Smart Cities Pitchbook

Contents

Foreword

It gives me great pleasure to present this pitch book. By 2050, more than 6 billion people will live in urban areas.

The Rt Hon Ed Vaizey
Minister of State for Culture and Digital Economy

For this growing urban population to live well and prosperously, we will need the world's cities to work better than they do now.

This is one of the great challenges of the 21st century. It is also a great opportunity, and UK cities and companies are ready for that. The projects outlined here in this pitchbook show UK cities and companies working together to deliver major innovations.

The UK has developed best practice in engineering, design, architecture, the digital economy, finance, legal and insurance. We have a strong research base with some of the best universities in the world.

UK cities are innovating in intelligent transport, connected healthcare, environmental sensing (including for flooding and air quality) and other areas that can show the way for cities worldwide. UK cities are creative, secure, innovative places to invest, and this is a great time to work with us.

Our global urban innovation centre, the Future Cities Catapult and our City Standards Institute are successfully helping city leaders create smarter cities. We have an Internet of Things City Demonstrator launching in Manchester.

London was the first global modern city. The UK continues to be a leader in designing and creating the cities of the future. I hope you will take advantage of these exciting new opportunities and together, we can build the smart cities of the future.

Introduction to Smart Cities

Around the world today, we are witnessing the biggest rural-urban migration in mankind's history.

With over 80 per cent of global GDP generated in cities, forecasts show that there will be 30 'mega cities' worldwide by 2020 and increasing demand for the concept of the 'smart city' as a way of providing a better quality of life and more sustainable living.

Smart City technologies use cross-sectoral solutions to address key urban challenges. Our cities are already becoming living and learning environments which record data on everything from traffic, air quality, energy usage, occupancy and activities over time, to security and environmental change.

There's a huge opportunity, right now, to develop liveable and resilient urban infrastructure using smart financing and business models, in order to make sure that our cities are healthy and successful. The global Smart Cities market is valued at more than £900 billion by 2020 and there's an estimated global infrastructure investment of £25 trillion required over the next 20 years to ensure sustainable urban futures.

With government plans in place in China, Brazil, India, Dubai, and Singapore to create the smart cities of the future, the UK is perfectly positioned to lead this innovative work. We are a world leader in providing solutions to make cities smart. Our expertise is focused around the convergence and integration of healthcare, transport, energy, smart grids, the built environment and digital media. We have particularly strong international expertise in smart city engineering consultancy, design and planning.

The purpose of this pitchbook is to be a 'one-stop shop' for UK expertise in Smart Cities: here you can find exciting Smart City projects in the UK needing investment, and some of the UK's most innovative companies looking to export their skills to the rest if the world. It brings together the UK's top architects, engineers, designers, academics, business professionals, and our supply chain, all of whom want to transform cities on a global scale.

The projects and opportunities listed in this pitchbook offer innovative solutions to improve quality of life, strengthen economies and protect the environment in urban settings.

I hope that many of you will take advantage of these and other opportunities in the UK Smart Cities market. I look forward to working together to turn excellent urban innovations into commercial reality.

Sir Michael Bear
UK Special Envoy for Sustainable Urbanisation to China

What is a Smart City?

The global economy is changing. The advance of information technology and big data has transformed the way we live.

Disruptive technologies have revolutionised many of the services we use, transforming the way we work, communicate, shop and travel. These technologies have allowed providers to reimagine the way that people interact with their services, making them more accessible and more responsive to real-time demand. In the same way, Smart Cities reimagine the way that citizens interact with the urban landscape, using cutting-edge technologies to create more efficient urban systems and better informed citizens.

A Smart City uses intelligent technology to enhance quality of life in urban environments, for instance by minimising waste, optimising energy usage, or reducing congestion. This is made possible by the Internet of Things, the networked connection between everyday objects, which means that nearly all elements of the urban landscape - including transit networks, energy grids, lighting systems and parking monitors – can wirelessly broadcast their state and activity in real-time. Although new hard infrastructure is sometimes required, these systems can often be superimposed on existing infrastructure through the installation of cheap and discreet sensors. The resulting smart infrastructure is dynamic and reflexive, monitoring its own operation, predicting faults before they occur and optimising the delivery of resources or services to match demand.

Today's cities need to adapt in order to respond to the global challenges of climate change, population growth, demographic change, urbanisation and resource depletion. The development of information and communications technologies presents an opportunity to transform the vulnerable power-hungry metropolises of today into the resilient low-carbon cities of the future. What's more, we already have the necessary tools to deliver Smart Cities. Most urban citizens are already equipped with smartphones and tablets, enabling them to access information about their urban environment, and even shape that environment by interacting with other smart technologies around them.

In this way, Smart Cities will be interactive, engaging citizens through audio-visual displays and interfaces, installations, websites and systems, overlaid onto the existing city.

The rise of Smart Cities will mean the rise of a new class of urban dweller – the Smart Citizen. Smart Citizens are not only engaged and informed about the relationship between themselves and their urban environment, but are put in control of that relationship – for instance providing feedback on the quality of services or the state of roads and the built environment. Smart Cities empower their citizens to continuously improve the urban environment, attracting more innovation, and making these cities desirable places to live, work and visit.

The growth of the global Smart Cities market

In 1950, 30 per cent of the world's population was urban, and by 2050, 75 per cent of the world's population is projected to live in cities.

This means that by 2050, the world will be roughly the reverse of the global rural-urban population distribution of the mid-twentieth century. With the world's population expected to reach 9.7 billion in 2050, this means there will be around 7 billion people living in cities - a huge market for Smart City products and services.

The Smart Cities market is forecast to be worth more than GBP 900bn by 2020, equivalent to the 12th largest nation on earth, in terms of GDP. Further, it is estimated that the top 750 Smart Cities will generate two-thirds of the world's GDP by 2030.

Smart Market equivalent to 12th largest GDP by 2020:

1	US	$16.6 tn
2	China	$9.1
3	Japan	$4.9
4	Germany	$3.7
5	France	$2.8
6	UK	$2.6
7	Brazil	$2.2
8	Italy	$2.1
9	Russia	$2.0
10	India	$1.9
11	Canada	$1.8
12	**Smart Cities**	**$1.5**
13	Australia	$1.5
14	Spain	$1.3

Factors that have led to a surge in demand for 'Smart' services:

• Global urbanisation trends, three-quarters of the world's population to live in cities by 2050.

• The need for urbanisation to be sustainable and resistant to environmental pressures such as climate change.

• Growth of a global urban middle class, with correspondingly high expectations of public services and the quality of the urban infrastructure and environment.

• Information pressure', i.e., the need to solve problems using data is increasing as 33% of the world has access to Internet. This has resulted in rapid development of 'Internet of Things' and driven the need to put monitors and meters on devices and plug them in to the network.

How will Smart Cities be delivered?

Cities are real-time systems, and a Smart City is made up of several smart systems. An intelligent city will have smart physical, social, institutional and economic infrastructure in a sustainable environment, with its citizens at the centre of these systems.

- Smart grids
- Flexible energy distribution
- Metering management and demand response
- Renewable energy
- Pollution management
- Waste management
- Flood management

Smart energy and environment

Smart buildings and housing

- High performance buildings
- Energy efficiency
- Security solutions
- Home energy management
- Integrated smart grid

Smart Governance

- Big Data/Information Management
- Information Security
- Urban planning
- Citizen collaboration
- Behavioural Insight

Smart Citizen

Smart Infrastructure

- Internet of things
- Sanitation and drainage
- Internet and telephony
- Public safety
- Video surveillance
- Emergency management

Smart Health

- Smart hospitals
- Emergency services
- Health monitoring
- Assisted living
- Tele-health
- Tele-care

Smart Mobility

- Improved access
- Integrated mobility
- Traffic management
- Congestion management
- Smart parking

UK expertise in Smart Cities

The UK economy has already made the transition from an industrial economy to a post-industrial economy. Now we're leading the way in the transition from a post industrial economy to a knowledge economy.

UK companies are world leaders in Smart City products and services, and are keen to export these skills abroad to assist the rest of the world in improving their own cities.

UK expertise in the Smart Cities sector includes:

Urban design, planning and architecture
- UK architecture firms – 67,000 jobs, 12,000+ enterprises, £6 billion turnover in 2015.
- UK developed BREEAM green building standards and Building
- Information Management (BIM) software used internationally

Infrastructure, engineering and construction
- UK civil engineering firms – 197,000 jobs, 19,000+ enterprises, £39bn turnover.
- UK construction and civil engineering firms lead major urban infrastructure developments worldwide

Data, software and analytics
- UK ICT industry – 1.3 million jobs, contributes 8% of the country's GVA
- UK is a world leader in urban open data and spatial data analysis, modelling and visualisation

Project management, financing and real estate
- UK professional and business services are very competitive in world markets, with a share of exports to developed (OECD) economies of 12%, second only to the US
- UK strengths applied in global context for major infrastructure and urban development financing and project delivery

Public engagement and service design innovation
- UK firms providing innovative user-centred service design solutions worldwide
- UK cities and civic organisations reinventing citizen engagement with city-making processes

The UK companies listed in this pitchbook are leaders in each of the six 'Smarts' that make up a Smart City.

These companies are already helping their clients in cities in the UK and abroad to improve economic performance, resource efficiency, climate change mitigation, operational efficiency and to deliver a greater place to live and work.

The following companies provide a snapshot of UK Smart Cities capability. They represent where innovative thinking and practical creativity are being brought together. They have an understanding of how cities themselves operate and have experience of working with new and established cities alike.

You will find details of the companies themselves and how to contact them. You will also get an insight into how they have met challenges head on, and the technologies and services they developed to do this.

Supported by UK Trade & Investment, the Government Department that helps UK-based companies succeed in the global economy and assists overseas companies to bring their high-quality investment to the UK, these companies and more are leading the way in bring UK Smart Cities expertise to the world.

UK Company Profiles

Key

Smart Health

Smart hospitals, Emergency services, Health monitoring, Assisted living, Tele-health, Tele-care

Smart Mobility

Integrated mobility, Traffic management, Congestion management, Smart parking

Smart Governance

Big Data/Information Management, Information Security, Urban planning

Smart Buildings & Housing

High performance buildings, Energy efficiency, Security solutions, Home energy management, Integrated smart grid

Smart Infrastructure

Internet of things, Sanitation and drainage, Internet and telephony, Public safety, Video surveillance, Emergency management

Smart Energy/ Environment

Smart grids, Flexible energy distribution, Metering management and demand response, Renewable energy, Pollution management, Waste management, Flood management

Smart Citizenship

Citizen Collaboration, Behavioural Insight

Kinetic flooring technology that generates renewable electricity

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The Company

Pavegen is a leading pioneer in the drive for smart energy and footfall tracking solutions within concentrated cities. It is a versatile custom-built flooring system and the global leader in harvesting and storing energy from human footfall. By generating electricity when and where it is needed as well as providing crucial real-time data analytics, Pavegen is currently installed in over 30 countries across various sectors including retail, transport, airports and public spaces.

