

Leveraging IoT Telemetry for Vulnerable Citizens – WM5G Strategy and Opportunities

Executive Summary

West Midlands 5G (WM5G) is a UK government-backed innovation body driving advanced wireless and IoT solutions to improve public services. In partnership with local authorities, WM5G has deployed smart devices and IoT sensors in the homes of vulnerable citizens (elderly and disabled residents) to support independent living ¹. Years of collected sensor and telemetry data present a unique opportunity to transform health and social care delivery. Key opportunities include predictive health alerts, proactive social care interventions, and data-driven service planning – all of which can improve outcomes and reduce costs. By leveraging this data responsibly, WM5G and its partners can realise significant value (e.g. fewer hospital admissions, optimized care visits ²) while upholding strict data governance and ethics. The following report details WM5G's context, strategic use cases for the data, value pathways (including monetisation in a public context), real-world case studies, and recommended next steps to unlock and demonstrate the value of these initiatives.

Background: WM5G and Smart Care Initiatives

WM5G's Role and Mission: West Midlands 5G (WM5G) is a subsidiary of the West Midlands Combined Authority, established as the UK's first regional 5G testbed. Its mission is to accelerate digital connectivity and demonstrate how 5G and IoT technology can drive economic growth and societal benefits ³. WM5G works across public and private sectors to pilot new use cases in smart cities, transport, manufacturing, and healthcare. A core focus is showing how advanced wireless networks and IoT solutions can “transform productivity, create skilled jobs, and improve health and wellbeing” in the region ⁴. WM5G has developed a proven model of partnering with local authorities, telecom providers and government to deploy infrastructure and innovative applications in compliance with regulations ³.

Health, Social Care and Vulnerable Populations: Under its Health & Care workstream, WM5G has spearheaded “Technology Enabled Care” programs aimed at supporting elderly and vulnerable citizens. By using IoT sensors and voice-activated technologies in homes, coupled with culture-change training for care staff, WM5G's pilots have enabled tailored care packages that help residents live safely and independently at home for longer ⁵. These solutions shift care from a reactive model (responding to emergencies) to a preventative model – detecting issues early and intervening before crises occur ⁵ ⁶. For example, traditional pendant alarms summon help after an incident, whereas the West Midlands TEC solution offers *bespoke packages of up to 50 different smart devices* to **proactively** support an individual's needs and wellbeing ⁶. Deployed devices include fall detectors, smart doorbells, wearable health monitors, voice-assistants (e.g. smart speakers), and other remote sensors tailored to each person ¹. These tools generate continuous telemetry (e.g. movement, vital signs, environmental conditions), creating a rich dataset for understanding each person's daily patterns and risks.

Implementation and Partners: The initial technology-enabled care trial launched in 2021–2022 with WM5G working alongside adult social care teams in Wolverhampton, Birmingham, and Coventry City Councils ⁷. Public funding has been critical – the program began under the UK Government's 5G

Testbeds and Trials initiative and later became part of the **5G Innovation Region (5GIR)** scheme. The West Midlands was designated a 5G Innovation Region in 2023, securing **£3.8 million** from the Department for Science, Innovation and Technology (DSIT) to scale these health and smart community use cases ⁸. WM5G leads delivery in partnership with the local councils and NHS Integrated Care Boards, aligning with national priorities for digital health and social care ⁷ ⁹. By 2024, the program had equipped over 350 citizens with IoT-based care packages across the West Midlands ². Focus populations include older adults (65+), as well as people with learning or physical disabilities who have care and support needs ¹⁰. This regional testbed not only provided direct support to participants, but also generated **several years of sensor data** on daily living patterns, health indicators, and care interventions.

