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the Land Trust

EVIDENCE OF ECONOMIC IMPACT OF PORT SUNLIGHT RIVER PARK

Alliance Manchester Business School
Master of Business Administration

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Executive Summary

1. This study was commissioned by The Land Trust in order to gauge the economic impact associated with the Port Sunlight River Park (PSRP), which is a landfill redevelopment project located on the banks of River Mersey in Wirral.

2. The main objective of this study was narrowed down to find out the evidence of PSRP's economic impact on residential property and businesses in the surrounding areas and quantify them wherever possible. These findings would be used as a proof of how PSRP has contributed to local economic uplift, which is one of The Land Trust's five charitable objectives.

3. Also, the impacts on property and businesses would be most useful for The Land Trust for marketing activities, and applying for future projects and funding.

4. Our key findings are as follows:

    - Trend analysis of residential property price within 1 mile radius of the park reveals a significant positive change for a two year period immediately after PSRP's establishment compared to the two year period before establishment.

    - Regression analysis of historic sales and current sales of residential properties in a 1 mile radius of PSRP shows that there is a 5.4% uplift in house price for every 100m moved closer to the park within a 500m radius of PSRP.

    - Using the above findings, it was estimated that PSRP adds a total value of £7,832,697 to the houses located within a 500m radius. This translates to an average addition of £8,674 per house within a 500m radius.

    - The findings in the point above are further supported by the results of a PSRP visitor survey. The survey reveals that park visitors are willing to a pay on average, £9,478 more for a house next to a park compared to the same house next to a landfill.

    - The same visitor survey reveals that, on average, £0.95 is spent at a local business for every individual visit to the park. This translates to a gross revenue of £38,026 added to local businesses as a direct result of visits to PSRP.

    - 47% of the survey respondents said that they visited a local business immediately before or after visiting PSRP. Of these, 27% (12% of all visitors) would not spend money at the local businesses if they did not visit PSRP.

    - 11 local businesses use PSRP for business purposes. Through utilising the park, these businesses generate a total revenue of £47,914 per year. Amongst other activities, they use the park directly for their operations or marketing activities.

    - Autism Together, who manage PSRP on a day-to-day basis, also use the park to run half-day sessions for their service users. These sessions currently benefit 55 people/week. Additionally, it was the opinion of the Quality & development Manager at Autism Together that PSRP raises brand visability of Autism Together significantly.

- Additionally, a local Garden Centre, which is also managed by Autism Together, has reported growth in revenues from £22,000 to £29,500 from 2013 to 2016. In the opinion of the Quality & Development Manager at Autism Together, PSRP plays a major role in this growth in revenue. Also, Visitor survey findings show that 25% of park visitors visit the Garden Centre before or after visiting PSRP.

- We interviewed major property developers and real estate agents. While some of them speculated that the park might have had some impact on the property prices in the area, the majority believe that PSRP has not had an impact on property/land values in the area.

- An interview with Tony Field of Dibbin Estates and Equipment, a major land owner in the area, revealed that after PSRP's establishment, the area around it has seen an increase in residential land assignment relative to commercial land assignment driven by Wirral Council. He suggested that PSRP might have indirectly influenced this change, and that residential land can be sold for three times more than land for commercial purpose.

4. Our findings clearly show there is a positive economic impact of PSRP on the the property and businesses in the local area. However, it seems developers and real estate agents are not aware of these impacts.

5. We would like to thank Sarah Williams and The Land Trust for commissioning this report and providing support throughout the study. The staff and volunteers of Autism Together are also thanked for their continuous support and assistance, in particular Anne Litherland and Terry Usher. We also thank Alison McGovern MP for her thoughts and advice. Finally, all people who participated in an interview or survey are thanked for their cooperation.

1. Introduction

1.1. Study Context

1.1.1. The Land Trust aims to improve the quality of local people's lives by creating and maintaining sustainable, high quality green spaces that deliver environmental, social and economic benefits.

1.1.2. One of the Land Trust's five charitable objectives is to contribute to local economic uplift. Whilst environmental and social benefits of green space are well documented, the economic benefits of green space are rarely studied and quantified.

1.1.3. Understanding and proving economic benefits of The Land Trust's projects is useful in achieving their goal as a business to secure future projects and funding, as well as achieving their charitable goal of marketing the value of green space.

1.1.4. Therefore this study was commissioned by The Land Trust to gather evidence of economic impact their first independent project, The Port Sunlight River Park has had on the local community.

1.1.5. The Port Sunlight River Park (PSRP) was created as a landfill redevelopment project by the Land Trust. It is located on the banks of River Mersey in the Wirral. The park's re-development from an inactive landfill site started in 2013 and it was opened to the public in 2014. Another Not-for-profit organisation, Autism Together, manages the park on a day-to-day basis.

1.2. Project Brief

1.2.1. Initially, the project brief was to carry out a full economic impact assessment of Port Sunlight River Park (PSRP) on the local community, with analysis of as many factors as possible. The brief was then streamlined, after discussion with The Land Trust to provide evidence of economic impact the park has had, particularly on local residential property value, new property development and business activities in the surrounding areas.

1.2.2. This new brief allowed us to focus on investigating and presenting the key economic impacts that The Land Trust will find most useful for marketing purposes and while competing for other new development projects going forward.

1.3. Project Objectives and Research Questions

1.3.1. Based on the revised project brief as mentioned in 1.2.1, the following key questions were identified.

- Is there any evidence of PSRP's economic impact on the property and businesses in the surrounding areas?
- How much quantifiable economic impact has PSRP had on the property and businesses in the surrounding areas?

1.4. Report Structure

1.4.1. This report is structured as follows:

- Section 2 details the research methods used to determine the economic impact of the Port Sunlight River Park has had on property and business in the local community.
- Section 3 presents the results of our research.
- Section 4 discusses our findings, predominantly how and why these economic impact have occurred, and what implications there may be for The Land Trust.
- Section 5 summarises our conclusions and recommendations.

1.4.2. The following annexes are included in the report:

- Annex A summarises the key assumptions and methodology used for regression and trend analysis.
- Annex B shows our survey templates in both paper and online versions and the results.
- Annex C lists the organisations and individuals interviewed for this research.
- Annex D provides a brief glossary of terms used in the report.

2. Methodology

2.1. Methodology Overview

2.1.1. To answer the key questions in 1.3.1., several sub-questions were identified. These questions, the research methodology used to answer these and the data sources used are summarised in table 2-1 and table 2-2.

Table 2-1: Impact on Residential property: research questions, methodology adopted, key deliverables and data sources

Research Questions	Is there any evidence that property prices for existing residential properties in the areas around the park have been affected by the establishment of PSRP?	How much and to what geographical extent does PSRP affect the existing house prices in the area?	Are people willing to pay more to live in the area close to a park as opposed to a landfill? And if yes, how much?	Is there any evidence that the park redevelopment has influenced new developments created in the surrounding area?
Deliverables	Historical Trend for average house prices (£)	Premium added to residential properties by PSRP (£); Geographical scope of impact (km)	Premium added to residential properties (£)	Impacts on development decisions and investment
Methodology	Trend Analysis	Regression Analysis	Face-to-face and online survey	Desk research; Phone interviews
Data sources	Historic sale prices for residential properties from HM Land Registry	Current and historic (after 2014) residential property prices and structural details from rightmove.com	Target population: PSRP users	Target interviewees: Developers: Dibbin Estates & Equipment Persimmon Homes, Barratt Homes, Bellway Homes Estate agents: Lesley Hooks Wirral Council

Table 2-2: Impact on Business: research questions, methodology adopted, key deliverables and data sources

Research Questions	How much value do PSRP visitor's add to the park based businesses?	How much value has PSRP added to any existing businesses in the surrounding areas?	How has PSRP influenced Autism Together?	What is the 'monetary value' of the volunteers' work at PSRP?
Deliverables	Revenue generated by park visitors (£);	Revenue generated by park visitors that are attributable to PSRP (£)	Changes in fund raised and savings (£); Changes in operations and brand awareness;	Savings attributable to volunteers (£)
Methodology	Face-to-face and online survey; Phone interviews	Face-to-face and online survey; Phone interviews;	Phone interview	Desk research; Phone interview
Data sources	Survey target population: PSRP users; Target interviewees: Park based business owners: Dog walker, Child minder, Ice cream van and Pet food retailer	Survey target population: PSRP users Target interviewees: Local Businesses	Manager at Autism Together	PSRP Park ranger and Manager at Autism Together

2.2. Secondary Research

Desk Research

2.2.1. Gathering and analysis of several forms of data were used to test the hypotheses below. Data sources included internal data from The Land Trust, online public domain data from Wirral Council and data from previous social, environmental and economic studies.

- **Hypothesis 1.** The park generated a commercial value from volunteering.
- **Hypothesis 2.** The park has had a positive impact on local spending and property value.

2.2.2. We used the internal records of volunteer hours provided by the park ranger and the average minimum wage from the National Minimum Wage (NMW) website (gov.uk, 2017) to calculate the value of volunteers as savings on employment expenditures, working as

substitutes of paid workers (Brain et al., 2017). We also retrieved the average salary and working hours of countryside rangers from the National Careers Service (UK government published data) to estimate the additional staff expense without volunteers (Nationalcareersservice.direct.gov.uk, 2017).

2.2.3. We used the ratio of the frequency of park visits to the number of individual visitors from the past 'Port Sunlight River Park Visitor Centre Survey' (The Land Trust, 2016). See Annex B. It was found that the percentage of unique visitors to total park visits was 1.87%.

2.2.4. Local businesses that could not be identified by word-of-mouth, and that may have been impacted by the park were found using social media (e.g. Instagram and Facebook).

2.2.5. A 1 mile region around PSRP was analysed using google maps historical data/imagery for finding out the major developments that have taken place from 2009 onwards.

Trend Analysis

2.2.6. From literature review, it was found that "a distance-decay function for open space premium, find a break point between 0.5 and 1 mile (0.8 and 1.6 km), depending on the type of open space being considered." (Cho et al., 2011 as quoted in Pouyanne et al., 2013). Based on this, it was hypothesised that Port Sunlight River Park has impacted residential property prices in the surrounding 1 mile area positively. In order to test this hypothesis, we analysed residential property variation with time using trend analysis, then compared these trends to residential property price trends in other control areas.

- Step1: Three comparable areas based on a similar ratio of land use (commercial, residential and green space) were identified. See table 2-3 and figure 2-1.
- Step 2: All residential property sale prices from 2011 to 2016 within a one-mile radius of Port Sunlight River Park and 3 comparable locations were collected from HM Land Registry Open Data (HMLR, 2017). Only old builds were considered. Outliers were from this data. For more details on calculations, refer to Annex A.3.
- Step 3: Average house prices of each year were then calculated in all areas and compared.

2.2.7. We chose 3 comparable areas as follows (See figure 2-2);

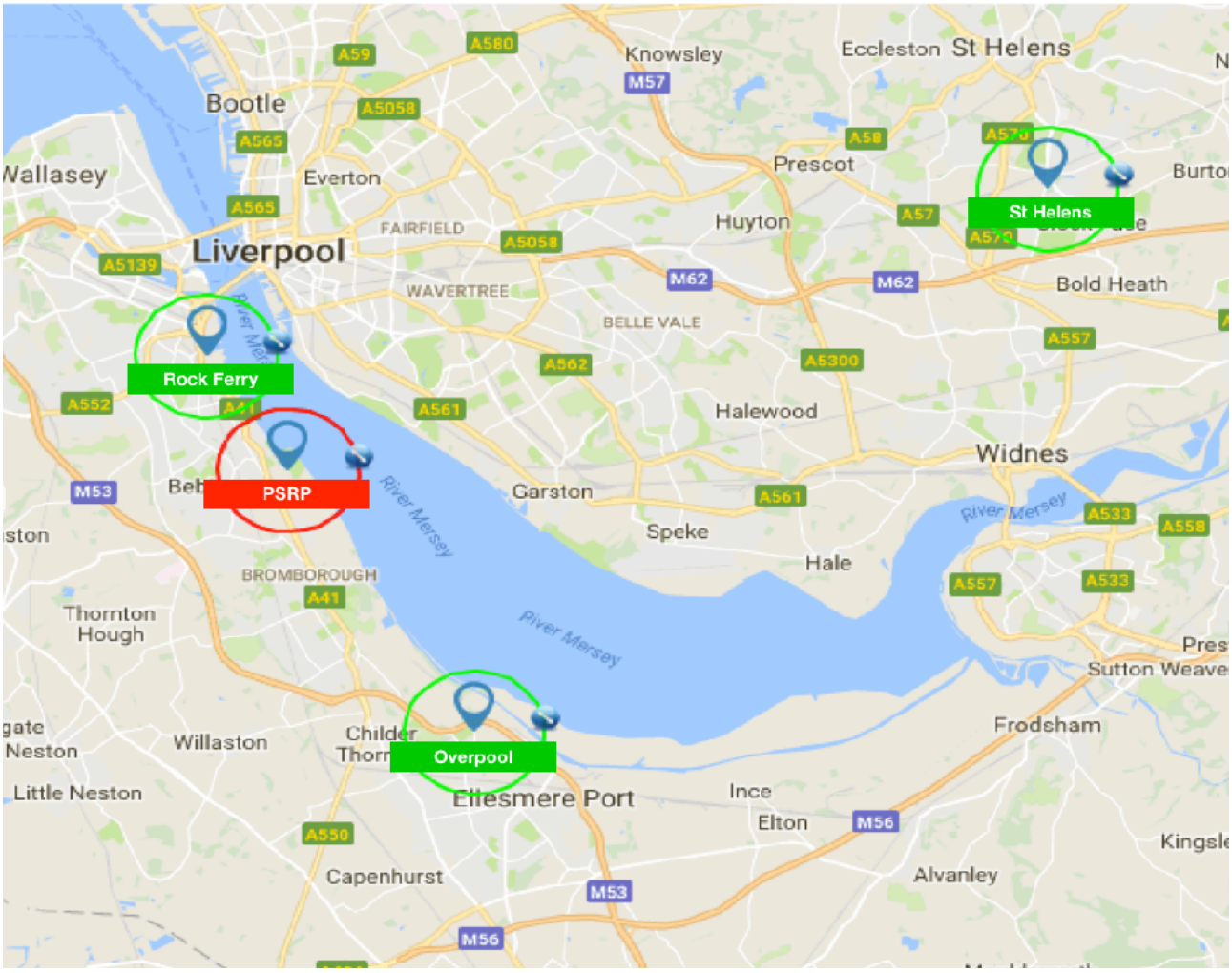
- Area 1. Overpool, Cheshire: an area with a park.
- Area 2. Rock Ferry, Birkenhead: an area with no park.
- Area 3. St. Helens, Merseyside: an area with an active landfill.

