complied with, it can be enforced by injunction. The planning officer would not allow a proposal to be granted unless it complies with Section 106. Likewise, if there is a breach the authority can take direct action and recover expenses if the developer does not follow through with the proposal. This mechanism creates many community benefits and reaches governance regeneration.

2.1.2 Culture-Led Regeneration

There is a recent emphasis in Britain in ‘culture-led regeneration’, which links cultural projects to social welfare and the renewal of communities. By integrating culture to projects this type of regeneration is sustainable: the community is invested in the projects and thus the project has long-lasting impacts (HMSO, 1995). Culture-led regeneration looks at historical uses of culture and employs them as a tool for redevelopment. Many times culture-led regeneration focuses on the arts, however it is not limited to this sector: culture can range from the arts to history of the area. In the last decade culture has gained prominence as a force for community and economic development. Cultural investment impacts economic, environmental, and social factors. Economically it increases visitor and resident spending, attracts an educated workforce, leads to direct and indirect employment, and creates inward investment. Environmentally it improves the public realm, re-uses buildings, and creates pride in a place that previously may have been viewed negatively. Socially it creates confidence and change in perception of an area,

community cohesion, and education and skills achievement (Greater London Authority, 2011). The London Assembly Regeneration Committee held a review to explore culture-led regeneration. The committee established how cultural regeneration could benefit “London’s culture, economy, and communities” and recommendation was given to the mayor Sadiq Khan (Snow, 2016).

2.2 London

London is the capital city of England and is governed by the Greater London Authority (GLA). It is a very significant city because it is not only an economic hub, but also the political center of the country. Composed of the 25 Member London Assembly and the mayor himself, the Greater London Authority is in charge of proposing plans to benefit the entire city of London (London Council, n.d.). London is thriving in areas such as the availability of educated staff and excellent market and transportation connections, but is struggling in fields related to quality of life, and air pollution. Therefore, the mayor and the London Assembly have a variety of plans to improve the city and also to provide funding to many different organizations. The GLA works in areas related to the environment, business and economy, education, housing, as well as countless others sectors. Funding and other opportunities are available for large and small businesses alike, and the GLA encourages businesses to create new apprenticeship opportunities (Greater London Authority, n.d.). The London plan, which is the city’s comprehensive plan for the future, is written and revised by the Mayor of London to focus on the current needs of the city. This plan sets a development strategy for London to be implemented over the next 20-25 years. It is also incorporated into the London borough’s individual development plans.

In 1965, 12 inner London boroughs joined with 20 outer boroughs forming 32 boroughs (Bradley, n.d.; Appendix A, Figure 1). As compared to the GLA, each borough is in charge of providing its own day-to-day more personal services (London Council, n.d.). They each have a Council of their own that works on their own regulations and future plans which range anywhere from taxes, to environment and planning, and housing.

2.2.1 History of the River Thames

The River Thames is in part located in London and historically has allowed for access to trade routes. Boats could travel on the river out into the English Channel and have numerous

options of where to sail. One could travel northeast and gain access to the North and Baltic Seas. One could also travel southwest out into the Atlantic Ocean or down into the Mediterranean Sea (Appendix A, Figure 2). Finally, one could travel into the rest of present day Europe since the River Thames is directly across from the three great continental rivers Elbe, Scheldt and Rhine (Port of Authority, 2017). In AD 43 the Romans landed in Kent and they established a garrison called Londinium along the River Thames (River Thames Service, 2000). However, due to the Roman withdrawal from Britain in 408, Londinium fell under Viking control and suffered greatly (River Thames Service, 2000). It was not until 1014 that the city was freed from Viking control (Port of Authority, 2017). In the centuries that followed, the city evolved further as a direct result of the River Thames giving seafaring boats access to the world. In the 8th Century, Edward the Confessor changed the name Londinium to the City of London (River Thames Service, 2000). Through the coming years, London's trade with other continents and the rest of the world increased steadily. Docks were built to allow ships to dock and unload cargo and boatyards were built so that more ships could be built for trade and transportation. In the 15th Century under Edward III London finally became the capital city of England (Cody, 1987). London kept growing both in size and power, eventually transforming into a city of trade, commerce, and industry. In the 17th Century the River Thames was so packed with ships that it was said to be possible for a person to walk from shore to shore across the decks of multiple ships (River Thames Service, 2000).

2.2.2 Present Day Usage of the River Thames

The River Thames touches sixteen boroughs in London and is regulated in part by the Canal and River Trust (CRT). The CRT is an organization responsible for all 2,000 miles of waterways in both England and Wales. They are also responsible for the large network of bridges, embankments, towpaths, aqueducts, docks, and reservoirs. Their goal is to make the waterways the "very best they can be" by protecting wildlife habitats, maintaining infrastructure, and preserving the history of the waterways (Canal & River Trust, 2017). The CRT recorded that in 2010 the number of boats sighted on London's waterways was 2,164. In 2015, the number of boats sighted on the waterways skyrocketed to 4,820 (Canal & River Trust, 2016). They concluded that the growth in the number of boats on the water showed no indication of slowing down in the upcoming years.

The River Thames is used for a variety of purposes including boating and watersports. Additionally, it has rich waterside usage as housing developments and businesses want to be along the water because of its aesthetic and leisure purposes. Tourists and locals participate in boating as a means of transportation, housing, leisure, and watersports. The primary reason most Londoners boat is for transportation, on both public services and using privately owned boats. The River Bus is a public service that is managed by the MBNA Thames Clippers, a company that provides fast and frequent boating travel for Londoners (Visit London, n.d.). This service allows you to get an Oyster Card, which works for not only boat travel but also almost all public transport such as the London Underground, above ground trains, and buses. The Transport for London system that connects public land transportation to the river is crucial to society as it decreases travel congestion on the roads.

Living on a houseboat rather than buying a house in the city has also become increasingly popular in London over the past few years. This is in direct response to the recent rises in prices of homes. In a survey conducted by the CRT in 2016 found that 69 percent of their 1,323 respondents said they are currently living on a boat in the London waterway area (Canal & River Trust, 2016) 59 percent also stated that they use their boat as their primary form of housing as well (Canal & River Trust, 2016). By buying a license from the CRT, people can Continuously Cruise (CC) along all of London's waterways and moor in any of the designated mooring locations. According the CRT, in 2010 the number of people CC'ing was at 410 and in 2016 that number jumped up to 1,615 (T. Smedley, 2016). CC'ing is not limited to just house boats: it can also include yachts and sporting boats. Yacht clubs are very popular in London and every year there is an annual London Boat Show where boat owners display their boats. In addition, sporting boats such as canoes, kayaks, and sailboats are used recreationally and also in competitions.

2.2.3 Thames Regulations and Plans

The London Rivers Association is an organization that gives strategic planning advice and creates policies for the Thames and works towards defining the Thames Policy Area. The Thames Policy Area is a London-wide designation under the Thames 2100 Plan, Policy GB5. This area calls for the historic and architectural character of the Thames to be protected and enhanced, and to ensure development has a positive influence on the river and waterside

environment (London Borough of Hounslow, 2017). Specifically, an area with this designation requires developers to pay attention to the impact of development on the character and conservation of the Thames landscape. Planning policies for the river focus on how planning can protect, enhance, and sustainably use the River Thames (Pinch, 2015).

The Blue Ribbon Network is an objective of the London Plan to “recognise the special character of the river and canal corridors as both a strategic and a scarce resource, and address the competing needs, uses and demands that are placed on them” (Imrie, Lees, & Raco, 2009). It is a name given to all of London’s rivers, canals, docks, and reservoirs to categorize them under one name. The network has a variety of uses including leisure, tourism, transport, and biodiversity. The London Plan and the local plans of the boroughs both have a series of policies that ensure the network is protected and contributes to a sustainable future for London (City of London, 2015). There are six principles to inform decisions taken in respect to the Blue Ribbon Network: (1) to protect and enhance the “multifunctional nature of the BRN to support uses and activities” that require a water or waterside location, (2) to protect and enhance the BRN to promote sport, leisure, and education, (3) to exploit the potential for leisure, tourism, and waterway support industries and capture the investment potential of the network through waterside development and regeneration, (4) to ensure the BRN is accessible for everyone and that its cultural and environmental assets stimulate development, (5) to increase the use of the network for transport of people and goods, and (6) to protect and enhance the biodiversity and landscape of the network (Pinch, 2015).

2.2.3.1 Port of London Authority

The Port of London Authority supervises all activity and protects the environment for a 95-mile stretch of the River Thames. With 60-80 million tonnes of cargo arriving at the port of London each year, and over 5 million tonnes transported within London on the river, the PLA has a great deal to manage (Port of London Authority, 2015). The authority serves to provide safe and smooth operation to all of the river’s commercial and leisure users and must also be consulted concerning any potential projects along the river. Furthermore, the PLA has multiple goals set up to make travel and transportation easier and more efficient and to increase the overall use of the River. The PLA is working on increasing trade, creating jobs and improving

port access. An additional priority of the authority is to increase intraport² transportation, which will double the number of people traveling up and down the river to 20 million each year. A third objective includes increasing sports and recreation participation across the river by increasing number of moorings and improving sport opportunity areas along the river. Lastly, a major goal set by the PLA is to make the river cleaner and to improve water quality through various projects such as the Thames Tideway Tunnel. Aimed to be completed in 2023, the 16-mile tunnel under the river will serve to capture sewage overflow that will decrease the amount of sewage that overflows into the river. (Port of London Authority, 2017.). Overall, the Port of London Authority has a big impact on the safety, development, and regeneration of the entire city of London.

2.2.3.2 Government Regulations for the Thames

Another designated area is a Nature Conservation Area. This area requires development to “conserve and take opportunities to enhance the character of the area” and to retain and reuse buildings (Hounslow Council, 2017). Conservation areas also aim to protect the wildlife and environment and there can be no construction in these areas. In order to build, change, or keep a structure on the River Thames an application for a “River Thames Accommodation” must be submitted. This applies to any structure that is on, in, or over the river or that cuts into the riverbank such as a dock or slipway. The license is valid until the structure is moved or changed. A flood defense consent application must be submitted to the Environment Agency if one is looking to build a new structure or change an existing structure (Government of the United Kingdom, 2017).

In addition to building regulations, different types of boaters also have varying required training courses and regulations. The International Standards of Training, Certification, and Watchkeeping (SCTW) was developed in 1978 in London and became the first document requiring basic training and certifications of boating (International Maritime Organization, 2011). This document set a requirement forcing anyone working on a boat to complete the basic training courses. People owning boats that operate on gas are also required to complete training courses. The Canal River and Trust has set up regulations through the Boat Safety Scheme, BSS, which aims to maintain the safety of gas boats by requiring inspections and certifications. This

² Trade and transport between ports in the city

examination helps transportation, housing, and leisure gas boats by reducing risk factors such as gas explosions, fires, and pollution (Boat Safety Scheme, 2012).

There are also specific regulations for the Tidal Thames, which is the section of the Thames that is affected by the ocean's tides. One regulation, set by the Port of London Authority, requires boat owners to register their boats in order to drive them on rivers and canals. An additional license is required to be able travel commercially on the tidal part of the River Thames (Port of London Authority, 2017). Stand-up paddleboarding also has a “Code of Practice for Paddling on the Tidal Thames”. Much of the river has ferries and barges with limited maneuverability and as a result, navigating a paddleboard on these areas requires greater knowledge, skills, and preparation. The use of the tidal Thames for paddleboarding is only permitted for more experienced paddleboarders who have undertaken recognised training courses and is limited to times when the river is less busy. The Paddling Code contains further information about paddling in these areas (Port of London Authority, 2015).

2.2.4 London Demographic

London’s 12 inner boroughs have a total population of 3.4 million people while its 20 outer boroughs account for 5.2 million (Trust for London and New Policy Institute, 2015a). London stopped expanding in area by 1950 due to the Greenbelt³, but the city and especially its’ outer boroughs became more populous due to increasing population in the city (Hounslow Council, 2017). Although there was drastic decrease in London’s population in the 1960s and 1970s, the population began to rise rapidly in the 1990s and is expected to continue growing with a forecasted 9.3 million people by 2021 (Trust for London and New Policy Institute, 2015a; Appendix A, Figure 3).

Additionally, London as a whole is a fairly young and diverse city, especially compared to the rest of England. Approximately 16% of those living in the outer boroughs and 25% living in the inner boroughs are between the ages of 25 and 34 (Trust for London and New Policy Institute, 2015b; Appendix A, Figure 4). In addition, 60% of London’s populace is white while 86% of England's residents fall in this category (Trust for London and New Policy Institute, 2015c).

³ an area of open land around a city, on which building is restricted

2.2.5 London Economy

London has one of the largest economies in the world. Its Gross Domestic Product is £565 billion annually, which accounts for 17% of the United Kingdom's GDP (London's Economic Plan, n.d. a). Approximately two out of three Fortune 500 companies have major offices located in London and the London Stock Exchange comprises of 32% of all international activity (London's Economic Plan, n.d. a). Additionally, tourism attracts 30 million visitors each year and accounts for 13% of London's overall GDP. Although Buckingham Palace attracts 15 million visitors each year and The British Museum attracts six million, many of the other famous attractions that draw tourists, such as the London Eye and Tower Bridge, are situated along the River Thames (London's Economic Plan, n.d. d).

In the late 18th and early 19th centuries, the city had an extensive manufacturing sector that spanned across numerous industries. The end of the First World War led to a decline in this sector. The manufacturing industry in shipbuilding and iron production weakened with the closing of the Thames Ironworks and Shipbuilding Company (London's Economic Plan, n.d. c). However Ford Dagenham, the largest diesel engine plant in the world, is still located in London (London's Economic Plan, n.d. c). Today, some of the strongest industries include electronics, communications equipment, and food production (London's Economic Plan, n.d. b). The city also has industries including banking, finance, and tourism and boating (Office for National Statistics, 2014). Additionally, London has 806,430 businesses in total but 99.8% of these are SMEs with less than 250 employees. They also contribute to 49.8% of employment in the city and have a total turnover of £430 billion (GLA Intelligence Unit, n.d.).

2.3 Hounslow

Hounslow is one of the outer boroughs of London and is the 18th largest borough. It stretches from central London in the east to Heathrow Airport in the west (Hounslow Council, 2017). The Hounslow Borough is divided into five major areas known as Chiswick, Brentford, Hounslow Town, Isleworth, and Heston West, which are even further split up into 20 different wards primarily for elections (Appendix A, Figure 5). Brentford, a port town, is located on the River Thames and is one of the wards of Hounslow. Its usage as a port town is a result of the Grand Union Canal intersecting with the River Thames, an area that has heavy boat traffic. In the

early 1800s, Brentford was a separate town outside of London, but as the city grew, it became part of the urban area within a hundred years (Hounslow Council, 2017).

2.3.1 Hounslow Demographic

Hounslow and Brentford have similar demographics to London as a whole, but the trends related to diversity and the young age groups are perhaps even more pronounced. From 2001 to 2011, the “White British” population decreased from 55.8% to 37.9%, while the percentage of people of Indian descent is 19% and forms the second largest population in the Borough (Hounslow Council, 2017). Additionally, most of Hounslow’s 276,000 residents are young; 52% are under the age of 35, and almost one half of these are under the age of fifteen (Hounslow Council, 2017).

2.3.2 Hounslow Economy

Hounslow provides a wide variety of jobs to its residents. The sectors of transportation and communications, distribution/ hotels/ restaurants, banking and finance, and public administration and educations each account for about 20% of the 140,000 employed in the Borough, while 3% of jobs are related to manufacturing (Office of National Statistics, 2014). However, the number of apprentices for skills based jobs is drastically increasing. In 2005, 390 apprentices began their apprenticeships, but in 2015 that number increased to 1,600 (Greater London Authority, 2016). Distributed by age, 300 of the apprentices were under nineteen, 430 were between the ages of 19 and 24, and 860 were over the age of 25 (Greater London Authority, 2016). In addition, the number of businesses in Hounslow grew by 20% and the number of people employed in the Borough increased by 12% from 2009 to 2014 (Hounslow Council, 2017). As seen in Table 1 below, small businesses make up most of the businesses within the Borough. Furthermore, with a growth of 23% from 2011 to 2014, Hounslow has the highest growth of micro businesses in all of West London.

Table 1: Businesses in Hounslow

	Number of businesses	%	% Employment
0 - 4	9,200	74	8
5 - 9	1,500	12	6
10 - 19	800	7	8
20 - 49	500	4	12
50 - 250	200	2	25
250+	100	1	42
Total	12,500	100	100

Source: Inter Departmental Business Register (ONS)

Since Heathrow Airport is in the west of Hounslow, the Borough has many tourists that pass through, and thus the Borough is considered the “Gateway to London”. Each year 70 million passengers arrived or departed from Heathrow. Of the 76,000 on-site airport jobs, Hounslow residents take 11,000 and an additional 5,000 residents are employed by off-site airport jobs (Invest Hounslow, 2017). An additional source of employment comes from the “catalytic effect” from companies located near Heathrow. The catalytic effect occurs because the airport creates many jobs that need to be supported by the surrounding community. A Heathrow Employment Impact Study, commissioned by the Hounslow Council, estimated that 20,000 jobs in the Borough rely on this catalytic impact (Invest Hounslow, 2017). Despite the availability of jobs due to the proximity of Heathrow, there are some barriers to business growth and job creation in Hounslow, one being the skills mismatch. There is a great difference between the skills of the residents and available jobs in the Borough, and as a result many local jobs are taken by residents of other boroughs (London Borough of Hounslow, 2016a). In the Regeneration and Economic Development Strategy written by the Hounslow Council, it states

“Business growth goes hand in hand with workforce development. It is about identifying critical job roles, skills and opportunities that local employers and sectors need. A skilled workforce can also attract businesses” (Hounslow Council, 2017).

