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**REPORT TO THE NORTH WALES ECONOMIC AMBITION BOARD**  
**19 JULY 2024**

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**TITLE:** LPWAN (Low-Power, Wide-Area Network) - Business Justification Case  
**AUTHOR:** Stuart Whitfield, Digital Programme Manager

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**1. PURPOSE OF THE REPORT**

- 1.1. The purpose of the report is to present the LPWAN Business Justification Case for consideration by the Board.

**2. DECISION SOUGHT**

- 2.1. That the Board approve the Business Justification Case for the LPWAN project and authorise the Portfolio Director, in consultation with the Chair, Vice-Chair, Section 151 Officer and the Monitoring Officer to procure and establish the required frameworks for the delivery of the project, subject to the Portfolio Management Office addressing the outstanding issues set out in section 7.1 of the report.
- 2.2. That the Board note the process for accessing funding through the frameworks will involve the submission of a delivery plan for each local authority area and delegate authority to the Portfolio Director in consultation with the Lead Member for the Digital Programme and the Digital Programme Board to approve the delivery plans and delegate solely to the Portfolio Director the subsequent allocation of funding through the frameworks.
- 2.3. That the Board note that the LPWAN Business Justification Case is a sub-set of the larger Connected Campus project from which funding will be allocated and agree to the principle that any underspend within the LPWAN project budget is ringfenced to the Connected Campus project in the first instance.

**3. REASONS FOR THE DECISION**

- 3.1. To seek the Board's approval of the Business Justification Case for the LPWAN Project.
- 3.2. As a project delivered by Ambition North Wales, approval is required by the Board to establish the frameworks that will deliver the project. Due to the nature and value of the project, in line with the Better Business Case guidance a Business Justification Case is presented that requires only a single approval from the Board.



#### **4. BACKGROUND AND PROCESS**

- 4.1. The North Wales Growth Deal is an agreement between the UK Government, Welsh Government and the North Wales Economic Ambition Board to deliver a transformational £1billion investment in the North Wales economy. The aim of the Growth Deal is to build a more vibrant, sustainable and resilient economy in North Wales, building on our strengths to boost productivity while tackling long-term challenges and economic barriers to delivering inclusive growth.
- 4.2. As per the Final Deal agreement, business cases are to be developed for each project within the Growth Deal in line with the 'Better Business Case' guidance developed by Welsh Government and HM Treasury. Each business case includes five cases which address key questions and should be supported by workshops. The guidance allows for single-stage Business Justification Cases to be used for projects of low-medium value and risk.
- 4.3. The North Wales Economic Ambition Board acts as the decision-making body for the North Wales Growth Deal. The Welsh Government and UK Government are funders of the Growth Deal, retaining a role in approving the assurance process each project has undertaken. The assurance process undertaken by projects will be included in all reports for consideration.
- 4.4. The LPWAN Business Justification Case (BJC) sets out the strategic case, options analysis, the procurement route, funding and affordability and the delivery arrangements for the successful delivery, monitoring and evaluation of the scheme.
- 4.5. The Portfolio Management Office has undertaken a review of the Business Case which will be finalised prior to submission to the Economic Ambition Board, including by external business case consultants Hatch Regeneris. The Project and Programme Boards have completed a review of the project.
- 4.6. Approval of the Business Justification Case by the Economic Ambition Board would represent the final investment decision for the project and enable the Portfolio Management Office to proceed with the procurement of the required frameworks and the launch of the project. Project delivery will be subject to local deployment plans being approved with each of the participating councils.
- 4.7. Should the Board decide not to approve the Business Justification Case, it may reject the business case outright or request further information to be included in a revised version of the business case for consideration.

