

# WISE COUNCIL

## INSIGHTS FROM THE CUTTING EDGE OF DATA-DRIVEN LOCAL GOVERNMENT

### Summary and recommendations

Tom Symons

Think of a local government service area and the chances are that data can be used to improve it. Whether it's protecting vulnerable children, supporting older people to return from hospital independent and healthy, collecting the bins, fixing housing repairs, gritting the roads, or helping local businesses to grow, data can help councils to perform these tasks better. *Wise Council* explores the many and various ways in which councils are already using data to make their services more effective, manage budget cuts and support the local economy.

At the outset of government austerity in 2010 there were two dominant ideas about how to address public sector funding and service pressures: streamlining and sharing back office services to reduce waste, while integrating and coordinating frontline services across the whole local public sector to be more effective. As councils have followed these two approaches, it has become clear that one of the essential ingredients in making both work is the better use of data and analytics.

Local authorities sit in the middle of a web of information. Everything from social care for vulnerable children, waste collection, procurement, council tax collection to planning applications produces huge quantities of data. This data is sometimes of variable quality, hard to analyse or personal and sensitive. But it is potentially hugely helpful as councils seek to make services more targeted and effective, to allocate resources to where they will have the biggest impact, to save officer time in front and back office processes, and to provide insight into the causes and solutions to costly social problems.

Running a city or a local authority is to a great extent about managing and responding to information. Increasing digitalisation of services, the use of sensors and other forms of data collection mean that there are emerging data sets which capture the wide variety of activities

performed by councils. And while big data presents opportunities for local authorities, there are equally important opportunities presented by smaller data sets already available to councils. Whether the data sets are big or small, there are major benefits to be had from using them more intelligently, sharing them more widely and making them more open.

The need to do this has never been greater. Local government is entering its seventh year of austerity, with spending cuts set to continue until 2020 at the earliest. The central government grant is forecast to be reduced by 54 per cent between 2015-2020, to just £5.4 billion. Newly permitted increases in council tax rates may mitigate some of these reductions, keeping funding levels broadly constant in this period, though there are concerns this will not be enough for all councils and may not cover increases in wage costs through the rise in the national minimum wage.<sup>1</sup> Furthermore, set against increases in demand, such as pressures in adult social care caused by an ageing population, it is clear councils will need to keep finding new ways to reduce costs while maintaining service quality and meeting their statutory obligations.

This research focuses on the specific ways in which data can help councils to meet these challenges. This is not to argue that data is a simple or complete solution. It is just one tool of many that councils will need to use. But while data on its own may not be enough, without making the most of the data that is available, an already tough task will be a lot harder.

This report, the second in the [Local Datavores series](#), uses case study research to profile some of the most pioneering uses of data in local government. It features a wide range of councils that have been using data as a way of informing decisions about adjusting to a harsher financial climate while maintaining high quality service levels. The research has explored the specific ways in which data can benefit people and communities, and how councils can make this happen. The report is aimed primarily at helping local public sector staff, from senior commissioners through to frontline professionals, get more value from their data.

The research involved nearly 40 interviews with data analysts, project managers and senior leaders in local authorities and their partner organisations. Through these interviews and a literature review, the research analysed councils' uses of data, the impact, their mindset and methodology, the challenges they encountered, the critical success factors they identified, and how these innovations could be scaled-up.

## How and why councils are using data

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The case studies revealed myriad ways in which data and analytics are helping councils across a wide range of statutory and discretionary services and responsibilities. The research found that the benefits are also numerous, helping councils to save money, make their staff more productive and their services more effective, support local businesses to grow, and reduce environmentally harmful activities. The ways councils are using data to realise these benefits - the key use cases - fall broadly into 11 areas of local government activity:

	Activity	Example use case
	<b>Optimising management of place and infrastructure</b>	Birmingham uses data from temperature sensors in roads to inform where gritting vans are required in icy or snowy conditions.
	<b>Testing ‘what works’</b>	Kent’s integrated data set in health and social care enables rigorous testing of the impact of services and interventions.
	<b>Intelligent case management</b>	Manchester’s integration of data from multiple agencies gives social workers rapid insight into family needs and circumstance during triage and assessment.
	<b>Outcomes-based performance management</b>	Suffolk’s shared health and social care outcomes framework align incentives between multiple organisations towards the same objectives.
	<b>Early identification of adverse events and future service pressures</b>	Newcastle’s data analysis identified the factors which are most predictive of a child becoming NEET, <sup>2</sup> enabling earlier intervention.
	<b>Understanding and responding to citizen needs</b>	Bristol uses plastic, sensor-equipped frogs to collect data which help residents report and manage damp in their properties.
	<b>Informing public service transformation</b>	Newcastle’s data-informed changes to children’s social care services help social workers deal with complex family needs better.
	<b>Streamlining operational council processes</b>	Camden’s Resident Index automates data integration, makes services more responsive, and eliminates duplication in the back office.
	<b>Opening government</b>	Leeds’s open data portal for councils in the North of England creates transparency and frees up officer time from the burden of Freedom of Information requests.
	<b>Supporting the local economy, businesses and innovation</b>	Leeds’s Innovation Labs provide a space for local developers to experiment with open data sets to solve social problems, and develop viable new products and services.
	<b>Identifying fraud and error</b>	Camden’s Resident Index can automatically check for the anomalies and discrepancies which indicate fraud and error.