The push for business growth, the Borough has opened business opportunities for the private and public sector to work together, and additionally has opened employment opportunities in the Borough.

2.3.3 Hounslow Council

The Hounslow Council is the local authority for the Borough of Hounslow and comprises sixty councillors who are elected from each of the twenty wards every four years. Councillors meet about ten times a year to set the budget and tax base, elect the mayor and other officials, and to decide overall Council policies. Of the sixty councillors, ten sit on the Cabinet (Appendix A, Figure 6). The Cabinet is responsible for creating strategic policy proposals that are discussed by the Council, overseeing the operational management of the Council, and ensuring that the policies are carried out within the budget (Hounslow Council, 2015). Each Cabinet member has specific responsibilities. Councillor Steve Curran is the leader of the Council and is responsible for corporate strategy, planning, and regeneration. The regeneration responsibility includes the department of Regeneration, Economic Development, and Environment, which oversees planning, transport, leisure, culture, and adult and community education. The Hounslow Council is also broken up into area forums that are responsible for monitoring the delivery of services in their areas (Hounslow Council, 2017). In addition, the Council is committed to being an open government and encourages the public to have a say in decisions that affect them, their families, and the community as a whole.

The Hounslow Council has made a four year budget plan from 2014-2015 to 2018-2019. This budget plan includes several departments such as Children's and Adult's, Regeneration Economic Development and Environment, and Corporate Resources. The breakdown of this planned budget includes growth, savings, capital programme, and taxes. Growth includes both inflation cost increases and reductions. With a net expenditure of £249 million in 2014-2015 and £73 million in 2015-2016 in the Regeneration, Economic Development and Environment sector, the Hounslow Council has a budget on the improvement of the community, but it greatly varies each year depending on the government grants given (Hounslow Council, 2016).

2.3.4 Planning in Hounslow

The vision for Hounslow in 2030 is to develop the Borough to be “distinctive, vibrant, and thriving, with a happy, high-achieving community at its heart” (Borough of Hounslow, 2017). By 2030, they hope to have built a minimum of 12,330 new homes while maintaining and enhancing the culture of the Borough, specifically the natural environment and residential character. All of the plans the Council have made also focus on stimulating the local economy in different manners such as improving access to a range of jobs and skills for local people (Hounslow Council, 2017). Overall, the Council prioritizes the quality of life of the residents and will obtain their vision by supporting new infrastructure, maintaining and enhancing local character, and improving local benefits for both local residents and businesses. The Council and its departments have developed several different published plans to achieve their vision and are facilitating and overseeing a range of projects throughout the Borough in order to achieve these goals. The Local Plan is created by the Hounslow Council and compliments the London Plan. The Regeneration and Economic Development Strategy was created by the Planning and Regeneration Department and cover the specific goals of the department and implementation strategies.

2.3.4.1 Local Plan

The Local Plan is a development plan that states the Council’s proposals for the future plans of the Borough over the next 15 years through the creation of new planning policies. Each ward prepares a Local Plan that focuses on sustainable development and economic, social, and environmental changes (London Borough of Hounslow, 2017). The starting point of developing policies for the Local Plan is to address the requirements in the national planning policy, the “London Plan”. If the policies in the London Plan are applicable and sufficient to the Borough and wards, the Local Plan does not include any alternatives or updates. Only when a policy does not adequately address the planning goals of the Council does the Local Plan propose an alternative to the national policy (Hounslow Council, 2017)

The Local Plan is not a static document and is continuously reviewed and updated to meet the changing needs of the Borough. It contains several strategies that look into detail at local improvements, investment, and development opportunities (Appendix A, Figure 7). The Spatial Strategy is the main strategy included in the Local Plan and includes three phases and

eight objectives. The phases target regeneration and planning in different areas of Hounslow. Policies are enacted to ensure that each objective is achieved. Objective 2 is to promote economic growth and inward investment in the Borough. Objective 2, Policy ED1 and ED4 are to promote employment growth and development, and to enhance local skills. Objective 5 is to maximize benefits to the Borough from green and blue infrastructure. Objective 5, Policy GB5 and GB6 are concerning the Blue Ribbon Network and residential moorings and how to maximize the usage and benefit of rivers and canals. (Hounslow Council, 2017). Lastly, Objective 6 is to deliver community infrastructure to the Borough. Objective 6, Policy C12 is to create educational opportunities that are seen as a positive reason to visit, live, or work in the Borough. This includes the creation of special schools, specifically in areas that a need has been identified in (Hounslow Planning Committee, 2015).

2.3.4.2 Regeneration and Economic Development Strategy

In congruence with the Local Plan the Council has created supplementary strategies specific to its departments. The Regeneration Department has a strategy that focuses on regenerating Hounslow through specific objectives. This strategy is meant to supplement the local plan by focusing on more specific plans for each department.

The “Regeneration and Economic Development Strategy” is a document, which provides objectives for economically, socially, and environmentally sustainable regeneration in Hounslow. The document is dedicated to planning and how planning will help regenerate the local economy and improve the daily lives of the residents of Hounslow. Using this strategy as a guide, the Council will help facilitate different projects to ensure they help grow business in the area and bring together the private and public sectors. Objective 1 of this strategy is to grow business. Under this objective, the Council plans to retain as well as add new businesses to encourage growth in the Borough (London Borough of Hounslow, 2016a). Priority P1b of this objective is to increase the skills of residents in the Borough and identifying partners that can help with this.

2.3.4.3 Planning on the River Thames

The current waterside usage along the River Thames and the Grand Union Canal includes housing, boatyards, moorings, and small industrial and commercial uses (Hounslow Council,

2017). Hounslow is planning to enhance both the area along the river and the Brentford Dock (Birch, 2016). This enhancement will provide important tourist attractions and will also increase tourist expenditure, create job opportunities, and offer facilities for local citizens to visit (Hounslow Council, 2017). As a result, there will be a need for more docking areas and mooring locations to be added in addition to the four currently in Brentford.

This past year, the Council introduced a plan for a £5.45 million jetty with 26 berths. Boat owners already at the site in discussion would be evicted to allow for the marina's construction (Cumber, 2015). The Council claims that many of the boats at the marina are moored illegally, but the occupiers contested. This sparked a several month-long argument about mooring regulations. Some of the boat dwellers claimed to have lived at the moorings for up to 20 years and were planning on pursuing legal action if the Council continued with the plan. The Council stated they would compromise if the existing boat dwellers would tidy up their boats, pay mooring fees, and pay the Council tax. At the nearby Brentford Dock the boat owners pay about £2,000 per year in the mooring fees (Cumber, 2014). The Council feels they are losing significant money by the boat dwellers who are mooring but not paying. The actions the Council has taken to resolve this issue have upset some boat owners and strained the relationship between the local government and some residents of the Borough.

In Brentford there are many private development projects being worked on as well. One plan that is currently collecting funding is for a footbridge to be built next to the island Lot's Ait. This footbridge would connect Brentford to Kew Gardens and would encourage more pedestrian traffic. In addition, it would improve the connectivity between the two areas, a problem the Borough currently faces. Another large-scale project is the Ballymore Plan at Brentford Waterside. This is a significant regeneration scheme that will bring 900 homes, 25,000 square meters of commercial space, and public realm to the town. Councillor Steve Curran believes the development will bolster the reputation of the Borough as a "west London boom town" and also bring new retail opportunities. The plans will benefit the boating community in London as additional moorings will be created at the development's new docks (Ballymore Group, 2015). There are several other large-scale development plans including three mixed-use uniquely designed skyscrapers and a new Brentford Football Club stadium being built. These projects are expected to start in 2020 and have the overall goal to regenerate the area, as well as make profit for the developers.



Figure 1: New Brentford Football Club Stadium (Source: BBC News, 2013)



Figure 2: Ballymore Scheme (Source: Regeneration Summit Presentation – with permission)

2.4 Lot's Ait

Between the 16th and 20th centuries, due to the traffic on the River Thames ships were not able to dock and unload their cargo. As a result in the 19th Century dump barges, or Lighters, were created to transport goods from ships berthed in the overcrowded river to convey the cargo to the riverside wharves (Thames Tugs, 2009). With the demand for Lighters, boatyards were established along the River Thames to both repair these barges and build new ones. In the 1950's there were over 8,000 Lighters on the River Thames in service (Thames Tugs, 2009).

In the Borough of Hounslow one boatyard was established by the Thames Lighterage Company in the 1920's on the island of Lot's Ait (John's Boat Works, 2013). The Boatyard at Lot's Ait was situated in a key location because less than a mile away from the island was the entrance into the Grand Union Canal. The Grand Union Canal opened for service in 1805. This canal ran from London all the way up to the Midlands and Birmingham (Canal & River Trust, 2017). It was used frequently for the transportation of goods that were freights received in

London and then taken to the rest of the country. Between the late 18th and early 20th century the section of river between the Canal and Lot's Ait had frequent boat traffic.



Figure 3: Historic Grand Union Canal (Source: West Watford History Group, 2011)

Eventually boating began to decline in the 20th Century; with the rise of cars and airplanes, people soon began to use these methods of transport over boats. Even today transportation of freight throughout the country is dominated by road transportation and in 2015 accounted for 76% of all tonne kilometres of domestic freight transported (Department of Transport, 2016). Eventually the boatyard on Lot's Ait closed in the 1970's and was one of the last ones to close along the River Thames (John's Boat Works, 2013). The island remained untouched for over 30 years and came under the new ownership of Monument Assets Ltd. As for the Grand Union Canal, today it is mostly used by "pleasure boats, walkers, cyclists and day trippers" taking in the sites (Canal & River Trust, 2017).



Figure 4: Abandoned Building on Lot's Ait (Source: Classic Boat Magazine, n.d.)

2.4.1 Current Day Lot's Ait

In 2004, Monument commissioned RPS Ecology to conduct an ecological study on the island and surrounding areas in Brentford to develop proposals for the site (Stronach et al., 2005). The surveying focused on the vegetation, bats, invertebrates, and birds that lived on the island. The results of the study found that the impact assessment suggested that the impacts of development are of low significance and would not affect the environment of the island (Tronach et al., 2005). This allowed Monument Assets to begin making plans into revitalizing the island and begin development so the island could be used once again. It wasn't until 2011 that the island received a new tenant and changes were undertaken. The current tenant on the island is a boat building business called John's Boat Works who revitalized the island to create a boat building business.



Figure 5: John's Boat Works (Source: John's Boat Works, 2015)

The company offers services including maintenance, restoration, repair, and building new boats from scratch. They work on all types of wooden boats from “clinker built rowing boats to beautiful carvel built yachts” (John's Boat Works, 2013). John Watson, the owner of John's Boat Works, has a passion towards traditional boatbuilding and the long great heritage of the boating industry in London and the whole United Kingdom. This passion led him and his company to relocate to Lot's Ait. All of this is offered in the hopes of reviving and rebuilding the boating industry in both the Borough of Hounslow and London. The opportunity, space, and experience

to learn these skills will be provided so residents can build, maintain, and repair their own watercrafts. John's Boat Works hopes to make boatbuilding and boat repair popular once again and help people learn and develop the necessary skills.

In addition to the restoration of the yard and the renovation of the facilities on the island, John's Boat Works made additional improvements to the island aimed to help improve the boatyard. Originally the only ways to get onto the island were to wait until the tide was low enough and take a crawler across the river's bed or by boat that launched up river from the island. Both of these methods took tedious and unnecessary amounts of time to travel. To make the island more accessible a footbridge was built and placed to connect the island to Brentford. The revitalization of Lot's Ait help further the regeneration of not only Brentford and the Borough of Hounslow, it was step towards helping regenerate boating within the boroughs of London and making boating popular again like in the past.



Figure 6: Lot's Ait Footbridge (Source: Project Team, 2017)

2.5 Boating & Craft Skills

2.5.1 Boating in United Kingdom

The United Kingdom is an island nation that has over 17,000 kilometres of coastline. This gives rise to various activities on the water throughout the island. (Brilliant Maps, 2016). The boating industry has a large impact on the United Kingdom economy and is growing annually. In the United Kingdom, the super yacht and small commercial marine industry alone

have direct revenues of £3 billion and overall contributes £6.2 billion to the GDP of the UK (British Marine, 2016a). Approximately £900 million was added to the country's GDP through just the exports of boats (British Marine, 2016a). Many subcategories of the boating industry such as in boat manufacturing and engine and equipment manufacturing are displaying growth. Fifty percent of boat manufacturing businesses had an increased turnover in 2015, while 46% of businesses that manufactured engines and equipment saw an increase in turnover (British Marine, 2016b). Additionally, tourist related boating activities in the United Kingdom are also seeing rising profits each year.

Table 2: Overall GDP contribution to the UK

Activity	Contribution
Super yacht and small commercial marine industry	£3 billion direct revenue
Super yacht and small commercial marine industry	£6.2 billions overall to the GDP of UK
Export of boats	£900 million to the GDP of UK
Watersports	£1.7 billion to the GDP of UK

2.5.2 Boating Skills in the United Kingdom

Boating maintenance includes a variety of work: post season inspection and winterisation of the engine, inspection of hull, propeller, and rudder, and inspection and replacement of anodes. Repairs and restoration also varies greatly depending on boat type and age, but range from the smallest rigging repair to full keel up restorations (John's Boat Works, 2011). Since most people with boats are lacking these skills, they are required to go to boating mechanic shops and pay high prices that can be unaffordable. Those who have boating skills have learned them in a variety of ways including apprenticeships, trade school, self-taught, or online. Self-taught skills are developed through trying new things and learning, watching on-line videos, and even being passed down from older generations. It is common for someone to learn trade skills from their father or grandfather. Traditionally boating skills have been passed down in this way or have been taught through guilds and apprenticeships. The best way to learn these skills is to have someone that has mastered them teach another in person. Additionally, a limited alternative in the United Kingdom is boating skills academies, which teach people the necessary skills to

build, repair, and maintain a boat. Currently in the United Kingdom there are three boating skills academies, all located on the coast and are several hours away from London. These academies are the Falmouth Marine School, The Boat Building Academy, and finally the International Boatbuilding Training College. Courses at these academies aim to teach specific types of skills. The course length can range from a day to multiple weeks depending on the skills being taught. The skills taught in these courses can be as broad as basic woodworking to being very specific like rope work or sail making. Professionals teach students how to apply these skills by giving them hands-on experience. There is another way to learn these boating skills: by researching online. There is a “Virtual Learning Environment” provided by the Maritime Heritage Skills Cluster Project, which offers online instructions for over fifty boating skills (Traditional Maritime Skills, 2017). This online resource is partially funded by the European Union and aims to preserve the skills of traditional boat building. These online courses are popular among people who are not be able to attend courses in person. People have multiple paths available to them to be able to gain the knowledge necessary to both maintain their vessels as well as building their own.

2.5.3 History of Craft Skills in the United Kingdom

Skills for boatbuilding first arose from the development of simple craft skills that focused on manipulating wood. However crafts skills weren't only just limited to woodworking and encompassed many areas. In historic Britain craft skills were a means for people to make a living, and resulted in the formation of guilds. The word “guild” is from the Saxon “gilden” meaning “to pay” and refers to the subscription paid to the Guilds by their members (Lords and Ladies, 2014a). People of the same crafts and trades banded together to form these guilds so that they could better control the trade and also to help deal with taxes they had to pay due to the system of feudalism (Lords and Ladies, 2014a). In addition this kept the skills alive through apprenticeships within the guilds and the craft skills were passed down from generation to generation. Soon merchant and craft guilds began to form throughout the United Kingdom; members of these guilds rose to great social status. Guilds held significant power in society and this power reached an all time high during the Middle Ages. Craftsmen and tradesmen from these numerous guilds created items necessary to daily life and helped people live better lives (Lords and Ladies, 2014b).

Within London these merchant and craft guilds help significant power. The specializations of these guilds ranged from goldsmiths, needlemakers, chandlers, masons, armourers, and carpenters (Lords and Ladies, 2014b). The medieval London guilds played a major role in the lives of the people in the city. The members of these medieval guilds became quite powerful. The guilds controlled the way trade was conducted in the city and surrounding areas. Members of the guilds also became involved with civic duties and were appointed to important and influential positions in the community (Lords and Ladies, 2014b). Once the Middle Ages ended and feudalism began to wither away guilds soon began to dissipate and disband.

