

SITA



2023

AIR TRANSPORT IT INSIGHTS

AIRLINE EXECUTIVE SUMMARY

In an era defined by rapid technological evolution, airlines are positioning themselves for a digital breakthrough.

They have increased IT spend year on year since 2020, reaching an estimated 34.5 billion USD in 2023, with 99% of airlines predicting an uptick in IT and technology spending in 2023.

Key investment priorities include Business Intelligence (BI) and Artificial Intelligence (AI). With generative AI's booming popularity and utilization in 2023, a shift is evident – airlines are investing in transformative technologies to navigate operational challenges, optimize the passenger experience, and advance environmental sustainability, making strides towards greener operations.

In particular they are exploring alternative revenue channels (with the use of BI in passenger processing for retail doubling year on year).

Passenger-centric technology adoption is another key investment area with touchless identity verification, self-service solutions, and real-time monitoring gaining traction.

Biometrics are becoming commonplace to help curb congestion, with 70% of airlines expecting to have biometric ID management in place by 2026, and 90% of airports investing in major programs or R&D in this area.

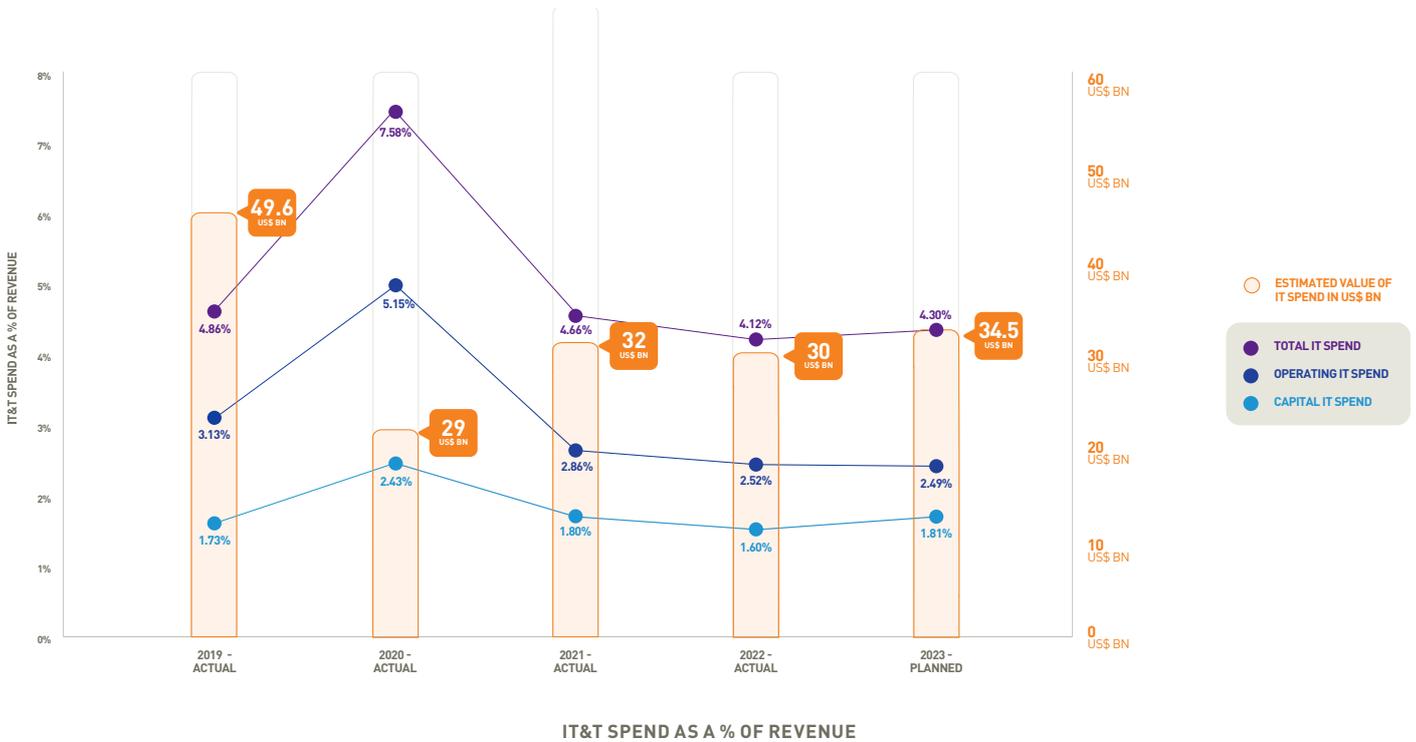
As sustainability takes center stage, airlines prioritize the renewal of their fleets efficiencies around aircraft turnaround and ground operations, and a commitment to Sustainable Aviation Fuel (SAF).

The report reveals a joined industry push towards an environmentally responsible future, with SAF adoption projected to reach 83% by 2026. By 2026, over 90% of airlines plan to have IT in place to boost the efficiency of flight operations and aircraft turnaround.

Strategic investments, innovation partnerships, and sustainability initiatives underscore a collective commitment to shaping a resilient, passenger-centric, and environmentally conscious future.



IT&T SPEND IN 2023



AIRLINE IT&T (IT & TECHNOLOGY) SPEND

When taken as a proportion of revenue, airlines' IT spend dropped very slightly in 2022 compared to 2021, reducing from 4.66% to 4.12%. This goes against the expectations from last year where a modest increase was anticipated,¹ but may be due to the swift recovery of air travel boosting airline revenues more than expected over this period.

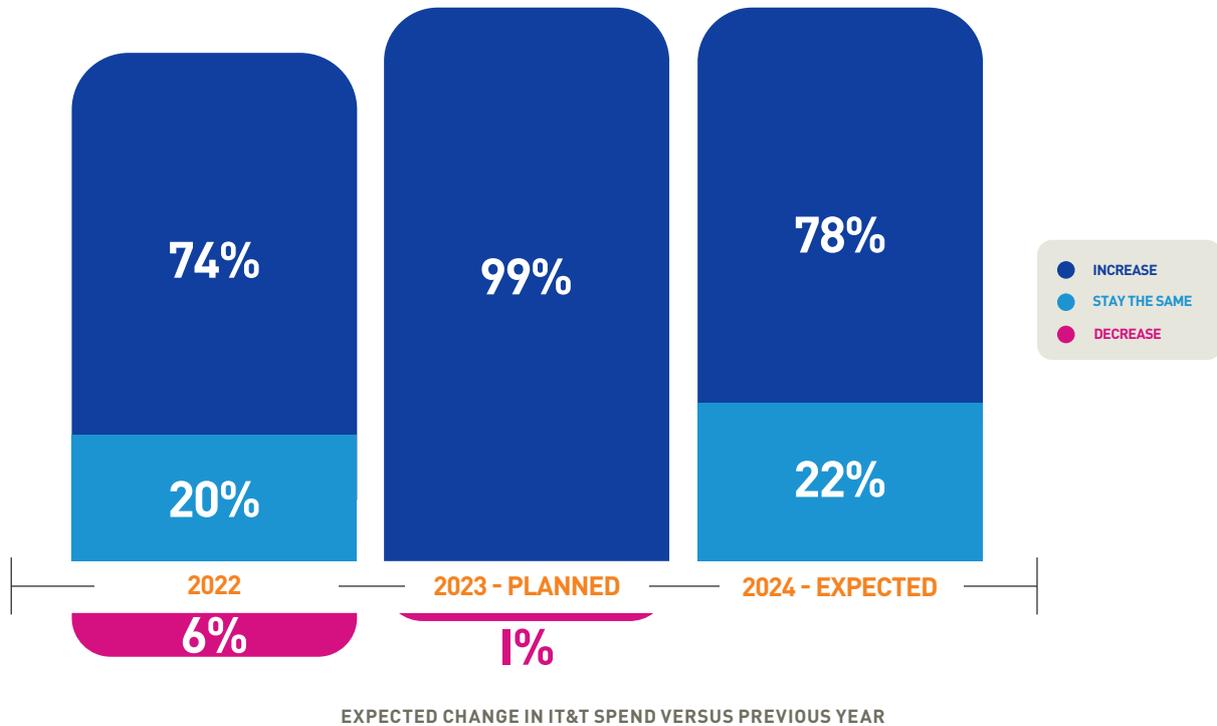
The fall in IT spending as a proportion of revenue came across both operating spend (down from 2.86% to 2.52%) and capital spend (down from 1.8% to 1.6%).

Airlines estimate a slight growth in IT spend to 4.30% in 2023, fueled mainly by capital IT spend.

¹ SITA 2022 Air Transport IT Insights



IT&T SPEND PREDICTIONS FOR 2024



IT&T SPEND PREDICTIONS

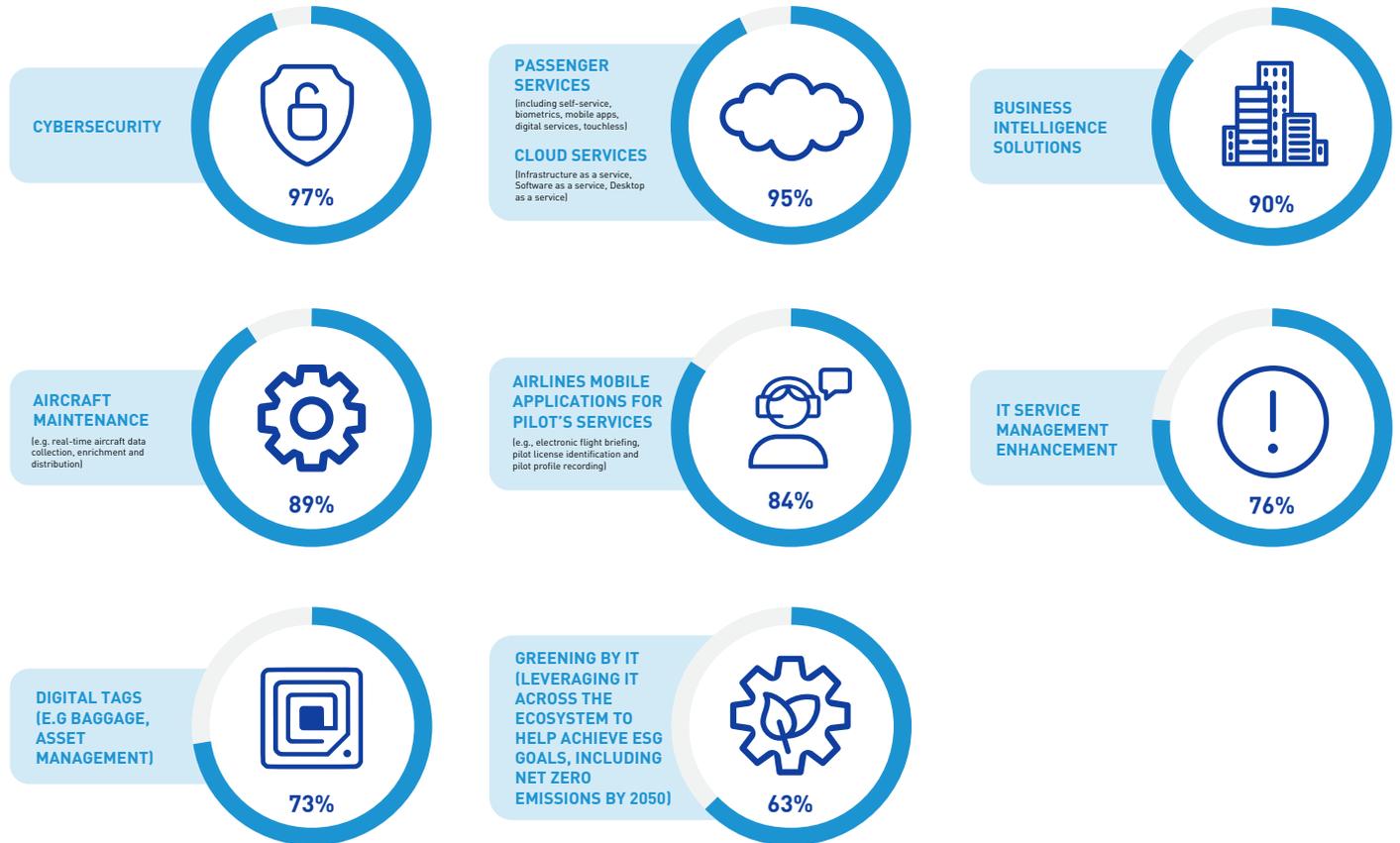
From an absolute perspective, we've seen predictions from 2022 prove to be very accurate. In last year's survey 72% of airlines anticipated an increase in IT spending in 2022 and this year's survey confirms 74% did in fact see an increase.

There is almost unanimous agreement that this will continue, with 99% of airlines predicting a further increase in spend in 2023 and a slightly more modest 78% anticipating an increase in 2024.

Overall, only 1% of airlines expect a decrease in spend for 2023 and none expect this in 2024, suggesting there is a strong commitment to investing in IT as part of overall business strategies in the coming years.



INVESTMENT PRIORITIES FOR IT SERVICES



% OF AIRLINES PLANNING MAJOR PROGRAMS/R&D BY 2026
THE TOTAL % SUMS BOTH MAJOR PROGRAMS AND RESEARCH AND DEVELOPMENT

AIRLINE CIO'S PRIORITIES FOR IT SERVICES

Cybersecurity and cloud services will remain key areas of investment for airlines over the coming years, with 97% and 95% respectively having major programs/ R&D in place, an increase of approximately 5% on last year in each case.

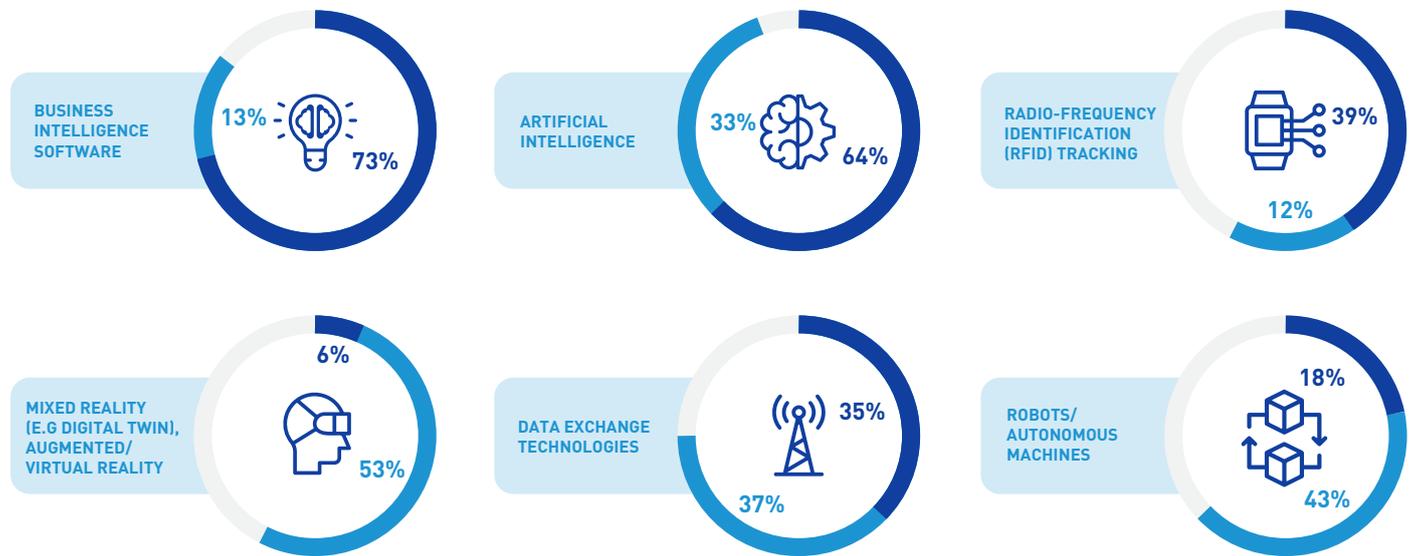
Three areas stand out. These are aircraft maintenance (increased from 80% to 89%), business intelligence solutions (79% to 90%), and digital tags , with digital tags , with digital tags being a widely discussed topic in the aviation sector in recent months.

As seen among airports, 'greening by IT'² is an area where there is significant R&D/pilot investment planned, likely in response to upcoming regulations regarding emissions and industry milestones for carbon reduction.

² Greening by IT refers to using IT and data solutions to help airlines achieve sustainability objectives in all areas (i.e. environmental, social, economic, and governance).



INVESTMENT PRIORITIES FOR TECHNOLOGIES



% OF AIRLINES PLANNING MAJOR PROGRAMS/R&D BY 2026

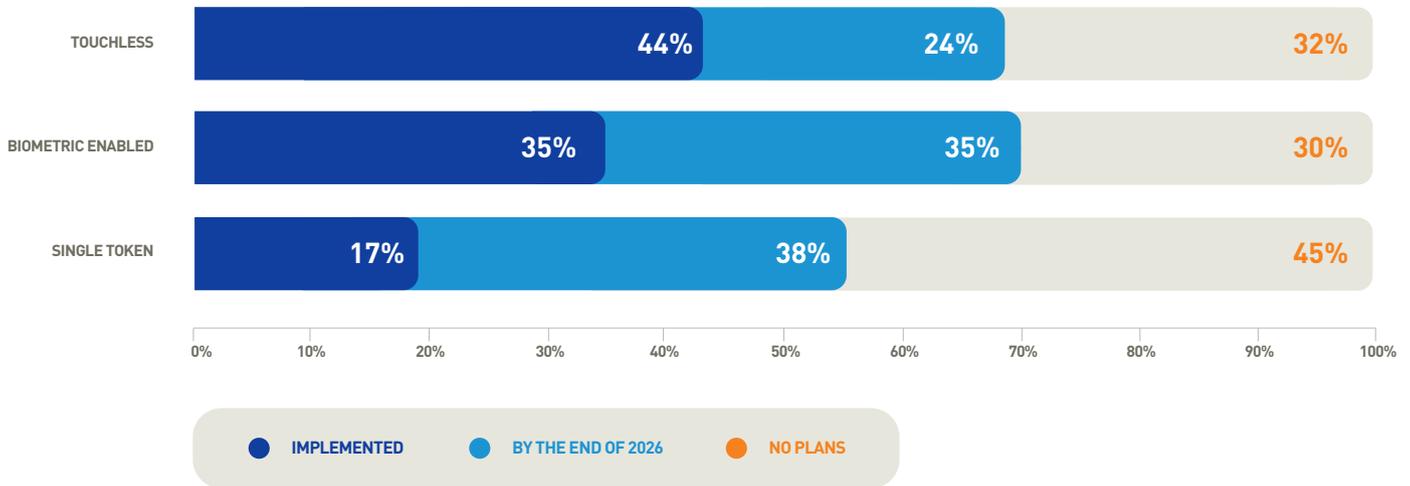
AIRLINE CIO'S PRIORITIES FOR TECHNOLOGIES

When it comes to technologies, business intelligence and artificial intelligence are by far the two highest-priority investment areas over the coming three years. 73% and 64% of airlines respectively are investing in major programs and both areas have seen an increase of more than 20% compared to 2022.