2.2.8. In choosing the comparable areas, we used satellite imagery in Google Maps to estimate the percentage of commercial, residential and green space. The area of each land component was then calculated using an online area calculator (FreeMapTools, 2017). As shown in Table 2-3, the component ratios are not exactly the same each other, however are close enough for the purpose of comparison.

Table 2-3: Percentage of the land use in research areas

Areas	Commercial	Residential	Green space
PSRP	38%	45%	17%
Overpool	50%	33%	17%
St. Helens	16%	57%	27%
Rock Ferry	39%	57%	3%

Figure 2-1: Location of research areas



Source: Google Maps, 2017

Figure 2-2: Image of land use of the research areas

Source: Google Maps 2017

Regression Analysis

2.2.9. In order to explicitly find out the spatial extent and the magnitude of impact of PSRP on property value, a hedonic price regression analysis was carried out. "The hedonic price method uses housing market transactions to infer the implicit value of the house's underlying characteristics (structural, locational/accessibility, neighbourhood and environmental)" (Gibbons et al., 2014). The generic theoretical framework for hedonic

pricing as described by Rosen, 1974 has been used in various house price studies since (Gibbons et al., 2014; Sheppard, 1999).

2.2.10. The model, adapted from one used by Gibbons, 2014, assumes the natural log (ln) of house price is a function of distance from PSRP, number of bedrooms, number of toilets/ bathrooms and the number of garden areas.

- **Equation 1:**

$$Ln(P) = s_1B + s_2T + s_3G + l_1D$$

where,
P is the house price
B is the no. of bedrooms
T is the no. of toilets
G is the no. of gardens
D is the distance of the house from the park
s_1,s_2,s_3 are coefficients for structural factors B,T and G respectively
l_1 is the coefficient for D

2.2.11. Although the house price also depends on multiple other factors such as environmental (pollution, noise etc.), neighbourhood (crime rate, demographics etc.), these were assumed to be similar for all houses considered due to the limited geographical scope of 1 mile, and therefore not considered in the model.

2.2.12. Another assumption taken for the regression analysis was that the brownfield site at the location of PSRP before 2014 had no effect (positive or negative) on the property values in the surrounding area before redevelopment of the landfill. Only property values after PSRP establishment are considered.

2.2.13. All the house price and house characteristics data was gathered from rightmove.co.uk (see Annex A.1). Historical house price data was converted to current day prices using the Land Registry House Price Index (HMLR, 2017).

2.2.14. Initially, data for houses currently on sale within 1 mile radius of the park was put through the model given above and the regression analysis was done. Details for this analysis are given in Annex A.1. It was observed that distance from the park (D) was statistically insignificant. Further analyses were carried out by gradually reducing the geographic scope until D was found to be statistically significant, i.e. the probability that the distance from the park (D) influenced price purely by chance is less than 5%." [Monson, 2009].

2.2.15. To confirm if the geographical scope arrived at was accurate, historic data for house sales from 2014 onwards (within this geographical scope) was gathered, corrected for inflation using the House Price Index and run through the model. Based on this analysis, the geographical scope was further fine-tuned. Finally, the coefficient l_1 was calculated for the finalised scope.

2.3. Primary Research

Visitor Survey

2.3.1. Both online and paper-based surveys were used in this project. We carried out face-to-face surveys at PSRP and some were carried out by the park ranger. Simultaneously, we ran the same survey online to get more responses. Communication channels for the surveys included emails sent out by the park ranger and the usage of relevant Facebook Groups and Pages. The surveys were used primarily to test the following hypotheses:

- **Hypothesis 3:** People are willing to pay significantly more for a house close to a park such as PSRP than the same house close to a landfill.
- **Hypothesis 4:** PSRP has directly and indirectly contributed to the revenue of local businesses, both on site and off site.

2.3.2. The survey questionnaire used is in Annex B.

2.3.3. The target population to be surveyed was defined as non-vulnerable adult park visitors, including first-time visitors and regular park users. The total size of the survey population was calculated based on number of unique visitors, estimated by using the record of park visits in 2016 and the ratio discussed in section 2.2.3. We estimated there were 748 unique visitors in a year based on 40,040 park visits in 2016.

2.3.4. Random sampling was used to obtain our sample. Based on the 748 unique visitors determined in 2.3.3., the minimum sample size was calculated to be 254 PSRP visitors, based on 95% confidence level with 5% margin of error. We got a total of 87 surveys - consisting of 39 online and 48 paper-based which gives us a 95% confidence level with a 10% margin error.

2.3.5. We asked for the visitor's post code to log where visitors typically come from. We also asked about their frequency of park usage, their tendency to use local businesses as part of their visit to PSRP and their typical amount spent in order to estimate what the park's visitors regularly spend in the local area.

2.3.6. In order to find out how much the park had an impact on individual businesses utilising PSRP, we asked if there were any products or services the visitors typically purchase at the park during their visits and if so, how often.

2.3.7. In order to test the hypothesis that people are willing to pay more to live next to a park rather than a landfill, we asked how much more would they be willing to spend, either in pounds or as a percentage. Then, we converted the percentage of house price perceived into a pound value by using the average house price we calculated from the online data.

Interviews-Park based businesses and local businesses

2.3.8. Another way to get an insight to the economic impacts PSRP has made on local business, was to interview any small businesses that utilise the park for the purpose of generating revenue. The main objective of the interviews was to understand how exactly these businesses use the park, what benefits it brings to their businesses and if possible, how much revenue has been generated as a result of PSRP.

2.3.9. The interviews were conducted by phone and whilst they were not formally structured, there were key questions that we posed to the interviewee in order to test our hypotheses. The main questions were the following:

- What is your business?: To know the field of the business.
- How many employees does your business employ?: To get information about creating employment.
- How long have you run this business?: To know the start date of operations which would then let us question if the park was a motivation to open it or how the park changed the business operations, hence according to the answer, subsequent questions were:
    - If it was before PRSP was opened, how (or why) did PSRP change the operations of the business? or,
    - How has PRSP affected your decision making in terms of: location, customers, pricing, costs, savings?
- What do you charge per unit product or service?: In order to estimate revenues generated directly by the park, coupled with the question below.
- How often do you use the park for the business?: Aiming to quantify the revenues on a time basis.
- Do you make any contribution or donation to the park from revenue generated?: To get information on PSRP's income as a result of these businesses.
- Who are your primary clients/customers, and where do they travel from?: Targeted to understand if the funds were spreading inside the town of Port Sunlight or also bringing them from other towns.

2.3.10. Regarding the target population, the main focus was made on businesses that need or use PSRP facilities for the running of their business, either occasionally or regularly. We found such businesses through the PSRP park ranger and through search engines and social networks.

2.3.11. Interview responses and any data was gathered, was then analysed separately for each businesses due to their small and unique nature. Some drawbacks observed were that because of the small number of businesses running in the park, it was not possible to get a considerable amount of data. Moreover, some identified and contacted establishments were not willing to share information about their park operations.

Interviews - Property Developers and Landowners

2.3.12. To test our hypothesis that PRSP has positively influenced the decision for property developers to build in the local area, we needed to speak to the developers and landowners directly. Interviews were carried out to understand the process behind new housing developments and the motivations of property developers. Our target was to interview 3 housing developers that have established sites in the local area; Barratt Homes, Bellway Homes and Persimmon Homes, as well as Dibbin Estates and

Equipment who own land adjacent to PSRP, Wirral Council, and Lesley Hooks; a local estate agency.

2.3.13. We interviewed Tony Field from Dibbin Estates and Equipment, Timothy Pegg from Persimmon Homes, David Ball from Wirral Council and Michael Hooks from Lesley Hooks Estate Agents. All interviews were unstructured, but aimed to answer the following key questions:

- What is the history of the land surrounding PSRP?
- Do you believe PSRP has had a significant impact on local land and residential property value?
- Was PSRP an influential factor in the decision made by housing developers to build in the area surrounding the park?

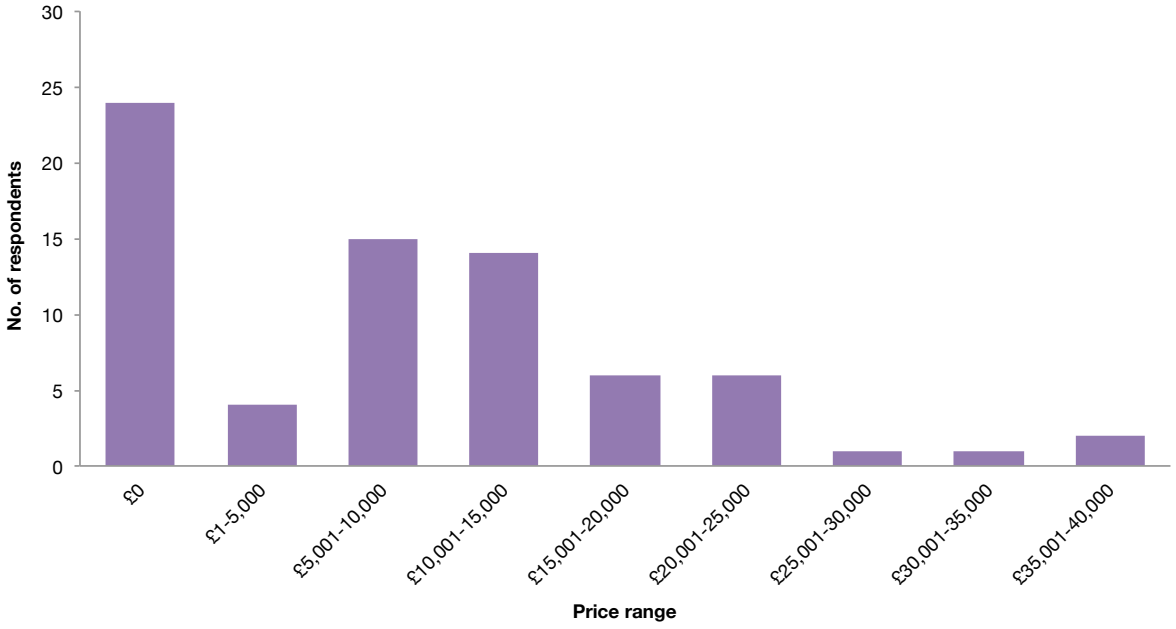
3. Findings

3.1. Existing Property Value

House Price Perception from Surveys

3.1.1. In order to determine local residents' opinion on how PSRP has affected local house prices, we asked how much more would they be willing to pay for a house close to a park as opposed to the same house close to a landfill. The results of this survey showed that more than 67% would pay more for a house close to the park as opposed to one close to a landfill. We also found that on average, respondents are willing to pay £9,478 more to be close to the park. These results disregard anomalies - those more than £40,000 - which were excluded from our analysis to minimise bias. See figure 3-1.

Figure 3-1: Graph showing the distribution of survey responses to house price premium value question between £0 and £40,000



Trend Analysis

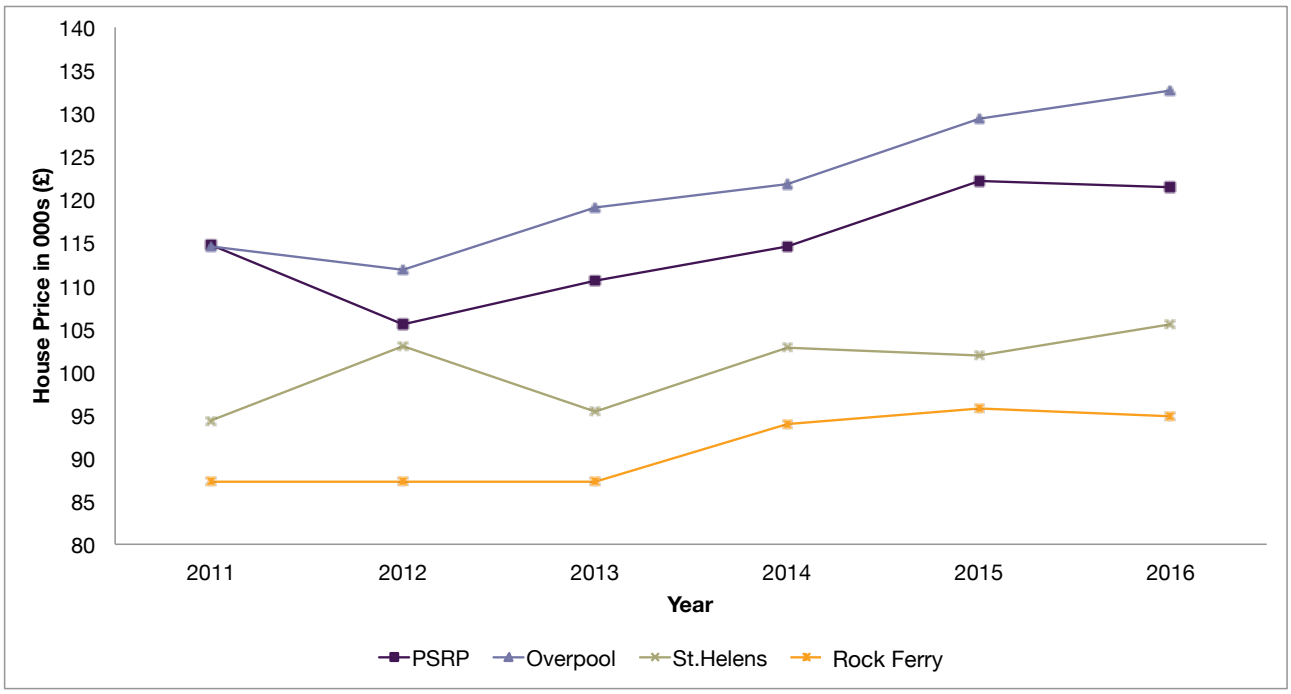
3.1.2. The number of data points used for finding the average price of residential properties is given in table 3-1.

