2018

UK FUTURE CITIES

BUSINESS PORTFOLIO

For China

CATAPULT
Future Cities

WELCOME

I'm pleased to launch this portfolio at the Shenzhen Smart Cities Summit as part of my first visit to China as CEO of Future Cities Catapult.

Shenzhen epitomises the success of the rapid urbanisation China has undergone in recent decades. In the last 40 years this city has transformed from a town of 30,000 people to an economic powerhouse of more than 12 million. Not only this, but it is now amongst China's wealthiest cities, and increasingly seen as a global hub for technological innovation.

China's continued urbanisation, and increasingly innovative businesses make it a priority partner country for us at Future Cities Catapult. In recent months we have been stepping up our engagement with China through our International Partnerships Manager Peter Young who focusses on this task.

In publishing this portfolio we have two core aims. Firstly, we hope to help Chinese partners understand the role that Future Cities Catapult plays in the UK and how we can work on projects here in China. Secondly, through presenting 38 profiles of UK companies that are working to make cities better, we hope to increase understanding of the advanced urban services that are on offer in the UK. The companies featured here have all expressed a desire to begin new, or strengthen existing, partnerships with Chinese cities. We hope that in the months ahead Future Cities Catapult can play a role in facilitating those partnerships, and in doing so contribute to an exciting vision of the future of cites in China.

Nicola Yates OBE
CEO Future Cities Catapult

CONTENTS

At the Future Cities Catapult, our mission is to help UK firms develop innovative products and services to meet the changing needs of cities, and to sell them to the world. In doing so, we support the emerging Advanced Urban Services sector in becoming an enabler of national productivity and a central plank of the UK economy.

Innovate UK is part of UK Research and Innovation, a non-departmental public body funded by a grant-in-aid from the UK government. We drive productivity and economic growth by supporting businesses to develop and realise the potential of new ideas, including those from the UK's world-class research base.

INTRODUCTION

The UK Future Cities Business Portfolio for China aims to raise awareness of advanced urban services being developed by UK companies, and how Future Cities Catapult can help Chinese cities access their expertise.

With twice as many urban dwellers as any other country and a fast-growing economy, China is an increasingly important market for UK providers of advanced urban services. At Future Cities Catapult we aim to foster partnerships that allow Chinese and UK experts to work together on city projects, and in doing so, come up with new solutions to the urban challenges we face.

In this portfolio we give an overview of some of the products and services being developed in the UK and the problems they help to solve. This includes 38 UK company profiles sourced from an advert hosted on our website in mid-2018. Whilst by no means an exhaustive overview of the UK's capability, the profiles provide a useful snapshot for Chinese cities looking to find out more about the UK offer.

The companies featured operate in a variety of subsectors including urban mobility, sustainable growth and health. They also represent a cross section of the business community: some being large, well established companies with decades of experience, and others being younger, high growth potential SMEs.

Through our previous projects (see pages 12-15) Future Cities Catapult has helped to break down barriers to deploying new products and services in cities by bringing companies together with universities and governments. This has helped them test new ideas in urban environments.

We are now looking to expand our partnership with China by working directly on city projects. The "**How We Work**" section of this portfolio explains the form that our projects with Chinese cities could take. If you'd like to find our more about working with us, please see the "**Getting in Touch**" section at the end of the portfolio.

SHAPING THE FUTURE OF CITIES

Cities are humanity's greatest innovation. Home to more than half the global population, cities are where the world lives, works, plays and learns. They are centres of enterprise, creativity and serendipity – the engines that drive productivity and prosperity.

As our cities continue to grow and evolve, new solutions are required to keep the engine running smoothly. This includes tackling productivity-sapping congestion by improving urban mobility; mitigating climate change and reducing pollution through increased sustainability; and ensuring urban environments are healthy and inclusive places that allow all citizens to participate, contribute and flourish.

The UK has a wealth of innovative companies who are working to find solutions to these thorny urban challenges, and many others. Some of these are introduced below.

MOBILITY

The direct and indirect costs of congestion currently amount to around £31bn per annum in the UK[1]. Companies featured in this portfolio are trying to tackle this by improving the way we move around cities. This ranges from changing the way citizens use private cars, to improving city rail and bus systems, to making cycling a more viable option for urban travel.

For example, **AppyParking** (p24) is delivering a smart parking solution that integrates parking bay sensor networks with a smart payment system. This has allowed their users to reduce the average time spent finding a parking bay from 20 minutes to as low as 30 seconds, and removed the hassle of individual ticket purchases.

For underground railways, companies like **Legion** (p22) are helping to increase passenger capacity by simulating and analysing people's step-by-step journey through rail infrastructure, allowing for better station and connectivity planning. They work in the UK but also overseas, advising cities like São Paulo on a metro extension that increased passenger capacity by 185m per year.

See.Sense (p20) make cycling safer and more attractive for citizens through their network of data-gathering smart bike lights. The data they collect is being used to inform the planning of new cycling infrastructure as part of Manchester's CityVerve smart city demonstrator.

Londoners make 2.2bn bus journeys per year[2] and **Wrights Group** (p30) manufactures the city's iconic Routemaster bus fleet which makes bus transport more accessible for those with limited mobility, and also more sustainable through its hybrid engine design.

SUSTAINABILITY

The UK places a strong emphasis on environmental sustainability. Amongst other environmental goals, the UK government aims to reduce overall carbon emissions to 80% of 1990 levels by 2050[3]. A range of UK companies are helping us to achieve a more sustainable future through better planning of cities, deployment of renewables, and improved energy efficiency.

SNC-Lavalin Atkins (p34) is implementing a Carbon Critical Design™ initiative which challenges planners to re-think the way they work on urban projects by considering carbon reduction as a starting point. **Resilience Brokers** (p44) are taking a systems

1. http://inrix.com/press-releases/traffic-congestion-cost-uk-motorists-more-than-30-billion-in-2016/

2. https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/715419/quarterly-bus-statistics-january-to-march-2018.pdf

3. https://www.gov.uk/government/publications/2010-to-2015-government-policy-greenhouse-gas-emissions/2010-to-2015-government-policy-greenhouse-gas-emissions

modelling approach to provide insights into the way that human and business activity interacts with resource flows and infrastructure. They use this to help guide new infrastructure investment and ensure that finite resources such as energy, food and water are utilised in a sustainable way. **Sunamp** (p62) are working with city housing associations to deploy solar power and energy storage more effectively, helping reduce fuel costs and increasing comfort for citizens. **Blockdox** (p66) is improving energy efficiency in urban developments by deploying IoT systems and using machine learning, helping building operators to manage space in a smarter way.

HEALTH & INCLUSIVITY

City living comes with many benefits, but it can also increase the chance of damaging health conditions, especially those linked to stress, social isolation, noise and air pollution. UK companies are increasingly developing new technologies to improve health in cities, whilst also making them more inclusive places to live.

Inavya (p58) has developed Avatr which enables users to create a digital profile of their selves which can be shared with doctors and family. This allows them to receive personalised medical care outside of the hospital, increasing access to healthcare for those less able to travel such as the elderly and disabled.

TPP (p56) has over 20 years' experience working with the NHS as an integrated software provider, and in recent years has started to form relationships with Chinese cities. The company is helping them to deliver their "Healthy China" strategy through the provision of centralised, cloud-based clinical software.

Trueform (p74) have been working with Future Cities Catapult on the installation of interactive "Tech Totems" (see p15) in Birmingham and Newcastle. Tech Totems have mechanisms to monitor street-level noise and air pollution, which impact human health and wellbeing. They also allow citizens to provide input on local planning decisions through an interactive interface, leading to increased citizen engagement and inclusivity.

CATEGORISING FEATURED COMPANIES

Future Cities Catapult supports firms that develop innovative products and services to meet the changing needs of cities. Whilst we have just given examples of three challenge areas where UK companies are creating innovative solutions, “future cities” is a broad theme that can be further broken down into sub-sectors. To help readers understand which sub-sectors the companies featured in this portfolio specialise in, we have created eight icons that are shown in the graphic below. These icons appear next to individual company profiles later in this document, to provide the reader with an indication of each company’s focus area in meeting city needs.

Infrastructure & Buildings

Environment & Energy

Healthcare

Education

Planning & Architecture

Mobility

Governance & Standards

AI & Digital Economy

HOW WE WORK

At Future Cities Catapult we are proud of having delivered successful projects across five continents (see p16-17). Through our work in countries such as UAE, India, Brazil, Mexico and Malaysia, we have helped cities around the world achieve their visions for success in a diverse range of challenge areas.

In China we are looking to find partners who want to better understand the challenges of cities and how best to address them, including through leveraging innovative technologies. Potential partners for us include Chinese city governments, developers and companies working on urban projects.

Our projects can involve helping clients understand urban challenges, advising options for tackling them through market engagement, and assisting with the early stages of solution deployment. By working through Future Cities Catapult, cities can access a range of expertise from the UK and other international markets in one place.

Although Future Cities Catapult seeks to work on projects in an agile way that takes into account the uniqueness of different cities, the below outline aims to give potential partners an idea of the general form our projects could take.

1. UNDERSTANDING THE CHALLENGE

When working on a Chinese city project our first stage would be to help our project partners understand an urban challenge. City challenges - such as traffic congestion, air pollution or lack of access to public services - can have many root causes. Recognising this, we first try to identify clearly what the causes are, leveraging the expertise of a range of disciplines. Our in-house team includes urban planners, anthropologists, technologists, economists, architects, and data scientists. These experts are able to work together to analyse city problems in a holistic way, creating the greatest chance of finding impactful solutions. In practical terms this tends to involve conducting research and engaging stakeholders that are impacted by a city intervention. This could include citizen groups, asset owners and operators (such as utilities companies), developers, government officials, or universities.

We previously worked with the city of **Belo Horizonte** in Brazil (p13) on the challenge of improving public transport. Through citizen engagement, field research, and running government workshops our team identified various causes of the transport challenges the city was facing. These included imbalances in the quality of service offered across the city, limited access in deprived areas, and connectivity issues between bus routes. By pointing out some of the root causes of mobility problems, we were able to engage the market in an effective way, and propose technological solutions.

2. ENGAGING THE MARKET

Once a challenge has been more clearly defined and understood we are then able to work with cities to engage the business community - such as the companies that feature in this portfolio - to explore innovative ways for the challenge to be solved. In doing this we encourage collaboration with academia and government to ensure interventions are informed by good evidence and the most up to date scientific knowledge.

Future Cities Catapult can engage the market in various ways. We can run **open calls**, where we pose a challenge using a public channel such as our website and invite companies to put forward suggestions for how they might solve it. We then help select what

we deem to be the best quality applications for procurement. We can also make direct approaches to companies with specialist expertise, or run targeted events such as **sprints** or **hackathons** (see p15), where we pose a challenge and ask companies to use innovative means to solve it over a set time period.

In Belo Horizonte we ran an open call, one of the winners of which was design-led technology company **Red Ninja** (see their spin-out **iSensing** on p72). They worked with authorities to deploy a wifi sensor network that collected real-time pedestrian movement and dwell-time data at bus stations and on bus routes. This generated valuable data that allowed citizens and transport operators to alter usage and operation respectively. We have also used open calls in other projects. When working on the **Smart Belfast Framework** (p13) we ran an open call to source companies with technologies that could help better monitor tax compliance. One of the successful companies was **NquiringMinds** (p46) who developed a tool that utilised publicly available data to identify likely breaches of compliance.

Other market engagement mechanisms include making direct approaches to specialist companies and hosting challenge-focussed events such as hackathons (see **Future of Planning** p15). Through engaging the market, our project partners will be presented with a range of possible solutions to an urban challenge. Future Cities Catapult's Performance in Use team can also work with you to assess the potential impacts of each intervention, informing decision making about whether or not to deploy a given solution. For larger projects this may involve facilitating collaborations between a range of solution providers, consisting of multiple companies with niche abilities. As a neutral platform in the UK market, Future Cities Catapult is well placed to convene and help manage delivery consortia for projects.

3. DEPLOYING THE SOLUTION

The final stage would be to work with you on the early stages of delivery, ensuring that the conditions are set for the chosen solution to be effectively deployed. We can help both the city and the solution provider reach a common understanding of the objectives, and help make sure that the right protections are in place on both sides. Forms that solution deployment could take include investment in physical infrastructure or the development of digital tools.

We recently worked on a project called **Tech Totem** (p14) which involved deploying physical infrastructure in the form of an interactive totem in Birmingham. We worked with the company **Trueform** (p74) to manufacture the totem and deploy it in a new mini park developed by **SNC-Lavalin Atkins** (p34). The totem contains sensors that allow it to gather data on local footfall, noise and air quality. There are also mechanisms to engage directly with citizens. The totems use low-power, e-ink screens and audio cues to prompt passers-by to engage with them. Through this, citizens are being consulted on local planning applications and signposted to local businesses, events and amenities. Citizens can also share opinions about the surrounding area with the totem via a voice-activated mechanism, which can be used to inform local decision-making. After initial deployment in Birmingham, Future Cities Catapult is now working with Newcastle University to extend the deployment of totems to the city of Newcastle.

Understanding the Challenge | Engaging the Market | Deploying the Solution

OUR UK PARTNERS IN CHINA

UK SCIENCE AND INNOVATION NETWORK

Part of the UK Foreign and Commonwealth Office, the **UK Science and Innovation Network** (SIN) promotes and facilitates international collaboration in research and innovation between the UK and China. They have staff based in the British Embassy in Beijing and Consulates in Chongqing, Guangzhou and Shanghai.

DEPARTMENT FOR INTERNATIONAL TRADE

The **Department for International Trade** helps secure UK and global prosperity by promoting and financing international trade and investment, and championing free trade. They play a role in promoting British trade and investment across the world and have a presence across all HMG Diplomatic Missions in China.

CHINA BRITAIN BUSINESS COUNCIL

China-Britain Business Council helps British and Chinese businesses and organisations work together in China, the UK and third markets around the world. They have a diverse 1,000-strong membership which includes some of the UK's largest and most established companies, some of the UK's most dynamic and innovative SMEs, and leading Chinese companies.

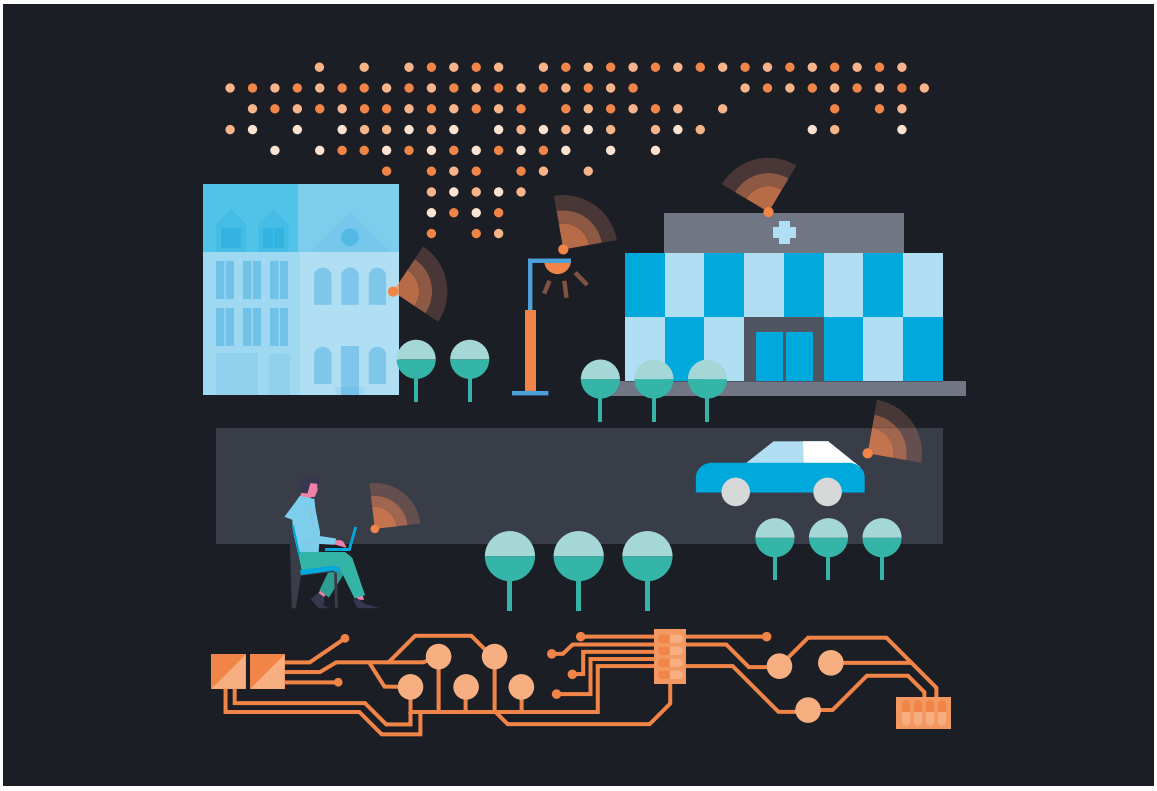
INNOVATE UK

Innovate UK is part of UK Research and Innovation, a non-departmental public body funded by a grant-in-aid from the UK government. They drive productivity and economic growth by supporting businesses to develop and realise the potential of new ideas, including those from the UK's world-class research base.

FUTURE CITIES CATAPULT

Future Cities Catapult is part of the UK's Catapult Network that was established by **Innovate UK**. Catapults support business innovation by providing access to expert technical capabilities, equipment, and other resources required to take innovative ideas from concept to reality. What distinguishes Future Cities Catapult from other HMG partners is that we work directly alongside UK companies as a partner on delivering urban projects, drawing on our in-house expertise in areas such as planning, insights, technology, project management and design. We are able to bring together larger more established companies with smaller companies and academics to deploy a new technology in a city environment. As such we are keen to hear from innovative companies looking to benefit from our project-based approach, especially those looking to become independent exporters in the future.

BELO HORIZONTE



Brazilian cities like Belo Horizonte face problems as diverse as improving mobility, increasing citizen safety and supporting local innovation. Whilst various technologies can help tackle these challenges, advice is often needed to match the right technology to the right challenge.

A study by Future Cities Catapult identified key urban challenges in Belo Horizonte that could benefit from UK knowledge and experience. Through a series of workshops and discussions with city stakeholders and businesses, the project identified challenges such as: imbalances in the quality of transport services, issues particular to deprived areas of the city, and connectivity problems between different transport lines.

To increase the ability of local authorities to tackle these challenges Future Cities Catapult ran an open call that invited UK small and medium-sized enterprises to provide innovative, technology-driven solutions.

A winner of the open call was a company **Red Ninja** who deployed a wifi sensor network that collects real-time pedestrian movement and dwell-time data at bus stations and on bus routes. Using this, and a citizen engagement app, they were able to measure punctuality, regularity and occupancy in real time. This generated insights for the local authorities on how to better run their service, and allowed users to make more informed decisions about which transport nodes to use.

BELFAST SMART CITY FRAMEWORK

Future Cities Catapult developed a smart city framework for Belfast City Council over a period of twelve months through consultation with key city stakeholders. The aim was to help Belfast City Council to devise a strategy for becoming a smarter city in a way that takes advantage of the city's innovation assets. Workshops with city stakeholders helped us identify areas where we could help to tackle existing challenges through business engagement and plan for the future using digital tools.

As part of this we undertook four activities as early exemplars of the new smarter approach. These were:

• Business Rates Maximisation: through a Small Business Research Initiative competition with the Council and Land & Property Services, we coordinated a pre-procurement process to source the most innovative solutions from small businesses to increase revenue from business rates in the city. The competition was won by companies **Analytics Engines** and **NquiringMinds** (p46). The tools that the companies created helped the local council identify underpaid rates and as a result generate >£300,000 in additional tax revenue, with annual additional revenues of >£1m currently forecast.

• Rates Forecasting: we laid the groundwork for developing a tool to enable to the council to accurately forecast income from business rates up to 5 years into the future.

• GrowthPlanner: we developed a digital tool prototype that visualises infrastructural capacity for different parts of the city to aid the Council's Local Planning Development team with major development and investment decisions.

• City Dashboard Design Brief: through consultation with a range of council departments, we developed a design brief to enable the Council to procure a city dashboard tool to communicate key metrics relating to the provision of services and drive performance.

TECH TOTEM

Future Cities Catapult has worked with UK SME TrueForm (p74) to manufacture the first Tech Totems.

Tech Totems aim to explore how digital street furniture (smart streetlamps, benches, signs, waste receptacles etc) could enable cities to tackle challenges. Due to restrictions on the use of public space, deploying and testing new technologies in real urban environments is something that is currently hard to do in the UK.

To help tackle this barrier Future Cities Catapult has developed a new physical city experimentation platform that makes use of "Technology Totems". These are adaptable installations that provide space for businesses to test and develop products, and in doing so also provide valuable data (such as noise, air quality or video footage) to city authorities. The totems also come with an easy to use interface and e-ink display that allows them to engage directly with citizens and solicit views on issues such as new local planning proposals. It can also signpost them to local places of interest or business promotions.

The first Tech Totem prototype is located in our Urban Innovation Centre in London and allows our team to experiment before new hardware, software and content is deployed in a real city environment. The second totem is deployed alongside SNC-Lavalin Atkins' (p34) new mini park in Birmingham's Southside district. It contains 3 live experiments being run by different companies. Rollout of three additional Tech Totems is currently underway in the city of Newcastle.

