UK SPACE AGENCY

UNLOCKING SPACE FOR BUSINESS

Introduction to the Unlocking Space for Business Programme

Contents

This is an interactive document.

Look out for this icon for elements that can be interacted with.

Satellite data and services already underpin over 17% of UK GDP, with innovation continuing to unlock new opportunities for business

Innovation is unlocking business value

Cost of accessing ‘space’ is decreasing

Steep decline in satellite manufacturing and launch costs is improving the affordability of business opportunities.

Rising satellite data availability and accessibility

Satellite innovation continues to improve the quality of sensors, frequency of data and integration capabilities.

More data, better processing, new insights

Data analytics and artificial intelligence are transforming the ability to process and extract value from satellite data.

Emergence of new business models

Significant capital inflows are fuelling the marketplace with new commercial satellite offerings for businesses.

… through three satellite domains that play a key role across our economy

Satellite imagery

Intelligently understanding, monitoring and predicting events and changes on Earth

With sensors evolving to capture new data more often on physical assets, emissions and the natural environment, what could these insights mean for you?

Satellite connectivity and communications

Extending the connectivity of your operations beyond cities, at sea, and on the move

Where are your connection 'black spots' and what could be enabled by improved connectivity speeds and data flows from satellites?

Position, navigation and timing (PNT)

Precisely geo-tracking your assets, navigating journeys and time-stamping events

Ubiquitous GPS has already disrupted industries, but what could greater geo-positional accuracy and navigation insights support you to do?

The UK Space Agency is launching a new, innovative programme to support the realisation of business benefits from satellite data and services

Overview of Unlocking Space for Business

'Unlocking Space for Business' is a new programme being delivered by the UK Space Agency to support businesses:

- **Better understand and prioritise** how innovations in satellite data and services, combined with complementary data sources, can drive businesses benefits
- **Connect** with leading data suppliers, aggregators, technology integrators and insight providers
- **Apply** for Government funding to support the delivery of benefits from satellite data and services, through pilot projects, data procurement or partnerships

The focus areas are **Financial Services** and **Transport & Logistics**

How satellite data and services can deliver value for you

Three types of commercial satellite data and services

- Satellite imagery
- Satellite connectivity & communications
- Position, navigation & timing (PNT)

Through direct data and service exploitation

Combined with complementary data types and sources

- Geospatial & demographic data
- Enterprise, financial & customer data
- Internet of things (IoT) hardware & sensors
- Mobile networks, remote sensing & drones

Through aggregators and marketplaces

Providing business insights and decision-making support

- Weather, climate & commodities
- Assets, fleets & infrastructure
- Urban development & land use
- ESG reporting & regulations

Through custom insights and analytics services

To unlock new revenue growth opportunities, operational efficiencies, customer experiences, and ESG benefits for your organisation

Unlocking Space for Business will deliver five key initiatives to support organisations

CLICK HERE TO SIGN UP

What's on offer for businesses through this programme?

Information Hub

Access to insights on how businesses can unlock value from satellites, with examples of activity from across the world

- Discover insights and global success stories on how businesses are benefiting from satellite data and services
- Learn more about the programme and opportunities to get involved
- Register interest for our Events, Workshops, Learning & Development and Funding Call

Insight and Networking Events

Interactive events that bring together customer and supplier ecosystems to connect and explore business opportunities

- Hear from expert panels and join live demonstrations from leading satellite data and service providers
- Build connections and identify collaboration opportunities with suppliers and integrators
- Be a part of cutting-edge discussions and help shape UK direction on new use cases

Exploration Workshops

Expert perspectives to help your business identify, prioritise, and prepare to further benefit from satellite data and services

- Access tailored expert guidance on potential areas where satellite data and services could drive significant impact
- Determine how satellite data and services can help address key business challenges for your organisation
- Shape a business case and delivery plan with cross-functional stakeholders

Learning and Development

Online and in-person learning to enhance business capabilities in buying, integrating, and exploiting satellite data and services

- Learn from a range of experts on how to buy and maximise the value of data and services
- Access online learning materials in your own time on the topics of your choice
- Develop understanding of the success factors required for your organisation's journey

