



Gwraidd Cydweli

People Oriented Smart Towns: Research Phase Summary

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Acronyms & Abbreviations

Acronym	Definition
CCC	Carmarthenshire County Council
CETMA	Community Engagement, Technology, Media & Arts
LORAWAN	LOng RANge Wide Area Network
NCN	National Cycle Network
ONS	Office for National Statistics
RFC	(Kidwelly) Rugby Football Club
RSPB	Royal Society for the Protection of Birds
WelTAG	Welsh Government’s Transport Appraisal Guidance

1 Overview

1.1 Gwraidd Cydweli – Discovery Phase

K Sharp, a leading Human Factors consultancy based in Carmarthenshire, are providing support to Gwraidd Cydweli (Smart Kidwelly) group in this discovery phase to help realise the ambitions of Kidwelly Town Council in taking full advantage of Smart technologies for the benefit of the people in the town. K Sharp are providing their expertise pro bono, as part of their social impact activities to benefit local communities.

This document is a summary of the discovery document (A00066-01) which provides an overview of the methodology and fuller evidence of the conclusions, recommendations and next steps detailed in this report.

1.2 Background

Kidwelly has spent the last few years as part of the Ten Towns initiative which aimed to encourage economic growth and recovery, following the Covid-19 pandemic, of rural towns across Carmarthenshire.

This People Oriented Smart Towns approach provides a clear path forward to deliver the most benefit for the Kidwelly Town Council. The town's identified stakeholders will provide the human focus for the objectives of enhancing Kidwelly as a Smart Town to enable a better basis for decision making by businesses, Kidwelly Town Council and Carmarthenshire County Council (CCC), as well as supporting the needs of visitors, residents and those from the local area.

1.3 Where?

The proposed area for this initial phase of the project is shaded in blue on the map below, and includes Kidwelly Town itself, together with the village of Mynyddygarreg and Carmarthen Bay Holiday Park.

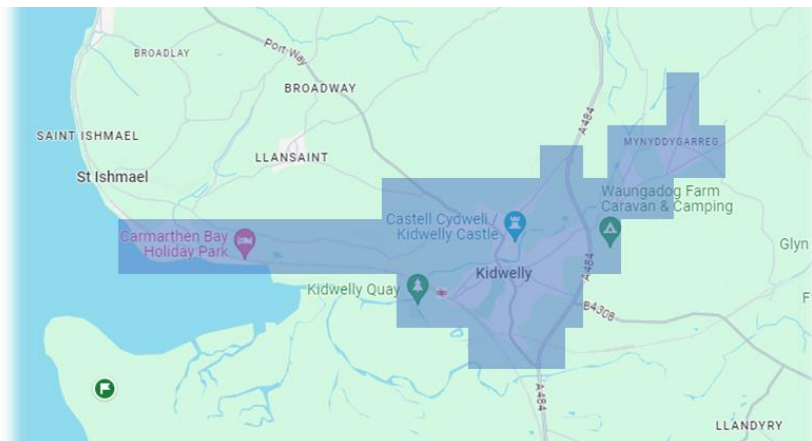


Figure 1 – Initial Geographical Scoping

It should be noted that this geographical bounding is to enable suitable scoping of the initial project. The overall intention is that the project will grow to cover a greater geographical area over time.

1.4 Who?

The most important factor to understand with a people first approach is who are the main users of Kidwelly and are their characteristics.

Visitors	Residents	Businesses	Stakeholders
<ul style="list-style-type: none"> • There were approximately 36,000 visitors to Kidwelly castle in 2023 • If distributed across 12 months, then that is 3000 per month (or 692 per week), but these numbers will realistically be mainly during the summer months. • These visitors will consist of: <ul style="list-style-type: none"> • Tourists • Visitors • Commuters 	<ul style="list-style-type: none"> • There are approx. 3700 residents within Kidwelly and Mynyddygarreg. These are the people who interact with the Town the most regularly and could impact it the most 	<ul style="list-style-type: none"> • Businesses are the economic life blood of the town. • Collected Smart data will particularly benefit shop fronts and places that accept footfall and vehicular traffic, but the data can also be of use to many difference types of businesses and services. 	<ul style="list-style-type: none"> • Hold responsibility for the safety and prosperity of the Town or contribute to the draw of people to Kidwelly. EG: <ul style="list-style-type: none"> • County Council • Town Council • Welsh Government • Rail Services • Cadw • Emergency service providers • Providers of services • Providers of Community services

1.5 Why?

Establishing a baseline of Kidwelly Town’s data and having a solid foundational infrastructure of Smart Technologies to monitor, collect and collate data will allow stakeholders to make better, more impactful decisions and track the effects more easily.

