

Results of competition: Future cities solutions - Phase 2 – SBRI

Total available funding for this competition was £4m from Innovate UK.

Note: These proposals have succeeded in the assessment stage of this competition. All are subject to grant offer and conditions being met.

Participant organisation names	Project title	Proposed project costs	Proposed project grant
Energy Saving Trust Enterprises Limited	Stakeholder interactive City Energy Demand Simulator	£998,877	£998,877
Project description - provided by applicants			
<p>The “Stakeholder interactive City Energy Demand Simulator” (SiCEDs) will be a vital tool for cities that will help them to optimise their energy infrastructure through a collaborative assessment of options. It will deliver a comprehensive understanding of the shape and scale of energy demand in the future - including an analysis of the implications of the time value of energy. SiCEDs will:</p> <ul style="list-style-type: none"> • Provide dynamic insights into the impacts on the shape and scale of demand of different levels of support for new energy technologies in buildings, ranging from insulation to heat pumps • Create a clear visualisation (through the display of data in map formats) of the impacts of alternative energy efficiency support strategies on fuel poverty • Allow the investigation of the economic, energy, and environmental impacts of moving to a more local architecture of energy supply within city/community boundaries <p>Our approach enables city stakeholders to collaborate and create scenario plans for energy projects so that approved schemes best meet each city’s unique visions and objectives through SiCEDs. The model will deliver effective information to decision makers, who can test scenarios and model solutions, in order to deliver the most effective city solution, from domestic retrofit schemes to district heating networks.</p> <p>A fundamental learning from our engagement with cities in the SiCEDs feasibility study was that the model must be able to operate in a ‘collaboration’ mode whereby all stakeholders are able to use the model together to test and fine-tune policy and investment solutions. This will be made possible through stakeholder engagement sessions using an intuitive and clear graphical user interface. This will better facilitate</p>			

consensus building around strategic energy infrastructure investments.

SiCEDs itself is an agent-based model which will enable the holistic design of a city's future energy architecture. It will contain a full data management system to overlay nationally available datasets and those the Energy Saving Trust and UCLs Energy Institute can provide with locally available data.

The model contains a series of calculation modules and configured assumptions which address fuel poverty, emissions, energy costs, capital and operating costs, job creation, and health impacts. This connects to the SiCEDs visualisation user interface which offers a series of lenses to deliver appropriate access and functions to stakeholders including planners, city leaders, investors, developers and citizens so each can evaluate alternative options from their own perspective.

SiCEDs will enable cities to develop a strong 'pipeline' of energy infrastructure projects that are investable, have consensus agreement and stakeholders in place to deliver. SiCEDs will help to build capacity and human capital enabling city authorities to efficiently unlock potential and make possible localised energy systems that achieve greater levels of energy autonomy, deliver economic activity, and generate societal benefits to help achieve strategic city objectives.

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Ethos VO Limited	The Future Cities Parking Management Platform	£999,985	£999,985
Project description - provided by applicants			
<p>Wherever you go in our cities, parking is a problem. Citizens spend too long looking for it, wasting time and fuel whilst pumping out CO2 as they search. Cash-strapped City authorities worry about maximising the operating surplus from their valuable parking assets, whilst minimising congestion on their already crowded streets. And it is all set to get worse.</p> <p>The 44% forecast increase in traffic volume, by 2035, will lead to a 170% increase in congestion (source DfT). And with the expected increase in numbers of electric vehicles (EV) needing charging points, and an aging population demanding more 'blue badge' spots, the complexity of managing different types of parking slot will only add to the pressure and complexity. What is needed is an on-demand mobility solution that helps the citizen finds the right parking spot in the minimum of time, whilst at the same time allowing city authorities the necessary visibility and control mechanisms to influence driver behaviour in a beneficial manner.</p> <p>The Ethos Parking Project Phase 2 is designed to demonstrate just such a solution. Building on the successful Innovate UK-funded feasibility stage, Ethos has assembled a collaborative team of SMEs, each of whom offer proven leading edge technology, covering the fields of open data, linked data and parking sensor networks.</p> <p>The challenge the project will address is to integrate these separate technologies for the first time, in order to deliver a 'multi city, sensor agnostic, open data parking platform' that will enable a range of different services to both citizen & local government. The citizen will be able to access the parking landscape for a given city or locality in real-time (for example via their favourite smartphone 'app'), enabling informed decision making ahead of arrival -especially important for special spots, such as with EV charging.</p>			

As a result, stress and traffic will go down, & time spent on productive activity and air quality will improve. City authorities will, on the other hand, be able to see the status of their parking assets in real-time, & be able to use dynamic pricing to alter driver behaviour, for example to use park & ride vs driving to the city centre (in response to the status of congestion & parking saturation), or to ensure the full utilisation of less popular parking facilities.

Moreover, this information can be published through multiple channels, resulting in a better informed public (& as an aside, reducing the number & cost of processing Freedom of Information (FOI) requests). Finally a scalable multi-city platform, offered as Software as a Service (SaaS), avoids each authority procuring its own solution, removing duplication of costs in a time of constrained local government budgets.