Funding Call

Apply for Government funding to launch innovative pilots, acquire new data, and start delivering benefits for your organisation

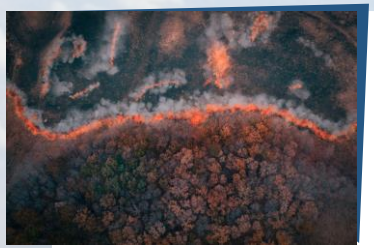
- Access funding to support investments, partnerships and projects using satellite data and services
- Receive support to launch pilots and turn opportunities into reality for your business
- Strengthen your brand as a leading innovator through Government-led showcases

No participation fees

Innovative satellite data and services can help to unlock value for businesses across **Financial Services**

Financial Services – Example opportunity areas

Select examples to discover more



Claims management

Click here

The frequency and intensity of extreme weather events is placing additional demands on the operations of insurance businesses. This includes an increase in processing customer claims and efforts to investigate fraud.

Satellite imagery can support more efficient claims verification processes, reducing the need for on-site assessments, and improved responsiveness of customer pay-outs. This includes through innovative parametric insurance solutions, that pay out after specific events take place, or predefined conditions are met.

Loan monitoring

Click here

Banks can face challenges accessing up to date information on the progress of funded projects when evaluating loan portfolios and drawdown requests. This includes infrastructure-related, remote operations or dispersed agricultural activity.

Satellite imagery enables timely remote monitoring of loan portfolios, helping to validate the use of funds with agreed purposes and timelines, and identifying potential risks.

Sustainable finance

Click here

Financial services have a pivotal role to support their customers transition to more sustainable business models and meet regulatory demands. However, the quality and availability of environmental data remains a significant challenge.

Satellite imagery can improve the measurement of essential climate and nature variables, enabling better alignment of lending, investment and insurance services to ESG[1] objectives and disclosure obligations.

Other opportunity areas

- Satellite imagery can enhance the assessment of physical assets and catastrophe risks to enhance pricing decisions and monitor overall portfolio risk.
- Satellite connectivity and positioning can enable global asset usage tracking to underpin insure-as-you-go models (e.g., gig economy, rental schemes, cargo, heavy machinery).
- Satellite imagery provides data that aids in lending decisions for property assessments for mortgages and loans.

Notes: 1) Environmental, Social, and Governance (ESG)

Innovative satellite data and services can help to unlock value for businesses across **Transport and Logistics**

Transport and Logistics – Example opportunity areas

Select examples to discover more

Cargo tracking

Click here

Logistics firms who operate complex global supply chains require timely insights on the location and health of their cargo. This insight can proactively prevent delays, damage and theft.

Satellite connectivity enables cargo tracking across multiple modes and geographies and can mitigate potential coverage gaps from ground-based networks. This strengthens supply chain planning and resilience with particular benefit for high-value and temperature-sensitive goods.

Fleet management

Click here

Transport operators are tasked with the planning, maintenance, security and operations of complex fleet networks.

Satellite connectivity enables global coverage of communication channels between fleets and remote operators. This in turn enables more proactive vehicle maintenance, tracking capabilities and route instructions.

Autonomous mobility features

Click here

Manufacturers are increasingly pursuing capabilities for semi- and fully-autonomous mobility. However, they must continue to navigate technical and regulatory challenges to establish resilient connectivity and precise positioning data for key features.

Satellite connectivity, positioning & navigation can facilitate improvements and additional resilience to autonomous features, through global connectivity networks and increasingly accurate geo-location data.

Other opportunity areas:

- Satellite imagery can contribute timely insights on weather and hazards, enabling safer journeys and operations that are more environmentally friendly across maritime, aviation and road.
- Satellite connectivity can provide enhanced internet and communication services for transport passengers to connect with family, entertainment options and emergency response.
- Satellite imagery enables new data inputs to support the assessment of emissions released by ships.