#### **5. INTRODUCTION TO THE LPWAN PROJECT**

- 5.1. The Digital Programme identified a need for investment in LPWAN (Low Power Wide Area Networks) in the Programme Business Case in 2020, initially as an intervention with a rural focus. The project is within the Portfolio which was approved by UK and Welsh Governments

in the North Wales Growth Deal. This is a project to deliver digital infrastructure alongside the 4G+ project (mobile networks), the Full Fibre project (fibreoptic networks), the Last Few % project (broadband) and the Advanced Wireless project (wireless technologies such as 5G). The Digital Programme also supports Bangor University with investment in the Digital Signal Processing (DSP) Centre project which is associated with research and development of telecommunications technologies. The LPWAN project sits within the overall Connected Campuses project alongside Advanced Wireless.

- 5.2. LPWAN is a broad set of technologies which support 'Internet of Things' (IoT) applications and several options are adopted globally to support economic activity across many industries. In the UK LPWAN is increasingly being adopted to serve users who have a requirement for remote monitoring of assets and environments in a cost effective way, which would otherwise be unaffordable. The technology allows greater capacity for the collection and monitoring of data and enables significant improvements in business efficiency and productivity when used appropriately.
- 5.3. In North Wales the main LPWAN technology type being used widely by the public sector is LoRaWAN (Long Range Wide Area Networks), particularly by councils and registered social landlords. While some councils have developed a strong familiarity with the technology and the opportunities it presents, others are at an earlier stage of adoption. Wrexham County Borough Council has invested in LoRaWAN coverage over the course of 2023/24, trialling various applications successfully associated with car parks management and more recently monitoring of environmental conditions in buildings to support energy efficiency management. The council has recently won the [RTPI Wales Excellence in Plan Making Practice](#) award for its Wrexham Digital Place Plan, in part due to its consideration of LoRaWAN. Conwy County Borough Council has trialled a broad range of applications including flood risk monitoring, in-building environmental conditions and the remote monitoring of refrigeration, for example. Cyngor Gwynedd has also established the use of LoRaWAN for flood risk monitoring and cites the technology in its corporate Digital Strategy. The social landlord Adra has deployed LoRaWAN sensors extensively across its estate to support the monitoring of conditions in its properties and work at Denbighshire County Council has also identified LoRaWAN as a preferred means of ensuring compliance with housing regulations, in part driven by Welsh Government's Optimised Retrofit programme. WLGA has been leading on the sharing of lessons learned associated with IoT and has developed a library of use cases which can be referred to which demonstrate benefits being realised across Wales.
- 5.4. In the private sector the use of LPWAN is more difficult to quantify however larger organisations with widely distributed assets, such as utilities companies commonly use forms of LPWAN for remote monitoring of assets and communities of SMEs in the region continue to develop interest in adoption. Welsh Government has sponsored several initiatives in recent years to promote IoT and particularly LoRaWAN, with initiatives including agriculture (through Farming Connect) and town centres (through Smart Towns, delivered by Menter Môn). Welsh Government has also funded councils to deploy LoRaWAN networks across Wales, including in North Wales, establishing coverage around some key areas of interest.



- 5.5. The LoRaWAN coverage currently maintained by the councils provides ‘open access’ to other users, supporting trialling and innovation of use cases in any industry. This is an accessible route for businesses to test and understand how this form of IoT can provide benefits. Access to the network is limited by coverage and providing extended coverage will enable a greater range of potential users to innovate, particularly in rural areas which currently have the least coverage. A relevant and established example of a similar approach taken by the public sector is in Cambridgeshire [LoRa - Connecting Cambridgeshire](#).
- 5.6. LPWAN is used to support and enhance service delivery and in doing so can support productivity and growth. The adoption of the technology requires skills and staffing resources and demand for these develops as demand from users increases. Job creation is therefore to be expected as a consequence of wider adoption, with additional ICT staff, data analysts and maintenance roles. Where the use of LPWAN supports business growth a general expansion of the workforce is expected.
- 5.7. The project will involve allocation of funding to councils to expand LoRaWAN coverage in the region and promoting its use to support both public and private sector applications. Delivery will include
- Initial mapping and network design
  - Procurement of gateways via a single supplier framework
  - Procurement of installation services through an approved suppliers list (suiting local companies with staff in the region)
  - Provision of funding to councils to trial a wider range of applications
  - Stimulation of demand and interest from the private sector through local promotion