Table 3-1: Number of house sale transactions used to calculate average house prices

Year	Number of house sale transactions used			
	PSRP	Overpool	St.Helens	Rock Ferry
2011	100	60	105	285
2012	118	64	101	256
2013	140	85	116	337
2014	186	95	158	450
2015	190	119	140	494
2016	216	136	200	547

3.1.3. Average house price trends for all comparable areas was calculated and plotted as shown in Figure 3-2.

Figure 3-2: House price variation in PSRP and comparative areas since 2011



Regression Analysis

3.1.4. With respect to regression analysis, we initially considered houses currently on sale only, to test the possibility of a significant correlation and the likely geographical extent of that correlation. Beyond 600m from the park, the natural log of house prices (ln(P)) does not show a statistically significant correlation with distance from the park (D). At 700m, the P-value representing the significance of the data is 0.76 for these two factors, and it needs to be less than 0.05 in order to be significant at a confidence level of 95% [Annex A.1]. "In other words, the probability that these characteristics influenced price purely by chance is less than 5%." [Monson, 2009]

3.1.5. As a result, we reduced the extent to 600m and this resulted in all factors in the regression (B, T, G and D) having a significant correlation with ln(P). Distance from the park correlates with ln(P) at a P-value of 0.032, and shows that ln(P) decreases by 0.58 for every kilometre moved away from the park. See figure B-3 annex A.1.

3.1.6. Therefore we carried out the same regression model including all house sales data from 2014 to present. At 600m the correlation between distance from the park and ln(P) becomes insignificant, but a reduction in extent to 500m gives a strong correlation of all factors (B, T, G and D) with ln(P).

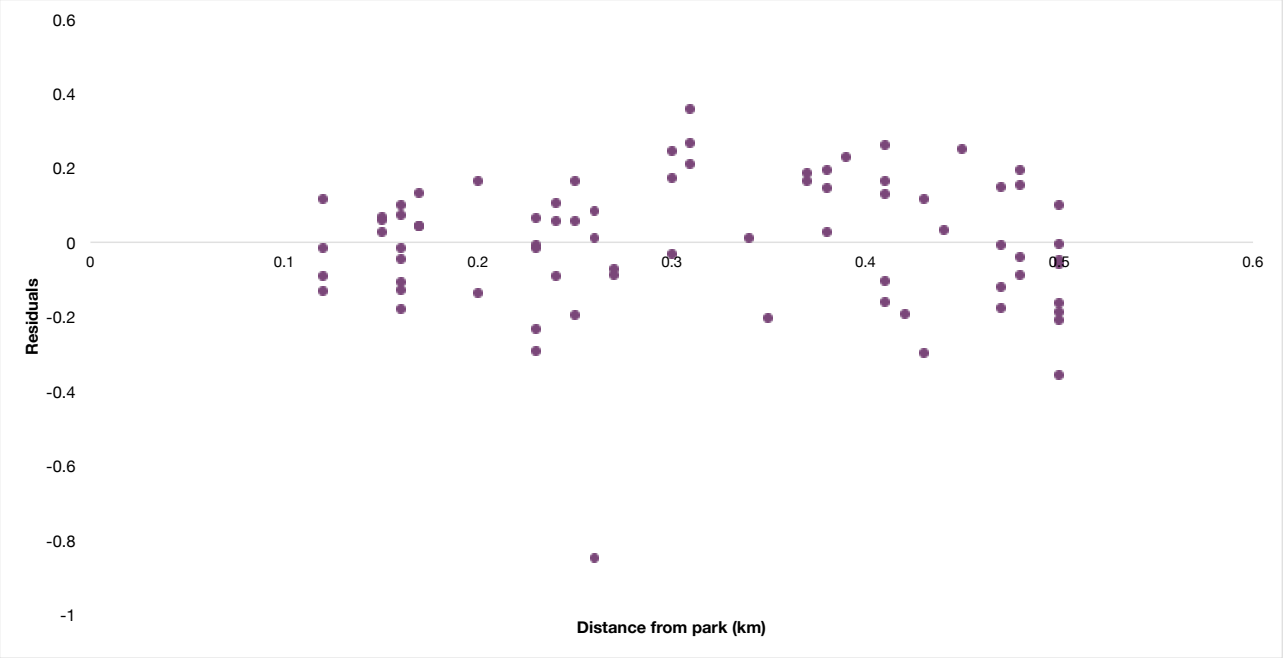
3.1.7. Figure 3-3 below shows the results of this final regression model. It shows that ln(P) decreases by 0.54 for every kilometre moved away from the park at a P-value of 0.007. Note that all other factors are also statistically significant in the model, which is required to draw reliable conclusions about any one of them. Figure 3-4 shows the residual plot from the regression model, and the random spread of points confirms that the results are reliable.

Figure 3-3: Results of regression analysis

Regression Statistics	
Multiple R	0.705
R Square	0.497
Adjusted R Square	0.468
Standard Error	0.187
Observations	75

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%
Intercept	11.131	0.140	79.560	0.000	10.851	11.410
Distance from park (km) (D)	-0.539	0.194	-2.782	0.007	-0.926	-0.153
No. of Bedrooms (B)	0.126	0.036	3.512	0.001	0.055	0.198
No. of Toilets & Bathrooms (B)	0.164	0.065	2.520	0.014	0.034	0.295
No. of gardens (G)	0.126	0.046	2.710	0.008	0.033	0.218

Figure 3-4: Residual plot showing the distribution of points either side of the best fit regression line, correlating distance from park and the log of house price

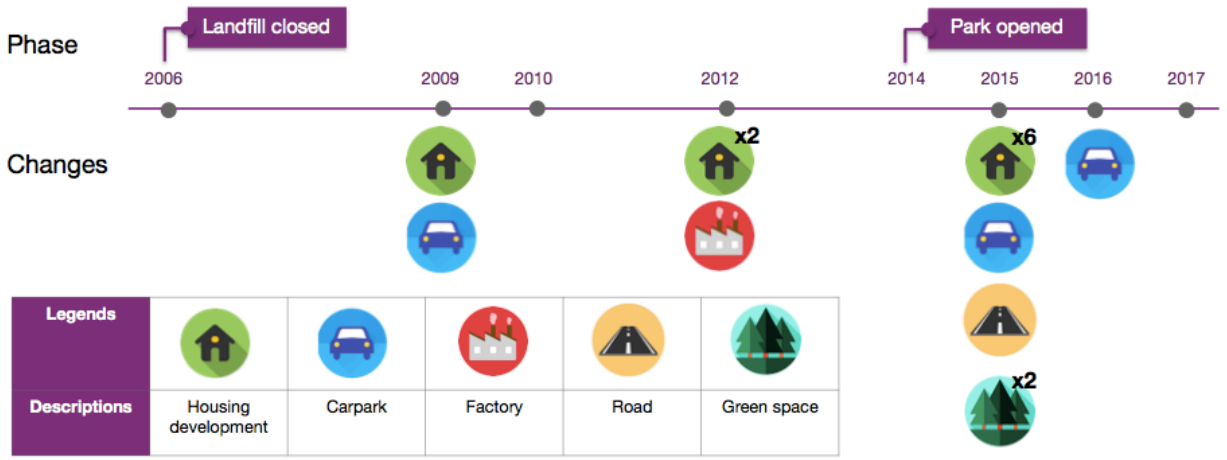


3.2. New Property Developments

Changes in surrounding areas before and after park redevelopment

3.2.1. New property developments were identified using Google Earth Historic data before after PSRP establishment. These are presented in Figure 3-5.

Figure 3-5: Changes in new developments within 1 mile radius of the Port Sunlight River Park based on Google Earth time-lapse between 2012 and 2015



Source: Google Earth, 2017

Residential Developments

3.2.2. Table 3-3 shows summary information for the 3 major developments close to Port Sunlight River Park. The findings listed below are from telephone interviews, and highlight the key points made in those interviews.

Table 3-2: Information summary for the 3 residential developments close to the Port Sunlight River Park

Development name	Housing developer	Start of construction	Completion date	No. of homes
Chandlers Walk	Barratt Homes	Oct-10	Oct-12	69
King's Hill	Bellway Homes	Feb-16	Aug-17	98
Mersey View	Persimmon Homes	Jul-15	Not complete	163

3.2.3. Key findings from interviews with developers and estate agents are discussed as follows:

- Tony Field - Director, Dibbin Estates & Equipment Ltd
  - Port Sunlight River Park has had little direct impact on the value of land in the surrounding area, it hasn't increased or decreased the price per acre.
  - The land owned by Dibbin Estates & Equipment Ltd was originally to be sold for employment purposes only, however it was later agreed with Wirral Council that

50% could be sold for residential purposes. Land for residential use can be sold for 3 times more than land for employment use, which currently sells for approximately £125,000 per acre.

- New housing developments in the area have been very successful, and houses have been sold rapidly. As a result, Wirral Council is considering whether or not more land can be sold for residential purposes, which would be beneficial to Dibbin Estates & Equipment Ltd.
- Port Sunlight River Park does have an indirect influence in that it is a supporting factor for new housing development applications. While it does not add value directly, it does give reason for more residential land which is more valuable than commercial land.

- Timothy Pegg - Land Director, Persimmon Homes plc
  - The park, to some extent, had an influence on choosing the location for Persimmon's Mersey View development. We would definitely have built in Bromborough regardless of the park, but it was a factor when choosing the specific location.
  - Persimmon's economic models and forecasting did not include the park as a variable as it was fully established when Persimmon made the decision to buy the land and develop Mersey View.
  - It is likely that the park has added to Persimmon's revenues in that house prices are higher now than they would be without the park. However, the value the park actually adds is difficult to quantify.
  - Persimmon would like to expand their Mersey View development and presence in Bromborough but there are no immediate plans in place.
- Michael Hooks - Estate Agent, Lesley Hooks
  - The park has not had a significant impact on house prices, there have been fluctuations but these are primarily dictated by the house prices of the more desirable listed buildings in Port Sunlight Village.
  - New developers have been attracted to the area, but it's more likely that this was because of land availability and market conditions as opposed to the presence of the park
- David Ball - Director of Environmental Services, Wirral Council
  - Land-use allocation has not been significantly affected by PSRP, instead it is dictated more by housing need, previous allocation and planning applications.
  - New developments in the area surrounding PSRP were attracted to the location before the park was established, and a major factor in their considerations was frontage on to the A41.
  - House prices in the area surrounding PSRP are driven more by proximity to industrial land in a negative sense than by proximity to the park in a positive sense.

- Environmental and societal benefits of PSRP are evident but economic impacts are very difficult to recognise and quantify.

3.3. Business Findings

3.3.1. In order to estimate the impact Port Sunlight River Park has had on local businesses' revenue, we asked visitors whether or not they visit a local business as part of their visit to PSRP, how often they do, and how much they typically spend. As well as the survey, interviews were executed to gain insight to the businesses that use the park. These interviews were designed to investigate how they earn revenues from the park, their procedures in doing so and their client-base. We found that PSRP impacts businesses directly associated with the park, businesses that are 'on-site' and businesses that are 'off-site'.

Findings on Port Sunlight River Park and Autism Together

3.3.2. Autism Together is a not-for-profit business that provides services and support to people with autism and their families in Wirral. The Land Trust partners with Autism Together who in turn manage and maintain PSRP. This partnership has ensured the park has become a safe and friendly place for people with autism to contribute to and socialise with the community.

3.3.3. We gathered employment and financial data from internal records, and carried out interviews with Autism Together to find out the impact of PSRP on the charity and how its affected employment. Since partnering with The Land Trust to administer the park, this charity has seen a significant increase in service users contributing to PSRP's maintenance through half day sessions, as reflected in table 3-4.

3.3.4. As well as increased park session attendance, there has been growth in the attendance of community and vocational services across the charity as a whole. From January 2015 to present day, the community and vocational services at Autism Together, of which Port Sunlight River Park is one of the activity areas, has benefited from steady growth from 240 service users attending to 256 service users attending, throughout the course of an average week.

3.3.5. Finally, based on interview with Terry Usher (Quality & Development Manager of Autism Together) Autism Together's involvement with PSRP has provided an excellent marketing opportunity for the charity. Visitors to PSRP directly see the work that Autism Together does which helps raise support and funding for the charity, and also allows Autism Together staff to 'signpost' visitors to the Garden Centre in Bromborough Pool.

3.3.6. According to our survey, on average people visit the park about twice a week. The majority of park visitors (69%) came for leisure activities such as dog walking and exercising; About a quarter came for doing voluntary works; and only a small percentage (7%) came for their own business purpose - e.g. dog walking service. All of the visitors came from Wirral area.

3.3.7. The park has been operated by Autism Together with full-time workers (rangers) hired at an average related cost of £39,794 per year - this includes salary, staff-related and other

agreed costs - while some other day-to-day works have been done by the volunteer services.

3.3.8. Since 2014, 9,849 hours in voluntary works was recorded in over 60 sessions with an average of 216 volunteers per year. The average total volunteer hours per year was 3,283 hours (based on data in Table 3-5). On average, individuals did volunteering about 3 hours per month. The 'community payback' work started on February 2015, accounting for 424 hours (13%) per annum on average, similar to that of 'corporate' (479 hours, 15%). The majority goes to the group of 'volunteers' (73%) with the average hours of 2,380 annually.

