Technology
Game Changers

Future Trends in Travel & Tourism

WORLD TRAVEL & TOURISM COUNCIL

DIGITAL TECHNOLOGIES

FINANCIAL TECHNOLOGIES

FUTURE OF MOBILITY

BREAKTHROUGH INNOVATIONS

In partnership with:

Trip.com Group™

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FOREWORD

As the pace of technological innovation accelerates around the world, it is set to introduce a future of change, where innovation is not just incremental, but can be truly groundbreaking.

Innovative technologies such as Artificial Intelligence (AI), are already reshaping operational models and customer expectations across the Travel & Tourism sector, as well as enabling enhanced productivity, creativity and growth.

Recognising the critical importance of understanding this rapidly evolving technological landscape, WTTC and Trip.com Group are delighted to present Technology Game Changers : Future Trends in Travel & Tourism.
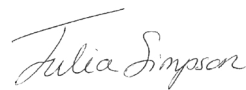
This report provides a strategic resource for Travel & Tourism stakeholders seeking to navigate the complexities of this rapidly transforming digital environment. It provides a concise and focused analysis of sixteen technologies, categorised under four overarching trends of Digital Technologies, Financial Technologies, The Future of Mobility, and Breakthrough Innovations.

In today's fast paced world, standing still can mean falling behind, so continuous innovation is essential for sustained success. This report therefore offers a forward-looking perspective of the opportunities presented by key technologies, including projections for their evolution and an assessment of their potential short to long-term impacts on the Travel & Tourism sector. It also highlights practical case studies and examples of organisations already leveraging these technologies to achieve tangible improvements in operational effectiveness and a better traveller experience.

To realise the full potential of these technological advancements will require strategic investments in workforce development, with digital upskilling and reskilling essential across the Travel & Tourism sector, to enhance digital literacy and technological proficiency.

A supportive regulatory environment is also crucial for success, with forward-thinking government policies that encourage innovation, support investments in sustainable technology infrastructure, and involve international government collaboration and engagement with the sector to achieve harmonised regulatory frameworks across borders.

Technology and innovation are key drivers of our rapidly changing world, so this report is an essential guide to staying ahead of the curve, with insights and analysis that enable Travel & Tourism business leaders to successfully navigate an evolving digital future.

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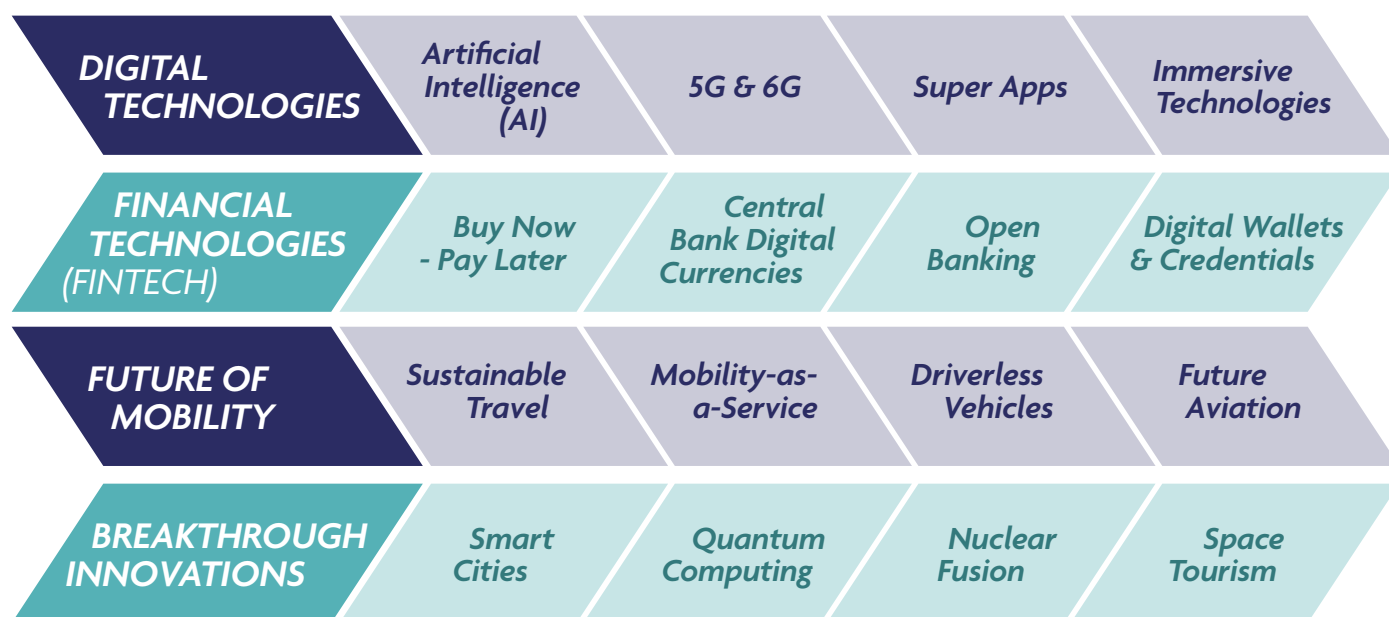
TECHNOLOGY GAME CHANGERS

INTRODUCTION

This report for business leaders and stakeholders from the Travel & Tourism sector explores **sixteen technologies** grouped into **four trends** that could change the future of Travel & Tourism. Each technology is carefully examined for its key features and critical importance to the Travel & Tourism sector.

To bring these technologies to life and show their immense value to travellers, the report also features **case studies from Trip.com Group** and **innovations from WTTC members** and the broader Travel & Tourism community.

To help businesses prepare for the future, the report also includes potential scenarios for how each of the **sixteen technologies may evolve in the future** and how they may be used in Travel & Tourism, both over the next decade and in the longer term.

*A 2024 survey of travel technology decision makers, conducted by Amadeus, found that **91% of travel companies expected 'moderate to aggressive' increases in technology investment** in their organisations.[1]*

DIGITAL TECHNOLOGIES	Artificial Intelligence (AI)	5G & 6G	Super Apps	Immersive Technologies
FINANCIAL TECHNOLOGIES (FINTECH)	Buy Now - Pay Later	Central Bank Digital Currencies	Open Banking	Digital Wallets & Credentials
FUTURE OF MOBILITY	Sustainable Travel	Mobility-as-a-Service	Driverless Vehicles	Future Aviation
BREAKTHROUGH INNOVATIONS	Smart Cities	Quantum Computing	Nuclear Fusion	Space Tourism

Digital Technologies

Digital innovations can transform the Travel & Tourism sector and unlock unique experiences. At the forefront of this revolution is **Artificial Intelligence (AI)**, which is reshaping industries around the world and is recognised by 94% of global business leaders as vital for future organisational success[2]. The advent of **5G, 6G, and LEO Satellites** is introducing a new era of connectivity, enhancing navigation, safety, and fulfilling travellers' desires for 'always on' high-speed communication. **Super**

Apps are streamlining services into a single, user-friendly platform, ensuring a frictionless customer experience and **Immersive Technologies** are captivating tourists at every stage of their journey, from the excitement of pre-trip planning to post-trip reliving of memories in virtual environments.

Financial Technologies

Financial Technologies (FinTech) are changing the global monetary landscape, unlocking innovative opportunities for businesses and travellers. **Buy Now, Pay Later (BNPL)** schemes make travel more accessible to everyone by allowing customers to pay in easy instalments, while also providing safeguards to businesses with digital assessments of customers' repayment capabilities. **Central Bank Digital Currencies (CBDCs)** could transform the way payments are made and managed, ushering in a new era of cashless operations, while **Open Banking** is enhancing customer experiences through the secure and trusted sharing of data. **Digital Wallets & Travel Credentials** are reducing stress for travellers and simplifying the travel process by securely storing and sharing a variety of digital documents, including bookings, loyalty cards, bank cards, digital passports, visas, and digital currencies.

The Future of Mobility

The future of mobility is rapidly evolving, driven by several innovative technologies. Leading advancements include **Sustainable Travel Technologies**, which are guiding the sector towards more environmentally responsible options, and **Mobility-as-a-Service (MaaS),** which is integrating various transport modes into a single, accessible platform, and providing new ways to explore destinations. **Driverless Vehicles** have the potential to transform airport transfers, enable customised tour routes, and reduce transportation costs, while **Future Aviation** holds the exciting prospect of the return of supersonic air travel and Advanced Air Mobility (AAM), which could enable new journeys by air.

Breakthrough Innovations

Breakthrough innovations represent technological advancements with the potential to fundamentally redefine travel, efficiency, and exploration. Among these innovations are **Smart Cities**, which aim to revolutionise urban life and tourism by delivering solutions for more efficient living and enhanced visitor experiences. **Quantum Computing** could soon be ready to tackle complex problems with ease, paving the way for new discoveries and **Nuclear Fusion** holds the promise of clean and abundant energy, significantly diminishing the world's reliance on fossil fuels and enabling truly sustainable operations. Finally, **Space Tourism** offers the prospect of a new era in travel, presenting unprecedented opportunities for extraordinary experiences.

RECOMMENDATIONS

Embracing innovation can enable businesses to thrive in a rapidly evolving technological landscape. Travel & Tourism businesses are encouraged to:

1. **Embrace a Culture of 'Smart Experimentation':** Review the technologies in this report to identify the most relevant innovation opportunities. Consider creating spaces where teams can innovate and explore emerging technologies on a small scale. Test new tools and gather feedback from staff and, where appropriate, customers. The goal of 'smart experimentation' is to foster a culture of continuous improvement and innovation.

2. **Invest in Digital Skills:** Technology is only as good as the people using it, so it is important to build teams with the skills and confidence to use new digital tools. This could involve training workshops, online courses, or mentorship programmes. By empowering teams with enhanced digital literacy, the Travel & Tourism sector can also more easily adapt to future technological advancements in a rapidly changing digital environment.

3. **Build a Solid Technology Foundation:** To make the most of exciting new technologies, businesses may need to upgrade their underlying ICT (Information & Communication Technology) foundations. For example, this could include investing in faster Wi-Fi, adopting cloud-based services, improving data management platforms, or purchasing new hardware and software systems, as well as ensuring policies and procedures are in place for areas such as data privacy and cyber security. Thinking about these core foundational areas could lead to more effective implementations of new technologies and innovations.

4. **Engage with Governments:** Where possible, actively engage with governments to encourage them to create forward-thinking policies that support innovation. This includes advocating for investments in technology research and development (R&D) and balanced regulations that are consistent across different countries. Harmonised regulatory approaches are key to unlocking the full potential of new technologies in international businesses such as Travel & Tourism.

DIGITAL TECHNOLOGIES

TECHNOLOGY GAME CHANGERS

For decades, the world of computing has followed a remarkable trend, often referred to as 'Moore's Law', which is the observation that the power of computer chips doubles every few years, meaning a laptop or smartphone today could be twice as powerful as a previous model only three years ago. This relentless increase in computing power and capability has paved the way for a suite of digital innovations that are rapidly reshaping nearly every industry, including those within Travel & Tourism.

This chapter explores some of these key advancements, including Artificial Intelligence, 5G, 6G & LEO Satellite Connectivity, Super Apps and Immersive Technologies. The chapter breaks down how these tools can be a driving force for the Travel & Tourism sector to better understand its customers, deliver more personalised experiences, and transform the way we travel in the years ahead.

DIGITAL TECHNOLOGIES

- Artificial Intelligence (AI)
- 5G, 6G & LEO Satellites
- Super Apps
- Immersive Technologies

ARTIFICIAL INTELLIGENCE (AI)

Artificial Intelligence (AI) today is like a very smart computer system that can learn from huge amounts of information and provide answers to almost any question.

But AI systems are rapidly advancing in capability and will get better over time as their algorithms are enhanced, computers become more powerful, and they continue to learn from massive amounts of data. **AI will therefore advance from only providing *information,* to being able to take *actions*.**

These actions can be done on a computer, such as helping a user to book a holiday if they provide their preferred date and mode of travel, to further in the future when they may be able to complete physical tasks in the real world when combined with robotics. AI systems that can complete tasks are called '**AI Agents'**, or '**Agentic AI'**.

*The AI for Good Impact Report 2024[2] from Deloitte and the International Telecommunications Union (ITU) – the UN Specialised Agency for Digital Technologies – found that **94% of global business leaders view AI as critical for their organisation's success in the next five years**.*

Why this technology matters to Travel & Tourism

AI is not a futuristic fantasy. It is a rapidly evolving technology that is here today and has the potential to reshape almost every aspect of the Travel & Tourism sector.

For example, AI could support customer service, with a 24/7 system that can answer questions instantly and resolve issues efficiently. AI could help to create customer travel experiences that are tailored to their exact preferences. It could also help to optimise pricing, provide more accurate demand predictions and enable better-targeted marketing campaigns, all leading to a more streamlined and profitable business.

TECHNOLOGY GAME CHANGERS

Travel company executives are increasingly recognising the value that Generative AI can bring to their operations. Accenture research found that **73% of travel leaders are focused on adopting Generative AI for cost savings and greater efficiency**[3], *and Travelport consumer research found that* **42% of respondents (and 52% of frequent travellers) trust travel businesses to use AI responsibly.**[4]

Enabling Technologies: Big Data & Cloud/Edge Computing

Big Data is the huge volume of information that is generated every day from all sorts of places, such as social media posts, customer reviews, bookings, and even weather patterns. Think of it as the **digital footprint of all interactions with the Travel & Tourism world**.

Large volumes of information are not new, but what makes 'Big Data' special now is not just the *amount* of data, but that we now have *AI tools* to make sense of it. For example:

- **Targeted Marketing:** Instead of general advertising, AI and Big Data can help target the right customers, with the right message, at the right time, improving the marketing return on investment (ROI). Think of recommending specific hotel rooms, or tours, based on a traveller›s previous trips, or offering personalised deals based on a customer's preferred travel style.

- **Improved Operations:** From predicting peak times at attractions to optimising staff scheduling, AI and Big Data can provide insights that lead to better business efficiency and resource management.

- **Enhanced Customer Loyalty:** By better understanding customer preferences and pain points, businesses could create exceptional experiences that build loyalty.

AI and Big Data is supported by **cloud and edge computing** which are the engines that process the data.

Think of **cloud computing** as a huge, shared library in the sky where data and software are stored and accessed remotely over the internet. It provides the capacity to *cost-efficiently* store, analyse and access enormous datasets from anywhere in the world and can provide the infrastructure for online booking platforms, customer relationship management systems, and vast marketing campaigns.

Alternatively, **edge computing** is more local and is like having powerful mini supercomputers strategically placed where data is created. This could be at an airport, a hotel, or any tourist attraction. This can improve the speed, reliability and efficiency of services offered to customers. Think of faster check-in processes, quicker access to digital room keys, or real-time information for on-location services. By processing data locally, edge computing reduces latency and bandwidth costs, leading to a much smoother experience for customers.

However, it is the appropriate **combination of both cloud and edge technologies that is paramount to enhancing the traveller journey** and running efficient and cost-effective operations with AI and Big Data.

By understanding the capabilities of AI and its enabling technologies, Travel & Tourism businesses can position themselves to thrive in this new era of smarter, more personalised, and more efficient travel.

Trend Evolution:

- **Near Term (1-10 years):** AI is already revolutionising customer journeys. With more use of Big Data, we could expect to see greater personalisation of travel offers, smoother online booking processes and more enjoyable travel experiences. Over time, AI-powered personal travel concierges will be able to dynamically anticipate customer needs, and offer real-time suggestions based on travellers' interests. AI will also likely be more integrated into business operations, with the ability to optimise everything from vehicle fleet management to staffing, based on highly accurate predicted demand. Cloud computing services could become more integrated into business operations of all sizes, whilst increased use of edge computing could enable more in-location services, such as access to digital hotel room keys.

- **Longer Term (10+ years):** By this time, AI will have advanced across all industries, so it is possible that in the longer term, AI will be ubiquitous across society and a foundational element in all aspects of travel. Big Data analytics could lead to predictive models so good that they are able to *anticipate* (not just *respond* to) tourists' needs, before they even have them, creating truly amazing travel experiences. This could be combined with a likely rise in other AI-powered consumer tools, such as 'smart glasses', which could for example provide easily accessible real-time translation of a conversation in the lenses of the glasses and remove any language barriers for travellers.

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Trip.com Group's Use of AI to Transform the Travel Experience

Trip.com Group has strategically incorporated Artificial Intelligence (AI) into its ecosystem to address common challenges in trip planning and customer service, transforming the travel experience with a seamless, effective customer-first approach.

At the core of Trip.com Group's product AI ecosystem lies **TripGenie**, an AI-powered travel assistant on the Trip.com platform that generates personalised itineraries, provides real-time booking assistance and delivers practical travel information.

TripGenie, powered by cutting-edge Large Language Models (LLM), offers a seamless and personalised travel experience through intuitive voice and text commands in multiple languages, including English, Spanish, French, German, Italian, Korean, Japanese, Thai, and more. Users can effortlessly book flights and hotels for their trips, and save itineraries as interactive routes with daily overviews. They can enhance their travel plans by adding clickable points of interest (POI) and personal notes, which can be easily shared with friends and family for viewing or editing, delivering enhanced personalisation and flexibility.

Since its launch, TripGenie has rapidly expanded its reach, with users in over 200 countries and regions. In 2024, TripGenie's traffic surged by 200%, while browsing time nearly doubled. The total number of conversations also saw a remarkable 200% increase, solidifying TripGenie's position as a key player in transforming how travellers interact with their journey.

