IoT Mesh

April 2016 will see the launch of Bristol Is Open's Internet of Things (IoT) Mesh network across the city. A canopy of connectivity across most of the city has been created from access points mounted on 1,500 street lamp posts. It uses a range of self-regulating advanced wireless technologies for extending connectivity, connected to the core fibre ring at nine points. It is essentially designed for low bandwidth applications, but can accommodate a large number of sensors spread around the city, visible to the Mesh.

The Mesh will enable IoT devices to be implemented at scale offering test facilities to network operators, application developers and manufacturers of IoT devices. IoT is still a relatively nascent concept and there is still much to understand about deploying it in a city environment.

IoT represents the convergence of a number of existing technologies which have been unified by the development of intelligent networks beyond the pure transport stage. The miniaturisation of integrated communications devices with massive processing capabilities, abundant, low-cost data storage, IoT platforms with rich analytics and edge computing have all contributed to growth of IoT. However, the requirements placed on an intelligent network by the varying demands of different IoT devices and sensors is still far from understood and can only be modelled accurately in a 'real-world' environment, such as that offered by Bristol Is Open.

Bristol Is Open's IoT Mesh is supported by SilverSpring's standards-based IPv6 wireless network, which is in use in a number of cities around the world. It allows qualified start-up businesses, network operators, entrepreneurs and academic institutions to utilise the sensor data and insights gained to prototype new smart city applications and services.

Eric Dresselhuys, EVP of Sales and Global Development, Silver Spring Networks says,
"Our commitment to open standards offers Bristol maximum choice of interoperable devices, software, and partners to help turn the living laboratory concept into reality, while providing companies with a global market place for their innovations."

A Testbed for diverse requirements

The number of possible applications for IoT is myriad, including:

- **Traffic congestion:** Sensors which monitor vehicle and pedestrian levels to optimize driving and walking routes as well as making the city safer for users of the city's extensive cycling routes.

- **Smart roads:** Intelligent messaging for motorists with warning messages and diversions in response to climate conditions, accidents and/or traffic jams.

- **Emergency services:** Smart routing for police, fire and ambulance services needing to reach incidents by the fastest route.

- **Smart parking:** Informing drivers of the availability of parking spaces in the city and how to reach them.

- **Air pollution:** Smart monitoring of air pollution levels in different parts of the city to advise citizens with certain medical conditions of areas to avoid.

- **Healthcare:** Remote monitoring of vital signs of patients who would otherwise require to be kept in hospital for observation.

- **Smart lighting:** Intelligent management of street lighting in response to weather conditions, time of day and pedestrian usage.

- **Waste management:** The smart routing of rubbish collection vehicles according to the levels of waste in particular areas.

- **Security:** Smart monitoring of crime hotspots or areas of the city prone to late night noise around clubs and bars.

- **Fun applications:** Interactive, multi-player games which involve navigation around the city's landmarks and other attractions.

This list is far from exhaustive and Bristol Is Open works with developers, manufacturers and network operators to add to it by utilising the city's Mesh testbed to further enrich the IoT ecosystem.