Public Funding and Smart City Context: WM5G's initiatives tie into broader smart city and digital inclusion programmes. The West Midlands was earlier a **5G Urban Connected Communities** testbed (part of a national programme by DCMS) which established much of the 5G infrastructure and initial use cases in 2019–2021. Additionally, WM5G collaborated with the **5SPRING** accelerator (a consortium of Telefonica O2, Deloitte, Wayra and Digital Catapult) to spur 5G innovation in public services, including challenges around health, social care and public safety ¹¹ ¹². Beyond health, the “smart communities” remit also covers social housing – for instance, WM5G deployed **connected sensors in council homes to monitor damp, mould and heating** issues, preventing environmental hazards for vulnerable residents ¹³. Voice-activated hubs (smart speakers) have been introduced to improve digital inclusion and assistive services for those who may be socially isolated ¹³. These efforts are backed by public funds (including regional devolution deals for Smart Cities and Innovate UK/UKRI support) and align with the UK's agenda to modernise adult social care through technology. In summary, WM5G provides the connectivity, project management, and innovation ecosystem to harness IoT in service of vulnerable populations, working hand-in-hand with councils and care providers.

High-Value Use Cases for IoT Sensor Data

WM5G's trove of IoT sensor and telemetry data can unlock numerous high-impact applications in public health and social care. The following are **key use cases** (with context and impact) that illustrate how this data can be leveraged:

- **Predictive Health Alerts & Fall Prevention:** Real-time data from motion sensors, fall detectors and wearables can trigger alerts if a person's activity deviates from normal patterns (e.g. a sudden fall or prolonged inactivity). Instead of waiting for an emergency call, carers can be notified early to check on the individual – potentially preventing serious injuries or escalations. WM5G's trials have already shown that this proactive approach helps *reduce hospital admissions* by addressing issues before they require acute care ². For instance, if a bed sensor detects an elderly person hasn't risen by their usual time, a carer could be dispatched to prevent a possible health incident. Early intervention not only protects the individual's health but also averts costly ambulance call-outs and admissions.
- **Optimised Care Visits and Resource Allocation:** By analyzing sensor data trends, councils can **optimize home care schedules and target resources** where they are most needed. IoT telemetry reveals when and where a vulnerable resident might require extra help – for example, increasing nighttime bathroom visits might signal a need for more frequent check-ins. In the West Midlands pilot, using data-driven insights led to *more efficient care delivery*, with **optimized carer visits** and a shift from time-based routine visits to needs-based visits ¹⁴. This ensures overstretched social care teams use their time effectively, focusing on high-risk individuals, and can reduce unnecessary visits for those managing well (saving staff hours and council budgets).

Importantly, such optimisation maintains or improves quality of care while helping local authorities balance rising demand against tight budgets ¹⁵ .

- **Early Intervention for Deteriorating Health:** Longitudinal data streams (e.g. daily activity levels, sleep patterns, heart rate from wearables, weight or nutrition logs) can be mined for **early warning signs** of health decline. Predictive analytics can flag subtle changes – such as a steady decrease in mobility or a irregular vital signs – that precede a health crisis. This enables healthcare and social services to intervene early with a GP visit, physiotherapy, or other support before the condition worsens. In Luton, for example, the council integrated telecare sensor data with NHS records to identify frailty sooner; this *personalised prevention* approach is projected to save **£2.7 million in hospital costs** by avoiding emergency admissions ¹⁶ . For WM5G, similar use of machine learning on the gathered sensor data could power a “frailty index” or risk score for each individual, prompting preventative action (like adjusting medications or providing mobility aids) and thereby improving long-term health outcomes.
- **Medication Adherence and Safety Monitoring:** IoT data can support medication compliance and safety for vulnerable people. Smart pill dispensers or medication reminder devices (paired with connectivity) can log when doses are taken or missed. These data help care teams ensure individuals take medications on schedule, preventing health complications. Additionally, sensors like stove monitors or smart gas detectors protect those with cognitive impairments from accidents. Evidence from Liverpool’s 5G health trial demonstrated striking benefits: **medication errors dropped by 51%**, medication costs fell by half, and overall health outcomes improved when remote pharmacy monitoring (like the “PAMAN” digital medication service) was implemented ¹⁷ ¹⁸ . By deploying similar solutions, WM5G could reduce adverse drug events and emergency calls (e.g., due to missed doses), leading to safer independent living and lower healthcare utilisation.
- **Home Environment & Wellbeing Monitoring:** Many health issues are linked to living conditions. IoT environmental sensors can continuously monitor factors like temperature, humidity, air quality, and noise in the homes of vulnerable citizens. The data can reveal problems such as inadequate heating, risk of damp or mould growth, or unsafe humidity levels – all of which can exacerbate respiratory conditions or general health. Through the 5G Innovation Region program, **sensors for damp, mould and heating have been installed in social housing** across the West Midlands ¹³ . When thresholds are breached, alerts can prompt preventative maintenance (e.g. repairing ventilation or providing a dehumidifier) to avert health hazards. Maintaining a healthy home environment keeps residents well and can prevent hospitalizations (for example, avoiding mould-induced asthma attacks or hypothermia in winter). Beyond physical health, **smart lighting or speaker systems** can be used to simulate daily routines and provide cognitive support (important for those with dementia or learning disabilities). Overall, environment monitoring data helps local authorities ensure housing conditions support the wellbeing of their most vulnerable, aligning with both health and housing objectives.
- **Social Isolation Detection and Support:** Loneliness and isolation are major risk factors for deteriorating mental and physical health in vulnerable populations. IoT devices can indirectly indicate social engagement – for instance, minimal door opening or movement over days might suggest an individual has few interactions or is struggling to get out. Smart speakers and connected devices (like voice assistants) not only provide companionship (through voice interaction or entertainment) but also log usage patterns that could signal changes in routine or mood. WM5G’s use of **voice-activated technologies in care** is partly aimed at improving digital inclusion ¹³ ; the data from these interactions (adhering to privacy rules) could help carers