Trip.com Group is further harnessing the power of AI and big data to create an intelligent and personalised hotel booking experience. With features like Image Recognition and Search, users can quickly find hotels by uploading pictures, while Semantic Search allows users to search using natural language, making the process faster and more intuitive. Furthermore, an Image-to-video feature transforms images into immersive videos, improving engagement and boosting bookings for business partners.

The Group's AI tools continue to transform the travel experience and have garnered several accolades across the travel industry, including 'Best Use of Artificial Intelligence' awarded by Travolution and CX Asia.

The Trip.com Group _Momentum 2025_ report explored the accelerating trends driving the future of travel across six Asia Pacific markets, with 80% of survey respondents agreeing that AI significantly influences their travel planning. Travellers are also increasingly using AI-powered apps during their journeys, with around half of all survey respondents using AI-powered translation apps whilst they travel. These figures underscore the critical role that AI will play in delivering smarter, more personalised journeys for travellers in the future.
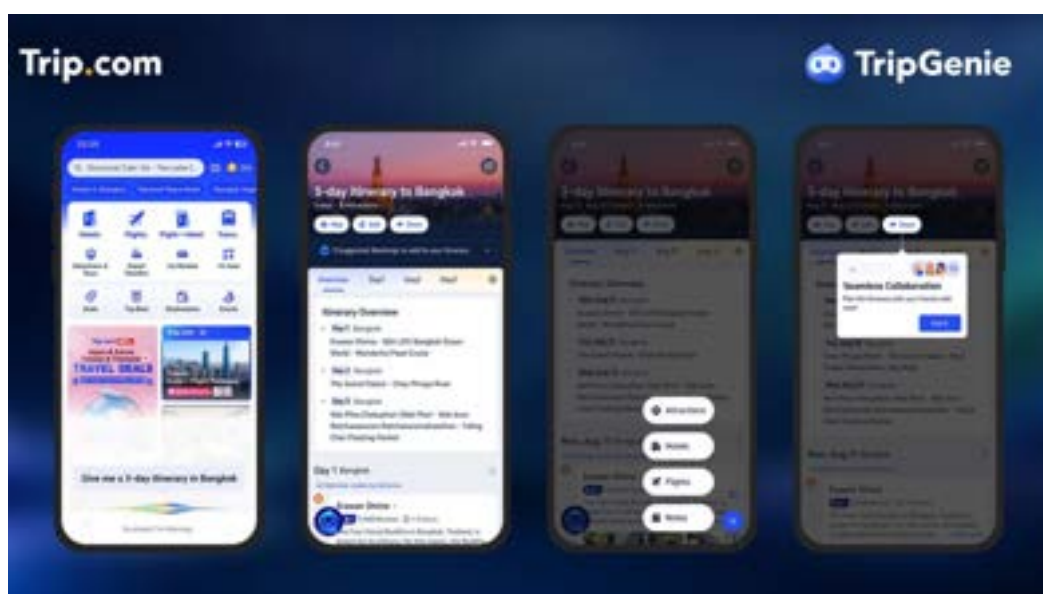
Download and try **TripGenie** here:

Image credit: Trip.com

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Hilton

In 2024, **Hilton** and **Be My Eyes** (a technology company focused on products for blind and low-sighted people) formed an **accessibility partnership** to bring **AI-powered virtual assistance** from 'Hilton Reservations and Customer Care' to Be My Eyes users in the US and Canada[32].

For hotel guests who are blind, or have low vision, navigating the layout of a hotel room, or an unfamiliar lobby location can be a challenge that can turn what should be a happy stay into a complicated and stressful situation. The goal of this partnership is to ensure all hotel guests have the same great Hilton experience, and travellers who are blind, or have low vision, have a more accessible and welcoming stay.

Hotel guests can request assistance through the free Be My Eyes mobile app, which connects directly with Hilton's dedicated agents for **live assistance**, such as asking where the hotel gym is. Alternatively, travellers can ask an **AI-powered assistant** in the app, which is tailored to the Hilton experience. For example, a traveller could point their phone camera at bathroom toiletries and ask which bottle is shampoo, point it at the bedroom and ask where the light switches are, or use the app to read a menu.
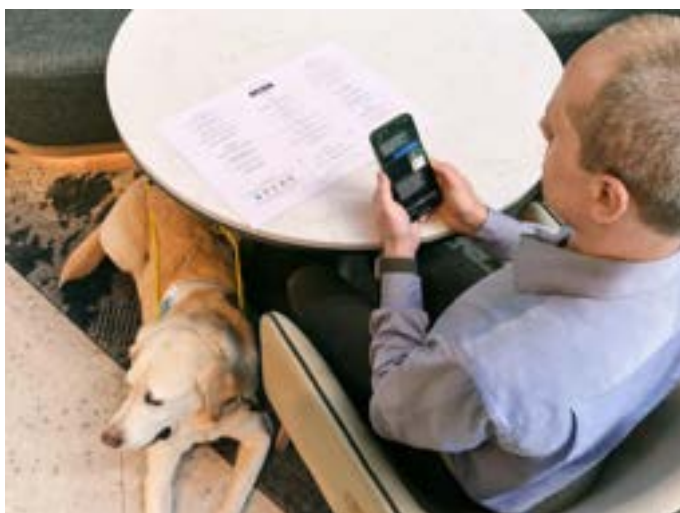
Using the Be My Eyes mobile app to read the hotel menu.
Image credit: © 2025 Hilton

Learn More

To learn more about AI and its benefits and opportunities for the Travel & Tourism sector, download the WTTC reports on AI, developed in partnership with Microsoft, from the WTTC Research Hub (https://researchhub.wttc.org/category/technology)

TECHNOLOGY GAME CHANGERS

5G, 6G & LEO SATELLITES

5G is the latest generation of wireless connectivity and can be 100 times faster than previous 4G technologies. Upgrading from 4G to 5G is like upgrading from a regular road to a superhighway – it allows much more data to be transferred, at incredibly fast speeds. This means downloading large files in seconds, crystal-clear video calls, and a generally smoother online experience.

*In 2022, the European Commission updated its rules for communications onboard aircraft, designating certain frequencies for **in-flight 5G technology**. Since then, airlines operating in Europe have been able to provide the latest 5G technology on their planes and allow passengers to use the full functionality of their smart devices on board the aircraft, as if they were on the ground.*

But this is not the end of high speed connectivity as **6G is already under development** and expected to be launched in the 2030's. Think of 6G as taking the 5G superhighway and adding a teleportation option. 6G promises almost instantaneous connectivity with sub-millisecond response times. This will provide reliable connectivity for applications such as driverless vehicles and fully immersive technologies.

Another notable communications technology is **Low Earth Orbit (LEO) satellites**. These are constellations of satellites at relatively low altitudes above Earth's surface that can enable high-speed connectivity, especially in remote locations. SpaceX-owned Starlink currently has more than 6,000 satellites in low earth orbit and aims to expand the fleet to tens of thousands of satellites around the world[5]. In late 2024, Starlink had over 4 million users, in more than 100 countries[6].

5G, 6G and LEO satellites will provide the backbone for a dramatically more connected and responsive digital world.

Qatar Airways

In 2024, **Qatar Airways** operated the **world's first Starlink equipped Boeing 777** aircraft from Doha to London and is the first airline in the MENA region to offer passengers Starlink ultra-high-speed, low-latency internet[33].

Engineered by SpaceX, **Starlink is the world's largest satellite constellation using a Low Earth Orbit (LEO)** and provides passengers with reliable, high-speed internet, so they can stay connected with friends and family, stream their favourite entertainment, watch live sports, play online games, or work efficiently at 35,000 feet. Qatar Airways is offering Starlink for free to all passengers and it will be available from gate to gate (departure to arrival) with a simple 'one-click-access'.

To demonstrate the power of the Starlink connectivity on its inaugural flight, Qatar Airways Group CEO **held a flawless video call from 35,000 feet**, with the on-the-ground CEO of SpaceX.

Qatar Airways has committed to rolling out the Starlink technology across its entire Boeing 777 fleet in 2025, with its Airbus A350 fleet starting in the summer of 2025.

Image credit: Qatar Airways

Why this technology matters to Travel & Tourism

This technology isn't just about faster surfing of the internet. Faster, more reliable connectivity translates into better business operations and traveller experiences. For example:

- **Improved Navigation & Safety:** Travellers can access real-time travel and destination information, whilst high-speed connectivity can improve safety protocols in crowded tourist areas and provide rapid response messaging in emergencies.

- **New Experiences:** Certain technologies, such as Driverless Vehicles and Virtual Reality (VR) tours (both covered later in this report), require extremely low data lag to operate safely and offer fully immersive experiences, so 5G and 6G could enable entirely new travel options.

- **Connect Anywhere**: LEO satellite receivers can be placed anywhere, from on top of buildings to on top of vehicles, ships or planes, enabling Travel & Tourism businesses to be connected anywhere, at any time. Portable receivers could also be used for connectivity in areas such as campsites, or on small boats.

- **Private Networks**: With network authority approval, it is possible to create a private 5G network (for example within an airport), which provides a localised and secure communications network dedicated to a specific organisation's use. This offers enhanced control, speed, and connectivity within a confined area.

5G, 6G and LEO satellite connectivity could be the catalysts for a more engaging and efficient Travel & Tourism industry.

In 2022, Airport operator **Fraport** *started building* **Europe's largest private 5G network** *at Frankfurt Airport (FRA)[7] to provide high bandwidth and low latency communications dedicated to airport operations.*

During the **2024 Superbowl** *in Las Vegas,* **Verizon created a private 5G network in the stadium***, with Verizon customers experiencing* **download speeds 3.8 times faster** *than other cellular networks [8].*

Verizon 5G antennas inside the stadium. Image credit: Verizon

Trend Evolution

- **Near Term (1-10 years):** We will likely see significant rollouts of 5G technology, especially around major tourism destinations. This could lead to better-connected travellers in tourism locations and faster travel apps, but businesses will need to invest in the right hardware and services to support this. We may also start to see the first implementations of 6G technology, and LEO expansion around the world is expected to grow, which will greatly improve remote and rural area connectivity.

- **Longer Term (10+ years):** 6G could revolutionise many businesses with instantaneous communication and enable true real-time experiences, such as language translation that supports frictionless global travel.

SUPER APPS

A 'Super App' is an application on a phone, or smart device, that doesn't just do one thing, but handles many daily needs and tasks. Instead of having separate apps for booking flights, hailing rides, ordering food, and making payments, a Super App brings these – and many other – services together under a single umbrella application. Think of a Super App like a digital Swiss Army Knife, offering a variety of tools all in one place.

Why this technology matters to Travel & Tourism

When a traveller lands in a new city, instead of downloading and juggling multiple apps to book a hotel, order a taxi, find local attractions, make restaurant reservations, or even translate road signs, they could use a single 'Super App' to help with all of these tasks. This would dramatically reduce friction in the travel process and create a much more satisfying customer experience.

*Accenture research found an **overwhelming majority (97%) of travellers want a travel super app** that will offer one-stop, integrated access to a whole range of travel-related services, including personalised, inspirational destination ideas, flights, dining and options.*[9]

Super Apps are widely used in Asia – with China's **WeChat** the most well-known – but they are much less common in other parts of the world. However, if this technology were to be embraced around the world, it could lead to a fundamental shift in how travellers interact with services.

Trip.com Super App - A Seamless End-to-End Travel Companion

In the realm of travel, Trip.com Group's travel app - Trip.com - exemplifies the evolution of super apps by offering a suite of travel products through its all-encompassing platform.

Serving 24 languages across 39 countries and regions, Trip.com is an innovative and intelligent app that integrates a wide array of functionalities beyond flights and hotel bookings. It is a global ecosystem that enhances the traveller's experience at every stage of the journey, from planning and booking to in-destination support and post-trip engagement.

Planning and Booking: During the planning phase, users can use TripGenie and Trip.Best, AI-driven tools that curate personalised itineraries, suggest trending destinations and recommend top-rated experiences. These features simplify decision-making by providing tailored, real-time, relevant insights.

Centralised Travel Management: The Trip.com app keeps travellers informed for a stress-free journey. The intuitive interface consolidates reservations and itineraries across all products, allowing customers to receive live updates on flight statuses, boarding gates, and baggage claims, contact their airport transfer driver or even book an airport lounge, all on the go.

Enhancing On-the-Ground Experiences: During the trip, Trip.com enhances on-ground experiences with practical tools like instant hotel address translations, ensuring smooth communication and navigation in unfamiliar environments. Furthermore, Trip.com members can enjoy exclusive membership perks to make their travel experience even more enjoyable; lounges, global eSIMs, airport transfer upgrades, and free attraction tickets are some of the perks available. Travellers can also access Trip.Gourmet for curated dining options in various locales and Trip.Moments, a social feature that allows users to share and gain travel inspiration from a global community. Real-time weather updates, currency exchange tools, and local event notifications further enrich the in-destination experience, making each journey more informed and enjoyable.

Post-Trip Engagement: After the journey ends, the app facilitates post-trip engagement through reviews and recommendations. Loyalty programmes and membership benefits incentivise frequent travellers, encouraging repeat usage and fostering brand loyalty.

Around-the-Clock Customer Care: Trip.com is committed to reliable global customer service via its 15 international sites in over 20 languages. Professional and passionate customer support advisors help thousands of travellers daily, prioritising hassle-free customer experiences. AI technology is further leveraged to handle millions of customer interactions annually, significantly reducing response times and improving resolution rates.

As a testament to its app's integrated capabilities, Trip.com has won recognition with accolades for its user design and customer service, exemplifying the potential of travel super apps to reshape the way consumers are interacting with travel services.

Download and try the travel **super app** here:
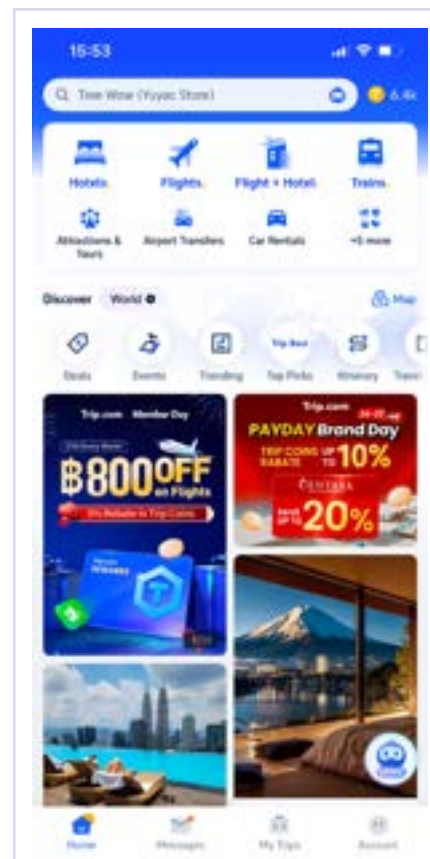
Trip.com's Super App.
Image credit: Trip.com

Trend Evolution

- **Near Term (1-10 years):** We may initially see increased adoption of Super Apps in travel markets around Asia where this model already thrives, before spreading to other parts of the world. We may also see Super Apps becoming more interoperable and regionally integrated, with some collaboration between existing Super Apps that enable frictionless bookings and personalisation of travel experiences across borders. In response, travel brands may also start building more mini apps inside new Super Apps to offer their services directly to a wider audience.

- **Longer Term (10+ years):** Super Apps could become a key interface for travel services, integrating pre, during and post travel-related activities. Think of a world where your journey, from the time you consider a holiday to when you return home, could be fully integrated within a single digital platform. These Super Apps could also have direct interaction with internet-enabled devices in your hotel room, or at tourism venues, enabling more personalised services.

IMMERSIVE TECHNOLOGIES

The line between the physical and digital worlds is becoming increasingly blurred, and this convergence opens up new and exciting possibilities for the Travel & Tourism sector.

Customers could visit ancient sites from history, or walk through a hotel room to experience a stay, even before they have left home. That is the power of **Immersive Technologies**, which can include **Augmented Reality (AR)**, **Virtual Reality (VR)**, **Mixed Reality (MR)**, **Extended Reality (XR)**, the **Metaverse**, and **Digital Twins**.

'Extended Reality' Technologies

EXTENDED REALITY (XR)

| Augmented Reality (AR) | Mixed Reality (MR) | Virtual Reality (VR) |

Lower Immersion — Higher Immersion

- **Augmented Reality (AR):** This is like adding digital 'stickers' to your view of the real world. AR can use your phone, or special glasses, to overlay digital images and information onto what you're seeing in the real world. It's like enhancing reality with extra layers of information. Popular consumer examples include 'Snapchat filters', or the mobile game 'Pokémon Go'.

- **Virtual Reality (VR):** VR takes you to a completely different place. You wear a headset that blocks out the real world and it transports you into a simulated environment. You can look around, and sometimes interact with this new world, making you feel like you are actually there.

- **Mixed Reality (MR):** MR is a blend of AR and VR. It not only overlays digital objects onto the real world, but also allows these objects to interact with the world realistically. For example imagine seeing a virtual sculpture in your hotel room, that accurately casts shadows onto your bed, desk and suitcase and allows you to walk around it. MR is a bridge between the physical and digital world.

- **Extended Reality (XR):** Think of XR as an 'umbrella term' that encompasses several exciting technologies, all focused on blending the real world with digital creations, however it is achieved.