The Challenge

Every week 1.5million people join the urban population. That's the equivalent of two people, moving into cities, each second. Rapid urbanisation means that meeting the energy demand requires a new innovative solution in the renewables mix of the future. Real estate for solar panels is diminishing, and wind tunnelling from high-rise infrastructure makes traditional renewables ineffective.

The Solution

Pavegen have developed a kinetic flooring technology that generates renewable electricity and crucial data analytics, whilst combining the physical, digital, and human components of a Smart City - through the power of a single footstep. The electricity generated from Pavegen can power applications including LED lighting, signage, phone charging and enable wireless communication networks with devices and building management systems.

The Opportunity

- generation of live granular footfall counting

- effective energy harvesting solution for cities

- commercially viable low-maintenance footfall or vehicle-power generation

SIEMENS

Advanced methods of transporting bulk green power over long distances

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The Company

Siemens is a global powerhouse in electronics and electrical engineering, operating in the fields of industry, energy and healthcare as well as providing infrastructure solutions, primarily for cities and metropolitan areas. For over 165 years, Siemens has stood for technological excellence, innovation, quality, reliability and internationality. Siemens is one of the world's largest providers of environmental technologies, operating in over 200 countries.

The Challenge

Siemens aims to tackle the world's most challenging engineering issues driven by the megatrends of urbanization, climate change, demographic change by focusing on the areas of electrification, automation and digitalisation. There is a need to secure future energy supplies with renewable energy generation and sophisticated energy management solutions. We aim to ensure secure the supply of clean water, and provide the rail and road solutions to counter the growing trend of urban congestion and air pollution.

The Solution

Siemens works on the efficient transmission of bulk volumes of green power over long distances, enabling dedicated power exchange between power grids and connecting micro grids to manage local assets in a decentralised urban landscape. Siemens has the world leading software which helps customers develop virtual products prior to manufacture to test reliability and our 'Totally Integrated Automation' approach makes Siemens a world leader in the field of manufacturing.

The Opportunity

- comprehensive portfolio of hardware and software products to integrate data from development, production and suppliers.

- transmit large volumes of green power over long distances

- decentralise urban landscapes through advanced power grids

≡ttp

Innovative wireless network which revolutionises smart lighting and energy in cities

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The Company

The engineers and scientists inside TTP play a pioneering role in a broad spectrum of sectors including drug discovery and pharmaceutical automation, bioprocess automation, laboratory instrumentation, wireless communications, digital printing, electric vehicles, digital radio, food and beverage, drug delivery, diagnostics, micro-devices and sensing, and consumer products. We have a team of over 300 scientists, engineers, and business innovators, with in-depth industry expertise, working closely with our clients to turn great ideas into reality. Recent activities in low power wireless networks, novel sensors and data analytics position us well to work in the Smart City sector.

The Challenge

At the moment there are a multitude of 'Smart City' application and service providers, all competing in different silos. Cities often end up investing in different architectures, one for each solution (e.g. parking, smart lighting, and environmental monitoring). This is very inefficient in both use of infrastructure and cost. Solutions in the 'Smart City' sector are all unique, and often one size doesn't fit every problem – each geography has a particular set of requirements.

The Solution

TTP has been working with Mayflower to develop the technology behind their wireless Smart Street Lighting Solution. This enables the use of ZigBee in Smart City applications, anchored around the energy and cost savings generated by the Smart Lighting system.

This same radio network can be utilised for a multitude of additional applications, from Smart Parking, Environmental Monitoring to Smart Refuse.

The Opportunity

- use of ZigBee radio standard for global compliance, power efficiency, security, symmetric 2-way communications

- wireless network which forms the basis for compelling 'Smart City' solutions

Space Syntax

Scientific evaluation of urban design proposals to minimise risk

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The Company

Space Syntax provides expertise in urban planning, transport, building design, social interaction and spatial economics. It specialises in identifying the role of spatial networks in shaping the social, economic and environmental performance of places, creating urban technologies to simulate the impacts of new developments on a range of social, economic and environmental indicators, and applying evidence-based techniques to some of the world's most complex and challenging projects.

The Challenge

Cities worldwide are growing at a rapid pace and are looking to avoid problems of traffic congestion, air pollution, social segregation and obesity. There is a serious risk of population migration away from the land and into the city that poses problems of social and economic stability. If development is not sufficiently dense and connected in cities there is a further risk of environmental harm through the generation of massive transport carbon emissions. Planners and designers are still relying on age-old methods that are based on intuition and experience rather than evidence and science.

The Solution

Space Syntax provides an evidence-based approach to planning and design, with a focus on the role of spatial networks in shaping patterns of social and economic transaction as well as environmental impacts. The company's reputation is based on a highly creative use of technology to identify the essential design features of urban and building design projects. These are typically aspects of the location, linkages, layout, land use and landscaping of a project that influence human activity and, in doing so, drive the performance of places.

The Opportunity

- mitigate risk to urban growth by explaining and evaluating, scientifically, the performance and value of urban design proposals.

- boost 'returns' on land value and rental income

- improve safety in streets and buildings

- increase interaction between people in buildings.

VIRTUAL VIEWING
3D · 4D · 5D · SMART

Fusing advanced graphical software with SMART building techniques

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www.virtualviewing.com ; www.slimbim2go.com

The Company

Virtual Viewing is one of the UK's market leaders in fusing advanced graphical software IP, SMART building techniques and our SlimBIM™ methodology to produce award winning interactive applications and support solutions - making complex data visually stunning. We have a long history of successfully providing some of the world's leading organisations with Smart solutions and imagery of the highest order to influence at every level.

The Challenge

Proving technologies to show ROI rather than cost is a key challenge in building the smart homes of the future. Virtual Viewing is forging the way towards creating an industry standard for thinking and planning smart construction.

The Solution

SlimBIM2go product is a perfect example of how we deliver these services to enable our customers to push the boundaries of SMART building technologies, SlimBIM™ and BIM Beyond Build™ to deliver lower cost services and a wider ranging deployment of BIM whilst adding value to their products and services for building owners, occupiers and stakeholders. This system can be used in the home setting, by construction workers, or even in hospital to visualise and manage the smart systems around you.

The Opportunity

• Asset Tagging

• Data Visualisation

• Decrease Build Cost

• Powerful 3D Graphics
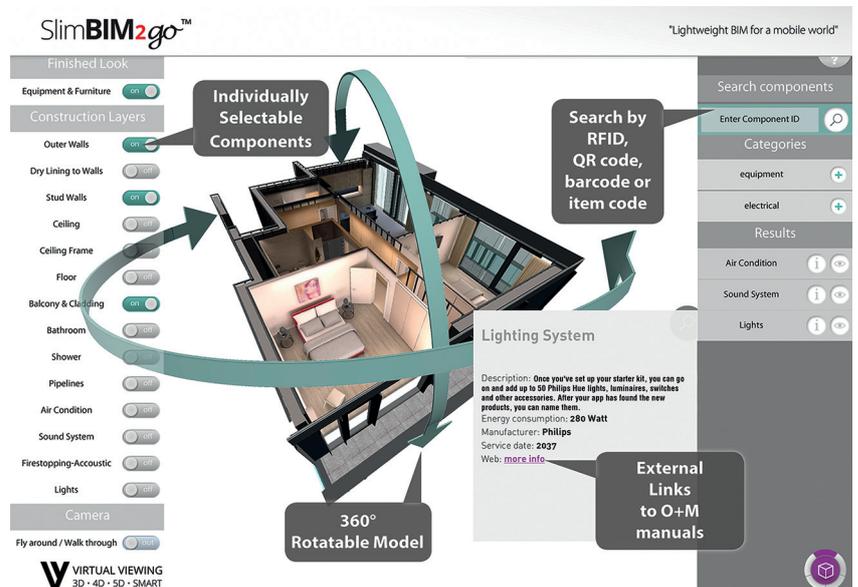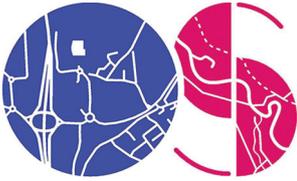
Ordnance Survey

Scientific evaluation of urban design proposals to minimise risk

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The Company

Ordnance Survey (OS) is the world's most experienced geospatial intelligence organisation. For over 225 years we have been reliably curating data and developing systems to defend and protect a nation, record progress, and transform citizens' quality of life in every respect. We deliver over £70m of data free at the point of use via our country's citizen-services, and on the international stage, OS offers geospatial innovation, infrastructure, expertise, effectiveness and efficiency for Smart developments of every kind on all continents.

The Challenge

Sustainability, flexibility, and urban resilience (the potential for recovery in the face of adversity) is achievable, but only with an in-depth understanding of geospatial context. Much smart urban development is not harmoniously connected: what unites these silos is a sense of place- where they are exactly, their roles in a specific area, and their context within a physical space.

Geospatial precision is the best, most efficient and accurately effective way to unite these streams of activity in pursuit of a 'smarter future state'. This needs to be incorporated into models of smart urban planning.

The Solution

Ordnance Survey provides the necessary capability, capacity and experience to unite independent silos of Smart activity. For advanced mobility (Connected and Automated Vehicles, plus efficient, economic and environmentally-conscious end-to-end journeys using traditional transport), innovators need complete confidence in the accuracy of location data. Ordnance Survey has the expertise to support this.

The Opportunity

• world-leading geospatial location data

• Internet of Things facilitated by 5G

• improve accuracy of sensors, receivers, and tagged asset-placement

• how to use this data to prioritise accuracy and minimise risk

citi logik
making sense of cities
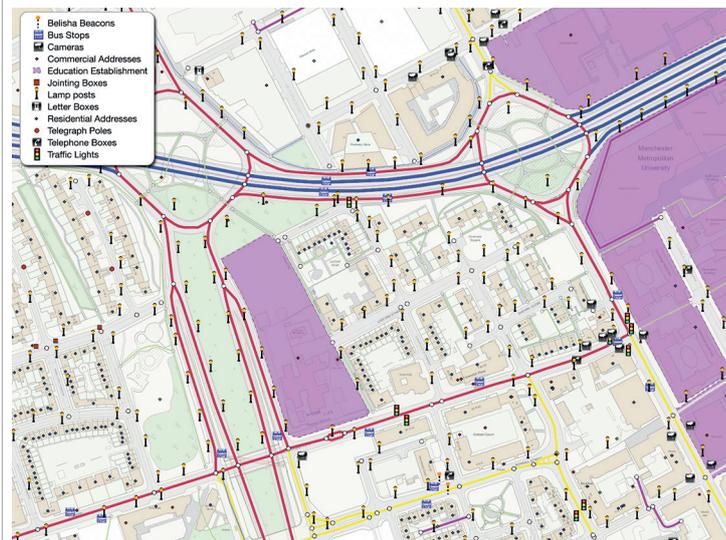
provides a comprehensive view of city transport systems and local urban areas through existing mobile networks

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The Company

Citi Logik is a British technology company established in 2011 with funding from the UK Technology Strategy Board to develop demand insights and predictive analytics derived from anonymised mobile phone network data in compliance with UK data privacy laws and future EU regulations. It provides insight into the way people move on foot, in a vehicle or by train, by applying analysis to complex spatial challenges in the sectors of Transport, Intelligent Mobility, Smarter Cities, Retail & Advertising, and the Built Environment.