One area to watch for the future is mixed reality. Currently, only 6% of airlines are investing in major programs, but 53% are running trials or pilots, suggesting strong growth could be on the horizon.



ID TECHNOLOGIES TO STREAMLINE PASSENGER THROUGHPUT



% OF AIRLINES WITH IMPLEMENTED IDENTITY PROCESSES TO STREAMLINE PASSENGER THROUGHPUT

PASSENGER IDENTITY PROCESSES

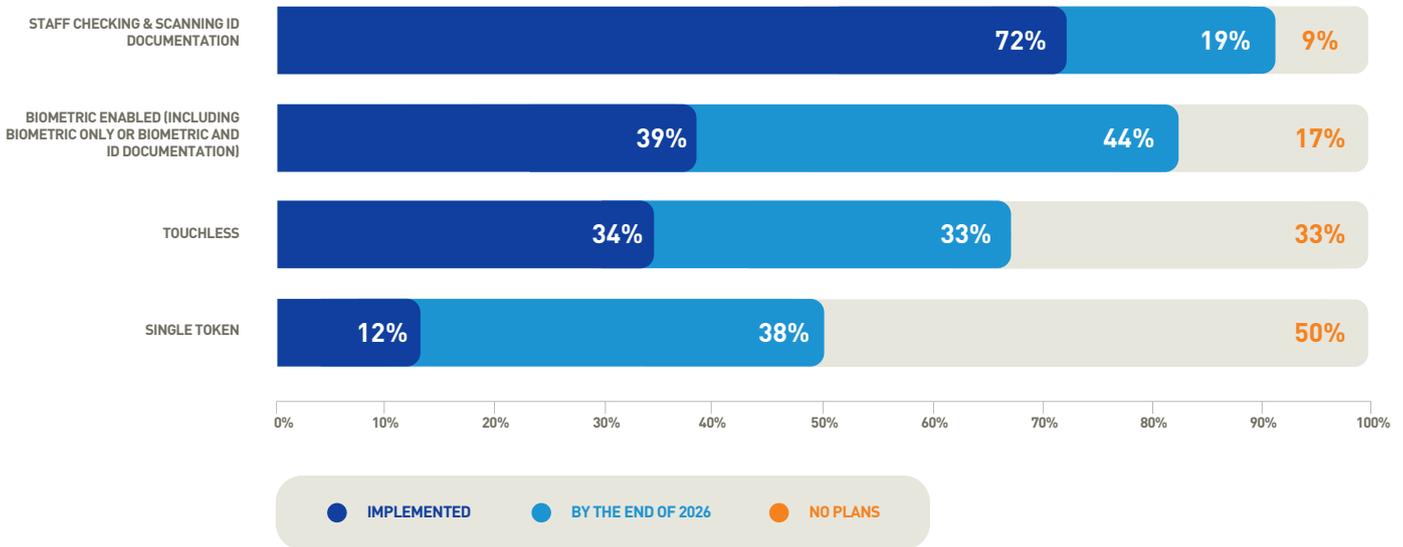
When it comes to passenger digital identity verification, there is clear appetite among airlines for technologies that will save time, minimize disruption, and streamline the passenger journey through the airport.

44% have already implemented touchless identity verification technologies and 35% have implemented biometrics – with a further 24% and 35% respectively planning to introduce these by 2026.

While only 17% of airlines have currently adopted a single token for passenger identification across all touchpoints, over half plan to have this in place by 2026, ushering in a more seamless digitally enabled experience.



ID PROCESSES TO STREAMLINE AIRCRAFT BOARDING



% OF AIRLINES WITH IMPLEMENTED IDENTITY PROCESSES TO STREAMLINE AIRCRAFT BOARDING

ID PROCESSES USED FOR AIRCRAFT BOARDING

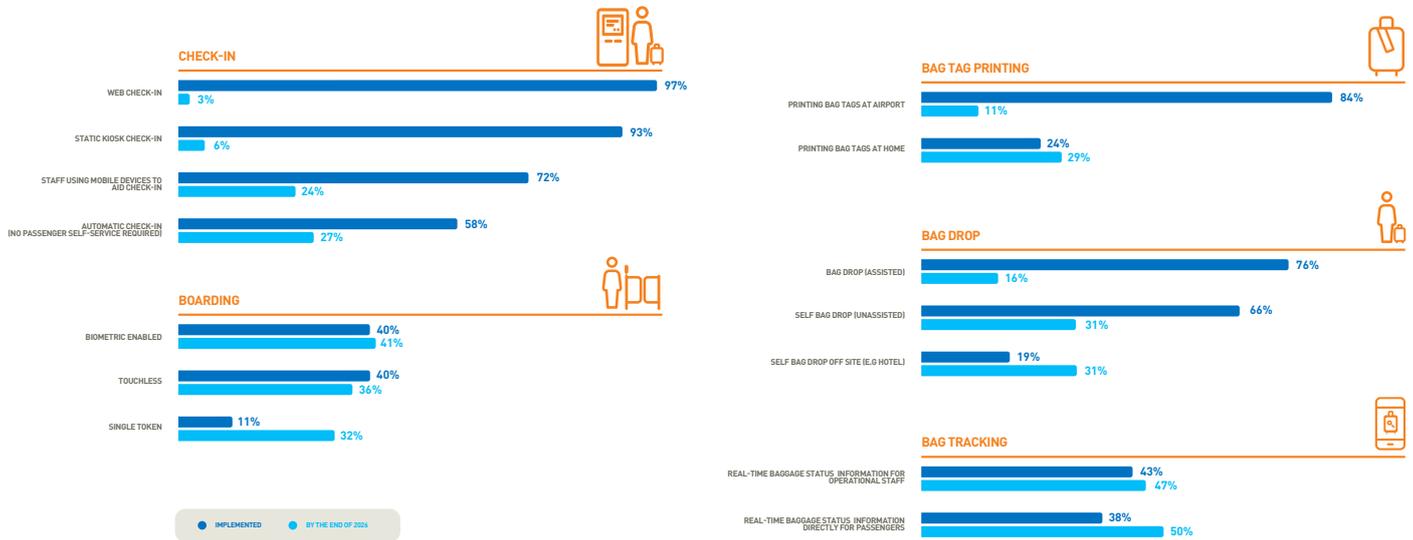
The majority of airlines still rely on manual ID verification processes at boarding. However, digitalization at this stage is gaining traction to help prevent bottlenecks and redistribute

staff to more complex tasks. 39% of airlines have implemented biometrics at boarding and a further 44% plan to do so by 2026, while 34% use touchless technology at boarding, with another 33% confirmed implementation by 2026.

Currently, the adoption of single token is at infant stage, however by 2026 half of the airlines expect to have the technology.



AIRLINE SELF-SERVICE TECHNOLOGIES INVESTMENT



% OF AIRLINES WITH IMPLEMENTED TECHNOLOGIES FOR PASSENGER MANAGEMENT

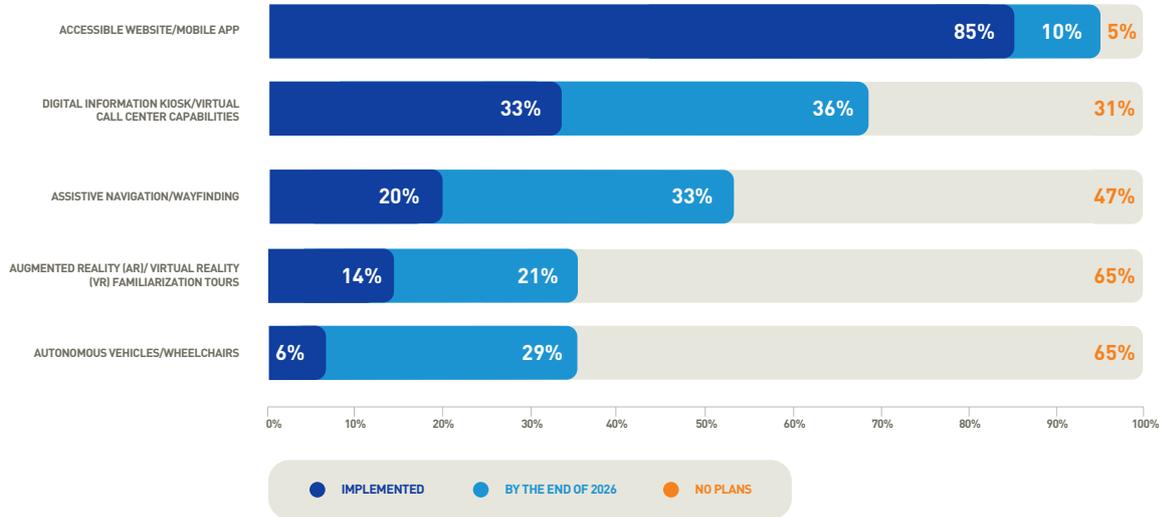
PASSENGER IDENTITY MANAGEMENT

Web check-in has become almost universal, increasing to 97% implementation. Staff using mobile devices to aid check-in jumped to 72% in 2023 and automatic check-in has seen a 18% increase year on year to 58% adoption.

When it comes to bag tagging, this is still mostly done at the airport, but printing at home is the main area of growth, with 24% having implemented this now (up from 16% last year) and a further 29% planning to do so in the next three years.

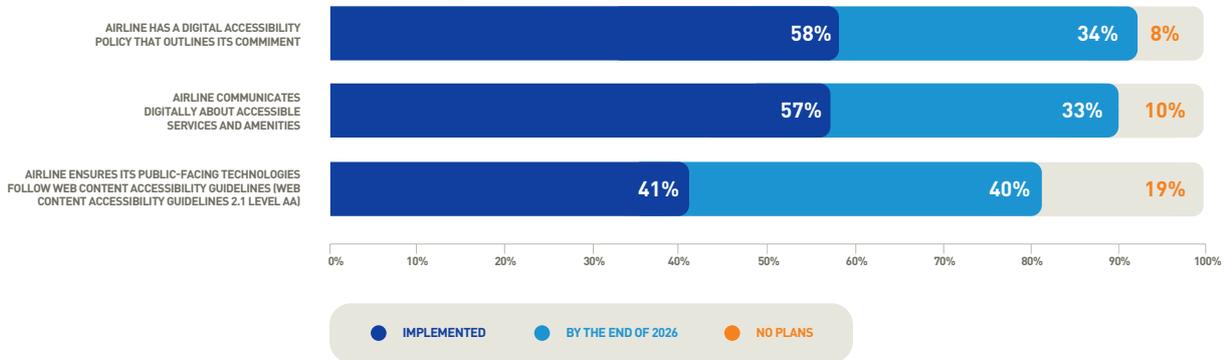


PASSENGER ACCESSIBILITY TECHNOLOGIES



% OF AIRLINES WITH IMPLEMENTED PASSENGER ACCESSIBILITY TECHNOLOGIES

PASSENGER ACCESSIBILITY INITIATIVES



% OF AIRLINES WITH IMPLEMENTED PASSENGER ACCESSIBILITY INITIATIVES

AIRLINES' INITIATIVES THAT FACILITATE PASSENGER ACCESSIBILITY

Airlines have much room for improvement when it comes to accessibility. The one technology that has been implemented by the vast majority is an accessible website/app, with 85% having this in place.

Beyond that, adoption is low; 33% have implemented digital information kiosks, but otherwise less than one in five have other technologies facilitating accessibility available.

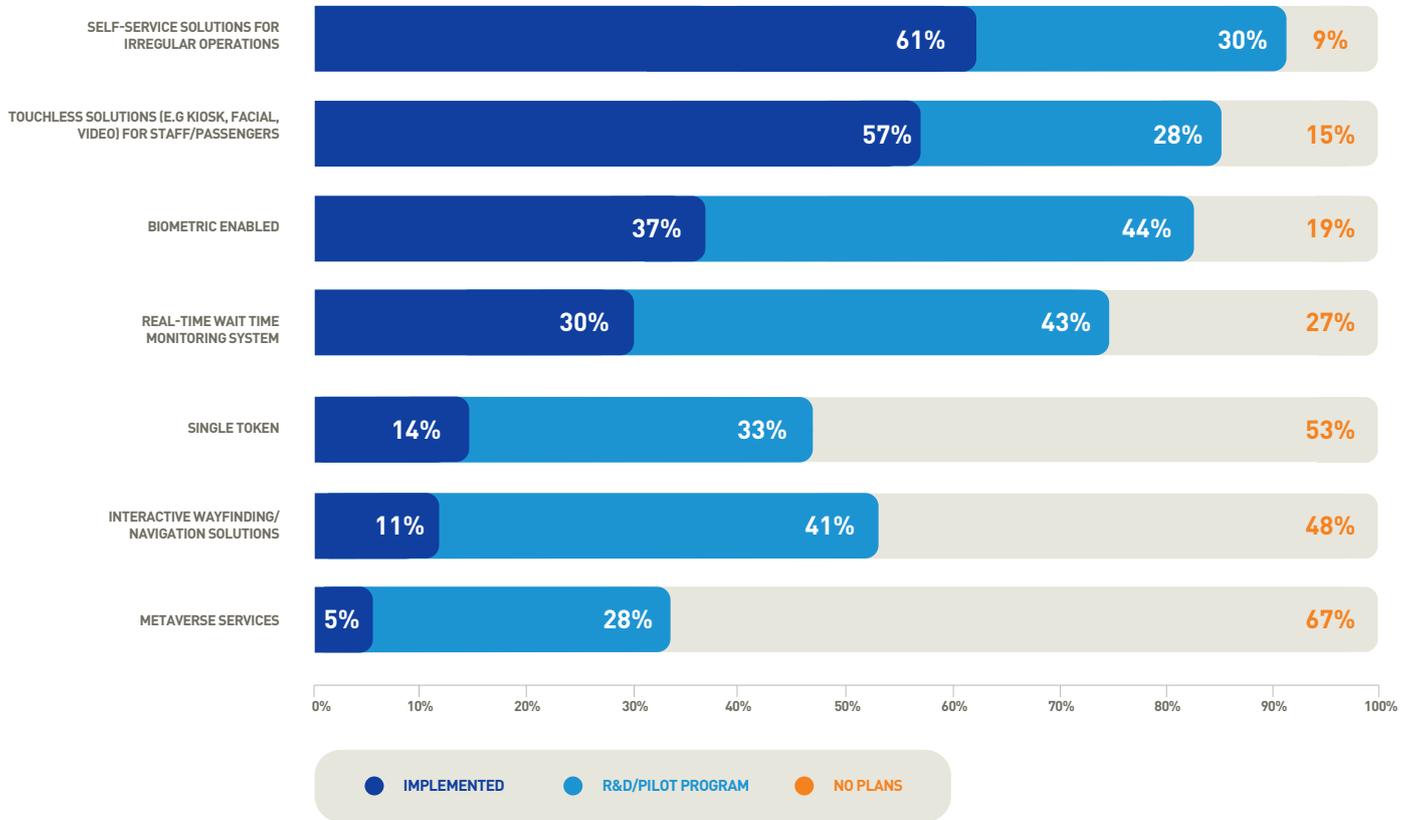
When it comes to making public-facing digital assets more accessible, things are slightly more advanced, but still far from ubiquitous. Over half of airlines have implemented digital accessibility

policies and communications about accessible services. Although only 41% have so far ensured their web content follows accessibility guidelines, a further 40% plan to do this in the next three years.

Looking to the future, over 80% of airlines expect to have each of these processes in place to assist with accessibility by 2026.



AIRPORT OPERATIONS INITIATIVES



% OF AIRLINES WITH IMPLEMENTED OR PLANNED OPERATIONS INITIATIVES AT THE AIRPORT

AIRLINE OPERATIONS SERVICE INITIATIVES

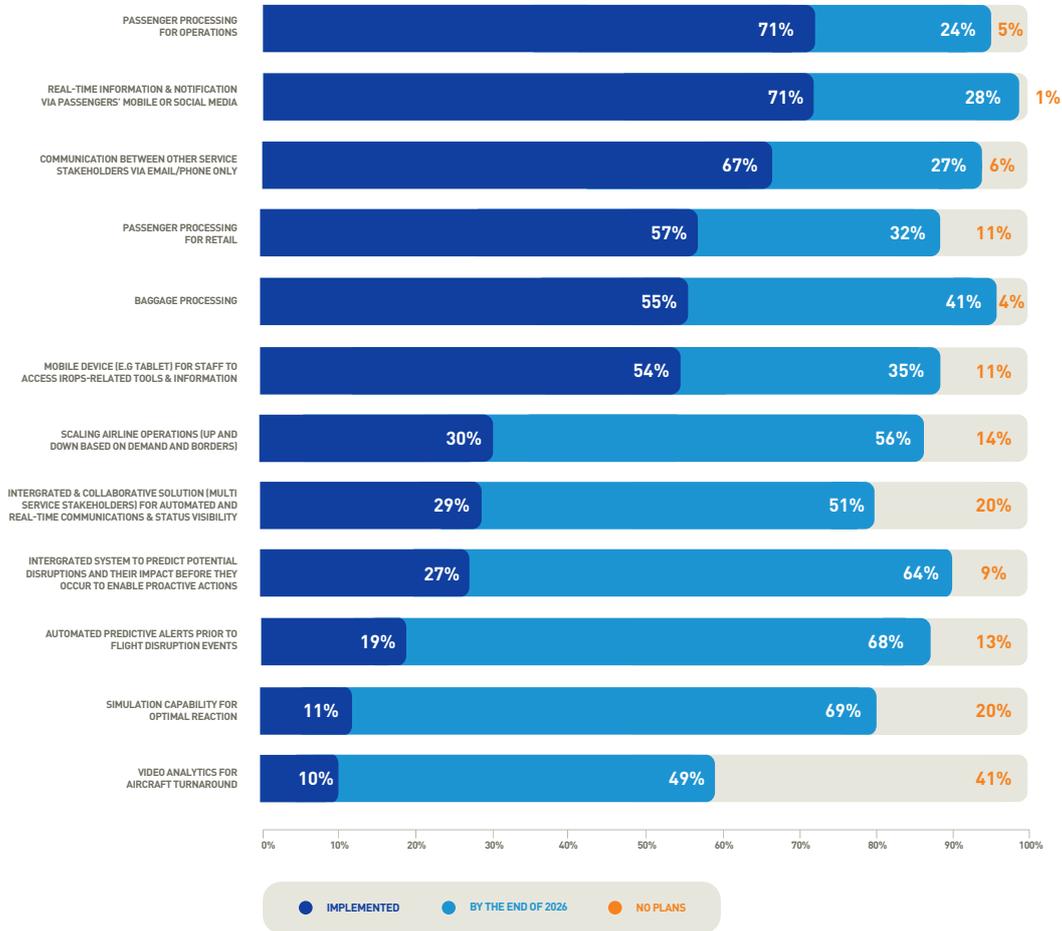
When it comes to initiatives at the airport, there are two areas where most airlines are investing in major programs: self-service solutions for irregular operations (61% implemented) and touchless solutions (57%). With most remaining airlines (roughly 30%) investing in R&D programs over the next three years, these are clearly high-priority areas for the industry.

