

AI IN URBAN PLANNING ENGAGEMENT AND CO-DESIGN

Commonplace



Table of Contents

Foreword by Al Kingsley:
Chair of the Business Board at Peterborough and Cambridgeshire Combined Authority 3

Introduction 4

AI in planning (an overview) 6

AI hurdles to navigate 11

Common barriers to adopting AI 15

Commonplace and AI: TrendsAI 17

Who are Commonplace? 21

Foreword by Al Kingsley: Chair of the Business Board at Peterborough and Cambridgeshire Combined Authority

As was recently commented at an RTPI event, **“AI in planning is going to happen whether we like it or not”.** Working in leadership roles across edtech and local government, I have a very similar view of the progress of AI: I have seen AI grow in a similar way to microprocessors following Moore’s Law. But I also strongly believe there are ways of doing AI well - and not so well.

So, I was delighted to participate in a panel hosted by Commonplace on the topic at the May 2024 UKREiiF conference in Leeds and contribute this foreword.

Planning and development are data-rich processes, so there is no shortage of scope for AI to improve their efficiency. One aspect of planning that stands to benefit significantly from AI is our ability to understand the needs and aspirations of the community, and to co-design solutions with them that are acceptable and beneficial, and deliver the scale of housing that the country needs. AI can help categorise, analyse, summarise, and compare data collected from the community, to help inform decision-making, which is essential if we are to deliver new developments that support growth and social value in our towns, cities, and villages. This report does a great job of explaining how developers and local governments can benefit from using AI for this purpose.

Introduction

It is a fact that artificial intelligence is already everywhere, including in urban planning and real estate development. When speaking to partners and customers on this, the same few questions surfaced time and again:

- **How is AI currently being used and how will it be used in the future?**
- **What legalities surround the use of AI in planning?**
- **How will local authorities benefit from AI?**

And we'll be answering all of these

AI has been gradually introduced to various areas of planning and local government, aiming to automate laborious manual processes, increase consistency; and save both time and money. With a continual squeeze on local government resources, there is a clear logic to this. However, it is currently being offset by hesitancy, caution and sometimes fear.

It's fascinating to observe how AI has started to take hold in planning and local government, and where it is (and isn't) working. The question that remains for many is simply is this the future?

And that's exactly what we'll be looking at in this guide!

Keep on reading to discover:

- **Where AI is currently being used in planning and development**
- **The opportunities and challenges that come with this new era**
- **The ethical considerations and the skills needed to navigate a potentially AI-powered future**
- **The risks and benefits of implementing AI yourself**
- **How we developed and trained our very own AI model: TrendsAI**

Let's get started!

> **Quick summary:** *A few years ago if we heard the words Artificial Intelligence, visions of Skynet and Hal3000 probably came to mind. However, in this day and age, AI is still a far cry from those dystopic visions. As defined by IBM, AI "is technology that enables computers and machines to simulate human intelligence and problem-solving capabilities," meaning any model or system that can learn from the data sets it is given.*

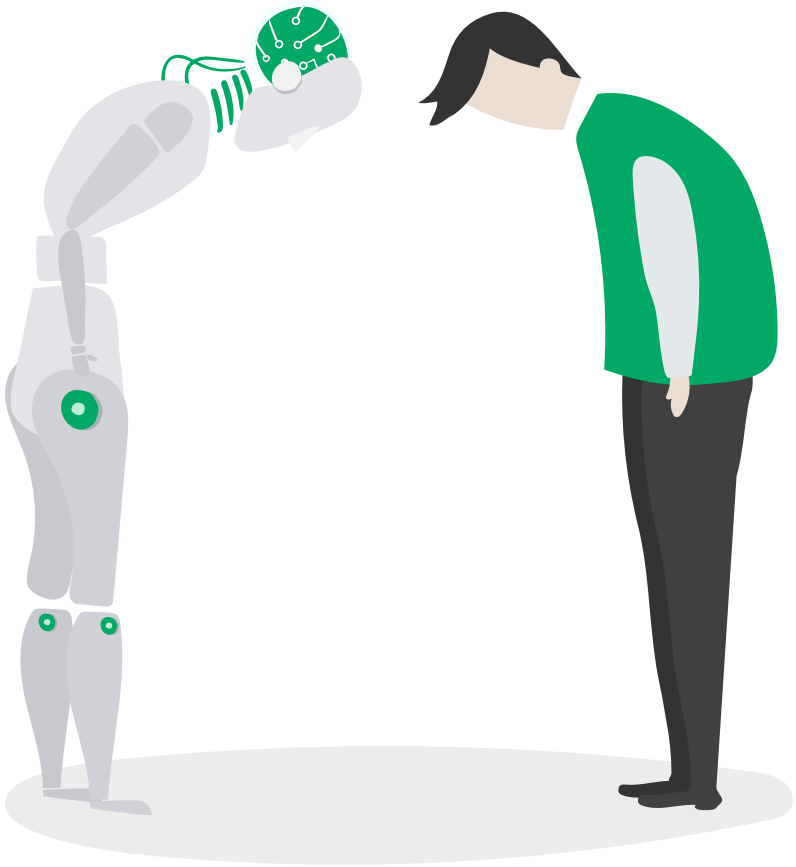
Here are a few terms that we will use throughout the report:

Analytical AI Tools are mainly used to classify, categorise and generate insight from input data.

Large Language Models (LLM) are machine-learning models powered by neural networks. They learn to understand statistical relationships from large amounts of text data.

Natural Language Processing (NLP) describes the ability of a computer program to understand human language as it's spoken and written, often using Extreme Text Classification (XTC).

Generative AI Tools such as ChatGPT and Copilot create new text by taking an input text (or prompt) and repeatedly predicting the next word.