The businesses that have worked with us report that using the totems has provided them with a useful launchpad for new products they are seeking to launch in the urban space. It can be a challenge for small businesses to navigate a city's complex policies and processes to get the necessary approvals to test their products in a city environment. Tech Totems are already providing a secure, powered space where sensors or other devices can easily be fitted to collect data from the local environment.

At the same time city authorities want to ensure that the public is as engaged as possible in contributing to the vision and planning of new developments. Such efforts are often unsuccessful and not designed with citizens in mind. This means people lose interest in the area and feel less ownership and sense of community. Tech Totems go some way to combating this problem by providing an accessible means for the public to be consulted on proposed changes to their local area.

FUTURE OF PLANNING

FUTURE
OF
PLANNING

In an age of rapid urban growth and expansion, planning is crucial to a city's ability to be competitive whilst supporting the wellbeing of its citizens. Poor planning is not only costly and time consuming, it can result in chronic stresses that weaken a city, like high unemployment and a lack of essential services.

Future Cities Catapult's Future of Planning project aims to create a more data-driven and digitally-delivered planning system for the UK. The process we underwent was to talk to planners, architects, developers and citizens to identify the key challenges faced by planning authorities around the UK. They were: data informed planning; flexible plan making; improving the user experience of the planning application service; and increasing citizen engagement.

To begin to build solutions to the challenges identified we held a **hackathon** during which we invited problem solvers working in built environment, urban planning and software to come together and provide ideas on how they could utilise a new API for planning applications. Alongside this we created an open call for collaborators to create prototypes for digital planning products and services that would drive innovation in the planning sector. UK businesses, individuals, entrepreneurs and planning authorities were invited to develop ideas to create a more data-driven and digitally-enabled system. We received 87 applicants in total, from large businesses, small businesses, start ups and local planning authorities from which we selected nine winners.

The nine new prototypes or products had applications that included: allowing planning officers to assess new development proposals within a live 3D model of the city; using augmented reality to visualise unbuilt development proposals to allow for public consultation; and tools that make it easier for local councils to compile, update and coordinate their land, planning and development completions data.

As part of the Future of Planning project we also:

• Researched state of the art innovations in planning from around the world

• Brought together practitioners from the fields of planning, architecture, development, citizen engagement and technology

• Conducted in-depth user research to understand the most common challenges in planning internationally

• Held the first #PlanTech Week, running talks, events and an exhibition

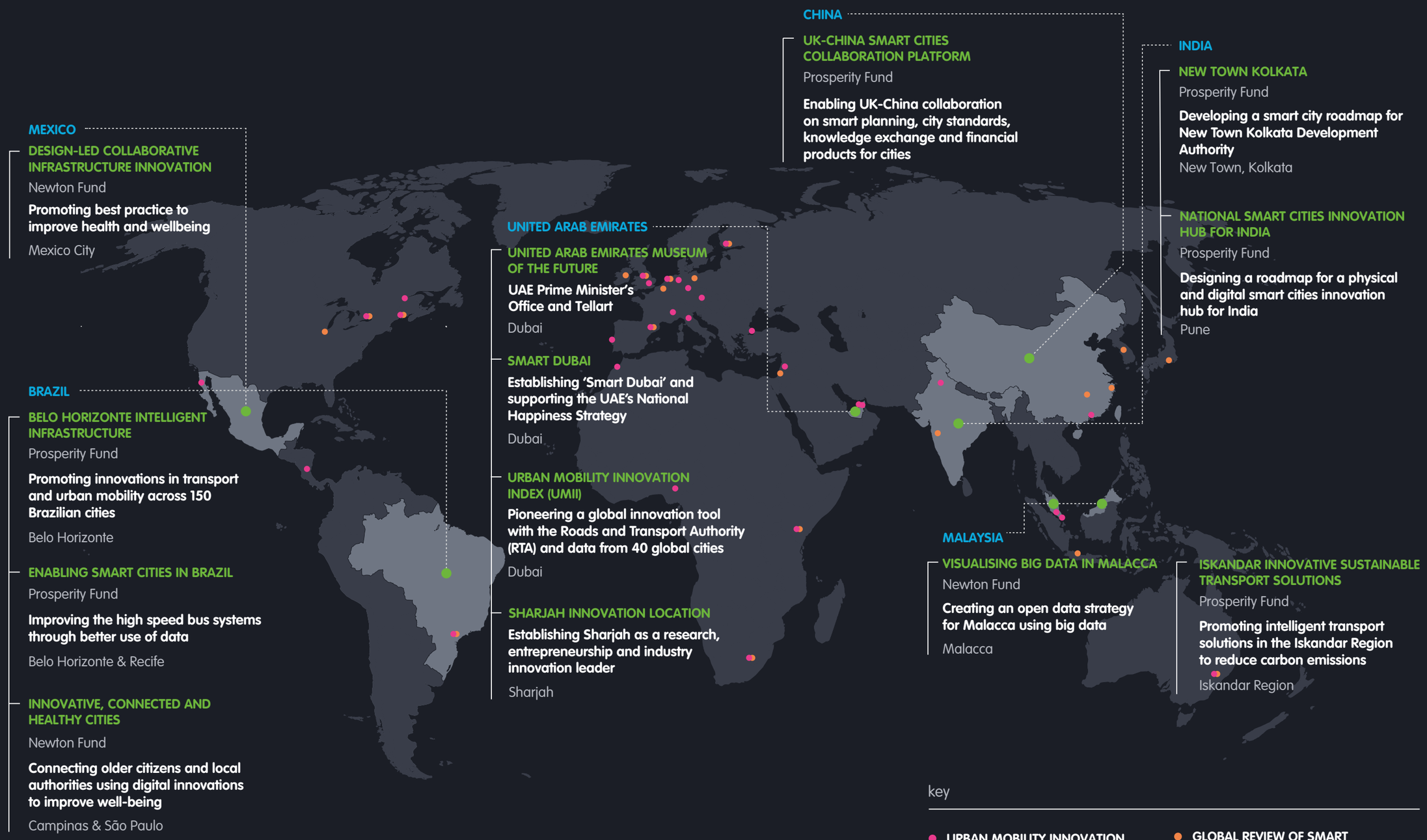
• Worked with the Ministry for Housing Communities and Local Government to identify what a new national digital planning system would look like

• Worked with Greater Manchester and Birmingham to create working prototypes of new digital planning software

FUTURE CITIES BUSINESS PORTFOLIO FOR CHINA

CATAPULT Future Cities

THE INTERNATIONAL PROJECTS MAP



key

- URBAN MOBILITY INNOVATION INDEX (UMII) CITIES
- GLOBAL REVIEW OF SMART CITIES STRATEGIES

FEATURED COMPANIES

The companies featured in this portfolio were sourced from an advert hosted on Future Cities Catapult's website in mid-2018. Whilst by not an exhaustive list of UK advanced urban services companies, the profiles featured here aim to give the reader a feel for the kind of expertise the UK has to offer.

SEE.SENSE®

LEGION SCIENCE IN MOTION

appyparking MAKE PARKING FORGETTABLE

stage intelligence

agility3 modelling and simulation

WRIGHT

grid™ eventually everything connects

SNC·LAVALIN

ATKINS Member of the SNC-Lavalin Group

Space Syntax

MOTT MACDONALD

hpw Architecture

urban

resilience brokers

nqm.ai ai • security • iot

Paremus

connectedspace

MassiveAnalytic The Precognition Company

WISCONT 云图智联

tpp

avatr

kinsetsu

Sunamp Heat Batteries™

CAMLIN

BlockDox Better Building Management

PAVEGEN

UtterBerry

iSensing Breakdown movement. Sense flow.

trueform

IMGeospatial

imont cloudless IoT

HELLO LAMP POST

Telensa making brighter cities

science scope Linking ICT with Science

bsi.

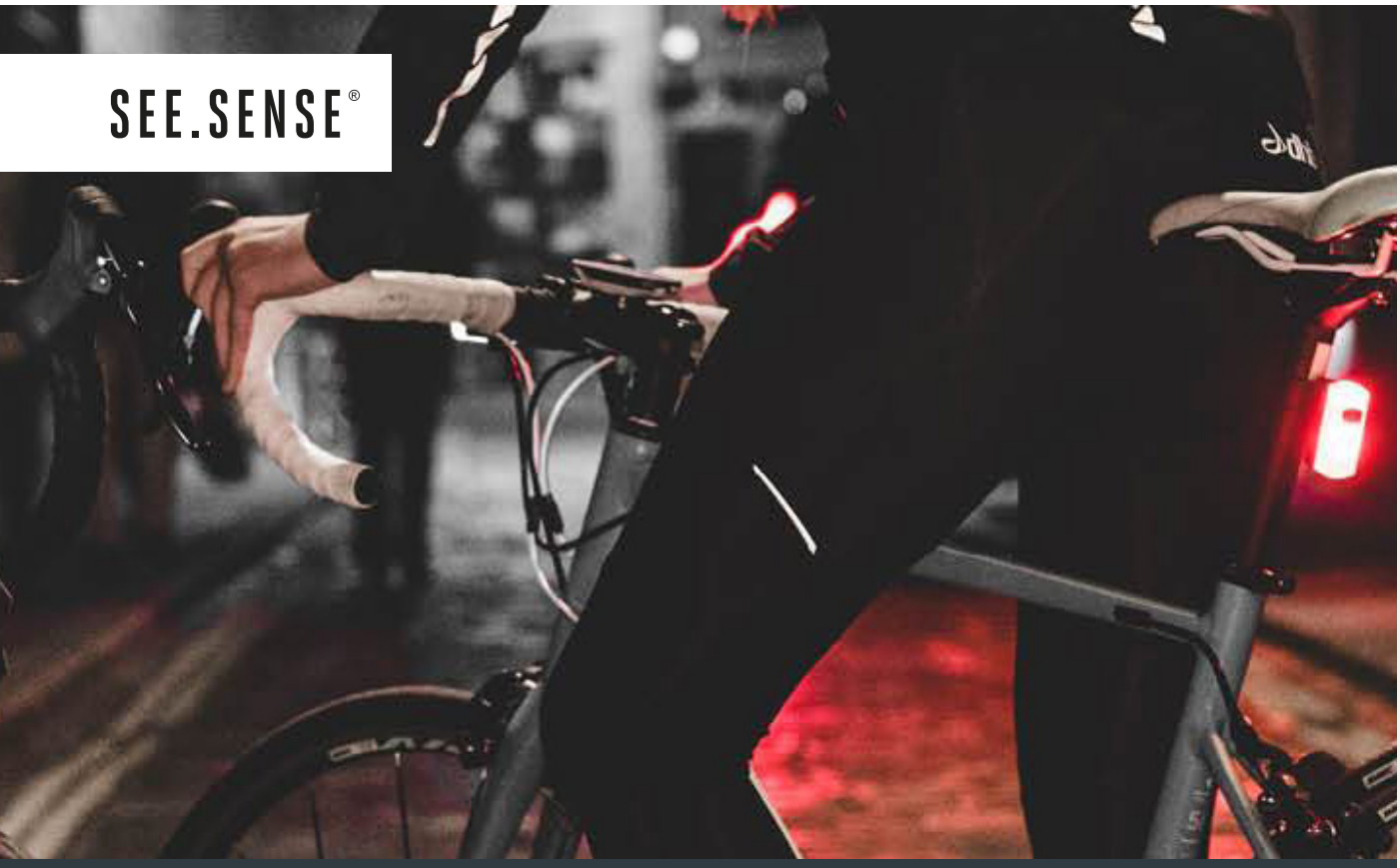
loqiva

CSTransform

UrbanEmerge

perform green

VRM TECH



SEE.SENSE

KEY FACTS

HQ: Belfast
Regions active: UK, EU, USA, Canada, Australia
Industry: cycling, technology, data

> Our unique insights have helped cities manage and direct their resources, enabling effective implementation of cycling infrastructure, ultimately making those cities better places to live."

Philip McAleese
CEO

OVERVIEW

See.Sense helps cities around the world improve the safety and quality of cycling, increasing its appeal as a sustainable mode of transport.

Every day, cyclists use See.Sense's bike lights when traveling around their city. When they do this, the technology within their lights acts as a city's mobile, all-encompassing and cost-efficient sensor network, constantly detecting road issues and monitoring cycling routes. Through the See.Sense app, cyclists are then able to share anonymised insights and feedback from their rides.

This data gives cities a real-time view of how a previously invisible part of society travels on their roads. With See.Sense, cities can map the condition of their roads, the flow of cyclists and potential collision areas in order to create better cycling infrastructure that enhances public safety, reduces congestion and lowers pollution.

What kind of projects our company works on

See.Sense partners directly with cities to deliver smart city projects. We deploy sensors within our lights for cyclists, rapidly creating a mobile, all-encompassing sensor-network throughout a city. We then aggregate the crowdsourced data and partner with the city to undertake analysis and deliver actionable insights.

We also provide tailored dashboards highlighting areas where mediating action can occur. See.Sense data can be supplemented with additional data sources, enriching the collected information to show patterns and opportunities for improving both existing and future cycling infrastructure.

With the release of ACE, See.Sense will allow all of its customers to contribute their data to help improve their city.

CASE STUDY

CITYVERVE

CityVerve is the UK's largest smart city demonstrator project bringing together the latest Internet of Things technologies deployed at city-scale to generate insights and deliver change. As part of the project See.Sense has collected data on over 5,000 journeys and is continuing to work alongside stakeholders to help deliver data-driven insights that will change how people chose to move around their city.

How Chinese partners will benefit from working with us

Our city partners benefit from the data-driven insights that we have uncovered, all without the significant costs of infrastructure deployment and maintenance usually associated with smart city implementations. Some of the many benefits include improved public safety, lower transport pollution, reduced congestion and reduced future road repairs. Furthermore, our projects involve working with the cycling community, engaging citizens and delivering people-centred planning solutions for the city.

How we take an innovative approach to delivering advanced urban services

Our collaborative approach to delivering advanced urban services utilises public-private partnerships with cities. We bring together a highly effective ecosystem of data, analytics and real world understanding to generate unique insights into the city to deliver change. We create a near real-time feedback loop between citizens and the city, empowering citizens to affect change and helping cities to capture value and grow more sustainably.

LEGION

KEY FACTS

HQ: London
Regions active: UK, EU, Americas, Asia
Industry: software development

> **Our key goal is to optimise space utilisation, directly translating into improved safety, efficiency and revenue."**

Eduardo Lazzarotto
Sales Director

OVERVIEW

Legion is a London-based tech SME focused on understanding people movement. Our scientifically validated software accurately simulates and analyses people's step-by-step journey through infrastructure. Metro station, stadium, shopping mall and airport managers work with us to model, test and deliver operational, commercial, footfall, wayfinding, crowd management and security strategies.

Cities around the world are growing at unprecedented rates which puts infrastructure operators under pressure to provide safer and more efficient public venues within budget constraints. The key goal of a Legion project is to optimise the use of space, directly translating into improved safety, efficiency and revenue.

Legion's simulator is based on extensive scientific research of people behaviour in real contexts. It microscopically accounts for individual decision making, crowd formation, allowing patterns of movement to emerge naturally. The algorithms are patented, and simulation results have been validated against empirical measurements, qualitative studies and more than two decades of application worldwide.

What kind of projects our company works on

Legion works with transport agencies worldwide, including London, Santiago and Beijing. Large events organising committees, such as London2012, Brazil2014 and Rio2016 and world leading consultancy companies such as AECOM, Atkins and Systra use our tools to test and operate infrastructure from the drawing board all the way to legacy delivery. Whether you are a transit agency, urban planning agency, sports venue or major event planner, Legion can deliver considerable capacity increases for your facilities, using your existing assets. We do this through a combination of Legion's unique predictive simulation technology, 15 years of consulting expertise, and integration with leading industry methods.

How Chinese partners will benefit from working with us

Multiple clients in China already adopt Legion as their preferred crowd modelling tool, including Shanghai and Beijing metros. We aim to work locally and transfer technology by training our users and allowing them to participate in our R&D scheme. China is a key market for Legion, and local companies can benefit from working with our expert staff to utilise movement simulation tools effectively.

CASE STUDY

SÃO PAULO METRO

São Paulo Metro transports 1.1 billion people annually, and the expected demand for a new line being built is an additional 185 million people per year. Legion has built models and scenarios for its 15 planned stations, prioritizing the 6 interchange stations that had significantly higher demands. We also trained the Concessionaire´s operational staff and transferred technology to the team so they could keep benefiting from our tools.

How we take an innovative approach to delivering advanced urban services

Legion simulator is based on extensive scientific research of people behaviour in real contexts. Through partnerships with leading UK universities and public companies we aim to develop scientifically validated and commercially viable tools. Legion can model any activity and/or space that affects people movement. We are currently working with world leading universities and transport agencies to deliver advanced urban planning.

APPYPARKING

KEY FACTS

HQ: London
Regions active: UK
Industry: smart city, mobility as a service, IoT

> 30% of air pollution in the UK's urban areas comes from people trying to find parking. Our solutions are designed to help the cities of tomorrow to become less congested, in turn leading to increases in productivity and improved air quality."

Jack Taylor
Head of Operations

OVERVIEW

AppyParking is a next generation connected car and traffic management platform that bridges the gap between big data, high definition mapping, IoT and payments.

The Parking Platform™ provides a digital infrastructure layer over the existing road network and offers a "Platform as a Service" for local governments and car park operators to manage their kerbside assets. Data as a Service is then licensed to vehicle original equipment manufacturers, connected car companies and B2C consumers through a marketplace.

Our agnostic approach offers a holistic and scalable connected car and smart city solution. In the short term, AppyParking can dramatically reduce congestion and pollution, increasing productivity and saving drivers both time and money.

Mobility as a Service is set to be worth £900bn by 2025. For this to reach its full potential, parking needs to be made completely forgettable and frictionless. One Click Parking™ is our flagship frictionless pay-as-you-go payment solution, currently being rolled out in Westminster.

What kind of projects our company works on

AppyParking uses Bluetooth-enabled real-time sensors to show parking space availability, bringing frictionless payments to on-street parking. Data from these sensors is then fed into our app, directing drivers to the nearest available parking space.

Users indicate that their parking session has begun via our app or a Bluetooth dongle attached to their car. They are then charged on a pay-as-you-go basis.

When the driver returns, they simply drive out of the parking bay and the sensor tells our system they have left, calculating a charge according to the amount of time that the car was parked.

CASE STUDY

ONE CLICK PARKING

Pimlico Plumbers is London's largest independent plumbing company. Plumbers reported regularly spending 20-30 minutes looking for a parking space and paying for 4-5 hours of parking time when a job would often only take one hour. In July 2015 AppyParking created the world's first One Click Parking™ solution. Using a combination of machine-to-machine dongles and our mobile app, we enabled drivers to find available spaces quickly and easily, and pay only for the minutes spent parked.

How Chinese partners will benefit from working with us

China faces challenges with congestion, pollution and lack of parking. We are looking to work with Chinese cities and districts who would like to implement our innovative solution to help tackle these problems. We are also interested in partnerships with Chinese vehicle manufacturers seeking to make parking more convenient for their customers through integration of our app into vehicle dashboards.

How we take an innovative approach to delivering advanced urban services

There are a number of parking solutions on the market that use sensors, however these only show available parking bays. AppyParking's approach is innovative because we go beyond just showing parking bays to also facilitating parking payments. In the future we hope to innovate further through vehicle dashboard integration, using platforms such as Apple's CarPlay and Google's Auto system. With widespread use of e-payment in China we also see the potential partner with Chinese e-payment providers.

STAGE INTELLIGENCE

KEY FACTS

HQ: London
Regions active: USA, Europe, Latin America, Canada
Industry: software

> In our business and beyond, we've seen how influential AI can be in changing business models and creating better mobility solutions."

Tom Nutley
Operations Director

OVERVIEW

Stage Intelligence was founded in 2011 to develop ground-breaking artificial intelligence solutions to solve some of the most complex challenges within the shared mobility ecosystem. We use artificial intelligence and self-organising algorithms to collaborate with our customers, solving complex problems and delivering solutions that have a lasting impact on their operations.

Our flagship product, BICO, is a cloud-based solution that delivers real-time intelligence via its intuitive built console and app to optimise the management of bikeshare schemes. It enables precise and optimal decision making and has been purpose-built to remove complexity from managing cycle, vehicle and staff resources by automating operation.

What kind of projects our company works on

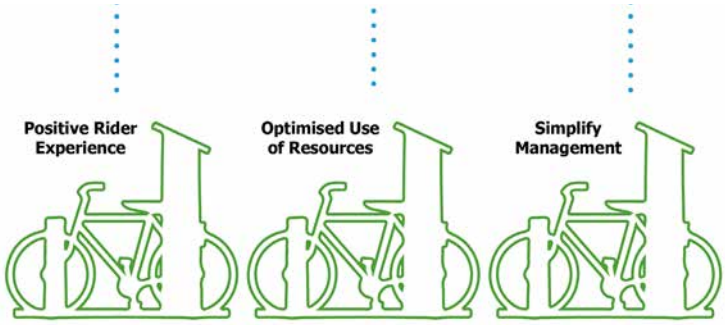
Stage Intelligence works with bikeshare scheme operators to provide real-time intelligence to optimise operations. We enable precise and optimal decision making and have been purpose-built to remove the complexity from managing cycle, vehicle and staff resources by automating operation processes.