The commercial arguments are strong too, with previous pilots having demonstrated a 5% increase in revenues for operators, when smart parking technology is deployed, which when coupled with the low cost of implementation, delivers an immediate & significant return on investment (ROI). From the citizen perspective, the plan is to offer the data in open format, enabling a valuable new service via their favourite applications (Sat Navs, Mapping applications etc.), with no advertisements, free of charge, encouraging mass uptake. In summary the Ethos parking project has the potential to make significant improvements to a city's quality of life, environment & economy.

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Nquiringminds Limited	OCDP - Open City Data Platform	£996,000	£996,000
Project description - provided by applicants			
<p>Data is the fuel on which future cities will run; a Connected Future City needs connected data. Behind this vision lie some major challenges. Firstly, a city is not a single entity, it is a rich collaboration of local authorities, national government agencies, private companies and of course citizens. Moreover, even when we consider a local authority in isolation, increasingly it does not own the data; complex subcontracting relationships mean that connecting city data means connecting data across a complex web of organisations.</p> <p>The second challenge relates to security. Even if we restrict to ourselves to only Open Data, we cannot ignore security and privacy issues; even open data starts its journey as closed data. And Open Data is only one facet of the "Connected Data" journey. At an operational level, a functioning city must share constantly between different organisations and different departments, and the vast majority of this data is private.</p> <p>Finally we need to consider application of data. The evidence suggests the vogue for open data portals that consider their job complete when data is uploaded to a website and are in serious danger of becoming data graveyards. A connected data strategy must consider the full data lifecycle; data needs to be turned into applications with demonstrable return on investment, if they are to succeed.</p> <p>The Open City Data Platform Open source project address the issues of a Future City Connected Data Strategy head-on during Phase 2. Three critical innovations are needed to demonstrate bringing this vision to reality.</p> <ol style="list-style-type: none"> 1. Data Harvesters (getting data into the platform); a portal will be created to share open sourced tools for extracting and processing source data. The harvesters can come in three forms: data converters - for processing static data files; enterprise feeds – for extracting live data from operational systems; IOT Sensor adaptors. 2. Trusted Data Exchange (managing data securely): a highly secure component is developed to allow different stakeholders from different 			

organisations to share and collaborate on data in a trusted environment. This component is a critical part of even “Open Data” publication, and it helps clean and anonymise data before publication.

3. City App Engine (turning data into applications): a highly innovative element that turns raw data and APIs into fully functional web sites and mobile applications. The proposed solution supports simple to use drag and drop GUI interfaces to democratise data access, for non-developers and developers alike, enhancing commercial adoption potential.

We are not working in a vacuum. There are excellent initiatives already out there. The OCDP platform builds on top of the highly successful Open Source CKAN and SWIRRL platforms, providing an existing install base of over 100 cities on which OCDP will work.

Phase 2 of the OCDP Future City project will work with Hampshire, Liverpool and Cambridge councils to prototype, demonstrate and prove the value of these technical innovations. Our initial application suite consists of Open Data Mashups (using multiple data sources), a Central Planning Registry and Liveable Cities Programme. The platform is however highly generic and can be adapted to most applications.

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Ricardo AEA Limited	Real time Energy Heat and Power platform (REHP)	£985,450	£985,450
Project description - provided by applicants			
<p>Challenge 1: Develop a data platform for power and heat usage with sufficient granularity to identify community trends and individual usage patterns in both domestic and commercial buildings.</p> <p>Title: Energy Data Integration System (EDIS)</p> <p>The Ricardo-AEA Energy Data Integration System (EDIS) project will develop and evaluate a prototype platform that will model energy demand and savings opportunities. The project will then demonstrate the platform's breadth of potential application and the commercial approach through a set of example studies aligned to our partner city's specific interests. Working with Coventry City Council, and with support from key industry partners, our project will also demonstrate the data brokerage solution necessary to overcome confidentiality barriers associated with sharing of actual energy data. The resulting platform, and its replicable application to other cities throughout the UK, will support informed decisions by city authorities and utility companies, as well as the wider community, based on a shared and evidenced understanding of heat and power use at a granular level.</p> <p>Built in a cloud-based delivery model, the platform's governing software, modelling and associated data will be centrally and securely hosted, with its 'user-clients' (eg the cities, energy providers, stakeholders) accessing the platform via dedicated portals (eg web browsers), to provide them with a highly tailored / personalised user-experience and interface. The system's architecture will be scalable from the outset, to not only allow for the breadth and volumes of heat and energy data, but also to allow for future expansion / extension into other data areas (eg transport, air quality), and to add further value by allowing combined data patterns to emerge. A highly intuitive user-interface will enable rapid modelling and sophisticated interrogation of the data, including fully integrated GIS visualisation. Granularity will be provided down to building level, while aggregation of that data will enable analysis of city zones to be reviewed and assessed.</p>			

Within this two year project, an advisory group comprising city representatives, power companies and community groups will work in partnership with us to review and guide the work, ensuring it develops to take account of the functionality needed now and into the future. We will demonstrate EDIS's breadth of application via case studies aligned to our partner city's specific interests and needs, and thoroughly examine and define EDIS's commercialisation potential.