Airline investment in real-time wait monitoring systems has nearly doubled this year compared to 2022 (30% up from 17%), perhaps in response to the congestion seen at airports during last year’s travel spike, which had a significant impact on the passenger experience. Biometric-enabled technologies are on the rise, with a slight increase year on year. Single token is still new to the market, with 14% implementation today in major programs and another 33% confirmed over the next three years in R&D.

Overall, airlines are embracing the next generation of technologies (self-service, touchless, biometric-enabled, and single token) to enhance operational efficiency and deliver a seamless passenger experience.



BUSINESS INTELLIGENCE INITIATIVES



% OF AIRLINES WITH IMPLEMENTED OR PLANNED BUSINESS INTELLIGENCE INITIATIVES FOR OPERATIONS

BUSINESS INTELLIGENCE INITIATIVES TO STREAMLINE OPERATIONS AND PASSENGER SERVICES

Business intelligence (BI) is the biggest area of technology investment for airlines in the coming three years – and BI continued to see increased focus across a number of use cases and operations areas.

There are three areas where BI has been implemented by two-thirds or more of airlines: passenger processing for operations, real-time information and notification via mobile, and

communication between other service stakeholders. Passenger processing for operations has seen significant growth in the past year, with implementation jumping from half to nearly three-quarters of airlines. This likely reflects airlines' focus on informed decision-making for optimizing the passenger experience in the wake of congestion and disruptions.

Another area that has seen significant growth in BI usage is passenger processing for retail, with implementation doubling year on year and a further 32% expecting to introduce this by 2026.

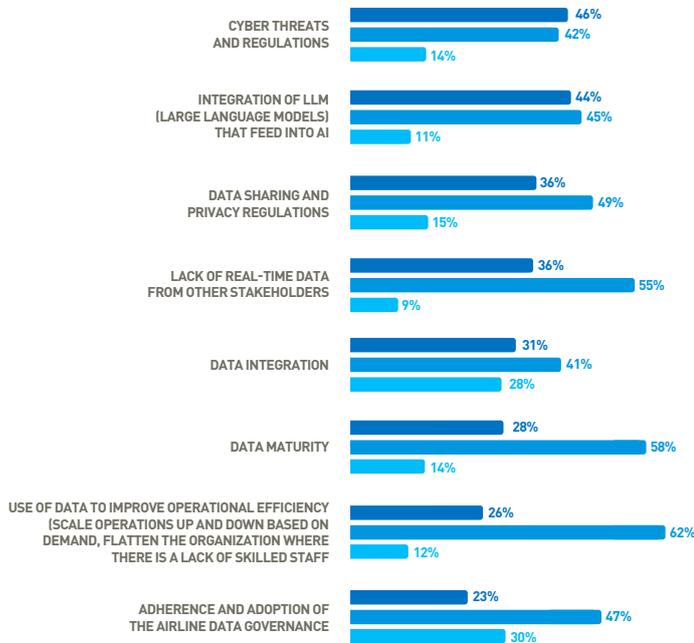
Airlines are clearly keen to explore alternative revenue channels in the wake of the pandemic's losses.

There are some areas where less than a third of airlines currently have BI processes, but in almost all cases the vast majority have plans by 2026. Two-thirds of airlines have plans for integrated systems to predict potential issues, automated predictive alerts prior to flight disruption, and simulation capability for optimal reaction, highlighting their emphasis on handling and communicating around disruptions in an agile way.

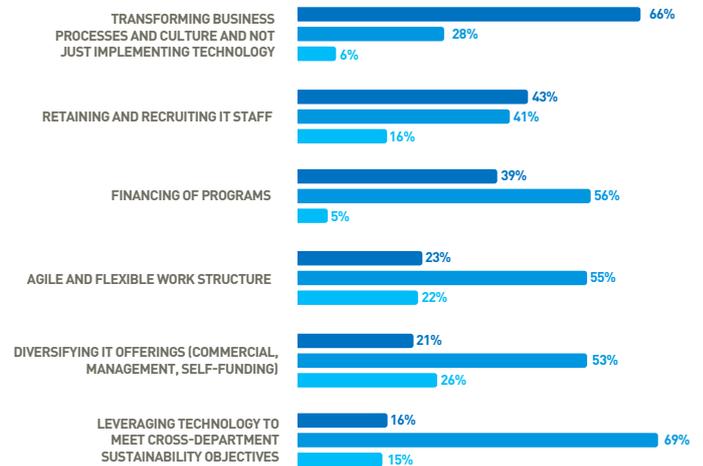


IT AND DATA CHALLENGES

DATA CHALLENGES



IT CHALLENGES



- MAJOR CHALLENGE
- SOMEWHAT OF A CHALLENGE
- NOT A CHALLENGE

% OF AIRLINES WITH CONFIRMED IT AND DATA CHALLENGES

CHALLENGES PREVENTING AIRLINES FROM MEETING THEIR IT & DATA OBJECTIVES

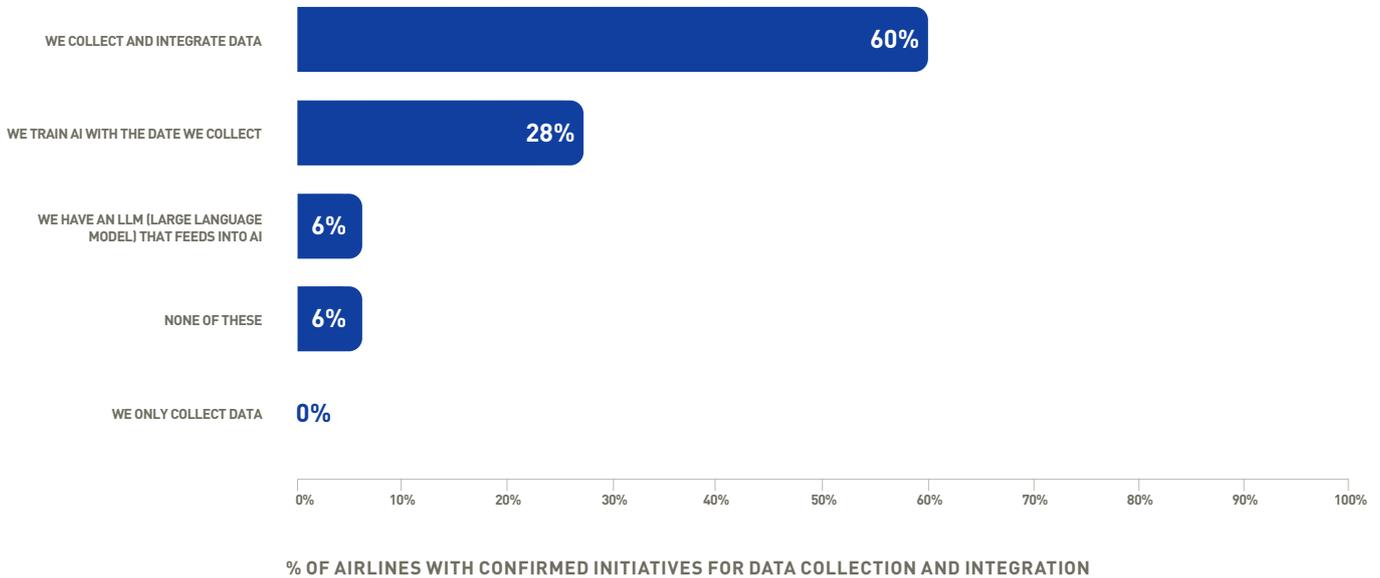
Airlines and airports appear to face similar challenges with respect to IT. Transforming business processes and culture, one of the top challenges for airports, is an even greater challenge for airlines (with 66% calling it a major challenge). The challenge of retaining and recruiting IT staff indicates that a significant portion of airlines’

difficulties is associated with workforce management. This observation aligns with the post pandemic staff shortage the industry has faced over the past two years.

Two areas considered somewhat of a challenge by almost all airlines are data maturity and the use of data to improve operational efficiency as airlines seek out technology-driven operational efficiencies to help tackle the difficulties with hiring and retention.



DATA COLLECTION AND INTEGRATION



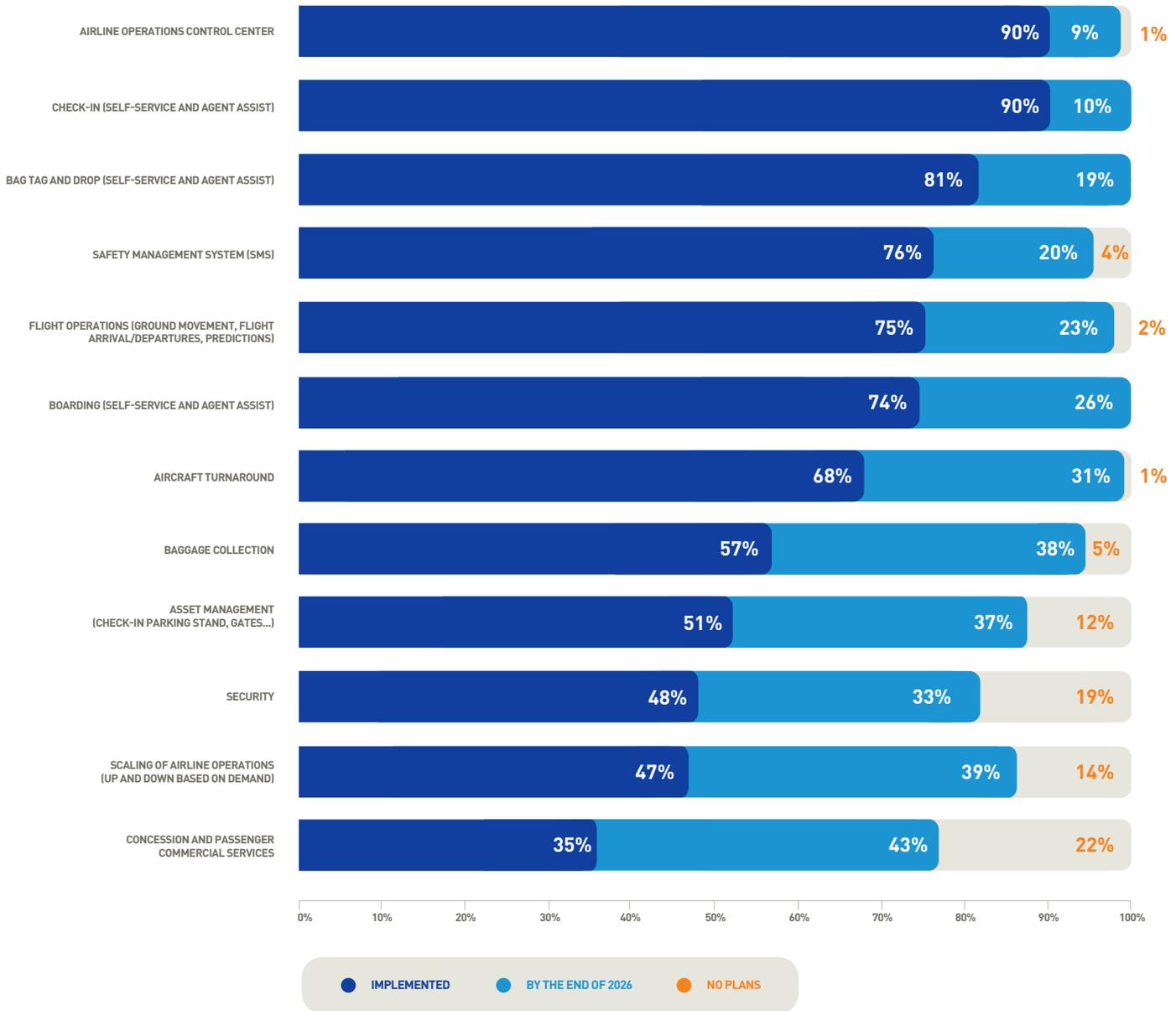
AIRLINES' DATA COLLECTION AND INTEGRATION

Two areas that airlines widely view to be a major challenge are integration of Large Language Models (LLM) and cyber threats. While the latter has been an ongoing challenge for years, it is promising to see that airlines are being forward-facing in their attitude towards AI, already considering LLMs to be a top priority for innovation.

When it comes to current use of data and AI, as with airports, most airlines are still at the collection and integration stage, although nearly a third are starting to train AI systems. Given that AI is one of the main areas that airlines are investing in over the next three years, this is expected to continue increasing over time.



DATA COLLECTION AND SHARING



% OF AIRLINES WITH CONFIRMED INITIATIVES FOR DATA COLLECTION AND SHARING

AIRLINES' DATA COLLECTION AND SHARING

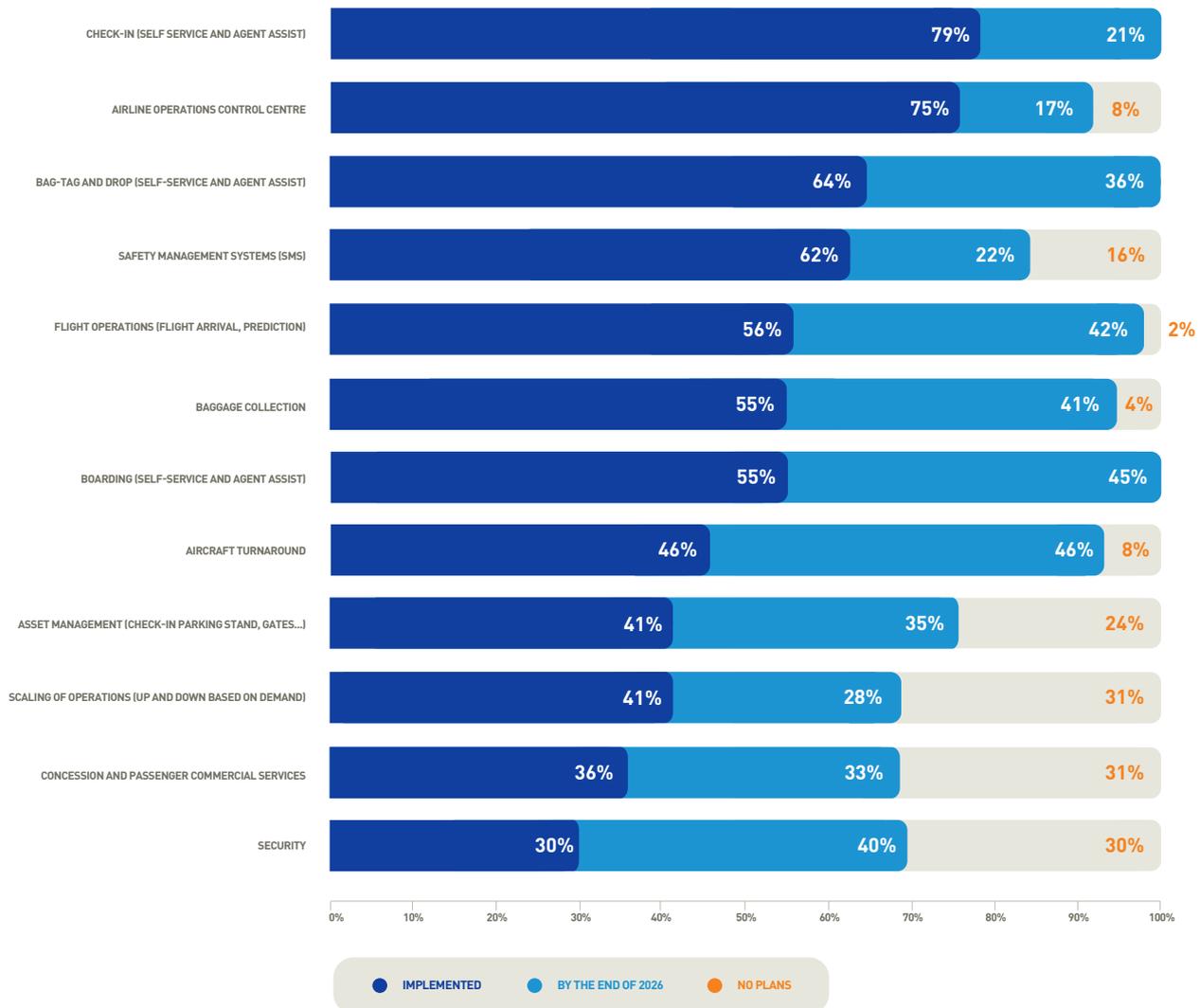
In terms of where airlines are currently collecting and sharing data, the check-in stage and airline operations control centers are where most currently have

integrated solutions, with 90% in each instance. Roughly four in five airlines also have data collection in place at bag tag and bag drop and for safety management systems.

Across the board, almost all airlines are planning to adopt data collection and sharing across most areas by 2026.



OPERATIONAL EFFICIENCY THROUGH THE USE OF IT



% OF AIRLINES WITH IMPLEMENTED OR PLANNED IT INITIATIVES THAT DRIVE OPERATIONAL EFFICIENCY

IMPROVED OPERATIONAL EFFICIENCY THROUGH THE USE OF IT

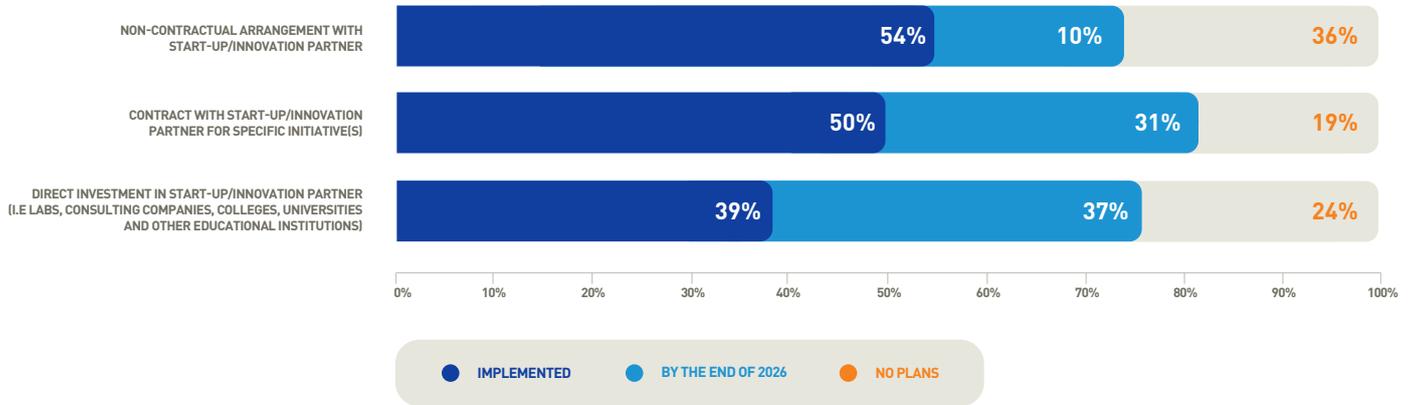
A majority of airlines have already implemented IT to improve operational efficiency within two key service areas (check-in – 79% and bag tag – 64%) and two key operations (airline operations control centres – 75% and safety management systems – 62%).