A 2024 Phocuswright report comparing travellers' views towards emerging technologies in seven major markets revealed that across those countries[10]:

- *Around **25% had used VR**, but **slightly fewer had used AR***

- *Between **38% (in Canada) to 50% (in Italy)** of those who were aware of these immersive technologies **were interested in using VR/AR to preview a destination, hotel or attraction before booking***

- *Similar numbers showed an interest in **using AR on their smartphone to enhance in-destination experiences***

The Metaverse

The **metaverse is an interconnected network of virtual spaces**. It is not a single platform or application, but rather the concept of shared digital spaces, experiences and economies.

Here's how it relates to the 'extended reality' (XR) technologies covered above:

- **XR as the Access Point:** AR, VR, and MR technologies are the primary ways people will access and interact with the metaverse. VR will likely be the most immersive experience for exploration, socialisation and entertainment, whereas AR and MR will provide a way to bring aspects of the metaverse into our physical world.

- **Beyond Simple Experiences:** While XR technologies can provide an isolated immersive experience, the metaverse concept focuses on creating interconnected and collaborative digital worlds. Instead of a virtual tour on its own, you could, for example, have a virtual travel agency within the metaverse which has a VR tour, an AR demo, or an MR demonstration space built in.

- **The Importance of Interoperability:** The key to the metaverse is interoperability – that is the ability to move between different virtual spaces with consistent identities and digital assets. For Travel & Tourism companies, this means the ability for brands to collaborate and offer connected experiences across different platforms, all within a persistent digital space.

The metaverse could be thought of as a destination, with XR technologies the vehicles to take you there.

Digital Twins

A 'Digital Twin' is an identical virtual copy of a real-world thing – for example a hotel, an airport, or even an entire tourism destination. It's a dynamic, living model that replicates a real world asset.

That means a digital twin isn't just a static picture, it's a constantly updated 3D digital representation, with real-time data, allowing businesses to see how a real thing is behaving, including an ability to predict potential issues, and test out changes in a safe virtual environment. A digital twin could be viewed on a computer, or a user could 'step in' to a digital twin via the immersive technologies discussed above.

Think of it as having a video game version of your business, where you can experiment with changes, without any real-world risk.

Why this technology matters to Travel & Tourism

Immersive technologies could enhance Travel & Tourism, from pre-trip inspiration to post-trip memories. Examples include:

- **Pre-Trip Inspiration and Planning:** Customers could use AR and Digital Twins to explore different destinations through their phones. This technology is available today where customers can "walk" through a virtual hotel, check out the view from a specific room, or even see what local attractions are like. Alternatively, VR can transport potential clients to a faraway destination, or back in time through history to visit ancient sites, allowing them to sample its unique atmosphere. This immersive approach moves beyond static images, to deliver a much more persuasive experience.

- **Enhanced On-Site Experiences:** Once customers arrive at a destination, AR can provide interactive maps, historical information layered over landmarks, or translations of signs and menus in real-time. Similarly, VR experiences could take guests on unique digital tours that are immersive, educational and fun.

- **Personalised and Immersive Activities:** Customised MR experiences at theme parks could interact with the park's environment, or VR tours of underwater reefs could be taken without getting wet.

- **Post-Trip Engagement and Loyalty:** Customers can use VR to relive memories, or share their journeys with friends and family using MR. This is a key feature of 3D 'spatial photos' on VR headsets such as the Apple Vision Pro[11].

- **Boost Operational Efficiency:** Digital twins allow managers to see the inner workings of their business like never before, enabling data-driven decisions that can lead to better efficiency, reduced costs, and happier customers. For example, hotel guest movements could be digitally analysed to optimise hotel layouts and staffing, whilst also identifying peak times and locations. By tracking energy consumption, a digital twin could identify maintenance needs before they become critical and new policies or infrastructure could be simulated in a safe environment.

In summary, immersive technologies allow Travel & Tourism businesses to:

- **Increase customer engagement:** Immersive experiences can be far more captivating than static content.

- **Offer personalised experiences:** Tailor experiences to individual preferences and needs.

- **Create unique differentiators:** Stand out from the competition with innovative offerings.

- **Drive bookings and revenue:** Turn browsing into booking, with compelling immersive experiences.

- **Improve customer satisfaction:** Deliver seamless and memorable travel experiences.

TECHNOLOGY GAME CHANGERS

Radisson Hotel Group

The **Radisson Hotel Group's virtual interactive tours** allow guests to **enter hotels, meeting spaces, and hotel rooms virtually** from their laptop, smartphone, or VR headset and are available for **150+ hotels** [34].

This interactive experience enables travellers to take a virtual walk through the hotel and its rooms, check out a restaurant table, or even plan a gym routine before booking.

Meetings and events planners can visualise room layout options with VR headsets, measure spaces, and create an instant booking with the Radisson 'Book It Easy' online tool[35]. Radisson is also implementing HeadBox 3D Studio, a tool which allows the hotel to create immersive, personalised 3D guided tours, enhanced with AI-generated narrator videos[36].

Since its introduction, the Radisson immersive experiences have increased **qualified meeting and event inquiries (+35%)** and achieved **more booking conversions (+12%)**[36] and the Radisson Hotel Group is steadily rolling out this technology across all of its hotels worldwide.

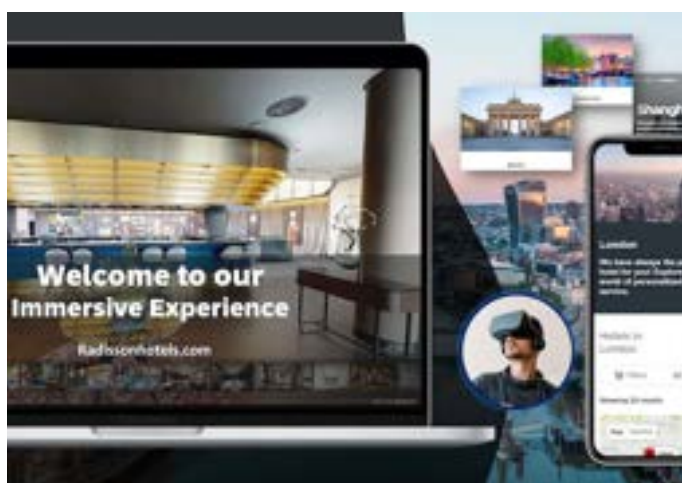Try it now for the **Radisson Collection Hotel, Gran Via Bilbao**

Image credit: Radisson Hotel Group

Immersive Glasses & Headsets

The world of immersive viewing technology is moving fast, and the latest headsets and glasses are very different from early prototypes. A key focus is on making them more comfortable, more powerful, and easier to integrate into our daily lives. Key advancements include:

- **Improved Comfort & Design:** Lighter, more ergonomic headsets and glasses. This is crucial for extended applications like all-day city, or museum tours. More stylish AR glasses are also approaching the look of regular eyewear for everyday use.

- **Superior Display Quality:** Sharper, more lifelike visuals for enhanced immersion and realistic AR overlays.

- **Increased Processing Power:** More powerful processors enable smoother performance and realistic experiences, with many headsets now wireless.

- **AI Integration:** AI powers such as speech, video and gesture recognition enable real-time interaction between the physical and virtual worlds.
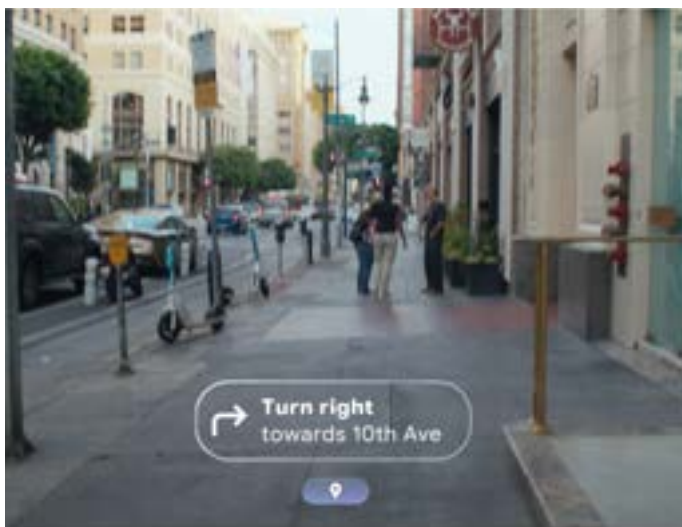

Translation on Android XR glasses. Image credit: Google

Google

Whilst there are a growing number of immersive technology headsets and glasses on the market, from a variety of manufacturers, in December 2024, **Google** launched a new operating system for any Extended Reality (XR) device, called **Android XR**[37,38].

Android XR builds on the existing smartphone and tablet Android operating system and aims to work with all participating headsets and glasses to transform how users '**work, watch and explore**'.

Android XR includes Google Gemini AI technology, as well as access to the internet, all apps in the existing Google Play store and integration with the Google ecosystem. For example, a user wearing an immersive headset or glasses could watch Google TV on a large virtual screen, relive moments with Google Photos, or have Google Map directions projected directly into their XR glasses line of sight.

Navigation on Android XR glasses. Image credit: Google

The evolution of immersive headsets and glasses is fast and we can expect even more exciting innovations in the years to come.

Trend Evolution

Near Term (1-10 Years):

- **More AR integrations:** We may see more use of AR in travel apps, such as interactive maps, or AR overlays that can translate menus and signs in real-time.

- **VR try-before-you-buy:** Travel & Tourism stakeholders such as hotels, airlines, or cruise lines may offer virtual tours allowing customers to experience their offerings before booking.

- **Lightweight XR Glasses:** We may see increasingly affordable and stylish XR glasses becoming more mainstream. These will move beyond current heavy and cumbersome headsets to enable a more seamless integration of AR and MR technologies.

- **More sophisticated MR applications:** We could see innovative MR applications such as interactive museum exhibits and personalised MR tour guides that adapt to a visitor's pace and interests.

- **Digital Twins:** We may see greater adoption of digital twins, that gradually become more sophisticated and integrate data from various sources – such as customer feedback, weather patterns, or local events – to create a holistic view of a business. These may be supported by dashboards for real-time operational insights.

Longer Term (10+ Years):

- **"Teleportation" Experiences:** Highly sophisticated VR, MR and other sensory tools (such as heat and sound) may be combined to further blur the line between the physical and digital world, allowing users to really feel like they are in a different environment.

- **AI-Powered XR:** Artificial Intelligence could personalise and optimise XR experiences in real-time, anticipating customer needs and enhancing interactions in the digital world.

- **Digital Twins:** It is possible that we may see 'large-scale digital twins' that move beyond single assets to larger, more complex scenarios, such as entire resorts, whole destinations, or even regions. For example a detailed digital replica of a city could be used to manage tourism, model different development scenarios, or react to real-time events.

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The way we handle money is constantly evolving, and the rise of new 'Financial Technologies,' or FinTech, is not just about new payment methods, it's about the on-going reshaping of the entire financial landscape, which could create new opportunities for both businesses and travellers.

This chapter explores some of the most significant FinTech trends, including the growing popularity of **Buy Now, Pay Later (BNPL)** options, the emergence of **Central Bank Digital Currencies (CBDCs)**, the impact of **Open Banking** standards and the ability to store **digital money and credentials in Digital Wallets**.

These technologies have the power to influence how customers book their trips in the future, manage their spending, and interact with Travel & Tourism businesses, as well as how companies will financially interact with their suppliers. By understanding these trends, the sector can position itself to offer more secure, flexible and convenient financial solutions, ultimately enhancing business operations and the overall travel experience.

FINANCIAL TECHNOLOGIES (FINTECH)

- Buy Now - Pay Later
- Central Bank Digital Currency
- Open Banking
- Digital Wallets & Credentials

Innovating Cross-Border Payments with TripLink's Fintech Solution

Imagine running a global business or managing a complex travel itinerary, only to be bogged down by complex cross-border payments. TripLink, a subsidiary of Trip.com Group, is reshaping the travel industry through cutting-edge fintech solutions that simplify and secure international transactions. Established in 2018, TripLink addresses the complexities of global transactions for businesses such as airlines, travel agencies, and cross-border e-commerce platforms, making transactions faster, safer, and smarter - bringing a new level of ease to global connectivity.

At the heart of TripLink's offerings is its **Virtual Commercial Card** solution. Leveraging self-developed technology, it ensures security, multi-currency transactions, real-time monitoring, and detailed expenditure reporting. **Enterprises are empowered to improve financial management and optimise workflows when they are provided with transparency and efficiency.**

Image credit: Trip.com

With a robust infrastructure supporting over **200 million transactions annually**, TripLink achieves a **99.99% system stability rate** and maintains a **processing time below 300 milliseconds for 99% of transactions**, ensuring swift and seamless payments. Additionally, the platform processes up to **1,000 transactions per second**, demonstrating unparalleled scalability.

TripLink VCCs offer significant benefits across 3 main stakeholders:

- Airlines and hotels: Enjoy faster cash flow cycle with settlement times reduced to 2-4 days post-ticketing. This minimises risks of chargebacks, frauds, and ADM costs, while enhancing partnerships with travel agencies by reducing credit monitoring needs.

- OTAs in Merchant Mode: Travel agencies can accept various payment methods, reducing fraud risk across the value chain and improving the travellers' experience.

TripLink's **multi-layered risk control system**, tailored to the travel industry, safeguards users through **advanced fraud detection, data isolation, real-time monitoring, and identity verification**. This has earned partnerships with global leaders like **AirAsia** and **Tencent**, along with accolades such as **MasterCard's recognition** for the **highest cross-border business card spending in Asia Pacific** for three consecutive years.

Since its inception, TripLink has issued over **70 million cards worldwide**, partnering with **500+ global businesses**. Customer testimonials praise TripLink's impact, with its services like NetEase Cross-Border Payments, highlighting TripLink's ability to improve payment efficiency and reliability.

Looking ahead, TripLink aims to expand its global presence, develop diversified financial products, and drive **digital transformation** in the travel industry, setting new standards for seamless global transactions.

BUY NOW, PAY LATER (BNPL)

With a "**Buy Now, Pay Later (BNPL)**" scheme, customers could book their dream holiday, but instead of paying the full amount in one go, it could be paid off in smaller, more manageable instalments, over several weeks or months.

*BNPL schemes have grown in popularity in recent years, with a study from Juniper Research forecasting **BNPL users will almost double in only four years, from 380 million users in 2024, to 670 million users in 2028**[12].*
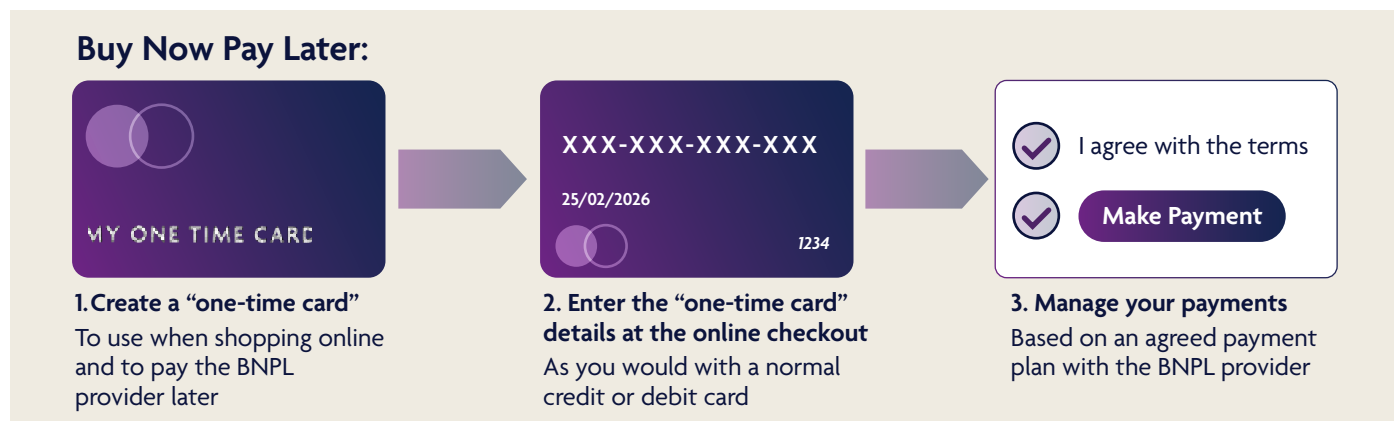
*Major travel companies, such as American Airlines, allow travellers to pay for a flight over a series of payments that work for their budget, either via third party BNPL providers, or their own **American Airlines Flex Pay**[13], which gives travellers the freedom to pay for their trip over several fixed instalments.*

BNPL schemes are often run by third-party providers and offered at the online checkout stage (or sometimes in-store), allowing customers to split their purchase costs into multiple payments. They are typically interest-free (0%) if payments are made on time, making them a particularly attractive option for large purchases, which could include a family holiday, or a once-in-a-lifetime adventure.

Other models from third-party BNPL providers include allowing a customer to make an online "one-time digital card" (similar to a credit card), which can be used to pay for travel and then paid off in instalments via an agreed payment plan with the BNPL provider.

But at its core, **Buy Now, Pay Later (BNPL) is a technology-driven financial service** providing instant credit assessments. When a customer chooses to pay with BNPL, algorithms rapidly analyse customer data (such as purchase history and location) to determine their eligibility and creditworthiness. Approved purchases are then funded by the BNPL provider, with the customer repaying in instalments.

BNPL platforms can be easily integrated into Travel & Tourism company websites via small technical plug-ins called APIs (Application Programming Interfaces), while automated technical systems handle repayments, notifications, and customer service.