By using AI to predict demand based on factors such as weather conditions, seasonality, large city events, holidays and public transport closures BICO enables operators to stay ahead of fluctuating demand by proactively ensuring that there are sufficient bikes and docking points available where and when they are required. We also work with other shared mobility companies to offer AI solutions.

CASE STUDY

DIVVY BIKES

Through our work with Divvy Bikes in Chicago we have been able to reduce the number of miles driven by bikeshare operators, helping bring about cost savings and other benefits. Even after a considerable expansion to over three times the number of bikes and stations, we were able to achieve significant gains for the company and hit our KPIs.



Creating Value & Growing Ridership for Operators

How Chinese partners will benefit from working with us

Chinese partners will benefit from the visibility of seeing what happens within bikeshare operations in cities. Operators will be able to optimise their resources to provide the best service for their users and city inhabitants, giving users a high level of bike availability when and where required.

How we take an innovative approach to delivering advanced urban services

Stage Intelligence works closely with partners to constantly adapt and deliver solutions to the problems they encounter whether this be a functional add on or new product. We are also heavily involved in industry discussions to ensure we are up to date and understand industry requirements.

AGILITY3

KEY FACTS

HQ: Stevenage
Regions active: UK, Europe
Industry: transport, infrastructure

> **At Agility3, we pride ourselves on being easy to work with. We ensure we have a complete understanding of our clients' goals and requirements and develop professional solutions that deliver maximum benefits."**

David Turner
Business Director

OVERVIEW

Agility3 helps transport and infrastructure development organisations save time and costs throughout the lifecycle of a project. We do this by creating interactive 3D visualisation applications that improve communication, understanding and engagement amongst the stakeholders involved.

Using commercially available tools and the latest technologies - including gaming technology, virtual reality and augmented reality - we create interactive 3D applications that enable our clients to visualise their developments before construction with high levels of realism. This improves understanding of large, complex projects for all stakeholders, including designers, engineers and (most importantly) end users.

Through being able to trial various development layouts and options, clients can receive better and more effective feedback on project designs and plans earlier in the development process. This saves time and costs, and reduces long-term risks posed to successful delivery.

What kind of projects our company works on

Typical clients are involved with large transport or infrastructure development projects. Our visualisation applications add value to all construction projects but are of particular benefit to those that are complex, high risk, have multiple stakeholders and involve large investment. Our applications enable more effective communication of complex development ideas and plans to ensure all stakeholders have a thorough understanding of what is to take place prior to construction. This benefits clients by enabling them to acquire better feedback on development plans earlier in the development process. Identifying potential issues early means they can be addressed when the time and cost it takes to do so is much lower in comparison to what it would be later in the project.

CASE STUDY

NETWORK RAIL

Network Rail's redevelopment of Liverpool Lime Street train station is a complex project with large investment, designed to increase station capacity. To ensure complete stakeholder understanding and to help recognise issues and risk early, Agility3 developed a visualisation application as well as a highly realistic 3D environment of the station in various stages of development. Users could move freely within the application, examining all aspects of the development from various perspectives and compare current station plans with the new design layout.

How Chinese partners will benefit from working with us

We are looking to work with Chinese partners seeking to effectively communicate development plans and designs prior to being awarded contracts. We are able to help them generate interactive 3D visualisation applications that provide a competitive advantage and can increase the likelihood of winning infrastructure development projects. Once contracted, Agility3's offering will be to: enable better and earlier feedback on project plans; facilitate the recognition of risks early on; and improve understanding and communication between stakeholders.

How we take an innovative approach to delivering advanced urban services

We use the latest, most innovative tools and technologies for creating interactive 3D visualisation applications. An example is our use of emerging technologies such as Virtual Reality and Augmented Reality which are tools that can provide additional benefits to our clients. Being knowledgeable in these new technologies and flexible in our choice of development tools means that we can use the best and most innovative tools that will be most appropriate for each project.

WRIGHTS GROUP

KEY FACTS

HQ: Ballymena
Regions active: Europe, Singapore, Hong Kong, Mexico
Industry: automotive, bus manufacturing

> "The team at Wrightbus want to be part of shaping future cities, based on our core values of quality, safety and environmental sustainability."

John McLeister
Managing Director

OVERVIEW

Wrights Group is a world-leading manufacturer of public service vehicles and developer of the world's first hydrogen fuel cell double decker bus.

We see public buses, built on the most advanced and sustainable technologies, as continuing to play an important part in the transport systems of future cities. Wrights Group is a company with a 72-year history, but we continually stay at the forefront of technological developments, spending more than £7.5m annually on R&D. We also have a dedicated Research and Development Centre of Excellence in Northern Ireland with Queens University Belfast that specialises in clean technology bus development projects. We have an annual turnover of £275 million per annum, employ 2000 people and produce more than 1300 Completely Built Up Units (CBU) and 350 Completely Knocked Down Units (CKD) a year. We have offices in the United Kingdom, Singapore, Hong Kong, Malaysia and India.

What kind of projects our company works on

Wrights Group have developed a range of clean technology vehicles which are having a positive impact on cities. We are unique in being a specialist public service vehicle supplier, and do not manufacture trucks or cars. This allows us to have a specialised focus on designing new and innovative products to cater to the needs of cities. We design and manufacture vehicles in a way that ensures maximised comfort, efficiency and safety.

CASE STUDY

NEW ROUTEMASTER FLEET

Wrights Group have successfully worked in partnership with Chinese suppliers to reduce emission levels in cities throughout the UK and Ireland. This included manufacturing the New Routemaster fleet: the iconic hybrid diesel-electric double-decker buses that currently operate in London. Our goal is to help achieve fully integrated public transportation for all people in urban areas.

How Chinese partners will benefit from working with us

Wrights Group are able to bring Chinese partners experience of working in major metropolitan areas throughout the world. We have been able to watch these cities grow and see how they adapt to increases in population density. From this position we have learnt a lot about how to keep a city moving efficiently during times of growth, something that we see as being particularly relevant to China.

How we take an innovative approach to delivering advanced urban services

Wrights Group displayed great innovation in developing the world's first hydrogen fuel cell double decker bus. It takes only 5 minutes to refuel these vehicles compared to 4 hours for full electric vehicles. We have been able to observe the positive impact that this shortened charging time has had on bus operations, allowing them to minimise vehicle oversupply that results when buses are required to sit idle whilst charging for long periods of time.

GRID SMARTER CITIES

KEY FACTS

HQ: Newcastle Upon Tyne
Regions active: UK, South Africa, USA, Australia
Industry: smart cities, urban mobility, freight optimisation, intelligent kerbside management

> "China represents a great opportunity for companies working in the smart city space; and the kerb space, which is our main area of expertise, is the gateway to most commercial activity in the urban realm."

Neil Herron
Founder and CEO

OVERVIEW

Grid Smarter Cities is an eco-system of smart solutions - connecting communities and people with transport, parking, goods and services.

There are a number of inter-connecting companies under the Grid Smarter Cities umbrella including Omnia (telematics and fleet optimisation), assist-Mi (a disability access and assistance app), Kerb (virtual kerbside management) and Skiptrac (skip distribution and end to end waste management).

In 2018 Grid was ranked 7th on the Clydesdale Bank and Metis IP100 Intellectual Property League Table, for their patented solutions that offer the unique ability to carve out new space in the smart city landscape. Over the past 18 months Grid Smarter Cities has won a number of Innovate UK grants and contracts, including related to accessible travel in rail and aviation, delivery as a service, virtual kerbside management and freight optimisation. We also have a number of patents for our technologies, both in the UK and internationally.

What kind of projects our company works on

Amongst our suite of products and services, Grid Smarter Cities has an intelligent kerbside management solution called “Kerb”. Kerb is an app that gives commercial vehicles the ability to book a virtual loading bay on previously restricted kerb space in the city or extend loading in areas where loading is allowed but time is limited. This intelligent kerbside management solution makes more effective use of the kerbside, helping speed up deliveries and in turn reduce congestion, emissions and improve air quality. It is patent protected and ready for market, with global potential.

CASE STUDY

KERB SOLUTION

Grid Smarter Cities successfully completed the first proof of concept of our Kerb solution in Westminster. More recently Grid was awarded Innovate UK funding at the start of 2017, deploying the Kerb solution in various boroughs across London and in urban centres across the UK. There is international interest following Innovate UK-sponsored trade visits to Australia and San Francisco.

How Chinese partners will benefit from working with us

We are able to offer Chinese partners access to our suite of complimentary products, and help them understand the benefit of using smart, real-world technologies to solve societal problems. As thought leaders in the smart city space our network sees decades of experience at the forefront of smart technology, with patented solutions in urban mobility, freight optimisation and kerbside management. Grid recently hosted a Chinese smart city delegation to London to help facilitate £1.2 billion worth of inward investment.

How we take an innovative approach to delivering advanced urban services

At Grid Smarter Cities, we strive to do smart things simply. With ever-increasing population size in cities it is clear that our finite kerb space has never been at more of a premium, and as such, to create real, practical and achievable benefit to our cities, we need to manage it effectively and efficiently. Managing kerb space at the granular level allows authorities to change behaviours through incentivisation.

SNC-LAVALIN ATKINS

KEY FACTS

HQ: London
Regions active: Asia Pacific, Africa, Europe, Middle East, North America
Industry: urban development, transportation, energy, infrastructure

> "SNC-Lavalin Atkins combines an integrated approach to urban development with deep experience in the China market and the ability to draw on global expertise."

Mark Harrison
Director, China Property

OVERVIEW

Atkins is one of the world's most respected design, engineering and project management consultancies. Together with SNC-Lavalin, a global fully integrated professional services and project management company, Atkins helps clients plan, design and enable major capital projects, and provides expert consultancy that covers the full project lifecycle.

We strive to build strong relationships by understanding the challenges our clients face, sharing their vision and helping them transform potential into reality. Our world-class expertise at scale delivers value to our clients, and the depth and breadth of our capabilities sets us apart from the competition. We are one of very few firms to provide clients with comprehensive end-to-end project solutions – including financing & asset management, consulting, digital & artificial intelligence, design, engineering, procurement, construction, project management, operations, maintenance and sustaining capital. Our specialized services can be contracted flexibly, from niche mandates to megaprojects.

What kind of projects our company works on

Atkins has an exemplary record of managing complex projects which involve specialists across a variety of sectors and disciplines. Our services encompass the whole project lifecycle – from feasibility studies, planning, conceptual and detailed design, to safety, risk assessments, project and contract management, life-cycle costing, design implementation, site supervision and whole life asset management support. “Plan Design Enable” is the simplest articulation of what we do. Our broad experience base of leading multidisciplinary projects will ensure that we can respond comprehensively to the diverse challenges presented by each project.

CASE STUDY

MEIXI LAKE CBD

In Changsha Meixi Lake CBD we created a dynamic, vibrant and liveable eco-low carbon urban environment for the local community of 260,000 people through our integrated approach. Our work scope covered urban design, concept architecture design, transport-oriented development (TOD), lake design, bridge design and a low-carbon planning and control plan.

How Chinese partners will benefit from working with us

Atkins has a deep and longstanding presence in China, stretching back more than 20 years. Atkins China designs integrate dramatic vision with practical function, and economic sustainability with depth of engineering.

We incorporate the natural ecosystem into our designs, making efficient use of energy and resources, managing environmental risks and creating beautiful living places. We help ensure our clients attain the maximum value from their projects.

How we take an innovative approach to delivering advanced urban services

Carbon Critical Design™ (CCD) is an innovative Atkins initiative that responds to the global need to significantly reduce carbon emissions to avoid economically, socially and environmentally catastrophic climate change. It has challenged all staff at Atkins working on urban projects to re-think the way they design by considering carbon reduction as a starting point. They then determine what the best and most practicable method for us to reduce the project’s carbon footprint is.

Space Syntax

SPACE SYNTAX

KEY FACTS

HQ: London
Regions active: Europe, North America, Middle East, China, Oceania
Industry: urban planning, building design

> "Our ambition in China is to engage with like-minded organisations to create thriving life in buildings and urban places. In doing so, we aim to deliver returns for investors, positive economic and environmental impacts and delight for everyone that uses our projects."

Prof. Tim Stonor
Managing Director

OVERVIEW

Established in 1989, Space Syntax is one of the UK's smart city pioneers. The company provides creative expertise in urban planning and building design through a process that is science-based and human-focused.

Combining global experience with advanced digital technology, Space Syntax forecasts the impacts of physical and spatial decisions on people and property. The key services provided by the company are: strategic architectural and urban design, consulting, training, research and digital development. Space Syntax has been working in China since 1992 and opened an office in Beijing in November 2013. Notable projects include the Beijing CBD masterplan and the Shanghai Pudong masterplan.

Recognition of Space Syntax's unique approach, expertise and client value means that Managing Director, Prof. Tim Stonor, is a popular keynote speaker at industry conferences throughout China and the company's work has been published in many Chinese academic and professional journals, most recently in the Urban Design Journal of Tsinghua University.

What kind of projects our company works on

Space Syntax has an extensive track record of high profile urban planning and design projects. In the UK, this includes the redesign of Trafalgar Square, the London 2012 Olympic Park and the redevelopment of London's South Bank district. In China, in addition to our masterplanning projects in Beijing and Shanghai, the company was recently commissioned to design four Transit Oriented Developments (TOD) in Jilin City, including the location of stations, masterplanning of the development around the stations and landscape design. Space Syntax leads design teams or contributes as specialist consultants. The company also provides professional training in the use of its "smart city" planning and design tools.

CASE STUDY

CAUPD PARTNERSHIP

The China Academy of Urban Planning & Design (CAUPD) invited Space Syntax to form a partnership to tackle critical urban challenges in the Central Business District (CBD) of Beijing. These included high levels of vehicle traffic, high demands on public transport infrastructure and energy-intensive buildings. Together, CAUPD and Space Syntax developed a radically different "people first" vision for the future, contributing both visionary design thinking and objective urban evaluation techniques.

How Chinese partners will benefit from working with us

Space Syntax brings extensive global expertise with a strong local focus. The company's Beijing office enables the delivery of a seamless service for Chinese clients and partners, connecting with a well-established professional and academic network in China. One example of this is a partnership with the Beijing Institute of Architecture and Design, including a recently signed four-way MOU with BIAD, Tsinghua University School of Architecture and University College London.

How we take an innovative approach to delivering advanced urban services

Space Syntax provides a unique, evidence-based and industry-leading "smart city" approach to the planning and design of buildings and urban areas. Its work demonstrates how great places can be created through the analysis, understanding and skilful manipulation of urban space. Combining technology, ability and extensive global experience, Space Syntax targets the social and economic value that good planning and design bring.

MOTT MACDONALD

KEY FACTS

HQ: London
Regions active: Global
Industry: energy, infrastructure, water, transport

> We're applying the latest thinking and the best available technologies to our work in Tianjin, helping achieve trailblazing performance in sustainable living."

Dr Anne Kerr
Project Director

OVERVIEW

Mott MacDonald is a global engineering, management and development consultancy focused on guiding our clients through many of the planet's most intricate challenges. We have over 16,000 staff working in 140 countries around the world from nearly 200 permanent offices and many additional project offices.

We have a range of expertise relevant to building the cities of future. Synergies between our many disciplines, and the breadth of our offering, mean that we can provide a genuinely all-inclusive service, covering the whole lifecycle of even the largest and most complex projects. One of our strengths is our ability to take a project on right from concept stage offering expertise in planning, finance and management, as well as technical and project delivery services.

We believe in working closely with our clients to deliver the right solution and to promote sustainability in all our projects. We strive to be ethically, environmentally, and socially responsible, helping improve quality of life today, and sustaining resources for future generations.

What kind of projects our company works on

Mott MacDonald has over 30 years' experience in China. We started working in the water and environment sectors but our work now covers a variety of areas. This includes providing integrated multi-disciplinary services for a number of Chinese smart city developments, including the design of utilities infrastructure and transport planning. As project managers and cost consultants Mott MacDonald has delivered many projects in the industrial sector. Our power engineers provide services to many external investors who are launching projects in China, often in the clean energy sector. The company also supports Chinese energy providers in their projects in third markets.

CASE STUDY

TIANJIN ECO-CITY

Mott MacDonald has been awarded a key role in a ¥150 billion flagship sustainable development in Northern China, Tianjin Eco-City. Once completed, it is hoped that the Eco-City, which will cover an area of approximately 30km^2 will house up to 350,000 people. Mott MacDonald will be working with local design teams on demonstration projects to determine which sustainable design features and improvements can be adopted in the city.

How Chinese partners will benefit from working with us

Mott MacDonald are able to build on decades of experience in China to deliver on projects across a number of disciplines including transport, water, energy, construction and environment. By working with us, partners get the advantages of size and stability that come from working with a US$2bn organisation. At the same time we offer the openness, friendliness and personal touch that you might associate with a much smaller business.

How we take an innovative approach to delivering advanced urban services

Smart technology and digital abundance have the potential to revolutionise the way cities operate. When working on smart city projects, Mott MacDonald treats cities as multifaceted organisms with complex interactions and interdependencies. One of the benefits of being a multidisciplinary company is our understanding of motivations in diverse sectors. We address challenges at city scale across all the dimensions of infrastructure: regulatory, political, governance, finance and funding.

HPW ARCHITECTURE

KEY FACTS

HQ: Southampton
Regions active: UK, Europe, North America, Russia
Industry: architecture, masterplanning, interior design

> "As architects and designers, we are passionate about delivering sustainable, resilient and qualitative design solutions, which balance commercial acumen with health and wellbeing."

Alan Powell
Founder and Chairman

OVERVIEW

HPW Architecture is an industry-leading sustainable architecture and design practice with over 30 years' experience in the leisure, retail, residential and commercial sectors. From our base in Hampshire, we operate throughout the UK and overseas. We deliver innovative, sustainable solutions to meet the design needs and budget of our widely varied client base.

We have extensive experience in creating mixed use schemes, which have been informed by the needs of people and the community. We create environments which offer a sense of place and where people wish to spend time (and money). This involves taking a holistic approach to design high performance buildings that reduce energy usage and running costs throughout their lifetime.

Our knowledge and experience allow us to deliver environmentally sensitive solutions that reduce carbon emissions and cut energy costs, whilst being attractive business ventures. As a multi-award winning sustainable design practice, HPW were delighted to be finalists in the UK's 2018 BD Architect of the Year Awards (AYA) in the retail & leisure category.

What kind of projects our company works on

Whether in urban or rural locations, many of the projects we undertake involve mixed-use schemes that seek to intelligently integrate different uses to create vibrant, resilient communities. We believe that these types of projects are where HPW offers the greatest added value to our clients.

Project values vary from £0.5m to £1bn and most involve our holistic, multi-disciplinary approach that encompasses architecture, masterplanning, interior design and branding.

CASE STUDY

WORLD CLASS CULTURAL QUARTER - SILVERTOWN, LONDON

As lead consultants, HPW has been working with the Essel Group for 3 years on the design for a world class Cultural Quarter planned for Silvertown, London. The Silvertown proposal will occupy 14 acres of the 62-acre brownfield site, with a £1 billion cultural facility anchoring the activities on the site, and forming a significant part of the £3.5 billion overall Silvertown development.

How Chinese partners will benefit from working with us

China is a rapidly urbanising country with interest in creating more sustainable, low-energy and resilient communities. HPW's track record and skills in these areas are well matched to support such development. Having already engaged with potential clients in China, HPW is keen to further develop our service offer in this exciting and dynamic market. Our key services include: sustainable, low-energy architecture, community masterplanning, and design and branding.

How we take an innovative approach to delivering advanced urban services

Our unique approach to creating resilient communities involves consideration of a range of factors including supporting education and creating a sense of community. When planning, we consider the needs of a range of stakeholders including individuals, local authorities, businesses and politicians. We use a carefully tailored approach, which includes, one-to-one meetings, focus group and community workshops, seminars, project-based assignments and market research. This inclusive approach embraces participation from all members of the community and is fundamental to the way we work.

URBEN STUDIO

KEY FACTS

HQ: London
Regions active: Europe, Australia
Industry: built environment, urban planning, architecture

> **Good design is good business, and good fun as well."**
>
> *Paul Reynolds*
> *Founding Director*

OVERVIEW

Urben is an urbanism studio delivering innovative designs for a range of planning, landscape, urban design and place-making projects. Our goal is to make cities more sustainable and enjoyable through quality planning and design.

Our name is an amalgamation of 'urban' and 'environment' because we view towns and cities as human ecosystems that must not only support our basic needs, but also give each and every person the space to thrive. Although our skills lie in urban planning and design, we often work collaboratively with architects, environmental managers and engineers in project teams assembled to address specific urban problems. We apply our rigorous and creative approach to projects by focussing on human wellbeing and design-led processes.

We have accreditation from the Landscape Institute, Urban Design Group, Royal Town Planning Institute, and International Society of City and Regional Planers.