#### **Project Spending Objectives and Benefits**

- 5.8. The project spending objectives are set out in the table below alongside programme spending objectives, and are in line with those set out in the Portfolio Business Case.

| <b>LPWAN Project Spending Objective</b>   | <b>Corresponding Programme Spending Objective</b>  |
|---|--|
| To deliver affordable and simple to use LPWAN connectivity to prioritised locations in the six North Wales counties by 2027, enabling efficiencies across public services and supporting innovation in the private and public sectors | To ensure that the region is empowered to participate in innovation and commercialisation of new digital infrastructure technology to achieve and consolidate a long-term role in a strategically important industry |
| To support between £0.1m-£0.5m investment in the region by 2032   | To deliver a total investment of between £37m and £46m through the programme by 2036   |
| To support the creation of 20 jobs in the region by 2032  | To create between 315-380 new jobs in North Wales through the programme by 2036  |

|   |  |
|---|--|
| To support the adoption of 10-20 new applications of LPWAN technology across the public and private sectors in the region by 2032 |  |
|---|--|

5.9. There are also a range of indirect benefits in the public and private sector which include:

- SME productivity
- SME innovation
- Public sector innovation
- Public sector service delivery efficiency

Job creation is forecast over 8 years on the basis of additional service demand within the public sector, equivalent to a full time member of staff within each county (council or other public bodies), (6), supporting operation and maintenance of networks and within services. In the private sector, job creation (up to 14) is expected over the 8 year period in each county as a consequence of business growth and provision of IoT services to support users

The rate of innovation is forecast to be between 10-20 new applications of LPWAN technology to be adopted in the 8 year period. This is based on ca. 2 applications in the public sector and ca. 3 applications in the private sector, per county.

*Additional investment of ca. £0.1m-£0.5m is expected over an 8 year period as a consequence of demand for wider applications, investment in sensors and analysis in both public and private sectors. The estimate is based on approximate investment in further sensors required for the use cases adopted through innovation.* Rates of productivity and efficiency improvements are difficult to predict with confidence at this stage however the evidence provided by the initial target counties of Wrexham (multiple use cases incl. car parking, social care, environment), suggests that the scaling up of these to other councils will derive similar benefits. In the private sector the use cases are expected to initially be likely focused on agriculture (e.g. improving nutrient management, reducing inputs), building on work undertaken by Farming Connect and the demonstration farm at Glynllifon.

#### **Climate Change and Biodiversity**

- 5.10. The project consists of the deployment of a large number of small items of low power equipment (ca. 20W per gateway) on existing built infrastructure and does not present a direct impact to biodiversity or a material increase in carbon emissions associated with energy usage. In operation the gateways network is expected to be used in applications which may generate carbon reduction benefits and these use cases will be confirmed by the participating councils in their deployment plans.
- 5.11. The extent to which supported applications can contribute to Ambition North Wales' targets on reducing carbon emissions and improving biodiversity will be defined in the county level deployment plans.



## Social Value

- 5.12. Social Value through procurement will be targeted through the use of Ambition North Wales' Social Value Framework and associated principally with the procurement of gateways which is the highest value procurement of goods from a single supplier. A single supplier framework will be procured from which councils can order gateways. Bidders will be expected to set out their social value offerings taking account of Ambition North Wales' procurement principles and where possible, aligning their offer to the measures set out within the Social Value Framework. The bidders' response to Ambition North Wales' Social Value requirement will account for 15% of the evaluated score when selecting the successful supplier.
- 5.13. The purchasing of installation services will be undertaken using a preferred suppliers list for individually very low value contracts (<£2,000). On this basis social value will be sought through the commitments suppliers can make where appropriate when purchasing. In addition, it is expected that the majority of installation requirements will be undertaken by regionally based contractors, supporting local employment.