Buy Now Pay Later:

1. **Create a "one-time card"**
To use when shopping online and to pay the BNPL provider later

2. **Enter the "one-time card" details at the online checkout**
As you would with a normal credit or debit card

3. **Manage your payments**
Based on an agreed payment plan with the BNPL provider

Why this technology matters to Travel & Tourism

The biggest hurdle for many prospective travellers is often the upfront cost, so BNPL presents an interesting opportunity for the Travel & Tourism sector to lower the barrier to travel. A customer might hesitate to book a $2,000 family vacation, but might more eagerly grab the opportunity to pay it off in four $500 monthly instalments.

Benefits to Travel & Tourism businesses could include:

- **Increased Bookings:** BNPL makes travel more accessible to a broader audience, potentially increasing bookings and revenue, particularly for those who may have previously only chosen cheaper trips, or chosen to stay at home.

- **Higher Average Spend:** Customers may be more inclined to book higher-value packages, upgrades, or add-ons if they can spread the cost over time, boosting the average booking value.

- **Improved Customer Satisfaction:** Providing a flexible payment option could lead to greater customer satisfaction and loyalty, as it addresses a key financial pain point for many travellers.

- **Seamless Integration:** The beauty of BNPL lies in its easy integration into existing websites and booking systems. Simple technical plug-ins (called APIs) mean that businesses don't need to reinvent their technology infrastructure.

- **Instant Credit Assessment:** The speed and automation involved means that customers receive credit approval in seconds, without any cumbersome application process. This creates a smoother and quicker checkout experience, which is crucial for online travel bookings.

- **Data-Driven Insights:** BNPL platforms collect data on customer spending habits, allowing travel companies to understand payment behaviours. This data can be used to inform marketing strategies and tailor offers more effectively.

The Phocuswright 'State of Global Travel Payments 2024' report found that **41% of retailers, 36% of wholesalers & tour operators,** *and* **31% of suppliers, already support and accept BNPL** *and/or payments by instalment.*

However, **BNPL's share of total travel sales was extremely low at just 1.3%** *across survey respondents*[14].

Trend Evolution

- **Near Term (1-10 years):** We may see an increase in the availability of BNPL payment options across travel booking platforms as awareness increases and solutions become more easily integrated. We may also see them going beyond just a basic payment option, to more sophisticated dynamic payment plans that can adjust in real-time to match a customer's financial health and travel preferences.

- **Longer Term (10+ Years):** We might see BNPL schemes integrated with other financial products, such as 'Super Apps' or 'digital wallets' (also discussed in this report), creating an interconnected ecosystem that allows travellers to manage their travel bookings and finance in a unified platform. We may also see the use of AI-powered systems that can automatically generate BNPL payment options based on a customer's spending history and risk profile, moving to 'smarter' and more personalised payment options.

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CENTRAL BANK DIGITAL CURRENCIES (CBDC)

A Central Bank Digital Currency (CBDC) is a digital form of a country's official currency, issued and regulated by the central bank and designed to facilitate secure, efficient, and cashless transactions. A CBDC is not a cryptocurrency. A CBDC is a digital currency that is government-backed with centralised control, unlike cryptocurrencies, which are decentralised and typically not issued by any central authority.

Think of a CBDC as having digital cash stored on a phone, or a special card, instead of physical notes and coins. This is also different from money in an online bank account, which is a digital record of physical money. A CBDC will never have been a physical note, or coin.

CBDCs aim to create a fast, secure, and efficient way for everyone to make payments, both within a country and eventually across borders. It's a move to modernise the global monetary system, making it fit for the digital age.

*The September 2024 report from the Atlantic Council Digital Currency Tracker found that **134 countries (representing 98% of global GDP) are exploring a CBDC**[15].*

This includes all of the original BRICS Member States (Brazil, Russia, India, China & South Africa), all of the G20 countries, with 13 of them in the pilot stage and three countries (Jamaica, the Bahamas and Nigeria) having fully launched a CBDC.

The Digital yuan (e-CNY) is the largest CBDC pilot in the world. *In June 2024, total digital CBDC transactions reached 7 trillion e-CNY (~USD $986 billion).*

This is nearly four times the 1.8 trillion yuan (~USD $253 billion) recorded only one year earlier by the People's Bank of China in June 2023.
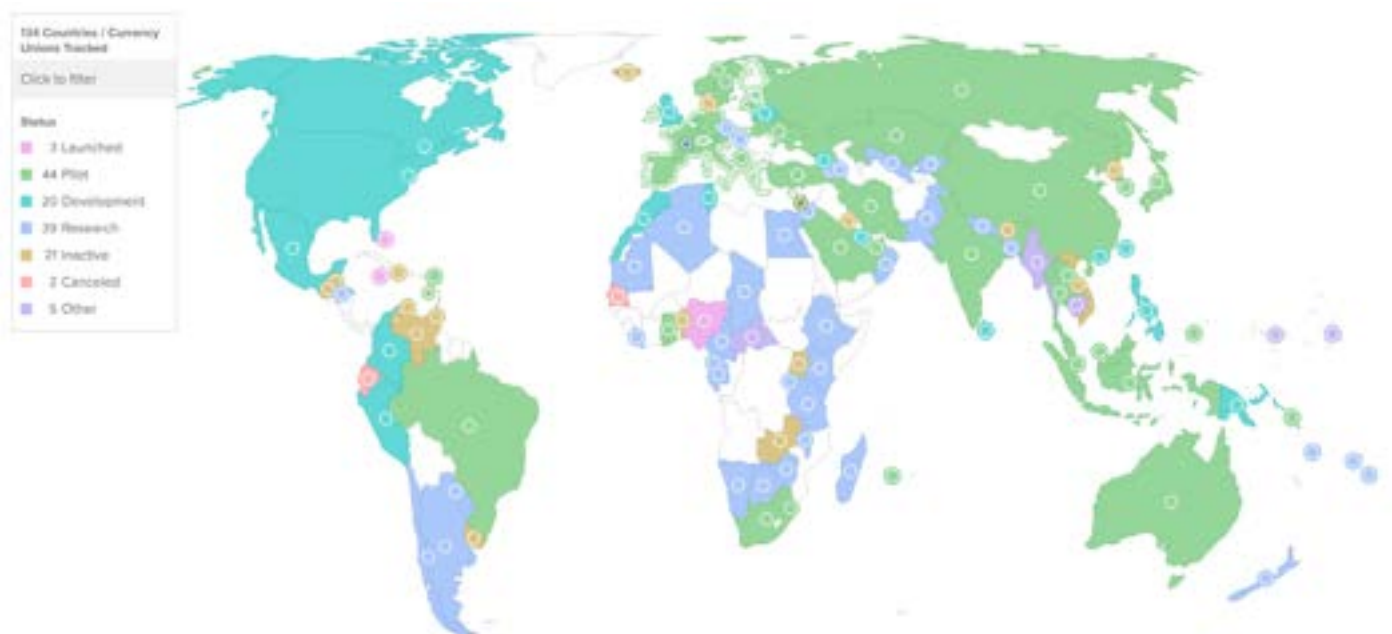
Map showing uptake of Central Bank Digital Currencies.
Image Source: Atlantic Council CBDC Tracker [15]

Why this technology matters to Travel & Tourism

CBDCs have the potential to revolutionise how customers pay businesses, how they pay suppliers and how companies manage transactions. For example:

- **Faster Payments:** Eventually, tourists from different countries could use their own CBDCs to pay directly for flights, hotels, or experiences. This simplifies the entire payment process, making travel booking faster and easier.

- **Reduced Transaction Costs:** CBDCs could reduce payment processing fees, which could reduce expenses and potentially allow Travel & Tourism companies to offer more competitive pricing to customers.

- **Enhanced Financial Inclusion:** CBDCs could make travel more accessible to people who don't have traditional bank accounts, particularly in developing countries who are embracing mobile phones. This could also open new markets and opportunities for Travel & Tourism businesses.

- **Improved Transparency:** With the digital nature of CBDCs, tracking payments and verifying revenue is likely to become far more transparent, reducing the risk of fraud and improving financial reporting.

CBDCs are still in their early stages in many countries, and achieving **cross border CBDC payment interoperability** is critically important for global widespread adoption and effective use within Travel & Tourism. By staying informed about this evolving technology, Travel & Tourism companies can position themselves to take advantage of CBDC opportunities as they become more widely available.

The Phocuswright 'Travellers and Tech 2024' report found that **46% of leisure travellers in the US are 'moderately to extremely interested' in the concept of making travel purchases via a CBDC.**[16]

Jamaica

In 2022, the Bank of Jamaica (BOJ) launched **JAM-DEX** (Jamaica Digital Exchange) as a Central Bank Digital Currency (CBDC), following a pilot phase in 2021. The aim of JAM-DEX is to enhance financial inclusion, improve payment efficiency, and modernise the nation's financial infrastructure[39].

The JAM-DEX is legal tender alongside the Jamaican dollar and provides a digital payment alternative. It is accessible to all Jamaicans, even those without traditional bank accounts, via digital wallets provided by authorised financial institutions, starting with the National Commercial Bank (NCB) of Jamaica, and uses robust cyber security features to minimise fraud.

To encourage use of JAM-DEX, the BOJ conducted public education campaigns with the slogan *"No Cash, No Problem, JAM-DEX"*, and provided financial incentives for early adoption including JMD $25,000 (~USD $160) for the first 10,000 eligible small businesses to receive five payments in JAM-DEX after March 2023 [23].

Increasing merchant adoption remains a key focus for the Government of Jamaica to improve usability beyond person-to-person transfers. Ensuring widespread access to technology (e.g. smartphones and internet) is also crucial for full nationwide inclusion.

Jamaica's JAM-Dex. Image credit: Bank of Jamaica

Trend Evolution

- **Near Term (1-10 years):** We are likely to see many countries piloting CBDCs, before they gradually become more widely adopted within domestic payment systems and could gradually replace physical cash transactions. If cross-border payment trials prove successful, Travel & Tourism companies are likely to begin integrating CBDC payment options into their booking platforms and travellers will be able to hold various CBDCs and other digital assets in their smartphone 'digital wallets' (discussed later in this chapter).

- **Longer Term (10+ years):** Interoperability between different CBDCs should be much more advanced by this time, leading to globally agreed standards for digital payments. Cross border travel payments will then feel effortless, with instant digital transactions.

OPEN BANKING

Open Banking is the ability to securely share personal financial information with trusted third-party apps.

Instead of financial data being locked away in a bank, Open Banking allows account holders to grant 'select access' to approved companies. Think of it like providing a temporary key to one drawer in a financial safe – but, importantly, not the whole thing!

This is achieved through secure digital connections and enables companies – with the account holder's permission only – to access information such as a transaction history. The purpose of Open Banking is to give consumers more flexibility and choice with their finances.

Why this technology matters to Travel & Tourism

Open Banking has the potential to streamline operations and enhance the customer experience in several ways. For example, it could simplify payments and customers could pay directly from their bank accounts on a booking website, cutting out processing fees and speeding up transactions. This use of Open Banking is sometimes called Account-to-Account (A2A) payments and could lower operating costs and reduce the likelihood of failed payments[17].

Alternatively, with the consent of customers, Travel & Tourism businesses could gain valuable insights into consumer travel spending habits, enabling businesses to offer more personalised packages, promotions, and travel experiences, which could also lead to improved customer loyalty. For example, if a customer frequently books weekend breaks, a travel platform – with the customer's consent – could identify this and recommend tailored packages based on their past travel and spending behaviours.

By exploring this evolving financial technology, Travel & Tourism companies could create more efficient and personalised experiences, while securing real business efficiency benefits.

Trend Evolution

- **Near Term (1-10 years):** We may see the start of Open Banking payments for travel bookings and ancillary services, offering faster and cheaper transactions. Travel apps may start using Open Banking for secure verification processes and may start providing personalised offers based on customers' financial data (with their consent). If Open Banking expands, we can expect to see more sophisticated fraud prevention models to protect customers and businesses, which would enable even smarter Open Banking and travel features, such as identifying cost-saving opportunities for customers based on their financial situation (also with their consent).

- **Longer Term (10+ years):** In the longer term, safe and secure Open Banking could become an opportunity for hyper-personalised travel experiences. For example, AI-powered platforms using financial data could craft entirely bespoke trips that could dynamically adjust to the customer's financial capacity and preferences, even while they are travelling.

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DIGITAL WALLETS & TRAVEL CREDENTIALS

A **Digital Wallet** is a secure application on a smart device that can store digital versions of bank cards, credit cards, Central Bank Digital Currencies (CBDCs), loyalty points, and other documents.

This could include digital travel documents, such as a **digital passport** or other credentials, such as a **hotel reservation** or **boarding pass**, all securely held within a digital wallet.

A smart device may have multiple digital wallets to store different types of information. For example, one digital wallet may store digital loyalty cards, while another, issued by a national government, could store official government documents, such as a digital passport or an electronic visa (eVisa).

This means that instead of fumbling with paper tickets, or worrying about losing a passport, everything a consumer needs to travel can be securely and easily accessible on their smart device.

*By 2026, the European Union will have rolled out an **EU Digital Wallet** which will provide a safe, reliable, and private means of digital identification for everyone in the EU. Every Member State will provide at least one wallet to all of its citizens, residents, and businesses allowing them to **prove who they are, and safely store, share and sign important digital documents**[18,19].*

*Prior to its roll out, the EU piloted four large scale projects to test digital wallets in real-life scenarios, including a travel use case, run by the **EU Digital Identity Consortium (EWC)**, which consisted of representatives of all 27 EU Member States, 41 partners and 35 associated partners[20].*

Why this technology matters to Travel & Tourism

Digital wallets and credentials offer convenience and efficiency. For travellers, they mean less stress and quicker movement through airports and other travel hubs.

With digital credentials, travellers can easily manage their bookings, check-in, and even make purchases with just a few taps of their phone.

For businesses, this technology offers an opportunity to streamline the entire travel process, from booking to arrival, with reduced administrative overheads, and happier customers. Digital wallets can also accept and store personalised travel offers and loyalty programs, driving up revenue and customer retention.

Digital Passports

A **digital passport** (which is formally called a '**Digital Travel Credential**', **or DTC**) is the next stage of digitally enabled travel.

Digital passports build on the foundations laid by electronic passports (ePassports), which were introduced in the mid-2000s. ePassports (sometimes also called biometric passports) contain a data chip, which enables travellers to use e-gates, or kiosks, in airports and other transport hubs, but the traveller still has to carry and present a physical passport book.

Digital passports are the next evolution that are coming very soon and will be a secure digital version of a physical passport, which can be stored on a mobile device. This will allow travellers to share their identity electronically with border authorities and travel providers from their smartphone – even before they have left their home – eliminating the need to queue at check-in counters, or at the border, and place physical passports in an e-gate or kiosk. A quick biometric check – which matches a traveller's real face to the digital image shared from their digital passport – is all that will be required to confirm that the person who shared the digital passport identity is the same person attempting to check in, board transport, or enter the country. Digital passports could also be used with hotel check-in procedures.

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SITA

In 2023, **SITA**, in partnership with **Indicio**, demonstrated the **world's first international border crossing with a digital passport** at Queen Beatrix International Airport in **Aruba**[40,41].

This initiative, called the **Aruba Happy One Pass**, enables travellers to send high-quality biometric and biographic data from their digital passport, stored in a digital wallet on their smartphone, to the Government of Aruba for border inspection, even before they have left their home. The Government of Aruba can then review travellers before their trip and issue Trusted Traveller credentials confidently, securely and digitally back to the travellers. This **enables eligible travellers to pass through the Aruba border in seconds** and eliminates the need for long queues and manual passport inspections.

Aruba's "Happy One Pass". Image credit: SITA

In the future, the use of a digital passport, which contains a government-approved biometric image of a face, means a traveller's face will become their 'travel token' – they won't need to physically show any paper documents when travelling. All that will be required is a very quick biometric match (e.g. taking only a few seconds) at any process touch point.

Trend Evolution

- **Near Term (1-10 years):** We could expect to see countries and regions (such as the EU) issue digital wallets to their citizens to hold official documents (such as digital passports and visas) and greater adoption of industry led digital wallets (such as from Google, Apple and Samsung), with digital currencies (discussed earlier in this chapter) and more digitally related travel credentials, such as digital boarding passes, digital hotel reservations and digital tourism attraction tickets, all held within digital wallets.

- **Longer Term (10+ years):** Digital wallets could become the primary point of interaction for the entire travel journey, handling everything from digital booking, transport and accommodation information to digital currencies, digital health credentials (such as digital vaccine certificates) and digital payment cards. They may also contain digital credentials linked to other services, such as insurance, entertainment and local attractions.

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The way we move between locations is fundamental to the Travel & Tourism experience, and the future mobility landscape is undergoing a rapid and exciting transformation.

This chapter explores the technologies poised to reshape how we travel, including the rise of **sustainable travel technologies**, the emergence of **multimodal travel solutions** that seamlessly integrate various modes of transport, the potential of **driverless vehicles** and the exciting advancements in the world of **Future Aviation** that could see the return of supersonic flight and an entirely new form of transport called Advanced Air Mobility (AAM).

