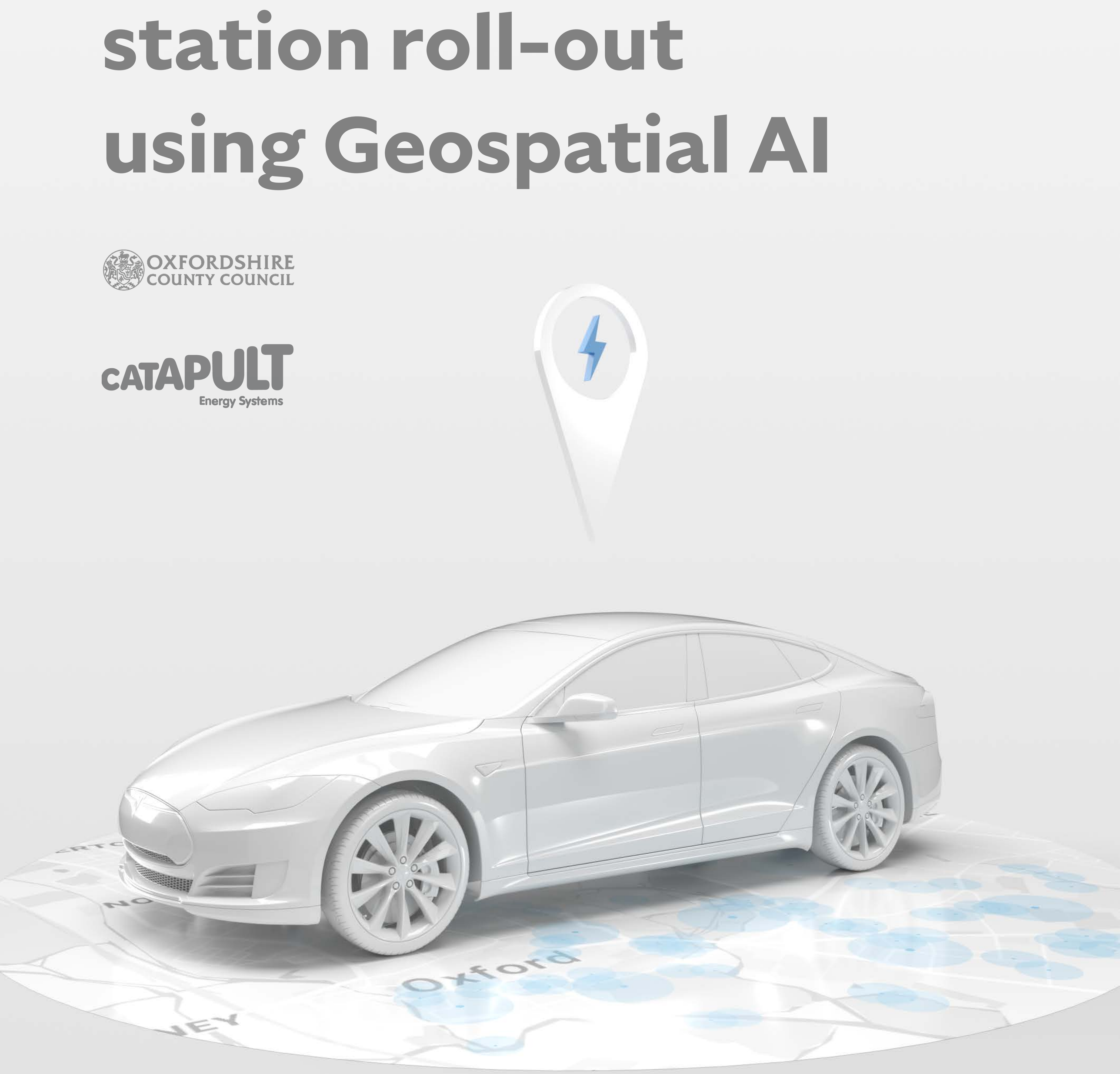
Optimising electric vehicle charging station roll-out using Geospatial AI

OXFORDSHIRE COUNTY COUNCIL

CATAPULT
Energy Systems



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The Earth’s climate is changing, and there is a strong scientific consensus that it is caused by human activities, especially emissions of greenhouse gases in the atmosphere.

