THE SIGNATURE TEAM FOR

DATA SCIENCE & VISUALISATION

SYSTRA

OUR SERVICE

Data is a key component in most projects and requires considerable skill to successfully capture, process, analyse and communicate, enabling the best decisions to be made.

Our highly-skilled data scientists provide the capability to confidently capture, process and analyse large data sets though applying the latest data science approaches.

Data visualisation is a key enabler to any project. We can deliver high quality dashboards, advanced geospatial mapping or bespoke web applications to ensure decision makers have the right tools to understand the data.

LEADERSHIP

Our highly skilled data science team combines scientific methodologies, maths and statistics, programming, analytics, artificial intelligence, demographic data and storytelling to identify, extract and explain insights hidden in data.

We communicate these insights to our clients through engaging, interactive dashboards and maps which they use to support their decision making.

Our team has experience in working with transport and environmental data and can work to ensure outputs can meet the required criteria to fulfil evidenced based business case requirements.

CAPABILITY

Visualisation and storytelling

Our team specialises in crafting and hosting interactive maps and dashboards, leveraging versatile open-source tools like R Shiny, Python, Leaflet, and OpenLayers. For clients inclined towards or already using proprietary solutions, we offer proficiency in ArcGIS Online and PowerBI. Additionally, we can design appealing static maps that cater to client needs, ensuring seamless integration with various formats of deliverables, including presentations and reports. This blend of skills enables us to provide tailored mapping solutions that align with the specific preferences and requirements of diverse industries.

Tool development and automation

Our custom tools, can be developed for various platforms to streamline tasks by automating and standardising repetitive processes. Using GIS as an example; tools like AutoECM for environmental constraint maps, BNG tools for Biodiversity Net Gain, and an automatic photo exporter all enhance efficiency. The multi-layer joiner merges various geometry types to simplify complex operations. This toolset, is designed to save time and ensure consistency across projects, making it an invaluable asset for businesses and professionals seeking to optimise their workflows and deliver precise, high-quality spatial analysis.

CAPABILITY

Spatial data analysis

Location intelligence is pivotal across all sectors, enabling a deep understanding and quantification of demographics within a study area or service. It allows for the visualisation of baseline conditions and supports optioneering by assessing and selecting the most effective interventions. By integrating multiple data sources, it uncovers new insights and elevates GIS with spatial statistics, providing clarity on the ‘why’ behind the ‘where’. Techniques like statistical hot spot mapping, spatial autocorrelation, and geographically weighted regression empower the aggregation of complex datasets into logical geographies, unveiling insights at various scales.

Data discovery

Our team of experts excel in data analysis, leveraging statistical and computational methods to extract insights from diverse datasets. Our proficiency extends to cloud-based environments, where we harness platforms like AWS and Azure to handle large-scale data processing. We’re adept at managing databases, implementing clustering techniques, and performing regression analysis. Additionally, our familiarity with cloud data warehouses enhances our ability to derive meaningful patterns and predictions from complex data. Whether it’s exploring data or building predictive models, our skills empower confident, data-driven decision-making across industry.

CAPABILITY

Web development

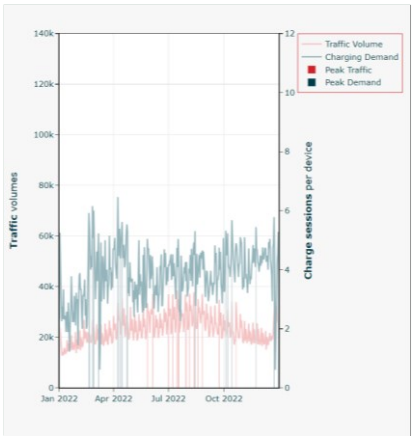
At SYSTRA, we provide full stack web development services, encompassing both front-end (what users see and interact with) and back-end (the behind-the-scenes data storage and processing) aspects of creating a website or application. Take your raw numbers and create a story by bringing together other aspects of our capabilities, to create a captivating user experience, allowing data equality, access and insights to anyone. Our team has a comprehensive understanding of various coding languages, frameworks, and various front and backend technologies, including cloud integration to manage databases, applications and server configurations.

Advice and consultancy

Not sure about your data capabilities? We offer advice and critical friend services to help you specify and procure data, or to open doors in your analysis. We work collaboratively to understand your unique challenges and data goals. By leveraging our expertise to analyse your data, we can identify patterns or insights that align with your business strategy. The outcome is clear, actionable insights based on this analysis, ensuring we make recommendations that are practical and achievable. Data driven decision making gives you confidence that you are making the right choice, and with our wider consultancy service, we can offer guidance on implementing plans effectively.

