



# **‘Able to approach the future as a friend’: Digital planning and its implications**

---

ODI Fellow research report



This is licensed under a Creative Commons  
Attribution-ShareAlike 4.0 International license

Open Data Institute

## About

This report was produced as part of the ODI research fellow scheme. Its author is Dr Sue Chadwick, a Strategic Planning Advisor at Pinsent Masons LLP, with contributions from Jeni Tennison, ODI.

If you want to share feedback by email or would like to get in touch, contact Sue at [sue.chadwick@pinsentmasons.com](mailto:sue.chadwick@pinsentmasons.com).

If you would like to learn more about the ODI research fellow scheme, please visit the [information and application page](#), or contact us at [fellowships@theodi.org](mailto:fellowships@theodi.org).

---

<sup>1</sup> Title page quotation is from "In Memory of Sigmund Freud" From *Another Time* by W. H. Auden,

# Contents

<b>Introduction</b>	<b>5</b>
<b>1 Reconceiving land and development.</b>	<b>7</b>
Digital twins	8
Dealing with data: current mechanisms	9
Digital Planning – beyond the rhetoric	10
The need for change – and where to start	11
Section 1 Summary	13
<b>2 Automation of the planning function</b>	<b>14</b>
Planning decisions	14
Automation and planning	15
Administrative process	15
Assessing Environmental Impacts	16
Automation: barriers to adoption	17
Current responses: policy	19
Current responses in law	21
AI governance: next steps...	21
Section 2 summary	23
<b>3 Ethical planning in a digital world</b>	<b>25</b>
Engagement	25
Equalities	28
Human rights	30
Ethics	31
Digital Ethics	32
Section 3 summary	33
<b>Conclusion</b>	<b>35</b>
Section 2 Appendix 1: AI Strategy	36
Section 2 Appendix 2: AI procurement checklist	39
Section 2 Appendix 3: Report on adoption of chatbot	41

# Introduction

The ‘fourth industrial revolution’, characterised by exponential developments in emerging technologies, has been described as a ‘[new chapter in human development](#)’ by the World Economic Forum. As divisions between the digital and physical worlds become increasingly liminal, the built environment has a digital existence which precedes, enmeshes with and survives the physical.

Data is the fuel – and the product – of this revolution. When a new development is proposed, data offers powerful new ways of assessing and mitigating its impacts, of engaging with the current and future populations affected by it and the opportunity to use the development as a source of rich data repositories to facilitate informed and intelligent urban management.

The revolution represents an existential challenge to the way that land is currently planned and developments are managed, while data presents a range of new and complex risks, especially when it is used as source material for machine learning (ML) algorithms. The current legal rules and procedural norms will need to adapt into an evolved, agile governance infrastructure.

This paper explores three areas of established planning law and practice, in each case examining how they are disrupted by emerging technology and how regulation and procedure should change to adapt. It argues that we should:

- reconceptualise the current definition of land in planning legislation to include its digital counterparts and begin to assess digital as well as environmental impacts and benefits.
- recognise the potential for Artificial Intelligence (AI) to replace an increasing amount of the human function in the decision-making process and build in appropriate levels of risk assessment and mitigation.
- expand current ethical norms to include emerging concepts of digital intrusion, digital discrimination, algorithmic bias and data ethics.

In the 1902 book [Garden Cities of Tomorrow](#), Ebenezer Howard recognised that his radical re-visioning of urban development could only be achieved through ‘the hearty co-operation of men and of women experienced in very numerous departments of human activity’. This paper also calls for everyone involved in the modern planning system – local and central government, applicants, agencies, institutions and stakeholders – to engage with the required change.

# 1 Reconceiving land and development.

At a fundamental level, planning is about land – what is built on it and how it is used. Planning law formalises these core concerns through a regulatory system that defines both ‘land’ and ‘development’ and requires formal consent for development to proceed. The emergence of a digital world challenges these fundamental principles.

This section begins by exploring current definitions of land and development in the planning system and how they should be reconceived to include digital notions of both. It then considers practical changes that could be made to existing regulations and planning application processes to encompass digital aspects of land and development.

The current definitions of land and development are contained in the [Town and Country Planning Act 1990](#). They are fundamental to the planning system because anything that comes within the definition of ‘development’ requires consent; the definitions mark the point where what an individual does with land is a matter of public interest and state control. Section 55 of that act defines development as ‘the carrying out of building, engineering, mining or other operations in, on, over or under land, or the making of any material change in the use of any buildings or other land’. Section 336 defines land as ‘any corporeal hereditament, including a building’, so land as defined by the 1990 Act as an exclusively physical entity.

Thirty years after this legislation was drafted, and more than 70 years after the concepts of land and development were first defined, both land and buildings now have a digital identity that precedes, enmeshes with, and survives the physical. Land is no longer just a ‘corporeal hereditament’, but also an increasingly dynamic store of data sourced and shared in real time.

As last year’s review [from the Centre for Sustainable Infrastructure and Construction](#) noted, we are moving from a concept of buildings as ‘static inanimate systems’ to combinations of technology and data analytics that will ‘bring the building to life’. A recent paper [by the Centre for Digital Built Britain \(CDBB\)](#) proposes that our current conceptions of land should expand to include a ‘cyber physical layer’. The [Connected Places Catapult](#) advocates the notion of ‘Space as a Service’ (SPaaS) in place of traditional concepts of ownership and the UK government is exploring [the potential for regulating Mobility as a Service \(MaaS\)](#) as part of its transport review – these are just two examples of a transition from acquisition of an entity or service to more of a subscription model where use and experience are integrated and monetised into on demand service.

Buildings are also developing capacity for autonomous adjustment and reporting: the [Alan Turing Institute](#) is working on a [bridge](#) to explore the potential for 'infrastructure to act as living objects' and University College London has recently completed the [Pearl Building](#), an experimental 'Person Environment Activity Research Laboratory' that can test the impact of environmental change on human experience.

Data connects land and buildings with each other; with the infrastructure that services both; with the pavements, streets and roads that enclose them; with the biophysical environment that surround them; and with the humans who inhabit and use it all. This digital proliferation challenges the planning profession to consider new ways of thinking about both land and development, beginning with an acknowledgement of digital twins.

## Digital twins

A digital twin has been [defined](#) by the [Royal Institute of Chartered Surveyors](#) (RICS) as 'A 3D digital model connected in real time to a real physical asset which could be a building, group of buildings, a piece of land or an infrastructure system'. As recognised [by CDBB, these twins can be static models](#) used for longer term strategic planning or dynamic models, with live data flows and feedback.

As soon as any aspect of development has data connected with it, its digital twin is conceived. All development proposals are shadowed by their digital equivalents, whether this be the outline proposal used for illustrative purposes in a pre-application discussion or a BIM level 3 model where data is shared, collected and stored as a single open source.

At the planning stage the twin is embryonic and will include:

- discussions between the applicant and the local authority
- environmental information from initial studies
- legal information on the ownership rights and restrictions relevant to the land, and
- social information from initial engagement exercises.

As the proposals mature through the submission, consultation and decision stages, the associated data also matures and proliferates to include construction plans, environmental assessments, design papers and consultation responses. Legal documentation, from subsequent appeals or court actions, can also be added to the store of data. As such, the proposal has an evolved and complex digital identity well before anything substantial happens to the land itself.

Once the concept of land includes its digital twin, then the notion of land as a fixed physical entity also evolves into one where the material elements combine with related data to provide a digital/real hybrid where land is still the physical site on which buildings are constructed but is also part of a complex, interactive supply chain of goods and services. The resulting digital environment mirrors the physical forms,

with data stored and shared by individuals, authorities, and businesses. This is where the digital life of the development becomes useful for strategic planning as it generates connective possibilities allowing data to be shared with other digital twins – of buildings, infrastructure and spaces.

## Dealing with data: current mechanisms

As the planning system adjusts to new notions of land, it becomes increasingly clear that the current law needs to recognise that land has a digital identity, and to legislate for it.

For most property practitioners, the primary source of regulation is the General Data Protection Regulation, (GDPR) transposed into UK law through the Data Protection Act 2018. A guide [produced jointly by the Local Government Association and the Planning Advisory Service](#) recognised that planning applications could include personal and special category data, that decision making could involve data processing, and recommended putting ‘appropriate measures and procedures in place’ for data management in this context. Local authorities must also consider their data sharing obligations under the Freedom of Information Act 2000 (FOIA), the INSPIRE regulations, and the Re-use of Public Sector Information Regulations 2015.

There is also information regulation specific to the planning process:

- The 2015 [Development Management Procedure Order](#) regulates a wide range of issues relevant to the administration of planning applications and this includes requirements relevant to information including consultation requirements in Article 3, 4, and 18–21, publicity requirements in Article 13–16 and the requirement in Article 40 to establish and maintain a public register of applications and decisions.
- The [Environmental Information Regulations](#) 2004 give the public a general right of access to environmental information. Environmental information is defined very broadly; according to the [Information Commissioner's Office](#) (ICO) the term should be interpreted to include genetically modified organisms, drawings, sound recordings and CCTV coverage, and there is already one [case](#) where a film about the Lea Valley Park was ruled to be environmental information and required to be disclosed.
- The [Local Government Act 1972](#) regulates local authority decision making, including planning committees. Section 100A–H regulates access to information in the committee process including access to agendas and reports, disclosure of background papers and retention of documents for inspection. Compliance is essential to the planning process: in a recent case [the judge ruled that non-disclosure of background materials amounted to ‘egregious unfairness’](#) and the permission was quashed.

For now these separate regimes – all dealing with data in one way or another – have been reasonably effective in ensuring that information about planning applications was publicly available and that decisions were made in a transparent way. However,

they all predate the digital revolution and many are based on analogue notions, such as paper notices and physical presence at meetings.