Table 3-3: Increase in average attendance per week for half-day sessions conducted by Autism Together at PSRP since August 2015

From Date to To-Date	Change in average attendance per week
August 2015 (opening) to December 2015	0 - 26
January 2016 to December 2016	27 - 47
January 2017 to Present	48 - 55

Table 3-4: Autism Together records of volunteer hours

	2014-15			2015-16			2016-17		
	Total hours	Sessions	People	Total hours	Sessions	People	Total hours	Sessions	People
Volunteers	1,743		43	2,370		68	3,029		90
Corporate	995	12	114	372	6	56	70	3	11
Community Payback	460	5	30	727	20	159	84	14	78
Total	**3198**	**17**	**187**	**3468**	**26**	**283**	**3183**	**17**	**179**

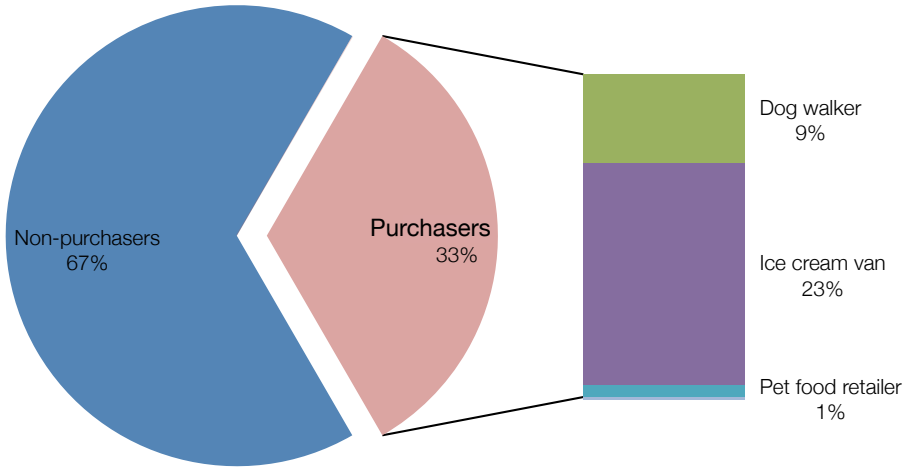
Source: Volunteer time at PSRP (2017).

Findings on businesses using PSRP for operations and marketing

3.3.9. Since park opening, there have been some businesses utilising PSRP for their operations/marketing activities. In total we identified 11 individual businesses according to the park records, search engines and social networks: 4 dog walkers, 2 child minders, 2 ice-cream vans, 1 pet-food retailer, and 2 personal trainers.

3.3.10. According to our survey, we found that 9% of visitors have used dog walking services at the park almost once a week; 23% have purchased ice-cream at least every other month; And only a small ratio of people (1%) purchased something from the pet food stall. However, 67% of park users have never purchased any products or services on site from these individual businesses. See Figure 3-6.

Figure 3-6: Visitors' spendings on individual businesses utilising the park venue



3.3.11. According to the interviews, no personal trainer was found using PSRP on a regular basis.

3.3.12. Due to the limited numbers of individual businesses we found and interviewed, we assumed to set the unit prices for products and services as shown in Table 3-6.

Table 3-5: Unit prices charged by individual businesses utilising the park venue

Business Type	Dog walker	Ice cream van	Pet food retailer	Childminder
Unit price	Average per walk £13	Average per ice-cream £3	Products with prices starting from £7.35	£4.5 per child, per hour

3.3.13. Furthermore, with the aim to have a better understanding of the results, businesses were subdivided into two types:

- On site transaction businesses: Transactions are made in the park such as the ice-cream van and the pet food retailer.
- Off site transaction businesses: Transactions are made outside the park such as the dog walkers, childminders and personal trainers.

Using this terminology, the findings from the interviews are listed in table 3-7

Table 3-6: On-site businesses interview findings

Topic	On site transaction	Off site transaction
	Petfood retailer - Ice-cream van	Dogwalker - Childminder
How many employees or individually operate?	Alone	Alone
How long have you run this business?	During or after the park opening	During or after the park opening
If it was before the park, how (or why) did PSRP changed the operations of the business	N/A	N/A
How often do you use the park for the business?	Only at events or specific dates	Monday to Friday
Contribution to the park	These businesses have to give a payback to the park, with commissions (20% of revenues) or kind donations	No contribution to the park asked
Main clients (do you know if your clients are coming from PS?)	Wirral	Wirral
How has the park affected your decision: location, customers, pricing, costs, savings?	For most of them the park was not the main motivation to open the business, mainly it was their backgrounds and passions	For all of them the park was not the main motivation to open the business, mainly it was their backgrounds and passions
Use of the park	Use the park parking only	Use the whole park facilities
Marketing purposes	These businesses use exclusively the park to sell the services, increase clients and create a branding awareness	These businesses use the park facilities to sell the services, increase clients and create a branding awareness
Profitability	Only profitable at events, on normal days there are not enough visitors to sell their products	They do not depend on the number of visitors. They run the business using the park facilities and clients pay on a regular basis for their services

Findings on local off site businesses near PSRP

3.3.14. In terms of local off-site businesses, about half of park visitors (47%) purchased products or services at cafes, restaurants, or retail outlets before or after park visit. The average spend for all respondents on an individual visit to the park that was coupled with a visit to a local business was £4.20. Taking in to consideration the frequency of business visits, and people who do not typically visit local businesses, this results in an average spend of £0.95 per person, per visit to PSRP. The places people visit and the percentage of people rising these places before or after visiting PSRP is given in Figure 3-7.

3.3.15. Additionally, the Garden Centre, which is under the management of Autism Together as well, has benefited because of its privileged location next to the park. An interview with Terry Usher of Autism Together highlighted that the Garden Centre has directly benefited from PSRP. Gross annual sales at the Garden Centre have increased as shown in Table 3-7.

Figure 3-7: The percentage of people visiting local businesses before or after visiting PSRP

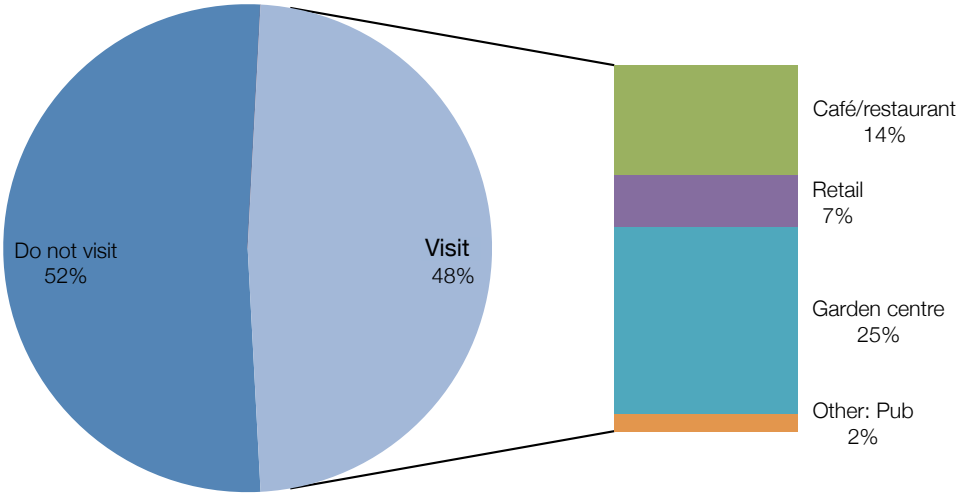


Table 3-7: Annual revenue of Garden Centre business

Period	April 2012 - March 2013	April 2013 - March 2014	April 2014 - March 2015	April 2015 - March 2016	April 2016 - March 2017	April 2017 - March 2018
Revenue	£22,000	£22,000	£22,500	£24,000	£29,500	£33,000 (projection)

3.3.16. Despite a small number of local businesses, it is evident that PSRP has made an economic impact on local business. This is discussed in more depth in section 4.3.

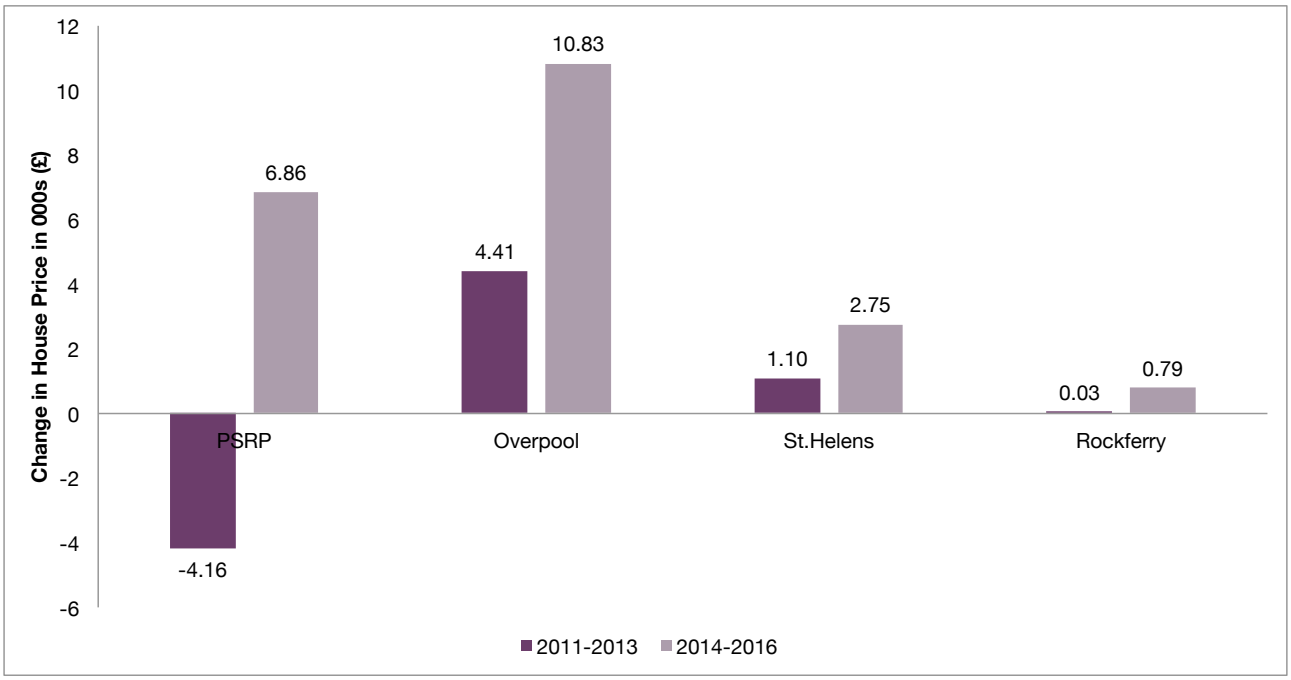
4. Discussion

4.1. Existing Property

Trend Analysis

4.1.1. The graph in figure 3-2 clearly shows an upward trend in house prices in a one mile radius of PSRP after 2014. The trend was further broken down to plot the cumulative change in average house price in a two-year period before and after park creation. The two-year period was chosen so as to avoid sensitivity to macro-economic trends. Also, data was available until 2016, i.e. two years after PSRP establishment, so, an equivalent period was chosen before establishment of PSRP. This analysis is shown in figure 4-1.

Figure 4-1: Changes in average house prices before and after park establishment



4.1.2. This analysis clearly shows that average house price declined by £5,030 in a 1-mile radius of PSRP in the two years before the park was established. This goes against the trend in all other control areas for the same period. After PRSP was established however, average house prices in the same area rose by £6,800 in the following two years.

4.1.3. Although this follows the trend of average price increase in the same period in all control areas, the increase in the area surrounding PSRP is significantly higher in comparison to average house price changes in St.Helens (an active landfill site) and Rock Ferry (a predominantly commercial area). The increase in average house price in Overpool region (an area with a green space of approx. the same size as PSRP) over the entire four year period is significantly more compared to all other areas. This is potentially linked to the mature green space present in Overpool, and could be indicative of a continuing upward trend in value surrounding PSRP.

4.1.4. We can state with some confidence that some of this significant increase in average house price in PSRP region can be attributed to the establishment of PSRP based on the findings in our interviews in point 3.2.3, but it is difficult to exactly quantify the impact of PSRP on house prices based on trend analysis alone.

Regression analysis

4.1.5. Based on the results of the regression analysis, the distance from PSRP clearly effects house prices in its 500m radius. It was found that that for every 100 meters that a house is closer to PSRP, the park adds 5.4% to the house price, given that the structural parameters remain the same (see annex A.2 for calculations).

4.1.6. The total value added by PSRP to the properties up to a distance of 500m from the park was estimated to be £7,832,697 (see annex A.2 for calculations). This translates to an average increase of £8,674 in residential house price within a 500m radius of PSRP.

Table 4-1: Limitations- Trend Analysis and Regression Analysis

	S. No.	Procedural Limitations	Limitations of Assessment Tools
Trend Analysis	1	Control areas were chosen on the basis of mix of commercial and residential properties for simplicity. To have better comparison, areas with residential properties with "similar age, size, type, degree of modernisation and state of repair" [Forestry Commission, 2005] could be looked at in future studies. However, compilation of this data is a time consuming task as open public data is not available.	A hard boundary of 1 mile radius around PSRP and control areas were chosen for comparison based on literature reviews as mentioned in 2.2.6. This distance is measured as a straight line distance and not as walking/driving distance.
	2	From interviews carried out with local developers and estate agents, it was found that residential property prices around PSRP may be influenced by property prices in the nearby Port Sunlight Village (that is more than 1 mile away from PSRP). These effects need to studied further in order to get a more comprehensive understanding of the residential property market near PSRP.	The effect of macro economic factors on property prices was reduced by considering a limited time scope. Although this limits the impact of macro economic factors on the trend analysis, some effects remain.
Regression	1	Only structural factors and distance from PSRP are considered for regression analysis, other factors are assumed to be same for all properties (see point 2.2.11 for details). For future studies, more factors could be considered given the project timeframe and ease of availabilty of data.	The results of regression analysis show that for every 100 meters that a house is closer to PSRP, the park adds a value of 5.4% to the house price, given that the structural parameters remain the same. This is a mean value. With a 95% confidence interval, this value can range from 1.5% to 9.7%.
	2	Limited data availability. Although sale price data for many properties are available in the data sources, but lack of availability of public data on structural factors for many of these properties limits the dataset that can be used for analysis. This dataset can be further expanded in future studies with tie-ups for data sharing with local real estate agents.	A sensitivity analysis can be carried out in the future projects to compliment the regression analysis findings in order to find out how different values of distances from PSRP actually affects property values. This could also include taking the walking/ driving distance instead of a straight line distance as considered in the model used for this study.