AI in planning (an overview)

So, how is AI supposed to help urban and rural planning processes? As a tool, it's best at identifying patterns, extracting ideas, and providing insights. As data-led models, they are currently being used to automate more complex administrative tasks and make planning processes smoother.

Local Plans

Community involvement in Local Plans is on the rise. Commonplace has hosted 40 consultations on Local Plans in the past 2 years, amounting to over 40,300 responses from the public, a figure unimaginable in the days of town hall meetings and letters.

Planning officers are continuously seeking ways to consult residents, workers and visitors at the appropriate stages of the Reg18 and Reg19 processes. In addition, beyond the statutory Local Plan, other similar engagements are underway on nighttime strategies, transport plans, net zero policies and so on. Each response generates data and work for local government teams to collate and analyse.

The process of reviewing public responses is often cited by planning policy teams as the most time-consuming:

- Summarising answers to single or multiple-choice questions is a long process, requiring skilled analysts to ensure the evaluation is robust
- Free text comments are often very long and cover several different topics and sentiments
- Many representations arrive as multi-page technical PDFs written by architects or lawyers on behalf of developers or statutory consultees

- Not all parts of the free text response are substantive or relevant
- Reading, tagging and reviewing each free text comment manually takes time (more than you might think)
- Reading, tagging and reviewing each free text comment is done by a variety of planning officers, which introduces subjectivity and inconsistency

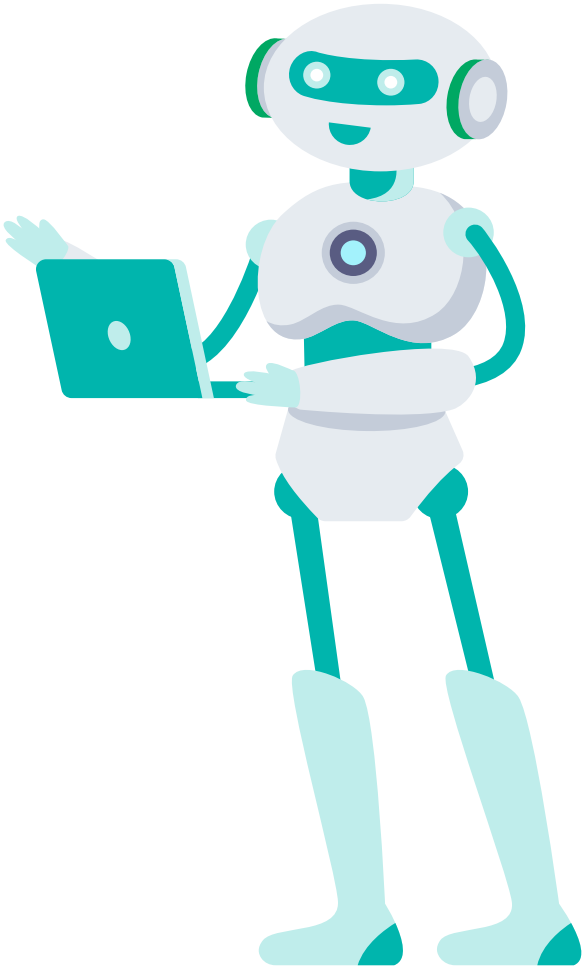
Planning policy teams not only need to analyse the data centrally, but also pass it to various departments for review and response. As such, the planning policy team's analysis is under scrutiny, not only from the public, but also from internal departments that have strong motives in the Local Plan process.

While 40 local authorities have taken brave steps to consult digitally, attracting over 1,000 responses on average, the remaining 90% of local authorities are more tentative, put off by the analytical burden of broadening their engagement.

The manual work to read and review public comments and PDF submissions represents thousands of hours for each phase of a Local Plan cycle. Ironically, this means that the local authorities who are best at reaching a wide audience for feedback suffer from longer development times and larger costs with the analysis. This often leads to delays.

So... how does AI fit into this?

- **AI can analyse almost unlimited volumes of public feedback data**: combining free text comments with quantitative information on respondent location, demographics and more. It also works to automatically summarise key themes, sentiments and opinions in Local Plan responses. It can do this more accurately, precisely and consistently than a team of humans.
- **Report writing can also be accelerated**: bespoke generative AI tools can be trained to write summaries at the policy level and take time out of producing stock paragraphs, responses and policy recommendations or decisions.
- **By considering the use of AI to review public comments**, planning officers could save hundreds of thousands of hours and be positioned to confidently engage the public about the design of the local built environment and community services. The newly appointed government (July 2024) is



working to shift the conversation about planning to be more focused on how a development should be designed, which is likely to drive further need for public engagement.

- Returning to the 90% of local authorities, who have not yet broadened out their engagement, there is no longer a variable cost to generating or analysing high numbers of responses, only a benefit in attracting a more representative, and typically more supportive, set of views.

Planning Applications

Every year hundreds of thousands of Planning Applications are submitted in the United Kingdom. Each requires days of local government time to validate, review and process. AI is already proving effective in educing time and cost, for example, in:

Analysing public feedback

Reviewing public comments is often cited by planning officers as the most cumbersome:

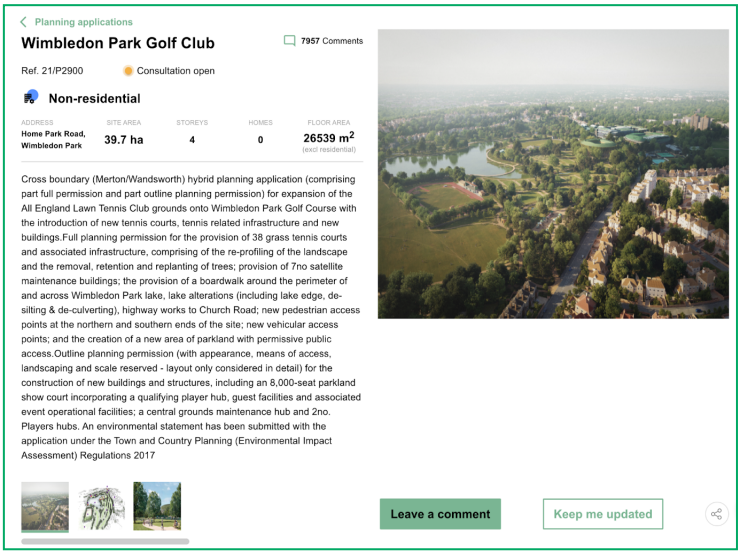
- Public comments are often very long and cover several different topics and sentiments
- Often, only small parts of the response are relevant
- Reading, tagging and reviewing each comment manually takes time (more than you might think)
- Reading, tagging and reviewing each comment is done by a variety of planning officers, which introduces subjectivity and inconsistency
    - This can lead to situations where free text comments from the public are not invited or considered, planning officers instead resorting to a count of objectors vs supporters

All this means that planning officers are hesitant to use free text questions (one of the best ways to maximise public participation and increase support), resulting in reduced collaboration with the community and missed co-design opportunities.

Now, thanks to a select few local government planning teams upgrading their digital engagement solutions, some major applications are beginning to attract thousands of comments. That's more work than ever for planning officers to sort through.

For example: This GLA planning application has attracted almost 8,000 comments at the time of going to press:

https://glaplanningapps.commonplace.is/en-GB/planningapps/21-P2900



The manual work to read and review public comments represents at least hundreds of thousands of person-hours per year. This has historically led to huge backlogs for planners and frustrations for applicants who have to chase for answers.

So... how does AI fit into this?

By considering the use of AI to review public comments, planning officers could save hundreds of thousands, or (according to our emerging analysis) possibly even millions, of hours and be positioned to confidently engage the public about the design of the local built environment and community services. The newly appointed government (July 2024) is working to shift the conversation about planning to be more focused on how a development should be designed, which is likely to drive further need for public engagement.

In summary: AI could not only save time and money but also increase the quality of the analysis and insights.

Predictive Modeling

When fed a constant stream of data, AI also has the power to predict potential issues like traffic congestion or the environmental impact of proposed developments. This allows for proactive planning and mitigation strategies.

One of the most exciting prospects for planning officers is for AI to support them with decision-making. We aren't advocating for AI to take over the expert role of the planning officer under any circumstances. However, the vast majority of applications are householder applications or change-of-use applications and AI could be harnessed to create an indicative recommendation on the decision.

If AI can be designed in such a way as to explain its workings and reasoning to the planning officer, its decisions could then be reviewed by the planning officer. This is happening in accountancy with tax returns or in legal contract reviews and is already showing early success. AI can output the level of confidence it has in its decision, helping planning officers identify and prioritise their time on the applications which are most difficult for the AI to work with.

Other planning use cases

Beyond Planning Applications and Local Plans, there are numerous other use cases where community responses can be analysed with AI:

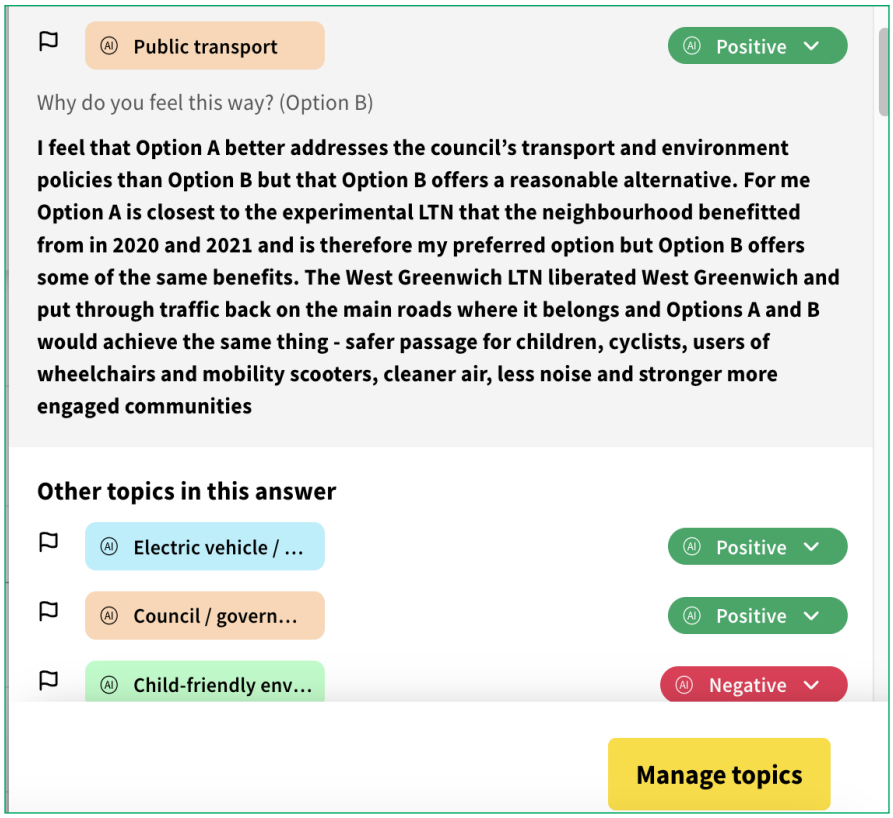
Residential property developers are under increasing pressure to engage communities in the run-up to a Planning Application. This is to support their design process and their statement of community involvement at the pre-planning stage. Taking the engagement route significantly reduces the risk of planning failure and enhances the real estate values post-development. Community engagement should continue through the construction and post-occupancy phases, allowing developers to build an end-to-end picture of their social impact.