The Covid-19 pandemic exposed the weaknesses of this system. A range of changes were introduced including electronic publication of notices, electronic planning registers and digital consultation and publicity. However, these changes simply retrofitted the existing system to facilitate digital rather than analogue compliance, almost all of them were temporary and there is no indication yet that there is or will be a digital by default approach in the future.

## Digital Planning – beyond the rhetoric

The planning system operates in a world where there is an exponential expansion both in the amount of data available and the technological capacity and commercial incentive to grab, share, manipulate and monetise it. The government is close to adopting a [National Data Strategy](#) (NDS), the G7 [Ministerial Declaration](#) included aspirations around an international roadmap for co-operation on data free flow with trust, and the National Infrastructure Commission has recently [reported](#) on the public benefits of data sharing.

However, the planning system has not even formally recognised the existence of the digital twin, and its regulatory foundations are built on a definition of land that excludes all but its physical manifestations. As described above, there are several existing regulatory requirements relevant to data and information, but they are not integrated, and do not anticipate or accommodate a digital world.

There are calls for change. The Royal Town Planning Institute (RTPI) [Digital Planning Manifesto](#) calls for a standardised digital processes for planning applications and last year's '[Living with beauty](#)' report proposed digitisation of data entry and the introduction of digital building passports. The 2020 planning white paper, '[Planning for the future](#)', encouraged local authorities to use digital engagement tools, draft machine-readable policies, rely on core datasets, automate processes and work with specialists on adopting new software. In November 2020, the Scottish government published the first [digital strategy for planning](#), 'Transforming places together', with missions including an end-to-end digital planning experience.

There are also some tools emerging that could help to implement changes. The Data Standards Authority has published standards and guidance [on how to improve data sharing across government](#), the CDBB has published an [Information Management Framework](#) including approved formats for open data; and the emerging NDS [proposes standard data formats, data sharing and data management based on an 'open by default' principle](#). The [Building Safety Bill](#) has just been introduced to parliament (July 2021) and includes a requirement for a digital register – described as a golden thread – of information to be established and maintained for all new buildings above a certain height, with the planning consent process identified as 'Gateway One' in a digital register of fire safety documentation and compliance processes.



The regulatory landscape for data is also changing. The [government's response to the Smart Data Review](#) proposes legislation to 'mandate industry involvement' in a range of industry sectors; [the government's response to the consultation on the NDS points to a 'bold new approach'](#) and new data partnerships; and the [Taskforce on Innovation Growth and Regulatory Reform report](#) recommends replacing the GDPR with a Framework of Citizen Data Rights.

In the meantime, actual change across the planning sector has been slow to negligible. The planning white paper introduced a discourse of digitisation, but the government has not engaged with the practical complexities of integrating digitalised processes with existing data protection regimes; the complexities and risks of automated processes; or even prescribed a data standard. A report [by CDDC](#) found that BIM was not well-understood by local authorities and that the benefits of adoption were perceived as not justifying the costs. Another report [by the Parliamentary Committee on Housing Communities and Local Government](#) stated that though the system was seen as 'antiquated' they recommended continuation of paper-based engagement as the online Planning Portal needed updating and there were deficits in access to digital skills and infrastructure.

## The need for change – and where to start

Everyone involved in the modern planning system shares some of the responsibility to expand and adapt current processes so they are fit for purpose in a digital future. Digital impacts and benefits should be viewed as core planning considerations alongside traditional concerns such as design and infrastructure.



*Everyone involved in the modern planning system shares some of the responsibility to expand and adapt current processes so they are fit for purpose in a digital future*

The government must lead the way because it is the only stakeholder with the ability to make legislation, adopt guidance and enter into agreements that create instant change and apply to everyone. A recent example of effective use of these powers is its agreement [with Ordnance Survey](#) allowing open public access to every Unique Property Reference Number (UPRN) and Unique Street Reference Number (USRN) in Britain. There are a number of future changes that government could sponsor or support that would make a significant difference to the implementation of digital planning by the planning profession:

- Primary legislation to amend the current definition of land to include its digital equivalents or promote a definition of 'the digital twin'.

- The Covid-related changes to the Development Management Procedure Order should be made permanent, ensuring that a wide range of planning processes are ‘digital by default’, including publication of notices, and validating e-consultation as the primary method for engagement.
- The government could mandate use of UPRNs when planning applications are submitted alongside clarity on data standards, either by introducing and mandating its own standard as it has for [brownfield data](#), or validating existing industry standards such as those promoted by [RICS](#).
- Digital impacts and benefits should be formally recognised as a material consideration, at least for major developments. This would require the applicant to consider how data is generated from the development, how it is used and shared, and what the impacts are both on the new and existing community. This would then facilitate relevant conditions and obligations requiring digital benefits such as 5G infrastructure, specific levels of connectivity and even mandate public data sharing.

Local authorities could also do more to bring forward digital planning. Last year’s [planning White Paper](#) detailed existing deficiencies including a legacy of paper documents that could not be machine read, a reliance on document management and storage rather than process transformation, and a lack of data standards and schemas. The UK government has not yet responded to the White Paper consultation nor is there any sign that it will follow the Scottish government in issuing digital-specific planning guidance for local authorities. In the absence of central government direction, there are simple changes that all local authorities could make, any one of which which would be relatively easy to implement while making significant steps towards digital planning systems:

- Development of digital planning policies at strategic levels.
- Requiring electronic submissions to be submitted in accordance with approved data standards. Local authorities are comfortable with a range of ‘Registered Providers’ when it comes to affordable housing; a similar approach could be taken to a range of industry-approved standards including the RICS standard mentioned above or the Planning Inspectorate standards set out in Appendix One of its [Procedural Guide](#) for planning appeals.
- Introducing training on digital planning for local authority officers and members.
- Collaborating with other local authorities on the creation and maintenance of datastores and exploring opportunities for collaborative data sharing.

Implementing digital planning is best led by the government and requires a significant culture change within local authorities but it also depends on involvement from everyone involved in the system: planners, lawyers, local authorities, and applicants. But change needs to be immediate and incremental and this means that applicants, agents and lawyers can play a part in building consideration of digital impacts and benefits into every stage of the process.

As soon as a development is proposed, there should be a review of the digital landscape, alongside surveys of the physical topography and investigation of legal title. This initial audit would register the identity of the data suppliers, the types of

data to be disclosed and identify special categories of data, such as that disclosable as environmental information or needed as a background paper for any committee report. It would also identify areas of potential future risk (such as embedded biometric technologies) and ways that the risk could be mitigated with embedded safeguards and robust consent processes. The digital benefits of the proposal could also be identified, such as the creation of real-time environmental information on air quality or transport impacts and the potential for this data to contribute to national or local data stores, or the provision of enhanced connectivity for disadvantaged populations. The impacts and the benefits would then be available for consideration alongside the physical changes, integrating the physical and digital elements of development within normal consent processes.

## Section 1 Summary

When Ebenezer Howard produced what some still see as an ideal [vision of the garden city](#) he referred to the town and country as two magnets, each with their own benefits and the garden city as an ideal combination of both. It is time for the planning system to realise that we are again situated between two magnets – the digital and the physical – and that planning can benefit from a combination of both. Hardwiring digital awareness into every stage of the planning process could lead to increased community participation, an enhanced appreciation of development benefits and risks and improved connectivity between homes and their wider environment.

In '[Garden Cities of To-morrow](#)' Howard reflected that 'there have in the past been inventions and discoveries on the making of which society has suddenly leaped upward to a new and higher plane of existence'. AI offers the same transformational benefits to modern planning as steam power did for Howard, but is proving equally tricky to 'harness to the task it was fitted to accomplish'. The next part of this paper looks at how this powerful and complex technology could play its part in a digital planning system.

## 2 Automation of the planning function

The year 1947 established the foundations of the modern planning system and also witnessed the quiet dawn of a digital age. The [Town and Country Planning Act 1947](#) established a legal definition of development and the requirement for all works or uses to be subject to a particular decision-making process carried out by a public body. As details of that legislation were being finalised, Alan Turing was working on another kind of decision-making function: the Automatic Computing Engine. As he predicted, the power of those machines and the pervasive nature of the technology means that they are beginning to replace the human function in areas. As a recent [House of Lords report](#) recognises, AI has the potential to ‘lead to more personalised services; and provide solutions to some of the most complex and challenging policy problems’.

The UK government’s [planning white paper](#) was the first formal recognition that AI and ML should have a role in the planning system too. AI will not wholly replace the human in planning decisions, but it will perform an increasing number of previously human functions; this part of the paper considers its scope and limits.

The white paper summarises the existing law on how planning decisions are made, and briefly explains the concepts of AI and ML. It explores the extent to which automation could replace the human function in planning processes and the legal and ethical implications of this shift. It ends with some concrete proposals on how the current procedural context can and should adapt to an increasingly automated future.

### Planning decisions

The legal test for making planning decisions is a conflation of section 70(2) of the [Town and Country Planning Act 1990](#) and Section 38(6) of the [Planning and Compulsory Purchase Act 2004](#). Essentially, the decision maker is required by law to consider the extent to which the development proposal accords with local policies, and also its particular merits, and consider both in coming to a balanced decision. In some circumstances the decision maker must apply a presumption in favour of sustainable development; or specific legal tests when listed buildings and conservation areas are involved, and other ‘material considerations’ include Environmental Impact (EIA) or Habitats Impact Assessment (HA); and designations that apply to land of particular value such as Sites of Special Scientific Interest, Areas of Outstanding Natural Beauty and green belt.