Learn more about example opportunities in Financial Services

Satellite imagery can support more efficient claims verification processes, which results in improved responsiveness in customer pay-outs

Claims management

Satellite imagery

Challenges | Opportunity areas | Global insights

Click the tab to discover more

Insurers are grappling with a rising tide of extreme weather events, with the number of **natural catastrophes** (NatCats) per year forecasted to increase 37% by 2025.[1] This includes floods, hurricanes, droughts, landslides and fires.

Consequently, the industry is contending with a surge in **global customer claims** for damages. 2022 was the second consecutive year in which insured losses from natural catastrophes exceeded the $100bn mark, reaffirming the trend of a 5-7% annual increase over the last 30 years that is only accelerating.[2]

This is adding financial and operational pressures of **incident pay-outs**, and an escalating risk of **fraud**. For example, in 2021, US fraud in disaster claims cost insurers as much as $9.2bn, adding 5%-10% to the total claims paid following a disaster.[3]

Sources: 1) Access Partnership; 2) SwissRe; 3) National Insurance Crime Bureau.

Satellite imagery can support more efficient claims verification processes, which results in improved responsiveness in customer pay-outs

Claims management

Satellite imagery

Challenges | **Opportunity areas** | Global insights

Click the tab to discover more

Access to data is critical to handling the increased demand for **risk and damage assessments** more efficiently, particularly through **remote digitised methods** rather than extensive on-site inspections.

Satellite imagery presents valuable opportunities for harnessing near real-time data on **environmental and weather conditions**, as well as the **state of assets** prior to and following damage. This can include the extent of flooding, and damage to building structures.

This capability for insurers expedites the claims verification process and fraudulent activity assessments, enabling **quicker disbursement of pay-outs** to customers. It can also play a key role advancing innovative **parametric insurance solutions** that rely on predefined triggers, further enhancing the responsiveness of insurers.

Satellite imagery can also provide intelligence on **post-event mitigation actions**, for example responding to oil spills and geo-targeting emergency responses for severely affected areas.

Satellite imagery can support more efficient claims verification processes, which results in improved responsiveness in customer pay-outs

Claims management

Satellite imagery

Challenges | Opportunity areas | **Global insights**

Click to see the next opportunity area

Agriculture drought insurance

A French insurance business formed a strategic partnership with a satellite imagery operator, to provide an environmental variable data feed into their innovative **drought parametric insurance services.**

This includes use of a **soil water content variable**, to monitor drought risks on a daily and global basis and is helping to protect farmers against drought-related losses.

Flood catastrophe risk management

A Swiss reinsurance business has a strategic partnership with a satellite operator, to advance their **natural catastrophe services** with satellite imagery. The service enables early flood warning systems, near real-time **flood monitoring** (within 24 hours), and expedited claims pay-outs globally.

The partnership is expected to soon expand to other natural disasters including wildfires, wind and earthquakes.

Satellite imagery can enable more timely and **remote loan portfolio monitoring,** validating the use of funds and identification of risk

Loan monitoring

Satellite imagery

Challenges | Opportunity areas | Global insights

Click the tab to discover more

When banking institutions make decisions on their loan portfolios, there can be gaps in up-to-date information on the **progress of funded projects**.

This includes the construction of **infrastructure projects** such as buildings, roads, bridges, dams, solar farms, wind farms, as well as for **agricultural activity** where loans can cover large volumes of remote and widely dispersed land holdings.

Irregular reporting and infrequent on-site inspections can limit the ability for banks to identify potential early warning signs and proactively manage issues.

This can have a knock-on impact on a bank's ability to **limit bad debt** in their loan books, guard against **fraud,** and efficiently managing drawdown financing at project milestones.

Satellite imagery can enable more timely and **remote loan portfolio monitoring,** validating the use of funds and identification of risk

Loan monitoring

Satellite imagery

Challenges | **Opportunity areas** | Global insights

Click the tab to discover more

From building a new motorway to the harvesting of new crops, satellite imagery can provide lenders with high-resolution, scalable and close to real-time insights on the **status of funded activities** without the need for on-site visits.