But these technologies aren't just theoretical futuristic concepts; they are rapidly evolving trends that have the power to redefine travel accessibility, reduce our environmental impact, and create more efficient, personalised and thrilling travel experiences.
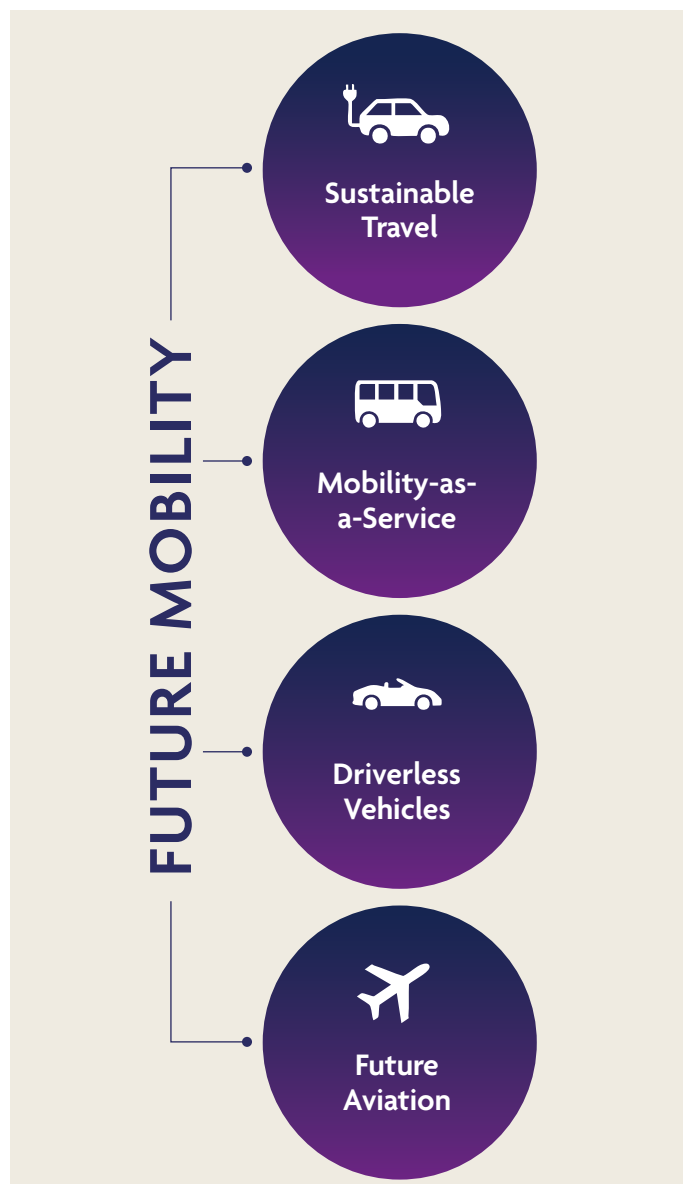
MORE SUSTAINABLE TRAVEL

This section explores technologies that could shift the Travel & Tourism landscape towards more environmentally friendly travel options.

Trip.com Group - Driving Sustainable Mobility for the Future

As sustainability increasingly drives innovation in the travel sector, Trip.com Group continues integrating more eco-friendly technologies and practices into its mobility offerings. Through initiatives like promoting electric vehicles (EVs) and collaborating with organisations to provide less polluting solutions, the Group is contributing to a transformation in how travellers move while minimising environmental impact.

Trip.com Group data reveals that the top form of more sustainable travel is 'taking lower-emission transport', with 'more eco-friendly accommodation' and 'carbon offsetting' as the second and third most popular options. Moreover, 91% of travellers express interest in Eco-conscioustravel, and 56% have already adopted more eco-friendly practices, highlighting a growing alignment between traveller preferences and the broader goals of lower-impact mobility.

Recognising the intrinsic connection between nature and people, Trip.com Group is committed to reducing environmental impact and fostering responsible tourism. As part of this sustainability strategy, the Group aims to introduce over 10,000 lower-carbon travel products, encouraging 100 million travellers to adopt more eco-conscious practices. This initiative reflects the Group's proactive approach to reducing its carbon footprint while enhancing the travel experience.

Trip.com Group embeds sustainability into its product offerings and services, ensuring travellers and businesses can make greener choices:

- **Flights** – The platform prominently displays lower-emission flight options and provides carbon offsetting solutions.
- **Cars** – Users can choose between petrol and electric vehicles when booking car rentals, promoting the adoption of EVs.
- **Trains** – The UK Trip.com site and select European markets feature emissions comparison tools highlighting the environmental benefits of train travel over car journeys.

FUTURE MOBILITY

Sustainable Travel

Mobility-as-a-Service

Driverless Vehicles

Future Aviation

- **Trip.Biz** – Corporate clients benefit from comprehensive sustainability tools, including carbon emission displays, detailed reporting, and carbon budget management, empowering businesses to meet sustainability goals.

Through continuous innovation and collaboration, the Group strives to inspire travellers and industry partners to focus on environmental stewardship, shaping a more sustainable future for everyone.
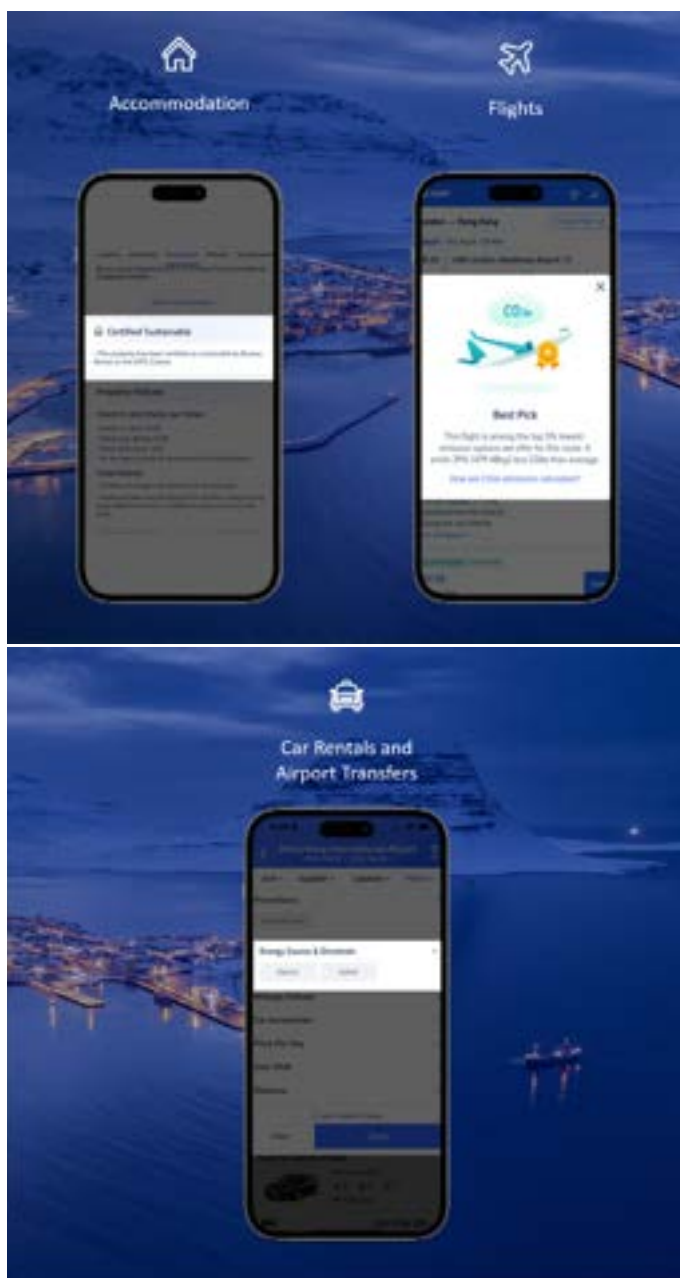
Trip.com "Lower Carbon" Travel Options. Image credit: Trip.com

Sustainable Fuel

Sustainable fuel is a much cleaner alternative to traditional oil-based fossil fuel. Sustainable fuels produce significantly fewer harmful emissions when burnt in an engine and are made from a variety of sources including plants, waste, or recycled cooking oils.

Sustainable fuels offer a 'drop-in solution', which means they can replace fossil fuels in existing engines without additional infrastructure. Airlines, cruise companies and even bus and train services can therefore use sustainable fuels today, without having to completely rebuild their equipment and existing fuel delivery infrastructure.

Virgin Atlantic

In November 2023, **Virgin Atlantic** became the world's first airline to fly over the Atlantic Ocean from London to New York with **100% Sustainable Aviation Fuel (SAF) in its engines** [42]. Called **Flight100**, the flight did not require any engine, airframe or fuel infrastructure changes and operated on safety standards equivalent to every other commercial flight.

Flight100 was a collaboration between Virgin Atlantic and Boeing, Rolls-Royce, Imperial College London, University of Sheffield, ICF and the Rocky Mountain Institute. It was funded by the UK Department for Transport (DfT) and approved by the UK Civil Aviation Authority (CAA) and other regulators including the US Federal Aviation Authority (FAA).

The successful flight used **100% SAF and saved the lifecycle equivalent of 95 tonnes of CO_2 or 64% of the emissions of a standard London to New York flight**. That is equivalent to taking 54 cars off the road for a year.

It also achieved a **40% reduction in particulates**, which can improve local air quality around airports, and **produced 1% more energy compared to the same mass of fossil fuel**. This efficiency means a reduction in the fuel used in flight, which brings further environmental benefits.

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Virgin Atlantic's Flight 100. Image credit: Virgin Atlantic

Liquefied Natural Gas (LNG) for Cruise Ships

LNG is a natural gas that has been cooled to a liquid state, for easier storage and transportation. For cruise ships, LNG can be used as a fuel source instead of heavy fuel oil (HFO), which has traditionally powered large vessels. When burned, LNG emits significantly fewer pollutants than HFO.

*LNG has **virtually zero sulphur emissions** and particulate emissions, **reduces NOx emissions by approximately 85%**, and achieves **up to a 20% reduction in GHG emissions.** By early 2025, CLIA (Cruise Lines International Association) data shows that **19 ships**, representing 7% of the global cruise fleet and 13% of the fleet's global capacity are already using LNG for their primary propulsion[21].*

The use of LNG is a significant step toward cleaner operations and improved air quality, especially in coastal areas and ports. LNG also offers a more stable and reliable fuel source than some alternatives, improving operational efficiency and advancing the cruise line's commitment to sustainable operations.

MSC Cruises

In June 2023, MSC Cruises flagship vessel, **MSC Euribia**, achieved the **world's first net zero emissions cruise** on her maiden journey from St. Nazaire, France, to Copenhagen, Denmark[43].

During the four-day voyage, **MSC Euribia used over 400 tonnes of bioLNG fuel** and **saved 43 tonnes of fuel**. By optimising speed profiles, routing, trim and engine configuration, with strict optimisation of the hotel's energy consumption, including heating, ventilation and air-conditioning, galleys, and lighting, **MSC Euribia never used more than two of its four engines during the voyage**.

In addition, all the required heat for galleys, heating systems, and hot water on board was recovered from MSC Euribia's engines, eliminating the need for boilers for the entire voyage.

MSC Cruises will gain seven more LNG-powered ships between 2025 and 2027, and its successful partnership with Gasum on the MSC Euribia has resulted in an agreement that it will deliver **eLNG by 2026**[44]. This is an even more environmentally friendly type of synthetic LNG, produced by combining green hydrogen with captured CO2, resulting in zero carbon emissions during the LNG production phase.

The MSC Euribia. Image credit: MSC Cruises

Port Power Technology

Port power (also called shore power, onshore power supply [OPS] or shoreside electricity [SSE]) is a technology that allows cruise ships to connect to the land-based electrical power grid when they are docked in port. This means that instead of running their onboard diesel generators to power lighting, heating, cooling, and other systems, they can switch off their engines and ships can draw electricity from the grid. This eliminates the need to burn fuel and generate emissions while in port.

*Plugging into **shoreside electricity can reduce emissions by up to 98%**, according to studies conducted by several of the world's ports and the U.S. Environmental Protection Agency (EPA)[22].*

*By early 2025, CLIA data shows **52% of cruise ships (147 ships) are equipped to operate onshore power**, and **by 2028, 239 ships will be able to connect**, but in early 2025, **only 35 worldwide ports visited by cruise ships (less than 3%)** have at least one cruise berth with shore power[23].*

*As part of the **EU's 'Fit for 55'** decarbonisation regulations, EU member states will require that **all major ports have shoreside power by 2030,** and CLIA cruise line members have made a commitment that all ships calling at ports capable of providing port power **will be equipped to either use this power by 2035,** or be able to use alternative low-carbon technologies to reduce emissions in port[22].*

Port Power can also dramatically reduce air and noise pollution within port areas and coastal communities, whilst achieving cleaner air for residents and cruise line passengers.

Port Miami

In 2024, **Port Miami** became the **first major cruise port on the US east coast to offer shore power capability** at five cruise berths[45]. The port expects more than 350 vessel calls plugging into the shore power system, which was introduced as a partnership between Port Miami and Miami-Dade County, Carnival Corporation, MSC Cruises, Norwegian Cruise Line, Royal Caribbean Group, Virgin Voyages, and Florida Power & Light Company.

Port Miami can plug in three ships simultaneously, and the **annual emissions reduced** with a connection to shore power, at just one terminal, is expected to be **equivalent to removing 7,500 cars from the road**[46].

Image credit: Miami Herald

Electric & Hydrogen Propulsion

Instead of burning fossil fuel, electric vehicles (EVs) are powered with electricity from batteries and produce zero CO_2 emissions when used, while hydrogen vehicles use a chemical process that combines hydrogen with oxygen to produce electricity and water vapour, which also has zero CO_2 emissions. These technologies could be applied to several forms of transport (not just cars), including buses, trains, and even ships or small aircraft, offering a dramatic reduction in emissions, with improved air quality.

Electric propulsion is rapidly gaining popularity in road vehicles and some public transport vehicles, creating an immediate and visible opportunity for destinations and Travel & Tourism businesses to reduce their land-based emissions. Hydrogen vehicles offer a promising option for long distances and vehicles with heavier loads, as they do not rely on big and heavy batteries. However, the

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development of the right infrastructure to support both of these technologies will be essential to realise their benefits. More electric and hydrogen vehicle infrastructure could enhance the attractiveness of destinations and regions for increasingly environmentally conscious travellers.

Hilton

In 2023, **Hilton** announced it will **install up to 20,000 Tesla Universal Wall Connectors at 2,000 hotels in the US, Canada and Mexico**, creating the **largest overnight electric vehicle (EV) charging network within the hospitality industry**[47].

This announcement followed the launch of Tesla's Universal Wall Connector, which is a product designed to charge any North American vehicle model, expanding Tesla's efforts to make charging available to all EVs.

Travellers are increasingly looking for EV chargers when they take road trips, with the EV charging search attribute on the Hilton website seeing its fastest volume of growth to date in 2023, jumping from fourth to second highest in converting searches to stays.

Hilton's charging station. Image credit: Miami Herald

Very High-Speed Rail

Very high-speed rail services are trains that travel at significantly higher speeds than traditional trains and use electric propulsion to achieve these very high speeds, such as the Japanese Shinkansen (bullet train), which can travel at speeds greater than 160 miles per hour (approximately 260 km/h). These very high-speed trains often require dedicated infrastructure (such as specific rail tracks) to minimise friction and offer direct routes.

Very high-speed rail could offer a fast, efficient and eco-friendly alternative to flying, or long-distance car travel. Trains can produce fewer emissions than other modes of transport, while offering comfortable and convenient journeys. They could also unlock new opportunities for tourism and regional development, as locations become more accessible by rail. However, investing in high-speed rail infrastructure is expensive and often faces significant planning and land development challenges.

Japan's "Bullet Train". Image credit: Justin Brinkhoff, Pexels.

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Sustainable Fuel:

- **Near Term (1-10 years):** Current production levels of sustainable fuel are very low (in 2024, sustainable aviation fuel [SAF] accounted for only 0.3% of all commercial jet fuel[24]). Energy sector investment combined with government regulations and incentive schemes will therefore be required to drive up production. If successful, we could expect to see much greater availability and reduced costs for sustainable fuel, with many airlines committing to use 10% sustainable fuel by 2030.

- **Longer Term (10+ years):** To ensure the sustainable fuel transition is not just in advanced economies, global action will be required to ensure the long-term availability of sustainable fuels for all countries and transport operators. In the long term we will likely see significant emissions reductions from the use of sustainable fuel, although it will need to be combined with other technologies to reach net zero emissions by 2050.

LNG for Cruise Ships:

- **Near Term (1-10 years):** We will likely see accelerating adoption of LNG-powered cruise ships, specifically within new ship builds. We might also see some retrofitting of existing ships to use LNG, but this will be less common due to its complexity and cost. As LNG infrastructure and availability expands in ports, refuelling could become much more efficient, with cruise itineraries and destinations influenced by the availability of LNG fuel.

- **Longer Term (10+ years):** While LNG significantly reduces emissions compared to HFO, it is still a fossil fuel. Therefore, in the longer term, LNG will likely serve as a bridge to other technologies, such as hydrogen or ammonia power for cruise ships. We may also see the development of dual-fuel engines, allowing ships to use both LNG and other future sustainable fuels when available.

Port Power Technology:

- **Near Term (1-10 years):** We will continue to see cruise lines equip their ships with port power connectivity, and an increasing number of seaports will install port power infrastructure, especially in regions with strict environmental regulations. Some ports may offer incentives, or subsidies, to ships using port power, to encourage its adoption.

- **Longer Term (10+ years):** By this time, port power could become standard for cruise ships visiting ports, and the technology could have expanded to other types of vessels, such as cargo ships and ferries. Further advancements may include using renewable energy sources to power the electricity grid that supplies the ships, making the process even 'greener'. This could even drive new renewable energy investments in port areas.