These decisions can be challenged in two ways. If the application is refused, an appeal can be made to the Planning Inspectorate who will reconsider the proposal on

its merits. Where a decision appears to be legally defective, any party with standing can apply to the courts. The courts may quash a permission if [policy is misinterpreted](#), if [committee members are misled](#) or a decision is [manifestly unreasonable](#) or [inconsistent](#), or if [no reasons have been given](#), but the decision maker has wide discretion on the way that policies are applied and the weight that is given to planning considerations – in fact, the courts have warned against the dangers of [‘excessive legalism’](#).

## Automation and planning

‘Artificial intelligence’ is a blanket term for a range of digital technologies that can take the place – partially or entirely – of human intelligence. The [UK government describes AI as ‘the use of digital technology to create systems capable of performing tasks commonly thought to require intelligence’](#). AI can be used to generate predictions, recommendations, or classifications and used in a range of processes. Its functions are performed through algorithms – pre-programmed rules applied to the data in question. Algorithms can be transparent and explainable, with clear rules and consistently repeated functionality, but recently there have been significant developments in machine learning, a type of AI, where the machine can devise its own rules that achieve the objective more effectively. These processes are powerful, complex and opaque and are commonly referred to as non-interpretable or ‘black box’ AI systems.

Turing himself acknowledged that some judgments – such as the artistic merits of Picasso – should be reserved for human judgment, and that the more important question was whether automation could be trained to [mimic part of the human function](#). The same question can be addressed to planning decisions – not whether computers can replace humans altogether but to what extent the human function can be replaced in making planning decisions.

## Administrative process

One area where automation can replace the human function is in administrative elements of the planning application process, currently regulated by the Development Management Procedure Order 2015 (DMPO):

- Articles 6, 7, 8, 11 and 27 set out the documents that must be submitted in an application; this could be automated including rejection of non-compliant applications.
- Article 9 design and access statements could be converted into standard templates pre-populated with some content generated from relevant local and national policies.
- Articles 13, 14, 17 and 26 relate to service of notices; where a particular format of notice is required this could be linked to a template form and generated automatically.
- Articles 15, 16, 18, 19, 20, 21, 22, 23 and 24 specify how applications are to be published and who should be consulted; if applications were submitted online

and the current notices were turned into templates, information such as a description of the site and the development could automatically populate the required forms or letters.

Several local authorities are already exploring the potential for administrative functions to be automated:

- Redbridge Council is working with [Agile Datum](#) to detect common mistakes in applications and improve validation.
- The London Borough of Lambeth is testing AI in the [processing of planning applications](#).
- The Ministry of Housing, Communities and Local Government (MHCLG) has recently [announced](#) that two new apps will be tested to help with small scale planning applications and processes.

## Assessing Environmental Impacts

Assessment of environmental impacts is an essential element of any decision to approve or refuse a planning application. In many cases, a [formal assessment](#) of those impacts and their mitigation is required. The process involves submission of a daunting amount of largely static information which is then assessed by the local authority, involving the use of specialist advisers. This [process has been validly criticised for being paper-heavy and impenetrable](#), with outputs archived rather than being made available for re-use and it is overripe for change.

There is a growing range of real-time sources of environmental information. The 'Geo6' are creating a [catalogue of geospatial data](#), the Geospatial Commission has started work on a [National Underground Asset Register](#) and has published a collection of 65 housing, land and planning [open datasets](#). The National Energy Efficiency Data-Framework collects national data about gas and electricity consumption data, property attributes and household characteristics, and publishes regular [statistical summaries](#). Meanwhile regional resources such as the [London Datastore](#) are also emerging.

There is a parallel movement towards metrification of environmental impacts and benefits. In March 2020 the government presented nature as an asset that could be assessed with a range of tools including an assessment template, biodiversity metric and [new valuation methods](#). The environment bill due to be introduced to parliament this year's session proposes the calculation of biodiversity credits through a [metric](#) where habitats are used as a proxy for value.

Finally, there are experimental projects where real time environmental information is combined with predictive analytics to model environmental impacts. Current projects at the Alan Turing Institute include:

- [SPENSER](#) (synthetic population estimation and scenario projection) a tool that uses dynamic microsimulation to produce a range of population projections in a wide range of scenarios.

- The development of a [causal inference model](#) to quantify the effect of a planning intervention, such as the introduction of public transport, on human behaviour.
- [Project Odysseus](#) which combines existing datasets to understand urban activity and facilitate targeted interventions to mitigate the impacts of Covid-19.

As well as automating processes, this is an area where, due to developments in sensory technology and predictive analytics, the assessment itself could be transformed into a real-time platform of information flows, analytics and predictive modelling which can be interrogated by any interested party to predict both the impacts of development and the effect of mitigating measures.

In March 2020, the Institute of Environmental Management and Assessment issued an [Impact Assessment Primer](#) and the [Digital EIA Project](#) was launched. It may not be long before the established assessment processes are replaced by a continuous harvesting of information from large, open, rich datasets accessed in real time and used as the basis for accurate predictions of environmental impacts and mitigations in a range of scenarios through the life of the project.

## Automation: barriers to adoption

Automation has the potential to replace the human function in both planning processes and assessment of planning impacts, but the transition will generate some significant issues.

First, the planning profession is not equipped with the skills or resources to make the most of automated processes. The planning White Paper may have raised the importance of a digital planning system but it is only just beginning to be recognised as a relevant topic for training for planners and local authority members.

Next, there are significant ethical issues associated with automation (considered in the next section of this paper) including the privacy implications of embedded sensory technology in buildings and places, algorithmic bias and the emergence of a 'digital divide'. The government has already been criticised for the [proposed use of a predictive algorithm](#) in the context of assessing housing need requirements that was '[blind to geography](#)' and concentrated growth in London, the South East and the South West.

There are also legal issues. The current legal framework for planning decisions was enacted in 1990 and rests on principles established in 1946 when machine-made decisions were hypothetical mathematical propositions. It anticipates decisions being made by corporations composed of human individuals. The High Court has recently [ruled](#) that an algorithm is not 'a natural or legal person'; if a decision is made even in partial reliance on an algorithm, it can be challenged on the basis that the decision was not actually made by a human at all. When permissions are refused – and sometimes when they are approved – planning law requires that reasons should be given. [The House of Lords has ruled](#) that: 'The reasons for a decision must be intelligible and they must be adequate. They must enable the reader to understand



why the matter was decided as it was'. Where a process is automated, and a decision has been made in reliance – even partially – on predictions generated by an opaque algorithm it is difficult to see how it can also be fully reasoned in a human sense.

The problem of opaque algorithms is already attracting attention. In June 2018, [Oswald](#) warned that the introduction of algorithms in the place of humans represented a challenge to the rule of law and created a specific risk of 'genuine doubt as to why decisions were made'. Shortly afterwards [Cobbe's](#) paper on the judicial review of automated decisions in the public sector proposed that the greatest challenge to those decisions was 'the explainability of machine learning decisions'. In October 2019, an [opinion on automated decision making](#) concluded that the 'inability to peer inside an algorithm, AI or ML process... has real legal implications'. In April 2020 Webley's paper '[Ethics, Technology and Regulation](#)' noted that 'the transparency of algorithms is currently insufficient to allow for many algorithmically rendered decisions to be subject to proper challenge'.

These concerns are not limited to academia. In January 2020, a review [by the Committee on Standards in Public Life](#) advised that public bodies 'should not implement AI without understanding the legal framework'. In June 2020, the Centre for Data Ethics and Innovation (CDEI) '[AI Barometer Report](#)' identified 'lack of explainability' as one of the principal risks to the adoption of the technology. In December 2020, the House of Lords Liaison Committee recommended [national standards for the ethical development and deployment of AI](#) and a recent report [from the Institute for Government](#) noted that 'policymakers, in particular, need to be critical users of models and algorithmic systems'.



*the technology is pervasive and the concerns are universally relevant*

The same issues are emerging in case law too. In February 2020, the [Hague District Court ruled that 'SyRI', an AI-based system used to detect fraud, was unlawful](#) because it was insufficiently transparent and verifiable. In April 2020, [Le Conseil Constitutionnel \(the French Constitutional Court\) dismissed a claim disputing the validity of an AI platform](#) used to select students and the subjects they should study, partly because the system was relatively transparent and not fully automated. In May 2021 the [Italian Supreme Court prohibited the processing of personal data](#) by algorithms to create reputational rankings for use by third parties. The court ruled that the algorithm was so opaque that it created a situation where a human could not validly consent to their data being used.

Some of these cases relate to algorithms in the private sector, some in the public, but the technology is pervasive and the concerns are universally relevant. As planning decisions are increasingly informed by automated inputs and predictions, it is likely that these kinds of challenges will proliferate in this area too. However, it is questionable whether the planning court has either the will or the capacity to



intervene. In February 2020, Dove J was asked to consider competing claims about the [validity of evidence on air quality](#). He ruled that ‘it is not the role of the court to embark on its own technical appraisal of the issues’. A similarly ‘hands off’ approach was taken by Jay J in relation to [expert evidence on tunnel structures](#) in June 2020. In both cases the judge did not analyse the evidence; instead, they considered only whether it was reasonable for the decision maker to rely on it. It is likely that the same approach would be taken to expert evidence on the use of AI.

## Current responses: policy

There is no shortage of guidance in this area – if anything the crowded landscape makes it difficult to decide what the best approach is.

In 2019, the UK government issued guidance on ‘[Understanding artificial intelligence ethics and safety](#)’ and a collection of guidance on [using AI in the public sector](#). The Alan Turing Institute issued its own guidance on [AI in the public sector](#). The Confederation of British Industry (CBI) also issued guidance on [ethics in practice](#) recommending an embedded approach, updated governance processes, impact assessments, and a commitment to engagement and explainability in relation to the workforce and the public.