The next wave of operations areas that airlines are looking to focus on have significant potential for cost reduction and sustainability improvements. By 2026, over 90% of airlines plan to have IT in place to boost the efficiency of flight operations and aircraft turnaround.

Industry stakeholders recognise that data is central for today’s digitally driven businesses and operations. To achieve these operational efficiencies, airlines will have to improve the way they collect, integrate, and share data to enhance operations and passenger processing.



INNOVATION PARTNERSHIPS



% OF AIRLINES WITH IMPLEMENTED OR PLANNED INNOVATION INITIATIVES WITH PARTNERS

AIRLINES' CO-INNOVATION PLANS

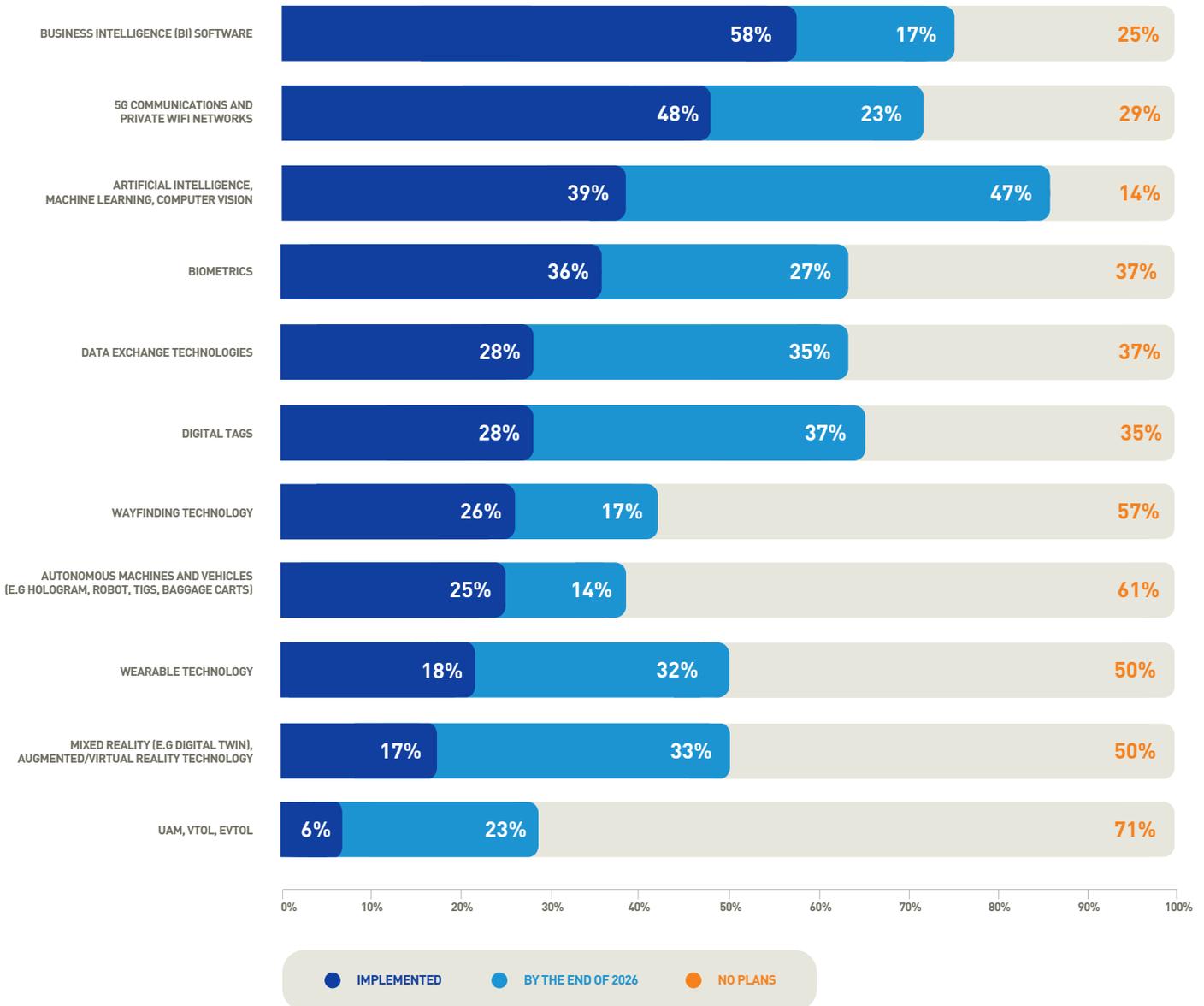
Building an innovation strategy has clearly become a priority for airlines. In 2018, 31% of airlines had no innovation strategy in place;³ in 2022, only 1% said they had no plans in place, while 87% of airlines confirmed having or actively developing an innovation strategy, and a further 12% have plans to build one in future.

Today, the trend continues, with airlines showing strong interest in partnering with start-ups and innovation partners. 50% of airlines have entered contracts, and 54% have established non-contractual arrangements. Direct investment in start-ups also looks promising, with 39% of airlines confirming investments and another 37% saying they have such plans in the coming three years.

³ SITA Air Transport IT Insights 2018



CO-INNOVATION TECHNOLOGIES



% OF AIRLINES WITH IMPLEMENTED OR PLANNED CO-INNOVATION TECHNOLOGIES

AIRLINES' CO-INNOVATION PLANS

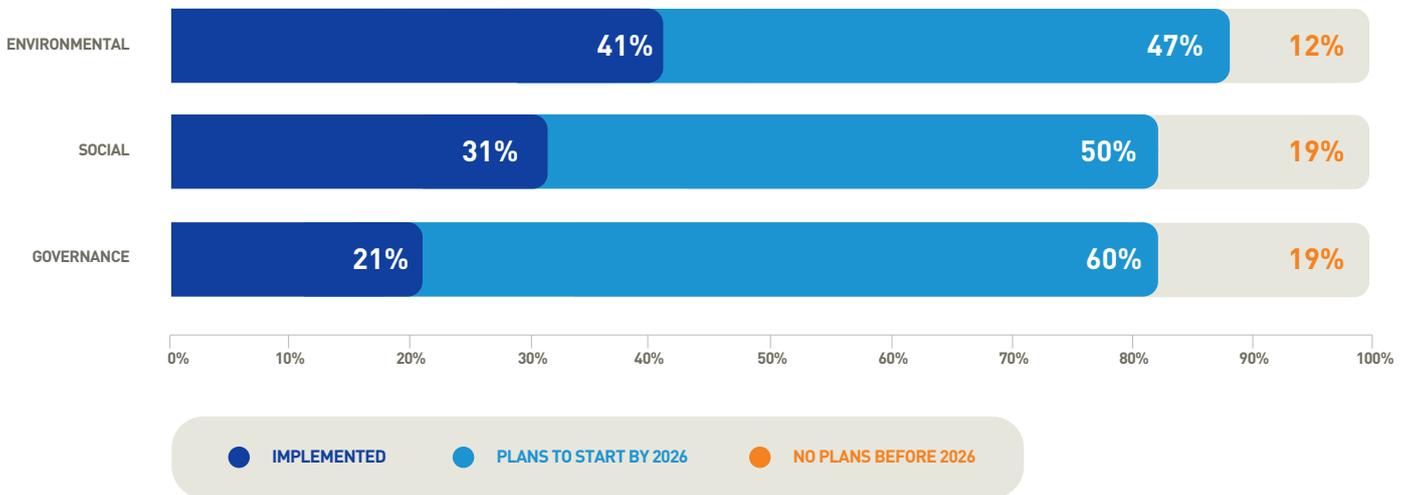
The most common area for which airlines are looking for innovation partners is business intelligence software (58% implementation).

The fact that this is at the top of the agenda for both airports and airlines suggests that stakeholders across the industry see huge value in working with businesses on the cutting edge of the technology.

Beyond this, the area that has seen the most significant growth in partnerships over the past year is 5G communications and private Wi-Fi networks (up from 27% to 48%).



SUSTAINABILITY ACROSS THE ESG FRAMEWORK



% OF AIRLINES WITH IMPLEMENTED OR PLANNED SUSTAINABILITY INITIATIVES ACROSS THE ESG NETWORK

AIRLINES' SUSTAINABILITY PLANS ACROSS THE ESG FRAMEWORK

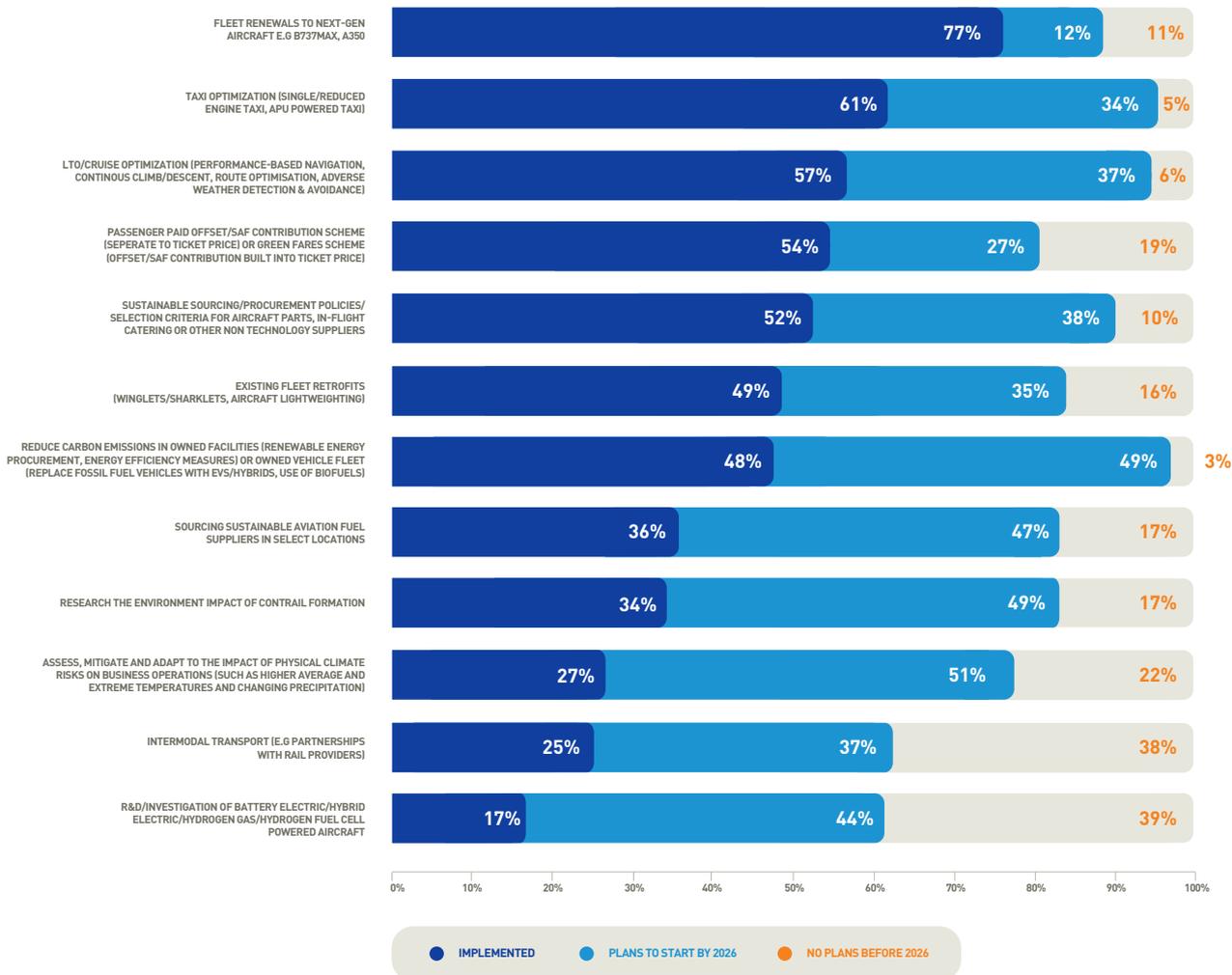
As with airports, there is still some way to go in the development of IT solutions to enable ESG programs. 41% and 31% of airlines respectively have currently adopted 'environmental' and 'social' initiatives, but less than a quarter have done so for 'governance' (21%).

Again, similarly to airports, plans exist amongst most airlines in all three areas, with over 80% adoption expected by 2026.

Looking at the regional level the data shows that 100% of European airlines have implemented IT solutions to enable environmental and social sustainability programmes, while in the MEA region less than 30% have done so.



SUSTAINABILITY INITIATIVES PRIORITIZED BY AIRLINES



% OF AIRLINES WITH IMPLEMENTED OR PLANNED SUSTAINABILITY INITIATIVES

AIRLINES' ENVIRONMENTAL SUSTAINABILITY INITIATIVES

A clear majority of airlines (77%) have renewed their fleets to next-gen aircraft, making this the leading environmental sustainability initiative in the industry. Further initiatives implemented by most airlines revolve around the optimization of aircraft performance, with 61% having adopted optimization for the taxiing phase and 57% for landing and take-off.

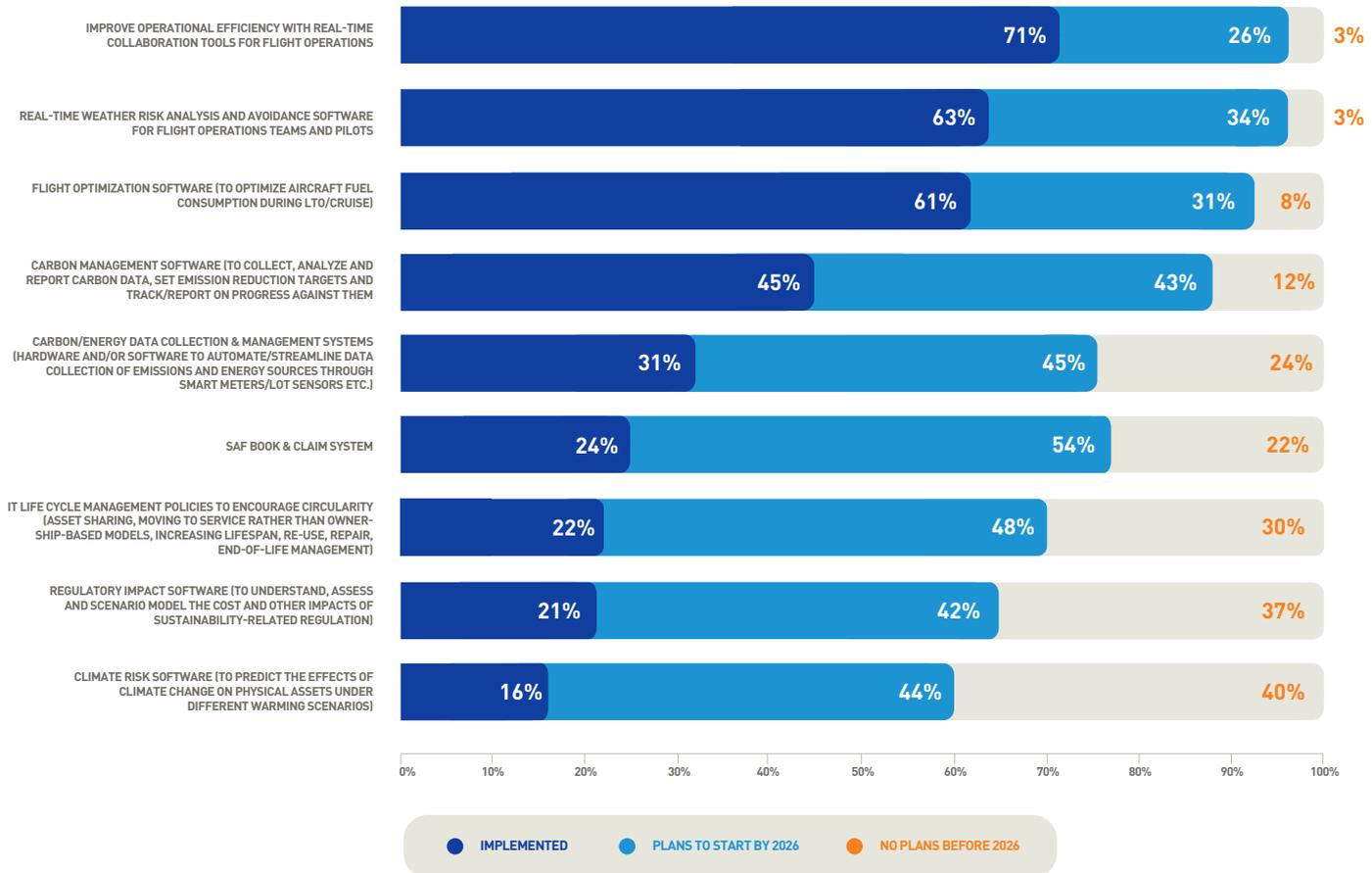
Significantly, more than half of airlines (54%) have implemented some form of passenger paid offset or SAF contribution scheme with a wide regional spread – 92% of European airlines have done so, leading the initiatives' implementation at regional level.

Moreover, on a global scale 83% of airlines either have started to research the environmental impact of contrail formation or intend to start in the next 3 years. Interestingly, no airlines in Europe have plans in place to do so before 2026.

Today, only 27% of airlines globally have implemented measures to assess/mitigate/adapt to the impacts of climate change; another 22% confirmed having no plans before 2026. Regionally, the Americas lead the way, with all surveyed airlines having implemented or planned measures before 2026.



“GREENING-BY” TECHNOLOGY INITIATIVES



% OF AIRLINES WITH IMPLEMENTED OR PLANNED “GREENING-BY” TECHNOLOGIES

GREENING-BY TECHNOLOGY PLANS FOR AIRLINES

The most widely implemented ‘greening-by’ tech investments involve the optimization of flight operations. Approximately two-thirds of airlines are working on: real-time collaboration tools to improve flight operational efficiency, real-time weather risk analysis and avoidance software for flight ops teams, and flight optimization software.

Sustainable Aviation Fuel (SAF) is a major topic among airlines, the subject of significant investment over the coming three years. Despite relatively low adoption so far, by 2026 half of airlines are planning to source SAF suppliers for select locations, indicating a positive outlook for the use of SAF (83% adoption by 2026). Similarly, half of airlines plan to start using the SAF book and claim system by 2026, raising adoption to 78%.

**Greening by IT refers to using IT and data solutions to help airlines achieve sustainability objectives in all areas [i.e. environmental, social, economic, and governance.]*

AIRPORT EXECUTIVE SUMMARY

Current trends see a notable surge in airport IT spending marking a pivotal era for technological advancements. For the first time since 2019, Opex and Capex are reaching similar levels, meaning that the industry is ready to invest in growth and development rather than just for sustaining operations.