## 6. ASSURANCE PROCESS AND OUTCOMES

- 6.1. In accordance with the arrangements set out within the Final Deal Agreement, the Business Justification Case (BJC) has been subject to the following assurance activity:

| Assurance Activity      | Date                      | Outcome   |
|-------------------------|---------------------------|---|
| Gateway Review          | n/a                       | As the LPWAN project represents a small proportion (£1.14m) of the Connected Campuses project and is deemed to be low-value and low-risk, it has been agreed with the Welsh Government Assurance Hub that no Gateway Review is required of this project prior to Business Justification Case approval. An externally appointed 'Critical Friend Review' is proposed following the initial network design (mapping) phase of the project to provide technical assurance that the project is targeting an appropriate scope of coverage with the most effective approach. |
| Project Board           | April 2023                | Business case approval  |
| Programme Board         | August 2023               | Business case approval  |
| PMO BJC review          | September 2023-March 2024 | Review of preferred option, Economic, Commercial, Financial and Management Cases revised. Deliverability and benefits realisation approach revised.   |
| Final PMO BJC review    | 27th June-10 July 2024    | Pending   |
| Portfolio Board         | 5 <sup>th</sup> July 2024 | Pending   |
| Business Delivery Board | 9 <sup>th</sup> July 2024 | Pending   |





## 7. PORTFOLIO MANAGEMENT OFFICE OVERVIEW OF BUSINESS CASE

7.1. The following tables provides a summary of the Portfolio Management Office's (PMO) assessment of the Business Justification Case (BJC) and any outstanding recommendations to be addressed by the PMO before the funding will be released.

|                        | Summary of PMO Assessment   | Outstanding issues  |
|------------------------|---|---|
| <b>Strategic Case</b>  | <ul style="list-style-type: none"> <li>Proportionate account of context and case for change</li> </ul>  | <ul style="list-style-type: none"> <li>None</li> </ul>  |
| <b>Economic Case</b>   | <ul style="list-style-type: none"> <li>Benefits to be reviewed, practicality of benefits assessment / quantification to be considered</li> </ul>  | <ul style="list-style-type: none"> <li>Benefits profiles to at county level to be confirmed within Local Deployment Plans as condition of funding</li> <li>Final PMO review incl. Hatch review.</li> </ul>  |
| <b>Commercial Case</b> | <ul style="list-style-type: none"> <li>Review commercial approach, councils' understanding of implications</li> <li>Sequencing of procurement to be made clearer</li> </ul>   | <ul style="list-style-type: none"> <li>Undertake initial mapping / network design prior to confirming affordability of core/desirable/optional scopes</li> <li>Final PMO review</li> </ul>  |
| <b>Financial Case</b>  | <ul style="list-style-type: none"> <li>Review cost assumptions; network design, gateway purchase, network management costs</li> </ul>   | <ul style="list-style-type: none"> <li>Confirm capital budget following initial network design</li> <li>Councils to confirm affordability of delivery resourcing for gateway operation and demand stimulation activities, to be confirmed in Local Deployment Plans.</li> <li>Section 151 Officer to review</li> </ul>  |
| <b>Management Case</b> | <ul style="list-style-type: none"> <li>Review project management and delivery resource requirements</li> <li>Update risk register</li> <li>Update Benefits Realisation Plan</li> <li>Confirm evaluation requirements</li> </ul> | <ul style="list-style-type: none"> <li>Confirm resourcing arrangements for project manager. Consult councils on secondment opportunity or recruit externally</li> <li>Update risk register before Economic Ambition Board review</li> <li>Update Benefits Realisation Plan before Economic Ambition Board review</li> <li>Grant Funding agreement for councils drafted, councils to review</li> <li>Final PMO review</li> </ul> |