What kind of projects our company works on

Key areas of focus for our projects are leisure, culture, regeneration, and transport. We have worked with Business Improvement Districts to provide public realm design and specifications for Bond Street, Hatton Garden and Regent Street in London. We have helped make these streets calmer, more desirable places for shoppers and visitors adding trees, water features, sustainable drainage systems, lighting, paving, street furniture, and signage, all of which contribute to the sense of place. For Queen Elizabeth Olympic Park and London Legacy Development Corporation we created a street design guide, provided development consent advice, and landscape design services. We have also advised Crossrail - a new railway for London and South East England - on the planning and design of their underground space.

CASE STUDY

BIRD STREET, LONDON

Urben Director Paul Reynolds worked with PaveGen (p68) and Airlabs to transform Bird Street into an urban oasis beside London's busy Oxford Street. The design incorporated a number of greening features - including a linear seating and planting feature which will ultimately provide a screen to the outdoor dining area of the adjacent restaurant, and also a green wall at the entrance to the street to mark its presence.

How Chinese partners will benefit from working with us

We love cities and are able to provide insights into what it takes to make them enjoyable and sustainable places. We want to work with Chinese partners looking to form joint knowledge sharing and advisory teams for projects. We are able to bring knowledge gained from training and research projects carried out in different locations across the world. Some examples include working with: Abu Dhabi Urban Planning Council in UAE; Bodø Kommuna in Norway; the city of Guangzhou in China; and Fabrique de la Cite in France.

How we take an innovative approach to delivering advanced urban services

Urben collaborates with artists, universities and technology providers to find innovative new solutions to urban challenges. In 2015 Urben was granted a design innovation award from Royal College of Art for our repurposing of construction grout shafts. We recently established Urben Labs to invest in identifying and testing our ideas to radically improve urban environments.

RESILIENCE BROKERS

KEY FACTS

HQ: London
Regions active: China, Australasia, Europe, Latin America, Africa
Industry: urban resilience, sustainability, infrastructure

> "I assembled the Resilience Brokers to provide systems modelling planning, and investment and decision-making tools that will enable the creation of the Ecological Civilisation across China."
>
> *Prof. Peter Head OBE*
> *Founder and Chair*

OVERVIEW

Resilience Brokers champions a holistic approach to urban-rural systems change. We focus on improving human, ecological and resource systems using the power of data and disruptive technology. We have experience designing, financing and delivering infrastructure and eco-city projects in China and around the world.

Resilience Brokers provides city regions with access to world-leading advanced urban services tools and support. Our work is powered by resilience.io: a pioneering systems modelling platform that combines computer representations of human and business activity, resource flows and infrastructure of a city region. It uses this to generate an integrated representation that highlights the linkages between different systems for design, planning and investment support.

Our resilience.io platform supports earth systems modelling, scaled for city-regions for multi-hazard risks. This enhances urban resilience and helps progress towards ecological civilisation. The platform also supports project design, planning and financing, as well as technology and business innovation scaling.

What kind of projects our company works on

Resilience Brokers facilitates projects with a focus on urban resilience, urban health, infrastructure, urban data modelling, project financing and urban planning. The knowledge, services and data tools we provide can be used to inform policies and guidelines on sustainable development in urban and surrounding rural areas. We see these as being highly applicable to urban planning in China. We have a key focus on infrastructure productivity, and aim to reduce the need for investment by up to 40% through the insights gained from our models.

CASE STUDY

ACCRA, GHANA

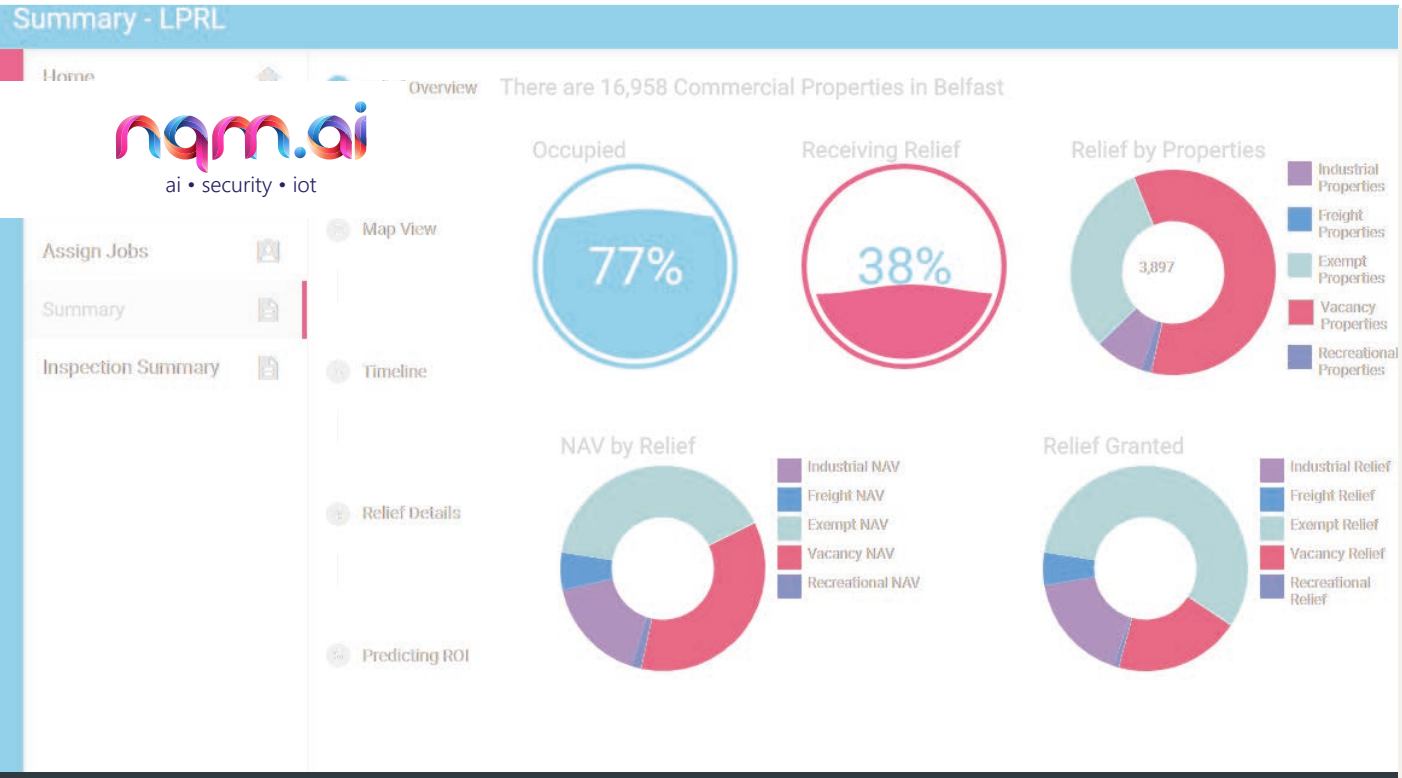
We have successfully prototyped our model in Accra, Ghana, using data from the community to tackle the region's water and sanitation challenges. Using resilience.io, we developed 50 digital twins that describe inputs and outputs for energy, material and labour. We also designed an agent-based modelling and resource technology network model with user interfaces that support decision-making. This project delivered three use-cases that demonstrated the benefits of an investment strategy to achieve 100% clean water access and affordable sanitation for the city.

How Chinese partners will benefit from working with us

Resilience Brokers would like to work with Chinese cities to codevelop sustainable solutions and approaches to support continued population growth and urbanization. We can help generate evidence to influence policy by demonstrating new urban concepts and approaches to achieving a city's goals. In doing this we place emphasis on ecological design, sustainability and resource efficiency. We present clients with the opportunity to combine new knowledge and design concepts with their own expertise, which allows them to overcome barriers to sustainable development.

How we take an innovative approach to delivering advanced urban services

The advanced urban service we provide is regenerative, resilient development modelling in which human and ecological systems health is factored into land use decisions. We also share this knowledge to promote best practice worldwide. We are developing a global knowledge and data sharing infrastructure that will help disseminate knowledge, and the rapid evolution and adoption of innovative solutions across city regions.



NQUIRINGMINDS

KEY FACTS

HQ: Southampton
Regions active: UK, India, China
Industry: smart city technology, artificial intelligence

> **A smart city by definition must manage and process data intelligently; our TDX technology provides the proven AI tools needed to do just that."**
>
> *Dr Nicholas Allott*
> *Founder and CEO*

OVERVIEW

NquiringMinds' Trusted Data Exchange (TDX) provides a data sharing and artificial intelligence-powered data analytics platform for smart cities.

Designed from the ground up with smart city requirements in mind, it can centralise a city's data assets, IoT data streams, open and confidential data records, and workflow records. It can seamlessly and securely share live data between separate organisations, and most importantly analyse this data at scale. These analytics can then be used for both strategic management analytics and operational integration.

Our TDX is designed to act as the centrepiece of a digital transformation program. It has been successfully deployed in many cities and counties including: Belfast, Oxford, Southampton, Hampshire and Cambridge. It has been used in projects in diverse areas such as: business rate analytics, economic trend analysis, distributed asset management, health and social care analytics, telecare provision, energy monitoring, traffic and parking monitoring and waste collection analysis.

NquiringMinds is a seven-year-old company that has won over 15 awards for its innovative approach to data analytics.

What kind of projects our company works on

Our platform is designed to work on projects with large and complex data sets, potentially owned by different organisations. We can securely share, fuse and clean this data at scale. Then, most importantly, use AI-based techniques to analyse data for strategies and operational deployment. Examples include: economic business rate analysis to help city councils optimise tax collection; social care management tools that utilise intelligent sensors; deep analysis of health and social care data for service planning and optimisation; distributed asset management of IoT sensors; and IoT deployments in areas such as air quality, parking, traffic management, energy consumption and production, and waste management.

CASE STUDY

OPTIMISATION ENGINE

NquiringMinds developed a Business Rates Optimisation Engine for Belfast City Council. Using our TDX we combined 15 separate data sets, and 12 AI algorithms to create a local economic model. Incidences of tax fraud and poor data collection were detected, identifying over £2.1 million worth of collectable revenue. To demonstrate public sector AI innovation, the UK Government has featured this work in its Industrial Strategy Challenge Fund white paper.

How Chinese partners will benefit from working with us

NquiringMinds are looking to find Chinese partners who require: tools to intelligently process data at scale using AI technology; tools to take the risk out of data sharing; tools to deploy operationally (e.g. mobile workflow); and tools to speed up IoT deployment. NquiringMinds have market-tested solutions that have been deployed at scale. We also have a deep understanding of what solutions work and what solutions achieve in real-world smart city deployments.

How we take an innovative approach to delivering advanced urban services

Our approach is based on three innovation pillars:

- AI data analytics: we approach AI-based analytics with a unique and proven methodology, backed with a scalable deployment platform
- Cybersecurity innovation: our distributed public key infrastructure-based solution is unique in the smart city market
- IoT: focusing on edge analytics, power efficiency and security

Our social care management system CareTeam is a good example of how these three pillars have been deployed together in smart city solutions.

PAREMUS

KEY FACTS

HQ: London
Regions active: UK, China
Industry: technology, independent software vendor

> **To realise cost savings, energy efficiencies and environmental benefits smart cities must look towards sustainable and maintainable software ecosystems. The Service Fabric enables this."**

Dr Richard Nicholson
Founder and CEO

OVERVIEW

The Paremus Service Fabric is a smart city operating system that provides a software platform for smart city applications. The Service Fabric is simple to install and maintain and is secure by design. If local control, services and data ownership are important, the Service Fabric provides an easy solution.

Self-organising behaviour allows local computing environments to be rapidly formed using available local resources from data centres, IoT edge gateways and embedded computers. The Service Fabric may also be run in third party cloud environments such as Tencent or Amazon.

We support microservices, AI, big data and IoT applications as well as real time smart city systems. Fabrics run on anything from single machines to thousands of servers. The Service Fabric is built using OSGi™: the open industry standard for software modularity.

Funded by private UK investors, Paremus is recognised internationally for its advanced modular distributed systems expertise and provides OSGi™ consulting, training and products to government and FT100 customers globally.

What kind of projects our company works on

Paremus are interested in both greenfield and brownfield smart city projects and working with partners that include both city infrastructure solution providers and smart city application providers. We are the perfect technology partner for cities that realise they must invest in economically sustainable software solutions, and have the ambition to maintain ownership of those environments in order to realise local economic benefits and improve quality and diversity of services to their citizens. Paremus are interested in all smart city-related projects including, but not limited to, smart city infrastructure, utility resource optimisation, transport management, and citizen-centric services.

CASE STUDY

WATER INFRASTRUCTURE MONITORING

A water infrastructure monitoring and control solution for the metropolitan environment of Coruña (EU funded, BRAIN-IoT project) is based on the Service Fabric. It provides for the collection, AI analysis and secure publishing of data from tens of thousands of distributed, heterogeneous devices. Benefits include improved day-to-day management and operation along with the delivery of value-added services (predictive maintenance and fast reaction to water quality issues).

How Chinese partners will benefit from working with us

Partners will be trained by Paremus to use the Service Fabric and OSGi™ technologies to build highly innovative and differentiated software solutions. They will be able to inexpensively develop, maintain and scale their applications: adapting and changing these in response to shifting requirements of their customers. The adaptability and reusability of Service Fabric-based applications allows our partners' applications to be included in a world-leading smart cities reusable solution repository.

How we take an innovative approach to delivering advanced urban services

Smart cities will have to manage hundreds of thousands (maybe millions) of smart devices, feeding into a complex and changing set of software services. These must be operationally simple, robust and secure from cyber-attacks. Paremus are world leaders in self-assembling software environments that are simple to use yet highly adaptive and robust. We automate management and, wherever possible, make software easy to install, manage and evolve so that it can be utilised for a smart city ecosystem.

CONNECTED SPACE

KEY FACTS

HQ: London
Regions active: UK
Industry: mobility, govtech, smart cities, urbantech

> Our approach relies on partnerships where people work together towards a common purpose, co-creating a better future."

Mick Robins
CEO

OVERVIEW

Connected Space is a technology innovation company, building solutions across multiple sectors with a focus on smart cities, mobility, govtech and urbantech.

Our company was founded in 2013 at a time when technological advancements were disrupting multiple sectors. Since then our aim has been to create new models for innovation that take advantage of the latest technological advancements, in order to bring benefits to cities, organisations and businesses.

We work with a variety of government organisations, large corporations, and disruptive startups and scale-ups in the UK and abroad, which form part of our Strategic Partner Network.

Our projects are underpinned by our smart, adaptable, proprietary technology platform, which enables us to build secure and scalable solutions and harness technologies such as IoT (sensor data), machine learning and integrate with blockchain platforms

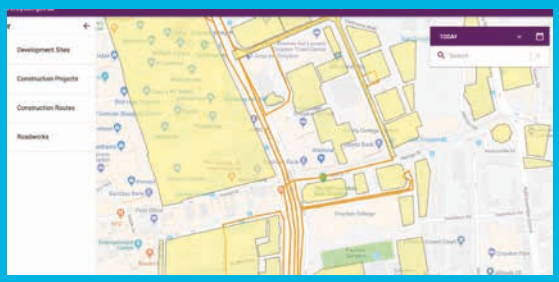
What kind of projects our company works on

Connected Space works on a range of innovative projects that utilise emerging technology to drive transformational change and deliver better outcomes for cities and their citizens. Whether it's our own proprietary platform or specialist technology from our partner network, we apply solutions that are modular, scalable, adaptive and responsive.

Our specialties and areas of interest include: emerging technology, Internet of Things, blockchain, AI, machine learning, mixed reality, mobility, data-driven applications, govtech and smart cities.

CASE STUDY

URBAN DATA PLATFORM



The Urban Data Platform is an easy to use platform that combines data and intelligence to help local authorities and cities deliver better outcomes. Multiple data types and sources can be consumed (e.g. construction, traffic, road quality, air quality) to create a simple and intuitive map-based interface with filters to overlay data sources, providing visibility and insight on what's happening across the specified area.

How Chinese partners will benefit from working with us

Chinese partners will benefit from partnering with Connected Space by working with our team of technology and product specialists and using our platform to deliver smart city solutions. We are looking for partners with whom we can build significant and innovative commercial propositions for deployment in Chinese cities. We take an entrepreneurial approach to commercial agreements, allowing us to unlock value and achieve mutually beneficial outcomes.

How we take an innovative approach to delivering advanced urban services

At Connected Space we blend domain expertise with our technology and product specialists to create significant and disruptive commercial propositions. We not only try to utilise the best technology but also apply innovative commercial thinking and new business models to unlock value and create new markets.

MASSIVE ANALYTIC LIMITED

KEY FACTS

HQ: London
Regions active: UK, Europe, China
Industry: AI, big data, smart cities

> **"The China market is a top priority for Massive Analytic Limited and we are excited by the unique opportunities posed by applying our own brand of AI to smart urban projects in China."**

George Frangou
Founder and CEO

OVERVIEW

Massive Analytic works at the intersection of data science, machine learning and artificial intelligence.

With an entrepreneurial culture and ability to commercialise ground-breaking innovations, our vision is to become the global leader in the way people interact with data and control machines. Our artificial intelligence products are Trifecta, Oscar:DataScience, Nethra:VideoAnalytics, and Aftos:Robotics. Massive Analytic powers its products with artificial precognition technology, patented in over 20 countries including China, the United States and Israel. Artificial precognition provides unique solutions to the growing challenges posed by IoT and big data.

Each of Massive Analytic's products were built from the ground up to solve real-world big data problems and drive digital transformations in businesses. With artificial precognition technologies, Massive Analytic seeks to raise productivity and digitally transform businesses by automating the processes required to get insights from data with AI.

What kind of projects our company works on

Massive Analytic has a keen interest in urban analytics and smart cities. We take on projects where companies are looking to leverage IoT technologies in new and smarter ways to benefit their customers. Previously we have worked on smart parking projects, where sensor data was used to predict where and when parking spaces would be available in a busy city centre through an app. Another project involved using data from a mobile network provider to analyse patterns and predict movement in a town centre for the transportation industry. An upcoming project draws on synergies between our products Oscar and Nethra by providing real-time vehicle detection on highways for traffic control.

CASE STUDY

TFL TRAFFIC ANALYTICS

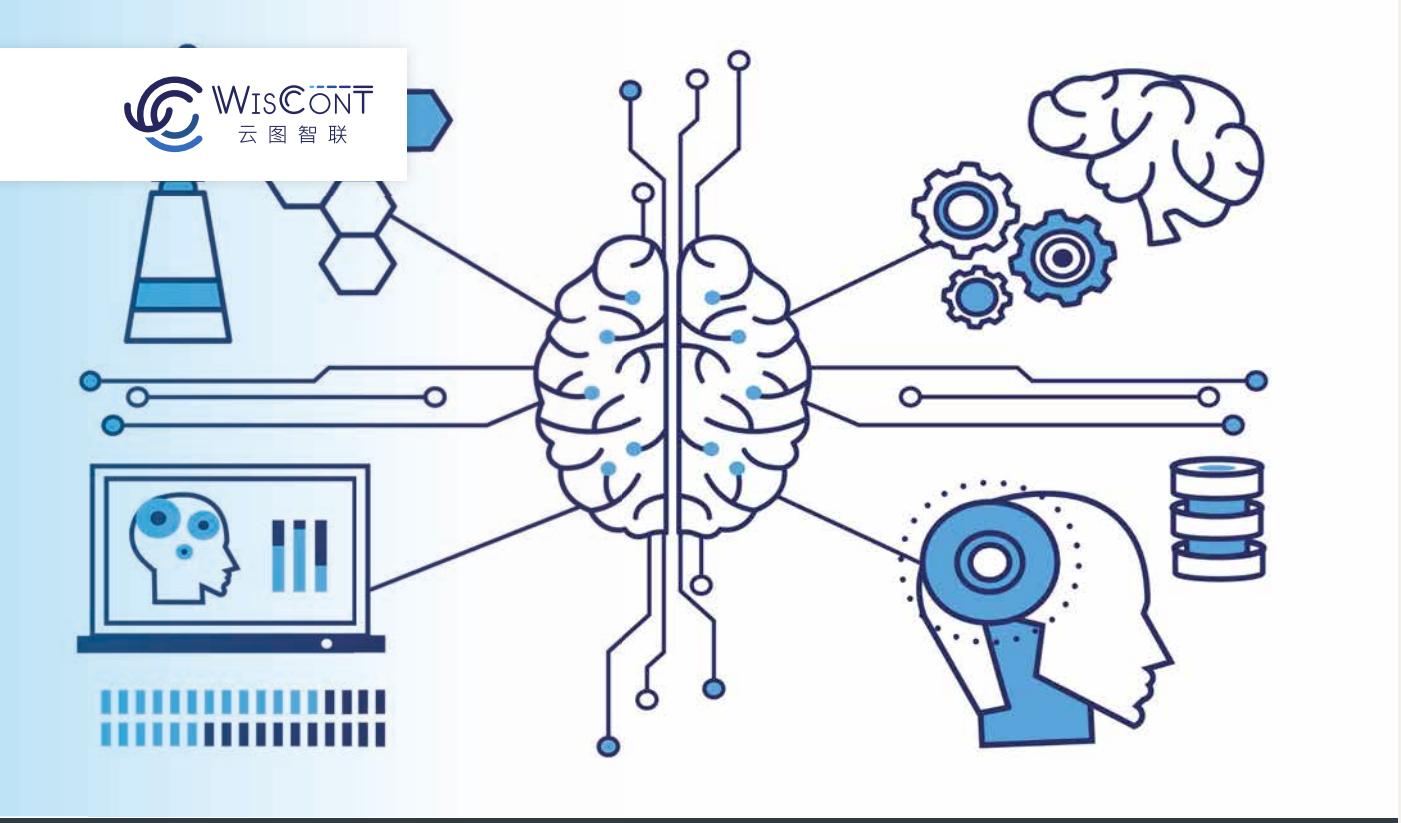
Transport for London (TfL) used Massive Analytic's AI technology to better understand how traffic moves along London's roads. Our software analysed Vodafone cellular data, weather data, CCTV footage and Twitter feeds to provide insights into likely traffic flow. When new events occurred, our machine learning algorithms informed TfL of the likely impact they would have on traffic conditions, and predicted where congestion might arise. As a result of this we were able to suggest some changes which could help reduce average journey times for the cars by 5%-10%.