OUR EXPERIENCE

CASE STUDIES



Transport for the North Visualisation Framework

The visualisation framework facilitates decision-making for TfN partners and stakeholders through an interactive web app platform. It incorporates outputs from data analysis, scenario modelling, and economic appraisals. The development process focuses on scalability and agility, creating data visualisations and associated pipelines. The framework includes distinct dashboards for EV charging infrastructure, bus service improvement plans, and Northern Powerhouse Rail accessibility.

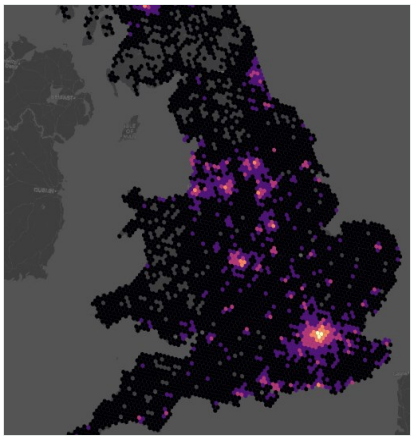
Peak Electric Vehicle Demand Analysis

The Climate Change Committee commissioned SYSTRA to conduct research to explore the differences between typical and peak demand for EV charging along the UK strategic road network and assess the impacts of these differences on the required levels of charging infrastructure. This included analysis of traffic flow data and chargepoint usage data sourced from Zapmap, as well as modelling to determine the optimal charging network to meet each demand scenario. This study is now available on the Climate Change Committee website.

CASE STUDIES

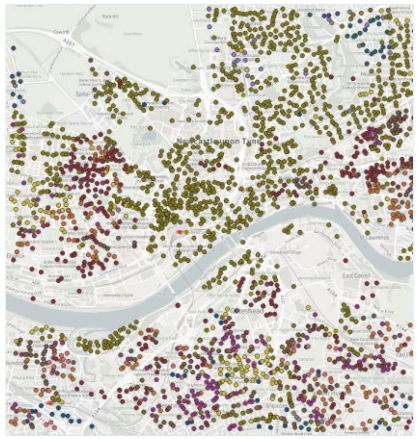
DfT BSIP Monitoring and Evaluation Dashboard

The national BSIP evaluation involves capturing and processing diverse data to monitor and assess spending impact. Data, varying in format, was standardised for analysis. Automation via Selenium streamlines monthly data collection, while PowerBI visualisations aid in sharing insights with clients, enhancing decision-making and spend evaluation efficacy. This streamlined approach ensures efficient monitoring and impactful data-driven decisions.



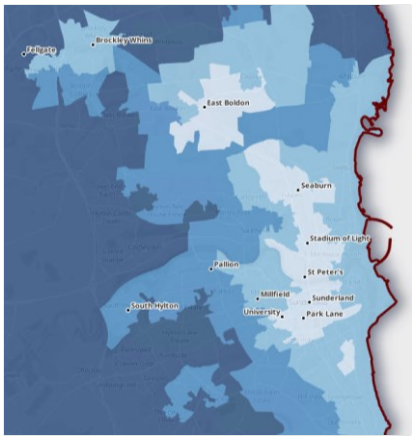
Road Safety Investigation Analysis

The project focused on analysing traffic accidents spatially and temporally, using accurate geocoding to map accident locations. Aggregating data onto Uber's H3 grid, it tracks trends over time with moving averages and conducts statistical hot spot analysis. It examines accidents by severity, vehicle type, and explores the influence of weather and road conditions, providing a comprehensive understanding of accident patterns and causes. This aids in targeted safety measures. The use of machine learning enabled further environmental context to be considered as part of the analysis.



Consumer Data

SYSTRA is accomplished with Mosaic data, a UK-wide demographic and consumer behaviour dataset. Each household is categorized into groups and types, based factors such as income, family life stage, occupation, and shopping preferences. We are developing valuable processes for understanding the occupants of a study area or those affected by proposed interventions. It aids in identifying target areas for new services or products. Mosaic, coupled with our domain expertise provides richer information than that available through open-source data at higher resolution.



Network Rail Mobile Phone Data

The exploration of Mobile Phone Network data opens avenues for mapping transport mode shares to/from various origins and destinations. We charted Origin-Destination (OD) pairs on both static and interactive maps, enriched with demographic data to decode the demographics driving movement patterns. This process is streamlined by scripts designed for swift loading, interrogation, and visualization of big data, enabling the asking of pointed questions across diverse spatiotemporal scales.

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For more information on how SYSTRA can help you with data, apps and geospatial analysis, please contact:

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SYSTRA

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