### Key Risks



- 7.2. The Portfolio Management Office considers the following as key risks which will need to be carefully managed to ensure the delivery of the benefits:
- **Revenue Funding** – securing the level of revenue funding set out in the business case will be essential to delivering the benefits associated with the project. Revenue costs are met by councils in supporting the additional gateway capacity and delivering demand modest demand stimulation activities over a three year period. The additional cost of managing gateways (ca. £177/gateway pa) is based on additional staff time and costs for connectivity where it not already present, although it is expected most sites will have access available. The councils’ local delivery plans will confirm manageable levels of deployment with the expectation that as applications are identified which can deliver cost savings to services the additional ICT revenue costs will be met. Where possible, additional funding for demand stimulation will be sought e.g. through future rounds of SPF or equivalent. Where appropriate the councils may delegate hosting of gateways to third parties to share this expense, subject to approval in their deployment plans.
  - **Public sector adoption** – if councils do not successfully identify productive applications which can generate benefits there is a risk that the extended gateway coverage may become unsustainable. This risk is managed through the local deployment plans which will commit the councils to an acceptable and manageable level of deployment over a period in which the network will grow in response to service demand. Evidence from some councils in the region and elsewhere demonstrates a wide range of transferable applications so this risk is currently considered relatively low. The provision of funding to trial or scale up sensor use by council services will stimulate use in the short term. Other public bodies and registered social landlords represent wider users who may have opportunities to benefit from the network in the same way, such as BCUHB and NRW. The key mitigation is intensive promotion and review of opportunities within councils and public bodies prior to and during deployment. The sharing of the growing expertise and experience across the region’s councils will be needed to support services understand the opportunities the network presents.
  - **Private sector adoption** – If the level of take up by the private sector is limited the wider indirect benefits associated with innovation, growth and employment may not be realised. The key mitigation is through the demand stimulation activities required at a local level to be confirmed in the councils’ deployment plans. Ambition North Wales will also work closely with stakeholders already actively promoting IoT in the region to raise awareness of the network and where possible seek further revenue funding to expand engagement, e.g. through SPF. There is potential for the Digital Programme’s Advanced Wireless project to further incentivise adoption with provision of funding and this will be considered in the Outline Business Case, due for Economic Ambition Board review in September.

## Conclusions



- 7.3. The Business Justification Case (BJC) provides a detailed description of the project. It sets out a clear strategic context, a clear case for change, and identifies the option that optimises value following detailed appraisal. The project is considered low risk as it represents a scaling up of business as usual activity for most councils in the region with the model being sponsored by Welsh Government across Wales including counties in the region. Initial assumptions of capital expenditure have been validated by council officers directly involved in similar activity in the region and the key capital expenditure of gateway purchase will be validated by the initial mapping exercise. The business case explains that the project is affordable for the Growth Deal and includes management arrangements for the successful delivery of the project, consistent with existing arrangements for the installation and management of the network at present.
- 7.4. The Business Justification Case has been subject to an assurance process, which resulted in recommendations from the Portfolio Management Office, Project Board and advisory group, Programme Board. Final Portfolio Management Office review including by Hatch Regeneris is to be undertaken prior to consideration by the North Wales Economic Ambition Board.
- 7.5. The Portfolio Management Office is recommending that the Board approve the Business Justification Case for the LPWAN project.
- 7.6. In making this recommendation, the Portfolio Management Office request that the Board note the following:
- Note the outstanding recommendations set out in section 7.1
  - Note that three procurements are required within the scope of this Business Justification Case and delegate authority to the Portfolio Director to confirm the Invitations to Tender meet the standards required.