How Chinese partners will benefit from working with us

Massive Analytic supports prototyping of smart city projects. Our data science and artificial intelligence products are tailor made to be beta-tested and can be shaped by Chinese partners to deliver maximum benefits to their specific urban projects. More than this we are uniquely positioned with three AI products that can be applied to add high-end value to smart cities initiatives.

How we take an innovative approach to delivering advanced urban services

Massive Analytic has a history of innovating in the field of smart parking projects, particularly when utilising the geospatial regression functionality of our Oscar product. Our product line spans data science, video analytics and connected vehicles, combining these technologies in innovative ways. By doing this Massive Analytic is able to deliver unique solutions to a variety of advanced urban services projects.



DATUMTURPIS

KEY FACTS

HQ: London
Regions active: UK, China
Industry: consulting, AI, IoT

> **If no two cities are exactly the same, why should they use exactly the same products and services? Our experienced team helps cities develop tailormade solutions that maximise value from data."**

Dr. Pedro Baiz
Founder and Director
DatumTurpis Ltd

OVERVIEW

DatumTurpis is a data science consulting firm headquartered in London offering a wide range of services in areas such as software development (web pages, apps), databases (Relational, NoSQL), IT architecture (DevOps, Cloud) and machine learning (artificial intelligence).

We were founded in December 2016 and since our inception have expanded into China. DatumTurpis co-founded WisConT, one of the first UK-China joint-ventures that combines the intellectual capital and global outreach of London with the fast moving and expanding opportunities of China's top tech city, Shenzhen. Although the expertise of DatumTurpis and WisConT spans the entire data ecosystem, it possesses unique world-leading experience in infrastructure asset management and industrial internet of things (IIoT). Founder and CEO Dr. Pedro Baiz has recently been appointed as one of the first Royal Society Entrepreneurs in Residence at Imperial College London.

What kind of projects our company works on

DatumTurpis and WisConT work particularly well on projects that are focused on digital transformation. This area is commonly defined as the profound transformation of organizational activities, processes, competencies and models to fully leverage the changes and opportunities of new digital technologies (e.g. IoT, data science, blockchain). These digital transformation programmes are now popular across all types of organisations, from entire cities to large or small businessess. DatumTurpis has particular expertise within the domain of infrastructure asset management. CEO Dr. Pedro Baiz is currently helping companies like HSBC to develop their understanding of charging infrastructure for electric vehicle projects in London.

CASE STUDY

UK & CHINA COLLABORATIONS

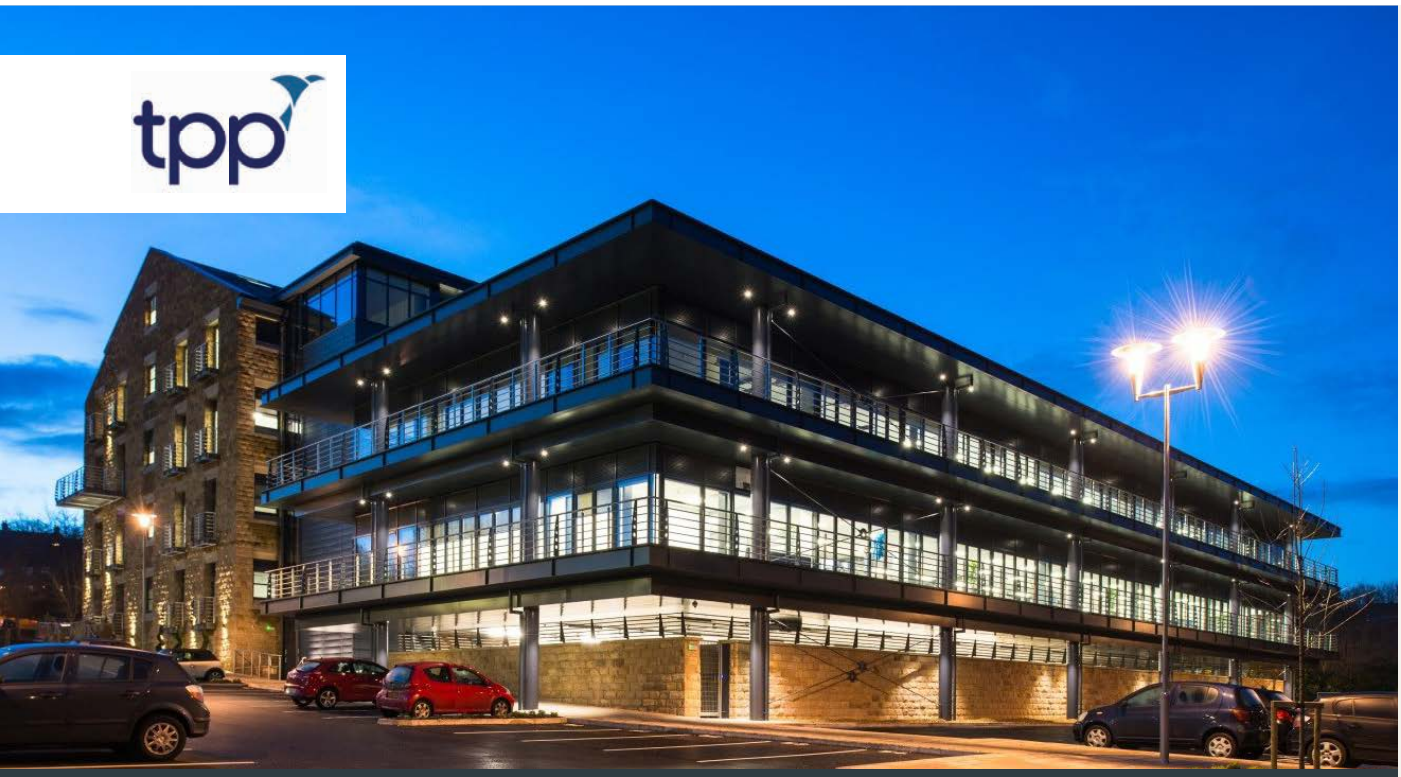
Despite their short histories, DatumTurpis and WisConT have been involved in important projects in both the UK and China. In the UK DatumTurpis is working with HSBC to develop a wide range of financial products and services driven by data, while in China WisConT is working with organisations like Shenzhen Taxation Bureau and China Telecom (in cooperation with hospitals) to develop platforms that help employees use data in innovative ways, helping them work more efficiently.

How Chinese partners will benefit from working with us

Chinese partners will benefit in multiple ways from working with DatumTurpis because of our unique balance of experience in industry and academia. For example, we have many years of experience delivering consulting services to some of the largest infrastructure asset managers and owners in the UK including London Underground and Heathrow Airport. In doing this we have helped to link industrial and academic research and development.

How we take an innovative approach to delivering advanced urban services

DatumTurpis has a broad range of expertise that helps engage all potential stakeholders in complex ecosystems such as those of cities. Advanced urban service delivery requires a multidisciplinary approach that places citizens at the centre. We have experience delivering city projects for well-known organisations such as London Underground and are able to offer end-to-end expertise. This ranges from traditional relational database support to the latest advances in artificial intelligence (e.g. deep learning).



THE PHOENIX PARTNERSHIP

KEY FACTS

HQ: Leeds
Regions active: UK, China, Qatar, Saudi Arabia, Kuwait
Industry: healthcare

> "I'm passionate about making a difference and improving healthcare globally. What drives the company is the desire to transform healthcare through software – helping clinicians to help citizens."

Frank Hester OBE
Founder & CEO

OVERVIEW

TPP is a world-leading clinical software company, dedicated to providing integrated healthcare software through our innovative product suite.

China's rapid urbanisation has created a wealth of opportunities for its population, but as cities increase in size, new risks to health can emerge, particularly from issues such as hospital overcrowding, air pollution and stress. TPP aims to ensure that cities are in the best position to provide quality and efficient healthcare by helping hospitals utilise the best software platforms. We specialise in smart electronic health records and our products facilitate intuitive, integrated care that works seamlessly with modern life.

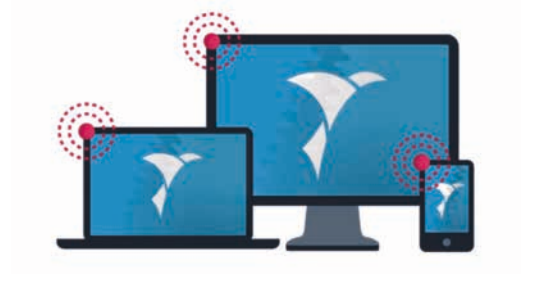
Our core product SystmOne is a centralised, cloud-based clinical system that offers customers a holistic solution to their needs. Not only do we provide the software itself, but also the deployment, regular software updates and technical support. We're also heavily involved in research and innovation projects, including utilising AI to improve health outcomes. TPP has over 20 years' experience working with National Health Service (UK). We're now expanding into new markets across the world, and want to forge new relationships with Chinese cities and healthcare providers.

What kind of projects our company works on

We offer much more than a simple electronic health record solution. Our expertise in both data management and research allows us to support governments in deciding health strategy and design, which benefits healthcare for cities now and in the future. In the UK, we work on projects that align with NHS strategy, delivering integrated, efficient and tailored care across all healthcare settings. We also work on products that empower patients to manage their own care and interact with their healthcare providers. We leverage our rich database for research projects, working with government bodies and institutes on projects such as disease outbreak prediction for health surveillance and developing algorithms to detect illnesses sooner.

CASE STUDY

SystmOne FOR BRADFORD



SystmOne is used across the city of Bradford. We introduced the 'Virtual Ward' to address challenges related to the city's ageing population and remote access to quality care.

The city now greatly benefits from an intelligent health system. Costs have been reduced, and patients have been cared for in a holistic manner with multidisciplinary teams and smart technology. Our app empowers citizens to manage their own care, and gathers insights to inform healthcare strategy.

How Chinese partners will benefit from working with us

TPP's products are easy to use, configurable and address issues common to cities with increasing populations including resource inequalities and increased healthcare needs. Our smart healthcare technology and artificial intelligence empowers medical professionals in both rural and developed regions. Our reliable data analysis capability can provide clinical and operational insights for both business partners and governments, and cities with the ambition to make healthcare smarter.

How we take an innovative approach to delivering advanced urban services

SystmOne can help improve population health, address challenges such as ageing populations and enable fully integrated, smarter care. This digital approach allows for services that enable healthier urban populations. Using the most modern technology, SystmOne helps to engage citizens in their own healthcare and allow for intelligent electronic communication. SystmOne also has intuitive decision support tools and risk stratification algorithms that can be used to detect conditions and trends swiftly.

INAVYA VENTURES

KEY FACTS

HQ: London
Regions active: Singapore, Brazil, Italy, UK
Industry: medtech, AI

> "Avatr enables a person to leverage their own data to create, own and share their digital profile to receive personal and contextual medical services."
>
> *Dr Michael Wilkinson*
> *Founder & CEO*

OVERVIEW

Inavya Ventures Ltd is a London-based, technology-led company established in 2015. With R&D grants and investment, and engagement by leading clinicians, Inavya has developed Avatr - an AI and machine learning mobile application designed to deliver personalised medicine at scale and beyond borders.

Avatr enables patients to create a digital profile of their self, which they can share with their doctor in order to receive personalised medical care outside of hospital. Avatr connects with medical grade devices, and environmental, social and behavioural data, to give a full view of the person in time and place. For patients, Avatr provides assurance and reduces the need to attend hospital. For doctors, Avatr provides actionable patient information to improve healthcare delivery and clinical outcomes. It also allows for the creation of personalised care plans and a ledger to support analytics.

We have started a clinical demonstrator of Avatr at the National Heart Centre in Singapore. Inavya is also engaged in Sao Paulo, London, Rome, Shanghai.

What kind of projects our company works on

Avatr is a design and technology-led service that aims to promote personal health in the city. In China, Inavya seeks to create a technology and market demonstrator based on Avatr deployment in a healthcare setting.

This China demonstrator would leverage core technology that is being deployed in Singapore and Brazil to enable efficiency savings and to support scale-up. The demonstrator would focus on building technology and market-making enhancements to meet the unique contextual and cultural factors in China.

CASE STUDY

PERSONALISED HEALTHCARE FOR PATIENTS IN SINGAPORE

In Singapore, Inavya is developing a service to enable doctors to provide personalised healthcare to patients across the ASEAN market. This project aims to refocus services from hospitals to the community, and from disease to health, with the patient taking an active role in promoting their own health. A similar Avatr service is being developed in Sao Paulo, funded by the Newton Fund in partnership with the Albert Einstein Hospital.

How Chinese partners will benefit from working with us

Avatr is perfectly positioned to support policy makers and clinicians deliver on the goals of Healthy China 2030. Inavya seeks to establish a clinical demonstrator with a specialist hospital or clinic in China. The demonstrator would focus on how Avatr improves clinical outcomes and reduces hospital utilisation and costs, with a focus on improving heart disease or Type 2 diabetes prevention and care management.

How we take an innovative approach to delivering advanced urban services

Avatr is a design and technology-led company that aims to improve health outcomes in cities through the delivery of personalised and contextualised healthcare. We focus on creating compelling user experiences, which exploit the full potential of AI and machine learning, giving the end-user full control of their data and Avatr profile.

KINSETSU

KEY FACTS

HQ: Belfast
Regions active: UK, Ireland
Industry: digital innovation

> "The Kinsetsu team drive efficiency with cost-effective automated platforms. We are passionate about improving outcomes for citizens, patients and our customers in various industries."

Joanne O'Doherty
Director

OVERVIEW

Kinsetsu provides intelligent tracking solutions to help cities and organisations transform. We use IoT to automate intensive manual processes, driving efficiency whilst reducing cost and simplifying management. IoT creates new demands in areas such as security and interoperability and Kinsetsu will help you to address these whilst avoiding the emergence of end-point solutions and data islands.

Our modular portfolio includes Ktrack which tracks thousands of assets in real-time across cities and within healthcare, manufacturing and education; Kcrew which automates the daily checking process carried out by field-based response teams enabling remote asset management and always ensuring job readiness within buildings, vehicles and healthcare environments; HomeHug which enables independent living at home in later life; and Transcheck which automates the passenger management of home-to-school transport for pupils and home-to-hospital transport for patients, capturing entry and exit from the bus, calculating journey time and providing alerts for passengers when buses are delayed due to traffic or incident.

What kind of projects our company works on

Kinsetsu drives transformative digital solutions for clients using IoT sensors to automate manual processes. We are tracking 500,000+ healthcare records in a large hospital campus ensuring the paper records are easily located and are always ready for patient consultation. We are tracking school bus transport routes in urban and rural areas to ensure pupil safety including notifying parents if a bus is late or cancelled. We are tracking job readiness for field engineering teams, utilities companies and healthcare clinical teams, ensuring all necessary equipment is immediately available for the job and reducing the pre-check time to just seconds, releasing the team from intensive manual process checking.

CASE STUDY

INTELLIGENT TRACKING PROJECT

Kinsetsu delivered Phase1 of an intelligent tracking project within education, tracking school children and their journeys.
This project improved pupil safety and information flow for the pupils, parents and schools. Kinsetsu deployed a mix of RFID and NFC technologies and a smart vehicle hub from which the bus driver could access passenger lists and record incidents. Management dashboards were included for fleet utilisation, journey time and vehicle check reporting.

How Chinese partners will benefit from working with us

Kinsetsu is seeking partnerships with city healthcare organisations in China, enabling us to help deliver solutions at a local level. We see solutions such as HomeHug, which supports the elderly to live independently at home, as being particularly relevant in China, where the UN predicts the 65+ population will increase from 27.5% from current levels by 2050.

How we take an innovative approach to delivering advanced urban services

Kinsetsu is looking to work with Chinese health boards, local care providers and providers of support to the elderly and patents. “Inclusion for all” is an important principle that underlies the deployment of our innovative solutions, as the people who are most vulnerable often have little money or limited means to engage with others. We see a lot of potential to work in China on the deployment of advanced urban services, and we look forward to developing relationships with Chinese partners.

SUNAMP

KEY FACTS

HQ: Edinburgh
Regions active: UK, Europe, USA, Asia
Industry: energy storage

> "Thermal energy storage has a very significant role to play in sustainable energy systems for smart cities. Our technology tackles intermittency issues, is ultra-compact and proven to lower carbon emissions and fuel costs."
>
> *Andrew Bissell*
> *Sunamp Chief Executive*

OVERVIEW

Sunamp is a world leader in thermal energy storage. We see energy storage solutions as being key to successful deployment of smart grids and renewable energy in future cities.

Sunamp's key strength lies in our revolutionary design for batteries, which contain non-toxic phase change material that stores and releases heat on demand. Our heat batteries are compact and scalable, and tailored for commercial and domestic use. UK Housing Associations are adopting Sunamp technology to cut fuel bills for thousands of tenants by taking the surplus electricity produced by photovoltaic systems and storing it to produce heat and hot water, with no need for a hot water tank or immersion heaters. This is improving energy efficiency in homes and meeting the large-scale industrial challenges of grid constraints, allowing for continuous generation from renewable energy technologies. Our company has immense global growth potential, not only in the built environment but also many other industry sectors, including in the power generation and automotive markets.

What kind of projects our company works on

Sunamp is active in residential, commercial, industrial and automotive markets. We are partners in a variety of projects which include: electrical and thermal storage optimisation of power plants; Smart Island Energy systems that facilitate the transition to smart grids; SPIRE 2 which explores how homes and businesses store renewable energy effectively; and CO2 reduction in fleets, which aims to increase the number of electric vehicles used in fleets to deliver chilled and frozen goods.

CASE STUDY

EASTHEAT PROJECT

With £3.2m funding from the Scottish Government's Local Energy Challenge Fund (LECF), the EastHeat project to install solar panels and Sunamp heat storage batteries in housing association properties is cutting fuel costs and increasing comfort for over 1000 residents across Edinburgh and the Lothians. Gas and electricity fuel costs will be cut by at least £120,000 per year across the project, and homes fitted with Sunamp's heat storage batteries will benefit from up to £300 savings on hot water and heating bills each year.

How Chinese partners will benefit from working with us

Sunamp already has experience of working in China and led a successful funding bid jointly with Glasgow University and Beijing University of Technology to boost the performance of Organic Rankine Cycle (ORC) power plants. These plants use clean, although intermittent, renewable heat sources for distributed heat and power supply in China. By integrating Sunamp's heat storage technologies with the ORC it is possible to produce a more dependable distributed heat and power supply using a wide range of renewable heat sources, such as solar energy.

How we take an innovative approach to delivering advanced urban services

Our heat and cool batteries solve daily challenges in new and innovative ways, storing and moving heat like an asset, saving energy costs and speeding up processes. They provide large scale static and transportable energy storage (90 kWh or more on a pallet to multiple MWh in a shipping container) which can store waste heat or be electrically charged. This can be done with heat or cool on a schedule that minimises demand charges or optimises behind-the-meter electricity generation.

CAMLIN GROUP

KEY FACTS

HQ: Lisburn, UK
Regions active: Asia-Pacific, North America, Latin America, South Africa, Europe
Industry: energy, smart grids

> "Camlin brings revolutionary products to life for a wide range of industries. We believe in high quality engineering and design, allowing us to develop market-leading products and services."

OVERVIEW

Headquartered in Lisburn, Northern Ireland, CAMLIN is an international company with a combination of engineering design, technical support and sales offices in over 20 countries across the globe. CAMLIN operates with the vision of improving our customer's operational performance through the application of technology.

We cover many sectors, including industry-leading R&D, state-of-the-art test facilities, in-house manufacturing, quality control, dedicated customer technical support and sales. Our regular customer base includes all of the electricity distribution companies in UK and Ireland, the vast majority in the US, and many in Europe. Our leading SAPIENT service has been adopted by many of these customers, assisting with day to day network operations.

The team in CAMLIN has developed cutting-edge technology in the power sector for more than 35 years. This unique combination of experience, dedication and in-house knowledge means that CAMLIN has the vision, strength and customer focus to bring industry-changing products to life.

