



Collected case studies: Using open and big data

- *Improving performance*
- *Raising awareness*
- *Delivering efficient services*

This paper brings together a number of case studies on how cities from the UK and beyond have made use of big and open data to improve local economies and service delivery.

Using city level data is crucial in improving urban economies and making cities better places to live and work.

Collecting and sharing such data enables places to identify opportunities and address weaknesses, and also allows for more effective policy development in delivering economic growth. Open data and big data can also be used to deliver a vast range of other benefits, from reducing congestion and pollution to improving service response times and safety.

The case studies demonstrating how cities use data and what they are trying to achieve are split into three groups:

- **Delivering efficient services using data**

The provision and re-use of public sector information can lead to an increase in economic growth. Improving access to data has a positive impact on the number of people using it, and is associated with greater innovation, improved and new services, and efficiency improvements from better resource allocation and informed policy.

- **Raising awareness of data**

To get the most out of an open data policy, organisations must do more than just release data – they must promote this data so that people are aware it is available and use it.

Delivering efficient services using data

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Utilising data to improve public transport

Lead organisation: Transport of London

Location: London, UK

Year: 2010-2015

Keywords: Open & Big Data; Innovation; Transport

Read the full report: [Open Data or closed doors?](#)

London leads the way in utilising local level data in the UK. In addition to providing information on real-time service updates and arrival and departure times of public transport, TfL has been collaborating with UCL to make use of the vast amount of data recorded through the Oyster card system.

The data has been used to monitor journey times, numbers of passengers and the effects of various situations on congestion patterns, such as the impact of mechanical failures on a particular line. This has enabled predictions to be made of how delays will impact along the network and what measures could be put in place to best limit disruptions. The data has also been used to identify where to prioritise investment in station upgrades and the impact any upgrades are likely to have. For example, TfL has estimated that, when completed, the Northern line upgrade will increase capacity on the line by 20 per cent.¹

Releasing local data on the population

Lead organisation: Lambeth Council

Location: Lambeth, London, UK

Year: 2012 – to present

Keywords: Open & Big Data; Innovation

Read the full report: [Open Data or closed doors?](#)

In 2012 Lambeth Council pledged to publish all the information it holds in order to enhance the understanding of the relationship between local assets and infrastructure and the activity and wellbeing of its population.² It began developing an open data demonstrator project titled ‘Lambeth in Numbers’ that allowed users to link up data sets about the local area. The site contained data relevant to Lambeth’s Food Strategy, including DCLG’s Indices of Multiple Deprivation, NHS data on child obesity, and data from Lambeth Council on food-related facilities and activity. The council has since expanded the amount of data available, providing around 120 dataset accessible through the main council website.³ In order to encourage reuse of this data it is provided in machine readable formats. The site is maintained by the councils open data team and users are able to provide feedback on any inaccuracies directly through the website.

1 Transport for London (2011) Business Plan 2011/12 – 2014/15.

2 <https://www.theguardian.com/government-computing-network/2012/jul/11/lambeth-council-open-data-pledge>.

3 <https://www.lambeth.gov.uk/open-data>.

Breaking down administrative barriers to open data

Lead organisation: New York City Council

Location: New York City, New York, US

Year: 2012 – to present

Keywords: Open & Big Data; Innovation; International

Read the full report: [Open Data or closed doors?](#)

In 2012, New York City Council passed a law to make all City managed data available through a single web portal on or before December 31 2018 (unless that data is deemed confidential). The aim is to improve transparency and allow the public to develop innovative uses of the data. Currently data is available on a variety of themes, including public safety, education, buildings complaints, restaurant inspections and real-time traffic numbers.

This has allowed organisations to link together different datasets and discover previously unknown relationships. For instance, through linking datasets from 19 agencies on all 900,000 property lots in the city, a relationship was found between properties where owners had unpaid/overdue property taxes, missed utilities payments, service cuts and illegal conversions. Given illegal conversions are highly associated with overcrowding and fires, this relationship allows inspectors to target which properties to inspect. Major violations are now found at around 70 per cent of the buildings searched, rather than 13 per cent previously, saving the city time, money and improving housing standards and safety.⁴

Mapping public assets and data

Lead organisation(s): Greater Manchester Local Enterprise Partnership

Location: Greater Manchester, UK

Year: 2013 – to present

Keywords: Public assets, City partnerships

Read the full report here: [Delivering change: how city partnerships make the most of public assets](#)

Incomplete information obscures opportunities. Having a deep knowledge of the assets in an area, and sharing that knowledge, can also help to reduce the costs and the time for planners and developers. In 2013, Greater Manchester Local Enterprise Partnership recognised that there was a lack of comparable, city region-wide data on infrastructure, which could hinder the speed and quality of decisions made by planners and the applications of developers.