Better Decisions

- Baseline data infrastructure enables understanding of how people interact with the town.
- Trends can be identified to see where changes can have the most impact.
- Allow authorities to make more informed decisions about where to invest and how to utilise services more efficiently.
- Will help local businesses to make important decisions like tailoring opening times, managing stock, and generating the most impact from advertising,

Interactive Engagement

- Digital activities can encourage visitors to engage with Kidwelly in a fun way and learn more about the area.
- Smart community groups can help build a closer community and instil a sense of ownership and pride amongst residents.

Measuring Success

- The impact of any new initiatives can be easily measured to determine success.

2 Current Technology and Infrastructure in Kidwelly

2.1 Introduction

This phase aims to identify the technology, data and information that already exists, and how effective it is within Kidwelly. This will help to identify useful assets to prevent wasting time and resources on repeating previous work and help highlight any shortcomings that will need to be overcome to most effectively move forwards.

2.2 Current Kidwelly Technologies

This section describes the current digital infrastructure in and around Kidwelly.

LoRaWAN

- The LoRaWAN Gateway is located on Kidwelly Library.
- There are sensors on the lifesaving equipment at the Quay. These alert when the live preserver is removed.
- Additional sensors were on the public toilets in the main square, but they have since been demolished and therefore are not utilised at time of writing.

Broadband Availability

- There is solid coverage for Superfast broadband,
- There is not currently any Gigabit supplied to Kidwelly Town centre.

Mobile Network Connectivity

- The topographical terrain makes mobile signal reception challenging for all providers.
- Mobile signal does not reliably work indoors across the area, even for voice calls

Town Wi-Fi

- There is a free Wi-Fi network available in Kidwelly with five hubs placed along the town.
- The speed of the Wi-Fi connection at 11 locations across the 5 hubs gave an average of 2.95Mbps,

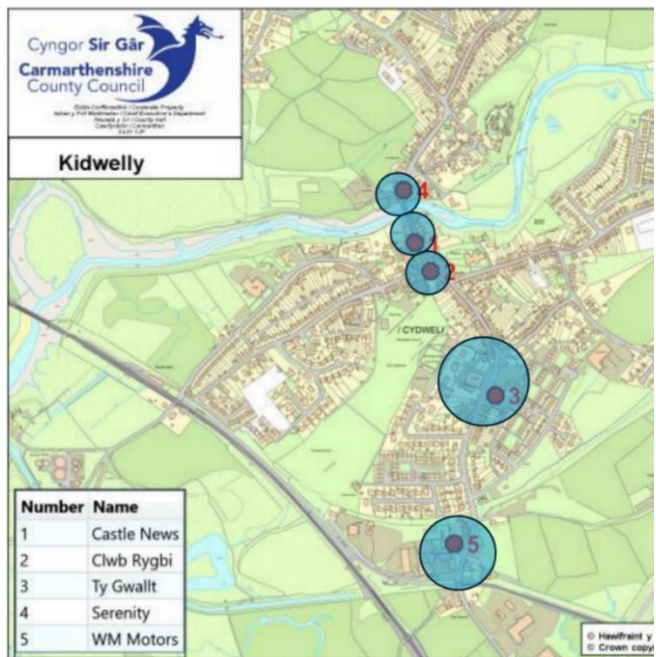


Figure 2 – Wi-Fi Provision

2.3 Infrastructure Recommendation

To achieve a reliable and fast data network with enough coverage, Kidwelly Town will need to control its own infrastructure rather than rely on mobile networks or OpenReach to improve their existing services. One method of achieving this data independence is through a private satellite-based data network service such as can be provided through Starlink (Starlink, 2024). It is recommended that this method is investigated to provide high speed internet capability. This may need one or more units that are connected in the same network to support the data needs of the town.

3 Baselining Kidwelly Smart Town Data

3.1 Introduction

As part of the initial Smart Kidwelly set up, Carmarthenshire County Council provide a monthly update to Kidwelly Town Council in the form of a newsletter.