“

The earth is what we all have in common.

Wendell Berry

SUMMARY

Transport accounts for around one-fifth of emissions around the world, which equates to 7.9 billion tonnes of CO2 each year. Because of this, many countries are trying to combat climate change by turning to electric vehicles (EV); Biden’s 2021 Infrastructure Bill provides for an additional $15 billion to build 500,000 EV charging stations, China installed over 800,000 EV charging outlets in 2020, and the Netherlands has the highest density of EV charging stations in the world.

In 2019, the UK became one of the first major economies to pass a net zero emissions law, meaning that by 2050 the UK will need to bring all greenhouse gas emissions to net zero.

Clean Growth is at the heart of the strategy, and the government sees growth in the EV industry as essential to the UK’s clean industrial future and National Infrastructure Strategy.

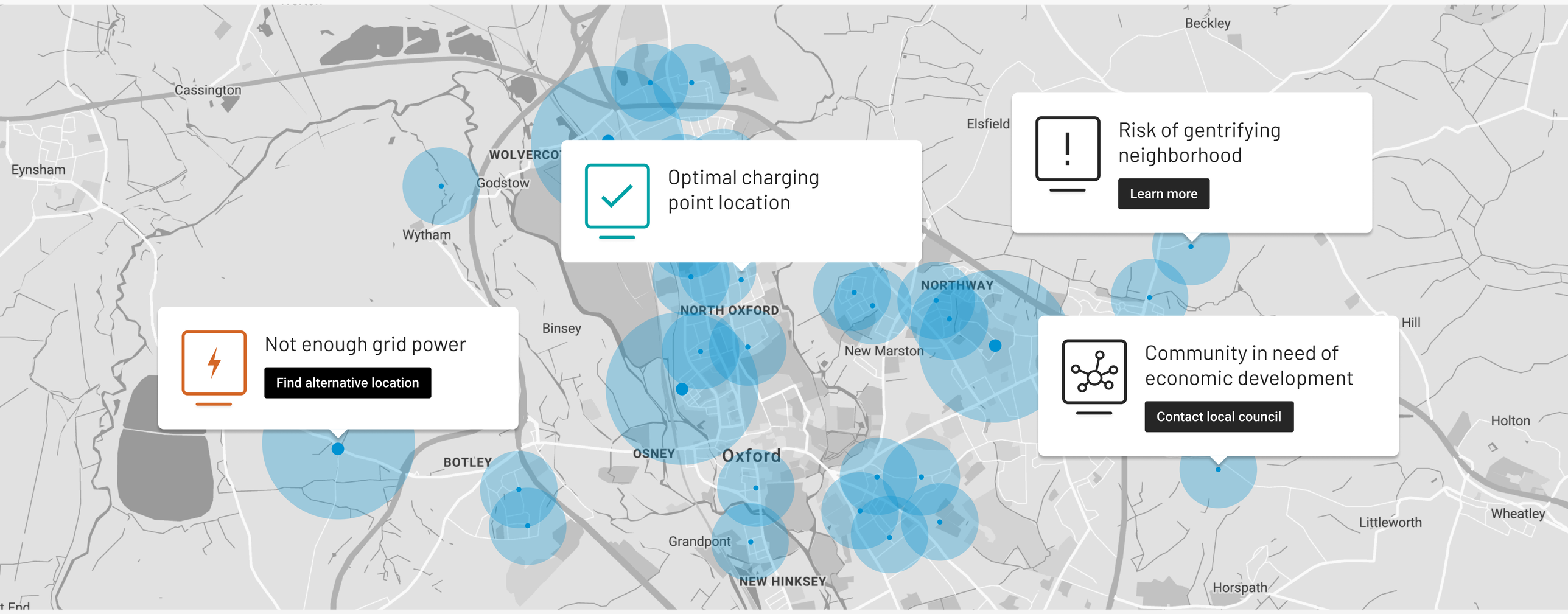
To achieve these targets, by 2030 there are estimated to be over 10 million electric vehicles in the UK, which will require an additional 35,000 charging points to be installed each year, costing approximately £2.2 billion in infrastructure.

