Collect and connect

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Rapidly improving digital tools and online technology are transforming environmental data collection and assessments. Mark Elton and Ben Blowers explain the impacts these will have

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Protecting the environment requires a thorough knowledge of its characteristics, quality and the way it changes over time. Only when we understand the environment fully can we maintain and enhance it while managing the impacts of development.

But with technology improving at a rapid rate, the environmental planning sector is engaging with new tools and techniques that allow us to collect better information about the environment more regularly and accurately.

Currently, depending on their size and scale, development projects are either accompanied by an environmental statement or by a series of technical reports on issues such as air quality, noise, ecology, lighting, flooding and ground conditions. The survey data collection and assessment work for each project is completed as part of the planning application process and then made publicly available via local authority planning application websites.

However, technical reports and data are only accessible as PDFs and therefore of limited value to those looking to validate, monitor or report the cumulative environmental implications of various development projects over a specific area. Companies such as Land Insight and Urban Intelligence are doing an excellent job of making planning application and policy data more accessible and searchable online, but they still only offer a link to the PDF planning documents rather than access to the original data.

Digital transition

Over the next five years, we will see a step change in the environment and planning consultancy sector. Technical consultants used to working in a specific discipline such as environmental impact assessment or ecology will have to understand digital tools for data collection and management.

At present, we need to overcome issues with the format and standards of data submission and collection, and get to grips with the platforms for managing and maintaining the data after it has been reported online. However, once consensus is achieved, the sector will continue to move away from Word and PDF reports towards using online tools and mapping.

Stakeholder engagement and public consultation associated with the planning process will also benefit from increased use of online mapping tools such as ESRI Story Maps and from the potential to link with other platforms such as Twitter and WhatsApp to get immediate consultee feedback during the planning application process and later when monitoring construction.

Lessons from other sectors

The good news is that this innovation and change is not happening in isolation. The environmental sector can learn considerable lessons from the digital processes already being tested in the planning, building management and facilities management (FM) sectors.

Future Cities Catapult has been at the forefront of research into digital innovation in the UK planning system, a system it describes in its current form as 'using 19th-century governance and 20th-century tools to tackle 21st-century problems'. It is therefore supporting various start-ups and new ideas in four main areas:

- data-informed planning;
- flexible planning;
- improving users? experience of planning applications; and
- increasing citizen influence.

For example, Create Streets uses a ground-breaking analysis of big data for British cities to show how the value of a place is influenced by a wider range of factors than economists and planners have typically realised (see Land Journal April/May , pp.12?14).

It is also working with SpaceSyntax in Greenwich to trail StreetScore , a project that aims to provide an objective, evidence-based and comparable evaluation of the place quality of individual streets.

In the FM sector, tools such as Spaceti are already being used to combine indoor location and environmental sensors and analyse various indicators in real time over the long term, in order to understand how a space is used.

Managing survey data

Our ecologists are using the latest technology to inform their reporting and advice on habitats and species. Smartphones are now equipped with highly accurate and useful tools, responsive touch screens and internet connectivity. This means they can process demanding tasks and collect data whether using their built-in sensors such as cameras, GPSs and microphones, or external plug-in or Bluetooth devices such as laser distance-finders or extra high-resolution GPS units. Integration with GIS mapping and development of an ecology app has enabled effective measuring and reporting of ecological data in the field, as well as allowing us to view different base maps with the GPS location overlaid.

Drones have become increasingly important for ecological surveys in the land-use and planning sector in recent years. They offer very high-resolution imagery, close-up inspections of inaccessible features, 3D models and hyperspectral imaging; the latter can show more than standard aerial imagery thanks to the additional colour bands that are captured using the advanced camera lens. Plants and habitats can be identified through spectroscopy and vegetation health recorded. Although satellite imagery is available, it is generally much lower in resolution than that of drones, and its drawbacks include images being taken at the wrong time of year ? for instance, wanting to see vegetation in winter when vegetation is dead, or to examine river shoreline features during a high spring tide.

Not only has this technology provided ecologists with an accurate and efficient way of recording and reporting ecological surveys, it also gives an opportunity for clients to access all ecological data and reports for their sites across the UK. They can now monitor biodiversity improvements over time and provide data for corporate social responsibility reporting as required.

Data tackling climate change

In the past, it has often been wrongly assumed that we cannot tackle climate change and promote development at the same time. Better understanding of the environmental impact of development, long-term mitigation measures and improved data collection mean we are now seeing more environmentally responsible developments.

Research has shown that human beings are healthier and happier living and working in green areas, which offer improved air and water quality and access to nature. Developers often find that the prices of their developments can increase when the environment is given careful consideration, and that any investment made with ecological understanding and enhancement is repaid many times over through a rise in property prices due to the desirability of green areas.

Figure 1: the Boscole Verticale or Vertical Forest, Milan

Projects such as the Boscole Verticale or Vertical Forest in Milan (see figure 1, above) are being built in the centre of cities to help tackle climate change. Thousands of trees and plants grow up this tower to create the equivalent of a 14,000m2 forest in what would otherwise be a concrete, steel and glass block. Each vertical forest has its own microclimate that regulates humidity, absorbs carbon dioxide and produces oxygen. In addition to these direct improvements to quality of life for humans, vertical forests bring suitable habitats for birds, bats and insects. This supports biodiversity and is also beneficial for humans, given that integration with nature improves mental states and increases feelings of positivity.

It is common to see development projects with zero carbon or zero emissions and positive biodiversity targets, aligned with green open space and active travel measures including cycling and walking. As this becomes the norm, we will see data collection and longer-term monitoring of environmental impacts such as landscaping, air quality and biodiversity catch up with design and planning sectors. Ultimately, this will provide vital evidence of how we can develop schemes that can start to tackle climate change.

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Further information

- Related competencies include: Big data , Environmental management , GIS
- This feature is taken from the RICS Land Journal (October/November 2018)
- Related categories include: BREEAM and SKA rating