identify who might benefit from a friendly visit or community activity. A possible use case is an “AI companion” that detects signs of depression or confusion in a person’s voice and alerts a social worker. While still emerging, such data-driven social care could mitigate isolation, improving mental health and reducing reliance on acute services (for example, preventing depression-related declines or cognitive issues).

- **Demand Forecasting for Health & Social Care:** Aggregating IoT data across hundreds of participants can yield powerful insights for **population-level planning**. Local councils and health services could analyze trends (e.g. frequency of falls, average activity levels, environmental issues) by neighborhood or demographic group to predict where demand for care will rise. For instance, if data shows a cluster of homes with increasing fall alerts in one district, the council can proactively bolster fall-prevention programs or assign additional care staff there. Predictive modeling on the regional dataset might forecast the future **social care load** – enabling resource planning and budget allocation to be more evidence-based. This was exemplified by Greater Manchester’s recent 5G smart communities pilot, which combined IoT data from social housing to inform service delivery at scale ¹⁹. By using data to anticipate needs (such as identifying which patients are likely to require hospital admission in the next month), WM5G can help partners shift to a forward-looking model. The impact is better continuity of care, avoidance of crises, and cost savings through efficient commissioning of services.

Each of these use cases demonstrates how the **telemetry data can be translated into actionable intelligence**. The common theme is moving from reactive care to proactive, **preventative care** – a transition that yields tangible benefits: improved quality of life for citizens, reduced strain on NHS and council services, and financial savings. Notably, WM5G’s own pilot results already indicate **measurable benefits**, such as fewer emergency hospitalizations, optimized care visits, and a more proactive care approach across the board ². These use cases should be explored in depth to fully capitalise on the rich dataset WM5G has accumulated.

Value Realisation Pathways

Harnessing the IoT sensor data can create value in multiple ways for public sector and partners. While direct “monetisation” of sensitive personal data must be handled with care, WM5G can pursue **value-realisation strategies** that translate data insights into economic and social benefits:

- **Cost Savings and Efficiency Gains:** The foremost pathway is through cost avoidance and efficiency improvements in health and social care delivery. By preventing hospital admissions, reducing falls, and optimizing care visits, the programme saves money for the NHS and local councils. For example, the Liverpool 5G trial projected **~£2,477 per user per year in savings** to health and social care services by deploying IoT-supported care ¹⁷. Likewise, WM5G’s technology-enabled care is helping councils handle rising care demands within tight budgets by **freeing up resources** (e.g. using data to cut down unnecessary visits and focus on preventative care) ¹⁵. These savings can be quantified and fed into business cases – demonstrating, for instance, that an up-front investment in sensors yields a return in reduced emergency service use or delayed entry into residential care. **Released capacity** is another value: Liverpool’s pilot freed **300+ carer hours per user per year** ¹⁷, meaning staff can support more people or spend quality time on each case, effectively expanding service capacity without additional cost.
- **Improved Outcomes and Social Value:** Beyond pound-for-pound savings, the data enables improved citizen outcomes – a core value for public services. High-quality outcomes (healthier, safer, more independent lives) often translate indirectly into economic value. For instance, if IoT