What kind of projects our company works on

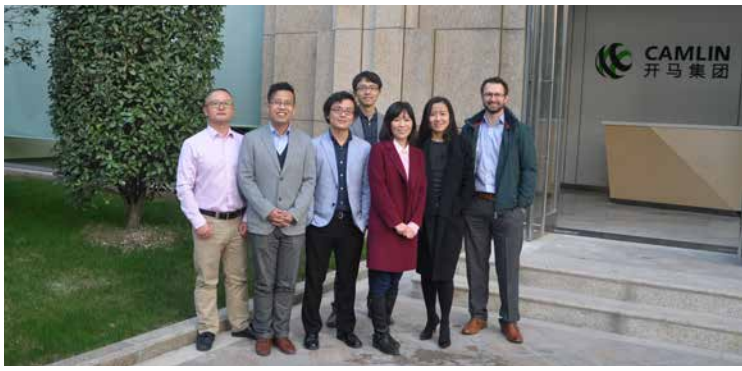
CAMLIN works with our partners to create solutions that ensure reliability, improve efficiency, increase flexibility, and ensure the safety of electrical distribution networks and equipment. These solutions are delivered through a combination of installed hardware, collation and reporting software systems, and our highly specialised data analysis systems.

Artificial intelligence and machine learning are key areas of our solutions now and for the future. Sophisticated analysis of data can lead to the creation of predictive and optimisation algorithms. AI and ML add great value by automating analysis, and going beyond the capabilities of trained experts.

CASE STUDY

SMART STREET

CAMLIN worked in close partnership with Electricity North West to create a true smart gird for their SmartStreet trial project. CAMLIN developed two main products for this project. WEEZAP is a supply end device and LYNX is used at interconnection points on the distribution networks. These remotely re-configurable products enabled by the connection of low carbon technologies to the network, whilst demonstrating the benefits of energy savings through conservation voltage reduction.



How Chinese partners will benefit from working with us

For many years, CAMLIN has worked closely with power and distribution companies around the world, in many cases working in close partnership with those companies to deliver technically advanced solutions tailored to their customer's needs. From our Shanghai subsidiary office, CAMLIN can provide the benefits of that experience, along with the capabilities of our highly skilled team of development engineers and scientists. This includes vision, strength and a focus on bringing industry-changing products to life.

How we take an innovative approach to delivering advanced urban services

CAMLIN has a team of over 250 research and development engineers based in centres of excellence around the world, working to create innovative industry-leading products. In addition, we have invested heavily in our own infrastructure to help define and deliver these solutions. This includes our unique low voltage test centre where we can create a diverse range of network operating and fault conditions, bringing industry-changing products to life.

BLOCKDOX

KEY FACTS

HQ: London
Regions active: UK, Asia
Industry: IoT, asset management, transport

> **BlockDox helps make cities smarter by providing the data and insights needed to optimise space, save energy, reduce costs, and ensure safety."**

Nic Shulman
CEO

OVERVIEW

BlockDox makes spaces smarter using artificial intelligence, machine learning and the Internet of Things. Our award-winning and patented technology provides real time, predictive and cognitive intelligence so our customers can make better informed decisions about managing their buildings, estates and transport networks.

This means services are provided based on fixed assumptions rather than actual demand, with implications for space optimisation, operational expenses, cost reduction, health and safety, security, customer satisfaction, energy performance and revenue generation. We are currently focussed on two smart city verticals: smart buildings and intelligent transportation.

BlockDox has received widespread media interest in Europe and Asia including from the BBC, Financial Times and Channel News Asia. We were also competitively selected for two smart city accelerator programs in Hong Kong: Infiniti Lab and Blueprint by Swire Properties.

What kind of projects our company works on

BlockDox is focussed on two smart city verticals: smart buildings and smart transportation. Our Internet of Things sensors are placed around a building or in vehicles such as trains or buses to gather real time occupancy and other environmental data. We then perform predictive and cognitive analytics on this data to solve challenges for our customers. BlockDox's solutions are interoperable which allows customers to integrate them with other building management systems and workplace solutions. Combining systems in this way helps building managers make more informed business decisions. An example could include demand-side management of energy use in buildings. We have carried out projects in large commercial office buildings, shopping malls, fast food restaurants, bars, coffee shops, apartment buildings and train stations.

CASE STUDY

UK PILOT PROGRAMME

BlockDox's pilot program in the United Kingdom brought about substantial energy savings, improved operational efficiency and increased revenue for our clients. In a single commercial office building BlockDox was able to demonstrate how changing the use of underutilised space could generate GBP £500,000 in revenue. In a luxury apartment building we demonstrated the ability to help save £50,000 per year in energy costs, amounting to a 5-10% annual reduction.

How Chinese partners will benefit from working with us

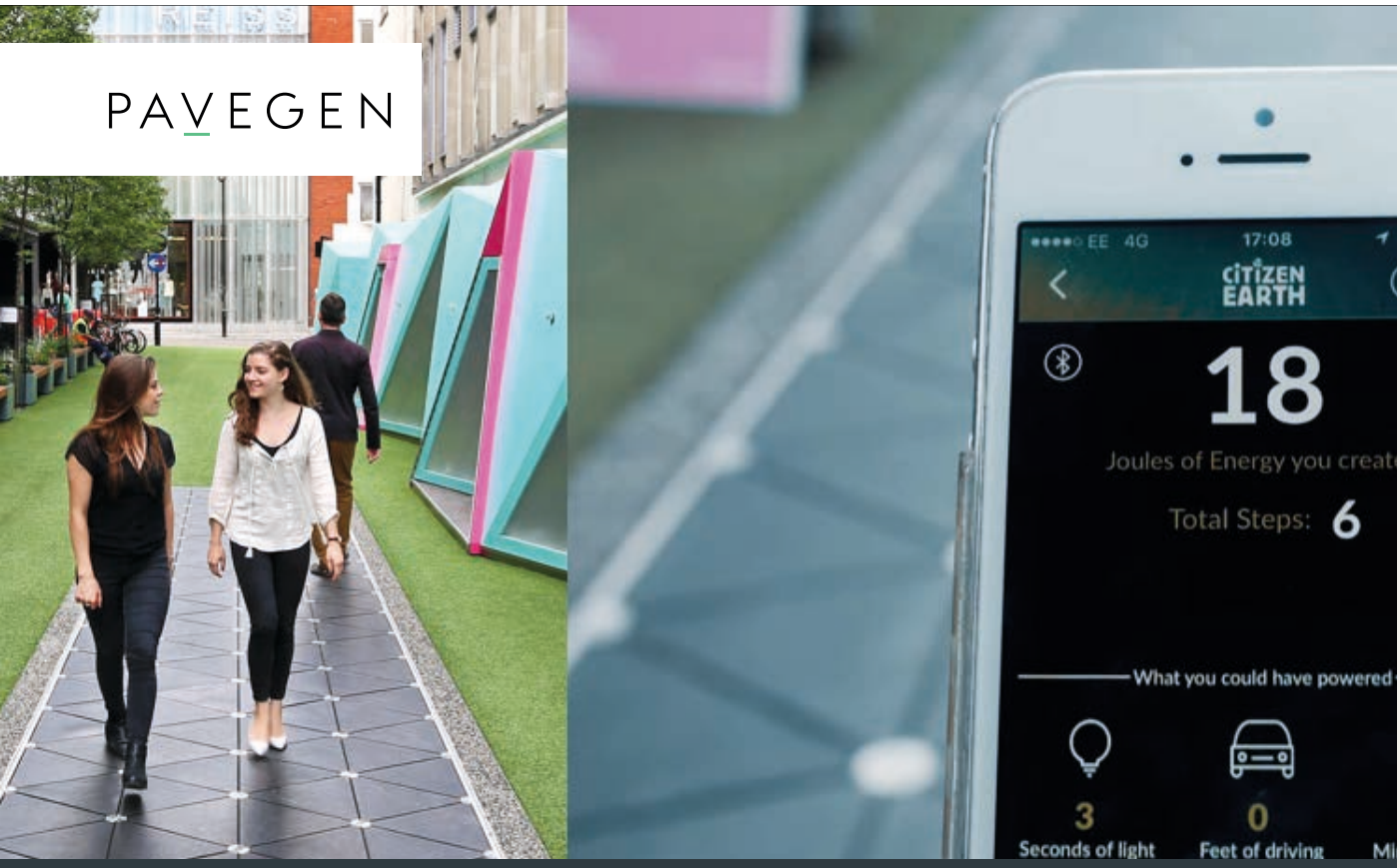
BlockDox are seeking the following types of Chinese partners:

- Customers such as building owners, facility managers and train/bus operators who want to save energy, improve operational efficiency and generate additional revenue.
- Manufacturers interested in working with BlockDox to build and assemble their proprietary Internet of Things sensor devices.
- Distributors and joint venture partners who want to help BlockDox expand our business in China.

We have some experience operating in China, having won projects in Guangdong which were jointly funded by the UK and Chinese governments.

How we take an innovative approach to delivering advanced urban services

BlockDox's patented, interoperable technology delivers reliable real-time occupancy and environmental data. This allows building owners, estate managers, facility managers and transport operators to make better decisions. Unlike other solutions, BlockDox does not rely on CCTV, face recognition, beacons, mobile apps, RFID, foot counters or door sensors.



PAVEGEN SYSTEMS

KEY FACTS

HQ: London
Regions active: Asia, Europe, North America, Latin America, UAE
Industry: cleantech

> China is a key market for us. With demonstrated impact in the smart cities market, Pavegen can play a role in ensuring the move to more sustainable cities is embraced and owned by communities and citizens."
>
> *Laurence Kemball-Cook*
> *Founder and CEO*

OVERVIEW

Pavegen is the global leader in harvesting energy and data from footfall. Our mission is to make our technology available to all communities, empowering people for a better world. Our patented technology connects people to sustainability and smart cities, creating powerful experiences which convert footsteps into off-grid energy, rich data and rewards. We call this the "internet of beings", making cities smarter with every step.

Pavegen supplies both permanent installations and experiential activations and we power off-grid applications such as games, lighting, and environmental monitoring. With embedded low-power Bluetooth connectivity, we can register the footsteps of individuals via our apps. When we combine this real-time data with analytics, we create powerful insights into the behaviours of people. We have delivered 200 projects in 30 countries, working with iconic brands including Adidas, Coca-Cola, Google, Heathrow Airport, Shell, Transport for London and Westfield.

What kind of projects our company works on

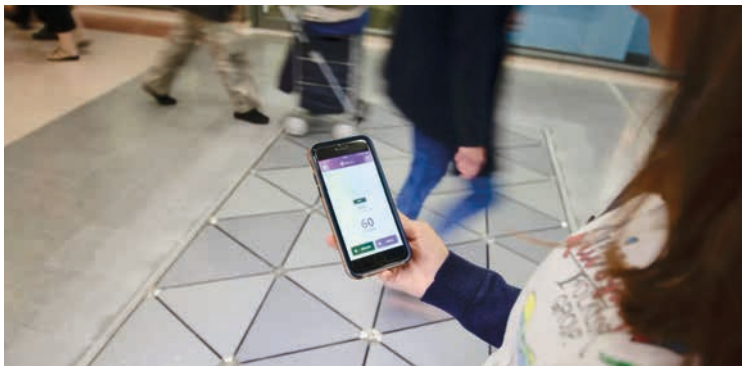
Pavegen is a patented flooring and software technology that converts people's footsteps into off-grid energy, data and rewards. It is a high-impact and versatile platform that enables citizens to participate physically in smart technology and engage with themes such as energy, sustainability, health, wellbeing, and science.

Pavegen's hardware is installed permanently in a growing number of cities including London, Melbourne, Seoul and Washington. The company has worked with airports, stations and information networks. Building on the success of its Heathrow Terminal 3 installation, the company is launching two airport installations in the USA and Middle East. Pavegen has also deployed its solution at train stations in the UK and France.

CASE STUDY

SUSTAINABLE PARK

At Dupont Circle, Washington DC, Pavegen has helped to transform a concrete crossing zone near the White House into a beautiful, sustainable park. Three walkways of Pavegen's award winning technology are converting the footfall of pedestrians into off-grid electricity. This is being stored to power the lights of this new destination and to provide our client, the Washington DC Transport Authority, with energy output data.



How Chinese partners will benefit from working with us

Pavegen's uniquely engaging clean technology will enable Chinese citizens to feel part of a smarter, more sustainable urban environment. That relationship has high value for Chinese partners in sectors such as urban planning and regeneration, retail, education and branding. Recent prominent news covered by Chinese news network CGTN demonstrates that there is already considerable interest in our technology in China.

How we take an innovative approach to delivering advanced urban services

We place people right at the heart of the smart city. We aim to build urban environments that work and reward people, not machines. Like many great ideas, the smart city is an easy thing to say but a lot harder to execute. Pavegen sees this as a revolution being driven, not by ideology, but by pragmatic business people, communities, and the scientists and engineers that empower them.

UTTERBERRY

KEY FACTS

HQ: London
Regions active: EU, Asia, Australia, North America
Industry: smart cities, AI, wireless sensing, engineering

> UtterBerry™ is a cutting-edge AI platform for structural health monitoring of buildings and infrastructure. We provide increased safety and reduced costs, while targeting infrastructure maintenance to exactly where it is needed."

Heba Bevan
Founder and CEO

OVERVIEW

The UtterBerry™ system consists of a collection of miniature, artificially intelligent, ultra low-power sensors. These sensors can be utilised to tackle a range of city challenges, with applications in construction, transport, smart hospitals, crowd sensing, smart industry, smart agriculture and smart buildings.

Our sensors self-calibrate to form a mesh network and relay data between each other, working as a family to solve targeted challenges. UtterBerry's™ sensors do not require a line of sight between them. For real-time remote access to the sensor data, the sensors are supported by a base station providing connectivity to the internet or a local network.

Our company was founded in 2013 as a spin-out from Cambridge University. We are based in London, where we design and develop our own hardware and software technologies. Our smart sensors are all manufactured in the UK and exported throughout the world.

What kind of projects our company works on

Our patented technology has been used in a variety of major national infrastructure projects including London's Crossrail and Thames Tideway. Previous customers include Network Rail, London Underground, Thames Water, Laing O'Rourke, Costain, BAM and BFK. UtterBerry's™ electronics technology is also used to create smart IoT devices. These devices are small, compact and equipped with a live feed sensor to detect a wide variety of immediate environmental changes. Whilst the sensors are unnoticeable to the public eye, they provide a valuable source of live data. They are also housed in durable waterproof casing designed to survive the harshest of environments.

CASE STUDY

CITYVERVE

UtterBerry™ is working with Gammon Construction in Hong Kong to monitor complex building sites such as the Lyric Theatre MTR, applying expertise gained through previous work in London. Smart construction will be an essential part of smart cities, which aim to create a better environment for the citizens who live in them, and are capable of learning about themselves in order to bring about further improvements.

How Chinese partners will benefit from working with us

As China's urbanisation level continues to rise, high quality sensor networks will be key to making city systems more efficient, helping cope with new construction and accommodating growing populations. UtterBerry™ develops and provides technology that helps cities to do this, drawing on capability in artificial intelligence and machine learning to process and utilise the data gathered. We are able to draw on our experience of deploying monitoring solutions for large infrastructure projects across the globe.

How we take an innovative approach to delivering advanced urban services

Utterberry's™ innovative technology enables cities to retain their vibrancy, while improving the performance of the invisible but critical infrastructure that keeps them running. We aim to make our work almost invisible, through seamless integration of our sensors into the fabric of the cities they work in. Our battery-powered sensors, which are the size of a coin, can be installed in minutes and immediately begin to intelligently monitor their surrounding area.

iSENSING LIMITED

KEY FACTS

HQ: Liverpool
Regions active: Europe, Latin America
Industry: IoT

> Our goal is simple: for every city in the world to have access to our platform. We want cities to embrace data as a way of driving positive changes."

Harvey Beilinsohn
CEO

OVERVIEW

iSensing helps organisations meet the challenges and opportunities of urbanisation by helping them visualise how citizens move around cities in real time.

Our platforms allow for instant access to data to help inform better decision making. They are deployed around the world in Europe and Latin America for customers that include local and central governments, tourist agencies, construction companies and transport authorities.

Our platform is made up of IoT sensors that collect data on passing mobile devices. The data is then sent back to our cloud platform where it is stored, processed and made available to users. We visualise data in four ways; through our API, dashboard, infographics and raw data. As well as designing bespoke platforms and sensor networks, we also have permanent sensor networks in Manchester in the UK. Permanent sensor networks are a part of our strategy for large cities around the world.

What kind of projects our company works on

iSensing supports projects related to smart cities, urban design, security, advertising, tourism and retail. We design bespoke solutions with our customers to answer questions they have on the development of their cities or business.

We also work in partnership with other technology companies to integrate our platform and data with image and environmental sensors and platforms.

iSensing has experience working on specific city challenges related to security, cycling investment and street cleaning. We have worked to produce unique, long term studies for local and regional governments around the world to improve citizen well-being.

CASE STUDY

CITYVERVE

Belo Horizonte transport authority conducted a customer survey that highlighted long wait times for buses. iSensing deployed a sensor network to capture wait time and the busy bus routes. Eight sensors were deployed, four in the main bus station and four at key transference stations along the main bus routes. The data was delivered into the iSensing dashboard and a bespoke movement analytics dashboard was developed.

How Chinese partners will benefit from working with us

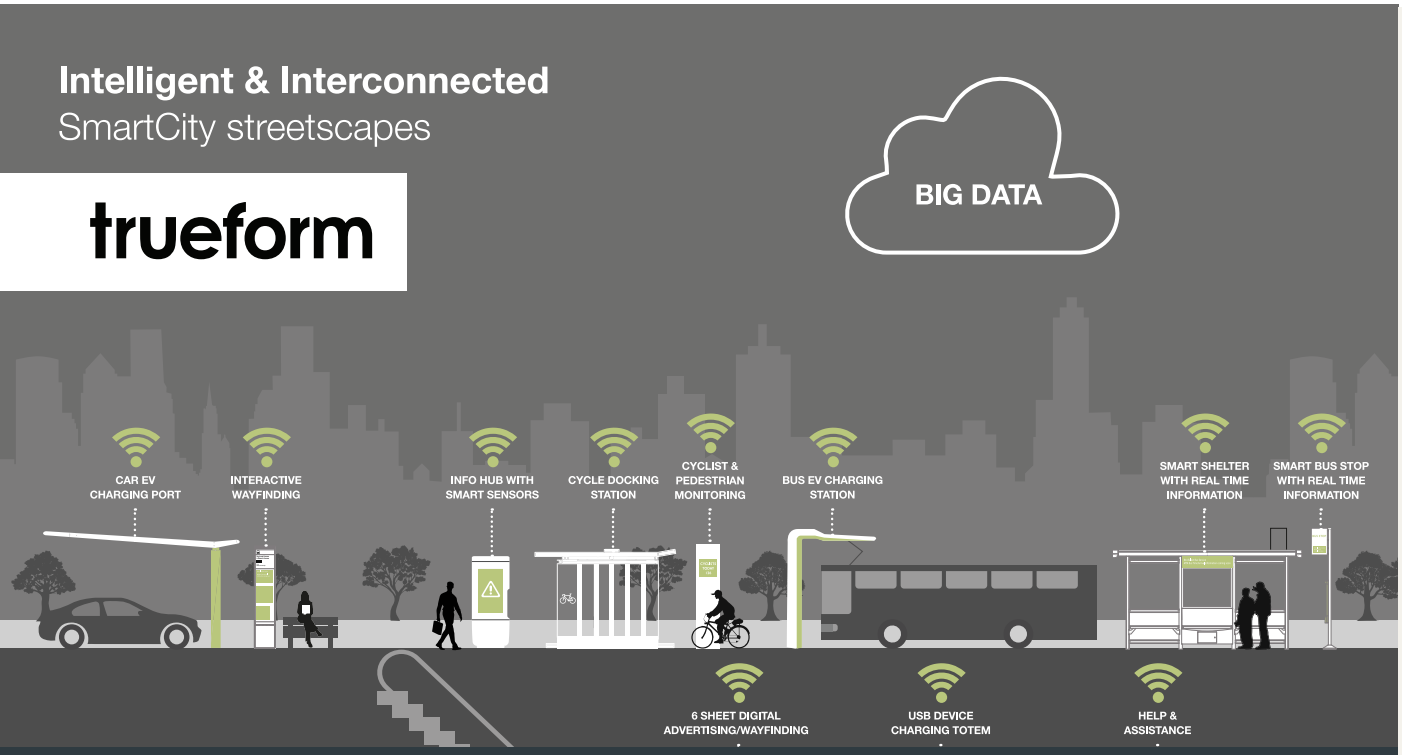
iSensing works around the world, we adapt quickly to different environments. We work with our customers closely to design a platform solution for them. We also have a team of engineers that adapt our platform to different regions and localities. This approach enables our platform to be user centric and easy to use. We are interested in applying our expertise to some of the urbanisation challenges that China faces.

How we take an innovative approach to delivering advanced urban services

iSensing approaches urban innovation through collaboration, design and a best in class platform. We work with stakeholders to understand their problems, design a solution and then create a project plan to deliver our platform to fit our customers' needs. We have run design workshops around the world and our customers love being part of this phase of the project life cycle.

Intelligent & Interconnected
SmartCity streetscapes

trueform



TRUEFORM

KEY FACTS

HQ: London
Regions active: UK, Europe, USA, Asia, Middle East
Industry: transport, infrastructure

> "Trueform are committed to building and delivering the advanced, intelligent, urban infrastructure that is needed for our times. Our aim is to enrich the human experience with meticulously designed, manufactured products and innovative technology."
>
> *Jonathan Morley, CEO*

OVERVIEW

Trueform is a pioneering technology and manufacturing company that provides custom solutions for public spaces. We develop and harness leading technology and advanced manufacturing techniques to create innovative products that tackle urban challenges.