The Challenge

The challenge within the Smart City is to increase capacity in the transport network. Journey time reliability associated with unplanned incidents needs to be improved, and elay savings associated with typical daily commuter journeys need to be realised.

The Solution

The Citi Logik Transport Information System solution provides a detailed understanding of demand and associated patterns of vehicle and people movement across a city. It utilises the existing mobile phone network infrastructure within the region to provide a comprehensive view of the city transport systems and the local urban areas. It improves understanding of the wider impact of building developments on the surrounding network

The Opportunity

• track demand and patterns of movement within cities

• use existing mobile phone networks to look at transport systems

masabi

Cloud-based ticketing and fare collection system to improve urban mobility

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The Company

Masabi is the global leader in transport mobile ticketing and payments. The company's award-winning JustRide platform is a cloud-based, deployment-proven, end-to-end mobile ticketing and fare collection system. It consists of services for ticket purchase, display and inspection, together with back-end infrastructure for secure payments, ticket management, customer service, reporting and real-time analytics.

The Challenge

As urban populations increase, it is important that cities improve transport systems to facilitate greater mobility in urban spaces.

The Solution

Masabi's technology signals the end of ticket lines, lost tickets and fumbling for cash by allowing passengers to quickly and securely buy and display tickets on their mobile phones. Masabi's JustRide platform helps people move around cities and transport networks, whilst reducing the cost of fare collection for transport authorities and operators. It does this with minimal (or no) capital expenditure.

The Opportunity

• cloud-based, deployment-proven, end-to-end mobile ticketing and fare collection system.

• services for ticket purchase, display and inspection

• back-end infrastructure for secure payments, ticket management, customer service, reporting and real-time analytics.

• scalable cloud-based technology which is operational with 22 transport agencies and operators round the world, including: Virgin Trains, Arriva, Abellio, Thames Clippers, Boston's MBTA, San Diego MTS, Transport for Athens, NICE Bus New York and New York's MTA.
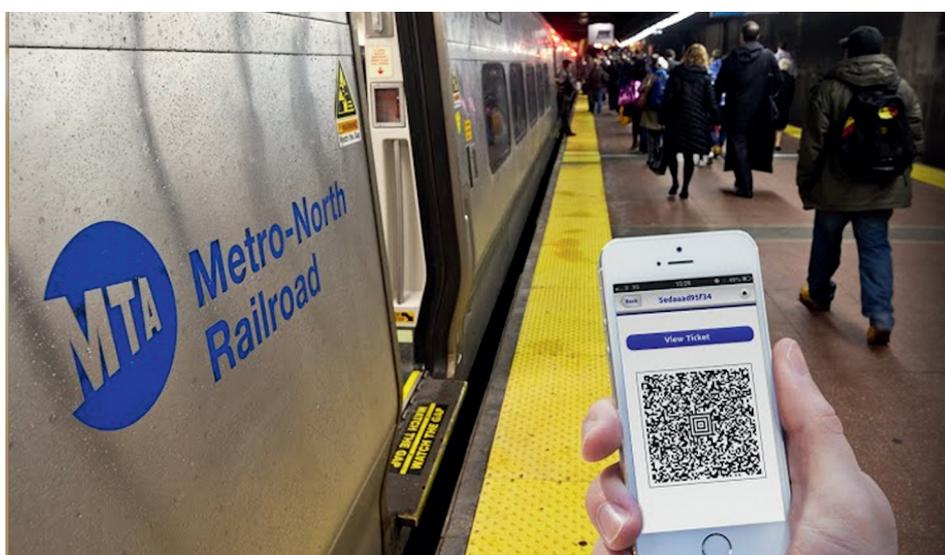
RDM GROUP

Ground-breaking driverless vehicles which reduce pollution, accidents, and congestion

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The Company

RDM Group is an advanced engineering automotive business based in Coventry, UK since 1993. Our passion for innovation and pushing the boundaries of technology has seen us lead the way in the production of autonomous vehicles within the L-SATS (Low-Speed Autonomous Transport System) first / last mile sector. Our specialist designers, engineers and electronic experts have delivered the UK's first driverless pods that can be used on public pavements, streets and private land.

The Challenge

Smart cities need to find ways to reduce vehicle related accidents and reduce road congestion. If we can do that,. We will also be able to reduce pollution in our urban spaces.

The Solution

Driverless vehicles are estimated to cut road fatalities by 95%. RDM Group has developed Driverless Pods which omit zero emissions and operate free of fuel. Connected vehicles and platooning will greatly reduce the number of vehicles on roads

The Opportunity

• 2,4,6 and 8 person variants of driverless pods

• Reduce emissions and pollution in cities

• Reduce road incidents with revolutionary new driverless technology

NICANDER
INTELLIGENT SOLUTIONS

A platform allowing stakeholders to engage citizens and gain behavioural insight

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The Company

Nicander is a specialist SME software systems company that delivers a range of Intelligent Transport Systems solutions from simple desktop applications for mobile phones, asset and fault management systems through to complex IT systems for effective regional and national transport information and control. Nicander work with many different technologies from databases, expert systems, geographical information systems and networking to telephony, smart devices and camera systems.

The Challenge

Correctly understanding the concerns of citizens, engaging with them and responding to their concerns is all too often a manual and lengthy process. The systems that support them are typically separate, leading to frustrations for both citizens and authorities. Asset management systems have typically become too complex, difficult to use and costly to operate. They tend to focus on the management of specific departmental assets and contractors and are not made visible to the citizen.

The Solution

Our solution is to link the functionality delivered by various disparate asset management, fault reporting and feedback systems in operation today into a unified platform addressing the problems of engaging with citizens and other stakeholders in a simple and effective way across multiple services. Through a single portal, authorities will be enabled to more effectively engage with citizens through a simple to use service that allows them to report issues with the places within which they live, work and play, receive information on issue resolution and provide constructive feedback on services provided.

The Opportunity

• transform network operations, personal and business mobility,

• deliver major improvements in safety,

• reduce delays and environmental impact of traffic,

• place clients at the leading edge of transportation management technology solutions
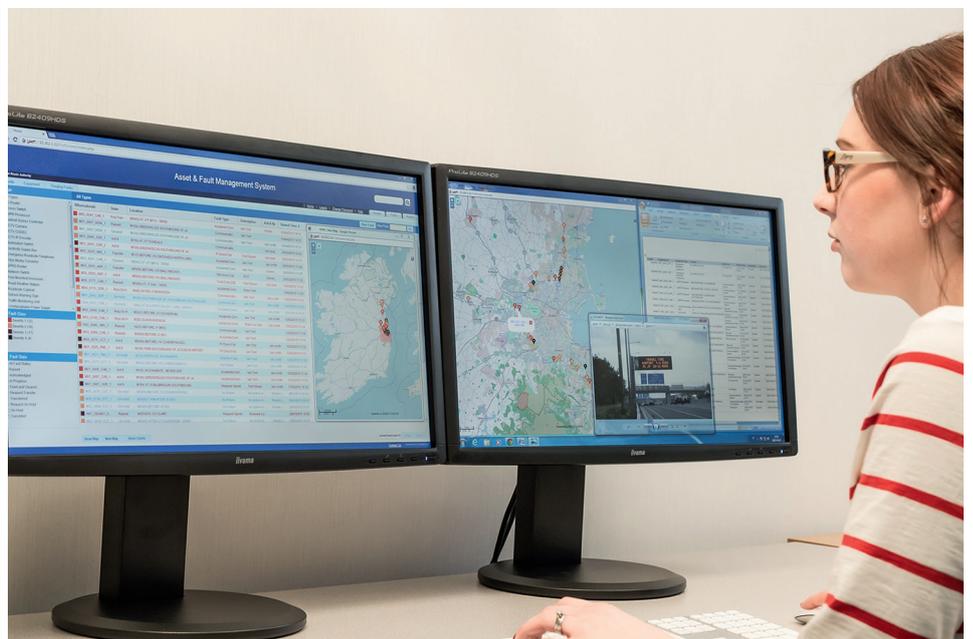
Mott MacDonald

A global engineering and management consultancy with expertise in smart utilities

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The Company

Mott MacDonald is a $2bn engineering, management and development consultancy. Our global business is multisector, spanning buildings, communications, defence, education, environment, health, international development, industry, mining, oil and gas, power, transport, urban development, water and wastewater. Over the last decade we have developed a range of Smart solutions for cities across the technical sectors in which we operate. Typically these have been internet-enabled systems to integrate urban data, and examples of successful applications include the London 2012 Olympic Games and Glasgow 2014 Commonwealth Games where we provided real-time control centres.

The Challenge

We live in a world in which over 50% of the population is urban, and many are vulnerable to climate change. Sustainability is a key future driver, and the interlinking of urbanisation and moves to tackle climate change is vital. There is a perception that sustainable solutions are too expensive, particularly in developing countries.

The Solution

We apply our ingenuity and the power of technology to create more sustainable solutions more cost-effectively. We recognise and prioritise the urgency of the challenges posed by urbanisation and climate change by developing solutions which reflect the needs of the whole community wherever they are delivered.

The Opportunity

• Development of ICT technology strategy and roll-out plans

• Cost/benefit analysis of technology options

• Business case development

• Procurement and contract negotiation

• Resilience and security

• Policy and regulatory issues

• Multidisciplinary expertise across a range of utilities

• Designing and building networks
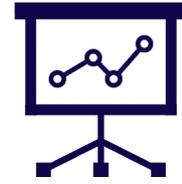
A new platform for overseeing organisation and governance of Smart Cities and getting citizens involved

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The Company

D4SC is an award-winning London based urban innovation company creating products and services combining human and machine intelligence to co-create smarter cities. Our Smart City planning tool CitizenCanvas won the Smart City World Expo showcase, and we are currently also running a technical pilot called Changify in Plymouth.

The Solution

D4SC's Changify is a highly purposed scalable social-network for communities and service providers who want to transform cities by co-solving urban challenges. Unlike traditional reporting apps, it's a second-generation platform answering the question 'Which problem needs fixing first?' Changify aggregates, prioritises and filters noisy data to close the social feedback loop between communities and service providers to co-create smarter cities.

The Opportunity

• We expect 'participative project prioritisation' to become the primary method of contract decision making.