## Data-led innovation - making it happen

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Realising these benefits is neither straightforward nor insurmountable. Any council undertaking data-led innovation should expect to encounter at least some of the challenges the case study councils contended with. For instance, they are likely to find they need to spend time making their data of useable quality, that legislation about information governance offers few black and white answers, and that pulling data together from legacy IT systems feels harder than it should. Councils undertaking data work are likely to share the case studies' experience that embedding data and analytics in council services and decision-making can be challenging for some working cultures and staff.

The case studies covered different types of data work in different council service areas, but there were striking similarities in what they told us about how to make data projects work.

Many reported that they had sought expert legal guidance and invested significant staff time in developing highly specific information sharing agreements. Data quality was usually tackled head on, by attempting to use the data, exposing and fixing quality problems. To help their colleagues and working cultures be more receptive to using data they engaged with end-users about their needs and requirements. They built data models and analysis that responded to these needs, for instance saving staff time or helping them do their jobs more effectively. Their working methods involved starting small, being flexible, testing and iterating, often without a fixed idea of what the final product would look like. Finally, they all worked to bring senior managers and leaders on board as champions of their work, helping them push through barriers such as a reluctance to share data, or to use data tools in their day-to-day work.

Taken together, the experiences of the case studies can be seen as a 'how to guide' for undertaking data-led innovation in local government. The lessons they learned can be lessons for the whole sector. Collating these insights offers a ten-step guide to data-led innovation in local government:

1. Start with a clear problem to be solved, for which data can offer impactful and actionable insight.
2. Gauge the level of support for data-led work in senior leadership and work to convince them of the importance of the project.
3. Start small, engage with end-users to find out where and how data could be used to make their day-to-day work easier.
4. Be clear about ultimate objectives and how these will be measured.
5. Ensure there are realistic financial and staff resources allocated to the project.
6. Approach the work through a series of short, repeatable work cycles that enable rapid development, testing and iteration.
7. Secure dedicated expertise for information governance and be specific about the purposes of sharing data.
8. Test the product with end-users and take on board their feedback.
9. Be receptive to making decisions informed by data.
10. Evaluate the overall impact of the work against the original objectives.

The work profiled in our report has all happened recently, in the period from 2011 onwards. Even in that short period, analytical capabilities have increased massively, as has the ambition of local authorities to use their data. The opportunities to get more value from data are increasing all the time. Over the next year Nesta will be exploring these opportunities and others to help government - central and local - get more from the data they hold.

# Recommendations

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**O**ur research found that councils are becoming increasingly sophisticated in how they gather their data, how they manage it, the types of analysis they can perform, and the ways in which they use this to contribute towards positive social change.

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But this is really just the beginning. Most councils are only just starting to get to grips with all the data they hold, and all the ways they could use it to make improvements. The data held by the local government sector is a potential goldmine of insights into how to improve people's lives and make communities stronger. The case studies featured in *Wise Council* are some of the first attempts at doing this.

Over the next year, Nesta will work with the sector and others to make this happen. Our Innovation Lab programmes include pilots for Offices of Data Analytics in UK cities, will enable us to put these insights and our expertise to use in practical settings. Based on the findings of this work, we also set out five opportunities which Nesta will be exploring and developing with the sector.

## 1. Promoting continued data-led innovation

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- To promote further data-led innovation, DCLG and the Government Digital Service should establish a dedicated scheme to embed data analysts alongside frontline workers, managers and leaders in councils across the country.

A key insight of this research is that bringing data analysts and scientists together with end-users (such as frontline professionals, managers, or senior decision-makers), can result in new and impactful uses of data. In Newcastle, embedding data analysts in teams of social workers has produced insights that changed the way social work is delivered, made social workers more productive, and shifted the culture of service, making it much more receptive to the use of data. Social workers who once eschewed data now see it as a vital part of supporting children and families.