2.5.3.1 Craft Skills in the United Kingdom

Once the middle ages and feudalism died out guilds did not disappear from existence. Even to this day in modern London remnants of these guilds exist and still use their craft skills. Within London there are various Livery Companies dedicated to different working in craft skills. These companies are modern day guilds and the crafts they work in range from goldsmith and chandlers to skimmers and musicians. In western London there is the Richmond Bridge Boathouses, these boathouses are home to the Richmond Boatbuilders. These boatbuilders are dedicated to traditional wooden boatbuilding and keep to ways of days past. They even offer apprenticeships for people interested in boatbuilding. This apprenticeship is much like the ones in the middle age guilds and aim to keep the skills from dying out.

The United Kingdom National Heritage Plan works to identify and ease the threat of shortages in the “vital areas of traditional craft skills”, a field that was once prominent in England. The Heritage Plan aims to help maintain the level of key craft skills in the country and additionally promote traditional craft skills to encourage more to enter this field (Historic England, 2017). Currently in the UK, 10.4% of citizens are employed in a skilled trade occupation (Office for National Statistics, 2016). This number has drastically dropped in the past centuries. If the younger generation is not introduced to these skills this number will drop further and the crafts could die out.

2.6 Watersports

2.6.1 Watersports in the UK

As an island nation, access to water is not limited at all making watersports a very popular activity in the UK. In 2015, 3.2 million adults in the UK participated in a boating or watersport activity totaling nearly 19 million boating trips and using one million watercrafts (British Marine, 2016a). With five million domestic vacations taken related to these activities, a total of £1.7 billion was added to the economy (British Marine, 2016a). Watersports include sailing, paddleboarding, kayaking, yacht cruising, and spending leisure time on the beach. In the United Kingdom they can generate approximately £261 million on a given holiday (United Kingdom Sports and Recreation Alliance, 2011).

2.6.2 Watersports Skills

Watersports skills training is the training needed for one to be able to participate in any form of watersports on the Tidal Thames. Instructors certified by accredited institutions teach these skills to people. The skills range from how to use equipment properly, device usage, how to launch properly, and other skills that are needed to participate. Specifically, stand-up paddleboarding instructors must be certified by the British Stand-Up Paddleboarding Association or the Academy of Surfing Instructors on a level that permits them to teach people the requires basic SUP skills. To teaching paddleboarding skills on the River Thames instructors need a level two certification from the ASI. This certification allows an instructor to teach people to SUP on “large inland lakes and ocean environments with uneven waters and swell up to 2 ft” but with no breaking waves. (Academy of Surfing Instruction, n.d.).

2.6.3 Active 360

Active360 is a company in London dedicated to stand-up paddleboarding (SUP) and watersports skills training. SUP is the fastest growing watersport in the world and Active360 is at the forefront of developing SUP in London (Think360 Sports Ltd, 2011). SUP is a very accessible sport and is popular with people of all ages and provides a great workout to develop fitness and core strength (Think360 Sports Ltd, 2011).



Figure 7: Stand-up Paddleboarding (Source: Yelp, 2017)

Within London people can SUP on the city's canals, as well as on the River Thames. Active360 gives people the opportunity to take part in this growing watersport by selling SUP equipment and offering training. The training opens up the opportunity for trainees to coach SUP. Currently Active360 has four locations in London where people can SUP: one of the locations is in Hounslow located at Kew Bridge where a pontoon serves as their base of operations. From the pontoon Active360 has people with little to no experience with SUP launch into the Thames. By launching from the pontoon and not the shore people are exposed less to chopping water and more level water that will be easier for the people to SUP. Active360 aims to build the popularity of SUP in London to make it the biggest watersport in the city and accessible to everyone. Active360 wishes to relocate the pontoon at Kew Bridge to the island of Lot's Ait. This relocation would not only promote the company it would also provide a better environment for less experienced paddleboarders to launch from and receive training at due to the waters surrounding the island.

2.6.4 Pontoon at Kew Bridge

A pontoon is defined as a boat or a floating device used to float itself and carry heavy loads. There are different types of pontoons, one of which is specifically used for docking and launching boats. This type of pontoon acts as a dock where people can unload their goods from their boats or can get into their recreational boats at the edge of the pontoon. Therefore, the pontoon must be able to be level with the water depending on the tide and height of the water. When the tide is high the pontoon must be able to rise to that water level and lower to the height of the low tide. The pontoon must meet these requirements in order for boats to properly dock

and launch. There is a pontoon located at Kew Bridge, which is less than a mile east on the Thames from Lot's Ait. It is currently owned by a private developer, St. George, and is a subject of controversy in the Borough.



Figure 8: Pontoon at Kew Bridge (Source: Project Team, 2017)

2.7 Business Incubators

2.7.1 Small businesses in the UK

Small businesses create new jobs and open up new markets both of which make them vital to the economy of the United Kingdom. They serve as seedbeds for innovation, they encourage competition and bring fresh ideas that challenge the status quo (Federation of Small Businesses, 2016). Within the past two decades the growth in small business has been increasing at a steady rate and shows no signs of slowing down. Since 2000 there has been a 2.0 million increase in private sector businesses (Small Business, 2015). In the past year alone in the United Kingdom there were 97,000 new small businesses in 2016 bringing the total number of small businesses up to 5.5 million (Small Business, 2015). The Global Entrepreneurship Monitor puts the UK at number one in Europe and fourth globally for places in the world to start and grow a business (ICAEW, n.d.). Small businesses are important to the further growth of the economy in the United Kingdom.

The United Kingdom is working to make the country an easier place to do business by providing funding and programmes to make loans more available to small businesses. Research done by the UK government shows that existing small and medium-sized enterprises are put off from growing their business because of lack of access to finance, not being able to recruit people lacking the right skills in new and existing staff, and day-to-day cash flow. The UK is working with small and medium enterprises in a variety of ways to solve these problems. They develop policies to support start-up businesses to help them continue to grow and make a contribution to the economy, and to get access to finance and support that was unavailable before. In addition, the government works with businesses, financial institutions, and other government departments to help UK business start, grow and succeed (Department for Business Innovation & Skills, 2015).

Small and medium sized enterprises are defined as any business with fewer than 250 employees. Within this group are micro-businesses, which are businesses with 0-9 employees. There were five million micro-businesses in the UK in 2014, which accounted for 96% of all businesses (Department for Business Innovation & Skills, 2015). The Gross Value Added of SMEs was 49.8% of the UK economy, compared with the EU27 average of 58.4%. The government's "Plan for Growth" was published with the UK budget in 2011 and included specific policies that would benefit SMEs. The policies included minimising regulatory burdens, helping SMEs access finance, reducing fixed cost for SMEs, making it easier for SMEs to access public sector procurement, encouraging innovation, and making it easier for SMEs to get planning consent (Small Business, 2015).

2.7.2 Description of Incubators

Business incubators are an effective way of enhancing the success of startups and small businesses. They can function in a variety of ways depending on factors such as the types and number of businesses targeted, available space, and the client's needs. The incubator can provide a physical space for entrepreneurs to network and share ideas or can be setup to provide guidance to entrepreneurs and small businesses online (De'Lacey, 2014). Many successful incubators provide both a physical space and online assistance and depending on the focus of the incubator, university involvement can also be beneficial. Additional benefits of being part of an incubator include possibilities for funding, more affordable resources and equipment, and better public

relations and advertising for their business. Incubators are sometimes referred to as accelerators because they are also effective at supporting and improving already successful businesses. The concept of business incubators in the UK emerged about 50 years ago and has been a valuable asset to the economy and small businesses ever since. Currently, there are 300 incubators in the UK, which support about 12,000 business in total (De'Lacey, 2014). Incubator businesses can range from life sciences, financial focused businesses, and craft-skill incubators. Craft focused incubators integrate people's business skills with their unique craft talents. In addition, they build upon traditional skills that have been passed down through the generations and keep these skills alive (Hatch, 2017).

2.7.3 Current Business Incubators in London

In 2014 with support of the Mayor and GLA, a regeneration project targeting multiple areas was completed in the London Borough of Waltham Forest (We Made That, n.d.). Black Horse lane is being revitalized through both the creation of a shared workshop known as the black horse workshop as well as improving the appeal of other businesses such as shops and eateries. The workshop acts as a craft based business incubator to boost manufacturing businesses in the area. The entire top floor of the workshop is dedicated to offering studio space for startup businesses and currently consists of 35 designers, carpenters, furniture makers, and other artisans sharing the space (Assemble n.d.). Those who have their own studio space pay £239 per month, which includes 24-hour studio access, as well as access to the workshop 6 days a week (Assemble, n.d.). Within the workshop access is offered to a fully supplied woodshop and metal workshop and technical support is offered when needed to work and fix things ranging from chairs and furniture to bikes and sculptors. Additionally, the black horse workshop offers a variety of courses to teach DIY skills to the community by inviting professionals from each respective field as an instructor (Assemble, n.d.). Furthermore, the area offers both a kitchen and cafe for everyone that uses the workshop. The overall regeneration project is described as “a blueprint for how industry can play a productive role in future mixed-use development”(We Made That, n.d.)

2.8 Regeneration of Lot's Ait

Lot's Ait is a man-made island that was originally planted with trees in order to hide Brentford from Kew Gardens, which is across the water (Revolvy, n.d.). The island developed into a boating yard and has a rich history of boating along with the rest of Brentford. In the 1970's the boatyard shut down and the island remained largely uninhabited. Recently, however, the island has started to see slight regeneration. A company John's Boat Works is now the current tenant on the island leases space to two incubators: a guitar maker and a bi-plane wing maker.

The Hounslow Council sees opportunity to fully regenerate the island. The goal of this project is to look into regeneration of Lot's Ait by assessing the feasibility of creating a boating skills academy, relocating a pontoon for watersports skills training, and creating additional craft-focused incubators. There are a few types of regeneration that can happen on this island including cultural, environmental, governance, and economic. Creating a boating skills academy will help revive the past culture of boating on the island, resulting in cultural regeneration of the ward. Environmental regeneration must also be considered with the nature conservation area on the island. Governance regeneration is the whole area around the island by examining the social impacts of the regeneration and considering more than just the island. The island connects to a high street, which may help benefit the people and island as well. Lastly, economic regeneration is the addition of income flowing into the island and then back to the community. Regenerating the island through creating a skills academy, adding a pontoon, and creating incubator spaces will aim to revive the island and better the community.

Chapter 3: Methodology

3.1 Introduction

The goal of our project is to look into the regeneration of Lot's Ait by assessing the feasibility of creating a boating skills academy, implementing watersports and relocating a pontoon for watersports skills training, and creating additional incubator spaces, and to make a recommendation to stakeholders based on our findings. We define feasibility into three components: market issues, technical and organizational requirements, and financial overview. From these components we investigate the social effect on stakeholders. A market issue is the area of a feasibility study to address potential market opportunities. If there is demand than a venture can be pursued. Technical and organizational requirements deal with the logistics of technical and organizational aspects including infrastructure, government regulations, and environmental constraints. Lastly, financial overview includes economic sustainability and funding. The social value is analysed in terms of the overall community impact of the three components and looks at the opinions of stakeholders. To achieve these goals and determine feasibility the project team has identified the following objectives:

1. To evaluate the need for a boating skills academy by looking at the relationship between boating and the boroughs of London
2. To evaluate the potential for incubators to further encourage the growth of small businesses in order to promote craft skills
3. To identify constraints and impacts
 - a. of creating a boating skills academy on Lot's Ait in Hounslow
 - b. of implementing watersports and relocating the pontoon from Kew Bridge to Lot's Ait
 - c. of the creation of additional incubator spaces on Lot's Ait
4. To offer recommendations for future study
 - a. into a boating skills academy
 - b. into implementing watersports and the relocation of a pontoon for watersports theory training
 - c. the creation of additional incubator spaces on Lot's Ait

- d. other options for the regeneration of the island

3.2 Data Collection Methods

We conducted interviews with various stakeholders, distributed a survey, and performed an on-site evaluation to meet our objectives. The following chart shows the correspondence between our data collection methods and objectives

Task	Objective									
	1	2	3a	3b	3c	4a	4b	4c	4d	
Hounslow Council Interviews	■	■	■	■	■	■	■	■	■	■
Island Stakeholder Interviews						■	■	■	■	
Boating Stakeholder Interviews	■		■			■				
Int. Boatbuilding Training College Interview	■		■			■				
Watersport Stakeholder Interviews				■			■			
Incubator Stakeholder Interviews		■			■			■		
Potential Funder Interviews						■	■	■	■	
Boating Survey	■									
On-Site Evaluation			■	■	■					

Figure 9: Project Tasks and Objectives

3.2.1 Interviews

We conducted interviews with a variety of people and groups including: members of the Hounslow Council; stakeholders of the island, pontoon, watersports training, and incubators; other boating skills academies and other incubators; and external funders. The interviews took place in the first three weeks of the project allowing time for data analysis. A list of the interview questions to obtain this research data can be found in Appendix B. The majority of the interviews were conducted in pairs, with one group member asking questions and one group member taking notes. Interviews with more than one person were conducted in groups of four, with two note-takers and two project members leading the interview.

3.2.1.1 Hounslow Council Interviews

The interviews with members and employees of the Hounslow Council served the following purposes:

- Clarify the nature and purpose of the project
- Define what feasibility means to the Council
- Identify any potential external funders in the area
- Establish the baseline skill level of Hounslow's residents
- Investigate the current and future regeneration in Hounslow

The areas above were developed into a set of questions that were presented to Hounslow Council Staff members in what started as semi-structured, in-person interviews. Follow up interviews and meetings were informal and discussion-based. As well as initial interviews we met with many key staff members on several occasions to discuss different objectives and topics of the project as it evolved. We specifically met with the Regeneration Team, Skills Department, a Brentford Councillor and a biodiversity staff member.

3.2.1.2 Island Stakeholder Interviews

The purpose of the interviews with island stakeholders was to find out more about the island's past, current, and future usage. The interviews served specific purposes including to:

- Determine the variety of visions for the island
- Identify the goals of each stakeholder
- Investigate the past and present usage of the island
- Investigate the regeneration occurring in the surrounding areas

The island stakeholders included the landlord of the island, the current tenant of the island, and private companies and organizations with plans to regenerate the surrounding area. These interviews were focused on the goals and views of the stakeholders and their opinions on the direction our project could go in.

3.2.1.3 Boating Stakeholder Interviews

The purpose of the interviews with the boating stakeholders was to find out more information about boating and boating skills in the United Kingdom, London, and Hounslow. The interviews also served certain purposes including to:

- Establish which skills the academy should offer
- Characterize the nature and extent of the supply/demand problem of boating skills and academies that teach skills
- Determine any indication of resident desire to learn boating skills

Boating stakeholders included the tenant on the island John's Boat Works, a worker at John's Boat Works, and a member of the Thames Festival Trust. From these interviews we identified demand for boating skills in the UK and specifics of how to teach skills. We also learned about the history of boating and the importance to the culture of Hounslow and the city of London. We used a set of bulleted points rather than a set of predetermined questions as we did not know enough about boating to have structured questions. These points were based off of our initial interview questions and topics.

3.2.1.4 International Boatbuilding Training College Interview

We conducted this interview in order to gain additional knowledge into existing programs at the school and to identify the possibility of a satellite school. We investigated further into a variety of aspects including:

- Clarify the structure of the academy and courses offered
- Identify the required space needed to offer the courses
- Determine the economic success of the academy
- Learn more about the background of the teaching staff
- Examine the possibility of a satellite school at Lot's Ait

This interview was a semi-structured phone interview. The school is located several hours away so were not able to visit it, however we asked in-depth questions about the school and developed a further overall understanding of what makes a boating skills academy feasible and successful.

3.2.1.5 Watersport Stakeholder Interviews

The purpose of this interview was to learn more about watersports and their social and economic benefit. We investigated further into the following:

- Determine the effect watersports has on the community
- Identify key needs of a watersport business
- Examine the possibility of relocating a pontoon to Lot's Ait

Watersport stakeholders include the owner of Active 360, St. George Property Developers, residents at the Kew Bridge Development, and a member of the Thames Estuary Partnership. These interviews were formal with specific questions catered to the interviewees and their background and profession.

3.2.1.6 Incubator Stakeholder Interviews

The interviews with incubators began in the third week of the project to gather individual perspectives and served several purposes:

- Identify existing incubators in London
- Establish which characteristics an incubator should have
- Identify any groups or businesses that would need a space for work
- Determine any indication of deficiencies in the provision of incubators in general

The areas above were developed into a set of questions that were asked in semi-structured interviews for the first half of the interview. The second halves of these interviews were discussion based. We interviewed the landlord of the island, an industrial engineer who is involved in craft-based fields, the current tenant of the island, a guitar-making business owner, and a regeneration officer of the GLA. These interviews were also informal and based on bullet-points as the potential for incubators to be on the island was introduced late to our project and we had little background information. We collected as much information as possible from these interviews and asked many follow-up questions.

3.2.1.7 Potential Funder Interviews

We identified several potential funders who provided key insight as to projects they have previously funded as well as what they look for in future projects. The interviews served to achieve the following objectives:

- Clarify the funding process
- Determine the needs of each organization in order to fund a project
- Identify past projects that were funded
- Investigate the potential for growth along the River Thames

We interviewed a regeneration officer from the Greater London Authority (GLA) as a potential funder. He had extensive knowledge about regeneration projects in Brentford and in London and discussed the newly introduced plans for funding. In addition, he explained the goals of the Mayor with new projects.