4.2. New Property Developments

4.2.1. We hypothesised that new housing developers would be attracted to the area surround PSRP following the park's establishment. The reasoning behind this is that it is believed a park makes the area a more desirable place to live, and therefore would be more lucrative for housing developers.

4.2.2. Based on desk research findings in 3.2.1., there was a significant number of new developments in the 1-mile distance of the park. This provided further support to our hypothesis.

4.2.3. Telephone interviews with a landowner (Dibbin Estates and Equipment Ltd), a housing developer (Persimmon plc), and an Estate Agency (Lesley Hooks), resulted in a mix of responses. The overall perception is that the park has had no major impact on the value of land or the motivations of housing developers. However, Persimmon did agree that house prices would be higher due to the park, and Dibbin Estates and Equipment suggested the park is influential in the case for more residential land which is more valuable than commercial.

4.2.4. There are several reasons why these stakeholders may not view the park as a major factor when considering new housing developments:

- The economic impact of the park is negligible
- The geographical extent of the park's impact is not great enough
- The decision making process for a new housing development and its location are affected more by other factors, such as land availability
- Other local features, such as Port Sunlight Village and frontage on to the A41, are more influential than the park when determining a new housing development location

4.2.5. However, there is another significant reason why stakeholders do not consider the park as an influencing factor when it comes to housing developments. A lack of understanding around what economic impact the park provides is evident, it particularly showed during the interview with Persimmon Homes. Few studies have quantified the economic impact of green space on local property, and it seems that few housing developers have attempted to quantify its impact previously.

4.2.6. Therefore, it is unlikely that green space such as PSRP has been an integral part of a housing developer's decision making process. This research shows that PSRP has had a positive economic impact on property value surrounding the park, and with this knowledge it may be the case that developers will choose locations closer to the park.

Table 4-2: Limitations - Interviews regarding new property developments

Procedural Limitations	Limitations of Assessment Tools
During this study, only 1 of the 3 major housing developments close to PSRP was interviewed, as well as 1 estate agent and representatives from Wirral Council. Interviews with Bellway and Barratt Homes would further calibrate our findings and increase the reliability of our conclusions. Equally, a better understanding of the thinking of estate agencies would be achieved with further interviews beyond Lesley Hooks.	PSRP has a unique history and surrounding area. Therefore, one limitation of this study is that our hypotheses were not tested with other brownfield sites and/or redevelopments. For example, comparison would improve our understanding of the significance of Port Sunlight Village relative to the park.
Due to the fact that the economic impact of green space is poorly understood, and also that PSRP is fairly unique, the nature of our interviews were unstructured and encouraged subjective answers. Whilst this was the aim of interviews around new property developments, opinion-based answers limit the confidence with which conclusions can be made.	It is commonly known, and was evident from our interviews, that the economic impact of green space is poorly understood. Therefore it is unlikely that PSRP would have had a significant influence on the decision-making processes regarding new housing developments in terms of economics. This also limits the ability of our interviewees to give insights to the matter.

4.3. Business

Discussion on business impacts on PSRP and Autism Together

4.3.1. Given the volunteer data in 3.3.8, and the average of the minimum wages since 2014 from [www.uk.gov, 2017], the total savings that PSRP/Autism together made from volunteering since PSRP establishment were estimated to be £68,603 or about £22,868 per year.

4.3.2. For Autism Together, PSRP raises brand visibility and awareness, this in-turn raises the number of people that benefit from their services, thus improving their social impact.

Discussion on businesses using PSRP for operations and marketing

4.3.3. Businesses as listed in 3.3.9 use PSRP extensively for operations and/or marketing purposes. The marketing activities, especially during events held at PSRP, potentially increases the number of clients and thus their annual revenues.

4.3.4. Using the estimated base prices of products or services for the park based businesses as given in 3.3.12, the number of the park visitors using these services, and the frequency of usage, we can estimate the amount of earnings made these park based businesses because of PSRP visitors. This figure is estimated to be £47,914 per annum.

Discussions on local off site businesses near PSRP

4.3.5. Based on the average spend made by the visitors in local business before or after visiting PSRP as reported in 3.3.14 and using their answers on the question whether they would visit these businesses if they would not visit PSRP, it was calculated that an average spend in local businesses of £0.95 per person per visit can be attributed to PSRP.

4.3.6. The Garden Centre, a local business run by Autism Together, is one of the most popular places that PSRP visitors go to before or after visiting PSRP as is evident from Figure 3-7. This survey result is in accord with the interview findings in 3.3.15 which reflects the rapid growth of revenues for Garden Centre after PSRP establishment.

Table 4-3: Limitations - Interviews regarding business

Procedural Limitations	Limitations of Assessment Tools
We detected a small number of businesses in the area surrounding the park that are relevant to this study, and a small number of businesses that use the park for business. This may be due to a lack of detection or a lack of presence, either way, a greater number of data points would increase confidence in our conclusions. We have mitigated this to an extent by triangulating our findings from interviews with our findings from the visitor survey.	The economic impact PSRP has on local business is limited by how many businesses it can impact. A small number of businesses surrounding or associated with the park means it is unlikely the park will be more impactful than other local features such as Port Sunlight Village which show a higher density of local businesses.
On top of a small population of businesses within a 1 mile radius (approximately 30), our sample (11) was decreased further due to some businesses refusing to conduct interviews and share information.	The businesses we interviewed and found are all relatively small, and therefore do not keep detailed accounts and information on their business. Therefore, some answers are based on speculation and estimation.

5. Conclusions and Recommendations

5.1. Conclusion

5.1.1. The purpose of this study was not to carry out an extensive economic impact analysis, but instead to gather evidence of economic impact resulting from Port Sunlight River Park. Early research and discussions with The Land Trust concluded in a streamlining of the project to focus predominantly on the economic impacts to property and business.

5.1.2. Our study confirms that there are positive economic impacts on property and businesses associated with the Port Sunlight River Park. See Table 5-1 and Table 5-2.

Table 5-1: Conclusions drawn from research questions for impacts on property

Research Questions	Is there any evidence that property prices for existing properties in the areas around the park have been affected by the establishment of the park?	Are people willing to pay more to live in the area close to PSRP as opposed to a landfill? And if yes, how much?	How much and to what geographical extent does PSRP affect the existing house prices in the area?	Is there any evidence that the park redevelopment has influenced new developments created in the surrounding area?
Conclusions from research	There is an upward trend in price of the house within one-mile radius from the park since the park opening.	People are willing to pay, on average, £9,478 more to live next to the park as opposed to the landfill site.	PSRP positively impacts house prices in a 500m radius; Every 100 meters that a house is closer to it, the park adds 5.4% to the house price up to 500m.	The park has not been significantly influential in the process of new housing development construction.

Table 5-2: Conclusions drawn from research questions for impacts on business

Research Questions	How much value does PSRP add to the park based businesses?	How much value has the park added to any existing businesses in the surrounding area/ local community?	How has PSRP influenced the charity business and operations of Autism Together?	What is the 'monetary' value added by the volunteers' work at the park?
Conclusions from research	Estimated total annual revenue for businesses that utilise PSRP is £47,914 per annum. However, PSRP was only a major influence in the establishment of one business.	On average, each visit to PSRP is associated with £0.95 being spent at a local business.	PSRP plays a major role in revenue growth at Garden Centre business; Steady growth in number of service users attending; Significant increase in brand visibility.	The minimum savings from volunteering since park opening is estimated to be £68,603 or £22,868 per year.

5.2. Future Work

5.2.1. Carry out more interviews regarding new housing developments, in particular with Barratt Homes and Bellway Homes. Our findings from the perspective of a housing developer are predominantly based on our conversation with Persimmon Homes. Different housing developers may have different strategies and criteria for their decision making processes and therefore it could be possible to get more insight to PSRP's influence from other developers. These interviews can also be carried out in a slightly more structured way, following the knowledge we've gained from this study.

5.2.2. Run a regression analysis on a comparable park or brownfield redevelopment. Our study shows that house prices increase significantly with reduced distance from PSRP within a 500m radius. However, there may be other characteristics that are also affecting the house prices that we have not considered. Therefore, a comparison regression analysis would help identify these missing characteristics, or improve the confidence and reliability in our findings.

5.2.3. Investigate the impact PSRP has had on commercial property value. Primarily due to time constraints, we prioritised residential property impacts which are more valuable to The Land Trust for future marketing purposes. However, a large proportion of the land surrounding PSRP is commercial rather than residential, and therefore it is entirely possible that the park has had an effect on the value of this land. One example of investigation would be to look at square foot price of retail space over the previous 10 years.

5.2.4. Incorporate social and environmental impacts that have an associated economic impact. Previous studies have shown that green space, and PSRP in particular, improve the environment, the health of local residents and can reduce crime. All of these factors provide an indirect economic impact, such as through savings in public spending. In order to make our study achievable, we narrowed our scope to exclude these factors from our study, however to get a broader view of the economic impact PSRP has had, it would be beneficial to incorporate them back in.

5.2.5. Investigate the relationship between Port Sunlight Village, and property value close to PSRP. More than one of our interviewees eluded to the fact that property behaviour in Port Sunlight Village has a significant effect on the value of property close to PSRP, and this is more influential than the park itself. However, the findings of our regression analysis shows that the park appears to have a significant influence. There is also the possibility that Port Sunlight Village is rich in green space, and therefore it may not be proximity to the Village itself that is influencing house prices, but more so the proximity to a different green space.

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Annexes

Annex A: Regression Data, Iterations & Iteration Results and Trend Analysis

A.1. Data used for Iteration 1

A.1.1. For iteration 1, house price data in a 1 mile radius of PSRP was gathered from the current 'properties for sale' section on rightmove.co.uk as on 25th October 2017. This is shown in the table below. For details on regression methodology and terms used refer to Regression Methodology in points 2.2.9 to 2.2.15.

Table A-1: Properties currently on sale data up to 1 mile radius of PSRP as on 25th October 2017

Sn. No.	Post Code	Price for sale(in £) (P)	ln(P)	Distance from park (D) (km)	No. of Bedrooms (B)	No. of Toilets & Bathrooms (T)	No. Of Gardens (S)
1	CH62 4RZ	179950	12.10	0.12	3	2.5	1
2	CH62 1HJ	115000	11.65	0.15	2	1	1
3	CH62 1HL	127950	11.76	0.16	3	1	1.5
4	CH62 1HQ	122000	11.71	0.16	3	1	2
5	CH62 4SA	127395	11.76	0.17	3	1	1
6	CH62 1HH	132500	11.79	0.2	3	1	0.5
7	CH62 1HE	90000	11.41	0.23	1	1	1
8	CH62 4SG	60000	11.00	0.42	1	1	0
9	CH62 1DB	139950	11.85	0.43	3	2	1
10	CH62 4RD	90000	11.41	0.48	2	1.5	1
11	CH62 1AU	95000	11.46	0.51	3	1	0
12	CH62 1AP	90000	11.41	0.52	3	1	1
13	CH62 1AP	89995	11.41	0.52	2	1	0
14	CH62 1AW	100000	11.51	0.52	3	1	0
15	CH62 4RE	269995	12.51	0.56	4	2.5	1
16	CH62 4RE	213995	12.27	0.56	3	2.5	1
17	CH62 4RE	207995	12.25	0.56	3	2.5	1
18	CH62 4RE	207995	12.25	0.56	3	2.5	1
19	CH62 4RE	100000	11.51	0.56	2	1	1
20	CH62 4RE	95000	11.46	0.56	2	1	0
21	CH62 1BA	64950	11.08	0.57	2	1	1
22	CH62 1DU	120000	11.70	0.57	4	1	1
23	CH62 1ED	62500	11.04	0.58	2	1	0
24	CH62 1ED	59995	11.00	0.58	2	1	0

25	CH62 1EB	59995	11.00	0.59	2	1	0
26	CH62 1BQ	50000	10.82	0.6	2	1	0
27	CH62 1DQ	60000	11.00	0.65	2	1	0.5
28	CH62 1EQ	110000	11.61	0.66	4	1.5	0
29	CH62 1EQ	115000	11.65	0.66	6	2	0
30	CH62 5AY	165000	12.01	0.69	2	1	0.5
31	CH62 5AY	155000	11.95	0.69	2	1	0.5
32	CH62 5AY	155000	11.95	0.69	2	1	0.5
33	CH62 1DL	87000	11.37	0.7	3	1	0
34	CH62 5AL	65000	11.08	0.72	2	1.5	0.5
35	CH62 5EP	170000	12.04	0.72	3	1	0
36	CH62 5HD	175000	12.07	0.73	2	1	0.5
37	CH62 1DR	142500	11.87	0.77	4	1	1
38	CH62 5AB	75000	11.23	0.77	2	1	0
39	CH62 5AB	69950	11.16	0.77	1	1	0.5
40	CH62 5AB	69950	11.16	0.77	1	1	0
41	CH62 1DZ	152500	11.93	0.79	3	1	1
42	CH62 5AW	155000	11.95	0.79	2	1	0
43	CH62 1DG	95000	11.46	0.8	3	1	0
44	CH62 1EW	275000	12.52	0.92	7	2.5	1
45	CH62 1EW	94950	11.46	0.92	2	2	0
46	CH62 5BU	99995	11.51	0.96	3	1.5	1
47	CH62 5JT	165000	12.01	0.97	3	2	1
48	CH62 5DD	195000	12.18	1	3	1	0.5
49	CH62 5DD	129950	11.77	1	2	1	0
50	CH62 5JX	165000	12.01	1.01	3	2.5	1
51	CH42 1PU	45000	10.71	1.04	1	1	0
52	CH42 1PR	152000	11.93	1.06	3	2	1
53	CH62 5JZ	108000	11.59	1.1	2	1	2
54	CH42 1PS	120000	11.70	1.14	3	1	1
55	CH63 7LP	135000	11.81	1.16	3	1	1
56	CH62 5FD	135000	11.81	1.16	3	1	1
57	CH62 5DG	220000	12.30	1.16	3	1	1
58	CH62 3LT	149950	11.92	1.18	3	2	2
59	CH62 3LP	145000	11.88	1.18	3	1	2