All such phases present a similar analytics challenge to understand, summarise, then act upon the feedback gathered from the consultation. Too many pre-planning engagements are cursory and lack the option for free

text or voice capture answers due to the perceived analytics burden. AI can help overcome these hurdles if deployed correctly.

Transport planners up and down the UK have come under extreme pressure from car users, delivery drivers, commuter cyclists, leisure cyclists, pedestrians, wheelchair users, electric scooter riders, public transport users and providers, taxi passengers and drivers. Whether they work in the private or public sector, transport planners are under increasing threat of retaliation if they do not consult local people at an early stage. As such, we've seen transport proposals in major cities across the UK each attract over 40,000 responses from the community. Analysing this volume of data is beyond the reach of any planning team. It creates a reliance on a team of people being used to analyse and categorise answers, leading to errors and subjectivity. This is where AI comes in, particularly on highly divisive topics where opinions can be highly polarised.

A single response can include an emotional rant about rat runs, a suggestion about speed humps, ambivalence towards parklets and a hope for faster access for emergency services. AI can categorise these statements in a fraction of the time a human can and with much greater consistency of results.



(Commonplace TrendsAI)

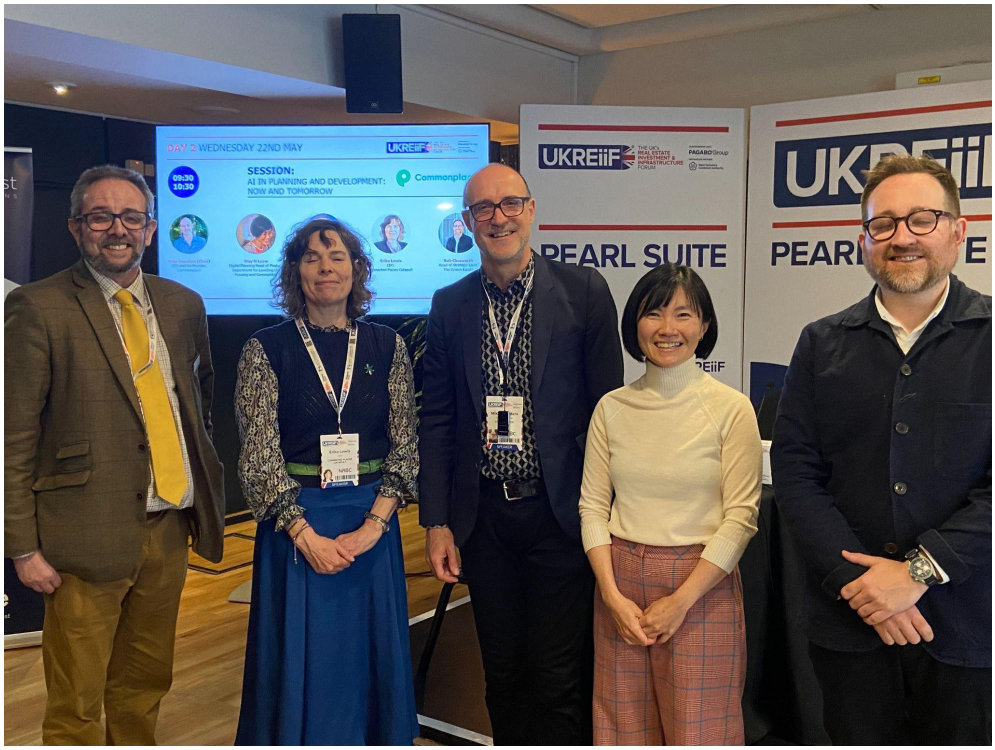
AI hurdles to navigate

To accelerate the effectiveness of AI in planning there are some hurdles to navigate:

- **Training the AI models accurately:** An AI model is only as good as the data it is trained on. The model needs to rely on a high volume of representative data and ongoing validations to deliver a sufficient level of accuracy. AI models will never be 100% accurate, but they deliver consistently against much higher volumes of repeat activity when compared to humans. Through our research, we've found that accuracy needs to be 95% plus for humans to adopt it confidently. Due to the specialised nature of planning, high precision cannot be achieved with generic off-the-shelf AI tools, requiring therefore a custom-built solution.
- **Training the AI models to be locally relevant:** Developing a model for one local authority is unlikely to provide a solution that can be employed in another geography. Planning law, material considerations and the nature of public comments vary hugely by neighbourhood, meaning that AI designed for Camden will perform poorly in Plymouth.
- **Training the AI models fairly:** While AI is being lorded as 'truly impartial' it will only be as impartial as the information it has access to. Historically, many demographics have been underrepresented when local authorities have tried to engage the surrounding community. If that data is fed to the model, it could lead to unfair and potentially discriminatory planning decisions. To solve this, we need to standardise the data to feed these AI models properly
- **Transparency issues:** It can be challenging to understand the models and algorithms that AI uses to reach its conclusions, making it difficult to understand or explain resulting planning decisions to the public
- **Legal uncertainty:** As a legal process, there are potential legal risks to the use of AI in planning. These might include the legal challenge of AI being used in the summarisation or analysis of planning applications to local authority officers and members. However, in the 2024 Spring budget, the previous government announced that 'a new pilot will use Artificial Intelligence to help speed up the development of local plans. In addition, new software will be explored to streamline key processes for

planning officers'. The Planning Inspectorate (PINS) also ran a pilot in 2022 to assess the potential of AI in assessing appeal evidence.
Many are also apprehensive about where accountability will lie should a decision made by the AI be wrong.
The Planning Officer? The company that supplied the AI? The LLM used by the AI company?