In a bid to support the UK’s ambitious targets, Mind Foundry are working alongside Oxfordshire County Council (OCC), and others, using artificial intelligence (AI) to optimise infrastructure budgets, ensure ethical considerations for local communities and distribute power more efficiently.

Almost £5 billion of funding is available* to help UK businesses become greener as part of the government’s commitment.

*https://www.gov.uk/guidance/find-funding-to-help-your-business-become-greener

CHALLENGES



Comprehensive, accessible and efficient charging infrastructure is essential in enabling the rapid adoption of electric vehicles. In 2019, 68% of NOx emissions in Oxford were caused by road traffic and 22 places in Oxfordshire were found to be breaching air pollution limits.

Over 30% of households in Oxfordshire have limited or no access to home EV charging as they park on the street, and on-street chargers require space on the public highway which can cause an obstruction to pedestrians.

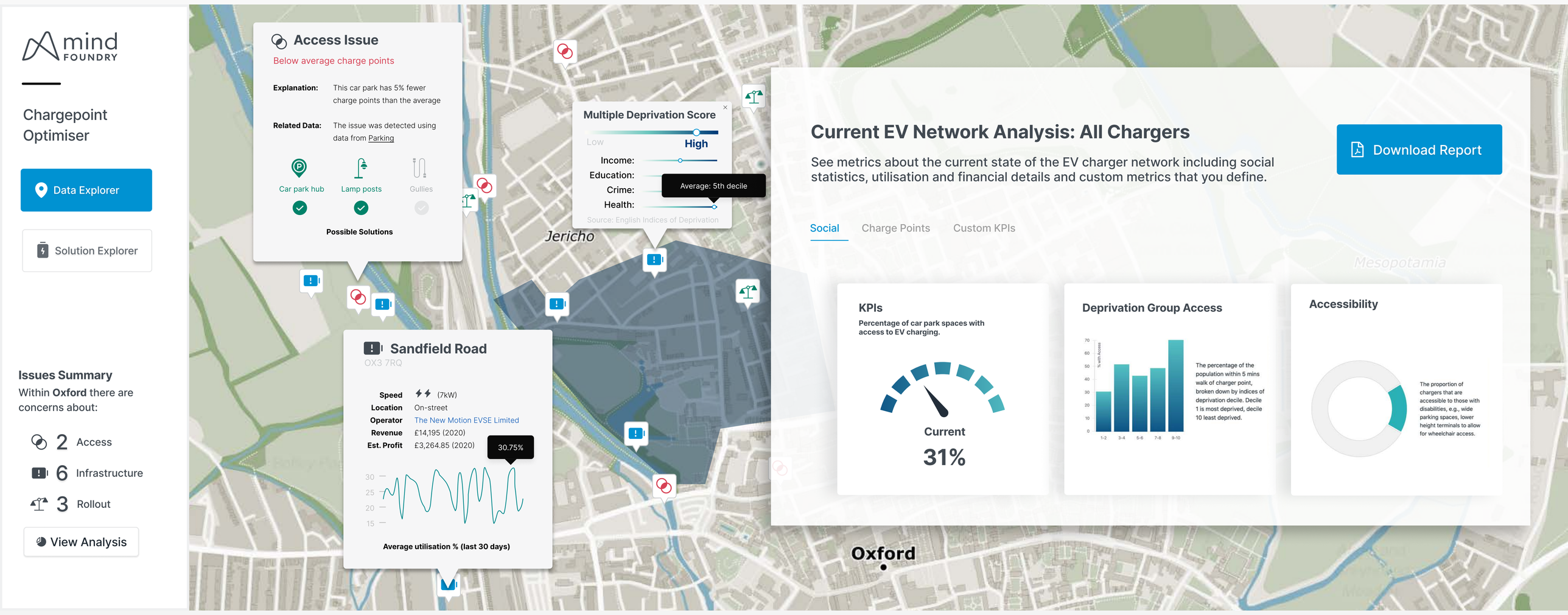
EV users may increase pressure on parking, requiring resources for the traffic order.