3.2 Data Extraction

From the 15 months' worth of Town Monthly Report data from CCC, a baseline average has been developed to understand what can be grown from.

Table 1 – Data averages over 15-month period

Month	Averages
Daily New Visitors	15
Monthly New Visitors	456
Daily Visitor Loyalty - Actual	83
Daily Visitor Loyalty - %	53
Weekly Visitor Loyalty - Actual	42
Weekly Visitor Loyalty - %	27
Monthly Visitor Loyalty - Actual	16
Monthly Visitor Loyalty - %	10
AP 1 - Castle News	0
AP 2 - Clwb Rygbi	37
AP 3 - Ty Gwallt	0
AP 4 - Serenity	0
AP 5 - WM Motors	5
Get Connected WIFI	235
Total Visitors	4751
Ave Dwell Time	41
Busiest Day	-
Dwell 5-20m	49
Dwell 20-60m	27
Dwell 1-6h	37
Dwell 6h+	44

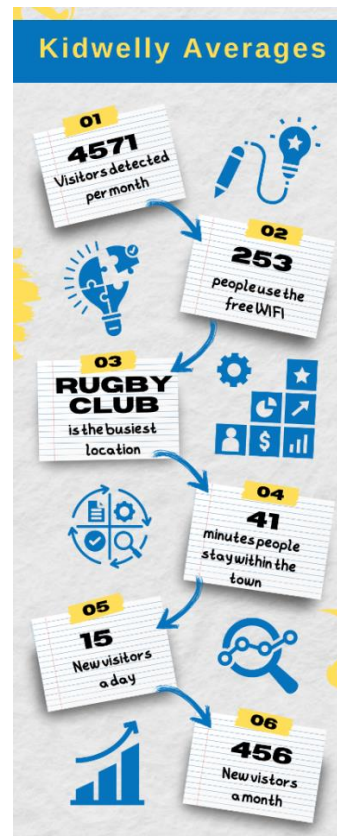


Figure 3 – Data Averages Highlights Infographic

Very few people (compared to the number of people identified within range) utilise the free Wi-Fi. It is unclear why this has such low take up and this should be investigated.

3.3 How can the data be used?

This data needs to be combined with an events log, an understanding of what activities have been held within Kidwelly and when, in order to put them alongside the visitor numbers and determine if there is any correlation.

If this data is also being provided to local businesses and residents, then they should have a say in how useful they find the data, what they use it for and what changes they would like to see, either in terms of the how the data is presented or extra data that is not currently reported.

4 Activities of Kidwelly’s People

4.1 Introduction

To ensure the best results for the intended audiences and stakeholders, it is imperative that all actions have people at the core of their focus, starting with their fundamental needs and building on these foundations to produce a robust, adaptable and useful service for many years to come.

The first step is to thoroughly understand how people are utilising the town amenities in order to then develop effective methods for increasing visitor numbers, enhancing resident experiences and supporting business growth.

These future interventions can include developing new events, modifying current activities, optimising management of facilities to optimise the use of Kidwelly town and all it has to offer throughout the year.

4.2 Permanent Visitor Activity







There is a need to be able to encourage visitors to move between locations. The initial six permanent locations for visitors are the Town Square, the Castle, the Train station, the Quay, the rugby club and the holiday park.

These are outlined in **Error! Reference source not found.** and Table 2 below.







Figure 4 – Proposed Permanent Visitor Locations in Kidwelly

Table 2 – Permanent Visitor Location Descriptions

ID	Circle Colour	Location	Rationale
V1	Purple	 Town Square	Focal point for the Town Centre
V2	Red	 Kidwelly Castle	36k visitors per year
V3	Grey	 Kidwelly RFC	Sports visitors attraction point and road junction point
V4	Blue	 Train Station	Access point for Rail visitors
V5	Green	 Kidwelly Quay	Attraction point for nature and walks
V6	Yellow	 Carmarthen Bay Holiday Park	A large number of visitors stay during visit season.

Each of the spots is linked by a route or combination of routes as detailed below in Table 3.