For airports, 2022 saw IT spending surpass expectations and reach 7.17% of airport revenue, up one percentage point from 2021, primarily fuelled by capital investments. This upward trajectory is projected to persist, rising to 7.45% of airport revenue in 2023. Absolute IT spend mirrors this trend, with most airports reporting increases from 2021 to 2022 and over two-thirds projecting sustained growth in 2023 and 2024.

In 2023, airports have strategically prioritized investments in data repositories, business intelligence software, biometric identity management, and 5G communications, driven by the increased use of mobile self-service by passengers.

The newest and most advanced technology implementations, such as biometrics, touchless, single-token, augmented reality, and autonomous vehicles, suggest an ongoing commitment to digitalization for enhancing the passenger experience and boosting operational efficiency. Passenger processing continues to be at the top of IT service investment agendas, with almost all airports engaging in major programs or research and development. The border control stage leads the way for adoption of biometric ID management, but over half of airports expect to implement this across other journey stages by 2026.

In parallel, only a few airports share passenger screening information with the government/security or with airlines, and around half of them have no plans to share the information with either of these stakeholders in the future.

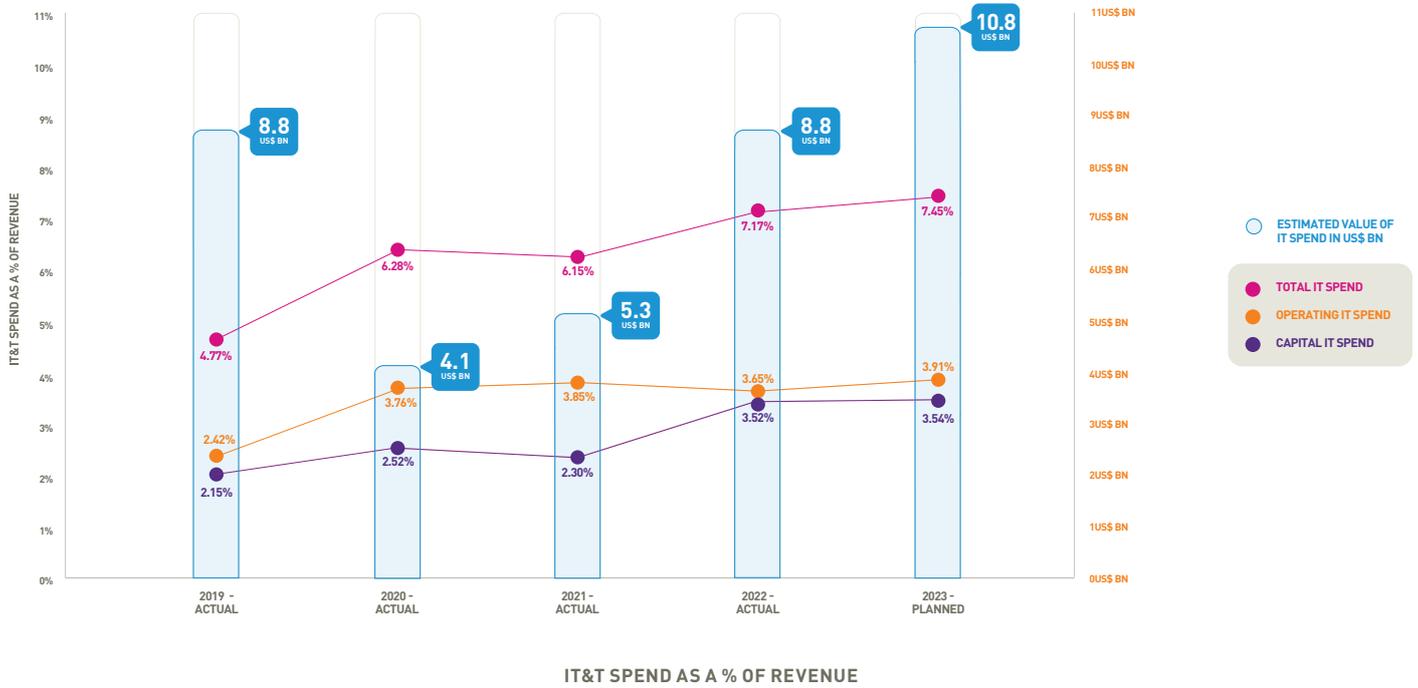
On the innovation front, the industry is exploring and fostering collaborations with start-ups in AI and business intelligence. Airports are strategically investing in AI-powered technologies such as machine learning to enhance decision-making in cybersecurity and talent retention.

Concurrently, sustainability initiatives are gaining traction as they become embedded in business operations, with airports actively planning ESG-related IT solutions, prioritizing energy efficiency, carbon reduction, and sustainable fuel adoption.

In conclusion, airports' technology investments reflect a steadfast commitment to streamlining operations and passenger management and ramping up their sustainability and innovation commitments.



IT&T SPEND IN 2023



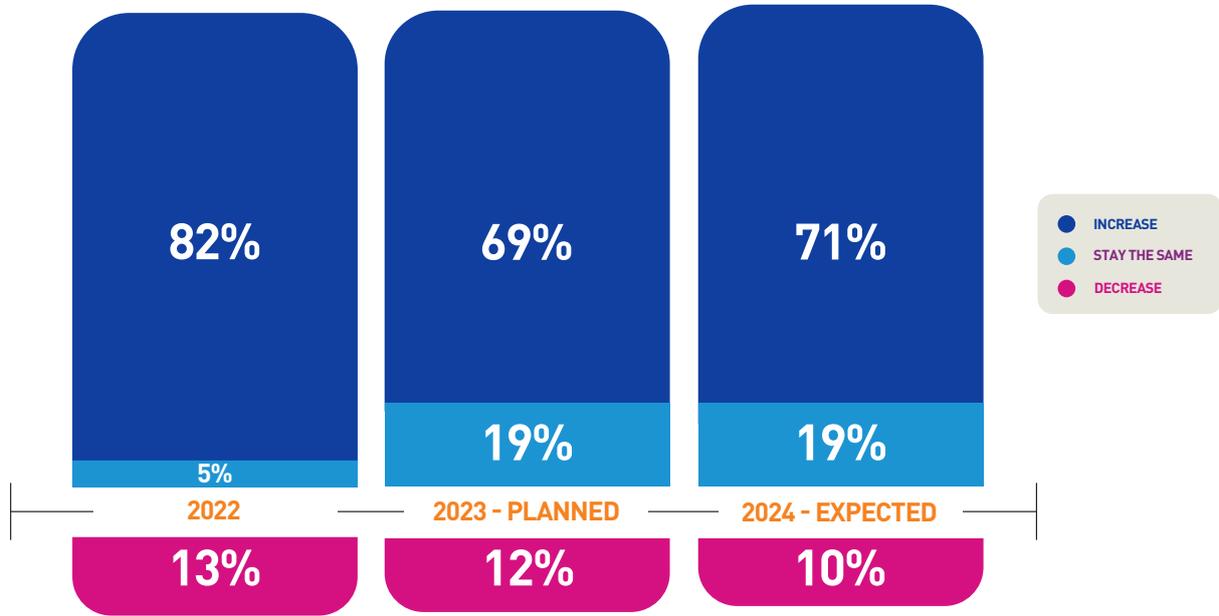
AIRPORTS' IT&T SPEND

The research paints a different picture for airport IT spend compared to airline. IT spending as a proportion of revenue has reached the highest levels seen for several years. 2021 spend was 6.15% of airport revenue and the prediction was that this would trail off a little in 2022. Instead, the opposite has happened, with an increase to 7.17%, primarily driven by capital spend.

The increase in IT spend isn't expected to be a one-off, with growth predicted to continue to 7.45% of airport revenue in 2023, with operating spend growing to nearly 4% of total revenue.



IT&T SPEND PREDICTIONS FOR 2024



EXPECTED CHANGE IN IT&T SPEND VERSUS PREVIOUS YEAR

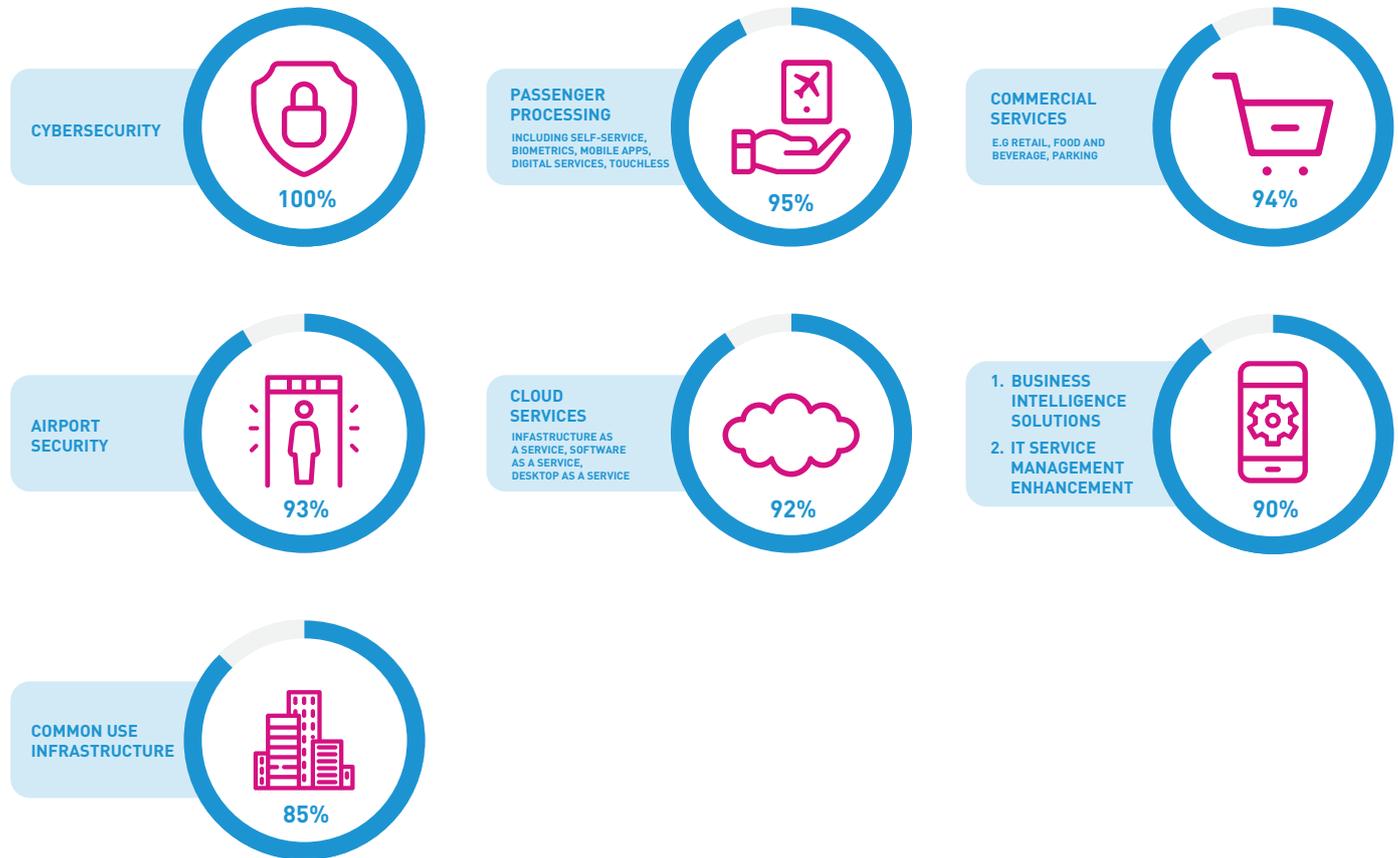
IT&T SPEND PREDICTIONS

Unsurprisingly, these statistics indicate a definite uptick in expenditure, with 82% of airports noting an increase from 2021 to 2022. Similar to the airline sector, this upward trend appears persistent, as more than two-thirds of airports anticipate IT spend to increase year-on-year for both 2023 and 2024.

As we move further away from the challenges posed during the pandemic and travel disruptions since, airports remain committed to sustained investment in technology to fuel their ongoing growth.



INVESTMENT PRIORITIES FOR IT SERVICES



% OF AIRPORTS PLANNING MAJOR PROGRAMS/R&D BY 2026
THE TOTAL % SUMS BOTH MAJOR PROGRAMS AND RESEARCH AND DEVELOPMENT

AIRPORT CIO'S PRIORITIES FOR IT SERVICES

Cybersecurity and passenger processing lead the way for airports' IT service investment priorities, with 100% and 95% respectively having a major program or R&D in place in 2023. For cybersecurity, this is up from 77% in 2022, demonstrating its ever-increasing importance in the aviation sector.

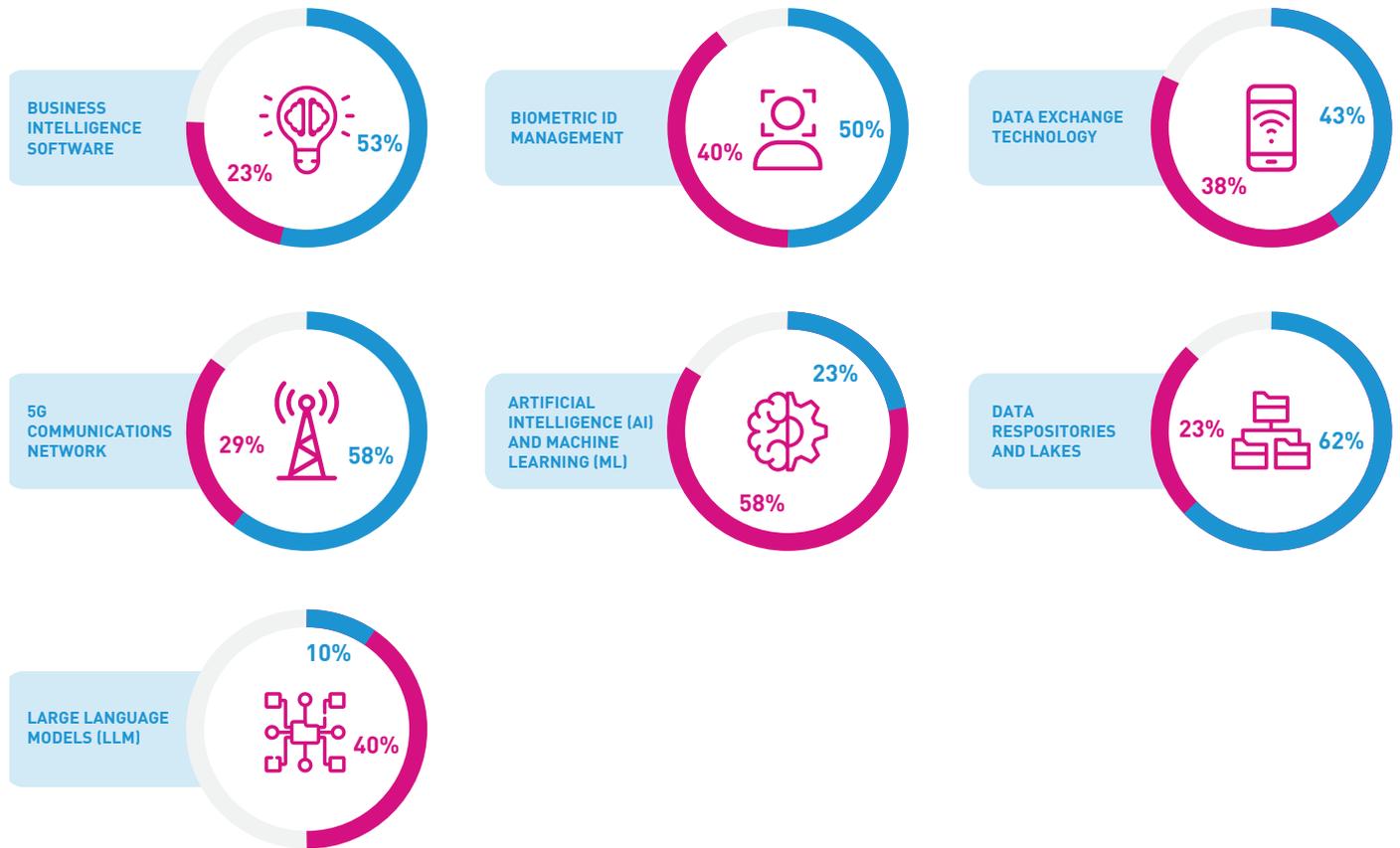
Similarly, passenger processing initiatives increased from 83% in 2022, indicating continued efforts towards enabling a seamless travel experience.

Commercial services and airport security are additional areas where more than two-thirds of airports are investing in major programs. The former suggests airports' renewed effort to revive revenues through retail channels now that the passenger traffic

has surged to 2019 levels. Commercial services have seen a major uptick from 2022 to 2023 in both major programs (71% implementation up from 40%) and R&D (38% up from 23%). This confirms airports' desire to build non-aeronautical revenues to recoup losses from the pandemic and fortify them against air transport disruption.



INVESTMENT PRIORITIES FOR TECHNOLOGIES



% OF AIRPORTS PLANNING MAJOR PROGRAMS/R&D BY 2026

AIRPORT CIO's PRIORITIES FOR TECHNOLOGIES

Four key technology investment priorities emerge for airports in 2023: data repositories, 5G communications/private WiFi, business intelligence software, and biometric identity management all see at least half of airports investing in major programs.

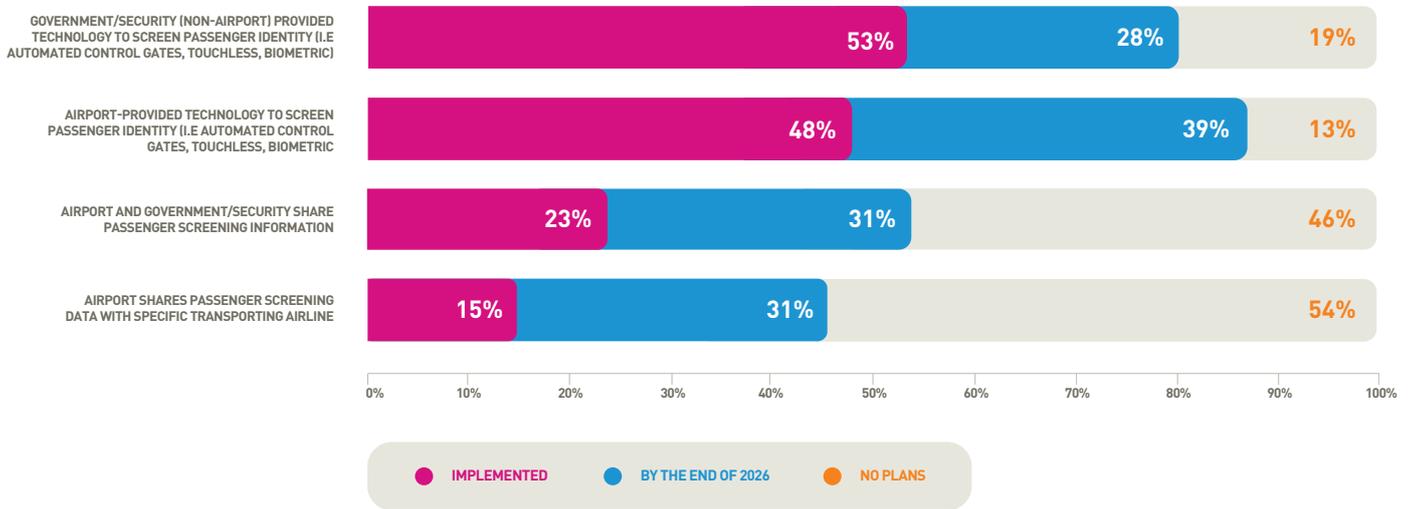
5G communications has increased significantly in importance over the past year, with 58% investing in major programs compared to 43% in 2022, perhaps responding to passengers' continued adoption of mobile self-service across the journey.