In May 2020, the ICO issued, in partnership with the Alan Turing Institute, comprehensive guidance for organisations on [explaining decisions made with AI](#). In June 2020, the Office for Artificial Intelligence (OAI), BEIS and the Department for Digital, Culture, Media and Sport (DCMS) issued joint [Guidelines for AI procurement](#) and in July 2020 the ICO issued further guidance on [AI and data protection](#). In October 2020, the Ada Lovelace Institute issued its review of [transparency mechanisms](#) in the public sector. It identified practical steps public sector bodies can take including impact assessments, procurement processes, open data standards and disclosure protocols. In November 2020, the Local Government Association published a practical [guide for local authorities](#) working on or considering predictive analytics. It includes specific criteria to consider at each stage of the process that could be used as the basis for structuring reports on the adoption and use of some AI software and processes, and recommends internal consultation with data teams, data protection officers, and establishing a board or group of senior managers. The [CDEI published its review of bias in algorithmic decision-making](#) in the same month, including guidance for local authorities on decision-making tools.

In January 2021, the World Economic Forum proposed a [10-step approach](#) for developing corporate knowledge about AI fairness and the UK AI Council published its [AI Roadmap](#) including a recommendation that the UK should encourage public scrutiny of automated decision-making. In February 2021, the ICO issued its [data analytics toolkit](#), integrating existing regulatory requirements with issues specific to data modelling, including the use of AI. It recommends the use of an impact assessment and includes guidance where deficits are identified. In March 2021 Digital Scotland published Scotland’s new [AI Strategy](#) highlighting the importance of trust,

ethics and inclusivity as being intrinsic to the effective and proper use of AI, and the UK government announced its intention to develop an [AI strategy](#) – currently the topic of a consultation [with the Alan Turing Institute](#).

Between 15 and 17 April 2021, CDEI issued three blog posts on AI Assurance. The first recognised the need for AI to be used in a consistent and compliant way, founded on an [assurance approach](#) comprising governance tools such as audits, certification, accreditation, and impact assessment. The second identified a range of ‘[user roles](#)’ in relation to AI and the need for an assurance ecosystem to meet all of their needs. The third examined different [types of assurance](#) and standards. All three ended with an open call for stakeholder collaboration on creating an AI assurance roadmap. In June 2021 the Business Software Alliance proposed an AI [Risk Management Framework](#) to build trust in AI and AI systems with proposals including a governance framework (policies, personnel) and impact assessments carried out through the AI lifecycle.

In May 2021 the Cabinet Office, the Central Digital and Data Office (CDDO) and the Office for AI published the ‘[Ethics, Transparency and Accountability Framework for Automated Decision-Making](#)’ for use by government departments. It is aimed at government departments using either solely automated or automated-assisted decision-making and distinguishes between solely automated decision-making and automated assisted decision-making. It begins with a general recommendation to carry out a risk assessment, use data in accordance with the Data Ethics Framework, follow data protection law and engage with third-party experts, and sets out a seven-step framework process to follow when using automated decision-making. The recommended steps are set out and summarised below:

- **Test to avoid any unintended outcomes or consequences.** This includes recommendations to carry out risk assessments, Data Protection Impact Assessments (DPIAs) and an Equality Impact Assessment (EQIA).
- **Deliver fair services for all of our users and citizens.** This step recommends carrying out an EQIA, having a diverse team and assuming that ‘the algorithm or system that you are developing is capable of causing harm and injustice’.
- **Be clear who is responsible.** This includes the recommendation for ministerial ownership of significant decisions.
- **Handle data safely and protect citizens’ interests.** This reminds operators of their responsibility to be compliant with data protection legislation and the Data Ethics Framework, a cautious approach to repurposing of datasets and carrying out a DPIA when required.
- **Help users and citizens understand how it impacts them.** This step recommends working on a ‘presumption of publication’, plain English explanations of automated systems, traceability mechanisms, and the appointment of an accountable officer.
- **Ensure that you are compliant with the law.** This includes early engagement with legal advisors and compliance with data protection law and the [Equality Act 2010](#)
- **Build something that is future proof.** This recommends continuous monitoring, formal reviews and end user challenges.

There is no shortage of guidance; at the same time it is difficult to identify what Central Government guidance on the use of AI for public sector decisions is.

## Current responses in law

The only formal regulation of AI in England is the GDPR, transposed into UK law through the Data Protection Act 2018. Articles 13–15 create individual rights to information about solely automated decision-making when that decision-making has legal or similarly significant effects; Article 21 provides a right to object to the processing of personal data in some circumstances; Article 22 gives individuals the right not to be subject to a solely automated decision producing legal or similarly significant effects without appropriate safeguards; and Article 35 requires organisations to carry out DPIAs where data processing, including processing using new technologies, is likely to result in a high risk to individuals.

Internationally, the picture is more evolved: Canada has a [Directive on Automated Decision-Making](#), New Zealand has an [Algorithm Charter](#), and the Singapore government has adopted an [AI Governance Framework](#). In April 2020, the European Commission published a [draft AI regulation](#) with aims including the need to ensure legal certainty and enhance governance. It defines ‘artificial intelligence systems’ in terms of techniques used and outputs generated and distinguishes between three types of AI techniques: machine learning approaches, logic- and knowledge-based approaches, and statistical approaches. It has a graded approach to regulation depending on whether AI system risks are unacceptable, high risk, limited risk, or minimal risk. High-risk systems include the administration of democratic processes and proposed obligations include transparent risk assessment and mitigation measures including documentation on the system used, human oversight and activity logging. Voluntary codes of conduct are proposed for non-high-risk AI, as well as regulatory sandboxes to facilitate responsible innovation.

## AI governance: next steps...

The new ‘[Ethics, Transparency and Accountability Framework for Automated Decision-Making](#)’ is a welcome development, because it is this kind of central government guidance that will give local authorities the basis to help them use technology effectively and to minimise the risk of challenges to decisions based on procedurally unfair decision-making. It is also useful because it includes references to case studies, detailed practical guidance, a glossary of terms and a template ‘Ethics transparency and accountability’ risk assessment form.

However, it appears to be aimed only at central government departments, and it is not clear whether or not it should be taken as authoritative in other contexts, including by local authorities. It is guidance, not law, so it would be difficult for an individual or organisation to assert non-compliance as a successful basis for challenging a government decision. It refers to the need for legal compliance but the

only specific legal reference is to Article 22 of the GDPR. There is no reference to the particular risks of biometric technologies, which is surprising given that algorithmic bias was successfully asserted to [challenge the use of facial recognition technology](#) by the South Wales police. Equality Impact Assessments are recommended, but the examples given relate to [Welsh Government policy on English for Speakers of Other Languages \(ESOL\) Policy for Wales](#), and [general guidance from the UKRI](#); neither of which offer any real help in this context.

In February 2020 the [Committee on Standards in Public Life](#) published a report '[Artificial Intelligence and Public Standards](#)' including 15 recommendations. The government issued its [response](#) in May 2021. That response makes few specific commitments to taking forward any of the recommended actions and no response at all to recommendations 9-15 which were addressed to 'front-line providers, both public and private, of public services':

The CDEI has since issued a [blog](#) summarising a [report](#) on its work with the [CDDO](#) and [BritainThinks](#) on the potential for a 'mandatory transparency obligation on all public sector organisations using algorithms when making significant decisions affecting individuals'. The proposal is that two tiers of information would be available: some provided automatically as a 'signpost' that an algorithm was being used, with more available on request. The recognition of a need for greater transparency is welcome, as well as the proposal but the proposal is based on very limited research carried out over four weeks with 36 people. It is intended to inform the development of a prototype standard for future testing and there is no indication of whether or when it will be formally adopted.

The breadth of the range of guidance available, without clear government advice on which should take priority could discourage local authorities from engaging with the issues. In the absence of a coherent national policy position or emerging regulation there is an urgent need for practical guidance on how a decision maker can integrate the procedural considerations specific to emerging technologies into the mechanisms of public sector decision-making on planning applications.

Regulatory technology is promoted as a way to automate compliance with the law but its utility has been questioned in a [recent paper arguing that concepts such as discrimination require human assessment](#) on a case-by-case basis. In any case, the planning system already has an established statutory framework for making decisions, supported by a wide range of guidance. The most effective way to integrate emerging concerns about the new technology into the current system is to address those issues in a transparent way at all levels of the planning function.

- **Policy:** All local authorities have a range of policies that support and inform their decision-making. In relation to planning decisions, there is likely to be an adopted development plan which sets policies on how particular areas are to be developed or how particular issues such as highway impacts should be addressed. Some local authorities have policies relevant to the use of technology such as the [London Tech Charter](#) and [Manchester's Digital Strategy](#). The ideal foundation for the use of automated technologies within

the planning function is a formally adopted strategic policy document based on internal and external consultation. The policy should include, at a minimum, an explanation of what AI is, the principal benefits and risks, the relevant legal and policy context and where to go for further information. A template example of such a policy document is attached as [Appendix One](#).

- **Procurement:** Most local authorities implement the use of automated technologies through the use of externally procured software, and it is recognised that good procurement of AI can support the development of the technology and promote sound ethical standards. The UK Government's OAI has produced [guidance for AI procurement](#) which is clearly written and can easily be used as the basis for evolved procurement processes and documents in parallel with [specific training](#) on procurement processes and data management. As a minimum, the invitation to tender should include questions on data sourcing and training, equalities issues, cyber security, liability for defects, and data ownership and sharing, and the decision to procure and any contract entered into afterwards should include consideration of the same issues. A template example of a procurement checklist is attached as [Appendix Two](#), as well as a template for a formal decision to adopt a chatbot attached as [Appendix Three](#)
- **Individual decisions:** With a strategic policy and improved procurement practices in place, the risk of challenges to planning decisions based on opaque AI systems would already be reduced, but where AI is involved in any aspect of a planning decision, it would be good practice to acknowledge and address this in the decision. It is accepted practice for planning decisions to consider, as a matter of course, whether those decisions have an impact on equalities, and to consider the environmental impacts, benefits and mitigations, as well as wider legal implications. There is no reason why a similar risk-based approach could not be taken in relation to AI.