We are part of the Trueform Manufacturing & Technologies Group and have expertise in a range of fields including: intelligent mobility, electric vehicles, connected autonomous vehicles, smart cities, wayfinding, zero emission travel, digital advertising and applied digital display solutions.

Trueform has over 40 years' experience providing some of the largest and most successful cities with their supporting infrastructure. Previous clients include cities, transport authorities, highways agencies, governments, construction companies, outdoor advertisers and communication companies.

What kind of projects our company works on

Trueform are a key supplier to cities and transport authorities throughout the world, providing leading smart city infrastructure, manufacturing and technology solutions. We supply solutions across all mobility modes, including conventional bus and rail, bus rapid transit, light rail transit, pedestrian wayfinding, cycling, electric vehicle charging, connected autonomous vehicles and air passenger transport. Our hardware solutions include transit stops, shelters, interchanges, mobility hubs, stations, canopies, advanced digital passenger displays, interactive smart city kiosks, pedestrian wayfinding, counter terror systems, electric vehicle infrastructure and solar energy systems.

CASE STUDY

TECH TOTEMS

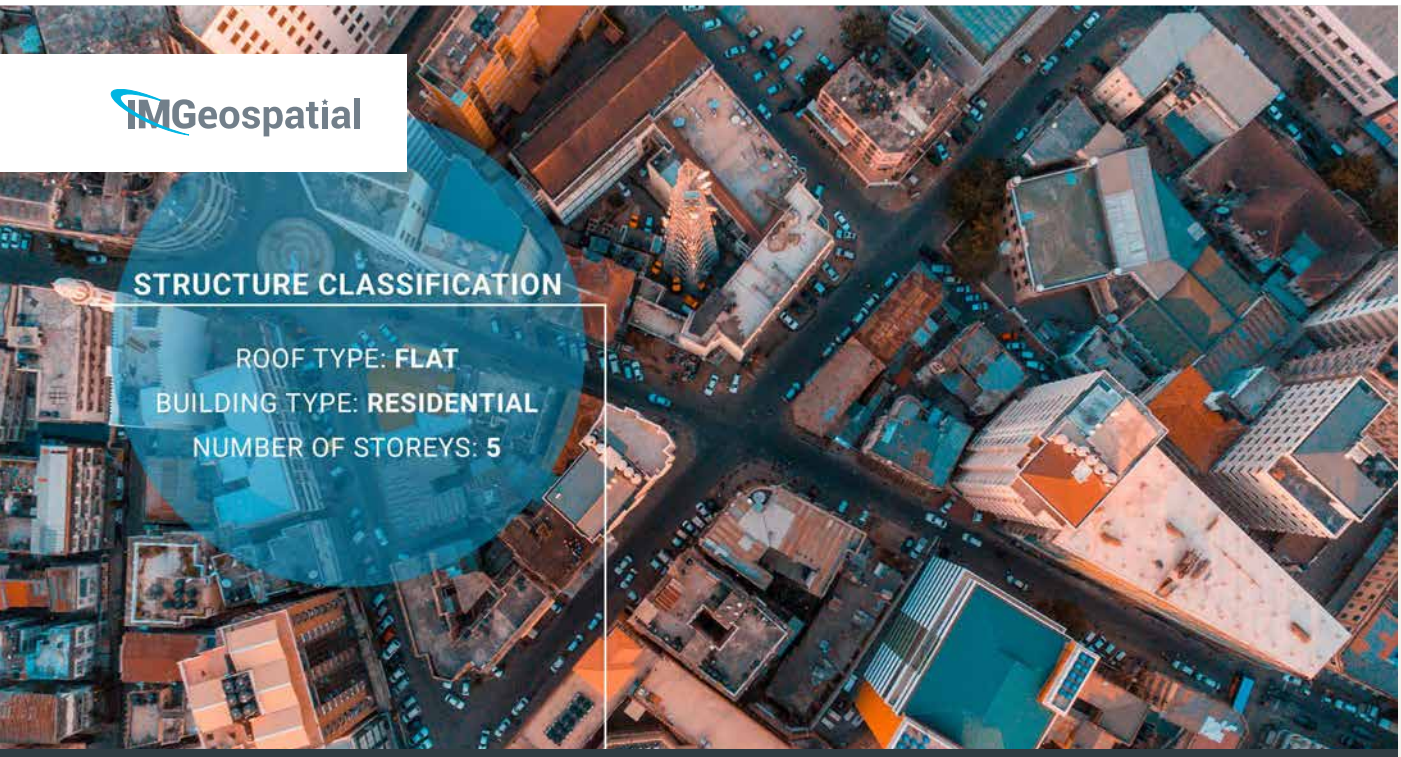
Trueform was appointed by Future Cities Catapult to design, manufacture and install a range of smart city Technology Totems. The totems contain a selection of sensing hardware, an e-paper 32'' display and are powered by a solar panel, meaning that they can be deployed off-grid. The totems contain sensors that allow them to gather data on their surroundings and engage with the public via dynamic on-screen content and wireless connectivity. The smart sensing equipment built into the totems includes thermal imagery, air pollution, pedestrian and cycle counting, vibration levels, proximity sensing, and voice activation.

How Chinese partners will benefit from working with us

We are interested in finding ambitious partners to work with in Chinese cities. In total we have over 150,000 deployments at premium locations in major cities throughout the world, and would like to extend our activity to China.

How we take an innovative approach to delivering advanced urban services

Trueform's team includes creative designers, advanced manufacturing professionals, and technologists with specialisms in IoT, artificial intelligence and smart cities. We take a user-centric approach to design thinking. We provide focus and tenacity , with the discipline and rigor of engineering and technology, helping cities realise their visions for becoming "smarter". We are committed to building and delivering the advanced urban services that will be a part of future cities.



IMGEOSPATIAL

KEY FACTS

HQ: Burnham
Regions active: Europe, North America, Africa
Industry: remote-sensed data processing

> **With successful demonstration projects for World Bank, Affinity Water, State of Nevada and Allianz, IMGeospatial is making significant improvements to many people's lives across the globe."**
>
> *Alexis Hannah Smith*
> *CEO*

OVERVIEW

IMGeospatial's AIMEE, our Automated Intelligent Multi-feature Extraction Engine, uses machine learning, AI and multi-scopic, remote-sensed imagery to create valuable Automated Business Intelligence.

Rather than producing enormous amounts of raw data which users must interpret to gain insight, IMGeospatial's AIMEE 'Digests, Distils and Disseminates' remote-sensed data to produce intelligence specifically suited to a particular sector. By producing Automated Business Intelligence in this way, we change the way our customers see the world. We supply critical answers to their questions, allowing them to work in a smarter way and do things more efficiently. Our services help sectors such as insurance and water utilities to gather vital information in their area of interest, carrying our tasks such as risk assessment of properties or identifying anomalies in water consumption.

With successfully completed demonstration projects for The World Bank, Affinity Water, the State of Nevada and Allianz UK, IMGeospatial is making significant improvements to many people's lives in communities across the globe.

What kind of projects our company works on

We work for a variety of entities across sectors such as smart cities, water, gas and power utilities, engineering, telecommunications, NGOs, transportation and insurance in disparate locations around the globe. We 'Digest, Distil and Disseminate' data over vast geographic areas, allowing users of our products to find solutions to their problems. For example, Land Use Classification allows for the accurate identification of an area's boundary and usage, identifying the presence of fields, trees, shrubs, roads and structures. Structure Classification allows for the accurate identification of building types and their attributes, including floor space, height and roof type.

CASE STUDY

NEWMARKET & WEST LONDON DATA GENERATION

We were asked by the UK arm of a global insurer to generate data for two areas within the UK: Newmarket and West London. Using unsupervised AI to process remote-sensed data, we extracted the features and attributes of a range of structures with AIMEE, producing results within a few percentage points of manual surveys for the same areas but significant improvements in cost and time efficiency.

How Chinese partners will benefit from working with us

We are able to offer Chinese partners cost and time efficiency through scalability and speed of data generation, which in turn make systems more efficient. IMGeospatial 'Digests, Distils and Disseminates' huge amounts of data to enable planning and to facilitate understanding of developments and other considerations in the evolving Digital Terrain Model (DTM) throughout a smart city's lifecycle. We have a record of delivering excellent return on investment for past clients.

How we take an innovative approach to delivering advanced urban services

Our innovation lies in the unsupervised classification of features and attributes from any type of remote-sensed data. This data may be less than optimal through shadow, off-nadir perspective or affected by adverse seasonality. As data changes over time, we create 'Evolving DTMs' so that when alterations in topography occur, the influences these changes make in the landscape can be shown in any data model.

IMONT TECHNOLOGIES

KEY FACTS

HQ: London
Regions active: UK, Germany, China, USA, Korea
Industry: IoT, telecoms, utilities

> "To avoid the disastrous consequences of cloud outages, an all too common occurrence, we offer a smart home software solution that does not rely on the cloud."

Larry Poon
Chief Operating Officer

OVERVIEW

Imont develops software for IoT device integration using a cloudless technology that delivers economic and security benefits for scaling smart home and smart city projects.

Our next generation IoT software connects devices from many different manufacturers, using many different communications standards. Our software allows these devices to be integrated so that they interoperate seamlessly, regardless of whether they are local or remote without reliance on expensive cloud services.

We lower the barrier to entry and the ongoing operational costs of scaling projects for organisations wanting to offer an end-to-end solution. We have partnerships with a number of device manufacturers, radio manufacturers and system integrators providing the hardware support for our software ecosystem. Security is key to the Imont proposition, having been integrated from the start. State of the art encryption is used throughout and our cloudless technology makes it difficult to attack the system.

What kind of projects our company works on

Imont works on smart home, smart cities and smart industry projects. We operate in four primary smart home verticals: smart energy, home entryway, security and senior care. In the smart city area we focus on smart energy. In industry, we focus on environmental monitoring and people flow and movement.

We currently provide device connectivity software to IP camera manufacturers, TV set top box manufacturers, heating solutions companies, smart meter companies, telecommunications companies and WiFi router manufacturers. These projects are designed to add IoT device capabilities to the existing devices of the manufacturer. This allows them to differentiate their products from their competitors and bring an enhanced product to the market.

CASE STUDY

COST-EFFECTIVE CAMERA SOFTWARE

Our challenge was to create secure, scalable and cost-effective software for a smart camera. Integrating our software into the IP security camera, Imont enhanced the camera's capabilities to allow it to work with other devices such as lighting, security sensors and smoke detectors. Taking advantage of our state-of-the-art distributed computing technology led to vastly reduced cloud costs for the manufacturer and enhanced security.

How Chinese partners will benefit from working with us

China is a particularly vibrant market for both consumer and industrial IoT. In the consumer segment the market is highly price sensitive, meaning that expensive cloud-based solutions have struggled to gain traction. Imont's innovative software solves these issues and opens the door for mass adoption at a viable price point. China's manufacturers have the scale and reach to take full advantage of Imont's scaling experience in both the domestic and export market.

How we take an innovative approach to delivering advanced urban services

Imont's software has been designed with advanced urban services in mind. Our software enables local autonomous systems such as lighting and energy to work together seamlessly as a network of equals. This provides built-in redundancy and resilience against multiple types of failure and enables the most efficient use of resources at a local level to maximize environmental benefits.

HELLO LAMP POST

KEY FACTS

HQ: London
Regions active: UK, India, Japan, Singapore, USA
Industry: information technology

> We're changing the way we live in cities for the better: enabling citizens to take back control of their cities, thereby co-creating resilient environments that citizens truly want."
>
> *Tiernan Mines*
> *CEO*

OVERVIEW

Hello Lamp Post is a human-centric citizen engagement platform, that encourages people to strike up playful conversations with street furniture using their mobile phones. We bring cities to life, allowing people to interact with their built environment whilst collecting data and insights to better inform the development and planning of future cities.

Our company encourages people to look at their city with fresh eyes. We give citizens a chance to slow down, reflect and feedback to their city, empowering them to take back ownership and influence its future development. Hello Lamp Post makes the planning of our cities more centred around the needs and ideas of its citizens.

We enable the co-planning and co-creation of happier, more liveable cities, allowing citizens to actively participate in city planning and innovation, and influence decision making. This leads to the development of resilient cities that citizens truly want and that are sensitive and responsive to their wellbeing.

What kind of projects our company works on

Hello Lamp Post projects have been designed and executed with local governments, construction companies and other private clients who understand the importance of engaging citizens in key decisions. Our representatives have travelled to 13 cities worldwide, working on a variety of different projects with a broad range of positive client outcomes.

Our system is versatile and scalable, with its content curated for the goals of that particular client, collecting desired data and insights from users in a unique way. All the projects we have delivered share a common idea: that through humanising urban environments, we can open a gateway to honest citizen data and insights that was previously inaccessible.

CASE STUDY

HELLO LAMP POST SINGAPORE

Hello Lamp Post was launched in Singapore, commissioned by the Singapore government alongside Future Everything to converse with the citizens about issues surrounding the future of technology. Over an 8 day period, the system received over 18,000 messages. These messages informed the government about its citizens' knowledge and ideas relating to technology and artificial intelligence, helping better inform future policy.

How Chinese partners will benefit from working with us

Hello Lamp Post would provide partners in China with an innovative, people-centred way to consult communities. It would allow them to engage large volumes of citizens on a given theme or plan, generating data and insights from these interactions. The qualitative and quantitative insights gained would then better inform future decisions and developments, enabling them to co-create more resilient cities with the citizens' needs as the primary focus.

How we take an innovative approach to delivering advanced urban services

The Hello Lamp Post system builds the user's trust and provides a platform for them to share views anonymously: an innovative approach to citizen engagement and consultation. Unlike an increasing number of advanced urban services, our platform has no hardware installation requirements, meaning each installation is extremely flexible and scalable, allowing for citizen engagement on a much larger scale.

TELENSA

KEY FACTS

HQ: Cambridge
Regions active: Europe, North America, Asia, Australasia
Industry: connected streetlighting, wireless smart city applications

> **We're looking forward to working together on low-cost smart city applications, enabled by the city's lighting network."**

Will Gibson
Founder and Chief Commercial Officer

OVERVIEW

Telensa is the global market share leader in connected street lighting, with technology that controls over 1.5 million lights.

Our PLANet® smart streetlighting system consists of Telensa Telecell® devices on individual streetlights, an ultra narrow band (UNB) network to connect them, and a central management system to provide visibility and control. Telensa PLANet® provides wide area coverage in a matter of days and is designed to run reliably for decades.

Telensa PLANet® has the ability to create sophisticated lighting control programmes, automate lighting with traffic sensors, and accurately meter energy usage. Telensa PLANet® provides real time monitoring of faults and this enables faster and more organized responses to failures. Together, these features reduce maintenance costs and improve citizens' safety and service experience. Telensa is at the forefront of the Internet of Things, enabling you to add smart city sensors to connected streetlight deployment.

What kind of projects our company works on

Telensa works with cities and electricity utilities all around the world to help them save energy, work smarter and deliver more joined-up services for their citizens. For cities, adding streetlighting controls is often the first step to becoming smarter.

Building on a compelling business case, Telensa provides an open, low cost platform to add multiple sensor applications. Our LPWA wireless networks simply attach to light poles. They provide wide area coverage in a matter of days and are designed to run reliably for decades.

CASE STUDY

PLANet LIGHTING NETWORK

Telensa is working with the Highways Department of the Hong Kong Special Administrative Region Government to replace 600 streetlights in Yuen Long. It's part of a pilot scheme to gradually introduce more sophisticated and intelligent lighting systems to the region's urban infrastructure. The Telensa PLANet lighting network enables other low-cost smart city applications, like providing information on rubbish collections or traffic congestion.

How Chinese partners will benefit from working with us

Telensa has over ten years of deployment experience. Our PLANet® streetlighting system is proven at scale, with our biggest single deployment consisting of over 300,000 lights. This means that we are able to scale to accommodate the needs of large Chinese cities. A long-range, low-power radio system offers the easiest deployment, it is compatible with all of the leading lighting manufacturers, and it integrates easily with asset management systems. What's more, Telensa is at the forefront of the Internet of Things (IoT), enabling you to add smart city sensors to connected streetlight deployments.

How we take an innovative approach to delivering advanced urban services

We understand the strategic drivers and economic imperatives of city digitization, based on expertise gained through a decade of deploying mass-scale street lighting control systems around the world. Our technology enables increasingly digitized city departments to work together. Our vision is of a fully instrumented, data-driven city. Instead of today's vague ideas about how sensor infrastructure will be paid for, we see a low-cost infrastructure built from specific operational savings in individual city departments.

SCIENCESCOPE LTD

KEY FACTS

HQ: Bath
Regions active: South East Asia, Africa
Industry: education, IoT, electronics, sensing

> **For learners of today an introduction to IoT and digital making is the key to future employment. ScienceScope is making this happen with projects in the UK, Singapore and Dubai."**

David Crellin
CEO

OVERVIEW

At ScienceScope we are working with cities across the world to develop the next generation of education systems.

Technology will have an unprecedented impact on jobs and careers in future cities. The easy accessibility of the latest developments such as maker devices and AI will enable everyone to use these technologies to build solutions for their life experience which will transform their lives and the lives of those around them.

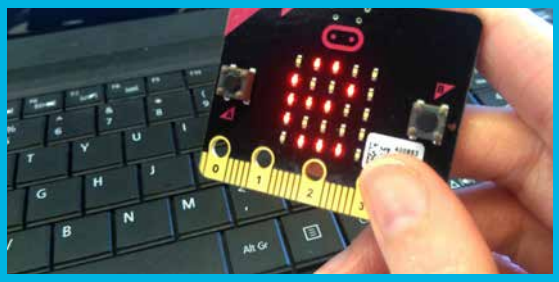
ScienceScope worked closely with the British Broadcasting Corporation to develop the micro:bit. In Singapore we are now leading the Digital Maker Programme project to deliver 100,000 micro:bits and kits to schools and community centres. This programme includes comprehensive training across the curriculum. In addition, moving beyond micro:bit programmes we have originated the concept of IoT@School which enables every student in schools across the world to share data and become data scientists. In 2017 ScienceScope was awarded a grant from EXPO2020 Live Dubai to develop a Digital Maker and IoT@School Programme in the UAE.

What kind of projects our company works on

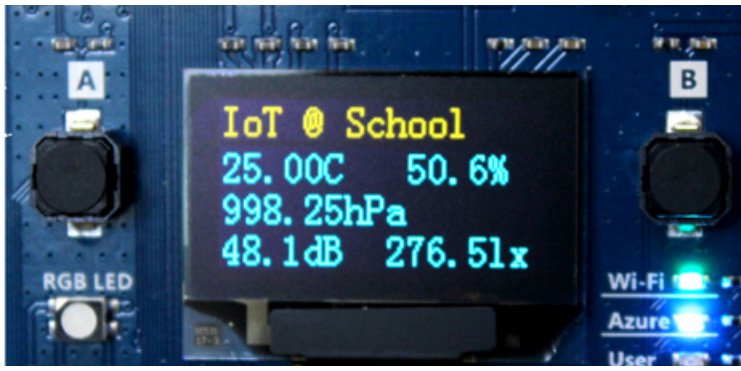
IoT@School is a smart education concept pioneered by ScienceScope Ltd. We lead the first IoT@Schools project, project Distance, which was set up to enhance the use of technology in schools and incorporate data collected from scientific investigations into a big data platform. Eight schools were provided with IoT connected sensors and dataloggers that they could connect to an online portal. The equipment allowed students and teachers to gather continuous data about their environment, design investigations around it, and share their findings with other schools. In 2015-6 we carried out a similar project in Singapore which built on the concepts and educational models while further developing the technology.

CASE STUDY

IOT SCHOOL LABORATORY



We are building an IoT@School laboratory at the National Institute for Education which is a department of The National Technology University of Singapore. This project includes multiple weather stations in the grounds as well as using technology to measure how food cooks. It will ensure all teachers being trained in Singapore will have a grounding in the IoT and big data using our platform and technology.



How Chinese partners will benefit from working with us

We will work with Chinese partners to develop a Digital Maker and IoT@School programme that will enable students to transform their digital skills through the use of the micro:bit and our IoT development kit. We will support the development of the kits and training programmes around the digital maker programme and IoT@School concepts. We will work with partners in developing the IoT Lab concept in their teacher training institutions.

How we take an innovative approach to delivering advanced urban services

We see schools as a central plank in the development of smart cities. Educational institutions can become centres of digital skills development for students but also, as we have demonstrated in Singapore, local communities. Schools can form hubs deployed evenly throughout cities and therefore represent an ideal location to build IoT based services such as LoraWAN as well as training the employees of the future.

BSI

KEY FACTS

HQ: London
Regions active: 193 countries worldwide
Industry: standards, certification, assessment

> **BSI sets the standards for smart, sustainable, resilient cities and businesses, and helps organisations implement them to improve citizens' lives."**

Richard Taylor
Director, Standards Market Development

OVERVIEW

BSI is a business standards company that helps organsations all over the world make excellence a habit. We are a global leader in helping organisations improve and our clients range from high profile brands to small companies that operate locally. We have worked with the UK government to develop a world-leading programme of standards on smart cities.