- **Cost:** Given the issues outlined above, the costs of building an in-house AI solution are prohibitive for most local planning authorities, particularly when risks around accuracy, bias, transparency and legality are factored in.
- **Skills:** This is a piece of technology that new and existing employees will need to be trained to use. In future, we may see skills like this popping up on CVs and as specifications in job descriptions.



To investigate these issues further, Commonplace hosted a panel discussion at UKREiiF in May 2024. The participants were:

- **Mike Saunders** (chair): CEO of Commonplace
- **May-N Leow:** Digital Planning & Head of Product at DLUHC
- **Erika Lewis:** CEO of Connected Places Catapult
- **Al Kingsley:** Chair of the Business Board at Peterborough and Cambridgeshire Combined Authority
- **Rob Chesworth:** Head of Strategic Land at the Crown Estate

The discussion delved into how artificial intelligence can involve stakeholders in shaping the built environment, while also acknowledging the hurdles facing both AI and the industry. **Here are a few key takeaways:**

Data quality is paramount for AI models anywhere: Models need to be fed large, representative, structured data sets in order to produce the most useful results. A model is only as good as the information it's been trained on, so that information must be carefully curated and the 'right' questions asked of the answers it produces.

> **Erika Lewis:** *"So it's really easy to put out the ability to capture data, and then not actually think about the interoperability of that data, how you're actually going to gather that data, how you're going to create datasets that people can use to innovate."*

New policy is needed to enable AI innovation while ensuring transparency, accountability and public trust: Questions were raised as to how authorities and local people can be confident in the technology when it's still so new. "Are we confident about how it's being used? What is the accuracy and confidence level of the AI being used?" A strong foundation of trust in the technology will be crucial for better decision-making and policy development.



> **Al Kingsley:** *"...how do we put transparency and rules in place as we go along? And the problem with government, not just this government, but around the world with something so fast evolving as AI, is that policy tends to be way behind what's actually happening. So it can be seen as either an anchor, or it can be seen as a really important safety rail."*

Less of the boring stuff: AI has the power to transform public service work. By automating repetitive tasks like data entry, AI frees up human workers to focus on more complex and creative issues. Additionally, AI's ability to analyse vast amounts of data allows for more informed and evidence-based decision-making.

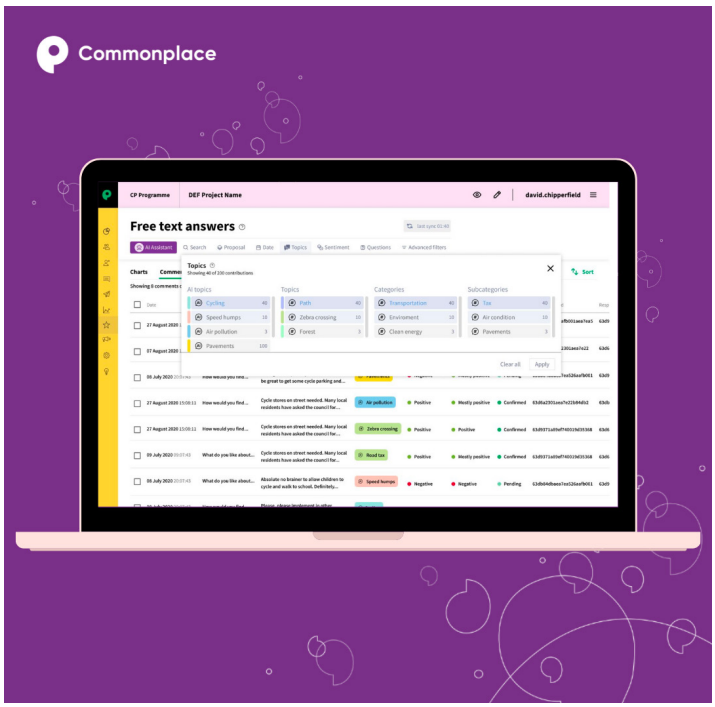
> **May-N Leow:** *"I think that we should steer away from AI being used to automatically make decisions because, in planning, there's case law, precedents- the things we definitely do not want to go anywhere near. But everything else in terms of manual work, documents, reviewing and analysing, I think where the opportunity lies... so I think if we can actually utilise it in those ways, in those marginal gains, those add up significantly as we look across all public services."*

Understand data, themes and sentiment at a glance: The ability to summarise long pieces of information, scour huge data sets in milli-seconds and identify core themes and sentiment can save massive amounts of time and resources. It can also make data much more accessible by presenting it publicly in a more digestible format and allow authorities to better engage communities in decision-making processes.

Barriers and common fears: Fear and lack of understanding about AI are significant barriers to its adoption in both education and planning. Plus, new hires are going to need to be trained to use and understand AI alongside their other skills. Strong leadership, standardisation of the technology and a clear showcase of the benefits will be necessary to overcome these challenges.

> **Rob Chesworth**: *"Let's look at my team (at the Crown Estate). They're all planning and development experts. They now need to understand decarbonisation, nature recovery,* ***and*** *AI. So I think there's not only building the specialist capabilities that the panel has been talking about, but, if we are committed to supporting the science and innovation economy, how do I equip my team with enough understanding to know what that means?"*

Watch the full 60-minute session for free!



Common barriers to adopting AI

From our conversations with colleagues in local government, here are some of the common barriers to adopting AI. There are legitimate concerns in every case, but as was noted at a recent RTPI event, AI transformation in planning is going to happen whether we like it or not. So being able to understand and overcome these barriers is essential to capitalise on the benefits and not get left behind.

1. AI is here to replace human planning jobs

When used well, AI is a tool to improve and transform job functions, rather than replace them. Besides automating the more tedious tasks like summarising meetings and lengthy documents, AI can also provide suggestions and initial drafts to be perfected by humans. For example, it can look at planning data and say that certain areas would benefit from a park or a cycle lane, but it's still up to humans to design them. AI frees up time to do strategic design work by supporting us humans with the operational work.