## Section 2 summary

AI has developed in ways that perhaps only Turing might have predicted in 1947 and there is significant scope to automate the way planning information is accessed and assessed. Algorithms are much more efficient than humans in processing large and complex datasets; automation can also provide a rich, real-time record of environmental impacts and make sophisticated predictions about the impacts of development proposals with reduced investment of human time and resources.

However, the complexity of the legal test regulating the decision-making function in planning makes it difficult to automate. The planning process is a locus for conflicting views on how land should be used, and an arena where irreconcilable interests intersect. Planning policies often have an inherent ambiguity and subjectivity that is irreducible to an if-then process. Decisions about land are also about the humans who inhabit it; the machines are not yet capable of factoring empathy into their decisions or to evaluate aesthetic merits as a human might.

Machine learning has not yet found a way of reconciling the need for landowners and developers to derive profit from the development of land, the need for new communities to access affordable homes supported by good infrastructure and the need for existing communities to preserve the land they inhabit free from radical social or aesthetic change. The prospect of entirely machine-made planning decisions is both dystopian and unrealistic.

Many elements of the process are either routine procedures or empirical assessments that do not need any human involvement. If algorithms are trained to do this work then human resources can be freed up to exercise judgment in those parts of the decision-making process where judgment and discretion are required. However, machines cannot be held accountable in the same way as humans, and their decisions cannot be challenged in the same way as human decisions. Moreover, humans are not yet comfortable with machine-made or even machine- assisted decisions; a recent report [by the Committee on Standards in Public Life](#) recorded that 69% of those polled said that they would be more comfortable with a public body using AI if a human was involved in the final judgement.

It can be argued that human decision-making is also flawed, and that the human brain is the ultimate black box, influenced by unconscious bias, daily experience, or even the contents of its host's last meal. Existing legal and procedural mechanisms – such as planning committees – are created to impose coherent regulatory frameworks on these human frailties, to make public decision-making more transparent and accountable. If the planning system is to make the most of AI while still maintaining public trust, existing regulatory frameworks need to readjust and expand to accommodate its strengths and weaknesses.

As well as procedural requirements for the processing of applications and a legal test for determining planning applications, planning decision-making is also subject to ethical requirements set out in legislation, common law principles, and codes of conduct. These also need to expand to adjust to a digital world and the final section of this paper looks at what that might mean in practice.

# 3 Ethical planning in a digital world

Urban planning is, and always has been, about more than land. The [first planning legislation was introduced to parliament in 1909](#) with the intention of providing ‘a domestic condition for the people in which their physical health, their morals, their character, and their whole social condition can be improved’. More than a century later, these social concerns remain: one of the aims of the [planning White Paper](#) was the need to achieve a ‘fair balance between consumers, producers and wider society’.

The ethical context of planning decisions is important: not just because human decisions need to be made as transparent and accountable as possible, but because planning decisions are made in a specific socio-political environment which shifts over time and in response to changes in wider society. There is no legal definition of ethics nor are they acknowledged as a discrete concept in planning policy, but ethical concerns are relevant both to the planning process and its outcomes.

Ethics are also highly relevant to data: the UK government has established a [Data Ethics Framework](#) for responsible use of data in the public sector and Mission 2 of the emerging [National Data Strategy](#) recognises the importance of maintaining public trust.

The first part of this section examines three specific areas – public engagement, equalities, and human rights – where ethical concerns are regulated; in each case looking at how existing regulatory norms are disrupted by developments in digital technology. The second part of this section reviews the existing landscape of data ethics and its relationship with existing ethical norms. It concludes with a brief exploration of ways that existing practice and procedure could adapt to embrace emerging notions of data ethics, so that digital planning can develop with embedded sound ethical principles.

## Engagement

Engagement is often used as a blanket term referring both to the informal engagement processes that happen throughout an application process and the formal consultation requirements required by law. The planning system has come a long way since the [1909](#) act when better homes and environments could be endowed on the working classes by those who were ‘more fortunately situated’ but many would argue that we are barely halfway up [Sherry Arnstein’s Ladder](#) with true citizen control of decisions.



For most planning applications, consultation is highly regulated, primarily through detailed requirements in the Town and Country Planning (Development Management Procedure) (England) Order [2015 \(DMPO\)](#) where the requirements can be summarised as follows:

Requirement	Detail
Consultation	<p>Articles 3 and 4 require pre-application consultation when a wind turbine is proposed.</p> <p>Article 18 is the general requirement for consultation; schedule 4 sets out who is to be consulted depending on the size of the proposal and the type of land involved.</p> <p>Article 19 requires consultation for Crown land applications.</p> <p>Article 10 requires consultation on applications to amend existing permissions.</p> <p>Articles 22 and 23 contain a duty to respond to consultations and report on them.</p> <p>Articles 24, 25 and 26 establish notification requirements specific to district councils, parish councils and neighbourhood forums.</p> <p>Article 33 imposes a duty on the decision-making authority to take representations into account before deciding a planning application.</p> <p>Additional consultation requirements are imposed by '<a href="#">The Town and Country Planning (Consultation) (England) Direction</a>'.</p>
Notification	<p>Article 13 requires the owner of land to be notified of an application and Article 14 requires the application to certify that this has been done.</p> <p>There are additional notification requirements for <a href="#">heritage applications</a>.</p>
Publication	<p>Articles 15 and 16 require the local authority to publicise an application. schedules 2 and 3 prescribe the form of the notice.</p> <p>Article 40 requires a public register of planning documents and decisions to be maintained.</p>

In addition to these regulations, the '[Gunning Principles](#)' established in case law apply to all consultations:

- 1) consultation must take place when the proposal is still at a formative stage
- 2) there should be enough detail to allow for intelligent consideration and response
- 3) adequate time must be given for responses
- 4) the consultation responses must be conscientiously taken into account

The principles were established in 1985 but remain highly relevant: in 2019 the government was forced to withdraw part of its National Planning Policy Framework after a judgment [that 'the consultation on the draft revised framework paragraph 204\(a\)'](#) was so flawed in its design and processes as to be unlawful'.

Neither the DMPO nor case law currently acknowledges the digital world. The DMPO assumes that notices are posted on land or buildings and published in paper newspapers and that consultation is carried out by post. Case law is similarly tethered to paper rather than its digital equivalents – and there is a [2014 judgment](#)



where the court ruled that relying solely on electronic consultation was insufficient to comply with relevant regulatory requirements.

The deficiencies of these assumptions were exposed by Covid-19, and regulations [were made to allow electronic publication of notices](#) and use of websites and online publications in place of paper editions and inspection of documents at physical premises. Subsequent guidance [on local plans](#) promoted online engagement methods including ‘virtual exhibitions, digital consultations, video conferencing, social media’. The [planning White Paper](#) encouraged local authorities to ‘reinvent the ambition, depth and breadth with which they engage with communities’. MHCLG has introduced a [new framework for consultations](#) and the [Local Digital Declaration](#) and is funding several [projects](#), including one for digital place-based engagement, and a community engagement playbook.

These are positive steps as they could make planning decisions more accessible and facilitate responses from a much broader range of the people potentially affected by the proposals. However, the transition to digital engagement is not unproblematic.

There is a risk, explored in greater detail below, that while smart engagement has the ability to open up the planning process to new participants, it may exclude others unless adequate protections are put in place. The communicative possibilities of emerging technologies sit awkwardly with the established regulatory norms, all of which are based on analogue engagement methods. For example, the courts have recently confirmed that reference in legislation to physical meetings cannot [include virtual meetings](#) and that reference to public attendance [cannot include attendance online](#).



*while smart engagement has the ability to open up the planning process to new participants, it may exclude others unless adequate protections are put in place*

The adoption of platform-based engagement raises its own issues. The House of Lords recently issued a report [on Democracy and Digital Technologies, ‘Digital Technology and the Resurrection of Trust’](#). This focused primarily on social media platforms but it also noted the increased use of platforms for democratic engagement generally. It expressed concern about the lack of accountability, the potential for platforms to be used as a forum for bullying and abuse, and the lack of content moderation or regulation. Planning is highly political and developments are often divisive; provoking strong emotions and allegations of misconduct. Major developments already use social media platforms as a way of engaging with the public; many of the concerns raised by the House of Lords are increasingly relevant to these engagement methods.

## Equalities

The Public Sector Equality Duty (PSED) is contained in [section 149 of the Equality Act 2010](#) and requires any public authority, when exercising its functions, to have due regard to the need to

- (a) eliminate discrimination, harassment, victimisation and any other conduct that is prohibited by or under the Act;
- (b) advance equality of opportunity between persons who share a relevant protected characteristic and persons who do not share it; and
- (c) foster good relations between persons who share a relevant characteristic and those who do not share it.

The relevance of these issues to planning decisions was established in 2010 when a [consent for redevelopment of an indoor market was quashed](#) because of a lack of regard to the implications of that decision on traders. Its relevance has not declined over the years – for example in 2016 [consent for an office block was quashed](#) because the planning inspector had insufficient regard to use of the car park and access by the disabled; in 2018 a [permission to redevelop an estate was quashed](#) because of a lack of regard for the implications on the elderly and disabled and last year, an [application by the London Borough of Bromley for an injunction preventing encampments](#) was refused because there had been no assessment or any engagement with the traveller community.

Emerging technologies disrupt equalities considerations in two areas.