A dedicated programme that focused on embedding data analysts across various councils and types of service, could emulate this example and find new ways in which data and analytics can improve the day-to-day work across a wider range of council service areas.

While it is easy to get distracted by discussions of new technology or software products, our research highlights the significant human dimension involved in getting more value from data. Changing organisational cultures, and solving problems with data, is as much about the people as it is about the technology. Creating a link between end-user and data analyst/scientist is a vital aspect of creating impactful and actionable data insights.

Externally funded programmes can also be a catalyst for data-led innovation. Manchester's data warehouse was a response to the national Troubled Families Programme. Newcastle funded their data-led changes to children's social care through the Department for Education Innovation Programme. Leeds' open data portal was funded by central government. Kent created the Kent Integrated Dataset to participate in the NHS Year of Care programme. Having a dedicated programme made space for data-led innovation, and in some cases the extra financial resource that accompanied them.

There are existing programmes that support the argument for bringing data scientists or analysts into organisations to find ways of using data to solve problems or improve decision-making. They offer some guidelines for how a similar scheme could operate in UK local government.

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- [Chicago University's Data Science for Social Good](#) programme pairs data science fellows from around the world with social sector organisations. They work in teams of three or four to tackle data-intensive, high impact problems in education, public health, public safety, criminal justice, environmental issues, city operations, and social services, learning from full-time experienced mentors and project managers. Projects have included preventing young people becoming involved in the criminal justice system and identifying high-cost public service users to provide early intervention.<sup>3</sup>
- [DataKind](#) is a worldwide organisation which matches data scientists and analysts, working pro bono, with charity and non-profit organisations. DataKind's method places as much importance on bringing people together as it does on the harnessing of data. Projects have included building a Civic Dashboard which mines data from Citizens Advice Bureaus to provide an overview of current issues being reported.<sup>4</sup>

### Developing a scheme for England

Taking these programmes as a template, the scheme should focus primarily on connecting highly skilled data scientists with staff in councils. Once in place, embedded data analysts should work with those staff to identify problems that can be solved with data, and demonstrate the tangible value of their data work. Objectives of the scheme should include:

- Creating actionable insights and data driven tools related to identified council needs, that can be scaled (for instance through open source code and apps).
- Leading culture change in councils, for instance by running workshops, promoting the use of data and analytics with operational or frontline teams, and developing in-house capacity.

Such a scheme would need five key ingredients:

1. External funding from central government and possibly other private or philanthropic sources, as a means of giving the sector space and vital finance in a constrained environment.
2. Highly skilled data scientists and analysts who are passionate about working on high impact social issues.
3. Local authorities with senior managers and leaders committed to using data intensively in service delivery and decision-making.
4. The ability to quickly scale any data tools, apps or analytic methods quickly across the rest of local government.
5. Rigorous evaluation that is relevant to the specific analysis, tools or apps being created.

**Development:** the scheme should be developed as a collaboration between central government and the local government sector, with interested external experts brought into help inform the design of the delivery mechanism.

**Administration:** the scheme itself could either be run by central government, or through an external delivery organisation, for instance by following the template of the Department for Education Innovation Programme which used a collection of organisations - the Spring Consortium - to administer the scheme.

**Applications:** Local authorities should be invited to bid for participation on the programme, setting out the areas of work in which they seek data-led innovation and expressing their commitment to use data and analytics to inform change.

**Funding:** The scheme should be funded primarily by the Government Digital Service and DCLG. At a total estimated cost of less than £4 million/year (see below), the level of funding required for the scheme would be a modest outlay from GDS's £450 million budget, and represents a concrete action to support the local government sector - an aspiration the organisation has held since at least 2015. To ensure councils taking part are committed to the scheme, there should be a requirement for some modest level of match funding, while recognising the extreme budget constraints in which they currently operate. In developing the scheme, options to bring in additional funding from philanthropic sources, or in-kind contributions from the private sector, could be explored to reduce costs.

**Data Scientists and Analysts:** In the first wave of scheme, it would be preferable to bring in data scientists and analysts with some level of experience, on a secondment basis. Private firms with expert data science expertise may be willing to second their staff to the scheme, funding some or all of their salaries, in order to gain insights into the local government sector. Secondees from central and local government could also be sought.

The final details require further development with the local government sector, funding bodies and delivery partners. Due to the devolved nature of local government in England, Wales, Scotland and Northern Ireland this recommendation focuses on a scheme for England which DCLG and the GDS cover. However, the devolved nations should also be invited to participate.