## **8. PROJECT TIMETABLE AND NEXT STEPS**



| Activity  | Target Dates               |
|---|----------------------------|
| Portfolio Board consideration of Business Justification Case                          | 5 <sup>th</sup> July 2024  |
| Business Delivery Board consideration of Business Justification Case                  | 9 <sup>th</sup> July 2024  |
| Final PMO and Hatch review  | 10 <sup>th</sup> July 2024 |
| NWEAB consideration of Business Justification Case (Funding decision)                 | 19 <sup>th</sup> July 2024 |
| Network design / mapping  | August 2024                |
| Gateway supply and framework and installation preferred suppliers list to be procured | Aug-Sept 2024              |
| External Critical Friend Review   | September 2024             |
| Initial Local Deployment Plans to be agreed, Funding Agreements signed                | October 2024               |
| Deployment of first gateways (subject to deployment plans and CFR outcome)            | October 2024               |
| Remaining Local Deployment Plans to be agreed   | By March 2025              |
| First demand stimulation activities to take place                                     | By March 2025              |



## 9. FINANCIAL IMPLICATIONS

- 9.1. The LPWAN project is one of two projects within the Connected Campuses project for which an overall budget of £20.68m is allocated in the Portfolio. The project represents a total capital cost to the Growth Deal budget of £1.14m.
- 9.2. The business justification case has estimated the cost of the principal capital items of expenditure (gateways) and this will be confirmed following the initial mapping phase of the project. This will in turn confirm the extent to which the core, desirable or optional scope of the project will be affordable.
- 9.3. The costs for the equipment, installation and capitalised delivery costs are set out in the table below.

| SPENDING PROFILE                                |                    |
|---|--------------------|
| Item  | Planned Spend<br>£ |
| Fixed assets (Gateways, sensors and connection) | 578,750            |
| Gateway installation (capitalised costs)        | 405,000            |
| Gateway mapping                                 | 20,000             |
| Other Capital item (equipment renewal)          | 43,750             |
| Capitalised Staff costs (ANW, project mgt.)     | 93,352             |
| <b>Totals</b>                                   | <b>1,140,852</b>   |

## 10. LEGAL IMPLICATIONS

- 10.1. The business case development and the assurance processes have been undertaken in line with the requirements of the Final Deal agreement.
- 10.2. The project plans to extend existing business as usual investment by the councils in the region, which has also been funded by Welsh Government. A funding agreement has been prepared by the Host Authority for participating councils to confirm requirements in the use of the supported network. Councils will remain responsible for operating the network in compliance with the Subsidy Control Act, for example, where third parties are engaged to support network delivery.
- 10.3. Should the Board approve the Business Justification Case, funding agreements will need to be entered into by Cyngor Gwynedd (as host authority on behalf of the Board) and each participating council. The funding agreement will set out the conditions of funding.

## 11. IMPACT ASSESSMENTS

- 11.1. An integrated impact assessment (Appendix 2) has been undertaken to assess the impact of the project on the Welsh Language, equalities and against the Future Generations Act. No negative impacts were identified through the assessment.



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**APPENDICES:**

- Appendix 1** LPWAN Business Justification Case  
**Appendix 2** Integrated Impact Assessment  
**Appendix 3** Supporting information LoRaWAN

*\* The LPWAN Business Justification Case Appendices are not included as part of the pack, but are available as supplementary documents that can be requested from the Portfolio Management Office.*

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**STATUTORY OFFICERS RESPONSE:**

**i. Monitoring Officer – Host Authority:**

“The submission of the BJC for consideration and approval by the Board is a key step in the implementation of the Growth Deal. The report properly highlights the risks and elements which will need to be considered. The proposed governance arrangements appear appropriate and proportionate for the project. We will work with the Portfolio Director to establish the funding agreements as the scheme progresses.”

**ii. Statutory Finance Officer (the Host Authority’s Section 151 Officer):**

“The documents submitted show that very detailed work has been undertaken in the preparation of this Business Justification Case. I believe that the relevant financial and non-financial risks have been properly addressed, and appropriate mitigation arrangements are in place, or have been outlined.

I am satisfied with the financial accuracy of the information that has been submitted in the Business Justification Case and the covering report. I can confirm that the Growth Deal funding package is capital only.

Therefore, on the basis of the evidence I have seen, I have no objection to the decisions sought.”