We also attended a regeneration summit with the Hounslow and Brentford Chambers of Commerce. We presented an elevator pitch at the regeneration summit and had a brief Q&A with

the attendees. After the presentations we had conversations with many of the private businesses and presenters.

3.2.2 On-Site Evaluation

On-site evaluations provided significant information for this project. Geographic Information Systems (GIS) maps show better geographical data in Hounslow than Google Earth and many other programs. GIS maps provided a detailed representation of the island and started with a spatial layout, and then additional layers such as buildings, public utilities, transportation, and tidal data are added on top. This data allowed us to analyze the island layout and transportation data in order to make a better judgment on the feasibility of a construction on the island. We took pictures of the site to describe and illustrate the current state of the island and to be used in our final presentation. We also examined the abandoned building on the island and the site where planning permission for a single storey expansion has been granted. Also on the island is a Nature Conservation area. We looked at this area on GIS as well as at the on-site evaluation to ensure that the construction would not interfere with this protected area.

In terms of the pontoon, we determined if the new location was potentially feasible with regards to tides, currents, and other natural conditions. This was done by using GIS data and observing the area itself. We observed the size of the pontoon and how it functioned at low and high tides. We also observed the tides on the island and the potential location for the pontoon.

3.2.3 Boating Survey

Boating surveys were conducted throughout Hounslow and on social media platforms in order to gather information covering specific objectives:

- Identify the demographic of boaters
- Evaluate the frequency of boating
- Determine the existing boating skill level of residents
- Identify the desire of residents to learn boating skills

The surveys were completed online on WPI Qualtrics and were distributed on Facebook groups and Twitter as well as done in-person. The Facebook groups included groups with

residents from the local area, and groups focusing on boating in London. The in-person surveys were done at local moorings and parks in Brentford. The survey took approximately five minutes to complete. The surveys were developed and tested in advance to assure they were clear and thorough and would allow us to obtain the above objectives. The paper survey data and online survey data was analysed to determine trends and if our objectives were met. A list of survey questions is included in Appendix C.

3.3 Timeline

We made a timeline of the tasks we completed during our time in London via a Gantt Chart. The chart is broken up by weeks 1-7 and displays each day of the week. The areas filled in by blue are the dates in which we performed each task. See Figure 2 below for reference.

Timeline	Week 1	Week 2	Week 3	*Week 4	Week 5	Week 6	Week 7
	Mar 13- Mar 17	Mar 20 - Mar 24	Mar 27 - Mar 31	Apr 3 - Apr 7	Apr 10 - Apr 14	Apr 17 - Apr 21	Apr 24 - Apr 28
On-site Evaluation							
Council Interviews							
Stakeholder Interviews							
Potential Funder Interviews							
Academy Interviews							
Local Surveys							
Data Analysis							
Findings & Recommendations							

Figure 10: Gantt Chart of Tasks Completed in London

3.4 Ethical Considerations

Ethical considerations were an important part of our methodology. We made all survey participants and interviewees sign a consent form (Appendix D). This report aimed to keep our recorded data confidential in order to protect the participants. The project group minimized any adverse effects concerning the participation in this research study. Our ethical considerations followed the considerations of the Hounslow Council. In addition, as there were many stakeholders involved we focused on balancing the perspectives and ensuring as few people as possible were negatively affected by our research, specifically due to the controversy of some of research tasks.

Chapter 4: Findings

The findings are a result of analysing themes and key issues defined in interviews, analysing quantitative survey data, and completing an on-site and GIS analysis of the island and surrounding area. They are broken up into four sections according to our goal: 1) the overall regeneration of Lot's Ait, 2) the creation of a boating skills academy, 3) adding watersports to the island through the potential relocation of a pontoon, and 4) the creation of craft-focused incubators. From our interviews with Council members, potential funders, and island stakeholders we found recurring themes for the regeneration of Lot's Ait including goals of the council, regeneration of the surrounding area, planning regulations, and environmental constraints. We found themes of social impact and economic sustainability when considering the creation of the boating skills academy. Key issues defined when exploring the implementation of watersports on the island and potential relocation of the pontoon were social impact, environmental constraints, planning regulations, and economic sustainability. We also identified social impact and economic sustainability as the key issues regarding the creation of craft-focused incubators. This section explains the detailed findings from each theme. The infographic below shows a visual summary of the findings.





1 ENVIRONMENT

A portion of the island is a Nature Conservation Area and must remain untouched. A protected species of snails lives in the Ivy.

The island is on the Tidal Thames and there are ten-foot tides twice a day. The island floods a few times a year.

2 SOCIAL

Craft and boating skills are declining in the United Kingdom. The Hounslow Council has goals to increase the skill level and close the skills gap.

There were 5,000 boats spotted on London's waterways in 2016 and many Londoners have moved onto houseboats. Brentford specifically has a rich boating culture and 65% of 193 survey respondents have interest in a boat maintenance skills academy.

Stand-up paddleboarding is the fastest growing watersport in the world and over 3,000 people went paddleboarding with Active 360 last year.



The social impact and reach a project has on the community must be closely examined.

3 ECONOMICS



Since 2000 there has been a 2.0 million increase in private sector businesses in the UK



There is a successful guitar maker on the island that needs 3x more space



The International Boatbuilding Training College would host a satellite academy on the island



The relocation of the pontoon would cost approximately £40,000



The GLA and Brentford Community Sports Trust are potential funders

4 REGENERATION



Brentford

There is a rise in residential housing by private developers. A large development is the Ballymore Scheme.

The new Brentford Football Club stadium is being built.

The GLA is regenerating the high street and increasing walkability.

Lot's Ait

Lot's Ait remained untouched for 30 years until 2011.

A portion of the island was regenerated by a boat building and repair business. An abandoned building still sits on the island.

A footbridge was added in 2013 for improved island accessibility.



Figure 11: Infographic of Findings

4.1 Regeneration of Lot's Ait

4.1.1 Regeneration Goals of the Council

Our interviews with the Regeneration Team, Skills Department, and Brentford Councillors clarified the goals in the Regeneration and Economic Development Strategy. The importance of improvement in Hounslow was stressed in numerous instances during discussions with members of the Council and staff. There are many plans introduced by both the private and public sectors to regenerate the area. A member of the Regeneration Team noted that there is currently a big push for residential developments and mixed-use spaces. Therefore, both the Council and private businesses have introduced plans to increase residential spaces in Hounslow. In addition, recreational opportunities are being promoted. The local football club stadium is being rebuilt, and the Council wants to increase walkability in the area especially along the river. This would encourage residents and tourists to walk through the Borough, which in turn the Council believes would increase business and improve culture.

The Regeneration Team also stressed the importance of the historic boating culture in Brentford and the goals of the Council to integrate regeneration with culture. The interviews added to the information we already had from our background research. Departments of the Council found that residents appreciate the value of culture and understand there is a positive impact on physical, social, and mental wellbeing. The Council expanded on this finding to explain the goals to highlight the boating culture in Brentford. The boating culture has been declining in the past century and they want to introduce plans to reverse this decline. Our sponsor sees the opportunity to create a boating skills academy on Lot's Ait, as well as add watersports and a craft-focused incubator space. She has been in discussion with John's Boat Works and believes regeneration of Lot's Ait would revive the historic culture of the island and better Brentford.

4.1.2 Regeneration of the Surrounding Area

From interviews with a regeneration officer from the Greater London Authority an emphasis was put on the social value of projects rather than just the economic value. The new mayor has a platform focusing on the social return and community impact of projects. As a result, projects sponsored by the GLA need to engage the community. Newly introduced projects need to look beyond the initial scope of the project and should integrate existing projects in the area. The officer highlighted that obtaining funding from the GLA is much more feasible if the project benefits the whole community and encourages residents and tourists to visit the island. A potential idea given was tying in the island to the work being done by the GLA on the high street. A high street is the primary business street in a town or city that is the focal point for businesses, shops, and street stalls. The GLA is working on a project to regenerate the Brentford High Street and is adding new homes, shops, and leisure facilities. The Brentford High Street is located in close proximity to the island, and could be important to tie into the regeneration of Lot's Ait. Lastly, the GLA gave more information on the types of projects they fund. The regeneration officer said "there is a shift in the team in terms of focus on social impact rather than economic growth and jobs" as a result of the new labour mayor. There are several themes that projects incorporate including workspaces and creating workspaces, and industrial projects. These projects create leisure and recreational activities for residents to do on evenings and weekends.

4.1.3 Planning Regulations

We found that there are many government regulations involved with new projects from interviews with a planning officer of the Council, the Regeneration Team, and Brentford Councillors. On Lot's Ait there was a single storey expansion previously granted with space for an upper mezzanine⁴. This expansion was granted in June 2016 to the landowner to provide additional employment space in the form of a flexible workshop (Figure 3).

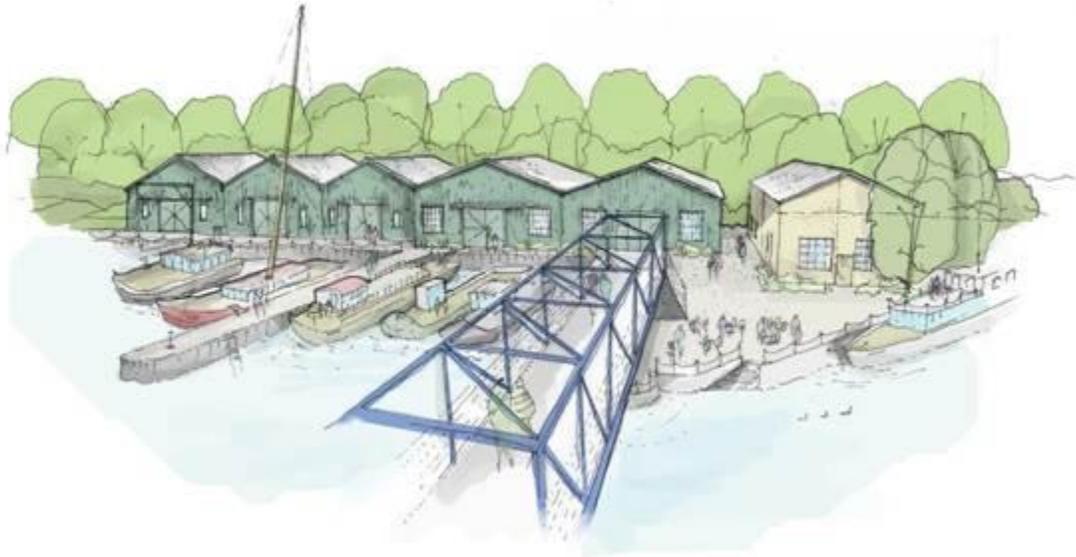


Figure 12: Concept Art for the Future of the Island (Source: Hounslow Council – with permission)

However, if this workshop space is to be used as a complete second story, additional planning permissions would be needed. In addition, the Port of London Authority would need to grant permission for construction to be on the island because a barge would be needed to both transport materials and hold construction equipment. Another issue given was that having residential housing on the island may not be an option due to planning permissions. An alternative could be adding residential moorings to the existing moorings around the island. The Council is working to create more moorings in the Borough as the number of houseboats on the water increases. Lastly, the regulation Section 106 was emphasized on multiple occasions during our interviews. Developers, a regeneration officer from the GLA, and the current owner of John's Boat Works all spoke of the potential to fulfill Section 106 for the developer of the

⁴ A second story loft space used for storage

Ballymore Scheme by regenerating the island. There are also several other developers in the area with projects that have not satisfied Section 106 that could fulfill this requirement on the island.

4.1.4 Environmental Constraints

During interviews with the biodiversity staff member of the regeneration team, the current owner of John's Boat Works, and the island landlord the environmental constraints on the island were highlighted. Many of the environmental constraints come from the existing nature conservation area on the island. Currently there is a protected species of two-lipped snails living in the ivy of the abandoned building and back strip of land. If no major development is implemented on the island and it is kept to just renovating the abandoned building then the environmental constraints would be minimal. The nature conservation area is limited to the eastern edge of the island and is marked out by a fence. This area of the island is protected due to the various species of vegetation and animals that inhabit it. This was determined through ecological surveys conducted between 2004 and 2005 to determine the extent of what development could be on Lot's Ait.

Since over ten years have passed from when this survey was conducted, if any new development were to be done another survey would be needed. According to a member of the biodiversity division of the Council this process can take several years depending on the extent of surveys needed. The process before any planning could be done in six sequential steps:

1. Contact the Greenspace Information for Greater London (GiGL) to obtain all ecological data on the island
2. Conduct a sight Phase One Ecological Survey to get basic information on what inhabitants the island including invertebrates, vegetation, trees, bats, and other animals, and where their habitats are located
3. Conduct a survey to determine how development on the island would impact each one of them
4. Complete an Ecological Management Plan and approval from both the developer, Hounslow Council, and Mayor of London's office
5. After construction, complete a sustainability plan and begin development

Tides on the island were also stressed in numerous instances during interviews with the stakeholders. We found that there are two types of tides, spring and neap. Spring tides happen during new or full moons while neap tides happen during first and third quarter moons, or half moons. During spring tides water will be a little higher during high tides and a little lower during low tides. However, during neap tides water will be a little lower during high tides and a little higher during low tides. These tides are important because the water level on portions of the River Thames greatly fluctuates as a result of the tides. As seen in the figure below it takes about seven minutes for the tide to move approximately three miles on the river (Port of London Authority, 2015).

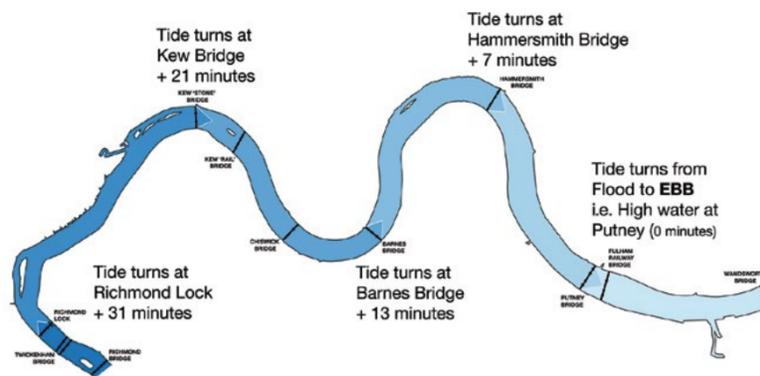


Figure 13: Tides (Source, Port of London Authority, 2015)

As a result of the tides the island floods once or twice a year on the northwest side. In addition, the water level varies greatly around the island as it is on the Tidal Thames. At low tide the water is so low the boats moored on the island are completely out of the water. At high tide the water is ten feet higher.

4.1.5 Economic Sustainability

According to the landlord, the island has not had any additions due to the economic constraints. He examined adding a pontoon and incubator spaces and found these would not generate enough revenue without the addition of residential space. He said “office space would bring in approximately £150 per square foot, and residential space would bring in £700 per square foot.” He asserted that the income generated from office space rent would barely break-even with the construction cost. Additionally, he believes there is no market for more office space and that there is not enough space on the island. However, he believes there could be

homes for an excess of 30 people on the island using the existing footprint of consented buildings with no increase in areas of land covered by buildings.

4.2 Creation of a Boating Skills Academy

Through interviews with various parties and data collected through our boating skills survey that we distributed to people active on London's waterways we were able to predict the social and economic impacts of the creation of the skills academy on Lot's Ait. Socially we determined how the academy could impact the local community and the rest of London. Economically we found how the academy could receive funding to start up and also how it could bring in enough profit to be self-sustaining.

4.2.1 Social Impact

From our data collection methods we determined the recurring social themes of the skills gap, accessibility to opportunities to learn skills, and boating culture. Interviews conducted with the Hounslow Skills Department, the Thames Festival Trust, the Richmond Boatbuilders, and John's Boat Works showed how the academy could help with the skills gap in both Hounslow and London. John's Boat Works informed us of the lack of expertise in boating maintenance within Hounslow. Many customers come to the business for simple boat repair work that they could do on their own if they had the skills knowledge. In our interviews with John's Boat Works, the Thames Festival Trust, and other parties they all concurred that the implementation of a skills academy on Lot's Ait would help provide people the opportunity to learn boating and craft skills. The skills department staff shared that within Hounslow there are over 7,500 craft skills based occupations. Boating repair skills can transfer over to craft skills as both are based off of woodworking. The basic skills to are the same across many craft fields and can be applied to the various fields.

We also found that the gap in repair skills arises from the lack of formal training opportunities to learn the skills. In the past, craft and boating skills were passed down from generation to generation within families. Today this method of skills transfer has become outdated and has almost died out completely. According to the Hounslow Skills Department apprenticeships are one of the ways people can gain new skills and hopefully get a job later down the road. The UK government wishes to promote apprenticeships and by 2020 create three

million. The Skills Department acts as a job brokerage service and works with local businesses to take on apprentices which would help the business run more smoothly and teach new skills to the apprentice. The International Boat Training College (IBTC) utilize apprenticeships due to their close proximity to commercial boatyards. Students in the apprenticeship program learn the skills necessary to work in the boating industry through classes at the college and working in the commercial boatyard. A member of IBTC said the apprenticeship program is “one of their best aspects of [the] school” and has had positive results for them.