AI holds promise, with 81% of airports engaging in major programs and R&D for its development by 2026. While language learning models (LLM) are

mostly in the pilot phase, 40% of airports have ongoing R&D programs in the next three years, indicating substantial interest in this area. Surprisingly, despite the anticipated impact of AI, 50% currently lack plans for language learning models, but this may evolve as more practical business use cases emerge in the coming years.



ID PROCESSES TO STREAMLINE PASSENGER THROUGHPUT



% OF AIRPORTS WITH IMPLEMENTED IDENTITY PROCESSES TO STREAMLINE PASSENGER THROUGHPUT

PASSENGER IDENTITY PROCESSES

Within identity processes, technologies are much more commonly implemented than data-sharing arrangements. 53% of airports have implemented non-airport-provided technology and 48% have implemented airport-provided technology to screen passenger identity. Meanwhile, just under a quarter share passenger screening information with government/security and only 15% do so

with airlines. While this is expected to increase over the coming three years, around half of airports still have no current plans to share with either of these industry stakeholders in the future.

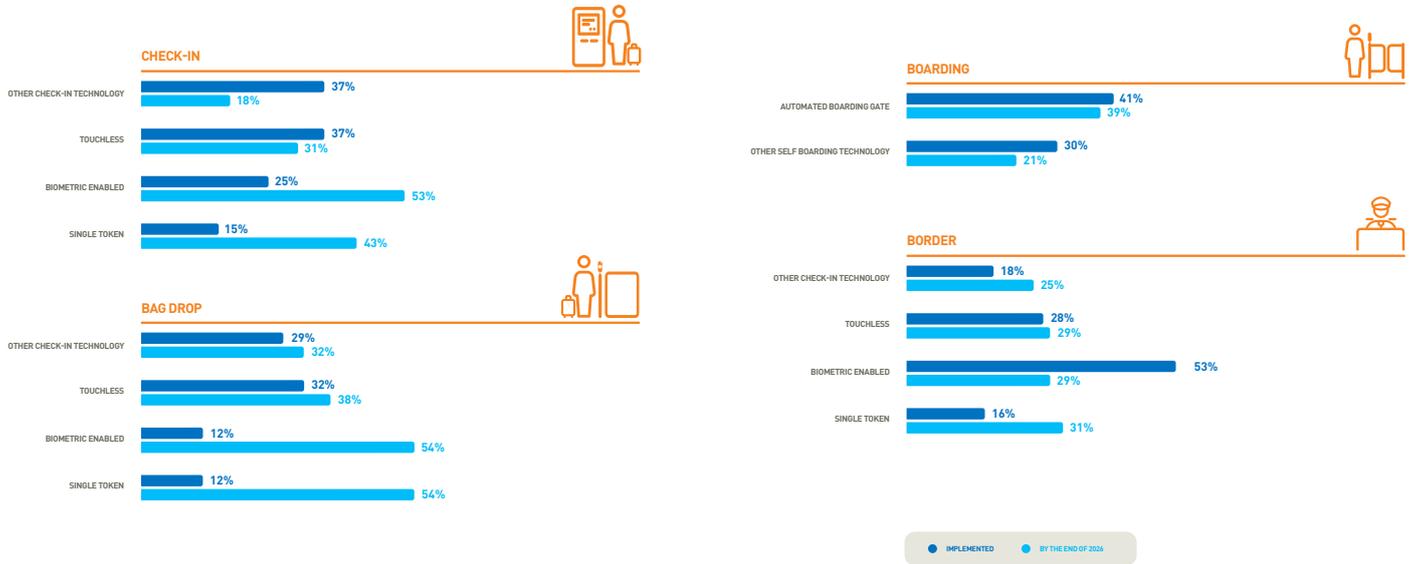
In recent years, there has been increased uptake of ID processes and technologies to streamline passenger throughout, more specifically biometric and touchless solutions.⁴ Border control

is the most mature area, where airports collaborate with governments and security providers to share data and help streamline throughput. There are signs of increased adoption of the next-generation technologies for passenger management in other areas, namely check-in, bag drop, and boarding.

⁴SITA Air Transport IT Insights 2022



NEXT GENERATION SELF-SERVICE TECHNOLOGIES FOR PASSENGER MANAGEMENT



% OF AIRPORTS WITH IMPLEMENTED TECHNOLOGIES FOR PASSENGER MANAGEMENT

PASSENGER IDENTITY MANAGEMENT

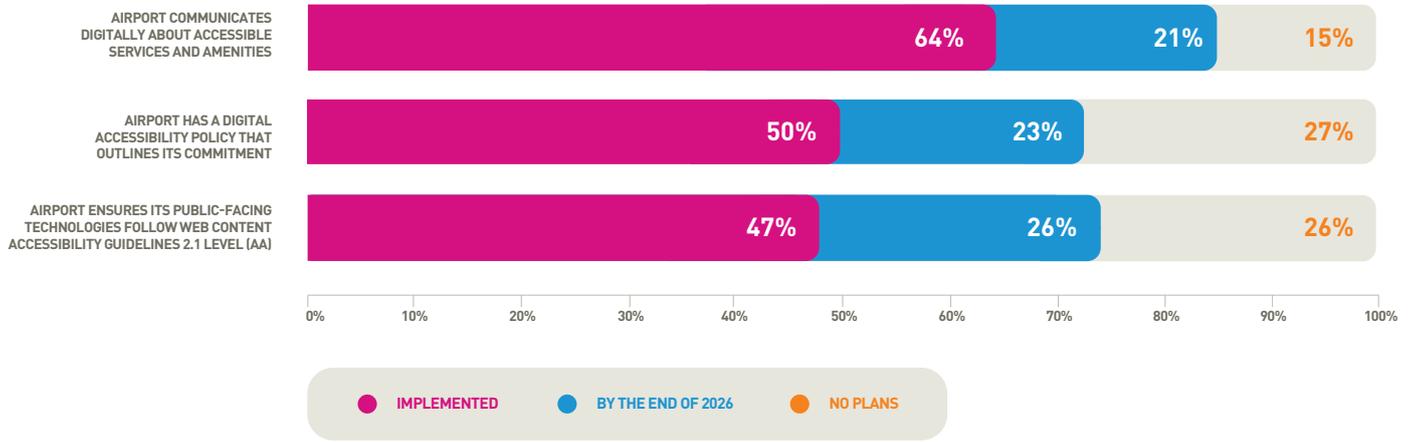
Airports expect biometric, touchless, and single-token passenger management technologies to be widely introduced by 2026, with 53% planning implementation of biometrics at self-check-in and 54% at bag drop.

As reflected in the previous section, border control is the most advanced stage, with 53% implementation in 2023.

Adoption of single tokens is further behind, with only 15-16% of airports having implemented these at each stage so far.



PASSENGER ACCESSIBILITY INITIATIVES



% OF AIRPORTS WITH IMPLEMENTED PASSENGER ACCESSIBILITY INITIATIVES

AIRPORTS' INITIATIVES THAT FACILITATE PASSENGER ACCESSIBILITY

When it comes to policies and communications, a large majority of airports communicate digitally about accessible services in the MEA region (87%), while 76% do so in the Americas and nearly two-thirds in Europe. Interestingly, when examining the implementation at the regional level of an accessibility policy that outlines its commitment to aid passengers with disabilities, the picture looks different, with MEA and Europe being the two regions consistent with having such a policy implemented.

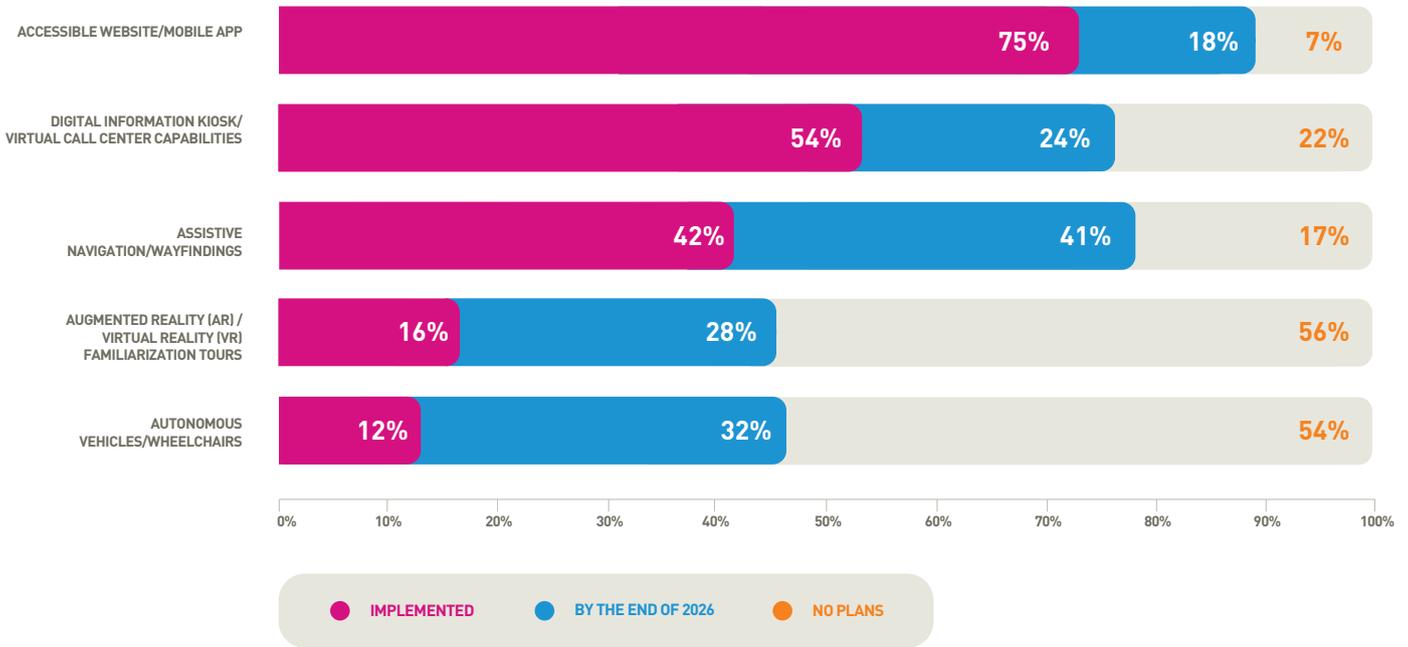
APAC and China show slower progress on this front, with less than half of airports communicating digitally about accessible services or having an accessibility policy in place. Given that a significant proportion of these processes are not in place, there is a long way to go for them to catch up with the rest of the world, and those with accessibility needs may continue to face difficulties.

Given the growing potential market share of the 'aging traveler' demographic⁵ along with accessibility legislation, this may be an area of focus that climbs the airport agenda more quickly than current figures would suggest.

⁵ SITA MegaTrends Report



PASSENGER ACCESSIBILITY TECHNOLOGIES



% OF AIRPORTS WITH IMPLEMENTED PASSENGER ACCESSIBILITY TECHNOLOGIES

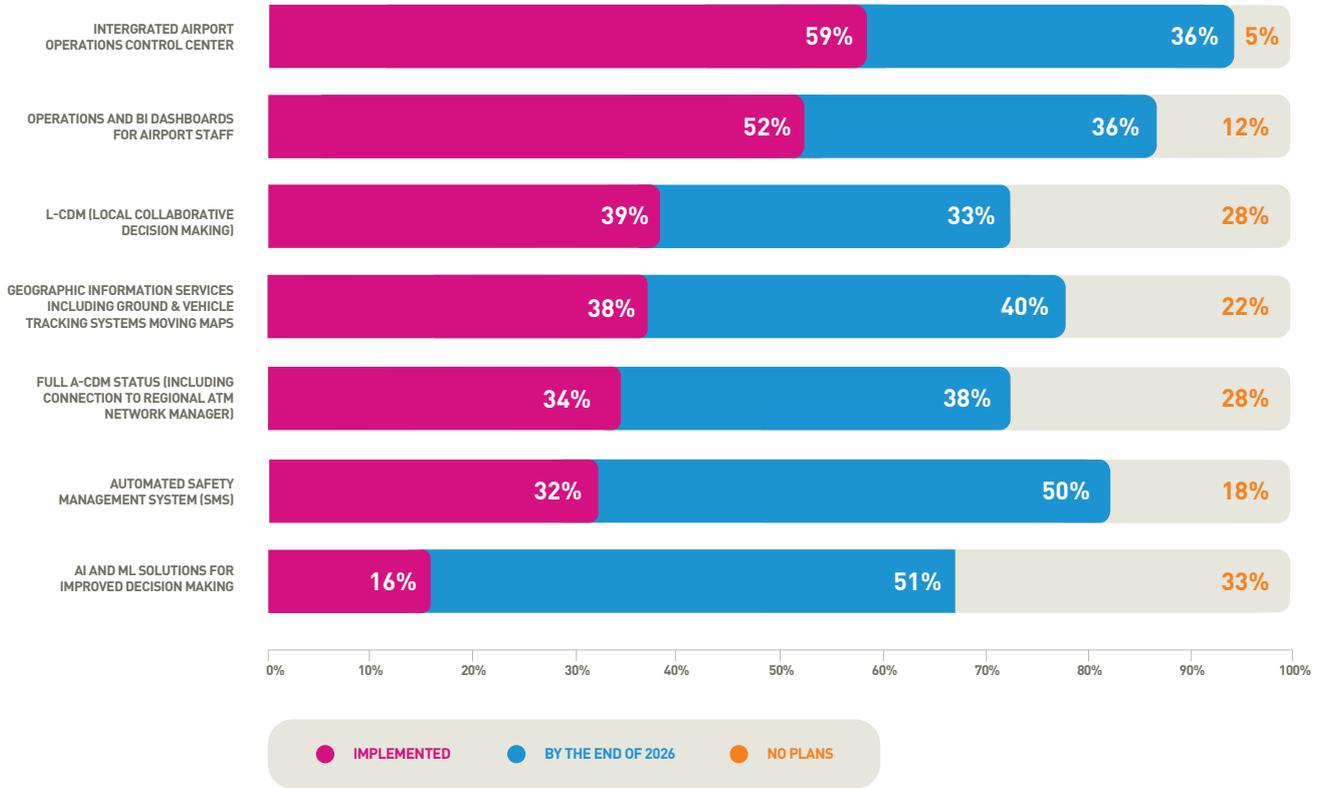
TECHNOLOGIES THAT FACILITATE PASSENGER ACCESSIBILITY

Globally, 75% of airports have implemented accessible websites/apps, with most of the remaining respondents planning to do so in the next three years. Fewer have implemented digital information kiosks (54%) and assistive navigation/wayfinding (42%), although again, a further 41% have plans for the latter in coming years.

Looking to the future, augmented reality familiarization and autonomous vehicles/wheelchairs may only have a small number of current implementations, but an additional 25-30% have plans for these over the next three years.



AIRPORT OPERATIONS SERVICE INITIATIVES



% OF AIRPORTS WITH IMPLEMENTED OR PLANNED OPERATIONS INITIATIVES

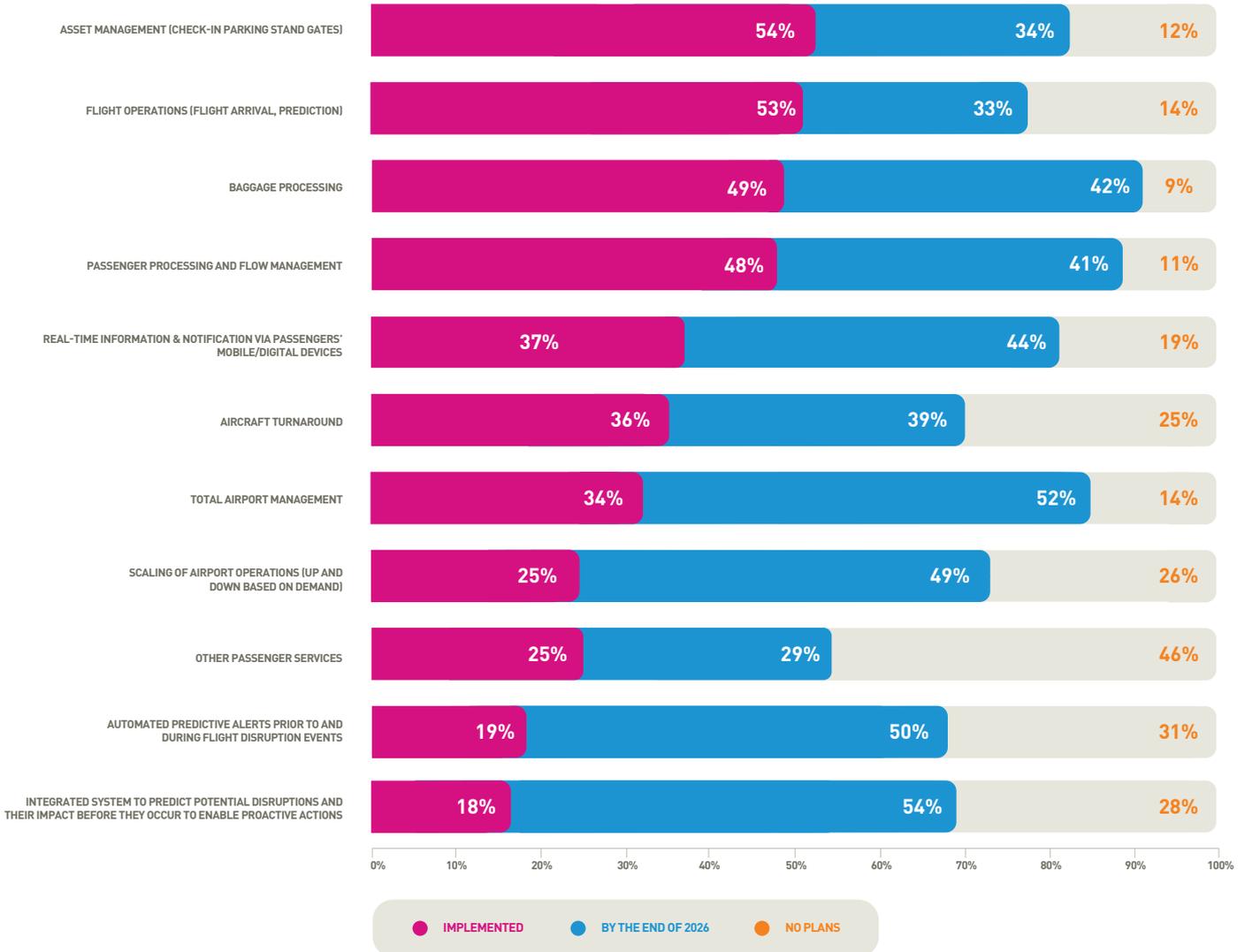
INTEGRATED AIRPORT OPERATIONS CONTROLS REMAINS TO BE THE TOP PRIORITY SERVICE INITIATIVE

Adoption of operations initiatives has remained at similar levels to 2022, with integrated airport operations controls remaining the most widely implemented by just over half of airports.