Funded by £330,000 from the Cabinet Office Release of Data Fund, Greater Manchester Local Enterprise Partnership commissioned New Economy to create a single map to allow planners and developers across the 10 local authorities to easily see Greater Manchester's infrastructure and housing information. Salford City Council was appointed to build the map and two part-time staff from the council worked on the project while New Economy provided two full-time-equivalent staff to develop the map. The first map was completed in five months and included public and private sector data. It has now been expanded with more datasets on heritage, flooding, property prices and river quality and is now looking to expand to in-

⁴ <http://www.csmonitor.com/Technology/Tech/2013/0607/How-big-data-helps-big-cities>.

clude other socioeconomic indicators to support public services. MappingGM offers users polygon rather than point data. This gives them an idea of the size and shape of an asset, allowing them to more quickly and clearly see the potential and limitations of a site, and whether utilities, flood risk or other factors important to developers and planners need to be considered. It is estimated that every time MappingGM is used, it saves planners the one to three hours it takes to digitise sites as the private sector can add their own plots directly onto the map.

Raising awareness with data

To get the most out of an open data policy, organisations must do more than just release data – they must promote this data so that people are aware it is available and use it.

Running competitions to find new uses to open data

Lead organisation: The Knight News Challenge

Location: Various cities including Chicago and Boston, US

Year: 2013-to present

Keywords: Open & Big Data; Innovation; International

Read the full report: [Open Data or closed doors?](#)

Several cities, such as Chicago and Boston, have started running “Hack Day” events and competitions, in which individuals and companies are challenged to find innovative uses of public data.

This has resulted in the creation of various apps that have improved the transparency and presentation of the data, making it easy for citizens to understand and re-use the data in research. For example, The Knight News Challenge in the USA received over 800 project proposals for uses of government data – 14 of which were then provided with funding to allow their creators to produce fully functioning apps.⁵ Projects included the Chicago Crash Browser⁶ which uses the city’s Transport Department data on pedestrians or cyclists injured by motor vehicles to determine where the city should invest in infrastructure upgrades to eliminate traffic accidents.

Delivering efficient services using data

Cities generate a lot of big data. However, it is typically not made publicly available or shared between organisations within the city. As such, UK cities are missing an opportunity to improve their performance.

⁵ <http://www.knightfoundation.org/articles/announcing-winners-knight-news-challenge-open-gov>.

⁶ <http://chicagocrashes.org/#zoom=18&lat=41.895924&lon=-87.654921>.

Sharing data to improve the public transport network

Lead organisation: Dublin City Council, IBM

Location: Dublin, Ireland

Year: 2010

Keywords: Open & Big Data; Innovation; Transport; International

Read the full report: [Open Data or closed doors?](#)

In 2010, in order to increase the efficiency of its public transport network without the need to invest in any major re-development, Dublin City Council began sharing data generated by its city services with IBM.

Data is collected from bus timetables, inductive-loop traffic detectors, closed-circuit television cameras and GPS updates from each of the city's buses to identify the cause of delays and the most effective measures to put into place to improve traffic flow. From linking these datasets together, a digital map of the city has been built up and overlaid with the real-time positions of Dublin's buses. This allows traffic controllers to see the current status of the entire bus network at a glance.

The data is being used to identify where additional bus lanes and bus-only traffic systems would be beneficial and if bus line start times are optimal. Meteorological data is being added to the model to allow operators to analyse the effect on the transport system of extreme weather conditions and to work to reduce the impact this has on delays. This will benefit the city through reducing congestion and pollution, as well as the time taken to complete a journey.⁷

Capitalising on a broadband cable ducting network

Lead organisation(s): Bristol Is Open

Location: Bristol, UK

Keywords: Public assets, City partnerships; Open and big data

Read the full report here: [Delivering change: how city partnerships make the most of public assets](#)

Bristol Is Open (BIO) is a joint venture between the University of Bristol and Bristol City Council to provide services and knowledge that capitalise on a unique publicly-owned asset belonging to the city – a broadband cable ducting network – and the strengths of its university. But due to a lack of business focus, lack of investment and insufficient organisational structure, the asset and the partnership was failing to meet its objectives.