2. How can it be accurate at identifying themes in such complicated planning subjects?

There is a common concern that AI models are simply not able to identify complex planning or policy themes in (or do not understand the nuances of) long-text answers. We have been able to prove that this is not the case. When trained with high-quality training data, our Trends AI product can categorise and assign a sentiment correctly in more than 95% of cases. This is better than a human would normally be able to achieve with the added benefit of consistency over subjectivity.

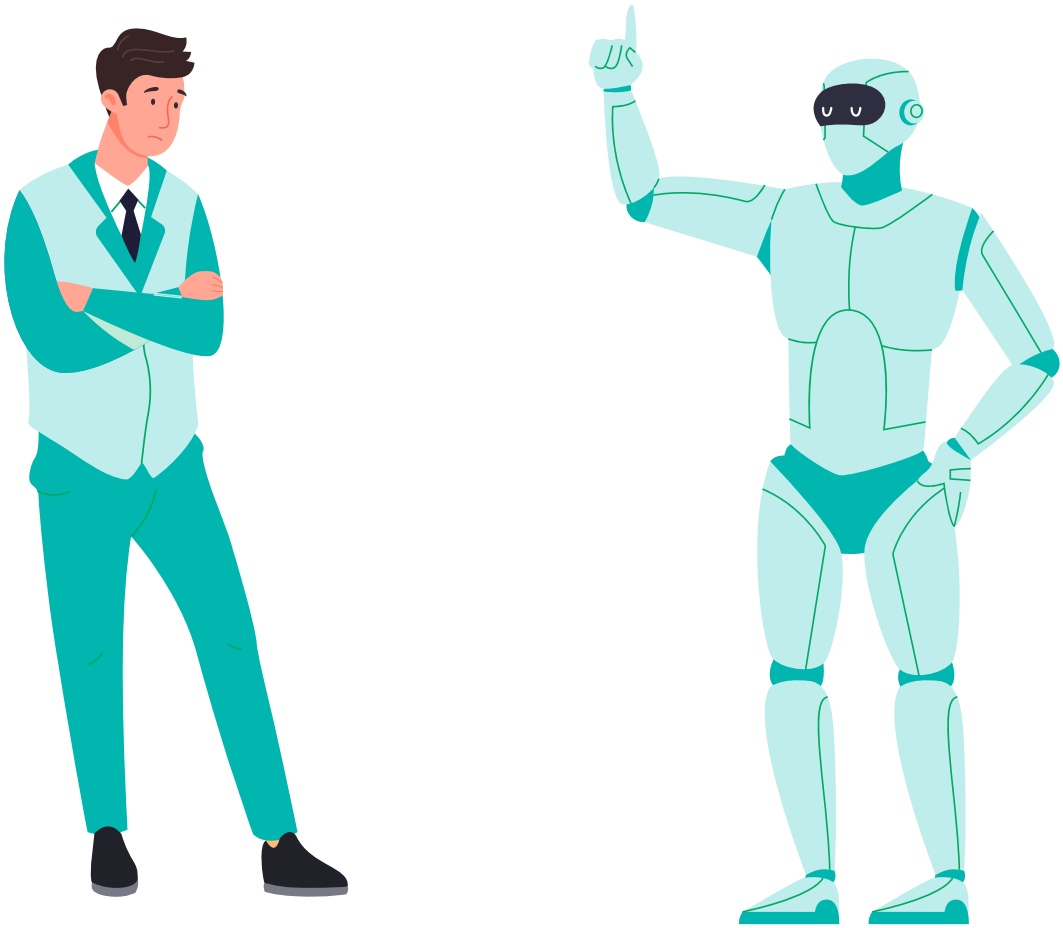
3. Legality of AI in different areas

Some are hesitant to use AI due to the strict legal requirements and processes involved in planning. This is an understandable concern, especially with such new (and currently not completely regulated) technology. For example, if a planning decision is appealed later in the process and AI was used to come to that decision, how do you explain the decision - and can it stand up to scrutiny?

The approach that is being adopted most commonly right now in the absence of any formal guidance, is that:

- Every planning officer needs to be able to understand how the AI works and its limitations.
- There must be scope to audit and quality control the workings of the AI.
- There must be the ability to correct what the AI has done (and for the AI to learn from these corrections).

This feedback loop is used to continuously improve the Commonplace TrendsAI tool. It shows everything that is happening and offers the ability for planners to flag and correct the AI suggestions where necessary.



Commonplace and AI: TrendsAI



What is TrendsAI?

TrendsAI is our in-house specially trained Natural Language Processing data model. It's designed to remove the tedious work of analysing every single response by instantly identifying the key trends your community is talking about. It uses a combination of Extreme Text Classification and Large Language Models that have been fine-tuned by analysing millions of Commonplace comments.

Why did Commonplace create TrendsAI?

Because our customers were spending thousands of hours analysing responses from consultations to classify and encode what people meant. We realised that with emerging technology there was a realistic way to automate this, saving huge amounts of time and money. Our experiments with off-the-shelf tools failed miserably, delivering a level of accuracy below 10%. Due to the technical nature of planning and the long and varied form of free text comments provided by the public, we embarked on building our own solution. The key to doing this successfully was our access to large volumes of specific, categorised training data and our in-house data science / machine-learning team capable of running multiple iterations in parallel.

How does TrendsAI work?