• We aim for the Gross Contract Value of public infrastructure (eg road maintenance) project decisions to be routed through our Changify platform.
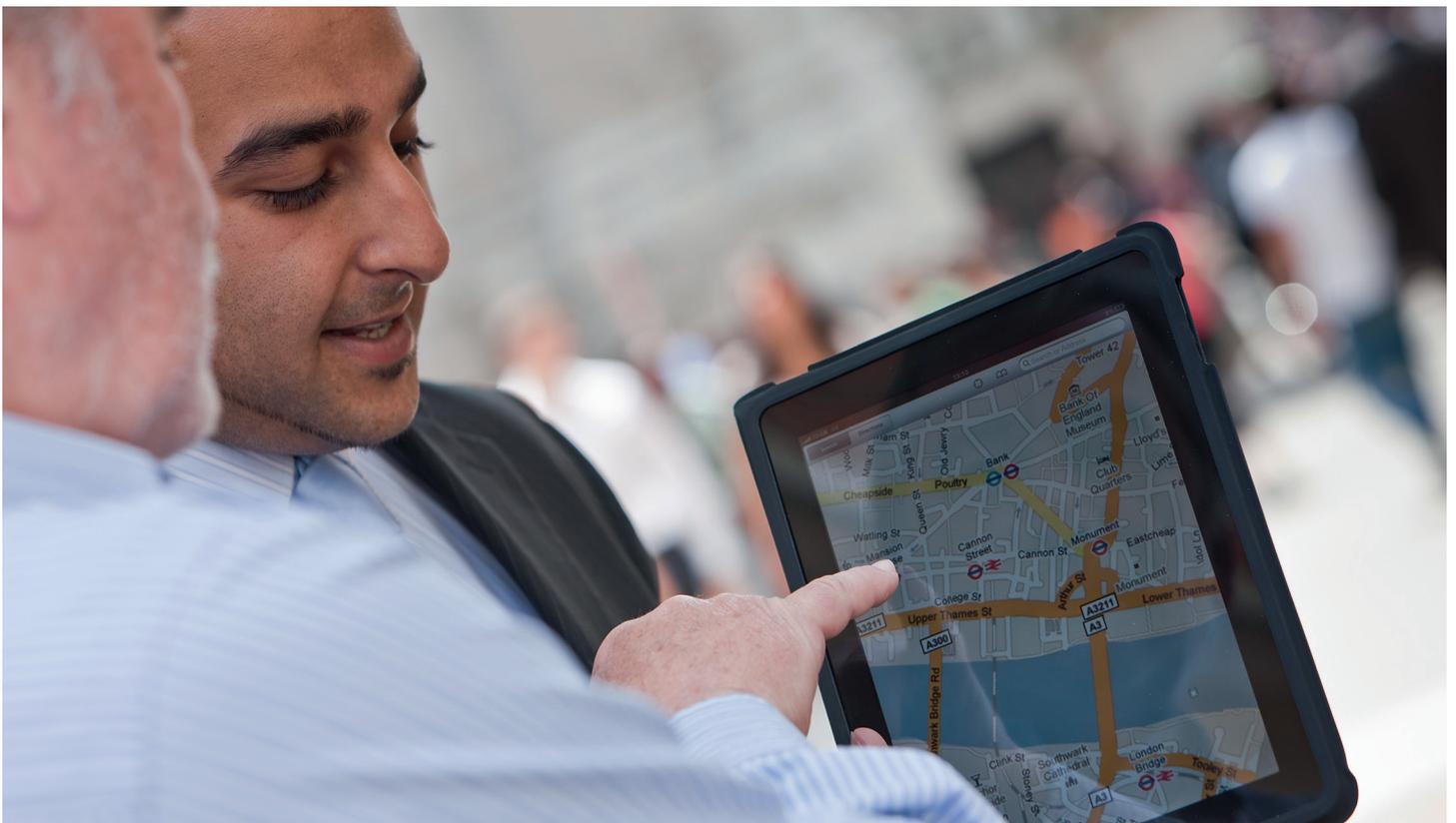
Care pathway management solutions delivered through a digital platform

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The Company

Qinec is a digital health company providing Care Pathway Management (CPM) solutions. The company works with healthcare providers to automate new and improved care pathways, connecting and integrating the entire patient journey on its cloud based SaaS platform. Managing millions of patients a year, Qinec tailors processes and optimises clinical and administrative workflows across every specialty of outpatient care to help deliver measurably better healthcare outcomes, at lower cost.

The Challenge

A big problem in healthcare is siloed clinical and administrative patient data across multiple systems, medical specialties and locations. The lack of visibility (and therefore measurability) leads to increased administration, a greater risk of errors, delayed treatment for patients and a higher cost of delivering care. Care pathways for patients and conditions can differ significantly. This amount of variation generates administration, uses resources and increases delays, costs and inefficiencies for the patient and organisation.

The Solution

Qinec helps healthcare providers create standardised, efficient, care pathways on one platform, utilising resources, tracking costs and optimising processes in real-time. For an organisation this means patients are treated at lower cost, with higher quality care.

The Opportunity

• a single system with a real-time view of all patients across all systems

• increase efficiency, quality and speed of care

• lower cost of administration,

• reduction in processes and errors,

• real time reporting gives visibility and control of the whole organisation, from patients not attending and average treatment times to clinician productivity and forecasting demand
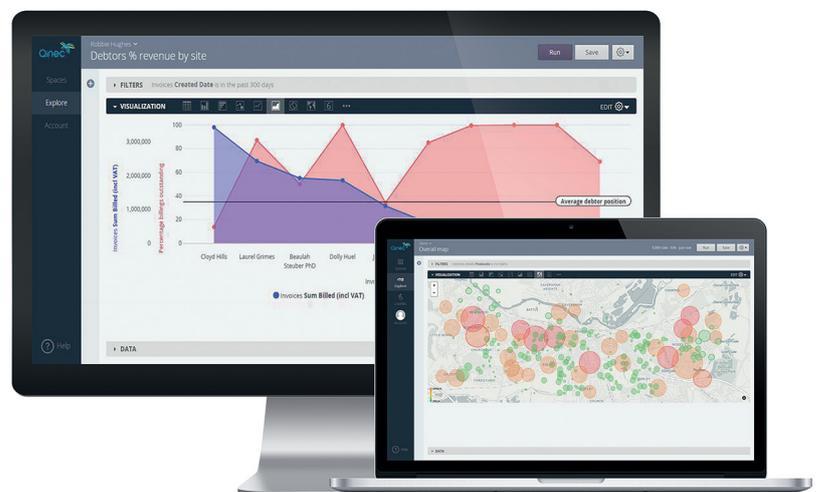
Tunstall

Solutions to deliver healthcare in the community, allowing citizens to live independently for longer

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The Company

Tunstall Healthcare Group offers a range of Connected Care and Connected Health solutions across each of its main regions - UK, Nordics, Southern Europe, Central Europe, North America and Asia-Pacific. Through the use of smart technology underpinned by high quality, high touch services we support older people and those with long term conditions to live independently, securely, healthily and happily as they are able. As the market leading provider of technology-enabled care, we have been working with health, housing and social care partners for nearly 60 years.

The Challenge

Society is facing increasing health and social care challenges - long term complex conditions, ageing populations and constrained budgets - technology is key to addressing these. By effectively supporting health, independence and wellbeing, our Connected Care and Connected Health solutions improve outcomes and deliver efficiencies when compared to traditional models of hospital or residence-based care. The aim is to enable people to be supported to self-care and remain independent in their community.

The Solution

Tunstall offers solution to support carers and users, enabling people to live more fulfilling lives at home by supporting patients in a community setting. The service combines a response service with a range of Connected Care solutions to support older people and those with long-term needs. Should the sensors detect a problem, such as a fire or flood, they will automatically notify the monitoring centre, where trained operators can talk to the service user and send appropriate help - assistance is available 24 hours a day.

The Opportunity

• Remote patient monitoring

• Patient Support Programmes

• Healthcare coordination services

• Expertise in IP and mobile solutions

Docobo™
towards a better quality of life

A system using big data to enable improve treatment options for patients with long term conditions

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The Company

Docobo is a digital health company supplying Remote Patient Management and Population Intelligence technology. The company offers a Targeted Population Health System which identifes patients for intervention, tracks their progress and supplies payers with health and economic analysis. The technology can be used in patient's homes or Carehomes. Data is presented centrally for clinicians to monitor patients (typically those with Long Term Conditions/co-morbid) and make informed decisions.

The Challenge

We need to reduce the consumption of resources by patients with Long Term Conditions (LTCs). To do this we need to find a way to keep people living at home independently for as long as possible, thereby reducing demand on the whole care system and improve patient flow.

The Solution

Docobo has developed a system (ARTEMUS-ICS™) which uses a 'big data' approach combining primary and secondary care health data with social care, mental health and community (visiting nurse) data. A telehealth (DOC@HOME®) system offers access on a very wide range of technology (web, smartphone, tablet, PC etc) and on Docobo's CAREPORTAL® device which is purpose built for older users or those not familiar with technology. This technology can then be used in the patient's home, or in a care facility. The data is monitored centrally by clinicians, enabling them to make better decisions about the care of their patient using live data.

The Opportunity

• Remote Patient Management technology

• access devices (e.g. smartphones, tablets, Docobo Careportal)

• cloud-based clinical server system.

• added applications: e.g. preventing stroke, detecting Atrial Fibrillation using Careportal's built-in ECG and bio-signal sensors

• Combining population health intelligence, near real-time telehealth data and assisting discharge with support of patients at home and in care home settings.

UK Trade & Investment Support

With a successful and robust regime for delivering investment in all manner of projects, the UK offers an exciting range of opportunities for all investors.

Included in this book are projects sourced by the Smart Cities team in UK Trade and Investment, which are investable and ready for development, in line with UKTI's mandate of helping international investors identify and fund projects in the UK. Many of the investment projects in this book were finalists in the recent Internet of Things Demonstrator Project competition, run jointly by the UK government and Innovate UK.

The UK is home to world-leading expertise in all sectors of Smart Cities and innovative technology. UKTI focuses on supporting the UK companies of today and tomorrow to export this expertise internationally. We can bring these skills to you, and help you to develop your city as it faces the challenges of 21st century urban life.

UKTI acts as an honest broker in directing international investors to credible project pipelines within the UK. The developments selected contribute to the regeneration and renewal of UK towns and cities with positive benefits to social and cultural life. Our services are free of charge and commercial-in-confidence. Contact details are provided at the end of this book.