One investment area that will be interesting to monitor over the coming years will be Artificial Intelligence (AI) and Machine Learning (ML) for improved decision making. AI is a massive area of interest within aviation IT, so while currently this is only implemented by 16% of airports, 51% have plans relating to this by 2026.



BUSINESS INTELLIGENCE INITIATIVES



% OF AIRPORTS WITH IMPLEMENTED OR PLANNED BUSINESS INTELLIGENCE INITIATIVES FOR PASSENGER SERVICES & AIRPORT OPERATIONS

BUSINESS INTELLIGENCE INITIATIVES TO STREAMLINE OPERATIONS AND PASSENGER MANAGEMENT

Four stand-out areas of investment emerge for airport business intelligence initiatives in 2023: asset management (54%), flight operations (53%), baggage processing (49%), and passenger processing/flow management (48%).

Of these, the area seeing most significant growth over the past year has been passenger processing, increasing by 10%, reflecting airports' continued exploration of technology to support with quelling post-pandemic congestion.

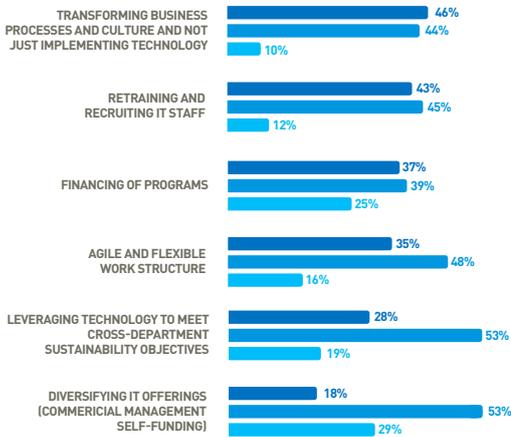
Despite small year-on-year increases in the adoption of integrated systems to predict potential disruptions and automated predictive alerts, these

remain areas where most airports are still in the 'planning' phase. By 2026, around 70% of airports will have in place a substantial development in the sphere of disruption management in the form of automated predictive alerts or an integrated disruption prediction system.

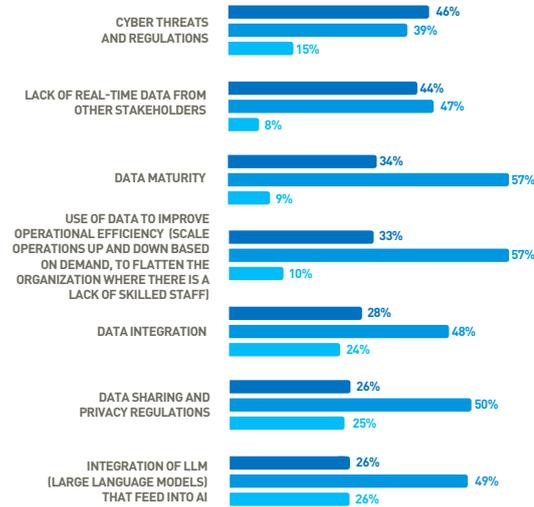


IT & DATA CHALLENGES

IT CHALLENGES



IT & DATA CHALLENGES



- MAJOR CHALLENGE
- SOMEWHAT OF A CHALLENGE
- NOT A CHALLENGE

% OF AIRPORTS WITH CONFIRMED IT AND DATA CHALLENGES

IT & DATA CHALLENGES THAT PREVENTING AIRPORTS FROM MEETING THEIR IT OBJECTIVES

There are four areas most often seen as a 'major challenge' for airports in 2023: cyber threats, transforming processes and culture, lack of real-time data, and retaining and recruiting IT staff. These challenges are common throughout many industries, shining a spotlight on

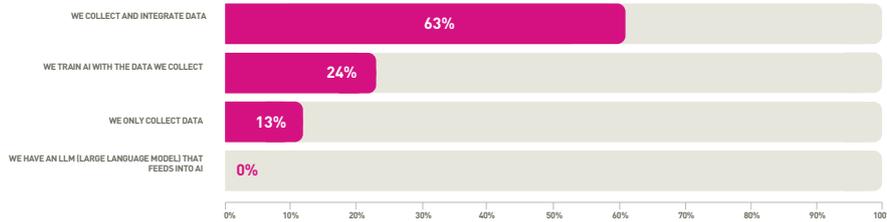
the need to find, train, and retain quality staff, transform the digital culture of organizations, and take actions to prevent and lessen the impact of any cyber threat.

Two areas also considered 'somewhat' of a challenge by 90% of airports are data maturity and using data to improve operational efficiency. The latter may play a crucial part in tackling

one of airports' foremost challenges, recruitment and retention, as IT solutions can support existing staff in becoming more productive or allow staff to be redistributed to more complex tasks.

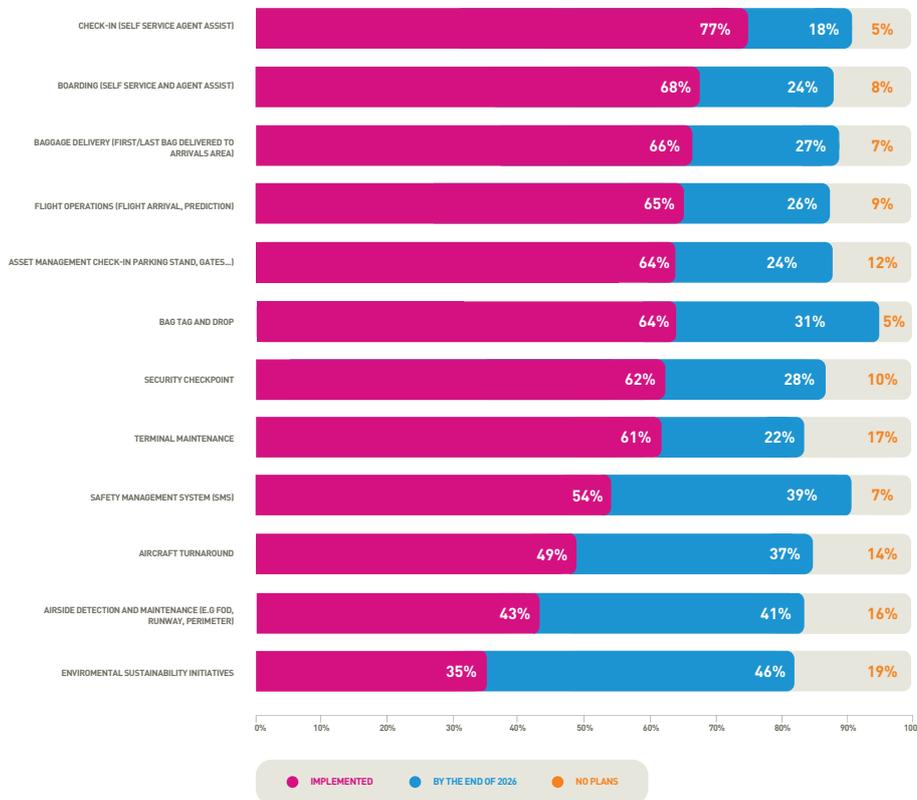


DATA COLLECTION AND INTEGRATION



% OF AIRPORTS WITH CONFIRMED INITIATIVES FOR DATA COLLECTION AND INTEGRATION

DATA COLLECTION AND SHARING



% OF AIRPORTS WITH CONFIRMED INITIATIVES FOR DATA COLLECTION AND SHARING

DATA COLLECTION AND INTEGRATION

Most airports are at the stage of collecting and integrating data, we can look at where across the travel journey they are doing this. Check-in is the area where most airports have integrated

solutions in 2023 (77%). Following this, there is a range of touchpoints throughout the airport where 61%-68% of airports have systems in place – from boarding to baggage to flight ops.

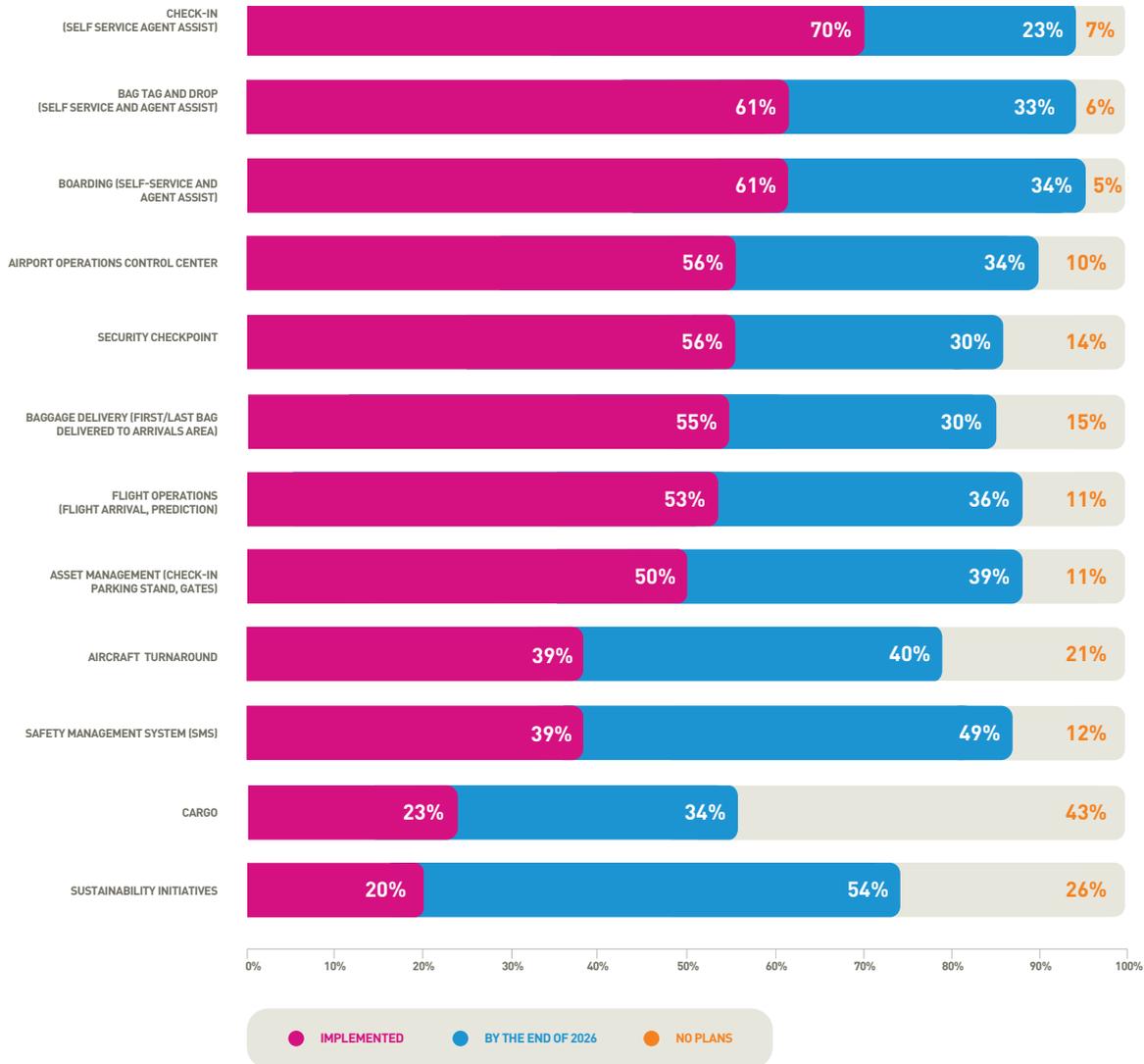
DATA COLLECTION AND SHARING

While the collection of data is commonplace at many airport touchpoints, there are some areas

where it is less so. Environmental sustainability initiatives (35%) and airside detection and maintenance (43%) are the best examples of this, but in both cases, more than 40% are planning to have systems in place by 2026, suggesting that data collection and sharing is only going to become more pervasive in the future.



OPERATIONAL EFFICIENCY THROUGH THE USE OF IT



% OF AIRPORTS WITH IMPLEMENTED OR PLANNED IT INITIATIVES THAT DRIVE OPERATIONAL EFFICIENCY

IMPROVED OPERATIONAL EFFICIENCY THROUGH THE USE OF IT

Our research confirms that around two-thirds of airports have implemented IT to improve efficiency at check-in, bag tag, and boarding in 2023, and almost all other airports have plans to do so over the next three years.

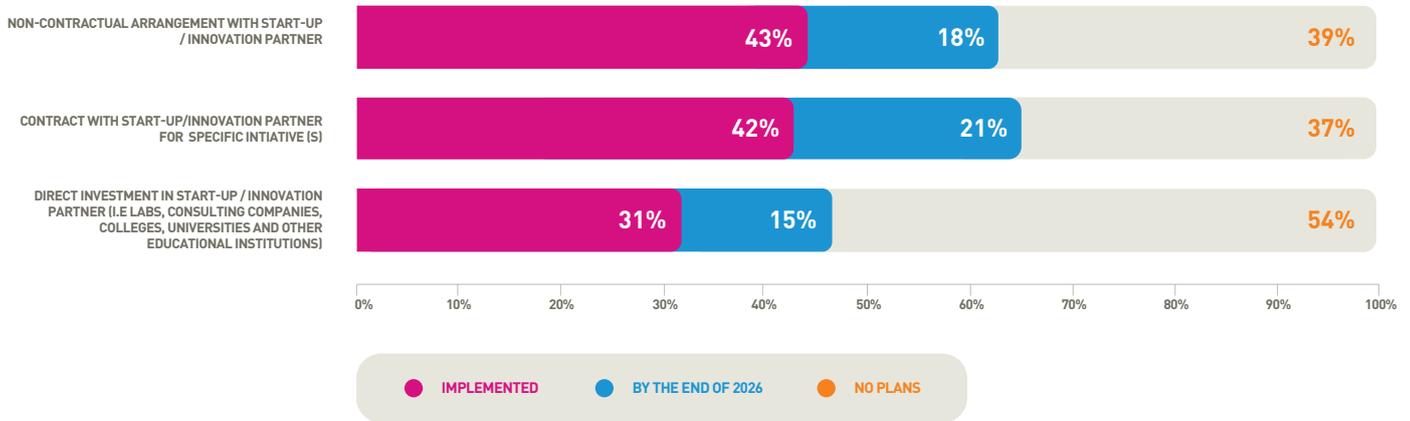
Two other areas stand out as key priorities for developing IT-driven operational efficiencies in the near future: safety management systems initiatives (49% of airports planning by 2026) and sustainability initiatives (54%).

Industry stakeholders know that data sharing is critical for today’s digital-powered businesses and operations. It’s likely that to achieve these operational efficiencies most effectively, airports will need to utilise AI technologies in

the analysis of their data. Currently, airports are just starting to work towards this, with 63% having collected and integrated data. Only a quarter are further on, with 24% having started to train AI with the data that’s been collected, but none so far are utilising Large Language Models (LLMs). AI, ML, LLM, and other technologies will empower airports towards leveraging data to enhance operational efficiency and passenger experience.



INNOVATION PARTNERSHIPS



% OF AIRPORTS WITH IMPLEMENTED OR PLANNED INNOVATION INITIATIVES WITH PARTNERS

AIRPORTS' CO-INNOVATION PLANS

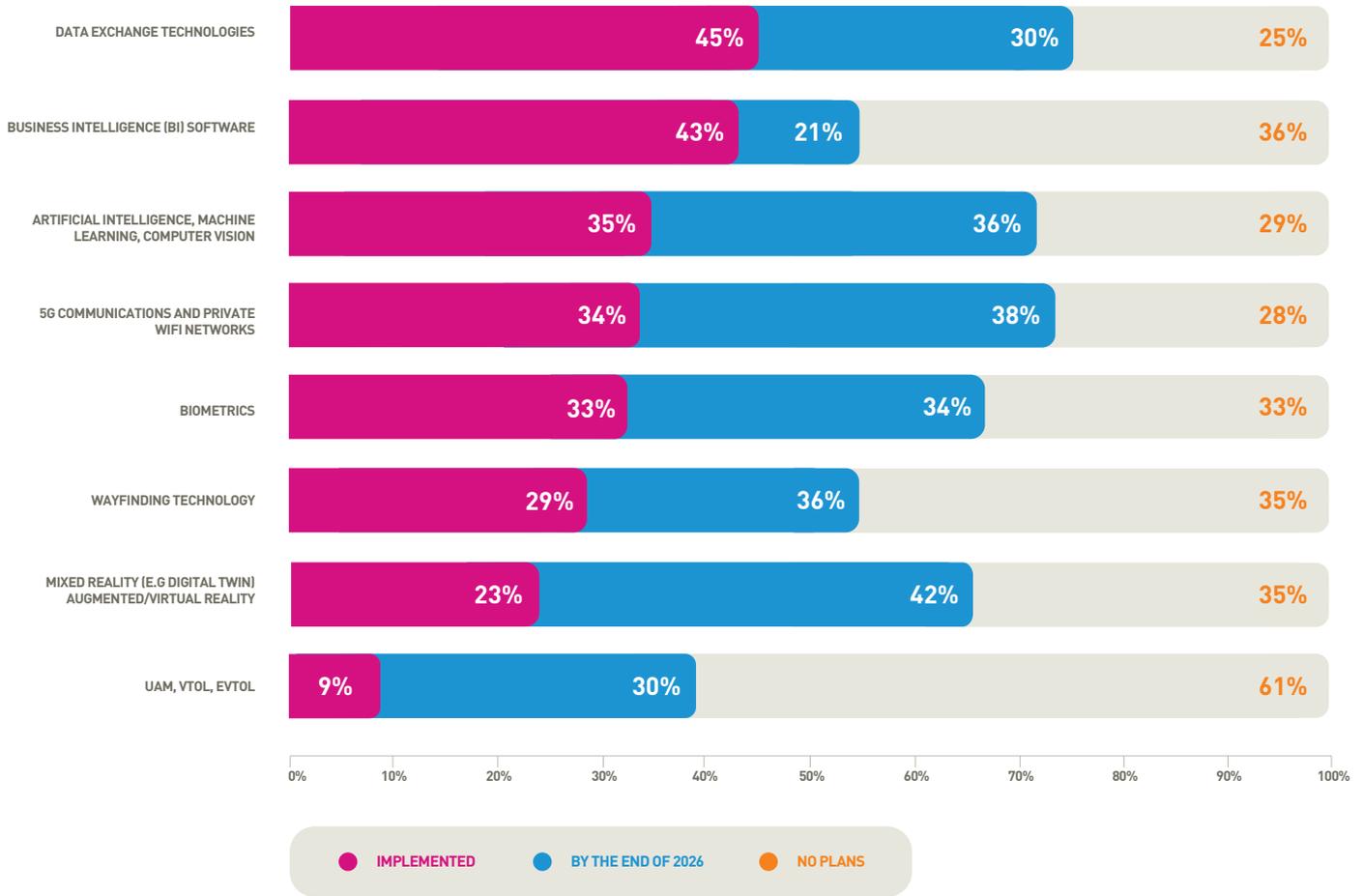
Airports are keen to work with start-up/innovation partners in several different ways. In 2023, 42% have entered contracts for specific initiatives, indicating a desire to leverage external expertise and resources. 31% of airports have established non-contractual arrangements with start-up or innovation partners, suggesting a more flexible and informal approach to collaboration.