To determine information about the relationship between boating and Londoners, the project group surveyed a total of 153 people. The respondents were from a variety of locations, with 16% from Hounslow, 13% from London, 8% continuous cruisers, and the remaining 63% choosing to leave this field blank. Additionally, the survey respondents came from a broad demographic, 70% were male and 28% were female. There was also a wide range of ages ranging from 18-84 with 82% of respondents in the age range 25-64. Our survey was distributed to many boating groups in London and we found that over 80% of respondents own a boat, more specifically 48 owning a houseboat, and 30 owning a narrowboat or Dutch Barge.



Figure 14: Image of a Narrowboat (Source: Heritage Narrow Boats, 2017)

Additional information gained from our survey showed how frequently people boat on London’s waterways. Our results showed that over 50% of the people who took our survey boat everyday. We also found that the season did not affect the frequency because over 50% of all respondents boat in all four seasons.

Table 3: Seasonal Boating Statistics

	Summer	Autumn	Winter	Spring
Never	13 %	17 %	22.5 %	15.6 %
1-3 Days/Month	13.7 %	14.9 %	12.7 %	14.2 %
1-2 Days/Week	11.6 %	12.8 %	8.5 %	8.5 %
3-6 Days/Week	9.6 %	2.8 %	2.8 %	7.8 %
Everyday	52.1 %	52.5 %	53.5 %	53.9 %

Hounslow and London have a history entangled with boating which has led to the development of the boating culture that many people are involved in. The Thames Festival Trust is dedicated to keeping that culture alive and holds a month long river festival to celebrate the history of the River Thames and boating on its waters through the years. Through interviews with both the Thames Festival Trust and John’s Boat Works we were able to discover how deep this culture truly runs and how the creation of a skills academy would help promote the culture.

4.2.2 Economic Sustainability

As told by our sponsor in the beginning of the project, in order for the skills academy to be economically sustainable it needs to be self-financed and bring a profit to the island landlord. We conducted interviews with the Greater London Authority, IBTC, and John’s Boat Works about funding for the creation and sustainability of the skills academy. Through our interview with the GLA we were able to find that they would be interested in helping fund the skills academy, pending more research on the impact the academy would have on the community. In addition, the regeneration officer said a “cost-up of what it might require” would be needed for the academy, specifically with space and equipment.

In our interviews with IBTC and John’s Boat Works we learned that it is very feasible for the skills academy to be self funded through various means. During our interview with IBTC we learned the short courses they offer and how they are structured. We gathered a basic understanding of the equipment, space, and personnel needed for a skills academy to function. Additional research into their website provided us with the cost of these four and a half day courses ranging between £110 and £680. During our interviews with John’s Boat Works the vision for the academy was explained. They see the academy offering short courses similar to

IBTC that cover specific skills in a few classes or days. In addition to short courses the academy could offer night and weekend classes so people would not have to take time off from work to attend the classes. During the same interview they opined that there would be a large market for people to attend the skills academy if it was in closer proximity to them and did not affect their work schedule.

From the survey question “would you be interested in taking classes from a skills academy” we got 133 responses. Over 65% of people who responded to our survey had some interest into the creation of an academy: 44 people would be interested in the skills academy, while an additional 43 would need more information before deciding if they were interested.

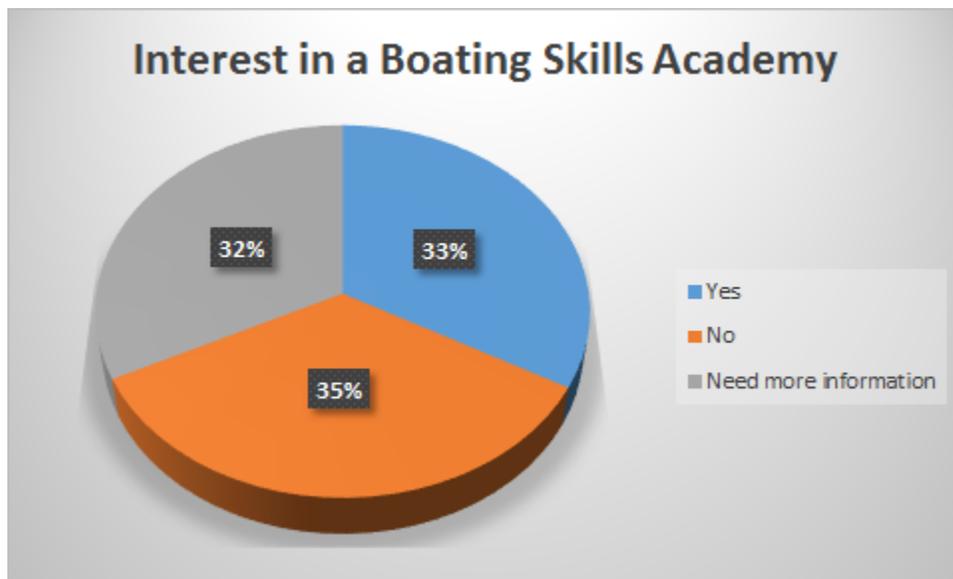


Figure 15: Interest in a Boating Skills Academy

In addition to this data, from our survey we also were able to gauge roughly how much people spend yearly on boat maintenance and repair. From our surveys we discovered that people pay significant amounts of money for maintenance and repairs to their boats. The money spent ranges from £0 to over £5,000.

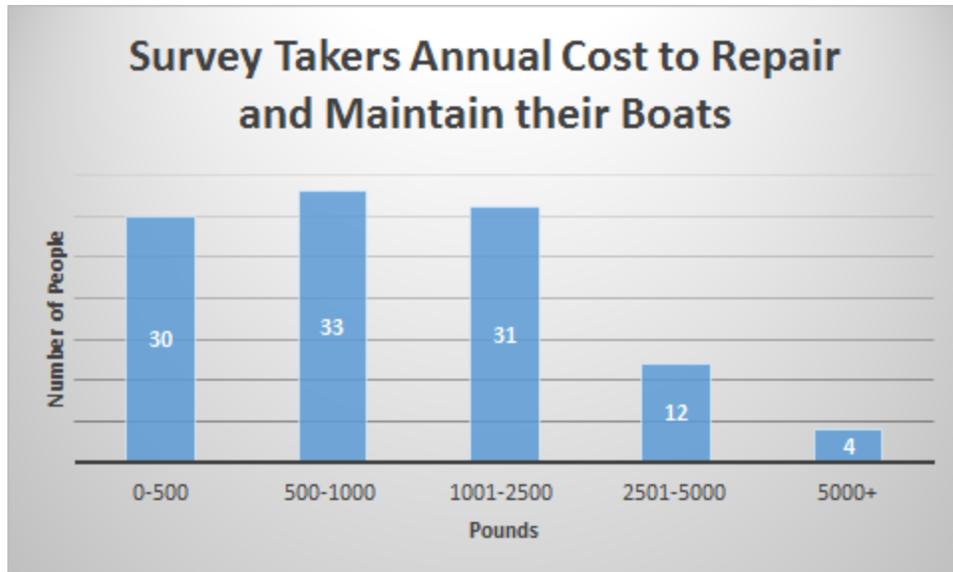


Figure 16: Survey Takers Annual Cost to Repair and Maintain their Boats

Early research before our findings suggested that there may be a chance for a satellite school at Lot's Ait that could either help in the startup of the academy or possibly run the academy to some extent. We explored several options for academy hosts that were suggested by our sponsor and also that we found from our background research. We found that the owner of the International Boatbuilding Training College has interest in hosting a satellite school on Lot's Ait to expand his business and promote boating skills.

4.3 Implementation of Watersports

The implementation of watersports on the island could be in the form of relocating the pontoon at Kew Bridge, or the creation of a new dock on the island. There are many social impacts, planning regulations, environmental constraints, and economic factors that play into both the relocation of the pontoon and the implementation of watersports.

4.3.1 Social Impact

There is a large social impact that the pontoon owned by St. George has on the area around it. This pontoon is located on the waterfront right next to Kew Bridge. Through interviews conducted with the current owner of Active 360, the current owner of John's Boat Works, and an employee from the Thames Estuary Partnership we were able to determine these

social impacts including tourism, recreation, controversy, and community usage. The owner of Active 360 took a little over three thousand participants paddleboarding this past year alone. In addition to that, there are eighty members of a canoeing club that regularly dock from the Kew Bridge location. We were also able to identify other watersports in the area including kayaking and rowing. There are many boating clubs along the River Thames including a prestigious one on Eel Pie Island. It is a popular sport that many people compete or participate in their leisure time. Rowing clubs like this generate a lot of revenue.

We interviewed two residents at the Kew Bridge development found that the residents and community are unable to access the pontoon without a special application. Without this application the pontoon gate is locked. The application is a tedious process that has changed several times. This year the pontoon is rarely used by the community including residents at the development. Active 360 uses the pontoon only at the times that the tides make it dangerous to launch from the other side of the bridge. The accessibility of the pontoon is very controversial, as is the maintenance. The residents at the development pay a small portion of their annual maintenance fee for the upkeep of the pontoon. The residents would prefer not to have to pay this fee, or even to have the pontoon removed entirely. This is controversial, as the pontoon is not intended to be solely for the residents' use, but also the community. The controversy also involves the users of the launch site at Kew Bridge as it blocks one of the arches of the bridge. (Appendix A). St. George recently agreed the pontoon should be removed and would pay for this, but will not pay for its relocation.

4.3.2 Planning Regulations

Through interviews conducted with the Hounslow Council, Active 360, and John's Boat Works we found that there are many planning regulations required for the implementation of watersports on Lot's Ait. In order to move the pontoon at Kew Bridge, the PLA needs to grant permission for it to be moved, and also for the barge that will help move it. Likewise, the PLA would need to approve a new pontoon being put at Lot's Ait if the pontoon at Kew Bridge was not relocated. The pontoon built next to Kew Bridge is currently the Section 106 requirement for the Kew Bridge Development. As required by the planning regulation this pontoon is supposed to better the community. However, it has both safety and accessibility issues and thus is rarely used. Under Kew Bridge there are two storage arches and three waterway arches. The two

storages arches are used by Active 360 for storage, meeting rooms, changing rooms, and showers. One of the three waterway arches closest to the pontoon, as shown in Appendix A, Figure 9, is permanently closed because of the pontoon.



Figure 17: One of the three Kew Bridge arches is closed at current Pontoon location
(Source: Project Team, 2017)

4.3.3 Environmental Constraints

The two main environmental constraints of this pontoon are the tide and maintenance. According to the owner of Active 360 they are “not able to use the pontoon for four hours a day” as it sits too high above the water at low tide, and occasionally floods at high tide. This is a safety problem as the pontoon should be level with the water and the tides rise and fall very fast. As a result, a lot of beginning paddleboarders are forced towards the pontoon and there is a risk of them being sucked under the pontoon support. There have already been two cases where people were rescued due to the tide and the pontoon according to the owner of Active 360. Additionally, people are unable to properly dock from the pontoon because it is not level with the water. The pontoon flooding also has a safety concern as well. Another aspect of the environmental constraints is the maintenance and upkeep of the pontoon. From our on-site evaluation we determined the pontoon to be poorly maintained. The pontoon was discolored,

warped, and covered in geese feces. It looked as though it had not been cleaned in a very long time even when we visited the pontoon two weeks apart.

4.3.4 Economic Sustainability

Economic sustainability of watersports was found through interviews conducted with the current owner of Active 360, two residents of the development, and an employee of the Thames Estuary Partnership. We found that the pontoon is currently not economically sustainable at its current location. Not only are the residents unwilling to pay for the upkeep, but additionally, the current owner of the development still needs to put in approximately fifty thousand pounds worth of electrical wiring for lighting. If the pontoon was to be moved it would cost approximately £30,000 to relocate according to an estimate in the *Kew Bridge News*. We identified the Brentford Community Sports Trust as potential funder to move the pontoon. This trust funds watersports along the River Thames including the arches under Kew Bridge. Also, watersports brings in revenue as people are willing to pay for a space to store equipment and teach classes, and customers pay to take the classes. The owner of Active 360 is looking for a space to teach paddleboard safety classes and would be willing to rent space for this purpose.

4.4 Creation of Craft-Focused Incubators

Various interviews showed that additional craft-focused incubators could be added to Lot's Ait to help regenerate the island. The GLA, John's Boat Works, and the Hounslow Council see potential in this consideration to aid in the regeneration of the island. We have found both the social impact the incubators would have on the community as well as information regarding their economic sustainability.

4.4.1 Social Impact

We determined that the creation of craft-focused incubators would have various social impacts on the Borough through interviews with the GLA, John's Boat Works, the Hounslow Council and other interested parties. The Skills Department emphasized that the number of small businesses is increasing in the Borough. They hope to keep this trend on the rise and support the residents who run the small businesses.

John's Boat Works explained how craft-focused incubators would be an appropriate addition to the island because they fit with what they do as a boat repair company and the other similar work that is completed there. The owner of Active 360 referred us to an industrial engineer who is an entrepreneur that makes wooden paddleboards. The engineer was very interested in the idea and explained that craft-based businesses can work very efficiently together. When asked what other businesses could be on the island he said "All those wood instruments that have to do with music, you've got furniture, household items, boards could be made for use as well as decorative purposes, electrical engineering, wooden biplanes, anybody who needs space, or anyone that wants to teach their own courses". Furthermore he explained how having different types of craft businesses would allow for any type of project or craftwork to be completed on the island.

4.4.2 Economic Sustainability

Through our interviews we also found that craft-focused incubators will benefit the overall economy and can be a guaranteed source of income to the landlord. The wooden paddleboard entrepreneur told us incubator spaces especially for craft related ventures are highly desired in large cities like London. According to him, many people do not have any space that they can use whether it's for a potential startup or just a hobby. Referring to his own passion of manufacturing wooden paddleboards and the potential of the island, he said, "If I had the opportunity to rent a facility like that, I would rent that". Furthermore, much of the required equipment needed for an incubator space is already on the island and is used by the Boatyard Guitar Workshop. The proprietor of this business handcrafts electric and acoustic guitars for sale and runs tuition sessions teaching his craft. He approached the landlord with plans to expand his business and would work alongside other small businesses on the island. He uses the equipment John's Boat Works provides including table saws, drills, mills, and lathes and only has to provide for specialty tools he needs.

The GLA funds a variety of projects including business incubators. An example of a recently funded project is the Black Horse workshop which is located in East London. The workshop serves as a craft-focused business incubator. The second story of their refurbished building is studio space that is rented out to small businesses while the bottom floor is a shared workshop space. The space provides different types of equipment and also offers advice and

guidance from professionals who are experienced in their respective fields. Additionally, the Black Horse workshop offers both basic and advanced short courses in a variety of craft related skills. Incubator workshop space typically does not have all of the amenities as a typical office space, however according to the owner of John's Boat Works "this is a good thing because it keeps costs down for small businesses that rent the space".

Chapter 5: Feasibility and Considerations

A feasibility study is an active investigative process to determine whether or not a “business opportunity is possible, practical, and viable” (Hoagland, 2000). The feasibility study does not end with a project proposal, rather an analysis of positive and negative aspects of the opportunity and provides a recommendation for future study. The author Brian Oleson determined three components that an organization should examine as guidelines to reach a decision. The following components are the feasibility categories determined from the paper *Forming a New Generation Cooperative in Manitoba* (Oleson, n.d). These categories served as a model for the three components in this project, a *Feasibility Study of the Regeneration of Lot’s Ait*. The first component of feasibility is market issues. A feasibility study addresses potential market opportunities and determines if there is enough demand for the opportunity to be pursued. The next component is the technical and organizational requirements. Technical and organizational requirements include logistical details including infrastructure, government regulations, and environmental constraints. Lastly, the financial overview component includes economic sustainability and funding. The social value is analysed last in terms of the effects of the three components and looks at the various opinions of stakeholders.

5.1 Considerations and Proposed Future Actions

The project team has identified the overall consideration to regenerate Lot’s Ait, with three specific suggested considerations for the Council including the creation of a boating skills academy, the implementation of watersports on the island, and the creation of a craft-focused incubator space. These considerations have been researched over the course of our project and this section explains each component of feasibility for each consideration. Additionally, we have identified other considerations that the Council could look into that require further data acquisition and study. Some of these considerations came as suggestions from stakeholders after hearing about our project, while others were determined through our research and interviews.

5.1.1 Consideration 1: Regeneration of Lot's Ait

5.1.1.1 Market, Financial, and Technical and Organizational Components

Brentford is seeing new developments and regeneration across the entire ward but especially on the Brentford High Street and waterfront areas. The regeneration of Lot's Ait would aid in the improvements being made to the entire area and continue the snowball effect of regeneration.

Also, adding the single storey expansion on Lot's Ait and regenerating additional space on the island could maximize profit. More space could house a larger academy or additional small businesses. However, the estimate from the landlord showed that adding an incubator space or other projects would not be financially feasible without additional funding, potentially from space utilized above. If a second storey could be built this could provide for residential space. However, there are many planning constraints that could limit this type of use and further study and discussion would be needed between the landlord and planning officers.