Investment Opportunities

1. **Falkirk**
2. **Milton Keynes**
3. **Peterborough**
4. **Slough**
5. **Liverpool**
6. **Birmingham**
7. **Manchester**
8. **London**
9. **Bristol**
10. **Newcastle upon tyne**
11. **Cambridge**
12. **Reading**
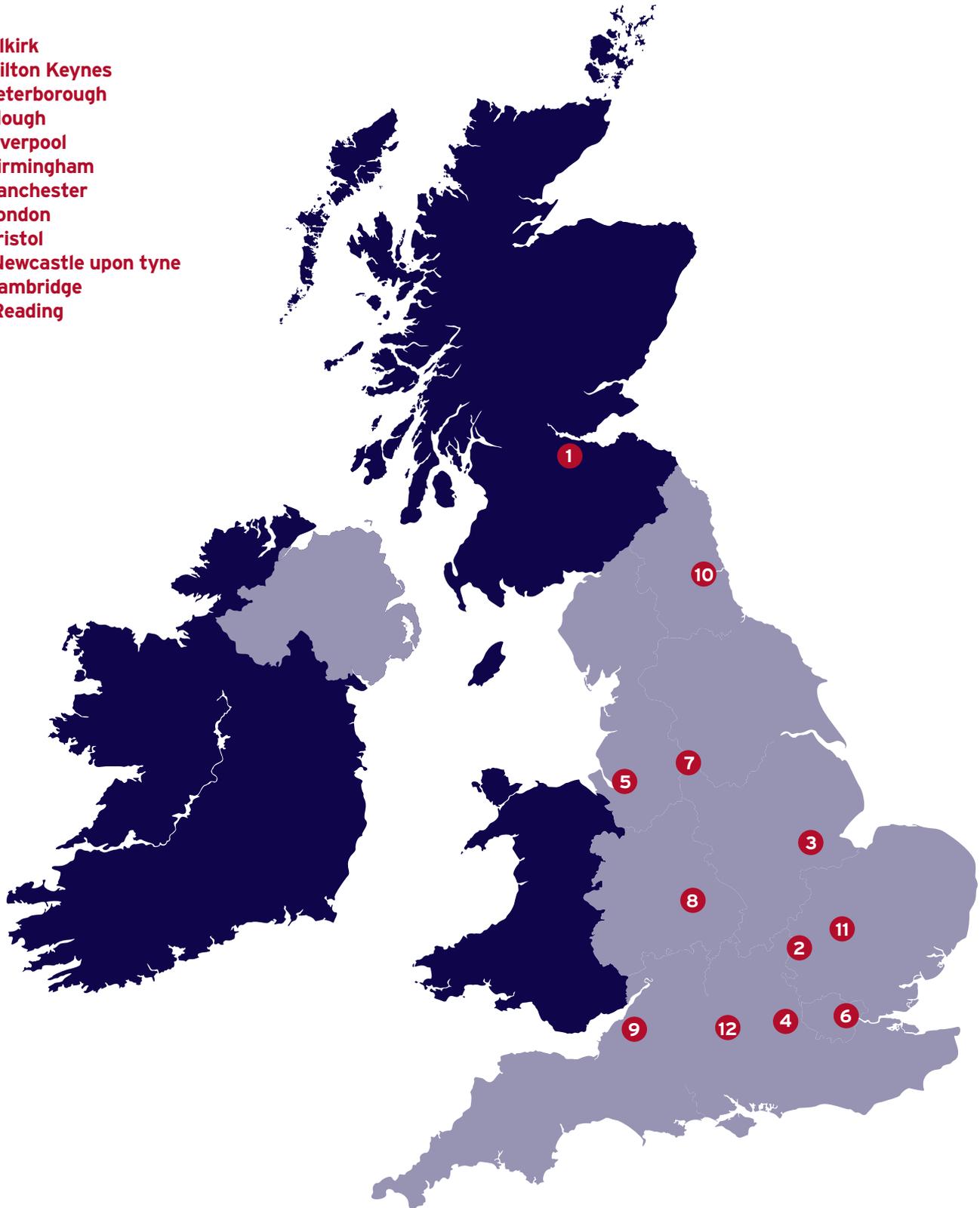
An ecosystem for urban innovation

Bristol

Bristol is the 2015 European Green Capital, reflecting a long-standing ambition by the council and wider community to improve the environmental performance of the city. The city is investing £140 million in energy efficiency and renewable energy to save costs and cut carbon emissions.

Manchester

Manchester is trialling a unique model for a common, open and linked data infrastructure platform for the city. The project applies Manchester's extensive digital economy capability to improving city systems. Manchester has one of Europe's largest concentrations of computing talent in Europe, with over 5,000 computing graduates each year.

Glasgow

UK Government funding of £24 million has kick-started the Glasgow City Council's smart city programme. Addressing everyday challenges that concern Glasgow residents such as crime, transport and affordable energy, pilot projects include an open data platform, city operations centre and intelligent street lighting.

London

The redevelopment of brownfield sites in East London to create the 2012 Olympic Park was a £12 billion undertaking illustrating innovation in urban design, supply chain management, sustainable building and community participation. London is committed to solving the challenges it faces from a growing population through the use of innovative smart technology.

Peterborough

The Peterborough DNA programme will integrate activity in the city around innovation, skills and environmental resources to help local companies bring innovative products to market, enable companies to test environmental solutions, and incorporate exciting, user-friendly visualisations of data in the city.

Milton Keynes

Milton Keynes is working with leading tech companies and Catapult Centres to roll out UK's first city-wide whitespace demonstrator for delivering services more efficiently to citizens. 1,000 sensors are being deployed, creating an infrastructure for companies and start-ups to test and commercialise new applications in a real city environment.

Birmingham

Birmingham City Council's Smart City Roadmap outlines an implementation and action plan for achieving their ambitious smart city vision. The city has taken a strategic lead in ensuring implementation with establishment of a Smart City Commission. The vision responds to economic, well-being, mobility and environmental challenges – but also to significant opportunities in the city's strong research base and one of the UK's largest business centres.

Newcastle

A new urban quarter under development in central Newcastle will be a major demonstration site for the application of innovative urban technologies while establishing a new economic and scientific hub for the city. Involving close collaboration between Newcastle University and the city council, the development will include university departments, business and housing.

Liverpool

Liverpool's regional economy is one of the fastest growing in England, and is the centre of a population of 1.5 million people that drives a £20bn economy in the region. Recent investment in the city includes the £300m expansion plans of the Port of Liverpool, a major bridge project (£600m) creating a second crossing of the Mersey; and £5.5bn regeneration proposals to transform Liverpool's northern docks. These vast regeneration and infrastructure projects bring with them new challenges around city planning.

Cambridge

Cambridge has a world leading tech sector and one of the world's best Universities. More than 25 of the world's largest corporations are based here, including Microsoft, Apple and Amazon, and the city has the highest density of Technical Consultancies in the world. The city is home to some of Europe's most advanced smart city engineers and application knowledge.

Falkirk- Grangemouth Investment Zone

Quick Facts

Location: Falkirk, Scotland
Size: £1.5bn
Project: a network of smart sensors to deliver real-time data on hazardous emissions, pollution, energy efficiency, security and flooding
Type: Energy/ Environment; Infrastructure

Overview

Falkirk is recognised at Government level as an Investment Zone of National Significance, which provides a key opportunity for private sector investment in individual projects or groupings of developments centred on Scotland's main oil refining and port complex. The scale of currently fundable projects is c£2bn with early stage projects underway in a development pipeline. Current projects include: energy generation, district heating and power networks, biotechnology, fine chemicals, freight & logistics, industrial, commercial and leisure developments.

Working with CENSIS, the Centre of Excellence for Sensor and Imaging Systems (SIS) technologies, Falkirk is developing a sensor shield for Grangemouth which utilises an Internet of Things approach to increase industrial resilience, support environmental monitoring and enhance security.

Opportunity

This will be an innovative network of smart sensors, laser detectors, and UAVs; delivering real-time industrial hazardous emission data, water and pollution level data, industrial energy efficiency data and security data to a bespoke 3D visual control dashboard.

Investment will contribute to developments in

- sensor technologies

- algorithms

- apps

- analytics and visualisation techniques

- providing accurate, real-time and multi-source information

- mitigating potentially hazardous and costly events, such as flooding, pollution, and lack of energy resilience.

Market opportunities extend into communications and networking, computing and storage, applications and services to analytics.

An approximate accessible market for products and services derived from the outputs of the project are estimated to be in the range of ~£120m p.a. by 2020.

This project will result in replicable and scalable advances in technology, with the potential to grow this elsewhere in the world.

Shield
Port
Residential Area

Sensors
Cloud

Communication:
Large screens, Touch screens, Laptops, Mobiles

To end users:
General Public, Blue light organisations, project partners

Coastline Sensors   Water Level Sensors   Land Sensors   Drone Sensors
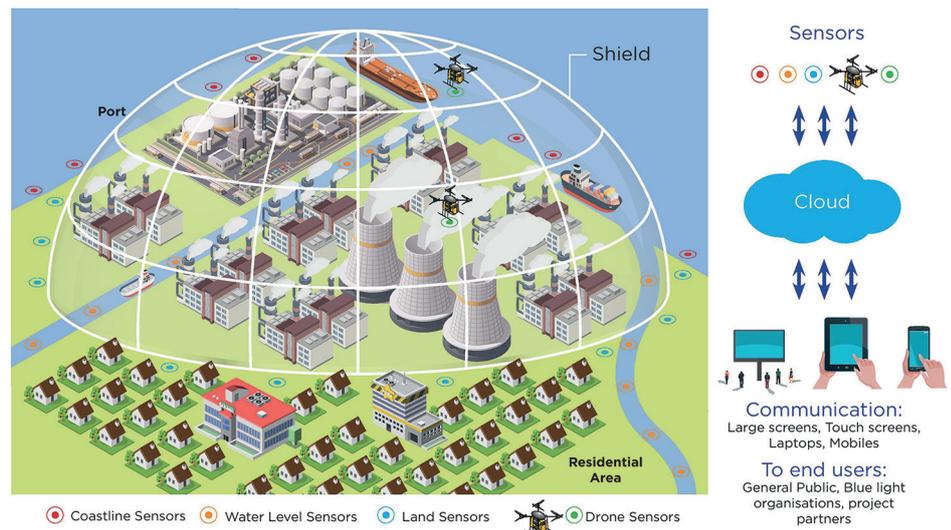
MK: Smart

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Quick Facts

Location: Milton Keynes
Size: £10m
Project: innovative use of new data hub to build a smart transport system and solve local problems of congestion and pollution
Type: Infrastructure; Mobility

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Overview

MK:Smart is a large collaborative initiative led by The Open University, which will develop innovative solutions to support economic growth in Milton Keynes. The project will create a state-of-the-art 'MK Data Hub' which will manage vast amounts of data relevant to city systems from a variety of data sources. These will include data about energy and water consumption, transport data, data acquired through satellite technology, social and economic datasets, and crowdsourced data from social media or specialised apps. You will also be investing into one of the UK's advanced Smart City projects, with all the transfer of knowledge that brings with it.

Opportunity

MK:Smart brings together Government, academia and business to test real Smart City solutions in a live urban environment, addressing issues such as traffic congestion has significant impact on air quality, and increasing health and productivity.

The development uses technology to enhance quality, performance and interactivity of urban services, to reduce costs and resource consumption and to improve contact between citizens, government, education and business.

Milton Keynes has a dedicated data hub that is

- an innovation space in IoT;

- an ambitious Electric Vehicle roll out;

- a truly collaborative network with excellent citizen engagement.

Investing in MK:Smart will help you address your city problems by learning from our work, extending our research and implementing aspects of our proven infrastructure in data driven technology.

The infrastructure elements (from data hub to buses) are scalable and replicable and the knowledge is transferable to various other urban contexts. In return for capital investment, your city will use our learning and infrastructure to replicate experiments, without excessive start-up costs, that can result in city change and the development of new services.