This is particularly beneficial for customers with **remote projects** such as offshore energy, or large and widely distributed portfolios in **agriculture**. In these instances, data captured from satellites can include the scale of **construction** activity across the planned site, to forecasting the output yield of crops for a season.

Across infrastructure and agriculture, this can provide scalable improvements in operational efficiencies and proactive **risk management**. For example, in helping to make sure funds align with project **goals** and agreed **timeframes**, while addressing wider issues like activity delays and excessive costs.

Satellite imagery can enable more timely and **remote loan portfolio monitoring,** validating the use of funds and identification of risk

Loan monitoring

Satellite imagery

Challenges | Opportunity areas | **Global insights**

Click to see the next opportunity area

Assessing construction progress

An Asian regional infrastructure bank is leveraging satellite imagery to conduct **remote monitoring** and **due diligence** on infrastructure projects across its lending portfolio, for example on metro rail projects.

This service includes progress updates on request, as well as an assessment of potential environmental and social risks.

Agriculture loan monitoring

A Dutch financial services business has partnered with a satellite imagery insights company to accelerate its **financial offering for smallholder farmers** through the use of satellite data and location intelligence.

These technologies extend agricultural credit access by supporting key **lending decisions**, customer onboarding processes, and improve the **risk assessment** of loans for example through continuous crop health monitoring.

Satellite imagery can improve the measurement of **essential climate and nature variables**, enabling better alignment to ESG objectives

Sustainable finance

Satellite imagery

Challenges | Opportunity areas | Global insights

Click the tab to discover more

The financial services sector has a critical role to incentivise and support industries transition to more environmentally-friendly business models, and address growing regulatory demands, for example **nature-related disclosures**.

However, there are significant data challenges. For example, a global BlackRock survey of investors found 53% cite '**poor quality or availability of ESG data**' as the biggest barrier to sustainable investing, higher than any other barrier tested.[1]

Consistent, timely and verifiable data about business **sustainability factors** and **risk exposure** will be critical to drive progress in sustainable finance, including on emissions, pollutants and biodiversity conditions.

Source: 1) Blackrock.

Satellite imagery can improve the measurement of **essential climate and nature variables**, enabling better alignment to ESG objectives

Sustainable finance

Satellite imagery

Challenges | **Opportunity areas** | Global insights

Click the tab to discover more

Essential Climate Variables (ECVs) help to provide a picture of climate change at a global scale. Of the 54 ECVs specified by the Global Climate Observing System, **60% can be addressed by satellite imagery**,[1] which is unique in providing global coverage, consistent time series and daily updates of consistent observation.

Examples of data captured from satellites includes **deforestation** and reforestation patterns from infrastructure projects, **methane emissions** and carbon storage levels in agriculture, air and water pollutants from manufacturing activity, and heat loss from real estate portfolios.

Through a better understanding of customers and their supply chains, these insights can enable financial institutions to better align their lending, investment and insurance services to increasingly ambitious **ESG objectives and disclosure obligations**.

They can also enable more tailored pricing models to incentivise customer behaviours, and play a crucial role in supporting the growth of trusted **carbon credit markets**.

Source: 1) Copernicus Atmosphere Monitoring Service.

Satellite imagery can improve the measurement of **essential climate and nature variables**, enabling better alignment to ESG objectives

Sustainable finance

Satellite imagery

Challenges | Opportunity areas | **Global insights**

Click to see the next opportunity area

Carbon credits transparency

A Singapore-based global exchange is being established by a consortium of major international banks to be a leading **carbon credits marketplace**.

Satellite imagery is being used as a key capability to enhance the **transparency**, **integrity** and quality of the carbon credit projects, such as on sequestration potential and biodiversity benefits.