alerts prevent a serious fall, the individual avoids injury and retains independence (which may delay expensive residential care placement). WM5G's trial is *"helping vulnerable residents live more fulfilling lives; reducing preventable hospital admissions and supporting local councils to balance rising demand with tight budgets"* ¹⁵. Improved health outcomes can be measured (e.g. reduction in A&E visits, improvement in well-being scores) and used to justify further funding. Additionally, keeping people independent at home longer can free up hospital beds ("bed-blocking" reduction) and care home spots, yielding system-wide value ²⁰. These improvements strengthen WM5G's case to stakeholders that IoT-driven care is not just a tech demo but a means to achieve policy goals like healthier ageing and community well-being.

- **Public-Private Partnerships and New Services:** The accumulated data (appropriately anonymised) can attract innovation and partnerships with the private sector. WM5G could collaborate with tech companies, startups, or research institutions to develop **analytics platforms or AI services** on top of the data. For example, a startup might develop a predictive health alert system trained on WM5G's dataset, which could then be offered as a service to the NHS or other councils (with revenue or licensing fees shared under a partnership). WM5G could act as an enabler or broker – providing a **testbed and anonymised data sandbox** for companies to create solutions for remote health monitoring, tele-rehabilitation, or smart homecare. Successful tools can then be scaled commercially (with appropriate public sector agreements). This mixed-economy approach ensures that while the data benefits public outcomes, it also spurs economic activity (innovators creating marketable products) in line with WM5G's regional growth mission. Any monetisation in this vein would come from delivering value-added services **derived** from the data insights (e.g. advanced analytics dashboards for care managers) rather than selling raw data.
- **Data for Research and Policy:** An often underappreciated value pathway is making the (anonymised) dataset available for academic research, clinical studies, or policy analysis. Universities and health researchers might be keen to study patterns in the data to, say, validate early indicators of dementia or evaluate the impact of environment on health. WM5G can facilitate **data-sharing partnerships** or a *data trust* model where researchers access the telemetry data under strict governance. The outcomes of such research (funded by research councils or Innovate UK grants) can yield new knowledge, which in turn guides public policy and future services. For instance, analysis might reveal that certain behavioral patterns predict hospitalisation, leading to a new preventative protocol across the NHS. While this doesn't monetize data in a traditional sense, it **amplifies the value** of the data by driving evidence-based improvements nationally. It also strengthens WM5G's reputation and influence as a centre of excellence in digital health, potentially attracting further funding or commissioning from government (e.g. to lead larger scale pilots).
- **Commercialising Scalable Solutions:** If WM5G or its partners develop successful pilot solutions (for example, an AI-driven falls prediction tool or an integrated dashboard for social care), these solutions themselves can be monetised or scaled beyond the region. WM5G could package the methodology and tools from its programme into a **"smart care" solution offering**. Other local authorities or health systems might pay for consultancy or managed services to replicate West Midlands' approach. For instance, a council in another region could implement a similar IoT care model by contracting WM5G (or a spin-off venture) to provide the platform and expertise. This way, the **intellectual property and know-how** gained from the data is turned into a product. Such monetisation must be balanced with WM5G's public mandate, but it aligns with the idea of public-private collaboration: the region's investment yields a model that can be franchised or exported, bringing revenue or further grants back to WM5G and its stakeholders.

In all cases, **ethical compliance and public trust** are paramount (discussed below). Value realisation in the public sector context leans heavily on demonstrating better outcomes and cost-effectiveness, rather than selling data outright. A clear **value narrative** should be crafted for each stakeholder: e.g. for local councils, highlight net savings in social care budgets; for NHS partners, emphasize reduced admissions and improved patient outcomes; for central government (DLUHC or DSIT), show contributions to national targets (like “ageing society” Grand Challenge goals or digital inclusion metrics). By quantifying and communicating these benefits, WM5G can secure ongoing buy-in and possibly unlock new funding streams (e.g. NHS England transformation funds or smart city grants) to sustain and expand the programme.