The Section 106 requirement of private developers in the area could be met by regenerating the island. This would help provide for the community and encourage more usage of the island. This option would also reduce expenses and provide someone to take charge of the planning and design process, making the regeneration process easier for the landowner. There are also PLA regulations and environmental constraints regarding the island. The PLA permission would be required to do any construction in order to get equipment and supplies to the island. The island also has a Nature Conservation Area, which must be redefined in order for any new construction to take place. These required permissions and obstacles cause time delays and would be a constraint of implementation of any project on the island. We suggest further study of these issues as well as on the tides on the island and the flood zone area. A specialist should look into these factors to ensure the site is appropriate for construction and development.

5.1.1.2 Social Value and Stakeholder Analysis

Any project on the island facilitated by the Council will bring together the private and public sector. The island is privately owned but the landlord is willing to work with the Council to meet his goals as well as the goals of the Council. The Council has goals to grow business in the area and increase the skills of residents. The landlord is part of a private company who wants to generate as much revenue as possible. If these two stakeholders work hand-in-hand they will

both achieve their goals beyond if they worked individually. This is because the Council economically cannot fund every project without partners, and the landlord believes the planning process will be more simplistic working as a partner with the Council. Another partner for the Council to work with is the GLA, who expressed interest in funding projects involving the regeneration of the island.

Overall, the regeneration of the island would improve Brentford and benefit the community in many ways. It would make the waterfront more aesthetically pleasing and thus increase the walkability of the area. It would also engage the community in the culture and history of Lot’s Ait. Economically it would increase business and jobs, and bring tourism into the area. Further interviews, surveys, and focus groups should be done with the community to gage their opinions on the regeneration. The following chart shows a summary of the stances of the stakeholders mentioned above.

Table 4: Stakeholder Stance 1

Stakeholder	Stance
Council	Interested, want to regenerate Lot’s Ait to meet their goals
Landlord	Interested, wants to regenerate Lot’s Ait to increase profit from island
Community	Interested, regeneration would create more things to do, better the aesthetics of the area, increase business and jobs, and bring tourism to the area.
Greater London Authority	Interested, wants to see more social impact of Lot’s Ait and a broader scope of regeneration

5.1.2 Consideration 2: Boating and Craft Skills Academy

5.1.2.1 Market, Technical and Organizational, and Financial Components

From our survey data we have identified that there is a demand for an academy that teaches both craft and boating skills in close proximity to London. Our interviews with IBTC provided us with basic details of the structure and logistics of a skills academy, however further

study should be done into who will run the academy and where instructors will be found. In addition, research needs to be done into the accreditation of the academy so that the people who attend the academy receive proper certifications and training.

Through our research and findings we have identified that the funding of the academy would be a huge part of the feasibility. Cost estimations should be done based on construction and cost of running the academy. Though the satellite school could help subsidize the academy, going forwards discussions need to be made between IBTC, the Council, the island landlord, and John's Boat Works to determine how feasible this satellite school is and to create a situation where all parties are satisfied. Using IBTC as a case study, additional work would also need to look into the economic sustainability of an academy on Lot's Ait. IBTC relies heavily on their commercial boatyard for revenue and would not be sustainable without it. For Lot's Ait, additional revenue could come from the relocation of the Kew Bridge Pontoon or the addition of more small businesses on the island. More research is also needed into determining appropriate prices for each class and the salary of instructors.

5.1.2.2 Social Value and Stakeholder Analysis

The implementation of an academy would help promote the boating culture in Brentford and help close the skills gap. This would make a huge social impact on the community by benefiting the residents culturally, economically, and skill-wise. The owner of John's Boat Works believes completely in the boating skills academy and its potential to revive the boating culture. The Council also sees the potential of this idea and believes a boating skills academy should be implemented in Brentford even if it is not feasible on Lot's Ait. An academy will reach their goals and create culture-led regeneration. The landlord of the island is unsure about putting a skills academy on Lot's Ait and questions whether it will be as profitable as the incubator space or other projects. Lastly, the community would benefit from the skills academy as the participants would learn boating and craft skills that would create new job, opportunities. The following chart shows a summary of the stances of the stakeholders of the boating skills academy.

Table 5: Stakeholder Stance 2

Stakeholder	Stance
John's Boat Works	Interested, wants to see the idea implemented on Lot's Ait
Council	Interested, sees the potential for the academy on or off Lot's Ait
Landlord	Unsure if it will bring him the maximum revenue
Community	Some interest, more surveys would need to be done to determine further interest
International Boat Building Training College	Interested, wants to pursue a satellite school

5.1.3 Consideration 3: Implementation of Watersports

5.1.3.1 Market, Financial, and Technical and Organizational Components

The demand for watersports in Brentford is clear through the analysis of the success of Active 360 and the usage of the river for other watersports. If Active 360 expands to Lot's Ait as a fifth location it would bring foot traffic and more visitors. It could also make the island a space used by more residents than if it was used only for an academy or incubator space. Also, there is a clear market for space to both store watersport equipment and provide amenities such as showers, lockers, changing rooms, and a launch pad. Lot's Ait could provide these amenities and storage space. After our on-site evaluation of the pontoon and space at Kew Bridge and interviews with watersport stakeholders we determined that people are willing to pay for a space to store equipment and teach classes. Several watersport clubs and Active 360 use the furnished spaces under the arches of Kew Bridge for these purposes. However, the spaces were rushed in their development and were made on a tight budget. The clubs and Active 360 would like to have a nicer space to use and the space on the island could be fitting. This income could also help supplement the skills academy.

In addition, the pontoon is not economically sustainable at its current location and if it is to be moved to Lot's Ait someone will need to pay for the maintenance and relocation. The Brentford Football Sports Trust is a potential funder but further discussion should be done with

them to determine their level of interest. The implementation of watersports on the island is not contingent on moving the pontoon at Kew Bridge. However, the movement of the pontoon would be less expensive than if a new one were to be built. In order to move the pontoon PLA permission must be granted which could be a time consuming process. Additionally, the PLA initially approved the existing location of the pontoon and stakeholders predict they may be unwilling to relocate it.

The safety of the pontoon at its current location is also big issue. It needs to be improved to prevent an accident from occurring. Both the stretch the pontoon is currently located on and Lot's Ait are on the Tidal Thames. The tides in this area play a major factor of the functioning of a pontoon. They can cause the pontoon to flood and thus further study must be done into the optimal design of a pontoon. If the pontoon is relocated and functions properly with the tides there would no longer be a high risk of liability or injury. An example of a functioning pontoon is located up the river from Kew Bridge and could be a basis of comparison for how this pontoon could properly function.

5.1.3.2 Social Value and Stakeholder Analysis

Implementation of watersports on the island would bring visitors and residents alike and create more things for residents to do in the Borough. This would benefit businesses, residents, and tourists. However, there are many stakeholders involved who have varying opinions. The owner of the pontoon, St. George, wants to resolve the controversy over the pontoon but would not be willing to pay to relocate the pontoon. Active 360 is very invested in relocating the pontoon due to safety reasons as well as the accessibility issues. Additionally, they believe watersports could be implemented on the island and are invested in the project idea. The Thames Estuary Partnership has a neutral view about the relocation of the pontoon, but understands there may be a better location than its current place. They want to better the Thames and the movement of the pontoon could reach these goals. The Council sees the potential to move the pontoon as well, and wants Lot's Ait to be regenerated to its full potential. More specifically, the Brentford Councillors want the pontoon moved due to its safety concerns. The landlord of the island sees many constraints with installing a new pontoon on the island and fears if the island is open to the community there would be theft at the permanent moorings. John's Boat Works also sees constraints in implementation of watersports on the island but thinks a shared space with an academy and watersports classes would be possible. The viewpoints of all the stakeholders must

be taken into account before a decision is reached, however if the environmental and economic constraints are overcome watersports could have a place on the island. The following chart breaks down the stances of the stakeholders of both the pontoon and the implementation of watersports on the island.

Table 6: Stakeholder Stance 3

Stakeholder	Stance
St. George	Neutral, recognizes the controversy of the pontoon and would remove it but not pay for relocation to Lot’s Ait
Active 360	Interested, wants the pontoon moved to Lot’s Ait, would utilise it there
Thames Estuary Partnership	Interested, recognizes the pontoon is unsafe at its current location and the Thames would be bettered if it was elsewhere
Council	Interested, want to regenerate Lot’s Ait and sees the potential for watersports on the island
Brentford Councillors	Interested, want to move the pontoon for safety concerns
Landlord	Needs further persuasion, sees constraints with the tides and is tentative about opening the island to the public
John’s Boat Works	Interested, believes a skills academy and watersports could successfully share a space on the island

5.1.4 Consideration 4: Craft-Focused Incubators

5.1.4.1 Market, Technical and Organizational, and Financial Components

Through our research, we found that there is a significant skills gap in crafts related to skills such as furniture upkeep and other types of woodworking. A craft-focused incubator space could help residents improve their level of craft skills and then open the opportunity for them to

teach skills to others. The incubator space is also beneficial to small businesses because they have access to other experts from the businesses around them. We concluded that this space is in demand and would be sought out by small businesses from both Hounslow and the other boroughs of London.

Craft-focused incubators also add to the feasibility of a skills academy on Lot's Ait. Professionals in various craft-related fields could be used to teach certain courses at the academy. This is another aspect that may draw small businesses to the island because they would be able to share their passion with others and can serve as another source of income. John's Boat Works already has equipment on the island used for their business and incubator space. This includes table saws, drills, mills, and lathes along with a lot of other basic tools. Other small businesses could use the tools John's Boat Works provides however specific craft-focused tools would have to be purchased and more tools would be needed depending on the amount of businesses.

John's Boat Works believes that one major benefit of the current setup for small businesses is the affordability of the island. The owner says that since the sheds on the island now are not very "sophisticated and fancy," the rent is fairly low. This is very important to small businesses that are just starting out and need a cheap place to work. For the new structures being built. It would be beneficial if the new structures being built are similar to the already existing infrastructure as it would maintain the low cost of rent for the small businesses. Keeping the infrastructure is also good because the initial cost of construction would be lower, however, the landlord then would also make less money from the lower rent. Another aspect of the financial component of feasibility is the potential funders. The Blackhorse Workshop is an already successful craft-focused business incubator funded by the GLA. The GLA funding a similar project on the island would reduce costs and strengthen the financial component of feasibility.

5.1.4.2 Social Value and Stakeholder Analysis

The craft-focused incubator would socially help Brentford and Hounslow by helping small businesses and closing the skills gap in the area. The businesses would also be beneficial for the community because trades such as plumbing, electricians, and carpenters with specific craft skills could all be located on the island. A person from the community can reach out to the businesses at the incubator spaces if they need assistance with a project and the island would serve as a "one-stop shop" for them. A craft-focused incubator would also promote different

types of craft skills and keep the knowledge and tradition from dying out especially in the Brentford community.

The various stakeholders related have different interests in mind in terms of the outcome and gains of the project. John’s Boat Works sees a potential and successful future of pursuing more small businesses in the incubator space since they already rent out space to a guitar shop. However, the potential overdevelopment of the island by adding too many small businesses must be considered to ensure proper functionality of the future businesses located there. The landlord is also interested in the idea and is considering the net profit of creating a craft-focused incubator to see if an additional revenue stream is needed. The Council also sees a potential in creating a craft-focused business incubator because it would reach their goals to increase business and better the area. The following chart shows a summary of the stances of the stakeholders of a craft-focused incubator space.

Table 7: Stakeholder Stance 4

Stakeholder	Stance
John’s Boat Works	Interested, would continue to lend support and tools to the businesses
Landlord	Interested, considering the net profit to see if an additional revenue stream is needed
Council	Interested, believes it would reach their regeneration goals
Community	Some interest, more surveys would need to be done to determine further interest

5.2 Scenarios

We determined three individual scenarios for the island including the creation of a boating skills academy, the implementation of watersports, and the creation of a craft-focused incubator space. These scenarios could be combined, however the following flowchart (see Figure 18) and matrix (Table 4) below outlines the basic constraints, benefits, and stakeholders involved with each individual scenario. The colors in the flowchart correspond with the matrix, which shows further details.

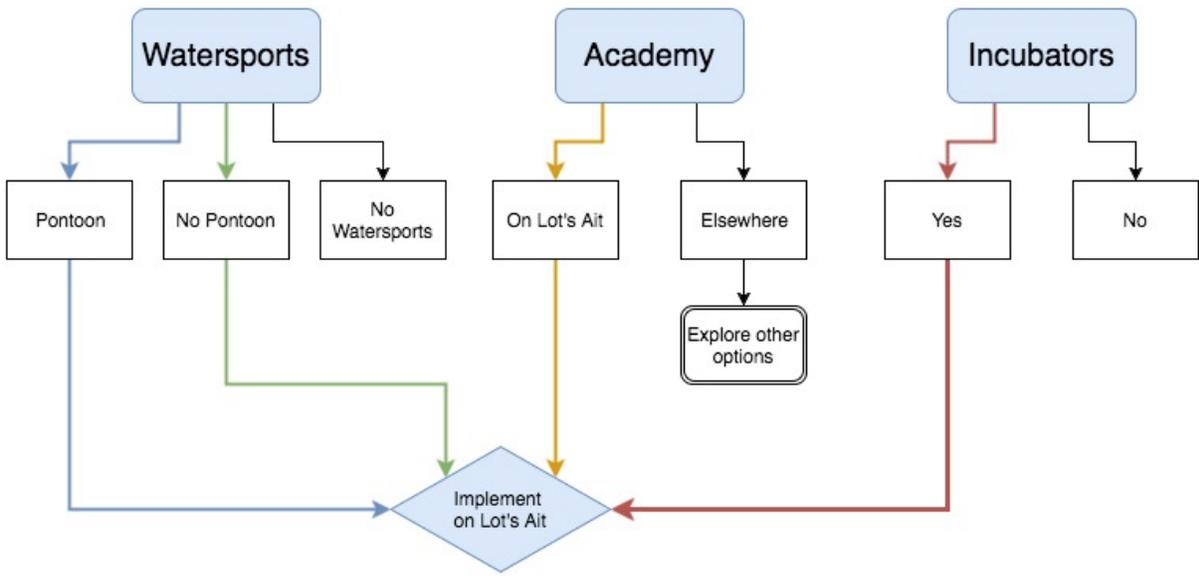


Figure 18: Flowchart of Scenarios

Table 8: Matrix of Scenarios vs Benefits, Constraints, and Stakeholders

	Benefits	Constraints	Stakeholders
Scenario 1: General regeneration of Lot's Ait <i>*applies to all scenarios</i>	<ol style="list-style-type: none"> 1. Community improvement 	<ol style="list-style-type: none"> 1. Environmental constraints 2. Infrastructure 	<ol style="list-style-type: none"> 1. Hounslow Council 2. Landlord 3. John's Boat Works 4. Community
Scenario 2: Boating Skills Academy on Lot's Ait	<ol style="list-style-type: none"> 1. Involve the community and engage them in the history and usage of the island 2. Close the skills gap and teach new skills 3. Economically sustainable from funding and satellite school 	<ol style="list-style-type: none"> 1. Academy needs to be subsidized from other business to be economically sustainable 2. Landlord of the island needs to be convinced this would generate revenue 	<ol style="list-style-type: none"> 1. Hounslow Council 2. John's Boat Works 3. Landlord 4. Community
Scenario 3: Relocate Pontoon on Lot's Ait	<ol style="list-style-type: none"> 1. Improve safety 2. End controversy on current location 3. Improve accessibility 4. Improve aesthetic value 5. Section 106 can be satisfied with new building on Lot's Ait 	<ol style="list-style-type: none"> 1. Cost of relocation 2. PLA permission to move the pontoon 3. Upkeep 4. Section 106 is not being satisfied at current location 	<ol style="list-style-type: none"> 1. John's Boat Works 2. Active 360 3. Hounslow Council 4. Community 5. Owner of pontoon 6. Residents at Kew Bridge Development 7. Thames Estuary Partnership
Scenario 4: Implementation of Watersports on Lot's Ait with No Pontoon	<ol style="list-style-type: none"> 1. Tourism and Recreation 2. Profit from watersports teaching classes and storage 	<ol style="list-style-type: none"> 1. Liability 2. PLA permission for dock or pontoon to launch from 	<ol style="list-style-type: none"> 1. Landlord 2. John's Boat Works 3. Active 360 4. Community
Scenario 5: Craft-Focused Incubators	<ol style="list-style-type: none"> 1. Improve small businesses in the Borough 2. Teach craft skills 3. Engage the community in culture 4. Collaboration among entrepreneurs 5. Provide profit for landlord 	<ol style="list-style-type: none"> 1. Economic sustainability is limited without additional rented space above or elsewhere 	<ol style="list-style-type: none"> 1. John's Boat Works 2. Council 3. Landlord 4. Industrial Engineer 5. Community

There are a variety of combinations of these scenarios with different results. These combinations are outlined in the Venn diagram below (Figure 19).