Smart Citizenship

Quick Facts

Location: Peterborough
Size: £9.5m
Project: The creation of a live demonstrator to explore and showcase the new commercial opportunities in a Smart City, using complex city data to address multiple city challenges such as healthcare, transport and environmental protection.
Type: Governance; Citizenship

Overview

November 2015 saw Peterborough win a 'Global Smart City Award' from the international expo in Barcelona, and it is one of the UK government's demonstrator cities for innovation and technology.

The "Smart Citizenship" project will harness the power of IoT technology to transform the lives of Peterborough's citizens; addressing vital health and well-being challenges; tackling disparities in life expectancy across the urban area; extending independent living opportunities and supporting behaviour change for more sustainable lifestyles. These IoT outputs will feed into a virtual city platform, "Peterborough V.4D", which will enable pre-rollout testing of policies, products and services.

Opportunity

This innovative approach will allow a shift away from the current demand-led model service delivery to predictive, tailored service interactions. The programme will also involve state of the art integrated sensor deployment in homes, the local environment and communities, with data collected by our existing Gigabit fibre network.

Part of the £9.5m investment will fund an integrated programme of research activity though our academic partner Cranfield University.

The research will get to the very heart of the transformational impacts of IoT as a catalyst for improved quality of life and economic development through the new information market.

We will then build a new 4D virtual model of the city to test city-scale policy and planning implications as well as new technology impacts prior to adoption or deployment. Furthermore, the investment will create a configurable and scalable product which all cities can configure and use.

Digital Health

Quick Facts

Location: Slough
Size: £5m
Project: innovative healthcare system using data to monitor diabetes patients and improve care
Type: Health; Citizenship

Overview

Slough will provide a digitalised healthcare management platform to its citizens which will be based on Internet of Things technology and cloud computing. The first stage will target a population of around 37,500 people and aims to collect and analyse data, then provide healthcare management advice though an interactive digital platform. Predicted outcomes of this project include:

- Enhancing citizen access to community based services

- Providing targeted preventative support and support for carers

- Ensuring personal safety and high quality service provision

- Ultimately saving National Health Service budget by reducing the number of diabetes cases within the borough

Opportunity

Slough is seeking investment to enable them to deliver the new technology already delivered by ZTE in a pilot in the region on a greater scale. Approximately £5m of investment will allow Slough to improve wifi infrastructure, enabling a greater number of people to access smart health devices and send health data at no cost. This will allow medical professionals in the area to monitor health conditions and treat patients at home, thereby freeing up more hospital space. If successful this pilot could then be rolled out across all local practices and then over time across all practices in England and Wales.

Connected City

Overview

Connected City is a transport innovation project consisting of a software and hardware component, which realises both urban transport and safety/health benefits through one city-level 'plug-in toolkit'. It alleviates traffic problems by analysing traffic patterns, optimising routing and minimising delays for all-road users including logistic transport and emergency services transport. By ensuring that the cities transport network functions at maximum efficiency, it will reduce transport, environmental and health costs.

Opportunity

The project has 3 focus areas:

1) Seamless Mobility

2) A Proactive Data-Driven Transport Network

3) Safety & Health.

Connected City is seeking ~£7m investment in developing real-time information to enhance transport, safety & health and environmental planning. Your investment will unlock the following:

• real-time and anonymised aggregated pedestrian movement and dwell-time data

• air quality and emission data

• data on flood levels and currents, snow and ice levels, gritter levels and dispersals

• integrate data from city transport and local authorities

• fuel consumption data

The ROI of Connected City is conservatively estimated to be 50% based on significant cost-reductions realised by replacing traditional (static) data collection methods with cost-effective sensor technologies that generate continuous and real-time data. Once developed, this could then be implemented in any city or urban environment.

Ubiquitous Beacon Network

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Quick Facts

Location: Ipswich, Suffolk
Size: £5.2m
Project: use of data to improve urban planning and transport systems, with further aspect of engaging local citizens via their mobile phones based on their precise physical location and context. This can improve communication around congestion, or can be used for targeted advertising.
Type: Mobility; Citizenship

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Overview

Suffolk Council and Proximity have developed a new platform of over 10,000 connected beacons which process big data about physical location and context. This enables us to engage citizens via their mobile phones based on their precise physical location and context, both indoors and outside; monetise location based advertising on mobile phones; and gather rich insight about citizen movement and behaviour through a city or transport eco-system to better aid planning and measure impact.

Opportunity

This project will lead to a detailed understanding of city and transport challenges that can be addressed through the deployment of mobile proximity services.

The opportunity is

- to enable exciting new audience profiles to be developed to better target engagement and marketing;

- real time decisions to be made to deliver the right information at the right time;

- insights to be developed relating to consumer movements within cities and transport eco-systems.

Funds will be utilised to develop and deploy a large scale proximity network and on-board the required eco-system partners.

Initial revenues are expected in the second half of year one with the service fully operational by year 2.

Proxama is currently deploying the advertising model at scale in London. This investment will accelerate the growth across other large UK cities. This investment will produce the blueprint, commercial model and key learnings which can be replicated internationally. Proxama is already exploring early stage opportunities in India and UAE to roll out these services abroad.
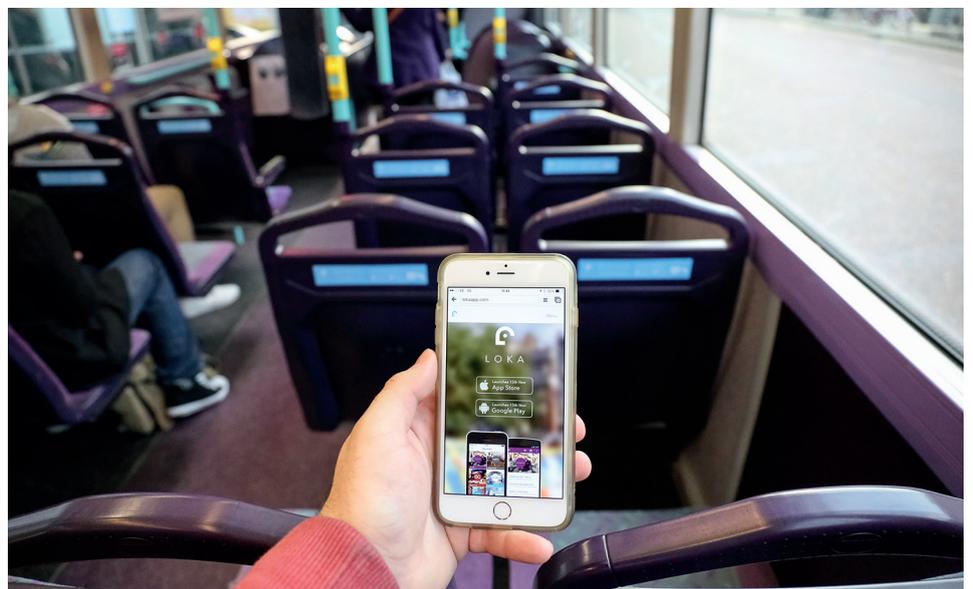
Remind Memory Suite

Quick Facts

Location: Liverpool, Northwest
Size: £1m
Project: ReMind is an app which connects dementia sufferers with care organisations to revolutionise the way citizens access their healthcare.
Type: Health; Citizenship

Overview

Remind Memory Suite is a package of new smart technology which connects patients with care organisations. It is specifically targeted at supporting those who suffer from dementia, with an app which sends and receives alerts and reminders, even to remote locations. This enables more people to be cared for in a community-setting, freeing up space in hospitals. Remind Memory Suite aims to target the 13% of people who live with Dementia (65,000 people) in the UK who already use technology, as well as their carers, 87% of whom already use technology. Dementia in England costs £19bn a year, so there is a vast appetite for technologically driven solutions. Moreover, this system has wider use, for example in responding to patients suffering from addictions.

Opportunity

This innovative technology can provide key benefits to communities by

• reducing the burden on tertiary care,

• allowing more citizens to live independently for longer,

• minimising costly appointment cancellations,

• saving time and money for healthcare institutions.

The software can be updated very quickly and additional features can be integrated in a very agile manner, allowing it to be reworked to assist different parts of the community.

Furthermore, this software is scalable and can be deployed in any area of the world that faces similar challenges around population ageing and heavy reliance upon a health system under pressure.

Silvertown Quays Development

Quick Facts

Location: Silvertown, East London
Size: £500m
Project: unique opportunity to build a Smart City within a city, on a large plot of empty land near London City Airport. This will involve designing smart energy, water, waste, transport, and health systems, and designing the 'city' around an Internet of Things model.
Type: Smart Buildings/ Housing

Overview

Silvertown is an underdeveloped area of East London, close to London City Airport, the Excel centre, and the Royal Dock. With government support, developers have started from scratch with a 62 acre site (the same size as Soho London) and are literally building a Smart City from the ground up.

This will involve a 'digital bubble' over the whole development, introducing a new vision for a connected society where everything and everyone is connected with huge potential for innovation. From energy efficiency and transport to waste management and parking, street furniture and way finding - new ideas will be able to be developed, tested and implemented quickly within the Silvertown 'smart grid'.

Opportunity

Silvertown provides a great potential to create the ultimate experience, driven by an app and powered with a 'location layer' of ubiquitous connectivity.

Solutions from healthcare and telehealth, through e-learning and e-commerce will ensure that Silvertown is one of the best places to live, work and do business.

£500m total investment is required for phase 1, of which c. 20% will be invested into an infrastructure imbedded with smart technology to deliver an intelligent core supporting big impact tech, smart spaces, cloud thinking and the internet of things.

In terms of knowledge transfer, there are opportunities at Silvertown available to work with world leaders in smart technology development and gain knowledge of implementation of leading edge smart technologies and how these can be successfully incorporated into new developments in innovative ways.
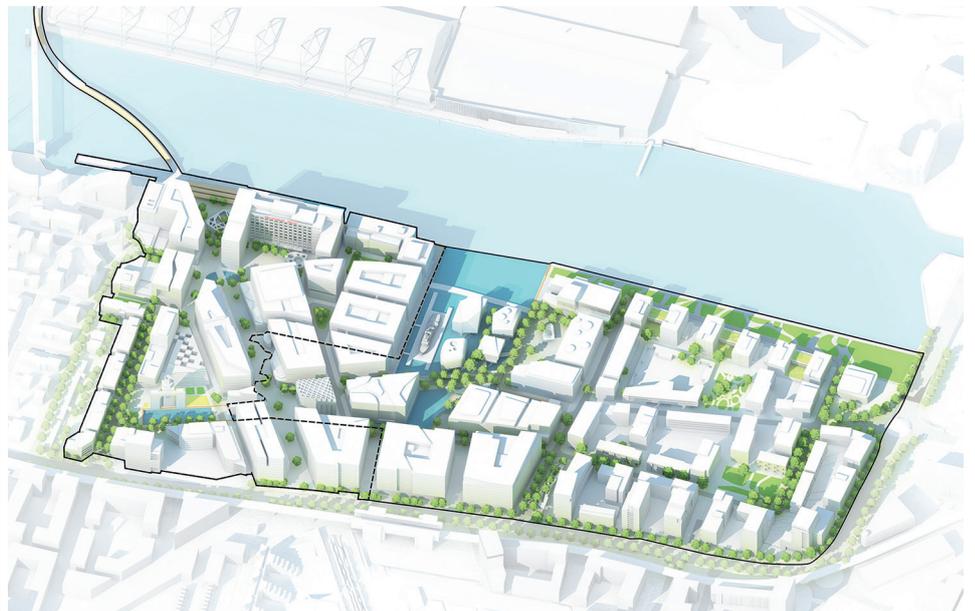
Innovation Birmingham

Quick Facts

Location: Birmingham, Midlands
Size: £30m, up to 75% of the business.
Project: An innovation campus that drives new business growth in the UK's largest city after London, and incubates new tech-based businesses, pairing them with corporate partners and universities.
Type: Governance; Citizenship

Overview

Innovation Birmingham is developing a 'campus' to bring together the necessary conditions for technology start-ups to grow, creating a structured offering for digitally-oriented entrepreneurs. One of its programmes, 'Entrepreneurs For The Future' has already helped over 120 start-ups business, who in turn have created at least 250 jobs and raised £10m in equity funding so far. This campus will consist of technical and market-driven incubation, fab lab, knowledge/ tech-transfer and significant grow-on space for growth businesses.