Thermal efficiency within real estate

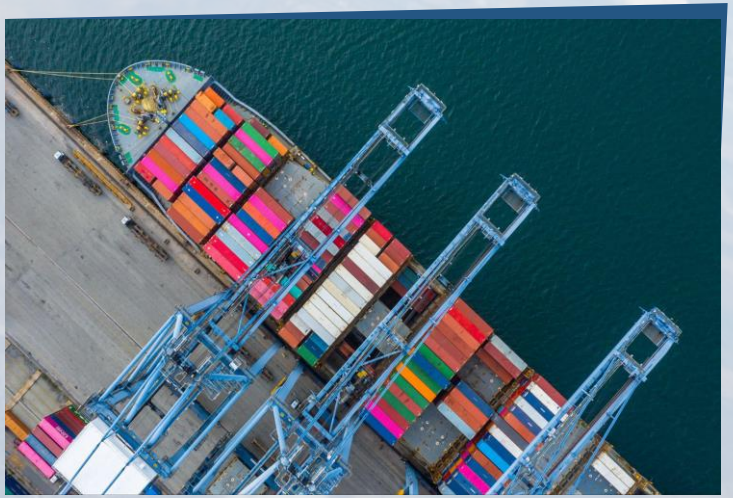
A large UK property and land data business has partnered with a satellite imagery operator to provide **thermal datasets** to the real estate market.

This service can help to promote better thermal efficiency and **insulation**, supporting the drive towards environmentally sustainable infrastructure projects and real estate portfolios.

Learn more about example opportunities in Transport and Logistics

Satellite connectivity can enhance the **tracking of cargo** to improve supply chain planning and resilience

Cargo tracking



Satellite connectivity and communications

Satellite position, navigation and timing (PNT)

Challenges | Opportunity areas | Global insights

Click the tab to discover more

In an increasingly globalised and complex trading environment, logistics firms have a critical need for secure and **intelligent supply chains** across air, land and sea.

This requires the seamless, real-time exchange of cargo information to proactively prevent delays, prevent damages, and deter theft which all incur significant costs to businesses.

For example, each year in the UK the cost of **freight crime** is c.£430m[1] and delays from UK road freight cost £6bn[2].

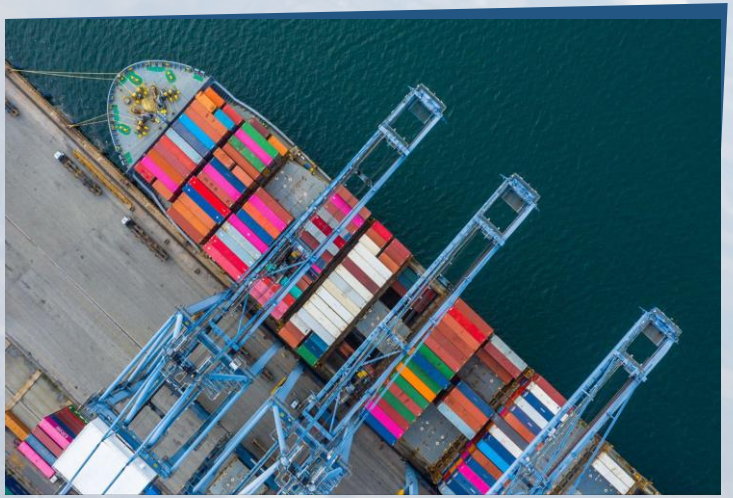
Ground-based connectivity solutions however can be constrained by **global coverage gaps** or **performance limitations**, for example when operating across remote areas or oceans.

This limits the ability for operators to constantly track cargo and promptly respond to **operational requirements** and **safety concerns**, as well as monitor cargo that necessitates specific environmental conditions.

Sources: 1) National vehicle crime intelligence service ; 2) Vivid economics.

Satellite connectivity can enhance the **tracking of cargo** to improve supply chain planning and resilience

Cargo tracking



Satellite connectivity and communications

Satellite position, navigation and timing (PNT)

Challenges | **Opportunity areas** | Global insights

Click the tab to discover more

Satellite connectivity can enable tracking solutions that address coverage gaps and resilience requirements across the supply chain.