### Indicative cost of running an embedded data science programme

While there are a number of details which could only be decided through discussion between funders and the local government sector, there are some basic components of the scheme which can be used to gain an indicative sense of the yearly cost of running this scheme.

In order to be large enough to properly test and evaluate, but small enough to be manageable in its first year, the scheme should seek to recruit c.50 data scientists and analysts to work in teams of two across 25 local authorities. There would need to be a handful of senior data scientists and analysts who could manage the data scientists and analysts day-to-day, support the development of their technical skill sets and collate and disseminate the tools and methods developed. Alongside this, the scheme would need to be administered and independently evaluated.

We estimate that a basic scheme running for one year, working with c.50 data scientists and c.25 councils, would cost c£3.75 million. The costs overview is below, or see Annex 1 for the full cost breakdown.

## 2. Supporting the replication of best practice

Indicative calculation of yearly scheme costs	
Data scientists (x50)	£2,730,000
Senior data scientist (management and training) (x5)	£487,500
Administration	£350,000
Evaluation	£150,000
<b>Total Cost</b>	<b>£3,717,500</b>

This scheme should be developed in the first half of 2017 with a view to launching in Autumn 2017.

- To replicate and scale impactful data analytics and tools, the local government sector, led by the LGA, should develop a knowledge transfer scheme for existing best practice.

This research has showcased a number of examples of data and analytics being used to support innovation, transformation and improvement activities in local authorities. The impact of scaling the uses of data observed in our case studies across the whole of local government could be significant. For instance, imagine if every top-tier local authority was able to undertake children's social care assessments as quickly as Manchester. Or if all councils were able to evaluate the impact of adult social care services in the way Kent can. Or if there was an integrated resident index in reducing duplicated work in every council, not just Camden.

Scaling these initiatives across the country is not as simple as finding the funding to purchase the software and technology used by the case study councils. The research found that successful implementation requires managing the internal culture of organisations, building relationships, good communication, knowledge about data sharing and information governance, and the ability to champion the work to data-sceptic stakeholders. This task requires committed, dedicated staff alongside new technologies.

There is a need for a programme which makes it easier to share these intangible skills and knowledge. Such a programme could use secondments or visiting support from people involved in leading best practice to councils keen to replicate this work. This would enable their explicit and tacit knowledge to be shared with other councils, through the process of implementing new ways of working with data. This scheme should focus on creating a mechanism for visiting support and partial secondments. Once underway, the programme should aim for each site which receives a secondee to then become the expert secondee in the next round. This would multiply the rate at which innovations could scale, and reduce the burden on the first wave of local authorities. It should also form a link to the scheme recommended above, to ensure that new data-led innovation can be replicated across the sector quickly. Participation in the above scheme should be contingent on participating in a knowledge-transfer programme afterwards.

The initial phase would require some leading councils, such as those featured in our case studies, to participate and there would need to be incentives to encourage their involvement. These could include financial incentives, such as contributions towards secondment costs, reciprocal arrangements, or access to other schemes (such as the one discussed above). A formal link with the scheme discussed above would ensure that during development the need for incentives could be considered.

### 3. Getting to grips with data at a combined authority or sub-regional level

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- City regions bidding for devolved powers should be required to set up an Office of Data Analytics (ODA) as part of the devolution settlements.

The case studies that involved the integration of data, such as Manchester or Kent, demonstrate that some of the biggest opportunities for enabling public sector reform lie with linked data. There is enormous potential in integrating data across the local public sector, such as health, education, housing, police, and social care. But the benefits of linked data apply as much across local authorities as to a single 'place'. With the emergence of new combined authorities, sub-regional entities such as LEPs, and other local partnerships, there are multiple vehicles to bring together data at a large scale. This should be a main area of focus for local authorities involved in devolution processes and who are exploring how to get more from their data. Nesta's programme of Offices of Data Analytics will be looking at some of these opportunities, but it should also become a feature of all devolution deals and combined authority arrangements.

- Central government should support an initiative to create a city data exchange in at least one area receiving devolved powers

Having established Offices of Data Analytics, or other forms of collaborative cross-boundary data work, councils should experiment with transforming their open data portals into data exchanges.

While it is positive that many local authorities are releasing ever greater quantities of their own data on open data portals, this model of open data fails to tap into the value of datasets held by those outside of government, including businesses, charities, universities and citizens. A data exchange would connect those with useful datasets to those that could benefit from them. Instead of merely publishing their own data, local authorities could publish the problems they are trying to address and invite submissions of data that could help solve them. A data exchange could focus entirely on the release of open data or function more like a marketplace where different organisations and individuals could set a price for their data. Copenhagen has announced plans to run a marketplace for private sector data on the latter model, creating opportunities to combine freely provided government data with data from telecoms firms, utilities, creating impactful and useful new products and services. Given the central importance of data to enabling public sector reform, this is an idea which is worthy of being trialled in at least one UK city.