Opportunity

All of this will be combined to turn Birmingham into a Smart City; reducing congestion and pollution, increasing the mobility and connectivity of people, raising living standards and increasing life quality for citizens.

Focus will be on

(1) Internet Of Things

(2) Intelligent Mobility

(3) Digital Health

(4) Digital Communities

The project is cash positive generating sufficient surpluses to drive a potential annual cash dividend in the order of 5-6% pa. The business is currently 100% owned by Birmingham City Council and the opportunity is for an equity-backed management led buy-out (up to 75%) of the business to establish a UK Community Interest Company (CIC).

The current CEO has taken the operation from an annual loss of £500,000 to an annual net profit of £100,000 in 2014-15 year, and he will remain throughout the continued IBL expansion. We anticipate hosting circa 300 start-up and growth businesses at any one time across all the buildings. In addition to the IBL equity deal (£30m) there is also the opportunity to establish an investment fund that participates in equity rounds in some of those businesses. Innovation Birmingham is reaching out to form a global network of similar initiatives and the mentoring processes and coordination structure can be scaled globally.
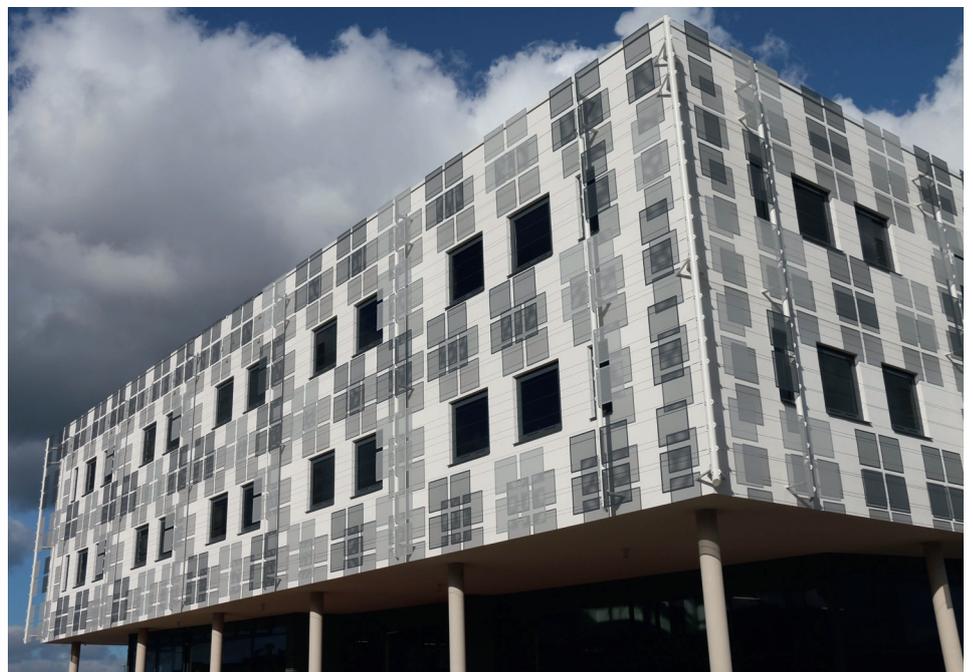
Cityverve

Quick Facts

Location: Manchester, North-West
Size: £10m
Project: an Internet of Things project that will connect disparate city systems (community and public realm; transport and travel; energy and the environment, and health and social care) using innovative technology, such as hyper-scalable cloud services, data virtualisation and real- time data sharing to demonstrate the scalability, replicability, and RoI of Smart Cities.
Type: Infrastructure

Overview

CityVerve was selected from over 30 applications to be the UK demonstrator for the Internet of Things. Whilst its focus is on Manchester, it will help provide a blueprint for other cities, but also for businesses to test and refine their solutions, enabling them to access the global marketplace for IoT. This project will demonstrate the successful deployment of technologies in a connected and integrated way across a range of city systems (community and public realm; transport and travel; energy and the environment and health and social care). Each service will generate an RoI for the problem-owner. The data generated will then be opened up and exploited for further insight and innovation, using Manchester's digital tech sector and leading incubator MSP.

Opportunity

This will be supported by new technical models for

• hyper-scalable cloud services

• real- time data sharing

• interoperability and integration at the network, platform and cloud levels.

The main innovations are in three core areas:

1.   the network;
2.   the data;
3.   cloud services.

The network will be a 'Fog-enabled' network, creating a flexible, extendible IoT network that removes duplication by gathering data from a range of sensor networks. Data will be virtualised, reducing the cost of data sharing, making data available in real time across providers, and enabling secure sharing of sensitive data. Finally, the new InterCloud service environment will support rapid scalability and interoperability, significantly improving service economics and RoI.

cityverve

Manchester: the UK's demonstrator city for the Internet of Things.
Official partner, supported by Innovate UK and The Department for Culture, Media & Sport.

Old Oak And Park Royal Development Corporation (OPDC)

Quick Facts

Location: West London
Size: £700m
Project: : Developing smart technology around traffic, waste and energy management, to deploy in inner London in the UK's largest regeneration programme.
Type: Energy/ Environment; Mobility

Overview

The Old Oak and Park Royal Development Corporation is tasked with delivering a new part of inner west London over the next 30 years that will contain at least 25,500 new homes, space for 65,000 new jobs and significant amounts of new transport, utilities, green and digital infrastructure. Development is envisaged to begin in 2018.

This project represents the unique opportunity to create a new smart part of inner London that champions innovation from across a wide range of built environment and technology sectors, including waste minimisation and management, air, ground and water quality improvement, freight and traffic management (including autonomous vehicles, drones and other last minute delivery methods), urban agriculture and sustainable construction techniques within a high density context.

Opportunity

Delivery of new and improved innovative transport, social, utilities, digital and green infrastructure is estimated to cost approximately £1.5 billion.

Currently, approximately £800 million of funding for infrastructure has been identified leaving a potential opportunity to secure contributions for the remaining £700 million. Given the long-term nature of the project new investment opportunities will likely expand as further development opportunities arise.

As well as financial return, potential investors will benefit from substantial knowledge sharing aided by OPDC's networks with governmental bodies, industry representational bodies, academia and entrepreneurs.

The scale and breadth of the development, as well as the way that smart technology is being embraced right from the start, means that many of the solutions developed in Old Oak and Park Royal will be widely applicable to large scale developments internationally. Timescales for investment are likely to include short, medium and long term opportunities.

The Bristol Brain

Quick Facts

Location: Bristol, South West
Size: £15m
Project: a physical and digital model of the city combined with power analytics and 3D visualisation tools. It aims to harness real-time data, predictive analytics and physical, virtual and augmented reality city models to help solve almost any city problem, including traffic congestion, poor air quality, improving health and wellbeing, resilience (such as flooding), sustainability (such as carbon emissions), as well as understanding the energy system.
Type: Governance

Overview

The vision is to develop a new holistic approach to the future planning of cities, based on real-time data and predictive analytics, visualisation, data projection and 3D physical and virtual city models that allows all stakeholders to create and explore future scenarios. It will contribute to solving almost any city problem, including traffic congestion, poor air quality, improving health and wellbeing, resilience (such as flooding), sustainability (such as carbon emissions), as well as understanding the energy system. It does this through using data to understand the city as a 'system of systems' and then visualising this in innovative ways that people can engage with.

Opportunity

Funding for the first two layers is currently being finalised between the City Council and the University of Bristol. After this initial phase there is an opportunity for private investors to join a longer term collaborative development partnership of this project; particularly around integrated analytics as well as virtual and augmented reality.

Long-term goals are to harness real-time data, predictive analytics and connect people with the sustainable future of their city Up to £15m investment is needed, and the initial £1-2m public investment is currently being finalised.

The Bristol Brain is part of an innovation cluster being developed in Bristol; with separate elements feeding into and supporting each other.

The cluster also includes:

- An integrated Smart City Operations Centre (phase 1 funding secured and progressing)

- A 3D Data Dome (established) - for data visualisation

- Bristol Is Open (established) - a city-wide R&D test-bed for Smart Cities and IoT. This is also being extended to the entire region under the Open Programmable City Region project (funding secured and progressing)

- Engine Shed (established) - a high-tech, high-growth SME incubator• 'Engine Shed 2' - a dedicated Smart City / IoT SME incubator

- An Open Data platform and related development activity.
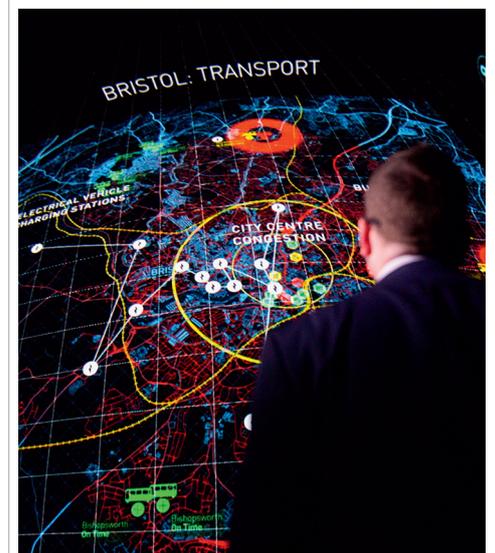
Newcastle Science Central

Quick Facts

Location: Newcastle-upon-Tyne, North East
Size: £200m
Project: a major development site at the heart of city which combines cutting-edge architecture with new public spaces, world-renowned scientific expertise, innovative companies and next-generation housing. The long term aim is to provide practical solutions to problems of local economic growth through digitally-enabled urban sustainability.
Type: Smart Building/ Housing

Overview

Newcastle Science Central will be home to Newcastle University's Computing Sciences Department, which is rated first in the UK for research impact, and will feature an innovation centre around smart data and cloud computing, with strong industry backing. In addition, the site itself is a 'living lab' – involving the practical deployment of research ideas, including around: smart energy grids, sustainable urban drainage and building sensors.