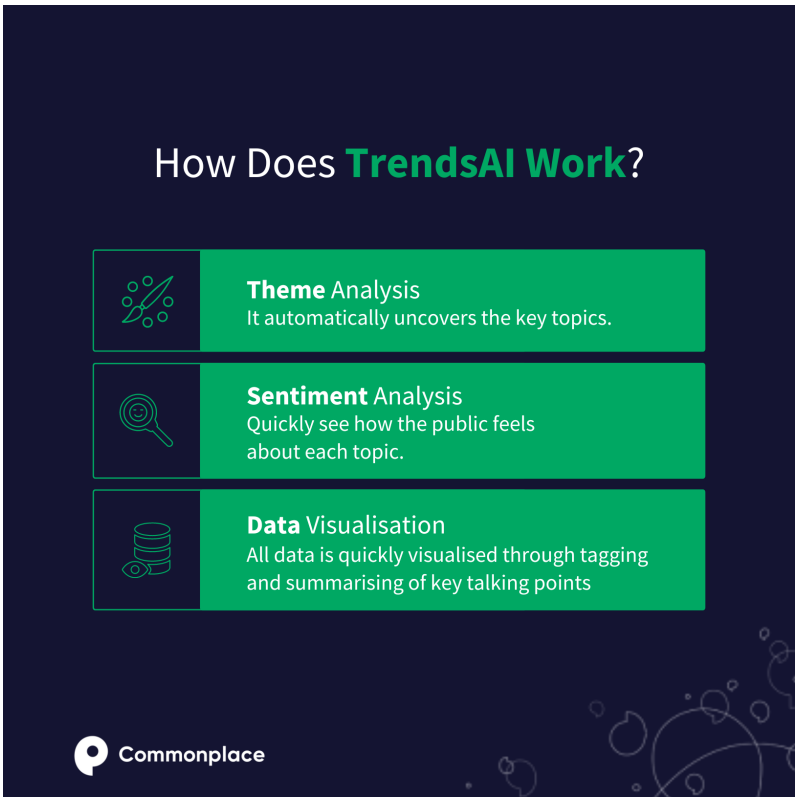
So far we have collected 12 million public responses about the built environment in their local community. By leveraging on this large sample of relevant comments, and with the help of information scientists who have helped to 'train' our model, we have developed a machine-learning model that tags each comment into one or multiple topics.

Available topics depend on the actual domain (local transport, housing), but we have about 150 topics for each.

On average, each comment has 3-4 topics associated to it.

At the moment we have achieved the following accuracy metrics:

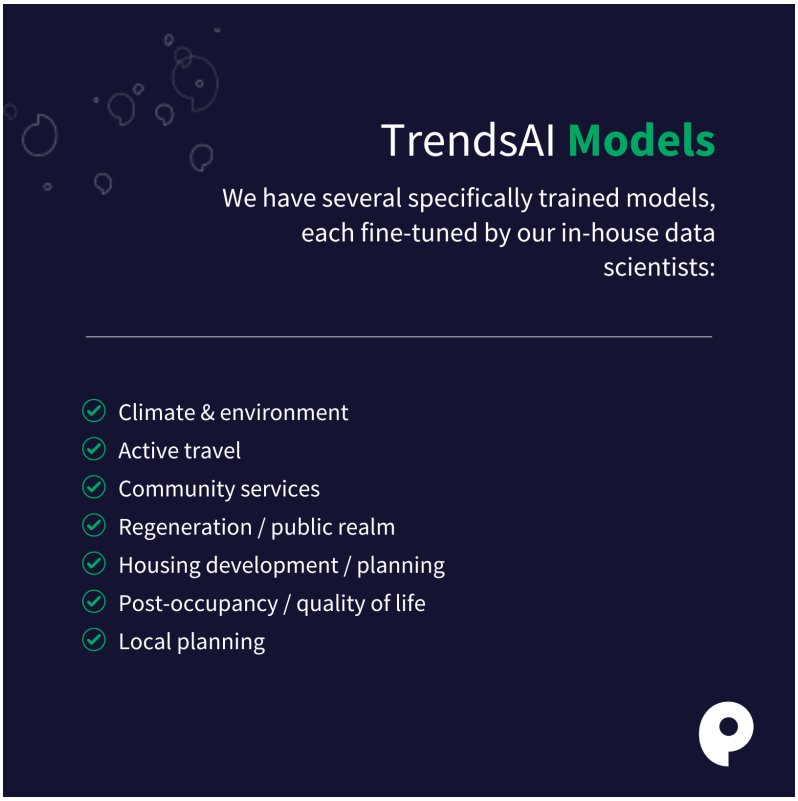
- 95%+ topic precision, that is 95% of AI-flagged topics are indeed correct
- 80% topic recall (which means only 20% of comments were missing topics)
- 80% sentiment accuracy (we also associate a sentiment to each topic mentioned)



How was TrendsAI trained?

At Commonplace we have created and trained our very own LLM to automatically analyse and categorise free text responses to public engagements and consultations. As is often repeated, AI models are only as good as the data they have been trained on. This has been done with a great deal of care and training: it has taken over 2 years for our data scientists to train and refine the technology, which has been trained with millions of data

points from previous planning engagement responses collected on Commonplace. Not content with doing that once, we have actually completed five cycles with multiple iterations in each cycle, so we have specialist, optimised LLMs for:



◘ If I was to buy it, how would it work?