BIO required recurring investment from shareholders, was being run on goodwill and was not meeting its KPIs. BIO was set up with a £5.3 million capital grant from central government but could not be funded every year. From the outset it was clear that the joint-venture had to make enough money to build up reserves and reinvest. The partnership aimed to use the city's ducting network to develop an open programmable city by putting in place a platform to develop and prove 'Smart Cities' technology. The collaboration was meant to allow the city to use this asset to lever in expertise and investment into the city from the technology, media and telecommunications industries, universities, local communities, and local and

⁷ <http://www-03.ibm.com/press/us/en/pressrelease/41068.wss>.

national government. This fitted into the broader vision of Bristol's economic development, as well as the then Mayor of Bristol's goal of becoming a more sustainable and equal city using the 'smart' approach. It would attract firms and academics to the city to use the platform and help to train engineers for the future. The partnership would eventually supply state-of-the-art services to the shareholders and other potential customers on a competitive, commercial basis. This vision for the asset to help support the city's economic development meant that action was taken to put the joint venture on track. An outside body was brought on board with experience of how to operate in this market and make the most of the network and skills of the university. It added to the assets and skills of the city and University and set out to:

- Develop a new business plan
- Renew focus to offer only the services of highest market value
- Design and implement a new organisational structure
- Introduce new funding arrangements.

Having the right resources to run the project was also a key part in improving the governance arrangements that made the organisation more commercially minded. A new, independent chair with extensive knowledge of the industry was brought in to provide outside, expert guidance to the board. Previously the board was equally split with two representatives from each organisation, meaning that BIO was still heavily beholden to the shareholders' separate interests. The independent chair helped ensure the focus was on the long-run success of the joint venture – to the benefit of both partners- rather than on the understandable short-term interests of the board members' parent organisations. With a change in political leadership in Bristol in 2016, there were some shifts in the vision for the city's economy from the new mayor. BIO was flexible enough to refocus its work so that the asset was used to more clearly support these new aims as part of the original plans for the programme. Today the joint venture is on a stable financial footing, performing according to the original aspirations, and Bristol's unique public asset is being used to help shape the city's economic development in tune with the new mayor's ambitions for the city. BIO has helped Bristol to be named a leading UK Smart City.

Creating a real-time map of road conditions

Lead organisation: The Mayor's Office of New Urban Mechanics

Location: Boston, US

Year: 2010

Keywords: Open & Big Data; Innovation; Transport; International

Read the full report: [Open Data or closed doors?](#)

As such, cities are missing an opportunity to improve their performance. Boston has developed an app – called Street Bump – that uses the motion sensor in mobile phones to identify when a car hits a pothole.⁸

This data is then transmitted along with a location reference taken from the phone's GPS. Existing speed bumps are already mapped so they don't get mistaken for defects. If a number of people hit a bump in the same spot, the system recognises it as a pothole and the city inspects the site to determine if repairs are

⁸ <http://streetbump.org/>.

needed. The app is free for residents to download and aims to create a real-time map of road conditions to catch problems earlier than traditional inspections.

Collecting big data using sensors

Lead organisation: University of Cantabria, European Commission

Location: Santander, Spain

Year: 2010 – to present

Keywords: Open & Big Data; Innovation; International

Read the full report: [Open Data or closed doors?](#)

Santander has received funding from the EU to become a prototype for smart cities across Europe.

Due to its small size, the city can be monitored by 12,000 sensors, providing an opportunity to assess the benefits smart cities can deliver. The sensors collect measures of air pollution, noise levels, identify available parking spaces, inform refuse collectors which bins are full and automatically dim street lights when no one is around. As well as sending this information to a control centre, residents receive real time information via their smartphones on issues such as road closures, parking availability and bus delays. Residents are also able to report issues (such as broken streetlights) directly to city hall.

The city has seen a reduction in response times to addressing problems and a 25 per cent fall in electricity bills. The city's rubbish collection costs have also fallen by 20 percent. Due to the savings seen, utility companies are happy to pay for the sensors' upkeep.⁹

Analysing congestion using phone location data

Lead organisation: Orange, IBM

Location: Abidjan, Ivory Coast

Year: 2012

Keywords: Open & Big Data; Innovation; International

Read the full report: [Open Data or closed doors?](#)

In 2012, Orange released 2.5 billion call records from five million mobile phone users in Abidjan, the Ivory Coast. Using location data from 500,000 of these phones IBM analysed congestion in the city.