Data Governance and Ethical Considerations

Any use of vulnerable citizens’ data must adhere to the strongest **ethical and privacy standards**. The telemetry being collected (health-related sensor data, personal daily living information) is highly sensitive, so WM5G and partners need robust governance frameworks to maintain trust and legal compliance:

- **GDPR and Data Protection Compliance:** All personal data collected via IoT sensors falls under the UK GDPR and Data Protection Act. WM5G should ensure there are clear consent processes for participants, specifying what data is collected and how it will be used. Data minimisation is critical – only data necessary for care or agreed analytics should be retained. Identifiable data should be protected with encryption and strict access controls, and any analysis for secondary purposes (like research or developing new algorithms) should use anonymised or pseudonymised datasets. Routine Data Protection Impact Assessments (DPIAs) are recommended to evaluate and mitigate privacy risks for any new use of the data.
- **Ethical Frameworks:** The UK government’s **Data Ethics Framework** provides guiding principles to ensure projects use data appropriately and transparently ²¹. WM5G should apply these principles – for example, being transparent about data use with stakeholders, ensuring data-driven decisions are fair and do not discriminate, and establishing accountability for data practices. The framework encourages public bodies to consider ethics throughout a project’s life cycle ²². In practice, WM5G might convene an **ethical oversight committee** (including council representatives, patient advocates, and data privacy experts) to review its data use cases. This builds credibility that decisions (like introducing a new predictive algorithm) are scrutinised for bias, accuracy, and impact on vulnerable people.
- **Healthcare Data Governance:** Since the use cases straddle health and social care, it’s important to align with NHS data governance standards as well. NHS bodies (formerly NHSX, now part of NHS England Transformation) have published guidelines such as the **NHS Digital Health Technology Standard** and the **DTAC (Digital Technology Assessment Criteria)**, which cover data privacy, clinical safety, and interoperability for digital tools. WM5G’s solutions should meet these criteria if they are to be integrated into health pathways. For example, if sharing data with GPs or hospitals, it must comply with NHS information governance policies (like secure IG Toolkit standards). An ethical use case must also consider clinical oversight – ensuring that any predictive alerts or analytics are validated by healthcare professionals to avoid harm from false alarms or missed issues.
- **Privacy-by-Design and Security:** The design of the IoT platform should continue to follow privacy-by-design principles. This includes securing the devices and network (to prevent hacking of cameras or sensors in people’s homes) and ensuring secure transmission and storage of data.

Role-based access should be enforced so that only authorized care professionals see identifiable information. When deriving insights for broader analysis, techniques like data aggregation and de-identification should be used. WM5G can also reference the ICO's Data Sharing Code of Practice for handling data sharing between councils, health providers, and any third-party tech companies in a compliant manner ²³. Cybersecurity is an ethical issue too – any breach could undermine public trust significantly – so investing in strong security and regular audits is non-negotiable.

- **Consent and User Trust:** Vulnerable citizens (and their families or carers) should be kept at the center of the data governance approach. This means obtaining informed consent for data collection and giving individuals (or their legal guardians) appropriate control or opt-out options. It also involves communicating the benefits of the data use back to participants – for example, showing how the data has helped improve their care or community services. Building this trust will encourage continued participation and honest data (e.g., people won't unplug sensors out of mistrust). Additionally, ethical use includes ensuring **no harm** comes from the data usage: for instance, avoiding any scenario where data could be misused to cut someone's services unfairly or invade their privacy. WM5G can adopt ethical charters such as the **UK Data Ethics Framework's** emphasis on fairness, transparency, and accountability to publicly reassure stakeholders that the data of vulnerable individuals is handled with utmost care and for their benefit ²¹.
- **Compliance Reporting and Stakeholder Oversight:** Regular reporting on data use and outcomes to stakeholders like the councils, NHS partners, and perhaps the Department for Levelling Up, Housing & Communities (DLUHC) will reinforce accountability. By sharing metrics on how data-driven interventions are performing – along with any privacy incidents or how they were mitigated – WM5G can demonstrate a mature governance posture. Engaging with independent bodies or ethics panels for evaluation can further validate that the project is compliant and ethically sound. For example, publishing a **data ethics assessment** or joining the Open Government partnership on responsible data could be valuable for transparency.