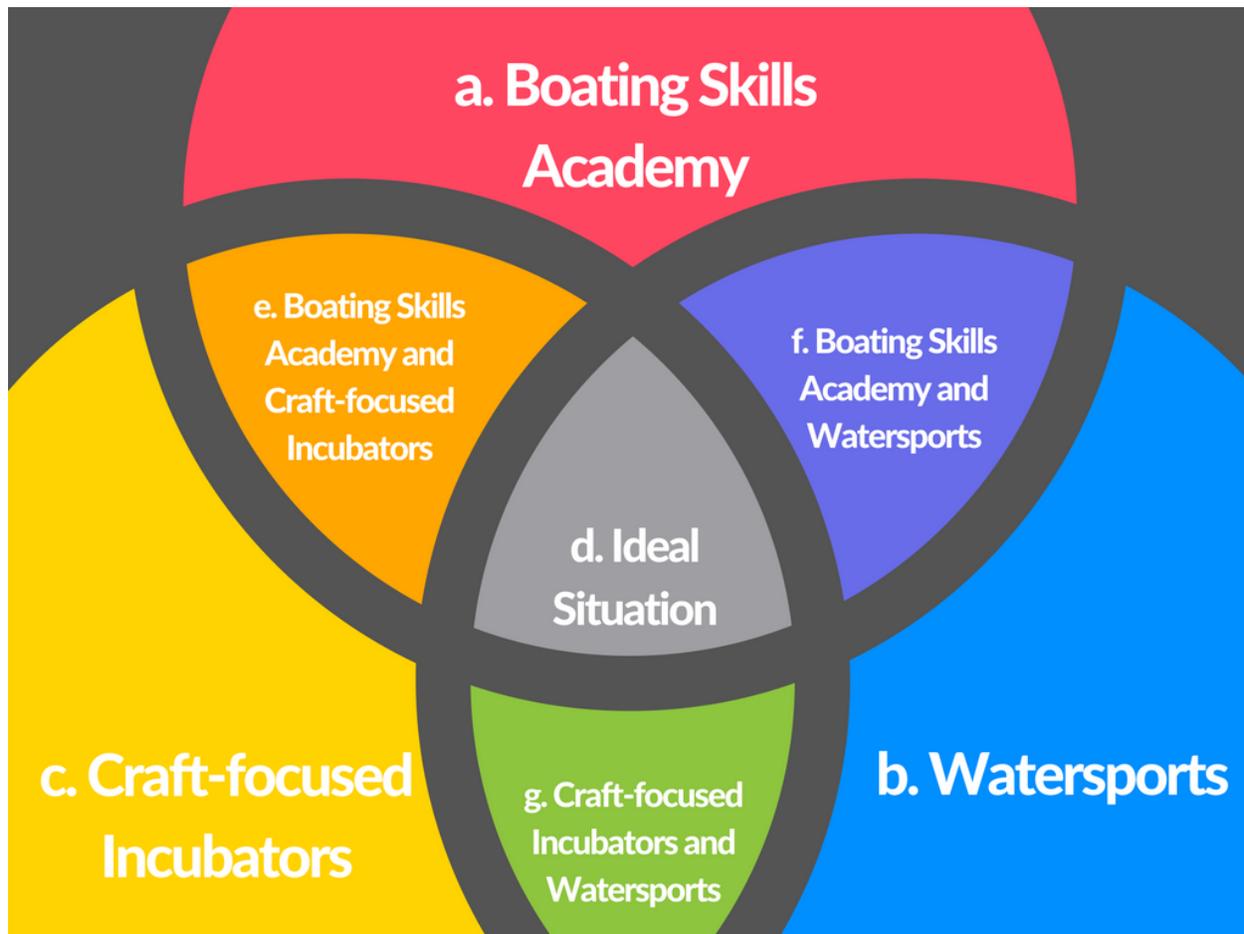


Figure 19: Venn Diagram of Scenarios

- a. There is potential for just a boating skills academy on or off the island. This academy could be taught by the owner of John’s Boat Works or could be a satellite school for IBTC. The academy would need some other form of revenue, which could come from space above, watersports, or a craft-focused incubator space. If the academy is not on the island it could be located elsewhere in Brentford and still be feasible.
- b. There could also just be watersports on the island. Watersports would need storage for equipment and a space for lockers, changing rooms, and showers. They would also need a designated space to launch from. The watersports would bring tourists to the island and it would not require significant regeneration of the island. However, the space on the island would not be maximised with this scenario.

- c. Craft-focused incubators could be a stand-alone on the island. These incubators could use the workshop space and would need a space for additional offices as well. A second floor could bring in revenue to the landlord to subsidise the incubator space.
- d. This is the ideal situation. All three could be on the island with the boating skills academy and incubator sharing a workshop space. Logistically this could work because the skills academy could use the space at night and the incubator could use it during the day. The business incubator personnel could also teach the classes at the skills academy. Also, there could be a shared meeting room that could function as a classroom setting for the academy and watersports training. Similar to scenario b, the watersports would need a designated launching space. The integration of the academy, watersports, and incubator would bring in the most profit for the landlord and have the greatest community impact, but space-wise could prove to be difficult.
- e. If all three could not be on the island, the boating skills academy could share the island with craft-focused incubators. This would be similar to “d” however the watersports would not use the space.
- f. If there are no incubators on the island, the boating skills academy could also share the space with watersports. The watersports would mainly use the classroom area and need a space to store equipment. The structure on the island would stay as is, with John’s Boat Works and the Boatyard Guitar Shop.
- g. If there is no boating skills academy, the craft-focused incubators could share the space with watersports. The watersports would bring in revenue to help fund the incubator space.

5.3 Limitations

During our project we examined many different factors. One challenge was balancing the time we had to collect all the data we needed. With more time, we could have conducted a much more detailed analysis of each scenario as well as other considerations that were not researched. We were able to get 193 survey responses but since the majority were from outside of Hounslow, more surveys should be done specifically for Hounslow residents to gauge their opinions on the ideas for the island. Additionally, there are more interviews that could be done, especially with the Brentford and Syon Councillors. Their opinions are valuable to this project, and though we

were briefly able to speak to one Councillor at the regeneration summit, speaking to all of them will be important. However, three of the Brentford Councillors and two Syon Councillors were able to attend our final presentation and expressed interested in taking the project further.

Additionally we were unable to interview the Falmouth Marine School and The Boatbuilding Academy at Lyme Regis. This limited the amount of information we could obtain about the logistics and structure of an existing skills academy to better our considerations. There are also other parties that we could have reached out to and found out more information in regards to potential funders and other small businesses and clubs that could be on the island.

5.4 Directions for Future Council Activities

Throughout our research and interviews other ideas for the island were brought up that we did not have the time to pursue. The ideas are outlined below and would need further research before any recommendation could be made or feasibility could be defined.

- 1) The boating skills academy could reside both on the island and off the island. The classroom space could be at the West Thames College, and the workshop space could be on the island. Lot's Ait has limited space and the success could depend on the flexibility of the academy.
- 2) "Open days" to visit the island and buy crafts from the incubators would involve the community while maintaining the safety of the island.
- 3) A pop-up cafe on the island was brought up on several occasions. The cafe would serve several purposes. First of all, it would bring people to the island. There are many residential housing developments being put up in this area that would use a cafe for meals, to get coffee, or to do work. Also, the academy, incubators, and watersports could use the cafe and help keep it profitable. The owner of John's Boat Works knows of someone who could open a pop-up cafe. This idea could be explored further and as of now the landlord, owner of John's Boat Works, and the Council are interested in further details.



Figure 20: Pop-up Café Example (Source: Element Space, 2015)

- 4) Residential moorings are another idea that could be explored further. The landlord of the island wants to have residential housing above the incubators or academy space. However, the Councillors and a planning officer said that this might not be possible due to planning and zoning ordinances. The idea of more residential moorings being added to the island was brought up. There are already residential moorings on the island that bring in profit to the landlord. This would be an idea that could be explored further.
- 5) Parking spaces across from the island were brought up. With the addition of an academy, incubators, or watersports, visitors would need a place to park if they drove. The area directly across from the island is limited, however if there is the addition of the new footbridge from Kew Gardens, parking could be across the river as well.
- 6) The footbridge plan that was introduced at the regeneration summit could benefit the island by foot traffic and aesthetically. Additionally, several stakeholders raised the idea that the footbridge could connect to Lot's Ait. After brief research we questioned the feasibility of this due to added expense and the Nature Conservation Area. However, this idea could be explored as it would connect the community with the island and create an additional exit from the island.



Figure 21: Spinal Cord Footbridge Plan Proposal (Source: Cumber, 2016)

- 7) Accessibility was an issue raised by several stakeholders. The island is only accessible by boat or by footbridge. The footbridge has several stairs to get up and down it and no ramp. There may be regulations requiring accessibility, and this topic should be further explored.
- 8) As mentioned previously, Section 106 funding could come from a private business such as Ballymore. We did not have time to make contact and investigate if this would be feasible, but economically this could be very helpful for the regeneration of the island and should be explored further.
- 9) Marketing opportunities are important with any of the ideas for the island. In order for residents of the Borough and in London to know what is on the island it must be marketed properly. This would come after or alongside implementation of any project.
- 10) We looked into watersports but specifically SUP. Additional research should be done into identifying rowing clubs and other watersports that would utilise the island.
- 11) The Brentford Football Sports Trust funds watersports. We did not have time to reach out to them but we did get a contact from the regeneration summit. They could be contacted in terms of the implementation of watersports on the island and be pursued for outsider funding.

5.5 Conclusion

To maximise the usage of Lot's Ait we recommend that the Council and stakeholders pursue the creation of a boating skills academy, the addition of a craft-focused incubator, and the implementation of paddleboarding and other watersports on the island. Regarding the academy, we found that there is a demand within Hounslow and the Greater London area among the

boating community. Additionally, Lot's Ait could be a satellite location for an existing academy in the UK, which would provide an additional funding stream to the landowner as well as aid with the organizational setup. A craft-focused incubator space could also be an additional source of income coming from monthly rent. Craft-focused incubators are greatly needed in London and can also contribute to the growth of small businesses within the community. The craft-focused incubator would be able to co-exist with the academy because craft skills are very similar to boating skills and most of the equipment and tools could be shared. Lastly, the implementation of watersports on the island would be beneficial to the overall community by creating more opportunities for recreational activities in the Borough. There would also be another stream of income for the landlord of the island.

However, due to our limited time there were aspects of the feasibility study that we were not able to fully cover in-depth. Specifically, the economic viability and profitability of the island after regeneration should be examined in further detail. In addition, the possibility of residential moorings and permanent housing should be explored. Housing could be a large source of income but may not be possible due to planning regulations. Furthermore, we believe that if the project progresses further topics such as island accessibility, funding for regeneration including Section 106, and the overall community impact should be researched so that Lot's Ait could be regenerated to its fullest potential. Overall, although there are some regulations and details that must be worked out before any work breaks ground we determined it would be feasible and ideal for all three considerations to co-exist on Lot's Ait.

5.6 Personal Reflection

Megan Hanshaw:

This project was within my major field of civil engineering, specifically urban and environmental planning. Most interactive qualifying projects are outside of students' major field, so this made this project experience very unique for me. Though I have taken classes within my concentration and also had an internship related to this field, this project gave me valuable experience working in the public sector with a team from varying backgrounds. Also, working in the public sector showed me what it was like to work with projects focusing on social impact rather than the economic impact.

This project also had many stakeholders with varying opinions of the projects. Some of these stakeholders were very invested in the projects and willing to be interviewed and give us information. However, others proved more difficult to get in contact with, were unwilling to help, or needed to be convinced that our projects were worth their time. Dealing with such a variety of professionals was a new experience for me and I was able to learn a lot about interviews and dealing with different parties. I believe this will help me in my career after college.

Lastly, this project also significantly improved my presentation skills. In ID 2050 we had several presentations, however, at this time I felt I lacked confidence in my personal presentation skills. After the final IQP presentation I felt confident presenting to a room of stakeholders and five Hounslow Councillors. I was able to answer questions about the project with ease and did not need notes. This project gave me confidence as a public speaker and as a project leader in a group setting, and I know I will be able to apply these skills to many aspects of my life.

Rhaine Sziy:

This project helped me improve both as an engineer and a person significantly. Spending fourteen weeks working on a project that had no relation to my major has helped me develop new skills. The feasibility study pushed me outside my comfort zone and had me communicate with people who were basically strangers to me. From these interviews I gained new communications skills that I can use in my future career. I was also able to build upon my presentation skills thanks to this project. Presenting to borough councilors and the other parties involved was the most difficult environment I ever presented in. Thanks to this presentation I am a better public speaker and feel more confident moving forward in my academics. This project also kept evolving and in the beginning was only focused on the feasibility of the boating skills academy. But over the seven weeks here in London additional things were added to our project. The project kept us on our toes forcing us to adapt and to never fall behind in our work. This helped me improve my ability to adapt to changing dynamics of a project which will help later on in life because nothing really ever goes to plan. Additionally the project helped me better learn how to work in a team. Going forward I feel I will be a better team member in my future team projects thanks to this feasibility study. The knowledge and skills I gained from this project

will help me in my future endeavors whether that be in academic pursuits or non-academics ones.

Patrick Donaghey:

This IQP project has been one of the most rewarding experiences of my life. A long fourteen week project that was out of the engineering scope was very challenging and helped me develop new skills. I learned how to deal with being in a new environment, work with professionals, and developed my communication skills. A feasibility study that took on new aspects and forced us to interview new people was challenging but satisfying. Conducting several interviews helped me organize questions and become a better interviewer and interviewee. In my future, I will definitely be more comfortable in interviews. I will also be more comfortable in presentations because of the numerous presentations I gave throughout this project. One of the main things I can take away however, is working with other professionals. During this project, I had to work and speak with several people in many different fields of work. As an engineer by background it pushed me a little out of my comfort zone but it was enjoyable and exciting. In my future career I plan on going into business, and speaking with these professionals for a feasibility study greatly helped me. This project experience gave me skills and knowledge that will greatly help me in my future career.

Andrzej Bielecki:

Overall I can confidently say that I learned a great deal from completing this IQP. Mainly, it helped me improve many skills that I will use in my professional life outside of strictly engineering knowledge. I can now more effectively manage my time, work with others, and have better communication skills. Although I have been interviewed before, one thing that I never did before this project was conduct an interview and since we conducted so many this past term I am much better at effectively organizing questions beforehand and follow up questions during the interview itself. In the future I think I will be much more comfortable in any interview because of this. Due to the various presentations we had to do, I also am now noticeably better at presenting. In terms of the specific project, I learned a lot about regeneration and the many aspects that must be considered before any major project is started.

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Appendix A

Supplementary Photos



Figure 1: Hounslow shown within Greater London (Retrieved from Wikipedia)

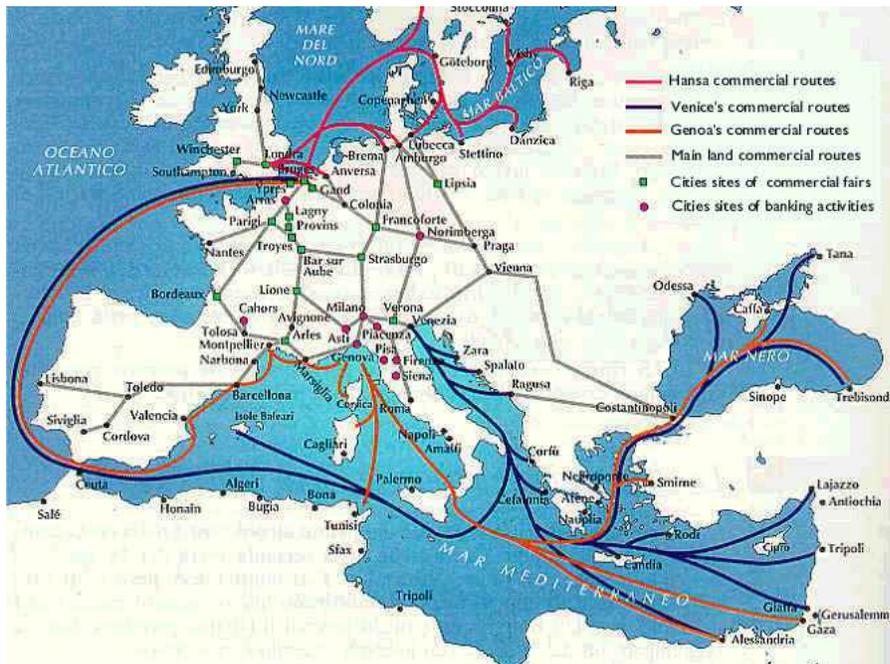


Figure 2: Trade Routes of the Early Medieval World (Retrieved from the Collegiate Journal of Anthropology)