The result was a model that predicted that the addition of two bus routes and enhancement of a third would improve the city's transport system, resulting in time savings of 10 per cent for users. Before release, Orange removed any personal information from the data that could be used to identify individuals¹⁰.

⁹ <http://www.npr.org/blogs/parallels/2013/06/04/188370672/Sensors-Transform-Old-Spanish-Port-Into-New-Smart-City> and <http://www.smartsantander.eu/index.php/testbeds/item/132-santander-summary>.

¹⁰ <http://datasmart.ash.harvard.edu/news/article/cell-phones-bus-lines-and-privacy-in-cote-divoire-243>.

Creating a city operation centre to connect data

Policy aim: Deliver more efficient services with fewer resources by using data

Lead organisation: Municipality of Rio de Janeiro, IBM

Location: Rio de Janeiro, Brazil

Year: 2010-to present

Keywords: Open & Big Data; Innovation; International

Read the full report: [Open Data or closed doors?](#)

In 2010, Rio de Janeiro asked IBM to create a city operation centre that would collect data from cameras and sensors located throughout the city and feed it back into a purpose built control centre. This information is joined up to data collected from all of the city's 30 agencies, such as transport and emergency services.

Having all this data connected up enables officials from across the city to collaborate to manage the movement of traffic, while also ensuring that power and water supplies work more efficiently. The city is also now better placed to deal with a crisis, such as a collapsing building, as the system makes it easier to roll out a coordinated response – transport systems can be shut down, emergency services mobilised and gas supplies cut off, while individuals can be informed of alternative routes via Twitter.¹¹

Creating an open data platform with real time information

Lead organisation: Glasgow City Council; Technology Strategy Board

Location: Glasgow, UK

Year: 2013-to present

Keywords: Open & Big Data; Innovation

Read the full report: [Open Data or closed doors?](#)

In January 2013, Glasgow City Council was awarded £24million from the UK Government's Technology Strategy Board (TSB) as part of its City Demonstrator project. The funding will be used to develop a City Management system that will provide an open data platform, improving the functioning of the city in a number of ways. In particular, the council aims to reduce overcrowding on public transport and congestion on roads, thereby lowering pollution, by providing people with real time information on traffic levels on roads, bus and train delays and the location of nearby empty parking spaces. They also hope to reduce A&E waiting times by providing real-time information on waiting lists in hospitals around the city, allowing individuals to identify which hospitals would be able to see them first.

Energy levels across the city will be monitored, including the new Combined Heat and Power (CHP) systems which will allow the city to store energy when demand is low and then use it during times when demand is higher. This has the potential to cut people's fuel bills and so help reduce fuel poverty. Through monitoring footfall and retail demand the specific areas of the city attracting visitors will be identified. Combined, all this information could be used to generate a quality of life index for the city.¹²

11 <http://www.bbc.co.uk/news/technology-22538561>.

12 <http://futurecity.glasgow.gov.uk/>.

Bringing individuals, communities and tech companies together

Lead organisation: Bristol City Council, Technology Strategy Board

Location: Bristol, UK

Year: 2013-to present

Keywords: Open & Big Data; Innovation

Read the full report: [Open Data or closed doors?](#)

In April 2013 Bristol City Council received £3million funding from the TSB to develop its city wide Living Lab.¹³ This will combine data provided from a range of sources including universities, SMEs, and citizens who have agreed to share their own data to discover how it can be used to improve city performance. Individuals and organisations will be engaged in using the data to develop new products and services through the staging of hack events and those that have supplied data will be able to trial these new products and services.¹⁴

¹³ <http://kwmc.org.uk/projects/bristolivinglab/>.

¹⁴ Bristol City Council (November 2012) Connect Bristol Feasibility Study.

More information



The case studies in this document came from the reports:

‘Open Data or Closed Doors’ published in 2013. Read it at: www.centreforcities.org/publication/open-data-or-closed-doors/

Delivering Change, how city partnerships make the most of public assets. Read it at: <http://www.centreforcities.org/publication/delivering-change-city-partnerships-make-public-assets/>

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