Table 3 – Route Descriptions

Route Colour	Point A	Point B	Rationale
Yellow	 Carmarthen Bay Holiday Park	Kidwelly Castle	A desire to encourage people from the park to Kidwelly
Red	 Kidwelly Castle	Town Square	Encourage castle visitors into the town
Purple	 Train Station	Town Square	Encourage visitors to utilise the Train to access the town
Blue	 Rugby Club	Quay	--

The Yellow and Red Routes coincide with the National Cycle Network Route 4 that runs between London and Ferryside, through Kidwelly. The Yellow Route has been identified as an option for potential improvement in a Welsh Government’s Transport Appraisal Guidance (WeITAG) commissioned by Carmarthenshire County Council in 2020.

4.2.1 All Routes

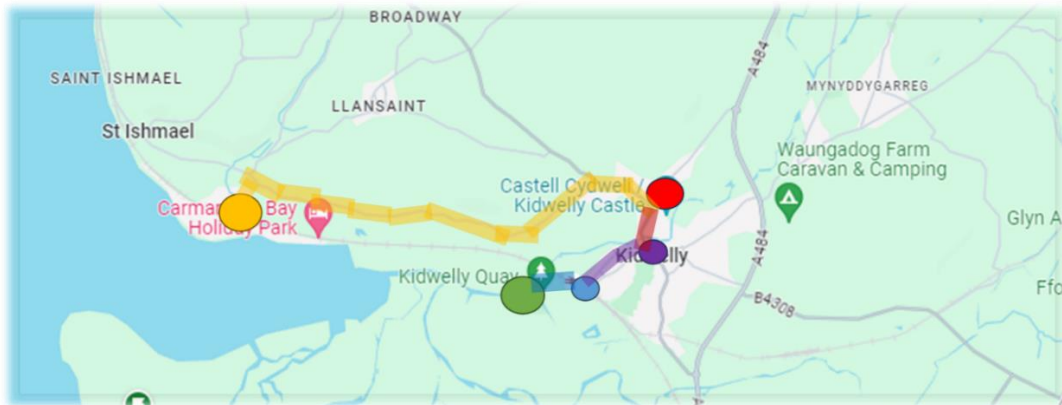


Figure 5 – All Permanent Visitor Location Routes

4.3 Permanent Resident Activity

There is also a need to consider the permanent residents of Kidwelly. If the number of visitors to the castle per year is used as a metric, approximately 36,000, and compare this to the number of visits by residents to the town centre just once a month, approximately 3,500 x 12 = 42,000 visits per year, it is clear that the local population is very important to the town.

With this in mind, improvements and provisions of Kidwelly should also provide benefits to the residents and include key locations of importance to them. Initial resident locations are outlined in Figure 6 and Table 4 below.

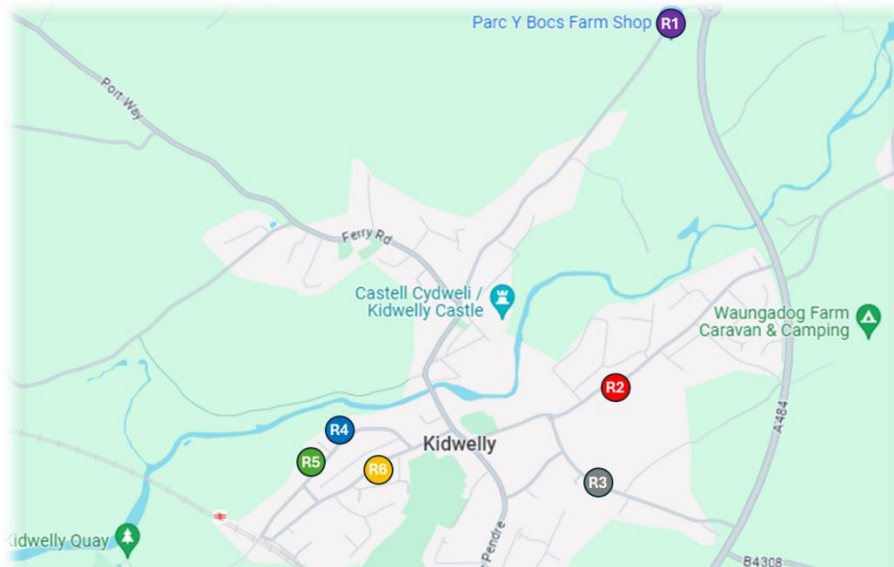


Figure 6 – Proposed Permanent Resident Locations in Kidwelly

Table 4 – Permanent Resident Location Descriptions

ID	Circle Colour	Location	Rationale
R1	Purple	Parc Y Bocs Farm Shop	Farm Shop and Café selling local produce
R2	Red	Ysgol Y Castell	Local Primary School
R3	Grey	Co-op	Supermarket for the town
R4	Blue	Kidwelly Surgery	Medical Centre
R5	Green	Library	Local Library
R6	Yellow	Ysgol Gymraeg Gwenllian	Welsh Medium School

Set routes between these hub spots have not been identified as it is anticipated that they will mostly be frequented by residents who will travel from their own, individual homes. Data should still be collected at the identified hubs, however, to help gain a fuller understanding of engagement within Kidwelly.