In essence, treating the IoT telemetry data with the same seriousness as medical data is crucial. By following legal mandates like GDPR and embracing frameworks like the UK Data Ethics Framework, WM5G will ensure that its innovative use of data does not outpace the public's comfort. This balanced approach will give stakeholders – from vulnerable residents to institutional partners – the confidence that value is being created **responsibly** and in line with societal values.

Real-World Case Studies and Examples

To ground this strategy in proven outcomes, below are brief case studies from the UK that highlight successful use of IoT and data in similar contexts, along with the benefits achieved:

- **Liverpool 5G Health and Social Care Trial (2018–2022):** Liverpool ran the UK's first 5G-supported health and social care testbed in a deprived community (Kensington). They deployed a private 5G network and IoT devices (such as vital sign monitors, medication dispensers, and telecare sensors) to support frail elderly and patients with chronic conditions ²⁴ ²⁵. The outcomes were compelling – the project demonstrated **measurable improvements in patient health and care efficiency**. According to published results, the 5G trial led to potential savings of around **£2,500 per user per year** for health/social care services, by reducing hospital visits and enabling more care at home ¹⁷. It also **freed up over 300 care hours per person annually** (through remote monitoring replacing some in-person checks) ¹⁷. Clinical outcomes improved:

there was a documented reduction in falls and hospitalisations among participants, and a 40% increase in service users who “felt more independent” thanks to the technology support ²⁶ . Medication adherence was enhanced via an IoT pharmacy solution, cutting medication errors by half ¹⁸ . A key takeaway is that a dedicated wireless infrastructure combined with IoT can bridge the digital divide for vulnerable groups and produce quantifiable benefits in care quality and cost – lending credibility to WM5G’s similar efforts. Liverpool’s success has informed a white paper on “civic networks” and is influencing how other regions view the business case for investing in digital care platforms ²⁷ ²⁸ .

- **Luton Council – Predictive Analytics for Adult Social Care (2020):** Luton, as part of an NHS Digital social care programme, pioneered a data-driven approach to identify frailty risks in the community. They integrated *Telecare* data (e.g. falls and alarm alerts from home sensors) with health records to build a “**Framework for Frailty**” that flags early signs of decline ²⁹ . By un-siloing data between social care and healthcare, professionals got a more holistic view of each person’s status. This enabled multi-disciplinary teams to target interventions (such as physiotherapy, extra home support, or GP reviews) before incidents occurred ³⁰ ³¹ . The projected impact was significant: Luton estimated **£2.7million in potential savings for hospitals** due to reduced emergency admissions, attributable to this predictive, preventative approach ³² . In practice, this meant fewer people reaching crisis point (for example, a frail senior getting a fall prevention intervention instead of ending up in A&E with a hip fracture). The case study underscores the value of *data integration and analytics* in social care – a relevant model for WM5G as it seeks to derive insights from its telemetry data. It shows that even without 5G, just combining data and applying predictive models can yield both health benefits and financial savings, by enabling early, targeted care.
- **Greater Manchester – IoT in Social Housing and Care (2021–Present):** Greater Manchester Combined Authority (GMCA) has also invested in advanced wireless and IoT solutions for community benefit, under a 5G Innovation project parallel to West Midlands’. One focus in GM has been on **smart social housing** – fitting homes with sensors for building management (like energy use and air quality) alongside health and assisted-living devices. A “*place-based model*” in GM combined multiple use cases (e.g. mould detection in homes, remote health monitoring, digital education access) to support vulnerable residents in public housing ¹⁹ . The integrated approach aimed to improve quality of life while tackling issues like fuel poverty and climate goals (by using energy-efficiency data). Early pilots connected hundreds of devices (including **air source heat pumps** and IoT monitors) and created “*connectivity corridors*” using 5G to carry data for city services ³³ ³⁴ . The outcomes reported include progress toward net-zero targets and improved safety/comfort for residents. While quantitative health results in GM are still being collected, the initiative is notable for combining healthcare aims with other smart city objectives (housing, energy, transport) in a holistic manner ³⁵ ³⁴ . For WM5G, this illustrates that the value of IoT data can extend beyond individual care – it can inform broader policy outcomes (like safer housing and environmental health). It also shows a path to scale: Greater Manchester is actively scaling successful pilots across its boroughs, guided by resident feedback and multi-sector partnerships ³⁴ . The cross-sector benefits (health, environment, economic growth) strengthen the justification for continued investment in such technologies.