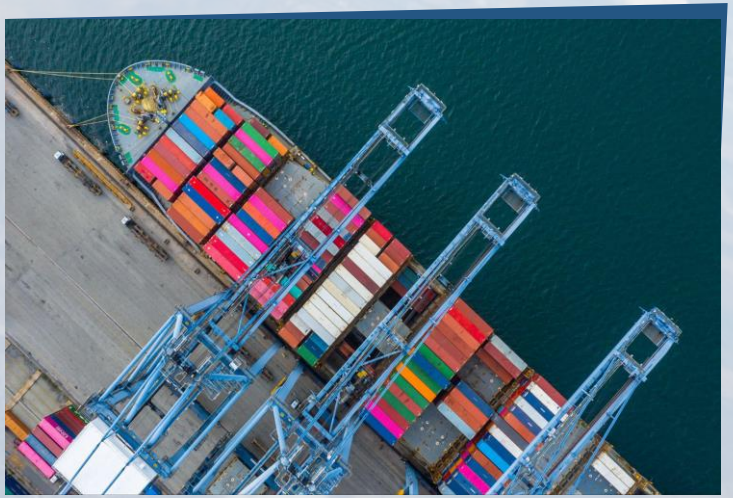
This is through **global coverage**, including in remote or hard-to-reach locations, across oceans and in rural areas – enabling improved **end-to-end tracking** of multimodal logistics routes.

These services, in combination with precise satellite positioning information can further improve **operational planning** and accuracy of arrival time forecasts.

Satellite connectivity can also underpin a global network of intelligent sensors (e.g. Internet of Things devices) to help **monitor temperature and humidity** levels of sensitive cargo, for example food produce or pharmaceutical products; the sensors can be used to trigger anomaly and theft alerts.

Satellite connectivity can enhance the **tracking of cargo** to improve supply chain planning and resilience

Cargo tracking



Satellite connectivity and communications

Satellite position, navigation and timing (PNT)

Challenges | Opportunity areas | **Global insights**

Click to see the next opportunity area

Monitoring of food freight

A UK food logistics business has deployed a cargo tracking solution that leverages satellite connectivity to fill its networks gaps for **persistent monitoring** capabilities.

This enables shipping containers with perishable food freight to transmit data from Internet of Things (IoT) devices along their transport route, where there is currently poor or limited terrestrial connectivity.

Cargo tracking in remote areas

An international logistics technology supplier is leveraging satellite connectivity to enable the **global tracking** of assets, in areas where a cellular connection is not available, particularly on open oceans.

This has enabled the monitoring of tens of thousands of trips valued at around $10bn in total, with ~6% requiring some intervention to safeguard cargo, and therefore helping to protect ~$500m worth of goods.

Satellite data and services can help to deliver improved real-time **communication channels** between global fleets and remote operators

Fleet management

Satellite imagery

Satellite connectivity and communications

Satellite position, navigation and timing

Challenges | Opportunity areas | Global insights

Click the tab to discover more

With the growth of global supply chains, customer expectations for faster deliveries, and emergence of new services such as micro-mobility fleets, logistics and transportation businesses need to have a firm grasp on their fleet operations.

Consistent, real-time data is required for effective fleet management solutions to monitor **vehicle security**, provide **remote diagnostics** and locate assets to improve operational planning.

However, terrestrial networks only cover about 15%–20% of the planet's surface.[1] This can undermine operators' ability to manage their fleets, with blind spots in particular environments including remote regions or areas where communications infrastructure is lacking.

Source: 1) IOT Analytics.

Satellite data and services can help to deliver improved real-time **communication channels** between global fleets and remote operators

Fleet management

Satellite imagery

Satellite connectivity and communications

Satellite position, navigation and timing

Challenges | **Opportunity areas** | Global insights

Click the tab to discover more

Global satellite connectivity can enable communication and tracking that address coverage gaps in remote and **hard-to-reach locations**.

This can support enhanced **predictive maintenance** by reducing data gaps that may occur if connection is lost, provides **backup resilience for communication** between vehicle operators and can enable remote vehicle immobilisation.

Real-time and precision location data enhances accurate monitoring of progress and estimated arrival times to help improve **operational planning**. This also underpins geofencing innovations such as sending alerts when vehicles are crossing boundaries or creating zones such as low-speed areas for micro-mobility bikes and scooters.