5 Smart Technology for Kidwelly's People

5.1 The Future of a Smart Kidwelly

This section and Figure 7 describe what is needed to establish a robust infrastructure that is capable of collecting useful data for a baseline and identifying the effects of future initiatives as the goals of Kidwelly as a Smart Town are worked towards.

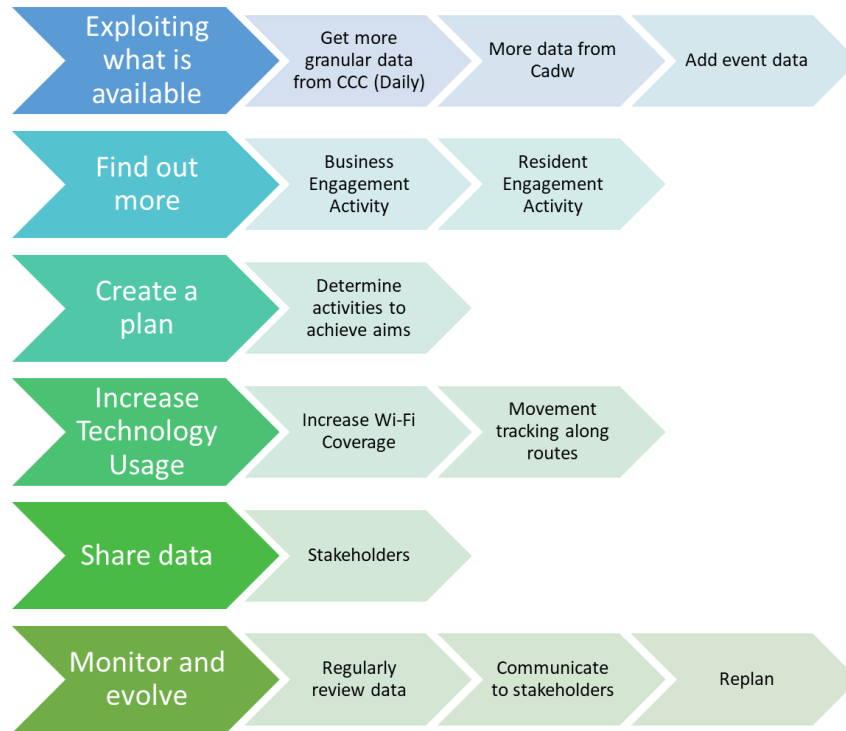


Figure 7 – Future Steps Action Plan

5.2 Maximising current infrastructure

The current Smart infrastructure is providing a certain amount of limited data. With an increase of the granularity of the reported data, and supplemented by local knowledge, then the current infrastructure can provide a much greater amount of information from which better decisions could be made.

- The data provided by CCC needs to be provided at a Daily level to be able to understand the daily activity and the success of individual events.
- The addition of the central events log will enable the correlation of people movement and event activity.

5.3 Improving Baseline Infrastructure / Sensor Capability

Hubs, points of interest and key routes within Kidwelly have been identified, as well as the gaps in the current ability to gather data in these areas. It is key to this project that some infrastructure is put in place to fill or link these gaps so that traffic, both footfall and vehicle, can be quantified.

5.3.1 Wi-Fi

Expanding the Wi-Fi access to cover the identified routes and hubs would provide the follow benefits:

- Enables more data to be gathered on visitors (with permission);
- Enable greater footfall tracking, giving a better picture of how people move around Kidwelly;
- Give data in the same format as the existing reports; and
- Other Smart sensors can be connected to the Wi-Fi network to provide additional data for various locations.

However, as has already been mentioned, the visitor data will need to be reported in a much more useful way or as raw data that can be analysed and interrogated locally. Wi-Fi also has the limitation of tracking devices, so may not be so useful for vehicle tracking.