60	CH63 7NR	135000	11.81	1.21	3	1	2
61	CH62 3LS	140000	11.85	1.23	3	1	2
62	CH62 3LN	126500	11.75	1.23	3	1	2
63	CH42 1RT	66000	11.10	1.24	2	1	0
64	CH42 1RQ	64950	11.08	1.25	1	1.5	1
65	CH62 3LH	229950	12.35	1.39	4	2	1
66	CH62 3LH	175000	12.07	1.39	4	2	1
67	CH62 3LH	175000	12.07	1.39	3	2.5	1
68	CH62 3LH	155000	11.95	1.39	3	2.5	1
69	CH62 3LH	149950	11.92	1.39	3	2.5	1
70	CH62 3LH	135000	11.81	1.39	2	1.5	1
71	CH62 3LH	135000	11.81	1.39	2	1.5	1
72	CH42 1RR	49950	10.82	1.46	1	1	1
73	CH42 1RR	49950	10.82	1.46	1	1	1
74	CH42 4NA	164950	12.01	1.46	3	1.5	1
75	CH42 4NA	117000	11.67	1.46	2	1.5	1
76	CH63 8PQ	155000	11.95	1.46	3	1	1
77	CH42 4NN	189950	12.15	1.47	3	1	1
78	CH63 7QG	162000	12.00	1.49	3	1.5	1
79	CH62 2BE	595000	13.30	1.49	5	4	1
80	CH63 7PH	125000	11.74	1.49	2	1	0
81	CH42 1NF	75000	11.23	1.51	2	1	0.5
82	CH42 2AJ	70000	11.16	1.52	4	1	0
83	CH62 2BH	180000	12.10	1.53	3	1	1
84	CH63 7SN	80000	11.29	1.54	1	1	0
85	CH42 4RG	79950	11.29	1.55	2	1	0.5
86	CH63 8PH	99995	11.51	1.58	2	1	0.5
87	CH42 4NR	170000	12.04	1.58	3	1.5	1
88	CH63 3DH	219995	12.30	1.62	3	1.5	1
89	CH42 2AR	135000	11.81	1.65	3	2	0
90	CH63 5JH	130000	11.78	1.65	3	1	0
91	CH63 3DN	230000	12.35	1.65	3	1	1
92	CH62 2BG	184950	12.13	1.65	3	1	1

A.1.2 Iteration 1 results are given in table A-2. As can be clearly seen P-Value for variable. Distance from Park (km) (D) is greater than 0.05, thus making it statistically irrelevant. "In other words, the probability that it influenced price purely by chance is less than 5%." [Monson, 2009]

Figure A-1: Iteration 1 results

Regression Statistics	
Multiple R	0.75
R Square	0.56
Adjusted R Square	0.54
Standard Error	0.31
Observations	92.00

ANOVA					
	df	*SS*	*MS*	*F*	*Significance F*
Regression	4.00	10.51	2.63	27.36	0.00
Residual	87.00	8.36	0.10		
Total	91.00	18.87			

	Coeffi cients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95.0%*	*Upper 95.0%*
Intercept	10.62	0.12	88.86	3.62E-87	10.38	10.85	10.38	10.85
Distance from park (km) (D)	0.12	0.07	1.55	1.24E-01	-0.03	0.26	-0.03	0.26
No. of Bedrooms(B)	0.20	0.04	5.32	7.82E-07	0.13	0.27	0.13	0.27
No. of Toilets & Bathrooms(B)	0.23	0.06	3.58	5.67E-04	0.10	0.35	0.10	0.35
No. of gardens (G)	0.19	0.06	3.19	1.99E-03	0.07	0.31	0.07	0.31

A.1.3. Data used for Iteration 2: Same data as listed in Table A-1. was used for this analysis, but data points used for regression were limited to within 1km radius of the park.

A.1.4. Iteration 2 results are given in figure A-2. As can be clearly seen P-Value for variable Distance from Park (km) (D) is greater than 0.05, thus making it statistically irrelevant.

Figure A-2: Iteration 2 results

Regression Statistics	
Multiple R	0.69
R Square	0.48
Adjusted R Square	0.43
Standard Error	0.32
Observations	49

ANOVA					
	df	*SS*	*MS*	*F*	*Significance F*
Regression	4.00	4.19	1.05	10.13	6.67E-06
Residual	44.00	4.55	0.10		
Total	48.00	8.74			

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95.0%*	*Upper 95.0%*
Intercept	10.69	0.19	56.57	9.86E-43	10.31	11.07	10.31	11.07
Distance from park (km) (D)	0.29	0.23	1.29	2.04E-01	-0.16	0.75	-0.16	0.75
No. of Bedrooms(B)	0.11	0.05	2.30	2.60E-02	0.01	0.21	0.01	0.21
No. of Toilets & Bathrooms(B)	0.24	0.10	2.34	2.39E-02	0.03	0.44	0.03	0.44
No. of gardens (G)	0.28	0.11	2.61	1.22E-02	0.06	0.49	0.06	0.49

A.1.5. Data used for Iteration 3,4,5 and 6: Same data as listed in Table A-1. was used for this analysis, but data points used for regression were limited to within 0.8,0.7,0.6 and 0.5 km radius of the park, until the variable Distance from Park (km) (D) was found less than 0.05.

A.1.6. Successful iteration results are given in figure A-3. As can be clearly seen P-Value for variable Distance from Park (km) (D) is less than 0.05, thus making it statistically relevant.

Figure A-3: Final iteration results

Regression Statistics	
Multiple R	0.93
R Square	0.86
Adjusted R Square	0.84
Standard Error	0.18
Observations	26.00

ANOVA					
	df	*SS*	*MS*	*F*	*Significance F*
Regression	4	4.30	1.08	33.05	8.73E-09
Residual	21	0.68	0.03		
Total	25	4.99			

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95.0%*	*Upper 95.0%*
Intercept	10.61	0.17	63.86	1.54E-25	10.27	10.96	10.27	10.96
Distance from park (km) (D)	-0.58	0.25	-2.30	3.18E-02	-1.11	-0.06	-1.11	-0.06
No. of Bedrooms(B)	0.23	0.06	4.05	5.77E-04	0.11	0.34	0.11	0.34
No. of Toilets & Bathrooms(B)	0.44	0.07	6.35	2.72E-06	0.29	0.58	0.29	0.58
No. of gardens (G)	0.09	0.09	1.07	2.95E-01	-0.09	0.27	-0.09	0.27

A.1.7. For the final iteration, historical data for house sales from 2014 onwards, up to 500m of PSRP was collected (see Table A-2) and added to the data already collected in table A-1. It was sorted for up to 0.5km radius of the park and final regression was carried out. The results for this are reported in the “Property Findings” section in the main report in Figure 3-3.

Table A-2: Historical data for house sales from 2014 onwards, up to 500m of PSRP

S. No.	Post Code	Date sold	Sale Price	Corrected Price for sale(in £) (P)	ln(P)	Distance from park (D) (km)	No. of Bedrooms (B)	No. of Toilets & Bathrooms (T)	No. Of Gardens (S)
1	CH62 4RZ	09/01/17	155500	159180	11.98	0.12	4	2.5	1
2	CH62 4RZ	13/11/15	153000	158339	11.97	0.12	4	1.0	2
3	CH62 4RZ	21/08/15	160000	165583	12.02	0.12	3	2.5	2
4	CH62 4RZ	30/10/17	179950	179950	12.10	0.12	3	2.5	1
5	CH62 1HJ	28/03/17	130000	131649	11.79	0.15	3	1.0	1
6	CH62 1HJ	11/12/15	107500	111251	11.62	0.15	2	1.0	1
7	CH62 1HJ	30/10/17	115000	115000	11.65	0.15	2	1.0	1
8	CH62 1HL	24/03/17	104000	105319	11.56	0.16	2	1.0	0
9	CH62 1HL	18/12/14	111500	115621	11.66	0.16	3	1.0	2
10	CH62 1HL	06/06/14	119950	124260	11.73	0.16	3	1.0	2
11	CH62 1HQ	05/05/17	132000	132639	11.80	0.16	3	1.0	2
12	CH62 1HQ	07/12/15	144000	149025	11.91	0.16	3	1.0	2
13	CH62 1HL	30/10/17	127950	127950	11.76	0.16	3	1.0	2
14	CH62 1HQ	30/10/17	122000	122000	11.71	0.16	3	1.0	2
15	CH62 4SA	08/05/17	138000	138668	11.84	0.17	3	1.0	1
16	CH62 4SA	02/10/15	123000	127292	11.75	0.17	3	1.0	1
17	CH62 4SA	30/10/17	127395	127395	11.76	0.17	3	1.0	1
18	CH62 1HH	15/04/16	88950	92146	11.43	0.20	2	1.0	1
19	CH62 1HH	30/10/17	132500	132500	11.79	0.20	3	1.0	1
20	CH62 1HE	02/05/17	110000	110532	11.61	0.23	2	1.0	1
21	CH62 1HE	11/08/16	99950	102823	11.54	0.23	2	1.0	1
22	CH62 1HE	28/08/15	66000	68303	11.13	0.23	1	1.0	1
23	CH62 1HE	17/10/14	79500	82192	11.32	0.23	2	1.0	1
24	CH62 1HE	30/10/17	90000	90000	11.41	0.23	1	1.0	1
25	CH62 1HG	18/11/16	121000	123864	11.73	0.24	3	1.0	1
26	CH62 1HG	18/02/16	102800	106920	11.58	0.24	3	1.0	1
27	CH62 1HG	02/03/14	110000	114524	11.65	0.24	3	1.0	0
28	CH62 1BS	12/02/16	104500	108688	11.60	0.25	2	1.0	1
29	CH62 1BS	21/08/16	101000	103903	11.55	0.25	3	1.5	1

30	CH62 4RS	20/05/16	117000	120962	11.70	0.25	2	1.0	1
31	CH62 4RU	23/03/17	102000	103294	11.55	0.26	2	1.0	1
32	CH62 4RU	10/06/16	48000	49527	10.81	0.26	3	1.0	1
33	CH62 4RU	08/04/16	121500	125865	11.74	0.26	3	1.0	1
34	CH62 1BX	15/07/16	118000	121753	11.71	0.27	3	1.0	2
35	CH62 1BX	26/10/15	90000	93141	11.44	0.27	3	1.0	0
36	CH62 4SB	04/12/15	139950	144834	11.88	0.30	3	1.0	1
37	CH62 4SB	20/11/15	93500	96763	11.48	0.30	3	1.0	0
38	CH62 4SB	16/02/15	129000	134575	11.81	0.30	3	1.0	1
39	CH62 4SD	28/11/16	157500	161228	11.99	0.31	3	1.0	1
40	CH62 4SD	21/11/16	136000	139219	11.84	0.31	3	1.0	1
41	CH62 4SD	26/08/14	142000	147102	11.90	0.31	3	1.0	1
42	CH62 1DE	22/05/15	108500	112510	11.63	0.34	3	1.0	1
43	CH62 1DA	22/08/14	83000	85982	11.36	0.35	3	1.5	0
44	CH62 4SE	29/09/15	135000	139850	11.85	0.37	3	1.5	1
45	CH62 4SE	21/11/14	137500	142582	11.87	0.37	3	1.5	1
46	CH62 1BP	23/07/17	110000	110640	11.61	0.38	2	1.0	1
47	CH62 1BP	13/05/16	117500	121479	11.71	0.38	3	1.5	1
48	CH62 4TY	07/08/15	112000	115908	11.66	0.38	2	1.0	1
49	CH62 4RX	30/05/17	135000	135653	11.82	0.39	3	1.0	1
50	CH62 4RW	03/04/17	95500	96335	11.48	0.41	3	1.0	1
51	CH62 4RW	20/12/16	120000	122237	11.71	0.41	2	1.0	1
52	CH62 4RW	12/06/15	88000	91162	11.42	0.41	3	1.0	1
53	CH62 4RN	13/04/17	110000	110962	11.62	0.41	2	1.0	1
54	CH62 4RN	08/12/14	112000	116140	11.66	0.41	2	1.5	1
55	CH62 4SG	30/10/17	60000	60000	11.00	0.42	1	1.0	0
56	CH62 1DB	30/10/17	139950	139950	11.85	0.43	3	2.0	1
57	CH62 1DB	09/12/16	77000	78436	11.27	0.43	3	1.0	1
58	CH62 4RT	18/12/14	140000	145175	11.89	0.44	4	2.0	1
59	CH62 4SN	12/12/14	114000	118214	11.68	0.45	2	1.0	1
60	CH62 1AL	28/01/16	107,000	111624	11.62	0.47	3	1.5	1
61	CH62 1AS	28/04/17	105,000	105918	11.57	0.47	2	1.0	1
62	CH62 1AG	30/03/16	65,000	67335	11.12	0.47	2	1.0	0
63	CH62 1AG	30/03/16	78,000	80802	11.30	0.47	2	1.0	1
64	CH62 4RD	30/10/17	90000	90000	11.41	0.48	2	1.5	1

65	CH62 4RD	26/08/16	107,000	110075	11.61	0.48	2	1.0	1
66	CH62 4RL	02/09/16	85,000	87270	11.38	0.48	2	1.0	1
67	CH62 4RL	28/08/15	89,995	93135	11.44	0.48	2	1.0	0
68	CH62 1BD	03/04/17	85,000	85743	11.36	0.50	3	1.0	0
69	CH62 1BD	16/12/16	70,000	71305	11.17	0.50	3	1.0	1
70	CH62 1BD	30/09/15	81,500	84428	11.34	0.50	3	1.0	0
71	CH62 1BD	04/09/15	86,320	89421	11.40	0.50	3	1.0	0
72	CH62 1BD	10/04/15	70,000	72733	11.19	0.50	3	1.0	0
73	CH62 1HW	06/01/17	64,000	65515	11.09	0.50	1	1.0	1
74	CH62 1HW	05/02/17	75,000	76249	11.24	0.50	2	1.0	1
75	CH62 1HW	15/01/16	95,000	99106	11.50	0.50	2	1.0	1