Combining geographical and environmental parameters from imagery enables improved **route planning** using traffic, weather and road conditions. This can help to minimise supply chain disruptions but also lowers fuel consumption, both unlocking operational efficiencies and reducing fuel costs and emissions.

Satellite data and services can help to deliver improved real-time **communication channels** between global fleets and remote operators

Fleet management

Satellite imagery

Satellite connectivity and communications

Satellite position, navigation and timing

Challenges | Opportunity areas | **Global insights**

Click to see the next opportunity area

Maritime vessel monitoring

A UK-based international ship management business has installed broadband technology on some of its ships.

This means that its vessels can communicate more easily with offshore systems and colleagues to improve the monitoring of vessels for **operational and safety** purposes.

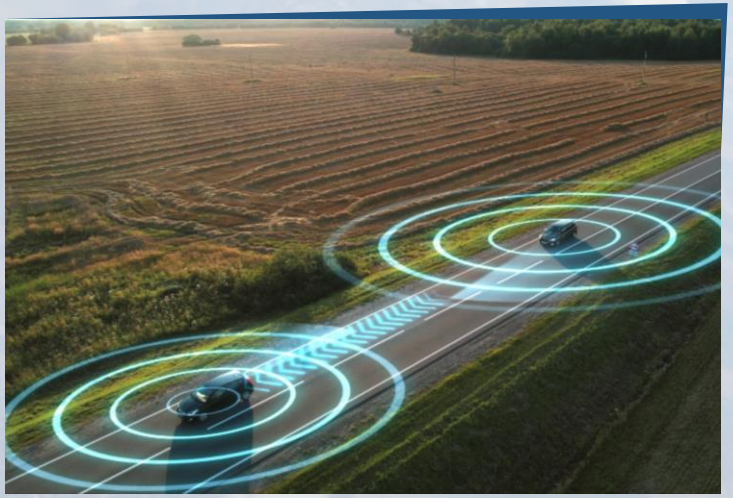
Train tracking in remote areas

A South America-based train operator partnered with a satellite connectivity provider to access advanced real-time **communication and telemetry services**.

This was to enable the tracking of trains across the regional network, and facilitate more reliable communications between drivers, maintenance teams and the operations control centre.

Satellite data and services can facilitate performance improvements and added resilience to **autonomous mobility features**

Autonomous mobility features



Satellite connectivity and communications

Satellite position, navigation and timing (PNT)

Challenges | Opportunity areas | Global insights

Click the tab to discover more

Vehicle manufacturers are poised to unlock a substantial opportunity through the adoption of semi- and fully-autonomous vehicle capabilities.

However, the manufacturers must navigate the **technical and regulatory challenges** of establishing **resilient connectivity** for safety-critical functions, such as steering and braking, as well as ensuring the availability of increasingly precise positioning data.

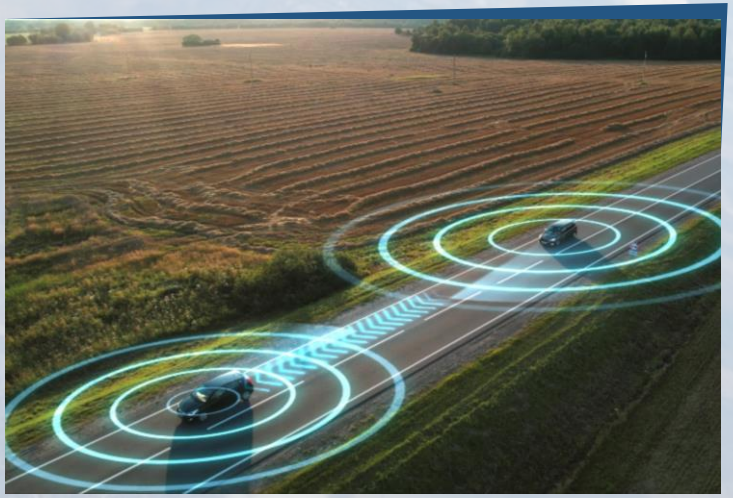
Direct positioning signals from satellites can have some **accuracy and reliability challenges**, whilst global cellular networks currently fall short of widespread coverage needs.