Oxfordshire's councils have an opportunity to encourage uptake of EVs by working together to enable the development of a high quality EV charging network. Deciding on the optimal location for building and maintaining additional charging points is a challenging task, but one that is critical to ensure smooth adoption of EVs.

> To ensure the smooth adoption of electric vehicles we need to consider balancing short and long term demand, in the face of uncertainty and changing legislation. In this case **the challenge is where to place new charging points, and to quantify the impact of those decisions."**
>
> **Alessandra Tosi**
> **Senior Scientist and Product Owner**
> MIND FOUNDRY

Local councils, energy providers and charging suppliers need to work together to ensure the placement of charging stations are efficient, accessible and fair for UK citizens.

SOLUTION



The Mind Foundry Platform combines geospatial modelling with a variety of different data sources, and advanced uncertainty awareness forecasting*, to intelligently model and predict the changing requirements for EV charging infrastructure. The Mind Foundry Platform provides key optimisations for planners, charge point operators and energy providers. This enables disparate departments to communicate with each other, and collaborate with AI at a more fundamental level. Given the wide range of multi-sectoral data, our customers are able to visualise and analyse insights to uncover EVs and energy-related issues, within a specific geographical area. The iterative workflows are powered by scalable probabilistic machine learning and connect to both live and historic data sources, providing sophisticated scenario modelling and rollout planning capabilities.

These forecasts are sensitive, not only to immediate demand, but long term strategy. The platform has natural extensions to monitor and manage the available electricity capacity, enabling smart, data-driven resource optimisation.

*With Mind Foundry's advanced uncertainty awareness forecasting, not only do our customers obtain intelligent and actionable forecasts, but they have complete transparency to see how 'confident' the AI models are of any specific forecast.

> "The importance of deploying the right type of charging asset in the right location to meet the demands of a rapidly increasing requirement for chargers against the need to minimise disruption cannot be over-emphasised. A flexible, easy to use mapping system utilising readily accessible data is a key component of the analysis that needs to take place to make this happen and the solution being developed by Mind Foundry has the potential to make this work **easier, simpler and more accurate than anything we've used before."**
>
> **Paul Gambrell**
> **Team Leader - EV Integration**
> OXFORDSHIRE COUNTY COUNCIL

Our customers have the ability to interrogate and add custom data layers, such as their own KPI's, local survey results and demand forecasts. By adding additional data sets, the Platform's algorithms are continuously learning and improving outputs. Customers are also able to easily export insights in different formats, visualising layers of data across different geographical areas.

BENEFITS

> “The Mind Foundry Platform is aiming to provide a state-of-the-art, transparent, data-driven approach for local councils, energy providers, and charging point suppliers, to ensure the placement of EV charging stations are efficient and accessible for all citizens across the UK. These types of data-driven solutions are essential for electrifying the transport sector at the lowest possible cost for the end consumers.”

Fabio Giunta
Digital and Data Associate
ENERGY SYSTEMS CATAPULT

The Mind Foundry Platform provides an advanced, transparent and data-driven approach to optimising EV charging infrastructure that enables local councils, energy providers and charging suppliers to work together. Thus ensuring the placement of charging stations are efficient, accessible and fair for UK citizens.

Our customers are empowered to interrogate, extract and strategise meaningful data, driving critical business decisions in a responsible and transparent way. They are able to understand the limitations of available data that is at their disposal today, and the data that is required to make a better decision tomorrow.

Mind Foundry enables our customers to:

- Optimise infrastructure budgets.
- Ensure ethical considerations for local communities.
- Better manage local and national electricity demand.
- Increase profits from charging stations.

To find out how our geospatial capabilities can benefit you and your organisation, please contact us using the link below.

CONTACT AN EXPERT

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