These case studies reinforce the credibility of WM5G’s direction. They provide evidence that IoT-collected data, when harnessed intelligently, **leads to real-world benefits**: cost reductions, improved care quality, and better experiences for vulnerable people. Liverpool’s trial in particular offers hard numbers and a reference model (the creation of a dedicated network and ecosystem) that WM5G can cite when engaging stakeholders. Luton’s example highlights the importance of data sharing and predictive analytics to get upstream of problems – aligning with WM5G’s goal of proactive care. And

Greater Manchester's project suggests that WM5G is at the forefront of a national movement; other major regions are pursuing similar solutions, so there is an opportunity for collaboration and shared learning (perhaps via the UK Telecoms Innovation Network or through joint bids for funding). By referencing these successes, WM5G can boost stakeholder confidence that **leveraging IoT data in social care is not speculative** – it is already delivering tangible value elsewhere, and the West Midlands can build on these proven approaches to become a leader in smart, connected care.

Recommendations and Next Steps for WM5G

To fully realise and demonstrate the value of the collected IoT sensor data, we recommend WM5G pursue the following steps:

- **1. Deep-Dive Data Audit & Strategy Definition:** Conduct a thorough audit of the telemetry data gathered so far (types of sensors, data quality, frequency, storage) and identify which data streams correlate most with key outcomes (hospital admissions, falls, well-being scores, etc.). Use this to define a clear **data strategy** focusing on high-impact analytics. For example, if motion sensor data combined with fall alerts is predictive of hospitalisation, prioritize developing that predictive model. Establish what success looks like for each use case (e.g. a fall prediction model that can predict 8 out of 10 falls at least 1 day in advance). This strategy phase should involve data scientists and domain experts, ensuring that the approach is evidence-based and aligned with care priorities.
- **2. Stakeholder Engagement and Co-Design:** Proactively engage the key stakeholders – local authority social care leaders, NHS Integrated Care Boards, DLUHC representatives, care providers, and even service users or advocates – to co-create the roadmap for using the data. Hosting workshops or “data innovation days” can help surface stakeholder questions and ideas. For instance, councils might want data insights on **social care demand forecasting**, while NHS partners might be keen on **preventative health alerts**. By involving them early, WM5G can tailor use cases to actual needs and secure buy-in. This co-design process also helps in identifying any concerns (e.g. clinicians may worry about false alarms from predictive systems – their input can shape how alerts are validated). The output of engagement should be a set of **use case prototypes** that stakeholders agree are valuable and feasible. Additionally, communicate the envisioned benefits in stakeholder-specific terms: e.g. for a council finance director, highlight potential cost savings; for an NHS clinician, emphasize improved patient outcomes; for DLUHC, connect the project to broader social care improvement and innovation agendas.
- **3. Pilot Projects for Analytics and AI:** With use cases defined, initiate **targeted pilot projects** to develop and test data analytics solutions. For example, a pilot could focus on a “Falls Risk Prediction” model using historical sensor data from the past 2 years for a subset of users, deploying it live to see if it can successfully alert and reduce incidents. Another pilot might create a dashboard for care managers that synthesizes various IoT readings into a single wellbeing score updated daily. Leverage partnerships for these pilots – local universities (e.g. University of Birmingham's data science or healthcare research departments) or innovation firms from the 5SPRING program could contribute expertise in machine learning and user interface design. Each pilot should run with clear metrics and an evaluation plan (e.g. did predictive alerts correlate with timely interventions? Did the dashboard users report better decision-making?). Within a short timeframe (3-6 months), aim to generate **initial results data** from these pilots that can be shared as proof-of-concept. Quick wins will build momentum – for instance, showing that a

predictive model identified 10 high-risk individuals and 8 of them indeed needed medical attention, thereby avoiding more severe outcomes.