A.2. Regression Calculations

A.2.1. Method and calculation for finding the percentage change in the house price over a 100m distance

- Assume two houses, house1 and house2, having identical structure (i.e. same number of bedrooms(B), toilets(T) and gardens(G)). House1 is at a distance of x km from the PSRP and House2 is 100m or 0.1m closer to PSRP. This implies that House2 is at a distance of (x-0.1) from PSRP.
- So, from the regression model, we have:
  - **Equation A.1:**

$$Ln\left(P_{House1}\right) = s_1 B + s_2 T + s_3 G + l_1 x$$

  - **Equation A.2:**

$$Ln\left(P_{House2}\right) = s_1 B + s_2 T + s_3 G + l_1 (x\text{-}0.1)$$

- So, subtracting Equation A.1 from Equation A.2 we get,

$$Ln\left(P_{House2}\right) - Ln\left(P_{House1}\right) = l_1(-0.1)$$

- Substituting the value of l_1 from the result of regression analysis in point 3.1.7, we get

$$Ln\left(P_{House2}\right) - Ln\left(P_{House1}\right) = (-0.54)(-0.1)$$

$$\Rightarrow Ln\left(\frac{(P_{House2})}{(P_{House1})}\right) = 0.054$$

$$\Rightarrow \left(\frac{(P_{House2})}{(P_{House1})}\right) = e^{0.054}$$

$$\Rightarrow \left(\frac{(P_{House2})}{(P_{House1})}\right) = 1.055$$

$$\Rightarrow \left(\frac{(P_{House2})}{(P_{House1})}\right) - 1 = 1.055 - 1$$

$$\Rightarrow \left(\frac{(P_{House2}) - (P_{House1})}{(P_{House1})}\right) = 0.055$$

$$\Rightarrow \left(\frac{(P_{House2}) - (P_{House1})}{(P_{House1})}\right) X\ 100 = 0.055\ X\ 100$$

$$\Rightarrow Percentage\ change\ in\ Price\ of\ house2\ compared\ to\ house1 = 5.5\%$$

A.2.2. Method and calculations for approximating the total value added by PSRP to the properties in 500m range.

Step 1

- House price for a house at 500m from the house is calculated as follows:
  - **Equation A.3:**

$$Ln(P_{0.5}) = s_1 B_{avg} + s_2 T_{avg} + s_3 G_{avg} + l_1 D$$

- Values for s_1, s_2, s_3, l_1 were taken from final regression findings in figure A-3. B_{avg},T_{avg},G_{avg}, were calculated as the average number of bathrooms, toilets and

gardens for all houses considered for the final regression within 500m of PSRP (shown in table x) and were found to be 2.60,1.14 and 0.95 respectively. Using these in the regression equation A.3, The value of a houses at 500m,450m,350m,250m and 150m respectively were calculated as shown in table A-3.

Table A-3: Distance from the park and approximated house price for

Distance from the Park (D)(in km)	Approximated House Price (in £)
0.15	118757
0.25	112525
0.35	106620
0.45	101024
0.5	98338

Step 2

- The number of houses between 101-200m, 101m-200m, 201m-300m and 401-500m from PSRP were found by using census 2011 data from https://www.nomisweb.co.uk. These are summarised in table A-4.

Table A-4: Assumed mean distance from Port Sunlight River Park and number of houses

Distance from PSRP (in km)	Mean Distance from PSRP (assumed)	No. of Houses
0.11-0.2	0.15	135
0.21-0.3	0.25	162
0.31-0.4	0.35	205
0.41-0.5	0.45	402

Step 3

- Since we have kept the B_{avg},T_{avg},G_{avg} same to calculate house prices for all distances in Step1, and as per regression there is no significant correlation between house prices and distance from PSRP after 500m, the difference of prices between approximated house prices at 500m and 450m, 350m,…,150m respectively can be attributed to the park directly. Multiplying these differences by the number of houses in table x and summing them up, the total value added by PSRP to the region was calculated. This is summarised in table A-5. Dividing The total value added by PSRP in table A-5 by the total no. of houses in the 500m distance of the park, the average premium added by PSRP to surrounding residential properties was calculated as £8,674.

Table A-5: Total value added by Port Sunlight River Park

Distance from PSRP (D) (in km)	House price at this distance D (E) (in £)	House price at 0.5km from PSRP (F) (in £)	Difference (F-G=H) (in £)	No. of Houses (J)	Value added by PSRP (H*J) (in £)
0.5	101,024	98,338	2,687	401	1,079,996
0.4	106,620	98,338	8,281	205	1,697,783
0.3	112,525	98,338	14,187	162	2,298,306
0.2	118,757	98,338	20,419	135	2,756,612
Total value added by PSRP (in £)					7,832,697

A.3. Data and Calculations for Trend Analysis

A.3.1. Post Codes within one mile radius of PSRP, Overpool, Rockferry and St.Helens were found using https://www.freemaptools.com/find-uk-postcodes-inside-radius.htm. These are listed in file https://drive.google.com/open?id=1yaQr1kXCjvUSewL8QWoab_616f4WIyq3

A.3.2. Past sales data since 2000 for the postcodes found in A.3.1. was gathered from http://landregistry.data.gov.uk/app/ppd/. Data was restricted to old builds and for detached, semi-detached, terraced or flats only. Outliers (abnormally high or low priced houses) for each type of house detached, semi-detached, terraced and flats were cleared from the dataset by the method described A.3.3.

A.3.3. The house prices were corrected for 2017 prices by using the wirral house price index in case of PSRP, Overpool and Rockferry areas and St.Helens house price Index in case of St.Helens area. Then, assuming natural distribution, the 95th percentile and 5th percentile house price was calculated separately for each area's detached, semi-detached, terraced and flats respectively. All data points less than the 5th percentile price and greater than the 95th percentile were ignored for the analysis. The final list of data points considered for analysis for all regions are given in file https://drive.google.com/file/d/1jVum0eslt_SngMqBxv8lWK_gu2zUOkxz/view?usp=sharing

A.3.4 Average sales price for year 2003 onwards was then calculated based on weighted average method, where weights for detached, semi-detached, terraced and flats, were calculated based of previous three years data to account for changes in property-type mix over the years. This is the same as the method as used in Karanka et.al. [2013]. Summary of weighted average for PSRP, Overpool, Rockferry and St.Helens regions are given in table x,y,z,a respectively. Detailed spreadsheet is given in file https://drive.google.com/file/d/1A5uVQGGFJ7sw2yIcrnS3DQkcSs1exe-A/view?usp=sharing

Table A-6: Weighted average house price value in Port Sunlight River Park area from 2000 to 2017

Year	No. of Transactions					Weighted average (in £)
	Terraced	Semi-detached	Flats	Detached	Total	
2000	132	86	10	6	234	NA
2001	96	101	8	0	205	NA
2002	131	102	14	17	264	NA
2003	147	104	20	9	280	73877.93
2004	134	120	42	9	305	99762.28
2005	109	81	33	5	228	110586.82
2006	140	92	21	7	260	117090.02
2007	133	93	27	9	262	120372.20
2008	64	37	25	6	132	118548.41
2009	51	40	10	2	103	114272.40
2010	55	35	16	2	108	118411.52
2011	56	29	13	2	100	114704.38
2012	65	42	7	4	118	105453.98
2013	65	50	16	8	139	110540.16
2014	90	65	23	6	184	114564.32
2015	108	52	18	11	189	122086.06
2016	102	75	28	11	216	121423.21
2017	70	42	12	6	130	120036.81

Table A-7: Weighted average house price value in Overpool area from 2000 to 2017

Year	No. of Transactions					Weighted average (in £)
	Terraced	Semi-detached	Flats	Detached	Total	
2000	23	54	2	5	84	NA
2001	33	50	6	10	99	NA
2002	39	51	3	13	106	NA
2003	43	51	8	10	112	77747.68
2004	43	70	3	10	126	99201.41
2005	28	49	6	5	88	111357.79
2006	42	55	6	10	113	118960.29
2007	47	113	12	8	180	125463.36

2008	21	26	2	11	60	115417.60
2009	13	25	6	15	59	109575.27
2010	14	17	3	10	44	104302.07
2011	20	31	3	6	60	114647.81
2012	14	33	2	15	64	111846.29
2013	29	38	2	16	85	119060.12
2014	26	38	9	22	95	121751.92
2015	34	49	12	24	119	129441.84
2016	44	53	11	28	136	132581.67
2017	18	43	3	12	76	127389.12

Table A-8: Weighted average house price value in Rock Ferry area from 2000 to 2017

Year	No. of Transactions					Weighted average (£)
	Terraced	Semi-detached	Flats	Detached	Total	
2000	461	161	99	27	748	NA
2001	426	181	99	22	728	NA
2002	556	198	163	25	942	NA
2003	624	214	169	34	1041	58030.47
2004	599	190	146	27	962	76313.65
2005	476	126	95	17	714	90221.35
2006	594	169	222	25	1010	100370.76
2007	459	180	186	30	855	106944.94
2008	220	74	78	15	387	98636.04
2009	122	51	41	6	220	92119.08
2010	129	65	44	9	247	90498.23
2011	170	65	41	9	285	89130.49
2012	154	54	39	9	256	87206.10
2013	171	87	59	20	337	87230.33
2014	257	103	72	18	450	93996.30
2015	285	105	83	21	494	95801.05
2016	271	115	118	43	547	94789.57
2017	189	71	40	22	322	98726.37

Table A-9: Weighted average house price value in St. Helens area from 2000 to 2017

Year	No. of Transactions					Weighted average (£)
	Terraced	Semi-detached	Flats	Detached	Total	
2000	50	146	0	11	207	NA
2001	66	135	0	8	209	NA
2002	89	171	0	13	273	NA
2003	70	132	0	8	210	69814.89
2004	81	134	1	21	237	92157.50
2005	58	92	7	9	166	107396.17
2006	82	150	5	21	258	112790.64
2007	74	131	8	21	234	119049.30
2008	28	56	3	15	102	113912.56
2009	21	59	5	0	85	83781.98
2010	17	60	3	9	89	98873.35
2011	23	67	0	15	105	94361.14
2012	26	56	5	14	101	102925.56
2013	36	65	3	12	116	95458.97
2014	45	97	0	16	158	102728.41
2015	45	77	4	14	140	101954.65
2016	58	107	6	29	200	105483.16
2017	43	77	3	13	136	112112.77

Annex B: Survey Templates & Results

B.1. Paper-based survey template

Port Sunlight River Park User Survey - October 2017

Your postcode: ☐

1. On average, how often do you use the park?
(Fill in number of days and circle unit of time or choose the given choice.)

_____ per week | month | year ○ Less than once a year

2a. Do you regularly visit any businesses close to Port Sunlight River Park before/after your visit to the park? (e.g. Food/retail outlets)

○ Yes ○ No

2b. If so, please specify:

Where:	**How often:**	**On average, how much you spend during each visit (to nearest £):**
○ Café	○ Everytime (100%)	○ £1 – £5 ○ £16 – £20
○ Shop	○ Most times (75%)	○ £6 – £10 ○ More than £20
○ Garden centre	○ Sometimes (50%)	○ £11 – £15
○ Other		

2c. Would you visit these businesses if you were not visiting the park?

○ Yes ○ No ○ Maybe

3a. Would you pay more for a house that is close to a park, as opposed to the same house close to a landfill site?

○ Yes ○ No

3b. Approximately, how much more would you be willing to pay? (in £ or %)

☐

5a. Which of the following products/services you have used/purchased at the park? (Choose more than one if applicable)

○ None of them
○ Dog walker
○ Ice cream van
○ Pet food retailer
○ Personal trainer
○ Other (please specify):

_____

5b. If so, how often? (Fill in number of days and choose unit)

_____ per week | month | year ○ Less than once a year

B.2. Online survey template

Port Sunlight River Park
General Survey for Gauging Economic Impacts of the Park

The purpose of this survey is to gauge what impact Port Sunlight River Park has had on the local economy.

General Questions

Your postcode:

On average, how often do you use the Port Sunlight River Park? (Select the unit and fill in number of days)

- ○ per week
- ○ per month
- ○ per year

What's the purpose of your visit?

- ☐ Leisure
- ☐ Volunteer
- ☐ Business (please specify type of business)

Which of the following products/services you have used/purchased at the park? (Choose more than one if applicable)

- [ ] Dog walker
- [ ] Ice cream van
- [ ] Pet food retailer
- [ ] Personal trainer
- [ ] Other (please specify): _____

If so, how often?

- ○ per week _____
- ○ per month _____
- ○ per year _____

Do you regularly visit any businesses close to Port Sunlight River Park before/after your visit to the park? (e.g. Food/retail outlets)

- ○ Yes
- ○ No

Please choose which business close to Port Sunlight River Park before/after your park visit.

	How often	Average spend per visit
Cafe		
Shop		
Garden centre		

Other

Would you visit these businesses if you were not visiting the park?

- Yes
- Maybe
- No

Would you pay more to buy a house that is close to a park, as opposed to the same house close to a landfill site?

- Yes
- No

Approximately, how much more would you be willing to pay for a house close to a park?