First, there is the issue of digital discrimination during the consultation process. As seen above, paper consultation and notification methods are being displaced by their digital counterparts and engagement is more likely to be achieved through an online platform of resources than face-to-face meetings. Alongside the demonstrable benefits of these changes there is a risk of reduced access for members of the population with insufficient skills, devices or connectivity. In January 2020 a [House of Lords report](#) noted that 19% of individuals lacked basic digital skills; in June a further report [warned against the adoption of digital engagement](#) as a replacement for other methods. The House of Commons Committee on Housing Communities and Local Government has reported [on the planning White Paper](#); noting that 9 million people in the UK struggle to use the internet and 11.9 million people lack digital skills. Although the emerging environment bill includes the first definition of a ‘digitally excluded person’ and there is some [planning guidance on how to reach people without internet access](#), the planning White Paper does not engage with the concept of digital discrimination and digital exclusion.

The other emerging issue is algorithmic bias. There is already a [concept of bias, established in case law](#): whether a fair-minded and informed observer with access to all the relevant facts concludes that there was a real possibility that the decision-maker was biased. The test is based on human assessment of human behaviour – in a recent case a judge ruled that [Thanet Council mishandled a planning application](#), leading to his conclusion that a “fair-minded observer would have thought there was a real possibility that the decision-maker was biased”.

Algorithmic bias occurs when an algorithm has been trained on inadequate data or programmed badly so that outputs can embed and amplify social inequities in a way that can neither be seen or understood by the humans they affect. The risks of such processes became apparent in summer 2020 where [automated exam grading](#) resulted in the perception of preferential treatment of students from private over state schools. An [Alan Turing Institute report](#) commented that the algorithm operated in a functionally discriminatory way, while [the ODI criticised Ofqual](#) for its lack of transparency, its unwillingness to acknowledge and address issues early in the process, and the inadequate assessment of potential impacts.

Algorithmic bias is a particular problem for planning where developments are approved including sensory technology embedded either in the buildings or the spaces around them. The [Neuroscience Playbook](#) promotes the use of electroencephalograms (EEGs) and eye tracking in public settings to create 'scientific baselines' for assessing how humans interact with the environment. There is emerging work on using [gait analysis](#) to assess intoxication and on [measuring emotional responses](#) in a court environment. [Moda is promoting a build-to-rent development](#) where 'multiple sensors' measure motion and occupancy, and residents connect directly with the building through the relevant app and the Connected Places Catapult is promoting 15 projects under the umbrella of [Forever Living Homes](#), most of which appear to use sensors or monitoring or both.

The use of such technology, combined with automated processing, creates a surveillant environment recording and processing a range of data about human movements and activities. Facial recognition technology (FRT) is an area of particular concern. In September 2020 the [Court of Appeal ruled that use of FRT by the South Wales Police was in breach](#) of the public sector equality duty and that police intending to use the technology in the future should 'satisfy themselves that everything reasonable which could be done had been done in order to make sure that the software used does not have a racial or gender bias'. In January 2021 the Biometrics and Forensics Ethics Group published [a report on the public-private use of live FRT](#) noting its increased use in shops, shopping centres and housing estates. A report [by the Ada Lovelace Institute](#) has called for comprehensive legislation for biometric technologies, an oversight body and minimum standards for the design and deployment of biometric technologies and has just started a [legal review on the governance of biometric data](#).



*public spaces and even private homes could become places and spaces where inequality is embedded, yet unseen*

The [Information Commissioner has recently published a blog post](#) and an [Opinion](#) on the use of FRT in public spaces following six investigations of its existing or planned use. She reported that ‘controllers often gave insufficient consideration to the necessity, proportionality and fairness of the use of Live Facial Recognition (LFR) systems and failed to be sufficiently transparent’ and that ‘controllers did not always do enough to demonstrate a fair balance between their own purposes and the interests, rights and freedoms of the public’.

None of these concerns look likely to halt the development of sensory technology or its potential to infer information about humans. Unless the planning system starts to address the full implications of these technologies, public spaces and even private homes could become places and spaces where inequality is embedded, yet unseen.

## Human rights

The European Convention on Human Rights (ECHR) is embedded in UK law through the Human Rights Act 1998. A number of rights are relevant to proposals for development but the one most commonly asserted is Article 8 that protects the right to a private life, including specifically family life, home, and correspondence. The relevance of Article 8 to planning decisions has been shown in numerous cases involving developments by the traveller community and continues to be relevant; in January 2020 an [injunction for a borough-wide prohibition on travellers in Bromley was refused](#) in partial reliance on Article 8 rights.

Article 8 is generally asserted in the context of development proposals to challenge the use of legal powers to deprive communities from occupying land – such as the injunction mentioned above. However, the courts have ruled that [Article 8 included a ‘reasonable expectation of privacy’](#) and Article 8 was one of the grounds of challenge to the use of FRT by the South Wales Police in the Bridges [case](#), where the Court of Appeal ruled that use of AFR technology both engaged and infringed Article 8. The intrusive nature of the new technologies, and their capacity to be embedded within physical structures, means that their human rights implications are potentially relevant to any development consent where these technologies are used.

In June 2020 the Surveillance Camera Commissioner’s annual report noted that: ‘The growing capabilities of overt surveillance technologies...are increasingly ‘a question of trust’ for society’ and the draft EU AI regulation recognises the potential for AI to impact on a number of fundamental rights including Article 8. It may not be long before the ‘reasonable expectation of privacy’ is asserted in challenges to developments where buildings themselves perform an ‘overlooking’ function and blur the lines between physical and psychological boundaries, making surveillant technologies a planning as well as a human rights issue.

## Ethics

Ethics are not defined in the same way as protected characteristics or human rights, nor are they regulated in the same way as consultation requirements, but they are relevant to the planning system because the decisions about development are managed by local authority officers, and taken by local authority members, or planning inspectors, or by the Secretary of State within the context of policies adopted by the UK government. The conduct of individuals in any of these roles is underpinned by the need to observe the Nolan Principles (the Principles) for conduct in public life promoted and upheld by the Committee on Standards in Public Life (the Committee):

- Selflessness
- Integrity
- Objectivity
- Accountability
- Openness
- Honesty
- Leadership

In 2019, [the committee reviewed the standards as they apply in local government](#) and identified four core elements of an ethical cultures:

- A civil and constructive standard of behaviour
- Training that embeds this culture across all parties
- Objective oversight
- Openness to scrutiny and change

The Principles underpin the codes of conduct adopted by central and local government, including those for planning authorities and planning processes, but they are based on established conventions rather than legal rules and rely on collective and continued observance. In July 2020 [Transparency International UK](#) issued a report [that identified a decline in transparency, scrutiny and oversight](#), an increase in cronyism and the adoption of local standards rather than the principles. In November 2020, the Chair of the Committee gave a [speech](#) that noted a tendency for ‘those in public life’ to ignore the Principles. The Committee has since reviewed the current standards and published an interim [report](#) noting that adherence to the Principles is being considered in a number of parliamentary and government inquiries and recommending immediate reform in four areas of government practice. The Law Commission has gone further, recommending [the creation of two new offences](#): corruption in public office and breach of duty in public office.

In November 2020, the CDEI published a review [on bias in algorithmic decision-making](#) and noted a lack of clarity on ‘how legislation such as the Equality Act 2010 and Human Rights Act 1998 should be applied’. A June 2020 [House of Lords report on digital technology](#) noted not only that regulation lags behind innovation but that democracy itself could be considered ‘increasingly outmoded and irrelevant in a digital era’. The existing ethical norms that frame planning decisions seem increasingly unfit for purpose.

## Digital Ethics

There is no formal definition of data or digital ethics, but there is a wide range of guidance saturated with principles and recommended actions that encourage ethical approaches to data.

- Section 7 of the [NDS](#) recognises government responsibility to drive ‘safe and trusted’ use of data, including provision of ‘a clear and predictable legal framework’ and willingness to be ‘transparent and prepared to open itself up to scrutiny’.
- The national [Data Ethics Framework](#) identifies three overarching principles: transparency, accountability and fairness.
- The Open Data Institute defines data ethics as: ‘a branch of ethics that evaluates data practices’. Its [Data Ethics Canvas](#) identifies issues relevant to digital ethics including the need to take existing legislation and policy into account, the importance of keeping personal and sensitive information secure; the need for transparency and the availability of appeal mechanisms.
- The CDEI has not identified a core set of ethical principles but its report [on trust in public sector use of data](#) stresses the need for accountability, transparency, and control.

There are also data ethics principles emerging that are specific to property. The [RED Foundation](#) has proposed [six principles to be applied to all data used in real estate transactions](#) throughout the supply chain:

- Accountable
- Transparent
- Proportionate
- Confidential and private
- Lawful
- Secure

And [EthicalGEO](#) has issued the [Locus Charter](#) with 10 principles:

- Realise opportunities
- Understand impacts
- Do no harm
- Protect the vulnerable
- Address bias
- Minimise intrusion
- Minimise data
- Protect privacy
- Prevent identification and
- Provide accountability.

Although they differ in context, content and purpose, these ethical data standards are consistent both with established ethical norms and have many values such as transparency and accountability in common. However, they have no legal weight. They cannot be asserted in the same way as a human right, they are not protected in

the same way as equalities characteristics, they have no canon of case law behind them to give them force as a precedent for future judgments.



*Local authorities besieged by housing delivery requirements and staffed with overstretched planning officers are unlikely to invest the necessary time and effort to evaluate competing principles or to adapt them for use in the planning process*

New blogposts, articles, reviews, toolkits, playbooks, reports, and recommendations emerge on what seems like a daily basis. The emerging guidance rarely references established legal controls on human rights and equalities or established ethical norms such as the Principles. Local authorities besieged by housing delivery requirements and staffed with overstretched planning officers are unlikely to invest the necessary time and effort to evaluate competing principles or to adapt them for use in the planning process. It is difficult to see why commercial property entities would invest in digital ethics while the policy landscape is so crowded and lacking in central direction.