Electric & Hydrogen Propulsion:

- **Near Term (1-10 years):** We are likely to see a significant increase in electric vehicles, buses and rental cars in cities and tourist destinations. Short to medium-distance ferries may start to adopt electric propulsion and expanded hydrogen infrastructure may start to develop in key hubs and transport corridors. Electric or hydrogen-powered trains may also become more common, lowering the carbon footprint of long-distance, land-based travel.

- **Longer Term (10+ years):** Electricity and hydrogen could become the dominant forms of propulsion for many modes of travel (as they produce zero CO_2 emissions) and we may even see some long-haul air travel powered by hydrogen and small planes powered by electricity. But this transition will drive the need for widespread electrical and hydrogen power infrastructure all around the world, in both urban and rural areas.

Very High Speed Rail:

- **Near Term (1-10 years):** We may see existing very high-speed rail networks expanded, with new routes and improved connections between airports and cities. We may also begin to see the emergence of international very high-speed rail networks, facilitating seamless cross-border travel.

- **Longer Term (10+ years):** We may see new very high-speed rail networks that dramatically alter the way we travel across certain countries, or continents.

MOBILITY-AS-A-SERVICE (MaaS)

Mobility-as-a-Service (MaaS) is about providing access to a variety of transport options through a single, user-friendly platform, usually a smartphone application.

This is often provided by a mobility subscription service, where MaaS allows customers to access diverse transport modes on demand, paying for what they use, when they need it. This can reduce the need for traditional car ownership, or relying solely on traditional transport methods.

MaaS can include a variety of transport options, including shared bikes, scooters, ride-hailing services, and flexible car rentals where 'free-floating' cars can be booked, picked up, and dropped off at various designated locations around a city.

Why this technology matters to Travel & Tourism

MaaS could impact future travel experiences in several ways. For example:

- **Flexible Car Rental:** Travellers could rent a car for only a few hours, picking it up near their hotel, then dropping it off near a point of interest. This offers a new form of flexibility and convenience for the traveller.

- **Data-Driven Insights:** MaaS platforms generate valuable data on travel patterns and preferences. This could provide opportunities for businesses to optimise marketing, and plan for future developments of destinations more strategically.

- **Integration with Travel Planning:** MaaS can fit seamlessly into a booking process, providing Travel & Tourism businesses with the ability to offer flexible travel at a destination, as a value-added service.

JR East

JR East (East Japan Railway Company) operates high-speed and commuter trains, with the **largest number of passengers per day in the world**[48].

In July 2018, JR East Group established the **JR East Group Management Vision 'Move up' 2027**, as a new growth strategy. This included a plan to offer seamless mobility services and JR East established a **MaaS Strategy** and Design Department in their Technology Innovation Headquarters.

In 2019, **JR East joined the MaaS Alliance**, a Belgium-based public-private partnership driving the rollout of Mobility-as-a-Service worldwide[48]. In early 2025, the MaaS Alliance had more than 100 organisations as members, who are all working together to create the foundations for a common global approach to MaaS implementation[49].

In 2024, there were nearly **50 million transactions per month** on JR East's MaaS platform, delivering seamless, stress free travel across Japan[50].
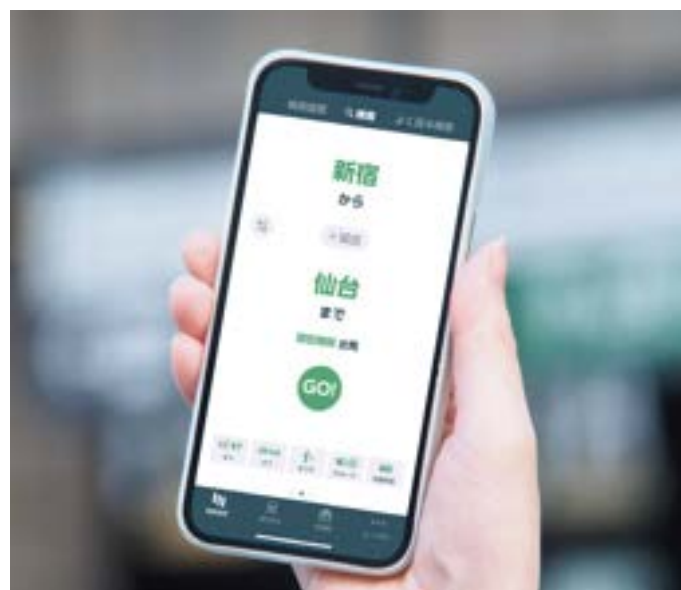
JR East's "Suica" app. Image credit: JR East

Trend Evolution

- **Near Term (1-10 years):** Mobility-as-a-Service could offer new ways for people to explore and experience destinations and could become a factor in destination competitiveness. For example, cities that embrace MaaS and develop their public and shared transport networks may attract more visitors who are keen to use a variety of easily accessible transport options when they need it. We may also see hotels and tour operators offering MaaS travel options as part of their booking packages and greater use of electric vehicles (EV's) in MaaS fleets, promoting more sustainable tourism.

- **Longer Term (10+ years):** The wider adoption of MaaS could re-shape how cities and travel destinations are designed. '15-minute city' concepts, where all essential services are accessible within a short walk or ride (discussed in the Breakthrough Innovations chapter of this report), may be more achievable with MaaS travel options.

DRIVERLESS VEHICLES

Driverless vehicles (also called autonomous vehicles) offer the possibility of cars, buses, taxis and shuttles that can drive themselves.

These vehicles use a combination of cameras, sensors, and powerful computers to 'see' the world around them, navigate roads, and make driving decisions, just like a human driver would. They are like a highly advanced version of an aircraft autopilot system, but on the ground.

Several companies are working on this technology, which is learning from huge amounts of data and improving every day, making driverless technology less of a science fiction concept and more of an upcoming reality.

Levels of Autonomy

When we consider autonomous vehicles, the driverless feature is not a simple 'on or off' switch. Instead, there is a spectrum of automation, which the Society of Automotive Engineers (SAE) define as '**Six Levels of Autonomy**'. These levels explain how much the vehicle is doing on its own, and how much a human driver is still involved:

At the time of publication of this report (early 2025), the highest level of autonomy achieved by a car certified for use on public roads is **Level 4**, which is **high automation**.

Level 0 DRIVER	Level 1 FEET OFF	Level 2 HANDS OFF	Level 3 EYES OFF	Level 4 MIND OFF	Level 5 PASSENGER
No Automation	**Driver Assistance**	**Partial Automation**	**Conditional Automation**	**High Automation**	**Full Automation**
The driver is in full control, but there may be some supporting technology, such as lane departure warnings, or emergency braking	The vehicle can control areas such as steering or speed, but only one at a time	The vehicle can control more than one automation at the same time, such as steering and speed, but only under certain conditions	The vehicle can drive itself under certain conditions, and the driver does not need to continuously monitor the environment **(this is the key difference to the previous levels)**	The vehicle can handle all driving tasks, but only within a specific geographical area, or under certain conditions (these are known as an "Operational Design Domain" or ODD)	This is the ultimate goal – a vehicle that can drive itself anywhere, in any conditions, without any human input. There might not even be a steering wheel, or pedals, in these vehicles

Human ← TRANSFER OF RESPONSIBILITY → **Machine**

But these Level 4 vehicles are not cars that can be bought by the public; they are '**robotaxis**' that can only drive themselves in 'geo-fenced' locations and are subject to specific regulations and limitations, including speed restrictions and time constraints.

The most common form of vehicle autonomy available today for the general public is **Level 2**, which is **partial automation**. This level allows the vehicle to take over some tasks such as steering, acceleration and braking, but still requires the driver to remain fully attentive and able to intervene at any moment. The Tesla Autopilot, BMW Highway Assistant, Ford Co-Pilot360 and Volvo Pilot Assist are all examples of Level 2 systems under the SAE six levels.

*In 2024, BMW announced they were the first car manufacturer to receive approval for a combination of Level 2 (BMW Highway Assistant) and Level 3 (BMW Personal Pilot) which would be offered in the BMW 7 Series[25]. In certain conditions this **lets drivers carry out other in-car activities, such as making phone calls, reading, writing messages, working or streaming videos.** However, the driver must always be prepared to reassume control within a few seconds when prompted by the car, for example when approaching roadworks.*

Why this technology matters to Travel & Tourism

This technology isn't just about futuristic cars, it could reshape several areas of the Travel & Tourism landscape. For example, consider airport transfers and shuttles. Tourists could be picked up by a driverless shuttle at the airport, which smoothly and safely transports them to their hotel, creating a consistent and predictable experience for the traveller and hotel.

Beyond that, another example may be sightseeing tours. Self-driving vehicles could enable more flexible and personalised tour routes, but with the same 'hop-on, hop-off' experience. Furthermore, driverless technology promises greater efficiency, potentially reducing operational costs for transport services and offering more affordable travel options for travellers, therefore widening access to travel opportunities.

*Many consumers still need to be convinced of the safety of autonomous vehicles. In an Amadeus 'Future Trends in Mobility 2024' report, **nearly half, (46%) of travellers** surveyed said they were either '**somewhat or very uncomfortable**' **with the idea of using driverless vehicles** on their trips.[26]*

Trend Evolution

- **Near Term (1 to 10 Years):** Limited driverless taxi services have already started in certain urban areas and may continue to expand, particularly in technologically progressive cities. We could also see driverless shuttles in controlled Travel & Tourism environments, such as airports, holiday resorts, and theme parks, which could serve as real-world testing grounds, demonstrating the reliability of the technology and gradually building public trust.

- **Longer Term (10+ Years):** In the longer term autonomous transport could become a more acceptable form of transport, as it is expected to increase safety and reduce road accidents by removing human errors[27]. This could also lead to changes in future urban planning and infrastructure, with roads optimised for driverless traffic.

Highly automated driving at level 3 in the new BMW 7.
Image credit: BMW Group

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FUTURE AVIATION

How we travel around the globe could soon be changing, as the world may see the return of **supersonic air travel** and an entirely new form of aviation, called **Advanced Air Mobility (AAM)**.

Advanced Air Mobility (AAM)

Options for travelling around cities, rural areas or tourism destinations may soon not only be by car, bus or train, but by a completely new form of transport called **Advanced Air Mobility (AAM), or sometimes called Urban Air Mobility (UAM)**.

These are small, quiet, and often electric aircraft that can transport people and goods over short distances. Think of AAM as sophisticated, modern-day helicopters, but designed to be much more affordable, accessible, quieter and environmentally friendly.

These AAM aircraft, which are also referred to as "**eVTOLs**" (electric Vertical Take-Off and Landing aircraft), often look like giant drones and eliminate the need for traditional runways. This new type of air travel opens up possibilities for quicker, point-to-point journeys that bypass traditional ground-based traffic.

Vertiports

AAM aircraft will take off and land from a new type of airport called a '**vertiport'**, which has landing and take-off bays instead of a runway. These vertiports can be much smaller and more adaptable than traditional airports, and therefore placed in a variety of innovative locations, from urban city centres (such as on building rooftops and car parks) to more rural areas.

Dubai

In February 2024, the **Dubai Road and Transport Authority (RTA)** signed an agreement with **Joby Aviation** (an all-electric AAM aircraft company) to launch **air taxi services in Dubai by 2026**[51]. The agreement provides Joby with the exclusive right to operate air taxis in Dubai for six years.

Additionally, Joby signed an agreement with **Skyports**, who will design, build and operate **four vertiport sites across Dubai** at:

- Dubai International Airport (DXB)
- Palm Jumeirah
- Dubai Marina
- Dubai Downtown

Construction of the **vertiport at Dubai International Airport (DXB)** began in November 2024 and will integrate with the Dubai Metro. The vertiport will include two take-off and landing stands, with high speed charging infrastructure[52].

Joby's aircraft is designed to carry a pilot and four passengers at speeds of up to 200 miles per hour, with a **journey from Dubai International Airport to Palm Jumeirah expected to take just 10 minutes by AAM**, compared to 45 minutes by car. Regulatory oversight is managed by the General Civil Aviation Authority (GCAA) of the UAE.

In April 2024, Joby expanded its partnerships in the UAE, signing a Memorandum of Understanding (MOU) with the Abu Dhabi Department of Municipalities and Transport (DMT), the Abu Dhabi Department of Economic Development (DED) and the Abu Dhabi Department of Culture and Tourism (DCT), **paving the way for expanded air taxi services across the United Arab Emirates (UAE).**

Joby air taxi. Image credit: Joby

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Piloted vs Pilot-less Aircraft

Initial deployments of AAM aircraft will all be flown by a pilot. However, the learning curve and skills required to fly an eVTOL aircraft is less than a traditional large commercial aircraft (such as from Boeing or Airbus) and therefore some technology companies are already working on the next generation of pilot-less AAM aircraft, which are similar to driverless cars. They could take passengers autonomously from point A to point B. However, flying without a pilot will require significant safety testing and considerable public acceptance before this could become mainstream.

Why this technology matters to Travel & Tourism

AAM isn't just a cool technology concept, it could have several benefits for the Travel & Tourism sector:

- **Faster Transfers:** Tourists could bypass congested city roads and arrive directly at their destination or resort, via a quick air hop from the airport (and vice versa).

- **Enhanced Experiences:** AAM could unlock access to remote, scenic areas that are currently hard to reach, providing unique tourist experiences like panoramic flights, eco-tours in a zero emissions aircraft, and easier access to secluded attractions.

- **New Premium Revenue Streams:** Opportunities could arise for exclusive AAM services, such as airport transfers, scenic flights, or even partnerships with resorts that have landing facilities. AAM could therefore become a premium option, within a service offering.

Advanced Air Mobility, powered by eVTOL aircraft and supported by an evolving network of vertiports, is not a distant dream – it is a tangible technology and exciting new era of flight that is rapidly developing.

Trend Evolution

- **Near Term (1-10 years):** We could expect to see some eVTOL aircraft achieving safety certifications (starting with piloted aircraft) and flights focused on specific applications, such as airport-city centre shuttles, or short distance hops between neighbouring city centres. Initially, this is likely to be a premium travel experience, with vertiports limited to a select few locations only. As the technology matures and the number of safe flights completed is increased, AAM could start to become more integrated into urban transportation systems in forward-looking cities, with several dedicated vertiports in operation.

- **Longer Term (10+ years):** AAM could become a more accepted transportation option, with automation and AI integrated into the system to improve safety and efficiency, whilst also enabling pilotless AAM flights.

Supersonic Air Travel

In 2003, the Concorde was retired and the world has been unable to fly supersonically on a commercial airline for over 20 years. But now, the dream of flying faster than the speed of sound is coming back, and this time, it is set to revolutionise air travel.

Supersonic flight means travelling faster than the speed of sound, dramatically cutting down journey times. One innovative company, Boom, is actively developing a new supersonic commercial aircraft.

However, the biggest challenge that has stalled the return of supersonic flight in the past (and currently limits flying at supersonic speeds to over the ocean only, including for the Boom aircraft) is the loud 'sonic boom' that the aircraft creates as it passes through the sound barrier at approximately 760 mph. This is where NASA's experimental X-59 plane is pioneering new ways to overcome this obstacle.

NASA Quesst & X-59

The **NASA Quesst mission** is a **research project** to build and demonstrate a **quieter supersonic aircraft**, called the **X-59**, which does not generate a loud sonic 'boom' on the ground, but a more acceptable acoustic '**thump**' (similar to the sound of a car door shutting)[53].

In July 2024, NASA and Lockheed Martin formally unveiled the X-59 aircraft[54]. This single-seat, experimental aircraft is not designed for commercial use and is only to inform the possibility of 'quiet' supersonic flight. NASA intends to fly this aircraft over communities at supersonic speeds and survey what people hear when it flies overhead. Reaction to the quieter 'thump' will then be shared with government regulators, who will consider writing new sound-based rules and lifting the ban on supersonic flights over land for aircraft meeting new design specifications.

Why this technology matters to Travel & Tourism

The return of supersonic aviation could be significant for the Travel & Tourism sector.

Business trips could be taken to continents previously unreachable in a day and tourists could take long weekends in far-flung destinations, or travel to countries that previously felt too far away.

Unlike the Concorde, which was considered a luxury-only experience, Boom is focused on achieving its first commercial flight by 2029, with ticket prices equivalent to a standard business class ticket price today, making future supersonic flights much more accessible to all types of travellers, tourists and families[28]. However, its initial flights at supersonic speeds will be limited to over the ocean only.

The success of the NASA X-59 aircraft will be crucial in making supersonic flight acceptable over land. If this is successful, it would enable even more exciting Travel & Tourism opportunities in the future.

Trend Evolution

- **Near Term (1-10 years):** We could expect to see the certification of new supersonic aircraft and the return of commercial supersonic flights (over oceans), along with crucial data and technology advancements from NASA›s X-59 flights. The success of the X-59 programme could lead to government regulations being updated and supersonic flights permitted over land for aircraft meeting new design standards. However, we are unlikely to see new commercial aircraft designed, built and certified to the NASA design specification for over land supersonic flight, within the next 10 years.

- **Longer Term (10+ years):** The long-term success of supersonic flight is most likely if aircraft are allowed to fly supersonically over land. If the X-59 programme is successful, we could expect to see new commercial aircraft designed and certified for supersonic flight over land. As supersonic aircraft technology matures, we could also expect to see more airlines purchasing supersonic planes, with more routes becoming available to travellers, specifically over land.