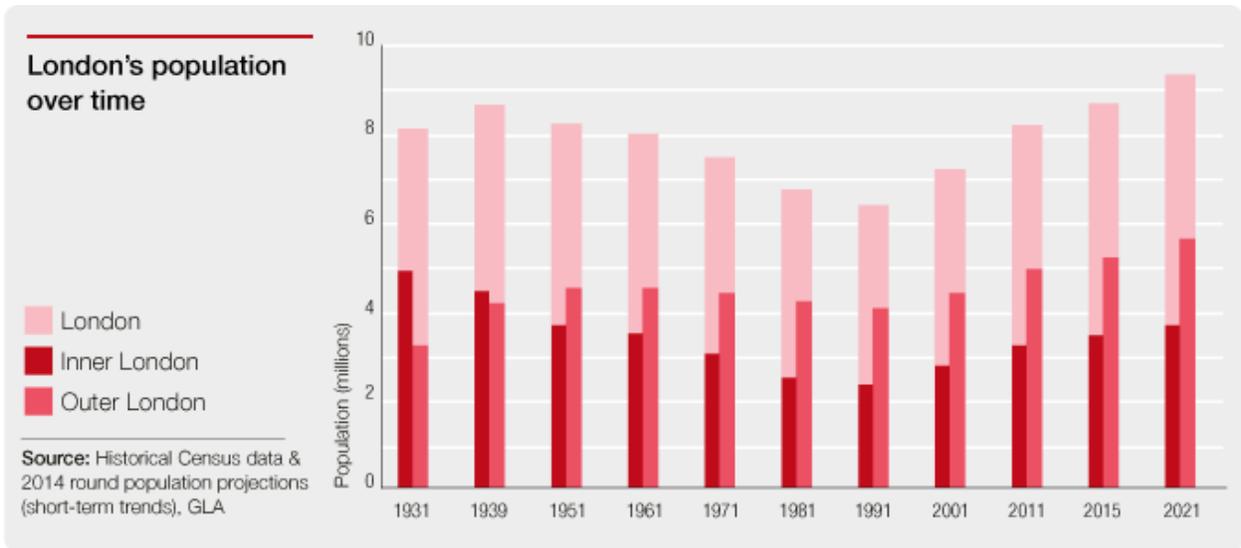


Figure 3: London's population over time

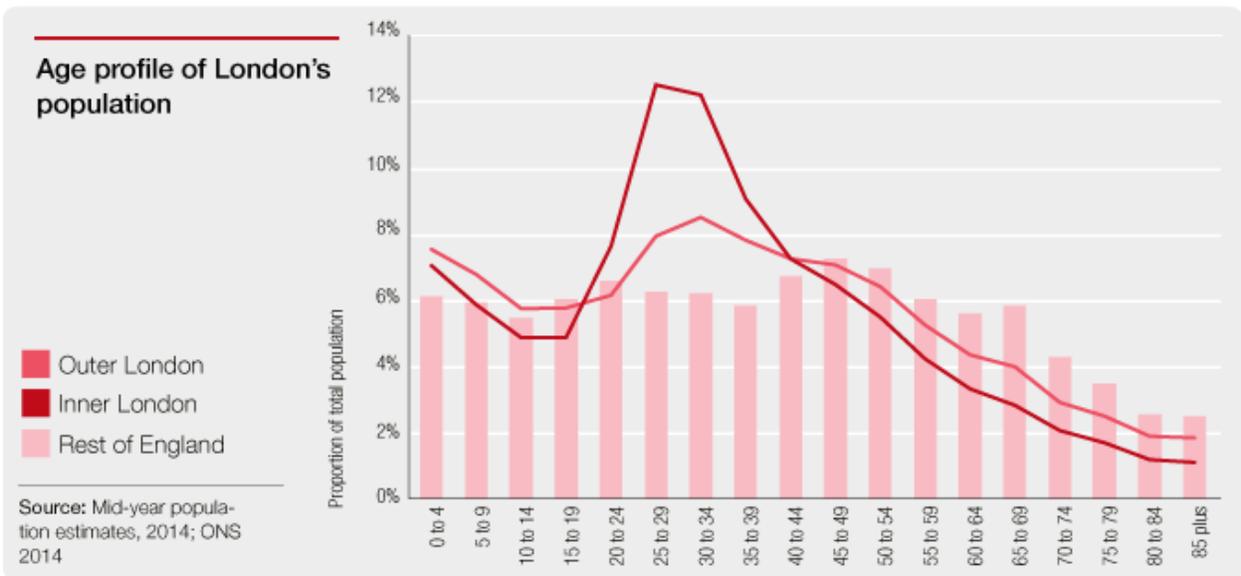


Figure 4: Age demographic of London and Boroughs

**London Borough of Hounslow
Ward Map, 2002-present**

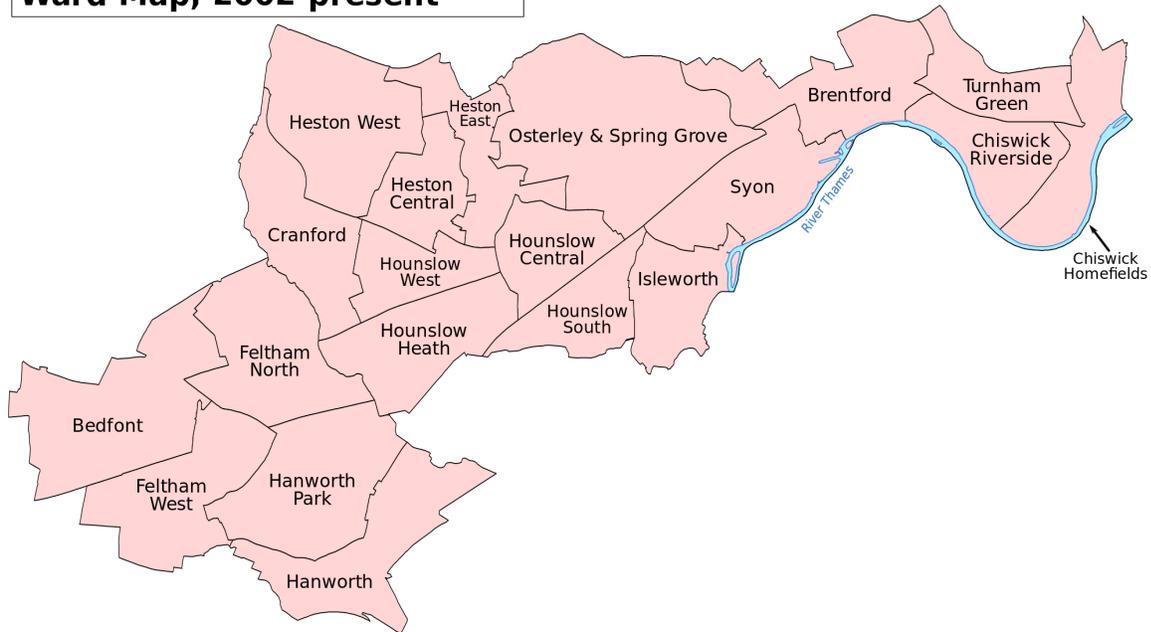


Figure 5: Map of Hounslow showing wards, we will be working in Brentford (Retrieved from Wikipedia)

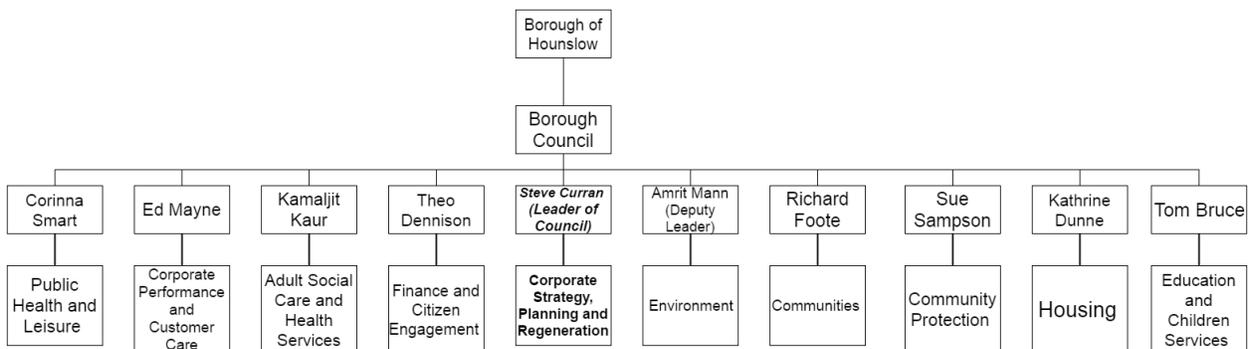


Figure 6: Hounslow Cabinet with Responsibilities (Information Retrieved from Borough of Hounslow Website)

TIMETABLE

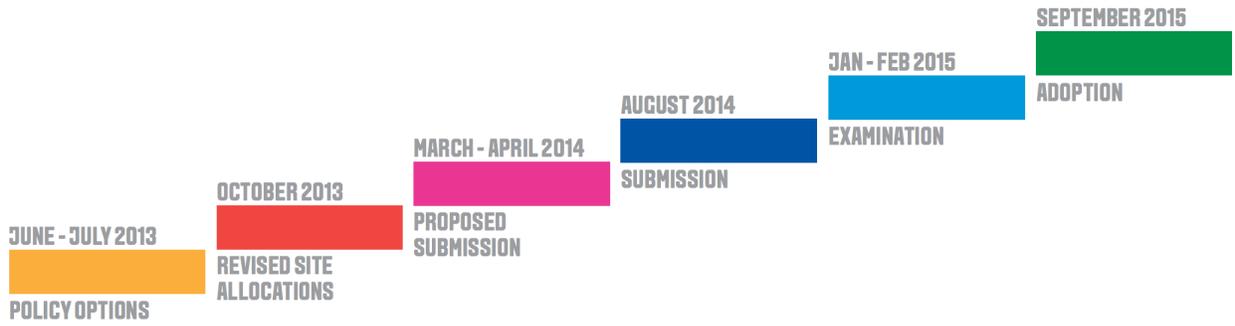


Figure 7: Local Plan Implementation Strategy



Figure 8: Abandoned Building on Lot's Ait

Appendix B

Interview Setup and Questions

Preliminary Discussion

1. Give a background on our group, including our goals and objectives.
2. Explain the boating skills feasibility project
3. Explain our preliminary results

Hounslow Council Interview

1. I'd like to begin by having you tell me about yourself and what your connection is to the Council?
 - a. What department are you in? How does the department function in relation to the Council and the public, and what type of control does it have of this project?
2. Can you tell me more about how this project will achieve objectives in the:
 - a. London Plan
 - b. the Local Plan
 - c. the Regeneration and Economic Development Plan
 - d. the Skills and Employment Strategy
3. Are there any laws protecting the island that would explicitly prohibit such a project?
 - a. Are there any laws or waivers that would be needed to begin construction on the island?
4. Are there any changes currently being implemented to increase the general skills and boating skills of Hounslow?
5. What are your feelings on the installation of a skills academy in the proposed area?
6. How do you expect future population growth will have an effect on the use of the Thames and the demand for boating skills?
7. How would the Council benefit by facilitating a boating skills academy?

Boating Stakeholder Interview

1. I'd like to begin by having you tell me about yourself and what your connection is to boating?
2. What type of organization do you work for?
3. What do you see as the most important issues affecting recreational boating these days?
4. What are your thoughts on the current boating skills of Hounslow residents?
 - a. Is there room for improvement?
5. In what ways would residents benefit from learning boating skills?
6. What are some common deficiencies you have noticed in Hounslow and other Londoners boating skills?
7. How are these deficiencies identified?
8. What are the basic skills you expect the boating skills academy to teach?
9. What are the basic requirements you expect the boating skills academy to have? (i.e. space requirements, equipment, storage)
10. Do you have any ideas of who could teach the academy?
11. Have you been to any boating skills academies or paddleboard classes in the area?
12. Are there any "red tape" factors you are aware of that could affect the building of the academy?

Watersports Stakeholder Interview

1. I'd like to begin by having you tell me about yourself and what your connection is to watersports?
2. What type of organization do you work for?
3. What are your thoughts on the current water sports situation in Hounslow?
4. In what ways would residents or the Borough benefit from adding more water sports?
5. What are some common deficiencies you have noticed in access to watersports in Hounslow?
 - a. How did you identify these deficiencies?
6. PH: What made you want to move the pontoon from Kew Bridge to Lot's Ait?

7. What are some basic skills and activities you expect to teach at the watersports theory training?
8. What is the current setup of the watersports theory training classes?
9. Are you looking to make any revisions to the classes?
10. What do you need from the location that hosts the training? (i.e. space requirements, equipment, storage)

International Boatbuilding Training College Interview

1. Beginning
 - a. I'd like to begin by having you tell me about yourself and your connection to Falmouth School?
 - b. How did you get into this career?
2. Structure of the Courses
 - a. How are the courses structured?
 - i. 47 Week Boat Building Course
 - ii. Short Courses
 1. Introduction to Woodworking
 2. GRP (Glass Reinforced Plastics)
 3. RYA Diesel Engine
 4. Lofting Course
 5. Basic Boat Plumbing and Electrics
 6. Tool Maintenance
3. Teaching
 - a. Who teaches these courses?
 - i. Guest Lecturers?
 - b. Where do you find instructors?
4. Space used for the courses
 - a. What sort of space is needed for these courses?
 - i. Square Feet?
 - ii. Minimum Space Required?
5. Equipment

- a. How much equipment is needed for Courses
 - i. Specific for courses
 - b. What type of equipment is needed?
 - i. Specific for courses
6. Apprenticeship
- a. In regards to Boat Apprenticeship program
 - i. How is it structured?
 - ii. How does it work with the sponsor/company in conjunction with school?
 - iii. How did this program come to be?
 - 1. How does one set up an apprenticeship program like this?
7. Job outlook after graduation/taking courses
- a. What is the job placement for people who take these courses?
 - b. Is there a good outlook for these careers in the future?
8. Cost
- a. What is the cost for these programs?
 - i. Cost for school to offer and run these programs
 - ii. Cost for attendees to attend
 - b. Is there funding outside the school for these courses?
9. Demand
- a. How many people attend at your Institution?
 - i. How many people are in the classes listed in section 2?
 - b. How many people are applying to get into institution?
 - c. Who gets into these programs?
 - i. What is looked at to determine acceptance into the program?
10. Student Feedback
- a. What do you like best about the program?
 - i. Specific Programs and it's aspects

Potential Funder Interview

1. I'd like to begin by having you tell me about yourself and your connection to (organisation)?
 - a. What department are you in? How does the department function in relation to the (organisation) and the public, and what type of impact does it have on this project?
2. What type of projects do you look for? What projects have you funded in the past and why?
3. Have you worked with any other skills academies in the past?
4. (PLA) Have you worked with watersport or paddleboarding organisations?
5. How does the specific process of receiving funding work?
6. (PLA) Describe the process of relocating a pontoon.
7. What are the most critical results you expect our project to produce?
8. Why and how does this project matter to you?
9. What are your concerns for potentially funding the skills academy/watersports theory training classes?
10. Are you aware of any other organizations effectively addressing this project?

Appendix C

Survey Questions

Boating Skills Survey Questions

Section One: Boating Skills

Boating Skills Survey

Boating Skills Test Survey

Thank you for agreeing to participate in this study conducted by the WPI Hounslow IQP Team from the United States. The aim of this survey is to understand the reach of boating and boating skills in the Borough of Hounslow. Your participation in this study is voluntary and you may stop at any time. Results of this survey will be kept confidential and will not be attributed to you in any way. Results of this survey will only be released in aggregate and with no personal identifying information. For questions regarding the research study, please contact our advisors, Prof. Adrienne Hall-Phillips (ahphillips@wpi.edu) or Prof. Josh Rosenstock (jrosenstock@wpi.edu). For questions regarding your rights as a research participant, contact the Human Research Protection Program at Worcester Polytechnic Institute, Worcester, Massachusetts, USA (irb@wpi.edu). If you agree and are ready to participate in this survey, please hit next and begin the survey with Question 1. This indicates your consent to participate in the survey and verifies you are over the age of 18.

Q1 Do you live in Hounslow?

- Yes (1)
- No (3)

Q2 How many times a month do you spend any time on a non-commercial boat?

	Never (1)	1-3 days/month (2)	1-2 days/week (4)	3-6 days/week (5)	Everyday (6)
Summer (1)	<input type="radio"/>				
Autumn (2)	<input type="radio"/>				
Winter (3)	<input type="radio"/>				
Spring (4)	<input type="radio"/>				

Q3 Do you own a boat?

- Yes (1)
- No (2)

Q4 What type of boat do you own?

- Houseboat (1)
- Recreational motorboat (2)
- Sailboat (3)
- Other: (4) _____

Q5 How much do you pay to maintain and repair your boat per year? (excluding mooring fees)

- 0-500 pounds (1)
- 500-1000 pounds (2)
- 1001-2500 pounds (3)
- 2501-5000 pounds (4)

- 5000+ pounds (5)

Q6 Do you have any boating repair or maintenance skills?

- Yes (1)
- No (2)

Q7 Rate the level of boating repair skills you have

- None (1)
- Beginner (2)
- Intermediate (3)
- Advanced (4)

Q8 How did you learn these skills?

- Skills Academy (1)
- Trade School (2)
- Online (3)
- Self-taught (4)
- Apprenticeship (5)
- Other: (6) _____

Q9 Would you be interested in learning boating skills from a skills academy? (nightly courses, drop-in sessions)

- Yes (1)
- No (2)
- I don't know/need more information (3)

Q10 Would you be interested in a career path involving boating/boating skills?

- Yes (1)
- No (2)
- Maybe (3)

Q11 What gender are you?

- Male (1)
- Female (2)
- Other/prefer not to say (3)

Q12 How old are you?

- 18 - 24 (1)
- 25 - 34 (2)
- 35 - 44 (3)
- 45 - 54 (4)
- 55 - 64 (5)
- 65 - 74 (6)

- 75 - 84 (7)
- 85 or older (8)