For example, in the UK there is only **66% 4G coverage on major roads**, 84% in urban areas, and 57% in rural regions.[1]

Source: 1) UK GOV.

Satellite data and services can facilitate performance improvements and added resilience to **autonomous mobility features**

Autonomous mobility features



Satellite connectivity and communications

Satellite position, navigation and timing (PNT)

Challenges | **Opportunity areas** | Global insights

Click the tab to discover more

Satellite connectivity, integrated seamlessly with terrestrial networks, will be key to extending the **global connectivity coverage** for autonomous mobility.

This connectivity can support with the **core functionality and backup resilience** of individual vehicles and robotic technologies across diverse terrains, particularly for **remote operations** and in rural areas.

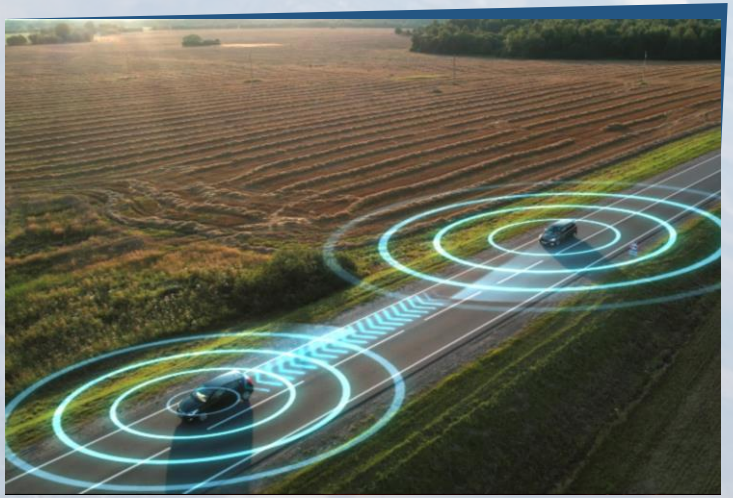
It can also unlock potential improvements in **vehicle-to-vehicle (V2V)** or vehicle-to-everything (V2X) communications and help to meet the **regulatory requirements** for continuous telemetry reporting.

Autonomous mobility functions are further being enhanced through precise location and navigation services, with innovative software that augments satellite signals. This can enable further **optimisation of routing** and response to live hazards.

These technologies all support Advanced Driver Assistance Systems (ADAS), which are bridging the gap to full autonomy and have a major role to play in improving safety and efficiency on our roads.

Satellite data and services can facilitate performance improvements and added resilience to **autonomous mobility features**

Autonomous mobility features



Satellite connectivity and communications

Satellite position, navigation and timing (PNT)

Challenges | Opportunity areas | **Global insights**

Precise position and navigation data

A leading US automotive business has collaborated with a satellite navigation and positioning software provider, to enable improvements in the **autonomy assistance systems** of future vehicles.

The greater accuracy of this satellite location data (i.e. enhancement of GPS), compared to before implementation, enables features such as **lane-level positioning**, as well as the improvement of security features.

Mobility navigation and connectivity

An Asian car manufacturer is launching a network of proprietary satellites into space, seeking **centimetre-level positioning accuracy** and high-precision maps and connectivity. This is intended to enable **intelligent and autonomous** vehicle driving features of its vehicles.

The UK Space Agency (UKSA) was founded in 2010, and supports a thriving space sector in the UK, which currently generates an annual income of £17.5 billion and employs 48,800 people across the country.

We are delivering UK Government's National Space Strategy through three key pillars:

- **Championing the power of space**, encouraging other sectors to use space to deliver better services, tackle the climate emergency and support a more sustainable future.
- **Catalysing investment** by deploying funding and resources to multiply the value of commercial contracts and private capital to maximise the UK space sector long-term growth.
- **Delivering missions and capabilities** that use space science, technology and applications to meet national needs and advance our understanding of the Universe.

Contact us to find out more:

unlockingspaceforbusiness@ukspaceagency.gov.uk

UK SPACE AGENCY

An accessible HTML version of this document is available and published on gov.uk.