### 4. Using systematic evaluation to test what works

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- Local authorities should build systematic evaluation into data-led innovation

Scaling-up the use of data should be done on the basis of rigorous evidence of impact. Our research noted that a lack of systematic evaluation of impact was a feature across the case studies. This was often for understandable reasons, such as lack of resources or in-house evaluation capabilities, and is certainly not unique to the local government sector. However, systematic evaluation makes scaling impact easier. Interviewees frequently noted that presenting tangible evidence of impact was the easiest way to promote further data-led work. Properly evaluating data and analytics work will provide a clear picture of which tools, analysis and projects should be scaled, and which do not produce the impact to justify continuation.

## 5. Translating insight into tools and resources

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The case studies were testament to the fact that the process of using data to inform changes to services, or as part of decision-making, is not straightforward. There are identifiable challenges that occur frequently where data and analytics are involved. The commonality of these challenges suggests that there is scope for the development of practical tools and resources that can be used by the sector.

In this research, we used the insight gathered to develop a prototype data maturity framework (see Appendix 2 of the full report). This was prompted by discussions in research workshops, interviews and the project's advisory group, which identified the opportunity to produce a framework which would help councils think about the data they hold and how they use it. As the sector continues to learn about how to use data and analytics for social good, the opportunities to turn this insight into practical tools and resources should also be taken by Nesta, central government and other organisations working across the local government sector.

### What comes next

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Over the next year, Nesta will be exploring these opportunities and others to help government - both central and local - get more from the data they hold. This report features ways of using data which are having hugely positive impacts for people, communities and councils. We hope this to the start of the story, not the end.

## Appendix 1 - Estimate of costs for recommendation 1

### Indicative calculation of yearly scheme costs

Data scientists (x50)	£2,730,000
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Administration	£350,000
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<b>Total Cost</b>	<b>£3,717,500</b>

### Workings

Average Salary	£42,000
On costs (pensions, NI) - 30%	£12,600
Data scientist yearly cost	£54,600
Evaluation	£150,000
<b>First cohort of data scientists (50)</b>	<b>£2,730,000</b>

Based on estimate of average salary by recruitment website Glassdoor - [https://www.glassdoor.co.uk/Salaries/data-scientist-salary-SRCH\\_KOO,14.htm](https://www.glassdoor.co.uk/Salaries/data-scientist-salary-SRCH_KOO,14.htm)

### Senior data scientists and management

Average Salary	£75,000
On costs (pensions, NI) - 30%	£22,500
Senior data scientists and management yearly cost	£97,500
<b>Total management costs (5)</b>	<b>£487,500</b>

Based on estimate of average salary by recruitment website Glassdoor - [https://www.glassdoor.co.uk/Salaries/senior-data-scientist-salary-SRCH\\_KOO,21.htm](https://www.glassdoor.co.uk/Salaries/senior-data-scientist-salary-SRCH_KOO,21.htm)

<b>Evaluation</b>	
<b>Benchmark - BLF Better Outcomes Fund (per year)</b>	<b>£100,000</b>
<b>Estimate of cost</b>	<b>£150,000</b>

The Big Lottery Fund Better Outcomes Fund part-funded outcomes payments for new Social Impact Bonds. The scheme had a total evaluation budget of £1 million over ten years, or £100,000 p.a. Based on needing a more intensive evaluation per year.

<b>Administration Costs</b>	
<b>Benchmark - BLF Better Outcomes Fund (per year)</b>	<b>£250,000</b>
<b>Estimate of cost</b>	<b>£350,000</b>

The Big Lottery Fund Better Outcomes Fund ran for two years and had a budget of £500,000 for external administration and promotional work. Based on needing a more hands-on approach to administration, but less promotional activity.

## Endnotes

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1. New Policy Institute (2016) 'Local government will be in uncharted water by 2020.' See: <http://npi.org.uk/blog/local-government/local-government-will-be-uncharted-water-2020/>
2. Not in Education, Employment or Training.
3. <https://dssg.uchicago.edu/>
4. <http://www.datakind.org/>



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1 Plough Place  
London EC4A 1DE

[research@nesta.org.uk](mailto:research@nesta.org.uk)

[@nesta\\_uk](https://twitter.com/nesta_uk)

[www.facebook.com/nesta.uk](https://www.facebook.com/nesta.uk)

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