The government has issued a Data Ethics Framework and consulted on a National Data Strategy, but universal regulatory controls look unlikely and it is difficult to identify a clear national policy position either. There is an immediate need for an evolved approach that accommodates recent developments in technology, anticipates future changes and integrates the current approaches with emerging guidance from new sources.

## Section 3 summary

The core challenge is how to embed emerging principles of digital ethics as a complementary element in a system of law and policy that has yet to acknowledge that land has a digital identity. There is no simple, or single fix, but there are a number of changes that, if made, would improve the ethics of digital planning immediately.

Because of the scope of its powers and its central role in making law and policy the government has primary responsibility to demonstrate good ethical practice in action. The recent parliamentary report [‘Digital Technology and the Resurrection of Trust’](#) recommended the creation of ‘an independent democratic information hub’ providing information and creating a way of sharing best practice. The government could also centralise its guidance on consultation in the planning process and provide clear

principles on how to carry out an online consultation together with specific recommendations for ensuring that digitally excluded individuals are still kept informed.

Local authorities could also do a great deal to embed digital ethics in the consideration of planning applications. The ICO has recently issued an opinion [on the use of LFR technology in public places](#); this gives local authorities the perfect opportunity to ask whether development proposals include embedded sensory technology, and to require compliance with the Information Commissioner's recommendations for its use.

In January 2021, the ICO launched a consultation [on data ethics and the GDPR](#) recognising that legal compliance could be enhanced with a 'structured consideration' of ethical implications. The ICO has not yet reported on the outcome, but in the meantime there is an opportunity for any organisation with responsibility for data to adopt a set of ethical principles that can be applied in both by planning practitioners adjusting to a digital world and specialists who want to see digital ethics embedded in all decision-making processes.

In December 2020 the World Economic Forum issued its [paper 'Agile Regulation for the Fourth Industrial Revolution'](#) proposing that the 'regulate and forget' model could be replaced with a cycle of continuous learning that tests regulation in parallel with the development of the technology. As the WEF recognises in its [paper on agile governance](#): 'If government alone can no longer provide sufficient governance of emerging technologies in the Fourth Industrial Revolution, then new sources of authority need to emerge'. Rather than waiting for government regulation or guidance, this is the perfect time for a co-operative local authority to establish a regulatory sandbox and work with developers and data institutions within this safe space on the co-creation of good digital practice that could be tested in other contexts and develop into an industry standard.



# Conclusion

The [planning White Paper](#) promised changes including ‘harnessing the benefits’ of digitisation and moving towards a system ‘based on data, not documents’. All stakeholders in the planning system acknowledge the need to shift to a digital future, and the need to improve the way that data is monitored, shared, processed and stored. There is less clarity and agreement on how this is to be achieved.

- There is much talk of digitisation but the system continues to be based on a definition of land that excludes its digital counterparts.
- Much of the recent shift to digital was reactive, we have already defaulted to ‘physical’ planning committees and many other procedural changes will revert to their analogue origins at the end of the Covid-19 restrictions.
- An increasing number of local authorities are using AI to replace human functions and inform planning decisions but there is no apparent intention to acknowledge its role, explain its function or mitigate its risks.
- The planning system is accustomed to taking the potential impacts of developments on equalities and human rights into account, but ethical norms are shifting and there is no evidence that the system is ready or able to adjust.

There is no single, or simple, solution to these issues but the future offers opportunities as well as challenges.

In the 1902 book [Garden Cities of Tomorrow](#), Ebenezer Howard recognised that his radical re-visioning of urban development could only be achieved through ‘the hearty co-operation of men and of women experienced in very numerous departments of human activity’. Civil society organisations such as the [Ada Lovelace Institute](#), the [Alan Turing Institute](#) and the [Open Data Institute](#) have emerged in parallel with the new technologies. These institutions are rich sources of expertise and insight on data and technology; developing relationships with them would be one good step towards developing awareness of the digital as well as the physical aspects of new developments.

In the 2020 [report on Global Technology Governance](#) the World Economic Forum argued that governing new technologies ‘will require new principles, rules and protocols’. A more agile approach to governance is also promoted in a recent [white paper](#) by the BSI, the CDBB and the Construction Innovation Hub. Neither the legal nor the planning professions are known for their agility and flexibility but if we really want to build an evolved system of regulation and governance, a regulatory sandbox is a great place to start.

# Section 2 Appendix 1: AI Strategy

| The appendices relate to [Section 2: Automation of the planning process](#) |

## Introduction

Artificial Intelligence (AI) is a powerful tool in delivering modern, agile, and efficient public services. It is also a disruptive technology which comes with its own risks, is constantly evolving, and is not always well understood. It is important to ensure that this Council maximises the current and future opportunities offered by this new technology while minimising the risk of harm from unintended consequences.

The purpose of this Strategy is to provide a brief explanation of what AI is and the benefits it offers as well as the major risks. It outlines the existing governance context for AI and introduces this Council's principles for the way we will procure, implement and use this new technology.

## What is AI

'Artificial Intelligence' is a blanket term for a range of digital technologies that can take the place – partially or entirely – of human intelligence. The UK government [describes](#) it as 'the use of digital technology to create systems capable of performing tasks commonly thought to require intelligence'. AI can be used to generate predictions, recommendations, or classifications and used in a range of processes. Its functions are performed through algorithms – pre-programmed rules applied to the data in question.

Algorithms can be transparent and explainable, with clear rules and consistently repeated functionality, but recently there have been significant developments in machine learning (ML), a type of artificial intelligence, where the machine can devise its own rules that achieve the objective more effectively. These processes are powerful, complex and opaque, and are commonly referred to as non-interpretable or 'black box' AI systems.

There are three main types of outputs: classifications, predictions and recommendations. An algorithm could be trained to recognise different types of trees and use this to classify the composition of a forest. An algorithm could be trained to understand which trees do well in warmer climates and use this to predict which trees would thrive best if temperatures increased. An algorithm could be written to combine both of these outputs to produce a good recommendation of what kinds of trees should be planted in a particular area.

## The benefits of AI

AI can process large amounts of information very quickly. This offers a range of opportunities, for example it can:

- improve the evidence base we use to make policies
- maximise human resources and reduce environmental impacts by replacing some administrative functions
- help us make decisions by providing a range of predictions about the potential impact of those decisions

## AI: issues and risks

AI offers specific benefits but also has particular risks, especially when used in a public sector context where people often do not have a choice over whether or not to use a service.

- AI relies on large quantities of relevant high-quality data, raising questions about how this data should be collected, stored and shared, and according to what restrictions.
- ML relies on algorithms that create their own ways of achieving outputs, this means that they are not transparent and it will be difficult to give reasons for decisions made by that algorithm.
- If an algorithm has been trained to operate using poor datasets or based on inaccurate assumptions, it may operate in a biased way, and the bias may become embedded or amplified over time.
- The combination of sensory technology and powerful algorithms facilitates the capture of a wide range of human information including biometric data. This raises significant issues in terms of privacy and intrusion.

## Governance context

The only current law on AI is the General Data Protection Regulation (GDPR) transposed into UK law through the Data Protection Act 2018. This protects principles of data protection including lawfulness, transparency, minimisation and accountability. Article 22 protects the right of the individual not to be subject to a decision based solely on automated processing which produces legal effects or similarly significantly affects him or her.

In addition, for public sector decisions the Public Sector Equality Duty (PSED) requires local authorities to have due regard to the need to eliminate unlawful discrimination, harassment and victimisation; advance equality of opportunity and foster good relations between people who share a protected characteristic and those who do not. The use of AI raises new issues to be considered, including digital discrimination and algorithmic bias.

Finally, Article 8 of the Human Rights Act 1998 protects an individual's right to respect for private and family life, home and correspondence. It is engaged when AI is used in partnership with biometric technologies such as Live Facial Recognition (LFR) and may need to be considered when, for example, developments are proposed that include these technologies.

There is a large and growing amount of guidance on the ethical use of AI; these are some of the most relevant and useful sources:

- The government's [guidance](#) on use of AI in the public sector
- The Committee on Standards in Public Life [report](#) on AI and public standards
- The Information Commissioner's Office (ICO) and Alan Turing Institute [joint guidance](#) on explaining decisions made with AI
- The NESTA [Principles](#) for public sector use of algorithmic decision-making
- The emerging National [AI Strategy](#)

## Our Principles

These principles are intended to act as a statement of intent, not the answer to every relevant issue, but they form the basis of all of our actions and decisions in relation to AI:

- At all times during the consideration or use of AI there will be a transparent chain of responsibility for procurement, implementation, or management of the technology.
- The public will be informed of any intention to use AI in any process.
- The proposed use or subsequent modification of an AI system will be subject to internal and external consultation.
- Procurement of AI software will include considerations specific to its use, including whether AI is the best solution to the problem.
- Any decision to use AI will include transparent assessment of risks, benefits and mitigations including consideration of cybersecurity, equalities implications, employment implications and risk mitigation.
- Any decision to employ automated capture of biometric information will take into account legal implications and compliance requirements under GDPR, PSED and Article 8.
- There will be robust monitoring of any AI system in use including compliance with GDPR and potential discriminatory outputs.
- All adopted AI systems will include human oversight and the ability to challenge decisions made using AI.
- There will be training for members and staff on the benefits, risks and mitigations specific to AI and on the responsible use of AI.
- These principles will be reviewed regularly and at least once a year.

# Section 2 Appendix 2:

## AI procurement checklist

| The appendices relate to [Section 2: Automation of the planning process](#) |

### Prior to procurement

- Identify the problem you are trying to fix, the likely benefits for the local authority and the public and why there is a need for external procurement.
- Let relevant members and officers know what you were doing, and consider if wider internal/external engagement might be useful – for example contacting other local councils to see whether this technology has been used before and if so what the issues were.
- Consider widening the scope of the exercise to non-traditional suppliers including academic research institutes, SMEs and startups.
- Set up a team that is as diverse as possible in terms of representation and skills, and agree who will have access to what data and information.