0 10 20 30 40 50 60 70 80 90 100

thousand pounds (£)

percent of house price (%)

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B.3. Survey Results

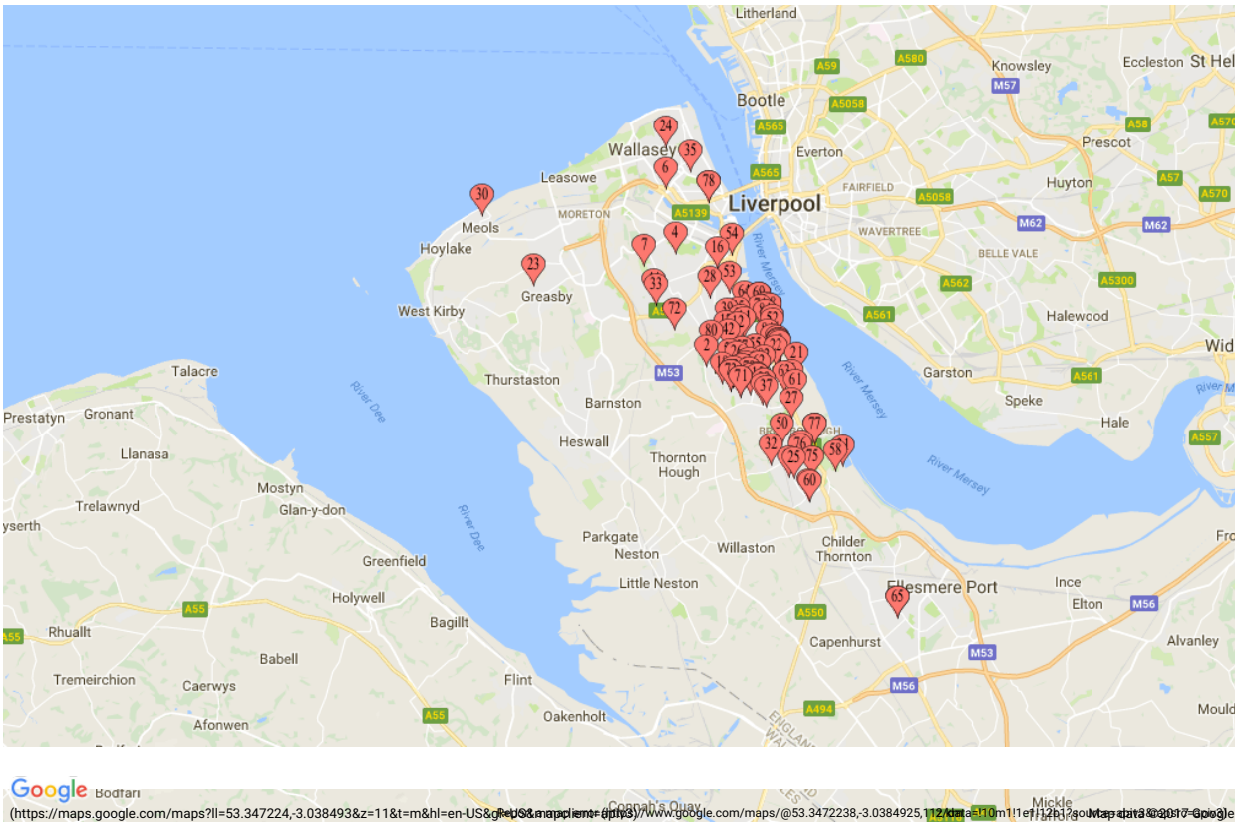
B.3.1. Survey inputs

Inputs	Data	Source
Visits p.a.	40,040	PSRP record, last year
Visitors p.a.	748	Estimate based on PSRP Social Value Survey data

B.3.2. Survey method and response

Survey Method	Response Count	Percentage
Online	39	45%
Paper	48	55%
Total	**87**	

Figure B-1: Map of survey response home location

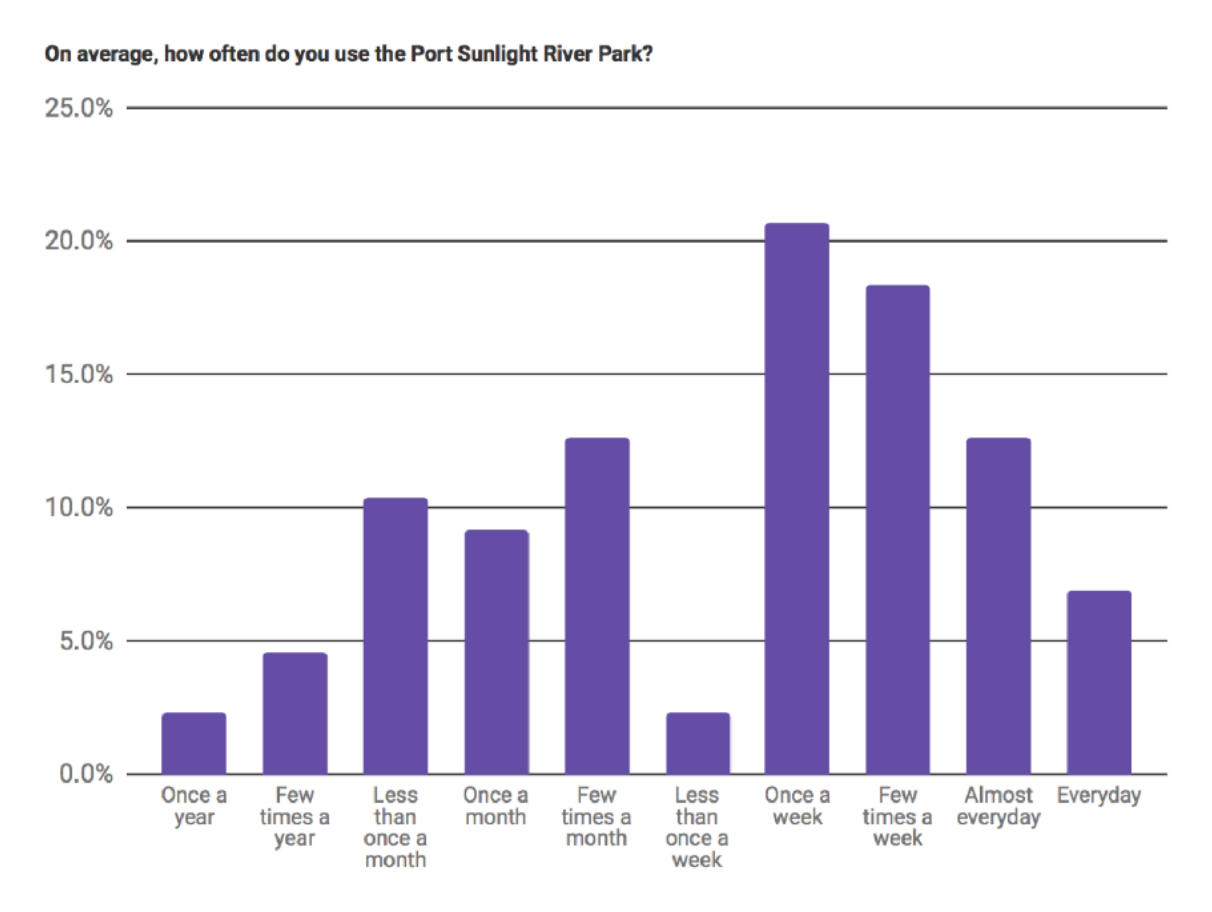


Source: Mapcustomizer.com

- **Question 1.** On average, how often do you use the Port Sunlight River Park?

Answer Options	Response Percent	Response Count
Once a year	2.3%	2
Few times a year	4.6%	4
Less than once a month	10.3%	9
Once a month	9.2%	8
Few times a month	12.6%	11
Less than once a week	2.3%	2
Once a week	20.7%	18
Few times a week	18.4%	16
Almost everyday	12.6%	11
Everyday	6.9%	6
Total number of response		87
Average number of visits per visitor		92

Figure B-2: Frequency of visits per year per individual



- **Question 2.** What's the purpose of your visit?

Answer Options	Response Count	Percentage
Leisure	24	62%
Volunteer	5	13%
Business	2	5%
Leisure, Volunteer	7	18%
Leisure, Business	1	3%
Total number of response	39	

List of business	Response Count
Dogwalking	1
Work as part of the manageing agent team	1
I am a support worker and take service users for a walk at the park.	1

- **Question 3.** Which of the following products/services you have used/purchased at the park? If so, how often?

Answer Options	Reponse count	Percentage
Dog walker	8	9%
Ice cream van	20	23%
Pet food retailer	1	1%
Childminder	0	0%
Personal trainer	0	0%
None of them	58	67%
Total number of response	87	

Unit of analysis	Total
Est. total revenue generated per year	£47,914.00
Est. revenue generated per visit	£1.20

- **Question 4a.** Do you regularly visit any businesses close to Port Sunlight River Park before/ after your visit to the park? (e.g. Food/retail outlets)

Answer Options	Response Count	Percentage
Yes	41	47%
No	46	53%
Total	**87**	

Question 4b. If so, how often and what is average spend per visit?

Answer Options	Reponse count	Percentage
Cafe/restaurant	13	24%
Retail	6	15%
Garden centre	22	57%
Other: Pub	2	4%

Question 4c. Would you visit these businesses if you were not visiting the park?

Answer Options	Reponse count	Percentage
Yes	20	53%
Maybe	12	32%
No	6	16%

Unit of analysis	Total	Direct Impact
Estimated revenue generated per year	£22,525.00	£7,637.00
Estimated revenue generated per year per visit	£4.20	£0.95
Estimated revenue generated per year, population based		£38,026.00

- **Question 5a.** Would you pay more to buy a house that is close to a park, as opposed to the same house close to a landfill site?

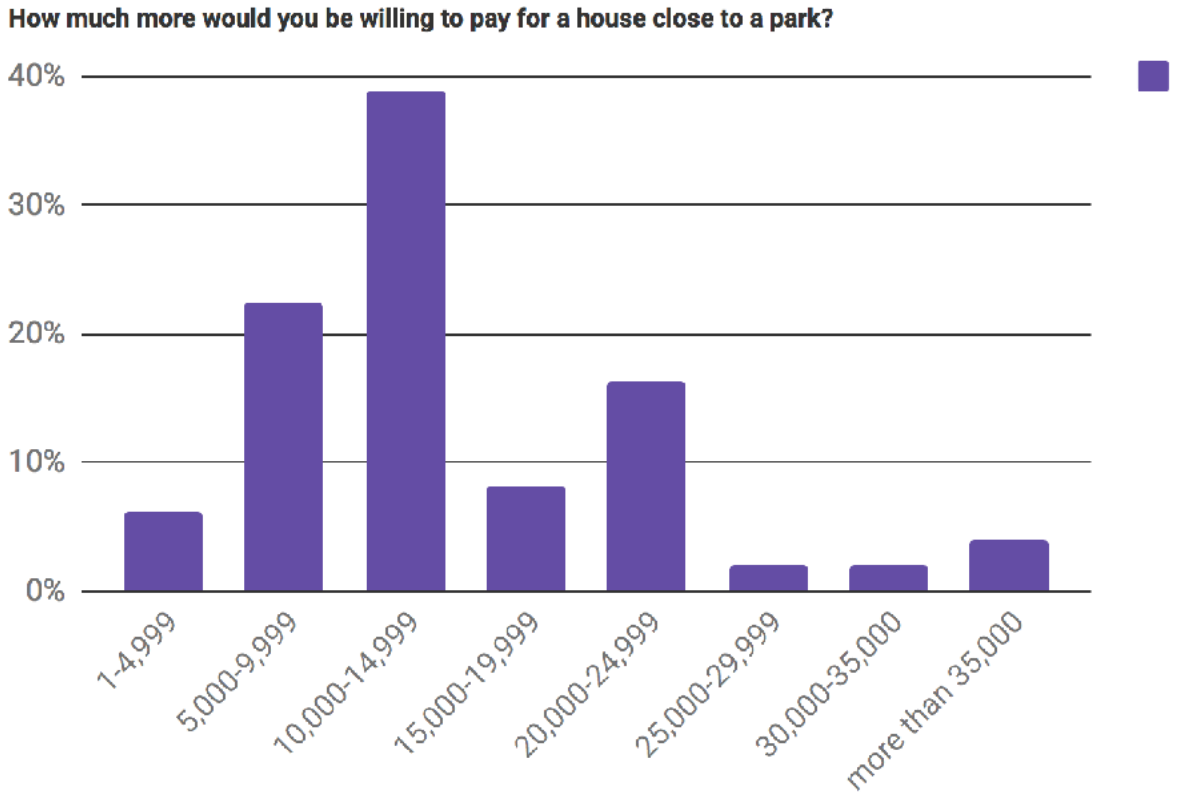
Answer Options	Response Count	Percentage
Yes	63	72%
No	24	28%
Total	**87**	

Question 5b. If so, approximately, how much more would you be willing to pay for a house close to a park?

Price range	Response Count	Percentage
£1-4,999	3	6%
£5,000-9,999	11	22%
£10,000-14,999	19	39%
£15,000-19,999	4	8%
£20,000-24,999	8	16%
£25,000-29,999	1	2%
£30,000-35,000	1	2%
more than £35,000	2	4%
Total	49	
skipped answer	14	

Unit of analysis	Premium (Â£)
Average additional house price willing to pay	£9,477.72

Figure B-3: Additional amount people would be willing to pay for a house close to a park



Annex C: List of interviewees

C.1. We are very grateful to the following individuals and organisations who were interviewed in the course of this study:

Table C-1: List of research interviewees

Organisation	Interviewees
Autism Together	Anne Litherland & Terry Usher
Dibbin Estates & Equipment Ltd	Tony Field
Hyacinth Ice-cream Van	Angela Atkinson
Lesley Hooks	Michael Hooks
Member of Parliament, Wirral South	Alison McGovern
Persimmon Homes plc	Timothy Pegg
Sarah Saxton Childminder	Sarah Saxton
Scruffy Tails	Carolyn Welsh
Silky's Dog Walking Services	Caro
Trophy Pet Foods Wirral	Sharon Leicester
Wirral Council	David Ball & James Hurley

Annex D: Glossary

PSRP	Port Sunlight River Park - The research area of this study, which is a landfill redevelopment project located on the banks of River Mersey in the Wirral.
House price premium	Additional amount of money that people are willing to pay for a house in addition to the proposed price for a particular reason.
Economic Impact Analysis	The effect of an event on the economy in a specified area, ranging from a single neighborhood to the entire globe. It usually measures changes in business revenue, business profits, personal wages, and/or jobs.
Regression analysis	A set of statistical processes is used to model the relationship between a response variable and one or more predictor variables.
Hedonic price method; Hedonic price model regression	A model identifying price factors according to the premise that price is determined both by internal characteristics of the good being sold and external factors affecting it.
Autism Together Community and Vocational Services	A program offering people with autism meaningful, realistic and achievable training, on the job work experience and valuable life skills.