Japan Airlines

Japan Airlines (JAL) is a pioneering force in the future of aviation, forging strategic partnerships to revolutionise **Advanced Air Mobility** and introduce **supersonic air travel** back to the market.

Supersonic Air Travel:

Boom is an American aviation company that is building a **supersonic passenger aircraft** called the '**Overture**', which could carry 64 to 80 passengers at a speed of Mach 1.7. Boom estimates there are more than 600 potential routes over oceans where Overture could fly supersonically[55].

In 2017, **Japan Airlines** and **Boom** formed a strategic partnership to collaborate on supersonic aircraft design and to help define the passenger experience for supersonic travel. JAL made a strategic investment of USD $10 million in Boom and has the option to purchase up to 20 Overture supersonic aircraft through a pre-order arrangement[56].

Advanced Air Mobility (AAM):

Wisk is a leader in the development of **autonomous, electric air taxis** and became a fully owned subsidiary of Boeing in 2023. Wisk is focused on creating a **self-flying eVTOL aircraft that will be accessible, safe, and affordable**. At the time of publication of this report (early 2025), Wisk is working on its 6th Generation aircraft, which is its first aircraft candidate for US Federal Aviation Administration (FAA) certification.

In 2023, **Japan Airlines** and **Wisk** signed a Memorandum of Understanding (MOU), along with the **Japanese Civil Aviation Bureau (JCAB)** to develop plans for the maintenance and operation of Wisk's autonomous air taxis in Japan.[57,58]

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NASA X-59 unveiling. Image credit: NASA / Steve Freeman

Boom's "Overture". Image credit: Boom Supersonic

Wisk Aero and Japan Airlines. Image credit: Wisk Aero

BREAKTHROUGH INNOVATIONS

TECHNOLOGY GAME CHANGERS

This report has explored many transformative technologies, and this final chapter focuses on a selection of 'Breakthrough Innovations' – these are technological advancements with the potential to fundamentally reshape not just the Travel & Tourism sector, but the world as we know it.

These are technologies that are further on the horizon, but demand our attention for their sheer disruptive potential. They are the world of **Smart Cities**, the immense processing power of **Quantum Computing**, the promise of clean energy from **Nuclear Fusion**, and the once-unimaginable realm of **Space Tourism**.

These technologies may seem like futuristic science fiction, but they are all in active development today, and offer radical opportunities to redefine travel, efficiency and exploration. This chapter aims to spark curiosity and strategic thinking, as these 'Breakthrough Innovations' could be the key to unlocking a future golden era of Travel & Tourism.

BREAKTHROUGH INNOVATIONS

- Smart Cities
- Quantum Computing
- Nuclear Fusion
- Space Tourism
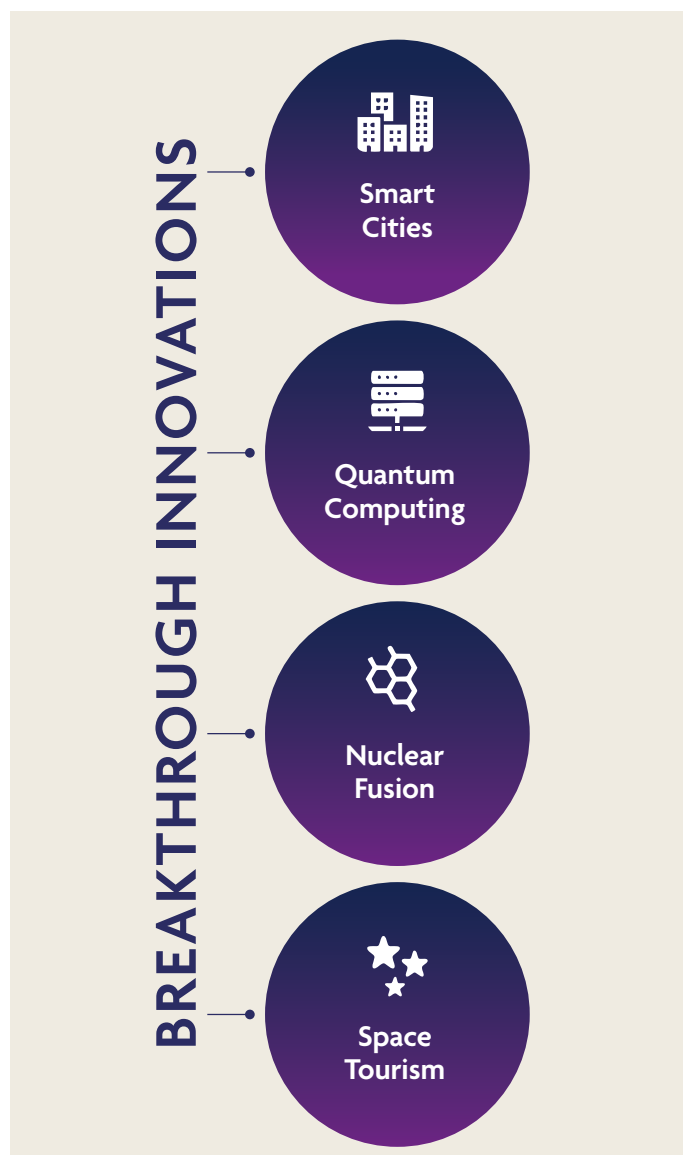
SMART CITIES

A '**Smart City**' uses technology and innovation to improve urban life.

Smart Cities often connect many systems together to make the city operate more efficiently, such as by integrating traffic lights, public transport and energy grids. They also use a variety of technologies, to improve how people move, live, and interact, such as by offering free city wide Wi-Fi.

Why this technology matters to Travel & Tourism

The aim of Smart Cities is to create a more liveable, sustainable, and – crucially for the Travel & Tourism sector – more travel and tourism-friendly environment.

For example, consider city navigation. Real-time traffic updates could be integrated into public transport apps to offer personalised route recommendations that minimise travel delays.

Alternatively, a city could provide improved visitor information. Smart city platforms could provide dynamic, localised updates on events and attractions, including live wait times that enhance visitor engagement and experience.

A major benefit of Smart Cities could also be sustainability. For example, they could enable reduced emissions from public transport, with more efficient citywide energy use and improved waste reduction.

Therefore, Smart Cities aren't just about better urban life for a local population, they can also create a better, more convenient, and enriching experience for tourists.

Abu Dhabi

Abu Dhabi is a leader in the adoption of smart city principles, and in 2018, the Abu Dhabi Department of Municipalities & Transport launched a five-year plan for Smart Cities & Artificial Intelligence (2018 – 2022) named the **Zayed Smart City Project**[59].

Since then, the Abu Dhabi government has launched many smart city initiatives including **Wi-Fi in all taxis**[60] and the development of the **Masdar City district**[61], a business and technology hub that in January 2025 launched testing of cutting-edge, zero-emission autonomous vehicles[62]. Its Free Zone is home to a thriving ecosystem of many local and international companies, including hundreds of start-ups dedicated to technology and sustainability innovations.

In 2024, **Abu Dhabi was ranked in the top 10 of 142 destinations in the 2024 Smart Cities Index** by the International Institute for Management Development (IMD), which evaluates the perceptions of residents to their cities' infrastructure and technological solutions[63].

In 2025, the Abu Dhabi government launched its Digital Strategy 2025-2027 which announced a plan to become the world's first '**fully AI native government' by 2027**[64]. In September 2025, the Emirate will also host the **Abu Dhabi Smart City Summit,** focused on developing Abu Dhabi as a smart and sustainable city of the future[65].

Masdar City "Personal Rapid Transit (PRT)" Image credit: Masdar City

The 15-Minute City

A key concept driving many Smart City initiatives is the '**15-minute city'**.

This increasingly popular idea centres around the goal that city residents (and by extension visitors) should be able to access all of their daily needs – such as work, shopping, recreation, healthcare, and education – within 15 minutes of their home (or hotel).

This concept relies heavily on Smart City technologies. For example, data analysis can map out areas lacking key public services, allowing city planners to address these gaps. Smart transportation systems, including bike-sharing schemes and efficient local transport, also become crucial for enabling the 15-minute concept.

Smart City digital platforms also allow visitors to find and support local small businesses, and experience more authentic neighbourhood life. Therefore, the 15-minute city is not just about convenience, it's also about creating vibrant neighbourhoods that are much more engaging and attractive to travellers who seek authentic and local experiences.

But Smart Cities, driven by concepts such as the 15-minute city, are not just a niche trend. They can be crucial for destinations, especially some of the world's most dynamic cities, to stay competitive and create unparalleled travel experiences.

Trend Evolution

- **Near Term (1-10 years):** Cities may start to become "smart" by installing existing technology more broadly throughout their location, such as more interactive information kiosks, improved app-based public transport, more city-wide free Wi-Fi, and smarter parking solutions, before embracing more advanced technologies such as AR (Augmented Reality) features around a city which can provide engaging historical and cultural context to travellers (discussed in the Immersive Technologies chapter of this report). We may also see more personalised travel recommendations based on data gathered from within city limits.

- **Longer Term (10+ years):** By this time, Smart Cities could embrace highly innovative technologies, such as integrated transport options and Advanced Air Mobility (AAM) (discussed in the Future Mobility chapter of this report), which would connect cities faster than ever before.

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QUANTUM COMPUTING

We may soon have access to a revolutionary new type of computer called a **quantum computer**, which uses the principles of quantum physics to perform calculations in a completely different way to traditional computers. This allows a quantum computer to solve problems that are currently impossible for even the most powerful supercomputers today.

On 7th June 2024, **the United Nations** *(UN) proclaimed 2025 as the International Year of Quantum Science & Technology (IYQ) to recognise 100 years since the initial development of quantum mechanics[29]. Many national scientific societies, governments and industry partners are collaborating throughout 2025 to increase public awareness of the importance of quantum science and its exciting potential applications.*

Alongside quantum computing, 'quantum technology' also includes two other areas:

- **Quantum communication:** This could ensure security of future communications, enabled by quantum cryptography.

- **Quantum sensing:** This could provide measurements of physical quantities at a sensitivity that vastly exceeds the capabilities of classical sensors today.

Microsoft

In 2024, **Microsoft** announced a partnership with Atom Computing to build the **world's most powerful quantum machine**[66,67] and in 2025, **Microsoft urged businesses to get 'Quantum Ready'**, as a study from HFS Research found that **only 12% of business leaders were prepared to assess quantum opportunities**[68].

The **Microsoft Quantum Ready programme**[69] provides business leaders with the insights and tools to:

1. Build practical, high-impact hybrid applications
2. Invest in strategic skilling and access to reliable quantum computers for experimentation
3. Embrace quantum safety and focus on cryptographic agility
4. Prepare for scale so that investments are future-proofed

In February 2025, Microsoft announced a new quantum chip called Majorana 1[70]. This new chip is expected to enable quantum computers to solve meaningful, industrial scale problems within only a few years.

Microsoft's new "Majorana 1" quantum chip. Image credit: Microsoft

Why this technology matters to Travel & Tourism

The Travel & Tourism sector is built on complex problems. These include optimising flight schedules, personalising travel itineraries, predicting customer demand, managing hotel occupancy, optimising logistics, or developing dynamic pricing strategies. Currently, the sector relies on

computer algorithms to solve these challenges with 'close-to-ideal' solutions. Quantum computing has the potential to discover the *ideal* solution, cutting costs, maximising revenue, and delivering far more personalised customer experiences.

For example, a quantum computer could consider thousands of variables simultaneously to build a truly optimised and personalised travel itinerary in seconds. It could take into account individual preferences, real-time disruptions, local opportunities and a variety of other data sources. This could mean happier customers and significant efficiency gains for Travel & Tourism businesses.

While quantum computing may seem futuristic now, its potential impact on the Travel & Tourism sector could be profound. Early adoption and strategic investments in exploring this technology, and how to access it efficiently, could shape the most successful Travel & Tourism businesses of tomorrow.

But quantum computers will not be a desktop device – they will not replace computers in an office. Quantum computers are large, complex and very expensive pieces of equipment that require specialised infrastructure to operate. They will therefore be accessed through two key methods:

- **Cloud-Based Services:** Businesses will likely access the power of quantum computing through the cloud in the future. Specialised companies will operate and maintain quantum facilities, and businesses will pay for the processing power needed to run complex calculations. This 'managed service' approach to quantum computing allows businesses to use the technology without the need for massive capital expenditure or specific in-house quantum expertise.

- **Partnerships with Technology Providers:** We may see existing technology companies and specialist quantum computing startups offering industry-specific solutions. Travel & Tourism companies could partner with these providers, who will then use quantum computing on their behalf to address specific challenges such as pricing algorithms or route optimisation.

Rolls-Royce

In 2023, **Rolls-Royce** partnered with the **UK National Quantum Computing Centre (NQCC)** and quantum start-up **Riverlane** to accelerate the **discovery of materials for jet engines**.

With air temperatures reaching 2000°C, jet engines can be a hostile environment for materials, which can take many years to research and develop. Rolls-Royce are therefore experimenting with quantum computing to rapidly identify new material properties and deliver more efficient aircraft engines.[71]

Rolls-Royce engine production. Image credit: Rolls-Royce plc

Trend Evolution

- **Near Term (1-10 years):** This will be the time for research and identifying Travel & Tourism use cases where quantum computing could give organisations a competitive edge. We may start to see proof-of-concept projects and experimentation within the Travel & Tourism sector, but these will likely be niche applications, such as optimised aviation and shipping route planning.

- **Longer Term (10+ years):** We may start to see commercially viable quantum-based solutions, accessed through cloud platforms, or partnerships. The generally accepted long-term view of quantum computing is that it could revolutionise many industries. This could lead to the emergence of completely new Travel & Tourism business models and unparalleled customer service levels.

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NUCLEAR FUSION

The sun produces enormous amounts of energy, not by burning fuel like a fire, but through a process called **nuclear fusion**. This smashes together tiny, light atoms (like hydrogen) to create heavier ones (like helium). When this happens, a little bit of mass is converted into a *huge* amount of energy. This is the same power source that lights up the stars, and scientists are now working on recreating this process here on Earth.

Unlike nuclear <u>fission</u> (which powers nuclear power plants today), nuclear <u>fusion</u> doesn't produce long-lasting radioactive waste, and uses readily available fuels like hydrogen. Nuclear fusion is a very promising source of clean, almost limitless, energy.

Why this technology matters to Travel & Tourism

Almost all of the Travel & Tourism ecosystem is powered by electricity and today much of that energy comes from burning fossil fuels, which contributes to carbon emissions and climate change.

Clean, abundant nuclear fusion energy could dramatically reduce the sectors reliance on fossil fuels. This would translate into lower costs (over time) and a more sustainable future, with greater appeal to environmentally conscious travellers. In summary, nuclear fusion could power the next era of much more sustainable travel.

Overcoming the '30 Years' Barrier

Nuclear fusion has often been said to always be '30 years away'.

This is because the technology required to achieve sustained nuclear fusion is hard, and progress has been slow and incremental. However, recent scientific advances have changed this.

In 2022, **Lawrence Livermore National Laboratory** *(LLNL) in the US achieved a major milestone by* **proving it is possible to produce more energy than is put into a nuclear fusion reactor***, in an achievement called* **'ignition'***. This laboratory experiment achieved a fusion energy gain of approximately 1.5, with 2.05 megajoules (MJ) of energy put in and 3.25 MJ of fusion energy output*[30].

While nuclear fusion is a very complex process, the fundamental scientific hurdles are now better understood and are being overcome. Commercial viability now seems more realistic than ever before and we are in a phase of accelerated innovation, making it more probable that nuclear fusion power will finally become a reality.

ITER

ITER is the largest energy research project in the world, where 33 nations are collaborating in a decades long effort to **build the world's largest nuclear fusion device**, called a tokamak, to prove the feasibility of fusion as a large-scale and carbon-free source of energy.

The 42-hectare site in the south of France has been under construction since 2010, with the central Tokamak Building handed over to the ITER Organisation in 2020 for the start of machine assembly, which contains over 1 million components. The site is scheduled for research operations to begin in 2034, with full operation by 2039[72].

To help the public better understand the possibilities of nuclear fusion, **ITER offers guided tours** for schools and universities, and twice a year opens its doors to the public and tourists with **ITER Open Days**, where visitors can explore the site by bus, talk with ITER specialists, visit exhibitions and take part in special activities for children. ITER also offers **online virtual visits** that last 90 minutes and include a presentation on the ITER nuclear fusion project, a video, and an immersive virtual tour of the ITER worksite[73].

The ITER site. Image credit: ITER organization

Trend Evolution

- **Near Term (1-10 Years):** We are likely to see significant progress in research and development with several universities and organisations working on nuclear fusion. Importantly the achievement of 'ignition' by Lawrence Livermore National Laboratory proved that nuclear fusion is not just a scientific concept and it is possible to get more energy out of a process than is put in. The focus in the near term will therefore be on scaling up this process, securing necessary investment, refining designs and conducting rigorous testing.

- **Longer Term (10+ Years):** By this point, we may see the first commercial fusion reactors being built and becoming operational. While this won't lead to overnight changes in Travel & Tourism, the cost of electricity could eventually drop dramatically. This could lead to much cheaper and more sustainable options for everything from transportation to hotel operations.

SPACE TOURISM

Space tourism could mean a trip to a different *world*, not just a different country.

Once a concept confined to science fiction, space tourism is now emerging as a reality, thanks to advances in rocket technology, significant investment and a growing number of commercial companies working on space vehicles and technology.