BSI has 90 offices worldwide and serves 86,000 clients in 193 countries, including China. Our service offered worldwide includes standards development, certification and assessment, product certification and training.

BSI is the UK national standards body and represents the UK in European and international standards-making. Formed in 1901, we were the world's first national standards body. Our role is to help improve the quality and safety of products, services and systems by creating standards and encouraging their use. BSI and the Standardization Administration of China have signed a Joint Cooperation Agreement setting out the framework for cooperation activities, including cooperation on smart cities.

What kind of projects our company works on

BSI helps organisations use standards to embed quality in projects, products and services. We have a large collection of standards that are relevant to cities and their delivery partners. BSI can also work with cities and their partner organisations to develop new standards and good practice.

We also offer training and certification on many topics relevant to cities including smart cities, BIM, government service improvement, city granularisation management, ageing service management, risk management and sustainable development.

BSI has developed a smart city leadership programme to help cities and their partners put citizens' needs at the heart of the way services are delivered.

CASE STUDY

SMART CITY LEADERSHIP PROGRAMME

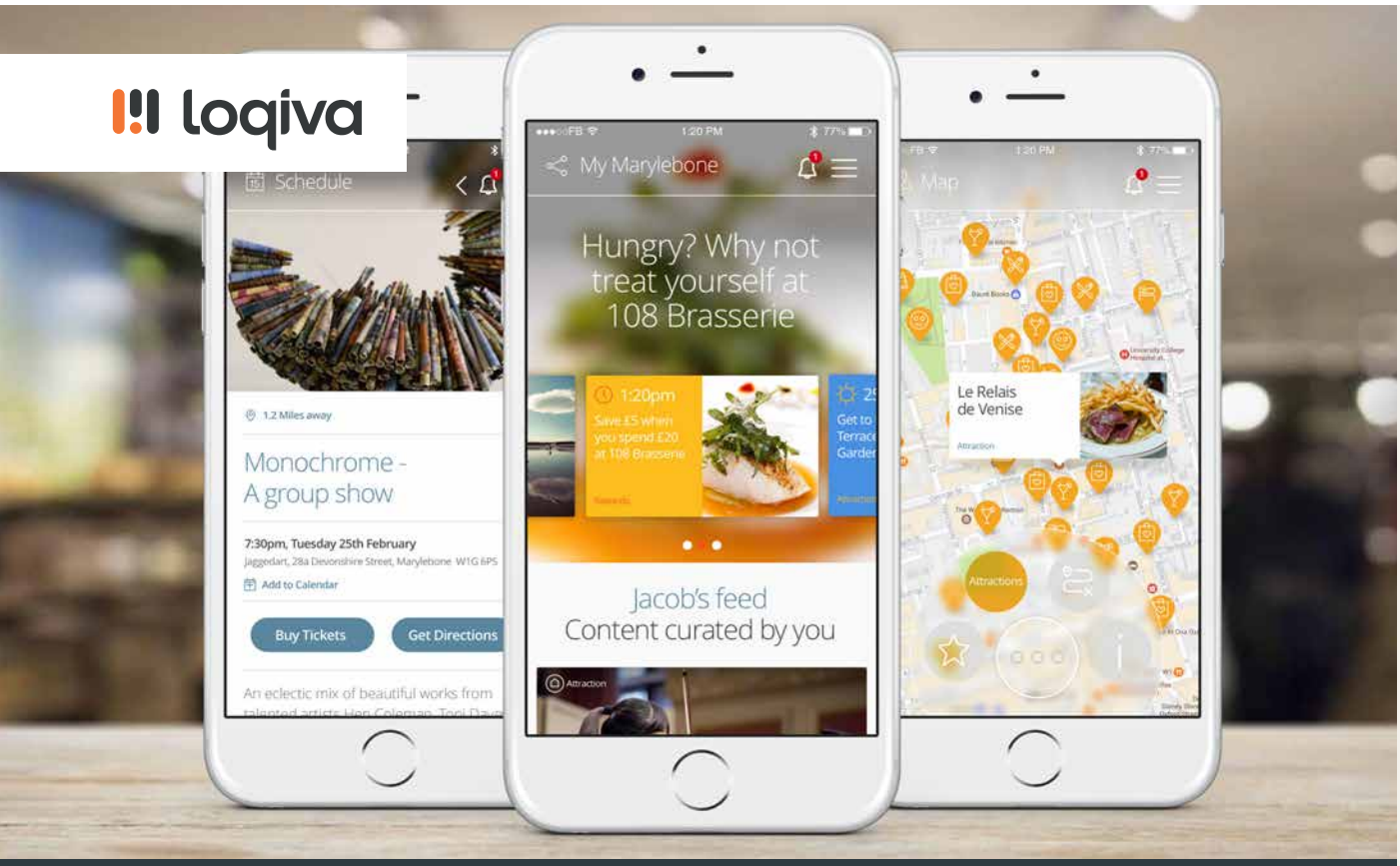
BSI developed a Smart City Leadership Programme in partnership with the city of Peterborough, to help them take forward their smart city strategy. The programme brought together a group of city leaders responsible for many different services, allowing them to draw on good practice, prioritise projects and create a roadmap for future city development. The approach has also been used with Indian cities.

How Chinese partners will benefit from working with us

Chinese cities will benefit from adopting good practice in relation to common urban challenges. These include: drawing up a smart city roadmap and plan; assessing the city's capabilities and performance; developing innovative project proposals; sharing data across the city; managing security; improving the environment and reducing carbon emissions. BSI's certification services allow cities to gain recognition for the improvements they are making and identify how to improve further.

How we take an innovative approach to delivering advanced urban services

BSI works with leading cities and innovative companies to capture knowledge from demonstrators and pilot projects, and share good practice with a broad community of cities and companies. For emerging technologies, BSI identifies how standards can remove barriers to adoption and support scale-up. In the urban context, BSI is at the forefront of developments in sharing data, Internet of Things, Building Information Modelling (BIM) and smart cities.



LOQIVA

KEY FACTS

HQ: London
Regions active: UK, USA, Europe
Industry: information technology, mobile services, IoT, payments

> We're excited to feature in the UK Future Cities Business Portfolio for China. We look forward to engaging with forward thinking Chinese partners to develop smarter urban services together."

Marcus Chidgey, CEO

OVERVIEW

Loqiva is a mobile city services platform. We enhance the quality, performance and interactivity of urban services for citizens, visitors and local businesses.

Through our IoT connected smartphone application, we intelligently find the most relevant information for citizens in any given location and present this on their device in engaging and meaningful ways. At the heart of our platform is a cloud application suite that processes diverse data sources and offers sophisticated content delivery features for city administrators and local businesses. Loqiva's modular architecture facilitates integration with specialist third party APIs (e.g. parking services) so that citizens can access everything in one smartphone application. We also offer a shared payment gateway and subscription services for local businesses. Originally designed to support the London Olympics, Loqiva has been developed in partnership with UK councils. It was selected as a Top 15 Future Cities business by Innovate UK in 2018.

What kind of projects our company works on

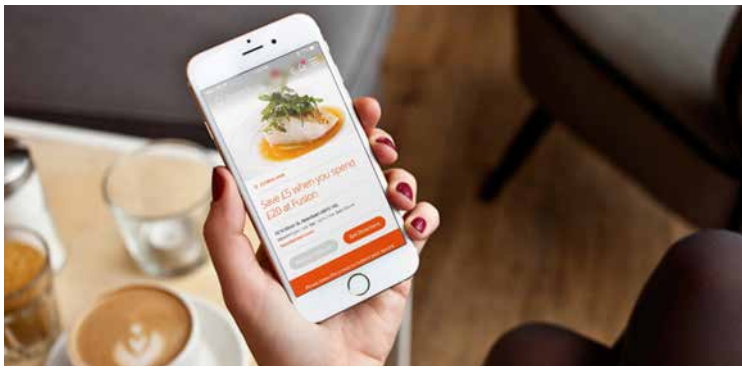
Our company works on projects that involve populations of 50,000+ potential users. We provide a hosted service and scale our network resources to suit the demands of each project. We work directly with local councils, consultancies and smart city consortiums.

Loqiva is well suited to PPP projects as our platform powers diverse methods of revenue generation. It can go live as a standalone solution or be integrated with IoT infrastructure in phased projects. The latest release of our platform is designed to support implementations with universities, BIDs and private real estate developers.

CASE STUDY

HOBOKEN CITY ENGAGEMENT SOLUTION

Loqiva has recently been commissioned by a US Smart City consortium to provide the main citizen engagement solution for the City of Hoboken, New Jersey. Over the next 3 years, Loqiva will be integrated into 20 service verticals including parking, street lighting, public wifi, street kiosks, EV charging points and public address systems. Local businesses will be able to access the platform to upload content, manage location-driven promotional campaigns and take mobile payments.



How Chinese partners will benefit from working with us

Loqiva is owned by Captive Minds Communications Group which has more than ten years' experience of working with Chinese partners. We have a turnkey solution which can be implemented within weeks. Loqiva has a plan to create a Chinese version of this, working with partners in-market. We are already working on a number of flagship smart city projects in the US and Europe and hope to introduce our Chinese partners to these, or similar opportunities.

How we take an innovative approach to delivering advanced urban services

We have been innovating with content personalisation and location technologies since 2009. During this time, we have built systems for the public sector locally and nationally with millions of active users. Loqiva was originally conceived to tackle real-world problems for councils. We believe our experience in applying technological innovation to business challenges is key to Loqiva's ability to successfully deliver advanced urban services.

CS TRANSFORM LIMITED

KEY FACTS

HQ: London
Regions active: Asia, Australasia, Europe, Middle East, North America
Industry: software, services for the public sector

> We offer city leaders a complete consulting and technology solution - backed by British and ISO standards - for planning and managing the changes that will make your city vision a reality."

Chris Parker
Managing Partner

OVERVIEW

CS Transform provide the world's only standards-based solution for city-wide transformation.

Smart cities require much more than technology. Truly smart cities require citizen-centric and data-driven innovation – a new city operating model that cuts across organisational silos and sectoral barriers.

With clients in 45 countries, CS Transform is the global leader in helping cities deliver this transformation. Our approach has been tried and tested all around the world - and forms the basis of British and international standards for smart cities.

Published by ISO in July 2018 (following a five-year process of research and engagement with city leaders led by CS Transform), ISO 37106 is the new global standard that: "defines a smart operating model for cities, which enables them to operationalise their vision, strategy and policies at a faster pace, with greater agility and with lower delivery risk." Our offer to cities is simple: a complete consulting and software solution for delivering these global best practices in your city.

What kind of projects our company works on

We provide consulting services and software to support city leaders. This includes:

- Baseline assessment of your city against international standards for smart city maturity.
- Roadmap development: building stakeholder consensus around a clear vision and strategy for the city's future, with a detailed roadmap to deliver this using proven best practices
- Business case and KPIs: global best practice tools to quantify and track the social and economic value that smart cities create
- Training and support for smart city leaders and implementers
- Smart City 360: an integrated suite of Cloud applications to track progress in delivery of your smart city roadmap – with intelligent early-warning of potential delivery risks before they become problems.

CASE STUDY

DUBAI ISO IMPLEMENTATION

Dubai aims to be the smartest city in the world. In 2016-2017, Dubai worked with us to implement key elements of the ISO 37106 smart city operating model. This included:

- Management of data as a collective city asset
- Open standards to drive data interoperability and re-use
- Nurturing a vibrant 'information market place' across Dubai.

Independent analysis estimates that this standards-based data strategy will add around $1.5 billion to Dubai's economy by 2021.

How Chinese partners will benefit from working with us

We are able to offer Chinese city leaders:

- A citizen-centric approach that overcomes organisational barriers that hinder innovation in cities
- Proven best practices, backed by global standards and tailored to the individual needs of Chinese cities
- Less risk, improved impact and higher return on investments.

Benefits to Chinese companies include:

- Helping you to incorporate international standards-based best practice
- Working with you to sell our licensable IP and Cloud tools as a service to your clients.

How we take an innovative approach to delivering advanced urban services

Four key principles drive our approach to urban innovation:

- A focus on outcomes – relentless focus on social, economic and environmental value
- Cross-silo governance – fixing the inter-organisational barriers that hinder innovation
- Citizen-centricity – agile, digitally-enabled and citizen-centric service transformation
- City data unleashed – building the open standards, collaborative processes and privacy protections that enable cities to manage data as a collective city-wide asset.

URBAN EMERGE

KEY FACTS

HQ: London
Regions active: Worldwide network. Permanent staff in UK and China
Industry: sustainable urban and economic development

> "UrbanEmerge enables clients to rapidly harness the expertise of our network of independent specialists, to help facilitate and co-create emerging urban solutions, emerging technologies, planning and strategy."

Andreas Beavor
Co-founder and Lead Consultant

OVERVIEW

UrbanEmerge is a self-managed urban development consultancy. As a network of independent experts, working with a shared brand and resources, we offer services to public, private and civic organisations in the field of sustainable urban development.

We help companies become more innovative and responsive to the needs of their stakeholders and the environment. By working with us, clients gain access to global and local expertise, coordinated through our online platform. This enables us to rapidly create bespoke teams that meet specific city needs.

The innovative concept for UrbanEmerge has been developed with the future world of work in mind, where ICT increasingly allows highly-qualified experts to work with clients and address issues, collaborating with cloud-based systems and coming together physically where needed. With strong peer review and quality control, we believe this approach can unlock value in urban development and contribute to a more just and sustainable world.

What kind of projects our company works on

UrbanEmerge works with public and private sector clients to create partnerships, conduct cutting edge research and analysis, help develop policy and implement initiatives that contribute to sustainable urban development. Through our online platform, we harness the expertise of independent specialists in areas such as strategy for economic development, resilient value-chains, low-carbon development and integrating smart city solutions. We've recently helped design new projects, funded by the UK government, for plastic waste management and for future cities interventions. We've also produced advocacy material on inclusive urban mobility for an INGO to lobby policy-makers at the 2018 UN Summit to review progress on the Sustainable Development Goals.

CASE STUDY

MARKET OVERVIEW STUDY

UrbanEmerge conducted a market overview study on off-site manufacturing and modular construction for a private developer in the UK. These approaches can help alleviate housing shortages, as off-site manufacturing techniques require less labour than on-site construction, as well as significantly reducing construction time. Our study identified the major players in the sector, smaller boutique firms, niche markets and emergent technologies.

How Chinese partners will benefit from working with us

Through our global network of independent consultants UrbanEmerge can bring bespoke expertise directly to clients looking to work on China-based projects. We also have much experience and expertise in African and Asian countries where Chinese organisations may wish to invest in industrial parks, real estate and infrastructure. Due to the low overheads entailed by our business model we are able to offer better value for money than many other consultancies.

How we take an innovative approach to delivering advanced urban services

UrbanEmerge's innovation lies in our business model. As a nimble, self-managed consultancy, we enable our clients to harness the expertise of hundreds of inter-connected independent consultants and academic institutions that can advise on city projects. We look for solutions that contribute to human and environmental progress. When carrying these out, we incorporate the positive aspects of new approaches, knowledge bases, technologies and data analysis and approach cities as interrelated systems.

PERFORM GREEN

KEY FACTS

HQ: Bristol
Regions active: Europe
Industry: management consulting

> "It is through the intelligent application of data and technology to solve real world problems that lasting positive change will come."

Barney Smith
Founder and Executive Chair

OVERVIEW

Perform Green provides insights to cities into how to use data and new technologies to drive innovation and productivity, enabling a connected smart society.

We work across five different crosscutting themes: smart society, digital transformation, commercial direction, change management, and organisational development. We also specialise in a number of verticals critical to city operations including energy, connectivity, health, mobility, fintech and waste. Our projects include two major initiatives in Bristol, work that led to it becoming the smartest city in the UK according to the Huawei Smart Cities Index 2017.

Perform Green helps deliver transformational smart society programmes that harness the new opportunities presented by data and technology to deliver positive benefits to individuals and communities.

What kind of projects our company works on

We support cities and communities to deliver transformational programmes using data and digital infrastructure to improve citizens' lives. Our work spans various domains of public service delivery – whether undertaken by the public or private sectors. In these areas we aim to disrupt business as usual to achieve lasting service improvement and efficiency.

We work on projects such as: smart city operations centres; digital strategies; 5G connectivity, digital transformation, smart waste and air quality. We also work with energy systems and are engaged in a multi-billion pound initiative to transform a city towards a more renewable and lower emission future.

CASE STUDY

SMART OPERATIONS CENTRE FOR BRISTOL

Perform Green delivered a city-wide smart operations centre for Bristol, which integrated multiple verticals and agencies through people, process and data, enabling advanced analytics to make the city work better. We provided strategic thinking and direction, developed a viable operating and commercial revenue model, provided programme leadership and delivery expertise. We linked this to an innovation engine to drive further improvement and development of capabilities.

How Chinese partners will benefit from working with us

We will apply our strategic thinking, understanding of data, and experience of having delivered smart society programmes to enable our Chinese partners to deliver real outcomes for their cities and communities. We bring leading edge, whole-system thinking, built on an understanding of how best to harness smart technology and the data it generates to improve lives and create a sustainable environment for all.

How we take an innovative approach to delivering advanced urban services

We focus on aligning smart city programmes with city strategy, ensuring that all partners deeply understand the urban challenges being addressed, through whole system, collaborative thinking and by using data analysis to inform real-world change. Our expertise lies in combining this with a deep understanding of technologies and data infrastructure, imagining possible futures that harness these for the benefit of people and cities.

VRM TECH

KEY FACTS

HQ: London
Regions active: UK, Ireland, France, Italy
Industry: software for built environment

> "VRM is excited about the opportunity to work in China and plans to use the current Innovate UK supported Shanghai project to explore further opportunities."
>
> *Neill Ryan*
> *CEO*

OVERVIEW

VRM Tech is a UK company providing software solutions for the built environment. Working in collaboration with local authorities, VRM has developed innovative products for energy performance management, construction compliance, technical monitoring and visualisations of sensing technologies.

VRM is a member of the Association for Decentralised Energy (ADE) and recently launched its energy monitoring platform for heat networks, VRM Clarity. The product was developed with Camden Council. This innovative software, hosted on Amazon Web Services, enables asset owners to take control of their district and communal energy networks, manage them more effectively and significantly reduce their costs and those of their residents, whilst also ensuring regulatory compliance. By using this software local authorities can significantly reduce their carbon emissions, and demonstrate these savings, along with costs savings, by utilising VRM's independently verified measurement and verification tool.

VRM is leading an Innovate UK funded Future Cities project with Shanghai-based collaborators to monitor air quality, urban heat island effects and to propose mitigation strategies.

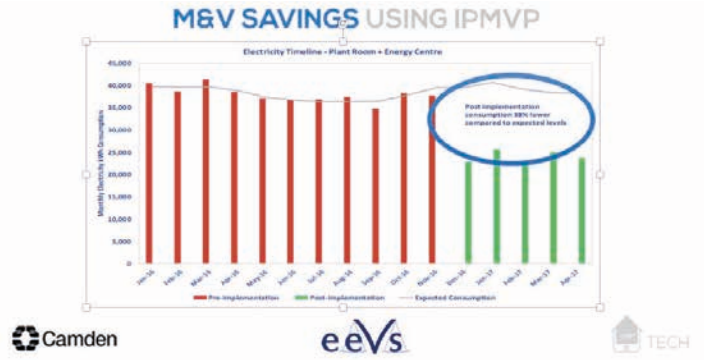
What kind of projects our company works on

VRM works on projects to monitor and improve the performance of assets. By utilising sensing technologies and pre-existing data sources VRM's products measure, monitor and optimise urban services. VRM's focus to date has been to work in collaboration with clients and other innovative companies through grant funding across the globe to provide integrated solutions for all aspects managing the built environment. Current projects include: providing Ireland's regulator SEAI with a cradle to grave compliance solution for grant funding, providing technical monitoring for the Greater London Authority's Warmer Homes scheme and providing a live monitoring platform for mould and damp in Camden Council tower blocks.

CASE STUDY

CAMDEN COUNCIL

VRM CLARITY, developed with Camden Council's Sustainability Team, is a live data intelligence platform with configurable KPIs and 3D mapping to monitor the performance of networks. Piloted on Somers Town energy network, the results showed verified annualised savings in excess of £100k. This meant that Camden could achieve savings of over £2 million per annum when Clarity has been rolled out across the entire estate.



How Chinese partners will benefit from working with us

Chinese partners will benefit from working with VRM to develop real-world solutions to their urban challenges. Findings from VRM's Innovate UK funded Future Cities project have already given us strong insights into the challenges faced by Chinese cities. By combining our understanding of China with our proven track record of delivering innovative solutions in the UK, VRM aims to help Chinese partners deploy solutions that save time, money and carbon as cities continue to grow.

How we take an innovative approach to delivering advanced urban services

VRM is focused on the research and development of innovative software solutions for urban services, with an emphasis on international projects. We have been fortunate to work with some of the leading EU companies in the fields of energy management and building science. VRM also has its own experts with over 60 years' experience within the fields of software, architecture, construction, sustainability and energy management.

GETTING IN TOUCH

Peter Young is Future Cities Catapult's International Partnerships Manager for China.

If you would like to find out more about working with Future Cities Catapult or any of the companies featured, please contact Peter on **pyoung@futurecities.catapult.org.uk**

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