These figures are very similar to those seen in 2022. Where we have seen significant growth is in investment by airports into start-ups/partners. Last year, only 18% had done this, whereas in 2023, 43% of airports have done so – and a further 18% plan to do so by 2026. This collaborative approach allows them to tap into new technologies and agile business models that could be challenging to develop internally.

By nurturing external innovation, airports can accelerate product development, enter new markets, and stay ahead in a rapidly evolving industry landscape. Additionally, these investments and partnerships often serve as a means to diversify their portfolios, mitigate risks, and enhance overall market resilience.



CO-INNOVATION TECHNOLOGIES



% OF AIRPORTS WITH IMPLEMENTED OR PLANNED CO-INNOVATION TECHNOLOGIES

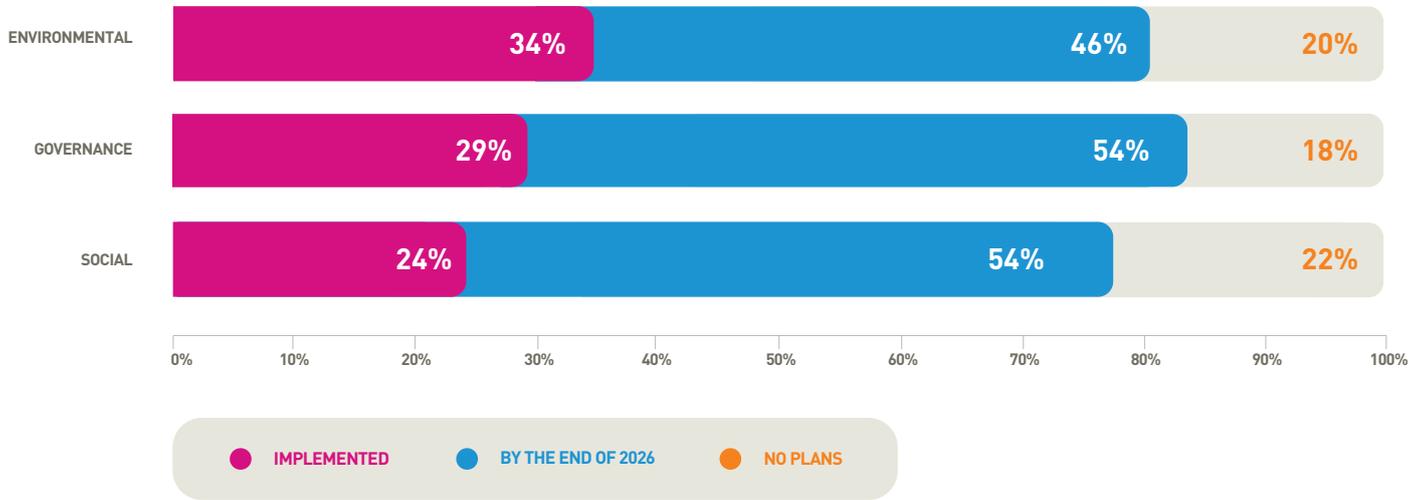
CO-INNOVATION TECHNOLOGIES PRIORITIZED BY AIRPORTS

In terms of where airports are looking to partner with start-ups in 2023, the most common two initiatives are artificial intelligence and business intelligence (45% and 43% of airports respectively).

Both areas are even higher in priority for partnership than they were last year, increasing by 17% and 19% respectively, which confirms the real interest in these technologies to help airports achieve their business and operational objectives.



SUSTAINABILITY ACROSS ESG



% OF AIRPORTS WITH IMPLEMENTED OR PLANNED SUSTAINABILITY INITIATIVES ACROSS THE ESG FRAMEWORK

AIRPORTS' SUSTAINABILITY PLANS ACROSS THE ESG FRAMEWORK

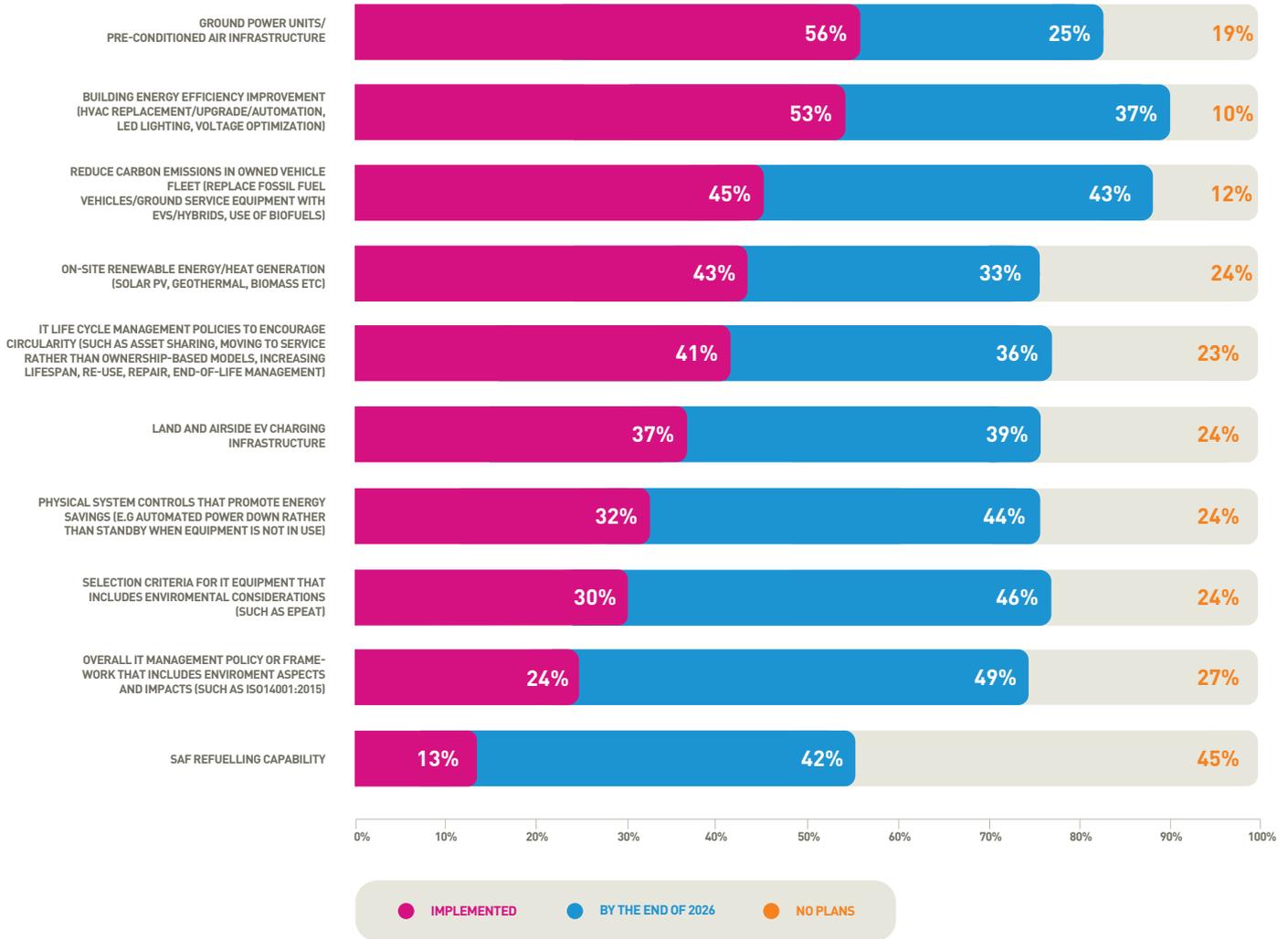
As the implementation of ESG-related IT solutions in the aviation industry has been a widely discussed topic, it's encouraging to see that a considerable number of airports are making progress in this direction. About one-third have already embraced Environmental solutions, while roughly one-quarter have adopted Governance and Social

solutions. The vast majority of airports are actively planning for the future, with approximately 80% anticipating initiatives in each of these areas by 2026.

Breaking it down by region, less than 10% of European airports do not have any plans to implement IT solutions to enable ESG programs. In China, this rises to half.



ENVIRONMENTAL SUSTAINABILITY INITIATIVES



% OF AIRPORTS WITH IMPLEMENTED OR PLANNED SUSTAINABILITY INITIATIVES

AIRPORTS' ENVIRONMENTAL SUSTAINABILITY INITIATIVES

When it comes to environmental sustainability initiatives, airports gravitate most toward those improving operational efficiency and saving costs long term, making day-to-day business operations more sustainable. Improving building energy efficiency and the use of ground power units are key for over 50% of airports in 2023.

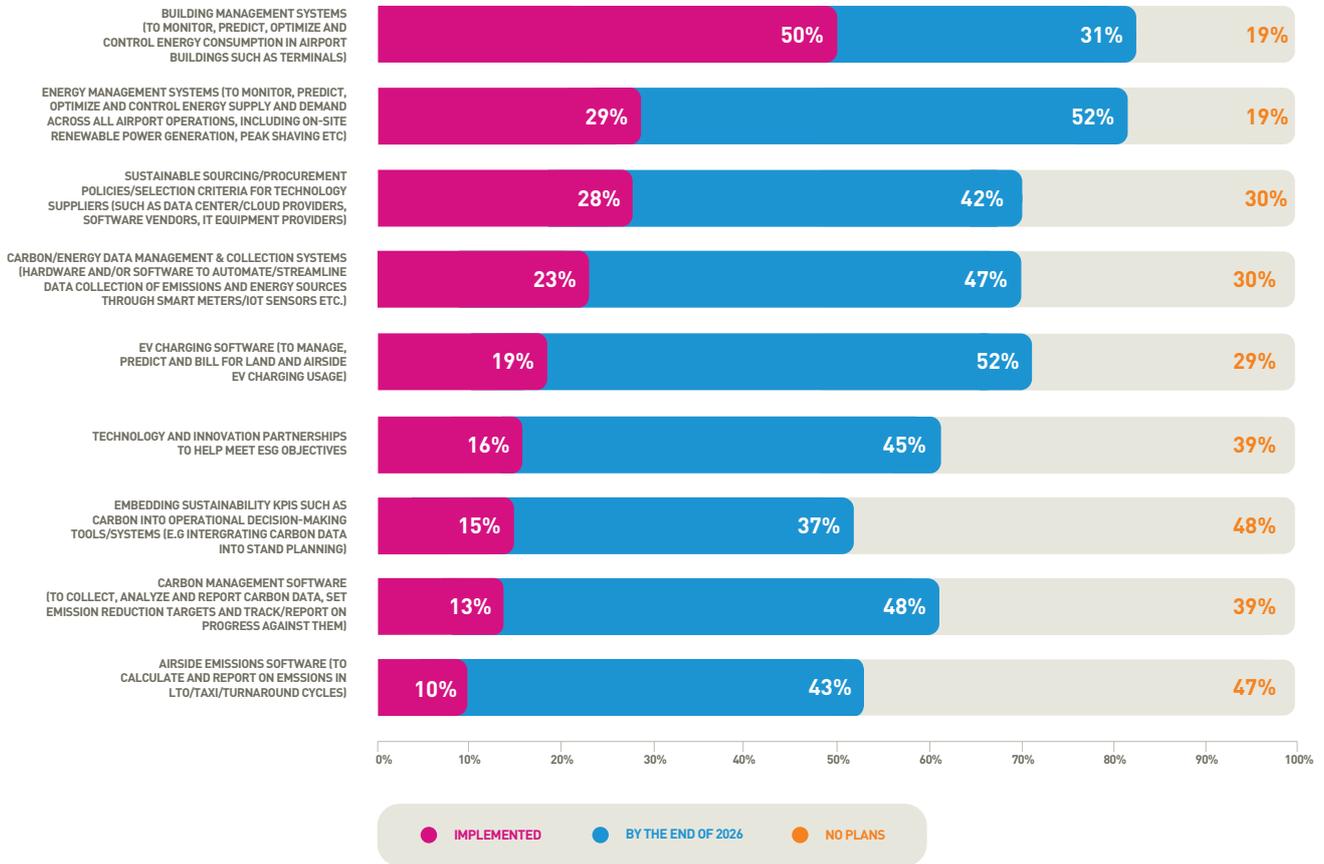
The next wave of investment by 2026 highlights several areas related to the governance and processes of sustainability. Three-quarters of airports expect to have in place by 2026 selection criteria for IT equipment that includes environmental considerations and an overall IT management policy or framework that includes environmental aspects.

Sustainable aviation fuel (SAF) refuelling is an additional area with much potential growth for the future.

Only 13% of airports have currently implemented this, but 42% plan to do so in the coming three years, and this might increase further as further industry emissions regulations come into place. At a regional level, while the Americas region's airports are currently at 0% implementation of SAF refuelling, a full 49% intend to adopt this by 2026.



“GREENING-BY” TECHNOLOGY SUSTAINABILITY INITIATIVES



% OF AIRPORTS WITH IMPLEMENTED OR PLANNED “GREENING-BY” TECHNOLOGIES

GREENING-BY TECHNOLOGIES PLANS FOR AIRPORTS

The technologies airports are prioritizing to help them meet sustainability targets are focused on energy efficiency and carbon emissions reduction. Airports appear to be in the early stages of ‘greening’ through technology. Half of airports have adopted building management systems to monitor, predict, and optimize energy consumption across their buildings, valuing technologies that provide broad and unified visibility on operations, also enabling real-time measurement against specific KPIs.

Energy management systems give even further insight into energy supply and demand across all airport operations, including on-site renewable power generation. Investment in such systems is expected to grow the most of any initiative over the coming years, with only 29% implementation so far, but over half of airports planning this by 2026.

Carbon management software is also expected to become more widespread in the next three years, with 48% of airports planning implementation.

This means that roughly one in two airports are planning to implement energy management, carbon management, or carbon/energy management software solutions in the next 3 years.

Additionally, as many as 71% of airports could have electric vehicle charging software in place by 2026, up from 19% current adoption.

**Greening by IT refers to using IT and data solutions to help airports achieve sustainability objectives in all areas (i.e. environmental, social, economic, and governance).*

METHODOLOGY

2023 AIR TRANSPORT IT INSIGHTS

AIRLINE

SURVEY

SITA's Airline IT Trends Survey is well established as the global benchmarking survey for the airline industry.

The survey was first produced in 1999 and was designed to offer all air transport industry stakeholders the latest facts, figures, and trends related to technology adoption and spending. Comparisons to previous surveys are made where appropriate, although the respondent sample may vary between years.

During August–November 2023, questionnaires were sent to senior IT executives in each of the top 292 passenger carriers, including low-cost operators, together with carriers representing important players in the regional and leisure sectors.

The survey represents the views and insights of carriers representing 29% of global passenger traffic (based on the 2022 IATA WATS passenger traffic), providing a clear insight into IT strategic thinking and developments for the industry. This year's survey also explores the transformational impacts of the pandemic and post-pandemic recovery period on the air transport industry.

WEIGHTING

A weighting system is applied, based on annual passenger traffic statistics, to ensure that the results are a representative sample in relation to global passenger traffic and to compensate for annual fluctuations in the respondent group.

RESEARCH

Independent market research agency Savanta was commissioned to undertake the research on behalf of SITA. The research was conducted in strict confidentiality and the results are presented in an aggregated form. All source data remains confidential, and the results of individual returns are not disclosed to the research stakeholders.

AIRPORT

SURVEY

The 20th annual Airport IT Trends Survey continues to be the most extensive study of IT trends within the global airport industry. The study took place during August – October 2023 and a total of 383 of world's airports were invited to participate.

This year's survey results came from respondents who collectively represent the views of 153 airports. The airports participating in this year's research represent 21% of global traffic (source: 2022 Airports Council International passenger traffic data).

WEIGHTING

A weighting system is applied, based on ACI annual passenger traffic statistics, to ensure that the results are a representative sample in relation to global passenger traffic and to compensate for annual fluctuations in the respondent group.

RESEARCH

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SITA AT A GLANCE

Easy and safe travel every step of the way.

- Through information and communications technology, we help to make the end-to-end journey easier and safer for passengers – from pre-travel, check-in and baggage processing, to boarding, border control and inflight connectivity.
- We work with over 400 air transport industry members and 2,500 customers in over 200 countries and territories. Almost every airline and airport in the world does business with SITA, and nearly every passenger trip relies on SITA technology.
- Our customers include airlines, airports, ground handlers, aircraft, air navigation service providers, and governments.
- Our solutions drive operational efficiencies at more than 1,000 airports, while delivering the promise of the connected aircraft to customers of 17,700 aircraft globally.
- We help more than 70 governments to strike the balance between secure borders and seamless travel.
- Created and owned 100% by air transport, SITA is the community's dedicated partner for IT and communications, uniquely able to respond to community needs and issues.
- We innovate and develop collaboratively with our air transport customers, industry bodies and partners. Our portfolio and strategic direction are driven by the community, through the SITA Board and Council, comprising air transport industry members the world over.
- We provide services over the world's most extensive communications network. It's the vital asset that keeps the global air transport industry connected in every corner of the globe and bridges 45% of the air transport community's data exchange.
- With a customer service team of over 1,700 people around the world, we invest significantly in achieving best-in-class customer service, providing 24/7 integrated local and global support for our services.
- In 2023, the Science Based Targets initiative (SBTi) approved our near-term and long-term emission reduction targets. These science-based targets are pivotal in guiding our climate actions to curtail greenhouse gas emissions effectively.
- We are also developing solutions to help the aviation industry meet its carbon reduction objectives, including reduced fuel burn and greater operational efficiencies.
- Our annual Air Transport and Passenger IT Insights reports for airlines, airports and passengers are industry-renowned, as is our Baggage IT Insights report.



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