- **4. Strengthen Data Governance & Ethics Oversight:** As these pilots and expanded data uses roll out, formalise the governance structures. WM5G should establish a **Data Governance Board or Steering Group** if not already in place, including data protection officers from the councils and NHS, ethics advisors, and perhaps an independent expert. This group would review all new data initiatives for compliance and ethics, ensuring alignment with GDPR and the **UK Data Ethics Framework** principles ²¹. Implement any recommended enhancements like updating consent forms to cover new analytical uses, improving anonymisation protocols, or adjusting data retention policies as needed. Also, consider publishing a **transparent report or blog series** about how data is being used and safeguarded – this can help demonstrate to external stakeholders (and the public) that WM5G is a responsible custodian of sensitive data. By proactively addressing ethical considerations now, WM5G will pave the way for smoother scaling and reduce the risk of public pushback or legal hurdles later.
- **5. Develop a Robust Business Case and Sustainability Plan:** In parallel with technical pilots, WM5G should crystallise the **business case** for long-term investment in this data-driven approach. This involves quantifying benefits like those discussed (e.g. X% reduction in hospital admissions equals £Y saved for NHS; improved home care efficiency equals £Z saved for councils; quality-of-life improvements measured through surveys, etc.). Leverage the findings from both internal pilots and external case studies (Liverpool, Luton, etc.) to put credible numbers on the value proposition ¹⁷ ¹⁶. The business case should outline the costs of scaling (e.g. more devices, analytics infrastructure, training care staff to use new tools) against the projected savings and outcomes. Since public-sector decision-makers often require HM Treasury-style justification, include both cashable savings (direct budget impacts) and non-cashable benefits (like health outcomes, which can be given a proxy economic value). Additionally, address the **sustainability** aspect: propose how this initiative can be funded and sustained beyond the initial grants. Options might include pooling budgets between health and social care (since both benefit), seeking additional grant funding (Innovate UK, NHS Transformation funds, or a possible expansion of the 5G Innovation Region funding given success), or even revenue from partnerships (if a commercial model is viable for certain components). The business case will be crucial for convincing stakeholders such as NHS Trust boards or council cabinets to endorse and adopt these solutions region-wide.
- **6. Showcase Value and Scale Up:** Lastly, plan for demonstrating and scaling the proven solutions. Once pilots show positive results, WM5G should create **compelling case study materials and dashboards** to showcase the impact to all stakeholders – this could include testimonies from participants (e.g. a story of an older adult whose smart sensors alerted clinicians and prevented a hospital trip), data visualisations of before-and-after metrics, and independent evaluations (perhaps by an academic partner or third party). Arrange demo days or executive briefings where council leaders, NHS executives, and relevant government departments (DSIT, DLUHC, DHSC) can see the technology in action and review the evidence. The goal is to secure their commitment to expanding the program. Scaling might involve onboarding more local authorities (the West Midlands has seven metropolitan councils – ensure all are engaged as the program grows beyond the initial three) and integrating the system with mainstream services (for example, linking alerts directly into NHS 111 or council call centers). WM5G can position the West Midlands as a **national leader in smart assisted living**, which could attract further public-private investment. Engaging with national bodies (like the Local Government Association, NHS England, or the Academic Health Science Networks) to disseminate lessons learned will also bolster credibility. Through 2025 and beyond, WM5G

should incrementally roll out the solution to more citizens, monitor outcomes continuously, and iterate on the technology and processes. By demonstrating value at each step, the initiative will build the case for long-term adoption as a standard part of adult social care services.

By following these steps, WM5G can transition from a successful pilot to a sustainable, impactful program that fundamentally improves how vulnerable citizens are cared for. It will also create a template that can be replicated in other regions – an outcome that fits WM5G's broader mandate to drive innovation across the UK. The combination of a strong evidence base, engaged stakeholders, ethical integrity, and a clear business case will allow WM5G to not only **demonstrate value to its stakeholders** but also secure the necessary support and resources to keep innovating. In summary, WM5G stands at the cusp of translating data into life-changing interventions, and with careful strategy and collaboration, it can ensure that years of collected IoT telemetry truly deliver **“way more greater care, closer to home”** ³⁶ for those who need it most.

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