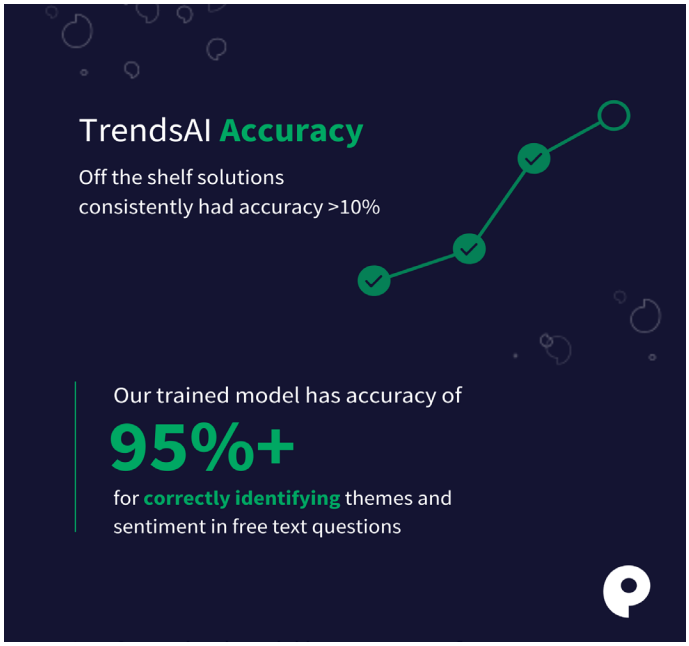
TrendsAI is an integral part of the Commonplace platform that can help collate data and improve engagements in several different ways.

Here are a few of its really useful features:

- **Topic analysis:** Long free text answers? TrendsAI automatically uncovers the key topics and attaches them to answers so you can easily get to the heart of community wants and needs. Each domain (eg local transport, housing) has around 150 topics i.e. 'parks', 'congestion', 'air quality', 'height of building'. If needed, more can be manually added.
- **Sentiment analysis:** With Natural Language Processing (NLP), sentiment towards each theme is easily identified, letting you see how people feel at a glance.
- **95%+ accuracy:** Thanks to years of specialised training, our models are specially designed for built-environment consultations and to pull out the most accurate data for you.
- **Automated free text summaries:** Using bespoke generative AI, we provide a written summary, tailored for use by planning officers, pulling out the key insights for each topic or free text question.
- **Automated survey question summaries:**
  Using a combination of analytical AI and generative AI, we provide a written summary of each

quantitative question used in consultations, tailored for use by planning officers.

- **Data visualisation:** TrendsAI assists with data visualisation through tagging, summarising key talking points and areas of interest quickly for stakeholders. The dashboard complements and guides data navigation rather than replacing the underlying analysis.
- **Control & transparency:** There are several ways to check and vet the answers that TrendsAI produces and make them as accurate as possible for your project.
    - Create custom tags for themes or topics and as well as create groups to determine links and connections between tags. This way your results can mirror existing reports.
    - Incorrect tags can be flagged to the Commonplace data science team for review, helping to continuously improve the AI model.
    - Assign tasks to reviewers so multiple officers can check and validate tags.
    - See and track the full history of tags and any changes made (date, time, change, name of officer etc.)
    - We have also worked to make the model and the process to be as transparent as possible. Transparency is vital in planning in case decisions are challenged. Plymouth is comfortable using TrendsAI because the tagging system allows officers to check, validate, and adjust tags as needed. This ensures accuracy and reliability, even in cases of potential legal appeal as they are not relying on AI to do all the work.



Real-time updates:

- Officers can review and update stakeholders 'live' as comments come in, rather than at the end of the consultation. This allows focus on active discussion areas.
- Daily updates and visualisations help officers dynamically organise events if there's a 'hot' topic or pattern of negative sentiment, making consultation result processing more responsive and transparent, especially during large consultations with substantial responses.

Efficiency and time saving:

- TrendsAI speeds up theme and topic categorisation, saving time and avoiding potentially tens of thousands of pounds for a large consultation.
- It acts as an assistant, performing the initial sorting tasks normally carried out by a graduate planner allowing planning officers to focus on in-depth analysis.

Find out more here

Who are Commonplace?

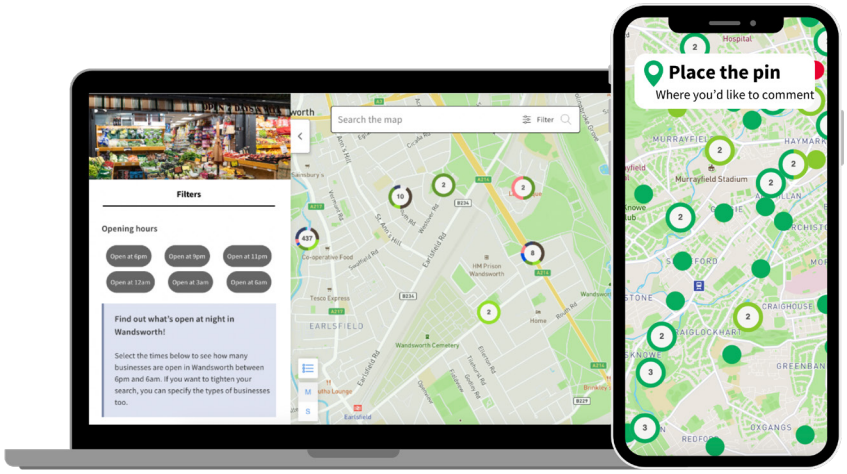
Commonplace supply websites for local community engagement that are used by local authorities, communities, private developers and other organisations to inform the public about plans and also gather feedback. **We are both a platform and a service:** with tools to gather the most meaningful data possible while also being available to support and guide all customers throughout their project's lifecycle.

Commonplace data is distinct in that there is a huge number of respondents who are self-selecting. This is because Commonplace is fundamentally an engagement tool, aiming for wide community participation.

It provides rich insight, but it is incumbent on policymakers to access other data if certain demographic groups are under-represented. The Commonplace dashboard provides real-time data that facilitates this additional activity.

We also offer ongoing customer success support once projects are launched. Our dedicated team will be there with best practice advice and weekly check-ins to make sure that the information gathered is the best possible for any given project.

We're also a certified B Corp!





Commonplace

commonplace.is
hello@commonplace.is

@Cmnplace
@Commonplace.is
@Commonplace
@Commonplace

Certified B Corporation