This will become a test bed for urban sustainability, driving forward solutions for tomorrow's society by combining cutting-edge architecture with new public spaces, world-renowned scientific expertise and leading-edge companies.

Opportunity

This is a phased development looking for investment from now until 2025, and the first two phases have already begun. There are investment opportunities in residential; commercial office; lab space development; and relevant test and demonstration facilities.

The timing and scale of the opportunities are flexible relating to the phased nature of the development and the interests of investors. Opportunities also exist for investment into the businesses on site. The returns on investment vary according to the opportunities investors are interested in. Occupiers benefit from access to two leading universities, advanced digital connectivity, parking, and office and lab space. Industry sectors that will be attracted to locate on the site are primarily within the areas of: medical science; computing & IT; software development; built environment & sustainability; and technology companies (e.g. in education technology, medical technology).

Smart Cambridge

Quick Facts

Location: Cambridge, South East
Size: £8.15m
Project: a deployment of Smart Technology across Cambridge to help the city address some of the challenges it faces and to unlock future economic growth. This will be one of the first retro-fit, city wide deployments of Smart City technology at scale and will create a replicable model for other cities across the world. It will help to address common problems such as congestion, air quality and how to deliver public services and environmental management in more efficient ways.
Type: Governance

Overview

This project will deploy Smart Technology across Cambridge in new and innovative ways to help address some of the challenges it faces (such as congestion, air pollution, delivery of public services and environmental management) and to unlock future economic growth.

This will be one of the first retro-fit, city wide deployments of Smart City technology at scale and would create a replicable model for other cities across the world.

Opportunity

This is an opportunity to trigger some of the UK's, and arguably the world's, smartest scientific minds to innovate professionally and publicly in the Smart City space by kick-starting the funding of their own municipal Smart City innovations.

The funds will trigger additional participants: Google's Smart City team in Mountain View are in discussion with Cambridge about deploying their data scientists to model citizen movements in the city. Wellcome Trust's Genome Campus already spends £600k per annum on bussing some of the world's leading scientists to work, and they have also indicated they would support this to seed an improved, expanded and dynamic network. Investment will contribute to:

- Cutting edge technology in sensors

- data management and analytics

- city management including traffic management, air quality, energy network and health and social care

By developing this sort of proposition in Cambridge, any investor would become part of a significant tech eco-system which leads the world.
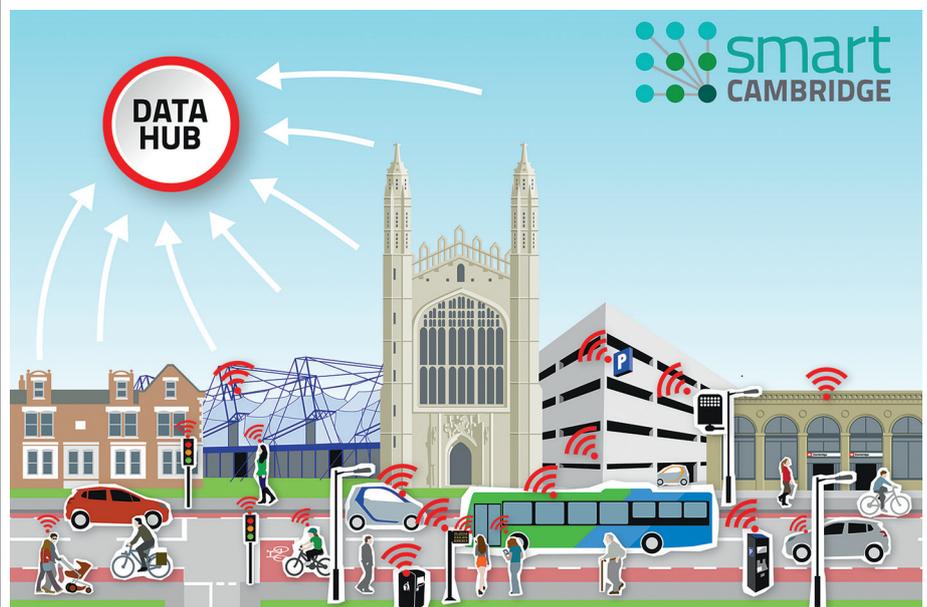
Connected Technologies For Enhanced Living (CTFEL)

Overview

This is an IoT based project which brings together state of the art and emerging assisted living, transport, environment and energy technologies to demonstrate, at a large scale, how by working across sectors we can much better meet the challenges of the modern city. CTfEL combines forward thinking city authorities with leading edge academic research and a large number of innovative commercial partners and business 'start ups' to develop a proposal which can be delivered in 18 months and combines over 45 integrated deliverables

Opportunity

The project provides a wide range of investment opportunities in a unique opportunity which demonstrates the real value of bringing different technologies in different sectors together to deliver solutions.

Development will include:

- retrofit energy technologies, where buildings represent 40% of greenhouse gases and the market is predicted to be £3b worldwide,

- smart transport solutions for highways and public transport services where the global smart market is estimated to be over £100bn worldwide,

- assisted living where already 20% of the population have some mobility impairment and this is increasing with an aging population.

City management technologies, system and data security and data standards are an integral part of all aspects of this project, which has been built around the need to be scalable and transferable to provide the business opportunities for the commercial partners.

The project is ready for immediate investment with a fast delivery programme of 18 to 24 months, and will conservatively deliver a tenfold return on investment. Cities will benefit from improved sustainability with a wide range of benefits to citizens, while this project will provide an excellent platform for Smart City knowledge transfer.

Oxygen Intelligent Mobility Fund

Quick Facts

Location: ready to be deployed across the UK
Size: £100m
Project: The UK's first Intelligent Mobility (Smart Transportation Fund). Through the unique relationship with the Transport Systems Catapult (the UK's leading smart transportation incubator) the fund will have leading access to UK-generated IP and business opportunities. It will look to solve problems of congestion, emissions and pollution by developing new digital technologies (such as autonomous vehicles).
Type: Mobility

Overview

The Transport Systems Catapult was created to drive and promote Intelligent Mobility – using new and emerging technologies to transport people and goods more smartly and efficiently. With a clear emphasis on collaboration, it is bringing together diverse organisations across different modes of transport, breaking down barriers and providing a unique platform for meeting the world's most pressing transport challenges.

Opportunity

The opportunity exists to invest in the UK's first Intelligent Mobility Fund, which will invest in early-stage technology ventures within Intelligent Mobility.

The Fund will target early-stage technology investments in the UK's emerging Intelligent Mobility sector, providing a major venture capital investor across the emerging Smart City transportation eco-system and the first pure-play fund of its kind in the UK.

The relationship between the Oxygen Intelligent Mobility Fund and the Transport Systems Catapult provides a unique source of the best IP and deal flow and access to the country's leading network of innovators and projects in the sector.

The fund will invest in venture capital transactions of £1m to £5m, targeting a market which is growing fast and currently underserved by the venture and private equity community.

As a venture capital fund, commitments will only be drawn on deployment of capital. The fund structure is planned to be a standard UK LP/GP with a target return of 3x invested over the fund time horizon (approx. 10 years). Other opportunities for scale such as co-investment and further funds can also be discussed with the management team.
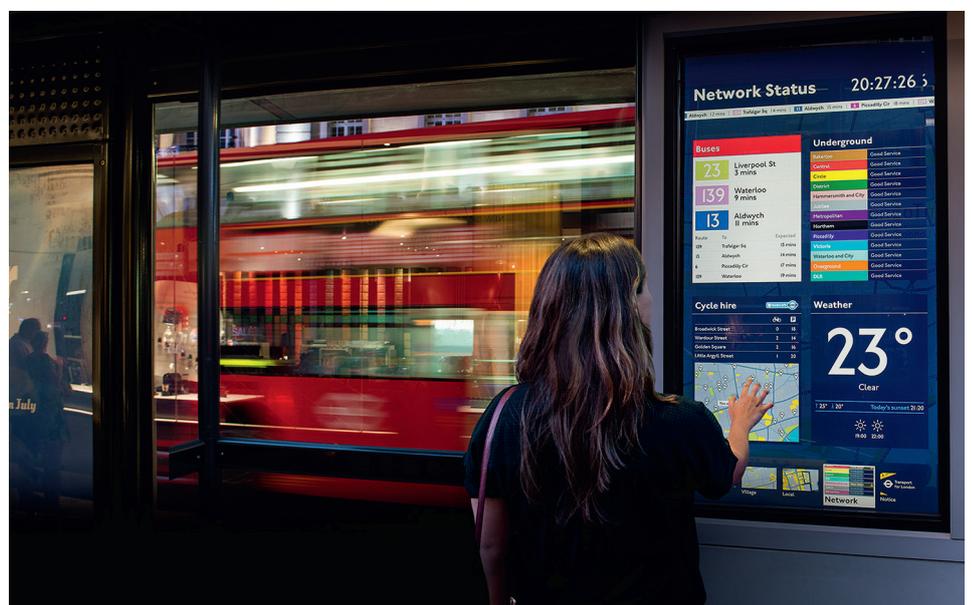
Community Action Platform For Energy (Cape)

Quick Facts

Location: based in Milton Keynes, ready to be deployed across the UK

Size: £13m

Project: CAPE is a community-led urban energy initiative that puts advanced urban data analytics into the hands of communities to enable social action. The aim is to create a local internet marketplace for green energy products, which brings together providers and buyers in a competitive and easy-to use system.

Type: Citizenship; Energy/ Environment

Overview

MK:Smart is a large collaborative initiative which develops innovative solutions to support economic growth in Milton Keynes. One of these community-driven initiatives is 'CAPE', which is now seeking to expand into other cities across the UK and beyond.

The CAPE project ("Community Action Platform for Energy") puts advanced urban data analytics into the hands of communities to deliver community energy initiatives. The use of data analytics to understand, forecast and model needs and consumption, aggregated at a community level, is the next frontier in the energy space. CAPE expects to unlock at least 1.5% of the UK renewable energy market worth £495m.

CAPE uses a unique mix of datasets comprising satellite, aerial, open and proprietary energy and socio-economic data to map and understand energy needs at a community level. Data sets of this variety and heterogeneity have never before been merged and analysed as a whole.

Opportunity

The platform being built is scalable and could be adapted to suit the energy needs of different cities across the globe.

CAPE is being trialled in a leading city council in UK (Milton Keynes), with the intention of replicating the success here in 10 other UK cities over the next five years.

The CAPE platform is at a development phase and the platform will be ready by May 2017. Presently, the platform is being funded by the partners and Innovate UK to carry out the trial in one UK city council. Further investment will enable CAPE to scale up this platform across different cities, tailoring it to local requirements.

Its business model is based around commission, where we would charge 5% to unlock the market potential. So the total Revenue expected after a roll out across major cities in UK would be £25 Million (5% commission on unlocking an addressable market worth £495Million). The total cost for all target cities in the UK would be around £13 Million, leaving a net margin of £12m.

UK Trade & Investment Support

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Smart Cities Pitchbook Notes

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