Instead of flying around the globe, future travellers may have the opportunity to experience suborbital, or even orbital, spaceflights.

Suborbital flights offer a brief, but exhilarating few minutes of weightlessness and stunning views of Earth from the edge of space. These are currently offered by **Virgin Galactic** and **Blue Origin.**

Orbital flights involve circling the planet in space, offering a truly transformative experience. These flights are part of **SpaceX's** ambitions, which also include future space flights to the Moon and Mars.

*With the **space economy projected to grow from $630 billion today to $1.8 trillion by 2035**[31], this industry could revolutionise the travel landscape and redefine the boundaries of exploration.*

Why this technology matters to Travel & Tourism

Space tourism might sound outlandish, but it could be a new frontier for the Travel & Tourism sector.

Space tourism could unlock a new type of ultra-premium experience, appealing to those seeking the ultimate adventure. It could also be a game changer for destination marketing. For example watching rocket launches and landings, or viewing iconic attractions such as the Pyramids or Niagara Falls from 'the edge of space' could become some of the most exclusive trips available.

The Bahamas

In 2024, the **Bahamas Ministry of Tourism, Investments & Aviation (MOTIA)** announced a Letter of Agreement (LOA) with **SpaceX** to position the **Bahamas as a global destination for space tourism**, with the ability to witness SpaceX booster landings[74].

At the time of publication of this report (early 2025), the SpaceX Falcon 9 rocket is the only reusable commercial rocket capable of launching people into orbit, and **SpaceX will position one of its autonomous drone ships for Falcon 9 landings east of Exumas (a Bahamian island chain)**, offering a spectacle that will only be visible in the Bahamas.

The exclusive visibility of rocket landings on an autonomous drone ship from various Bahamian islands means tourists will be able to witness these exciting events from cruise ships, resorts, and various tourist locations, positioning the Bahamas as a key player in the emerging space tourism industry.

In tandem with the LOA, SpaceX has also committed to supporting the creation of a **space installation, or exhibit, displaying recognisable hardware and a SpaceX spacesuit in the Bahamas**. This exhibit will be the only one outside of the US and is expected to draw significant attendance from both Bahamian citizens and international tourists.

In February 2025, the Bahamas became the first international destination to witness a SpaceX Falcon 9 booster landing, off the coast of the Exuma Islands[75].

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SpaceX Falcon 9 landing off the coast of the Bahamas.
Image credit: SpaceX / X

Beyond the sheer 'wow factor', early space tourism could also drive forward technological innovation and ultimately lower costs. For example, the current focus on the development of reusable rockets would reduce the cost of getting to space, potentially opening up new markets in the future for lower-cost space travel that is available to the general population.

Space tourism isn't just about rockets and astronauts – it is about expanding the definition of travel and creating new and unparalleled experiences.

Trend Evolution

- **Near Term (1-10 years):** Companies are already offering commercial suborbital flights for travellers looking to experience a few minutes of weightlessness and a view of earth from space, but they have a very high ticket price. As the technology improves, the cost of space flights is likely to decrease, albeit gradually. Space travel companies will also continue to focus on perfecting the safety of their flights and refining the customer experience.

- **Longer Term (10+ years):** In the long term, space tourism could become a more established industry, similar to other types of adventure travel. Prices will hopefully have decreased dramatically, making space travel more accessible to a wider range of people. This could be the start of a new era, where space is not just for astronauts, but for every person who wishes to experience it.

Trip.com Group on The Emergence of Space Tourism: A Giant Leap for Travel

As one of the most ambitious trends shaping the future of travel, space tourism appeals to adventure seekers and high-income travellers who crave extraordinary experiences.

To cater to this growing demand, Trip.com Group has introduced space travel products on select platforms, leading to a nearly fourfold increase in enquiries year-on-year. Although still in its early stages, the pioneering offering is already generating significant interest. In the quarter following its launch in mid-2024, searches for the keyword "space" surged by 56%. Additionally, Virgin Galactic's 2024-2026 flight seats on the platforms have been sold out rapidly, with bookings now open for 2027.

The Demographic Driving Demand

While current high flight prices make space travel only accessible to the affluent, interest remains high among mass-market consumers. Research by the Trip.com Group reveals that almost **25% of surveyed travellers express an interest in exploring this new realm of travel**. Among those with an interest, **Millennials and Gen Z lead the charge, with over 30% expressing strong enthusiasm**, indicating a younger demographic driving demand.

This aligns with other adventure-focused trends, such as glamping in extreme locations (20.95%), suggesting an increased desire among travellers to push boundaries and seek exclusivity, whether by exploring the wilderness or venturing beyond Earth's atmosphere.

Opportunities for Innovation

For online travel platforms like Trip.com Group, the rise of space tourism presents unprecedented opportunities to innovate. Beyond orbital and suborbital flights, there is strong potential in ancillary offerings. These might include pre-launch accommodation, luxury Earth-bound add-ons, post-flight recovery packages, and virtual reality (VR) previews of the space experience to enhance customer engagement.

Trip.com Group has already demonstrated its ability to cater to affluent, experience-driven travellers, selling a USD $200,000 travel package in just 17 seconds.

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With expertise in curating aspirational journeys, the platform is well-positioned to play a key role in shaping the space tourism ecosystem, ensuring a seamless experience from booking to the final frontier.

A Vision for the Future

Space tourism could well be the next big frontier for humanity. And as technological advancements lower barriers to entry – similar to the evolution of commercial aviation – space tourism is poised to expand beyond its current niche audience. The journey from exclusivity to accessibility could redefine global travel trends, inspiring millions to dream bigger.

Crowds watching a rocket launch. Image credit: Duren Williams, Pexels

ACKNOWLEDGEMENTS

The Voice of Travel & Tourism

WTTC promotes sustainable growth for the Travel & Tourism sector, working with governments and international institutions. Council Members are the Chairs, Presidents and Chief Executives of the world's leading private sector Travel & Tourism businesses.

For more information, visit: WTTC.org

Trip.com Group™

Trip.com Group is a leading global travel service provider comprising of Trip.com, Ctrip, Skyscanner, and Qunar. Across its platforms, Trip.com Group helps travellers around the world make informed and cost-effective bookings for travel products and services and enables partners to connect their offerings with users through the aggregation of comprehensive travel-related content and resources, and an advanced transaction platform consisting of apps, websites and 24/7 customer service centres. Founded in 1999 and listed on NASDAQ in 2003 and HKEX in 2021, Trip.com Group has become one of the best-known travel groups in the world, with the mission "to pursue the perfect trip for a better world".

For more information, visit: Group.Trip.com

ENDNOTES

1 Amadeus: Travel Technology Investment Trends 2024 (https://amadeus.com/en/travel-tech-investment-trends)

2 ITU AI for Good Impact Report 2024 (https://aiforgood.itu.int/wp-content/uploads/2024/10/AI-for-Good-Impact-Report.pdf)

3 Accenture: 'The Travel Industry's New Trip' report; 2024 (https://www.accenture.com/gb-en/insights/travel/travel-industry-new-trip)

4 Travelport: 'Travel's Tipping Point: State of Modern Retailing Report 2025' (https://www.travelport.com/travel-trends-2025)

5 Starlink Technology (https://www.starlink.com/gb/technology)

6 Starlink on X (https://x.com/Starlink/status/1839424733198344617)

7 Fraport Press Release – Private 5G Network (https://www.fraport.com/en/newsroom/press-releases/2022/q3/fraport-and-ntt-to-build-europe-s-largest-private-5g-network-at-.html)

8 Verizon Press Release – Super Bowl LVIII (https://www.verizon.com/about/news/verizon-customers-allegiant-stadium-super-bowl-lviii?msockid=328054896ab56c7e18da41be6be26dbf)

9 Accenture: 'The Travel Industry's New Trip' report; 2024 (https://www.accenture.com/gb-en/insights/travel/travel-industry-new-trip)

10 Phocuswright: 'GenAI and Emerging Tech Use Among Travelers', 2024 (https://www.phocuswright.com/Travel-Research/Consumer-Trends/GenAI-and-Emerging-Tech-Use-Among-Travelers)

11 Apple YouTube – How to Create Spatial Photos on the Vision Pro (https://youtu.be/pLfCdI0mjkI)

12 Juniper Research – BNPL by 2028 (https://www.juniperresearch.com/press/pressreleasesbuy-now-pay-later-users-to-exceed-670-million-globally)

13 American Airlines Flex Pay (https://www.aavacations.com/flexpay)

14 Phocuswright: 'The State of Global Travel Payments 2024' (https://www.phocuswright.com/Travel-Research/Technology-Innovation/The-State-of-Global-Travel-Payments-2024)

15 Atlantic Council CBDC Tracker (https://www.atlanticcouncil.org/cbdctracker)

16 Phocuswright: 'Travelers and Tech 2024: GenAI, VR and More' (https://www.phocuswright.com/Travel-Research/Consumer-Trends/Travelers-and-Tech-2024-GenAI-VR-and-More)

17 UK Payment Systems Regulator [PSR] Account-to-Account Payments (https://www.psr.org.uk/our-work/account-to-account-payments)

18 EU Digital Wallet (https://ec.europa.eu/digital-building-blocks/sites/display/EUDIGITALIDENTITYWALLET/EU+Digital+Identity+Wallet+Home)

19 EU Digital Identity (https://commission.europa.eu/strategy-and-policy/priorities-2019-2024/europe-fit-digital-age/european-digital-identity_en)

20 EU Digital Wallet Consortium (https://eudiwalletconsortium.org)

21 CLIA Sailing Sustainably (https://cruising.org/en-gb/environmental-sustainability)

22 CLIA 2023 Global Cruise Industry Environmental Technologies & Practices Report (https://cruising.org/en-gb/news-and-research/press-room/2023/september/new-environmental-data-report-confirms-step-change-in-cruise-industry)

23 CLIA 2024 Global Cruise Industry Environmental Technologies & Practices Report (https://cruising.org/en-gb/news-and-research/press-room/2024/september/cruise-industry-annual-environmental-technologies-and-practices-data-shows-continued-progress)

24 NESTE – Accelerating Fossil Free Aviation (https://www.neste.com/news-and-insights/aviation/fossil-fuel-free-aviation)

25 BMW Press Release - Level 2 and 3 autonomy (https://www.press.bmwgroup.com/global/article/detail/T0443285EN/road-to-autonomous-driving:-bmw-is-the-first-car-manufacturer-to-receive-approval-for-the-combination-of-level-2-and-level-3?language=en)

26 Amadeus: 'Driving Change: Future Trends In Mobility', 2024 (https://www.amadeus-hospitality.com/resources/driving-change-future-trends-in-mobility-2024)

27 Road Safety Factsheet (https://www.rospa.com/media/documents/road-safety/factsheets/autonomous-vehicles.pdf)

28 Euronews – How Boom Is Learning From Concordes Mistakes (https://www.euronews.com/travel/2025/01/29/boom-supersonic-learning-from-concordes-mistakes)

29 UN International Year of Quantum Science (https://quantum2025.org)

30 US DOE Press Release - National Laboratory Makes History (https://www.energy.gov/articles/doe-national-laboratory-makes-history-achieving-fusion-ignition)

31 WEF & McKinsey - Space: The $1.8 Trillion Opportunity for Global Economic Growth (https://www.weforum.org/publications/space-the-1-8-trillion-opportunity-for-global-economic-growth)

32 Hilton Press Release (https://stories.hilton.com/releases/hilton-and-be-my-eyes-launch-industry-first-partnership)

33 Qatar Airways Press Release - Boeing 777 & Starlink (https://www.qatarairways.com/press-releases/en-WW/242734-qatar-airways-launches-the-world-s-first-boeing-777-starlink-equipped-flight-taking-the-future-of-in-flight-connectivity-to-new-height)

34 Radisson Hotels Immersive Experiences (https://www.radissonhotels.com/en-us/experience/immersive-experience)

35 Radisson Book It Easy (https://www.radissonhotels.com/en-us/meeting-conference-hotels/book-it-easy)

36 Radisson Hotel Group Press Release (https://www.radissonhotels.com/en-us/corporate/media/press-releases/RHG-innovates-meetings-and-group-sales-with-cutting-edge-technology)

37 Google Android XR Press Release (https://blog.google/products/android/android-xr)

38 Google Android XR Webpage (https://www.android.com/xr)

39 Bank of Jamacia JAM-DEX (https://boj.org.jm/core-functions/currency/cbdc)

40 SITA Press Release – Four Takeaways from the WTTC Summit in Perth (https://www.sita.aero/pressroom/blog/four-key-takeaways-from-the-wttc-global-summit)

41 SITA and Aruba Demonstrate Digital Passports [DTC] (https://www.sita.aero/pressroom/news-releases/sita-and-aruba-demonstrate-how-physical-passports-can-be-held-as-a-digital-identity-on-your-mobile-device)

42 Virgin Atlantic Press Release – Flight100 with 100% SAF (https://corporate.virginatlantic.com/gb/en/media/press-releases/virgin-atlantic-flight100-saved-95-tonnes-of-co2.html)

43 MSC Cruises Sustainability Report 2023 (https://issuu.com/msc-cruises/docs/msc-cruises-cor-sustainability-report-2023?fr=xKAE9_zU1NQ)

44 MSC Cruises Press Release – Data from Net Zero Cruise (https://msccruisesuae.com/first-net-zero-emission-cruise)

45 Miami-Dade Country Press Release – Port Miami Shore Power (https://www.miamidade.gov/global/release.page?Mduid_release=rel1718657751924421)

46 Port Miami Shore Power (https://www.miamidade.gov/portmiami/shore-power.asp)

47 Hilton Press Release – Install 20,000 Tesla Wall Connectors (https://stories.hilton.com/releases/hilton-to-install-up-to-20000-tesla-universal-wall-connectors-at-2000-hotels)

48 JR East joins MaaS Alliance (https://www.jreast.co.jp/e/press/2019/pdf/20191101.pdf)

49 MaaS Alliance (http://maas-alliance.eu)

50 JR East 2024 Integrated Report (https://www.jreast.co.jp/e/environment/pdf_2024/all.pdf)

51 Joby to Launch Air Taxi Services in Dubai (https://www.jobyaviation.com/news/joby-to-launch-air-taxi-service-uae)

52 Joby Announces Beginning Of Work On First Dubai Vertiport (https://www.jobyaviation.com/news/joby-announces-beginning-work-first-dubai-vertiport)

53 NASA Quesst (https://www.nasa.gov/mission/quesst)

54 NASA X-59 Debut (https://www.nasa.gov/feature/special-report-x-59-rollout)

55 Boom FAQ (https://boomsupersonic.com/faq)

56 Boom & Japan Airlines Press Release (https://boomsupersonic.com/press-release/our-partnership-with-japan-airlines)

57 Japan Airlines Press Release – JAL & Wisk (https://press.jal.co.jp/en/release/202305/007388.html)

58 Wisk Press Release – JAL & Wisk – May 2023 (https://wisk.aero/news/press-release/wisk-jal)

59 Abu Dhabi Smart Cities and Mobility (https://www.moec.gov.ae/documents/20121/0/smart+eng.pdf)

60 Abu Dhabi Taxi (https://www.tamm.abudhabi/ar-AE/articles/abu-dhabi-taxis)

61 Masdar City, Abu Dhabi (https://www.masdarcity.ae)

62 Emirates News Agency: Masdar City unveils groundbreaking autonomous vehicle testing (https://www.wam.ae/en/article/bhopaj3-masdar-city-unveils-groundbreaking-autonomous)

63 IMD 2024 Smart City Index (https://www.imd.org/smart-city-observatory/home/rankings)

64 Abu Dhabi 2025-2027 Digital Strategy (https://www.dge.gov.ae/en/news/adg-digital-strategy-2025-2027)

65 Abu Dhabi 2025 Smart City Summit (https://smartabudhabisummit.com)

66 Microsoft Quantum Machine (https://azure.microsoft.com/en-ca/solutions/quantum-computing/technology)

67 Microsoft & Atom Computing Partnership (https://blogs.microsoft.com/blog/2024/09/10/microsoft-announces-the-best-performing-logical-qubits-on-record-and-will-provide-priority-access-to-reliable-quantum-hardware-in-azure-quantum)

68 HFS Research – Understand Quantum Computing (https://www.hfsresearch.com/research/understanding-quantum-computing)

69 Microsoft Blog – 2025 The Year to Become Quantum Ready (https://azure.microsoft.com/en-us/blog/quantum/2025/01/14/2025-the-year-to-become-quantum-ready)

70 Microsoft Majorana 1 Quantum Chip (https://news.microsoft.com/source/features/innovation/microsofts-majorana-1-chip-carves-new-path-for-quantum-computing)

71 Rolls-Royce, Riverlane and UK NQCC (https://www.nqcc.ac.uk/updates/nqcc-rolls-royce-and-riverlane-partner-to-accelerate-materials-discovery)

72 ITER – Introduction (https://www.iter.org/few-lines)

73 ITER – Visitors (https://www.iter.org/about/visiting-iter)

74 Bahamas and SpaceX LOA (https://www.prnewswire.com/news-releases/ministry-of-tourism-investments--aviation-secures-historic-agreement-with-spacex-to-propel-bahamas-into-the-space-technology--tourism-frontier-30-2065657.html)

75 Bahamas Falcon 9 Booster Landing (https://www.bahamas.com/pressroom/the-bahamas-makes-giant-leap-into-space-welcoming-first-international-spacex-landing)