5.3.2 LoRaWAN

Increase the LoRaWAN capability across the whole area. This will allow for:

- Secure data collection that can be stored and analysed locally;
- Specific data collection – sensors that are designed to collect a specific type of information can be placed in targeted locations; and
- Wider range data collection – the LoRaWAN network has a longer range signal than Wi-Fi, which allows for sensors to be placed in more isolated locations without an extra dedicated connection setup.

5.4 Future Aspirations

With the Baseline infrastructure and data in place, this can be built on by introducing new features and functionality to the town. The strong foundation will allow for easy data collection, analysis and direct comparison to show the effects, both good and bad, and provide direction for further refinement and improvements.

- Kidwelly Web App
- Digital Signage
- The Kidwelly Trail
- Active tracking
- New Events
- Building Management
- Community Safety
- Smart Lighting
- Waste Management
- Smart Parking
- Environmental Monitoring

5.5 Testbed Technologies

The town could benefit from funding or technology partnerships where new technologies are being developed and the suppliers are looking for areas to test them out on. If Kidwelly were to have a good baseline infrastructure, then it would be an attractive proposition for the future.

6 Conclusions & Recommendations

6.1 Conclusions

- There is some infrastructure for Smart Town capabilities within Kidwelly that are currently either underutilised or underpowered but is a good start on which to build.
- While there is currently a free Wi-Fi provision, it is not clear who is directly benefitting from this or how.
- There is some potentially useful data being collected, but it is not being analysed or presented in a particularly helpful way that would allow someone to identify trends or how to make best use of the information.
- Kidwelly has many positive assets available that can be developed and better utilised to grow and improve the town for its residents, businesses and visitors.
- To best facilitate changes, improvements and enhancements, it first needs to be fully understood how the town is currently used by the people who interact with it in order to uncover how they can be best served by the town by making better use of the existing data available and by improving the base infrastructure around the town
- When a baseline has been established, the data can be analysed to show where actions will have the most impact and the provide the biggest benefits
- Any actions can then be monitored, data recorded, and effects interrogated to show if they had the desired results.

6.2 Recommendations

As a starting point, a robust, foundational infrastructure should be built that will enable useful data to be collected, analysed and monitored over time. This data infrastructure should cover at least the routes identified in Section 4.2.

Table 5 – Recommendations

ID	Recommendation
R1	To create a Smart Kidwelly Stakeholder group with representations from the mentioned organisations that can meet at least every 6 months to review data, share insights and action plans.
R2	Determine who has access to the LoRaWAN sensor data.
R3	Deploy more Wi-Fi hubs to provide access, and therefore data gathering, to a wider area.
R4	Investigate Starlink as a method to provide good internet access.
R5	Investigate low user take-up of Wi-Fi.
R6	January 2024 delivered Wi-Fi data is checked against the raw data.
R7	Request Wi-Fi data at a daily fidelity as a minimum, with a view to greater granularity in the future.
R8	Create and maintain an events log to accompany tracking data.
R9	Request access data for all of the Wi-Fi hubs, not just the highest and lowest.
R10	Survey local businesses and residents to gauge opinion on the data reports and what changes they would like.
R11	Engage with Cadw about sharing more detailed visitor data
R12	To put the future steps into an action plan and get signoff from stakeholders.

6.3 Next Steps

A meeting was held with stakeholders to review the work to date and look at the next steps. As a result, the following are the three themes and underpinning activities that will form the next step of the project.

Knowledge Building

- Identify recipients of current monthly reports and determine how they are using them.
- Determine what Data is required by current recipients.
- Verify data quality of Castle visitors
- Identify what questions to ask of existing data.

Engagement and Education

- Engage with residents via different platforms to understand priorities.
- Engage with Businesses to determine their needs.
- Identify why people choose to travel to Kidwelly
- Identify what people feel they need to leave Kidwelly, what does it not have?
- Identify what data could encourage future businesses to come to Kidwelly.
- Identify what and how regular data should be communicated and to whom.

Technology

- Identify connectivity solutions, particularly for market traders.
- Identify what sensors would provide value as part of the LoRAWAN network.
- Identify what other assets there are within Carmarthenshire that could be utilised.

Figure 8 - Next Step Focus Areas