### Procurement questions

1. The algorithm:
  - 1) How was it trained?
  - 2) Is it interpretable - can we explain it in a way everyone can understand?
  - 3) Is there proof of concept?
  - 4) Who owns it?
  - 5) Who has the authority to change and/or modify the code?
2. The data:
  - 1) Is there any special category data?
  - 2) Have open standards been used - and are these standards consistent with any industry standard?
  - 3) Who can use this data in the future
  - 4) Can the data be shared in the wider public context?
3. Interoperability:
  - 1) What software has been used?
  - 2) How easy/difficult is integration with current systems?
  - 3) Who is liable for errors?
4. Equalities issues:
  - 1) How diverse is the data and is it appropriate for the context?
  - 2) Was tagging outsourced and if so where to?
  - 3) How diverse is the team who developed this technology?
5. Other impacts:

- 1) Can existing staff will be trained to run and maintain the system?
- 2) Will there be training for staff and members?
6. Future:
  - 1) Potential for improvements to be built into future operations
  - 2) Who owns future data?
  - 3) Will there be regular reports on its usefulness?

#### The decision to procure

- Decide who makes the decision and check that it is covered by the constitution
- Carry out an initial impact assessment including risks, such as impact on jobs, and benefits, such as savings of time and costs, and legal issues, including equalities, human rights, General Data Protection Regulation and Environmental Information Regulations
- Address the interpretability of the algorithm and any mitigation measures proposed
- Consider requiring specific contract terms covering:
  - Responsibility for each element of the model and any output failures
  - Data ownership, management and sharing arrangements
  - Ownership of algorithm and outputs
  - Ethical standards – compliance with recognised principles
  - Disaster recovery/business continuity and roll-back provisions
  - Process logs and incident management framework
- 7. Record the decision in writing with reasons even if the decision is well within delegated powers

Useful Resources: Office for AI '[Guidelines for AI procurement](#)', World Economic Forum '[AI Procurement in a Box](#)'

# Section 2 Appendix 3:

## Report on adoption of chatbot

| The appendices relate to [Section 2: Automation of the planning process](#) |

**Title** Adoption of chatbots for planning queries

**Date**

**Name:** xxx Council

**Purpose of Report:** To consider and approve the use of chatbots in the planning service

1. Executive summary
  - a. The planning service proposes to implement the use of chatbots in its planning service.
  - b. Chatbots are a form of Artificial Intelligence (AI) which is a novel and disruptive technology. The public are entitled to expect that decisions to use this technology are taken as transparently as possible, as is [recognised by the Centre for Data Ethics and Innovation](#).
  - c. The purpose of this report is to identify the specific issues relevant to the use of this technology so that all implications and benefits are clear before it is implemented.
2. Recommendation
  - a. The planning service adopts chatbots to deal with routine queries within the development planning service.
  - b. The use of this technology is formally reviewed no less than 12 months from the date of this decision.
3. The technology
  - a. Chatbots are conversational tools based on software designed to substitute human verbal interaction with automated processes to aid customer service on online platforms. They rely on a number of different algorithms:
    - i. Robotic Process Automation (RPA): where a robot or bot mimics the actions a human takes to complete a specific task such as completing a form;
    - ii. Natural Language Processing (NLP): a process facilitates communication between computers and humans, recognising words, their meaning, context and the narrative,

converting speech into text that generates automatic replies to human queries;

- iii. NLP relies on predictive analysis to help to anticipate the content of the exchange, sentiment analysis to help decide the meaning of a phrase in context and text classifications to understand specific phrases and colloquialisms.

- b. Chatbots are already in use at the [Driver and Vehicle Licensing Authority \(DVLA\)](#) to automate frequent customer enquiries and by the [Ministry of Justice](#) to investigate the usefulness of different ways of presenting information online.

#### 4. This project

- a. The planning service is keen to maximise officer time by focussing human resources on complex work and areas of the service where human interaction is most useful.
- b. A significant amount of officer time is currently taken up in answering very routine questions. Members of the public are frustrated by lack of access to officers who can answer their questions, especially outside office hours and at weekends.
- c. A recent review of resources examined records of telephone inquiries, emails and commonly raised concerns and reviewed the existing analytics for the most searched and visited webpages and combined this with feedback from users, advisors and team to identify problems that could be solved by the use of this technology.
- d. It was decided to investigate the potential to use a chatbot to provide a public service providing automated answers to routine questions asked by the public including:
  - i. Whether or not a property is listed or subject to other significant development constraints on development;
  - ii. The development plan policies relevant to a particular site;
  - iii. The fees payable for a range of planning applications;
  - iv. Whether or not consent is required for a specific list of small household developments.
- e. XX was selected as the preferred provider for this project because (more detail on selection process). In addition, this programme is seen as particularly helpful because it has the capacity to record the questions which it cannot answer. This facilitates constant human intervention and for new answers to be programmed in, so that the system improves continuously as it is used.

#### 5. Risks, benefits and mitigation

- a. It is also important that all of the potential risks identified with the use of this technology in this context are identified and the mitigations that have been put in place are clearly explained.
- b. The known risks, together with appropriate mitigating measures, are set out in this table.



Risk	Details and mitigation
<p>Openness: the decision to use AI should be an open one</p>	<ul style="list-style-type: none"> <li>• Internal consultation and engagement was carried out. It is also intended to carry out a similar engagement exercise within six months of implementation of the service.</li> <li>• There is no current intention to repurpose the software for use in other services and the council will consult on such proposals before they are adopted or implemented.</li> </ul>
<p>Data compliance and quality: The use of AI technology is considered special category data by the Information Commissioner's Office (ICO) and has particular regulatory requirements.</p>	<ul style="list-style-type: none"> <li>• A DPIA (Data Privacy Impact Assessment) has been undertaken and will be reviewed regularly. It is available as a Background Paper to this report.</li> <li>• We used structured data that was carefully sourced tagged and organised in a way that was as relevant to planning as possible and we tested response accuracy a number of times in the process.</li> <li>• Records are maintained on the programming of the algorithm, and they are stored and available on request for testing or inspection.</li> <li>• We will add and reorganise data as the project develops.</li> </ul>
<p>Bias: AI can lead to biased decisions from flaws in the overall design, from the use of biased data and by the creation of new personal data through automated de-anonymising.</p>	<ul style="list-style-type: none"> <li>• The supplier has shown that the system was trained on datasets that were sufficiently broad, covering all relevant dimensions of gender, ethnicity and other possible grounds of prohibited discrimination.</li> <li>• We have documented what the model optimises for and which weights are designed to certain parameters..</li> <li>• An EQIA (Equalities Impact Assessment) has been undertaken and will be reviewed regularly. It is available as a Background Paper to this report.</li> </ul>
<p>Accessibility: The service needs to be user-friendly so that it does not exclude members of the community who do not have digital skills.</p>	<ul style="list-style-type: none"> <li>• The service is easily identifiable within the council's website.</li> <li>• It is clear to anyone using the service that they are not talking to a real person.</li> <li>• Users have the option to download and/or have transcripts of their exchange emailed to them.</li> <li>• Where users do not have access to a computer or are uncomfortable engaging with a chatbot, they can always speak to a member of staff.</li> </ul>
<p>Security: The technology may be vulnerable to being hacked. It must also integrate fully with the council's existing software.</p>	<ul style="list-style-type: none"> <li>• The system has been designed to self-report on its accuracy during all life cycle phases including all errors or inconsistencies.</li> <li>• Liability for design flaws has been assigned to the software developer within the contract for the service.</li> </ul>

	<ul style="list-style-type: none"> <li>• The software used to build the chatbot is Microsoft Azure, a cloud computing service that enables applications to be built, tested, used and managed through Microsoft data centres. This enables full integration with all existing systems and ensures resilience to cyber attacks.</li> <li>• Although the software is externally provided the system will be operated by council officers who will be fully trained in its use.</li> </ul>
Opacity: The algorithm has the capacity to self-learn. As it becomes more sophisticated it will become more difficult to explain or challenge what it does.	<ul style="list-style-type: none"> <li>• While the algorithm is capable of working autonomously its basic function has been defined and constrained by human developers.</li> <li>• Outputs are regularly reviewed and validated by humans.</li> <li>• There is a retained human function of human intervention and/or deactivation, implementable in real time.</li> <li>• The system is regularly monitored and reported on.</li> </ul>
Human Impact	<ul style="list-style-type: none"> <li>• The adoption of this technology is not expected to lead to any loss of jobs.</li> <li>• Future impacts of the wider adoption of this technology will be mitigated by offering all members of staff access to training on use of AI systems and the development of digital skills.</li> </ul>

## 6. Benefits

- It is expected that this technology could automate up to 60% of routine queries, which will improve our responsiveness as a service.
- Staff time will be freed up to deal with more complex applications where human input is required, which will also benefit the service as a whole.
- Testing the technology in one service and in a relatively limited context will inform wider adoption of this technology in other services and help set a sound foundation for the use of more complex and/or pervasive technologies in the future.

## 7. Options

- The council could decide not to adopt the technology or to adopt this technology on a strictly temporary basis.

## 8. Conclusion

- Although there are some novel issues associated with the use of a chatbot, in this context the risks have been clearly identified and are sufficiently mitigated.
- This decision is consistent with our strategic policies the UK government guidance '[Using chatbots and webchat tools](#)' and the report '[Artificial Intelligence and Public Standards](#)', and is informed by '[Chatbots RESET A Framework for Governing Responsible Use of Conversational AI in Healthcare](#)' produced by the World Economic Forum.

- c. The technology is recommended for adoption, subject to a review of its use no later than twelve months from today.

Background Paper: Data Protection Impact Assessment

Background Paper: Equalities Impact Assessment