# TIACA E-commerce White Paper

## Opportunities & Challenges

**Today is hard, tomorrow will be worse, but the day after tomorrow will be sunshine.**

Jack Ma Founder of Alibaba

**Communication is at the heart of e-commerce and community.**

Meg Whitman, former CEO eBay

**Products can be easily copied, but a supply chain can provide a true competitive advantage.**

Professor Dr. Yossi Sheffi, MIT

# Foreword

## Steven Polmans, TIACA CHAIR

At the close of 2024, e-commerce accounted for approximately 20% of air cargo volumes worldwide, with projections that those volumes could double within the following decade.

Various business models have been employed to handle, process, transport, clear and deliver this high volume of shipments. However, as the growth happened over a rapid period, accelerated by COVID-induced changes in consumer behaviours, many deviations to processes emerged.

E-commerce shipments are not governed by industry standards in terms of processing or handling and there are no international regulations that cover handling for this specific commodity, although e-commerce shipments must comply with safety and security regulations.

In addition to a lack of industry standards, deviations in government regulations, deviations in standard operating procedures and deviations in customer expectations all contributed to a complex and challenging business environment.

In response to the need for industry harmonization and addressing the unanswered questions, TIACA established a multi-sector Task Force comprised of industry leaders covering the following areas:

- Airlines
- Ground Handlers
- Freight Forwarders
- Airports
- Technology providers
- Industry analysts

TIACA wishes to thank the experts who contributed their time and expertise in compiling this white paper and to the two Task Force Co-Chairs, Nikolai Schaffner, Swissport, and Carl Kent, Independent Technology Consultant.

**Thank you on behalf of the TIACA Board.**

# Task Force Members

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The Board also expresses appreciation to market intelligence and special data contributors;

WORLD ACD rotate AEVEAN

# White Paper Objectives

Nikolai Schaffner, Swissport
Carl Kent, Independent Technology Consultant

This white paper seeks to address many of the unanswered questions regarding e-commerce within the context of the global air cargo industry. Gaining clarity on these outstanding issues will enable our industry to deliver the world class solutions that e-commerce customers and global consumers demand.

**Fundamental questions that require clarification include**:

- How do we address e-commerce shipping safety issues?
- Why isn't there a standard handling process?
- Why aren't there defined data standards?
- Can a single process map work across the industry?
- How do we educate customs agencies about the need for expedited and efficient border processes?
- How do we integrate final-mile delivery solutions?
- Why aren't there industry guidelines?
- Would an industry standard special handling code help deliver safer and more efficient solutions?
- How important is innovation and advanced tech to the future of e-commerce in air cargo?
- What role does reverse logistics play?
- How do we identify and promote industry best practices?
- Is airport infrastructure sufficient to cater to projected e-commerce growth in the coming years?
- Are regulatory frameworks aligned to industry needs?
- Are waste management and sustainability concerns a factor impacting sector growth?

This White Paper offers a global perspective in terms of e-commerce opportunities; challenges and we provide recommended policy and action-based responses.
Future White Papers would concentrate on regional specificities and highlighting specific growth opportunities with targeted actions.

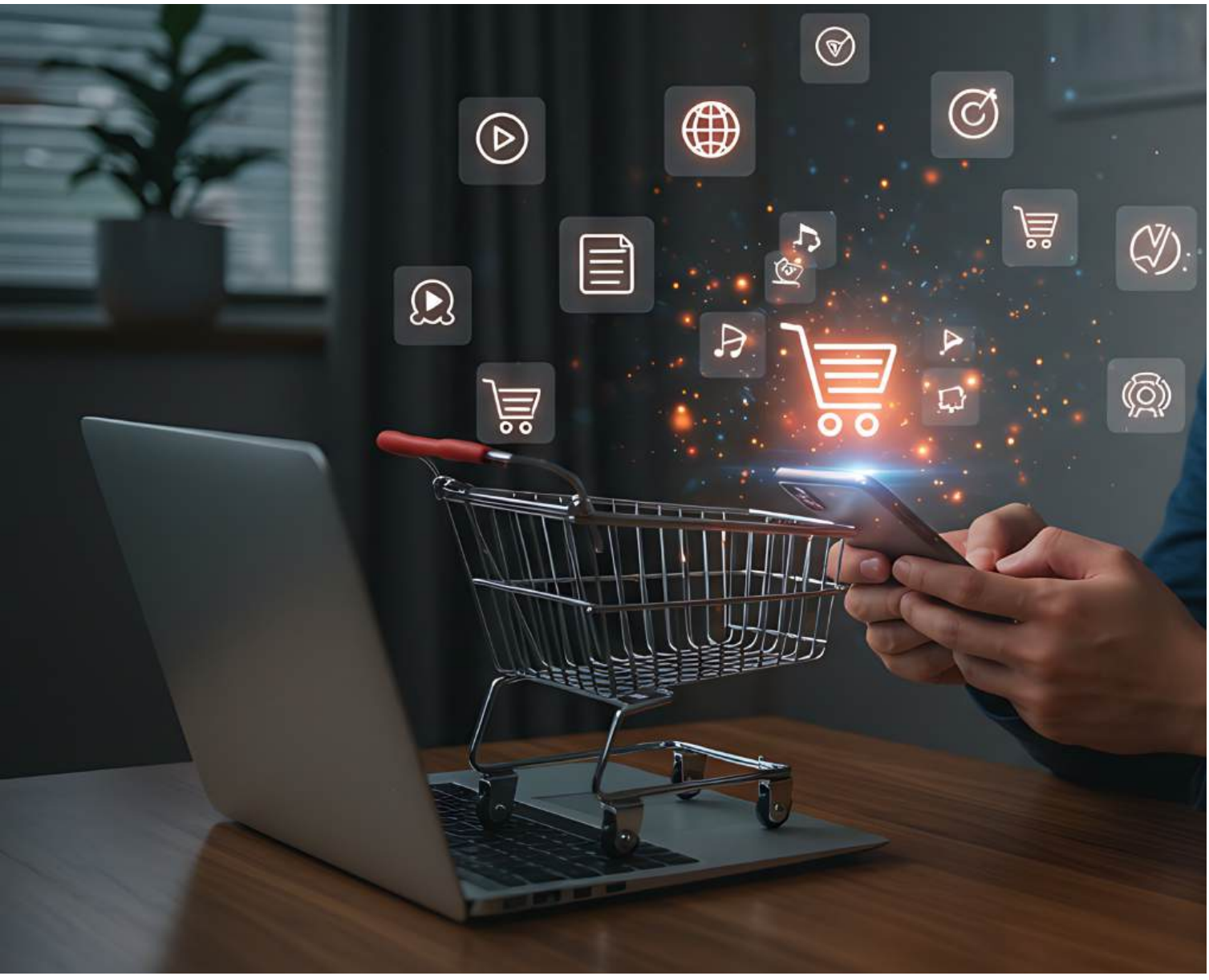
We hope readers find this report useful and we welcome any feedback, sent to the TIACA team at secretariat@tiaca.org.

# White Paper Contents

This white paper has identified numerous distinct areas to address and has dedicated one full chapter to each area.

Chapter 01

# E-commerce
# Market Outlook



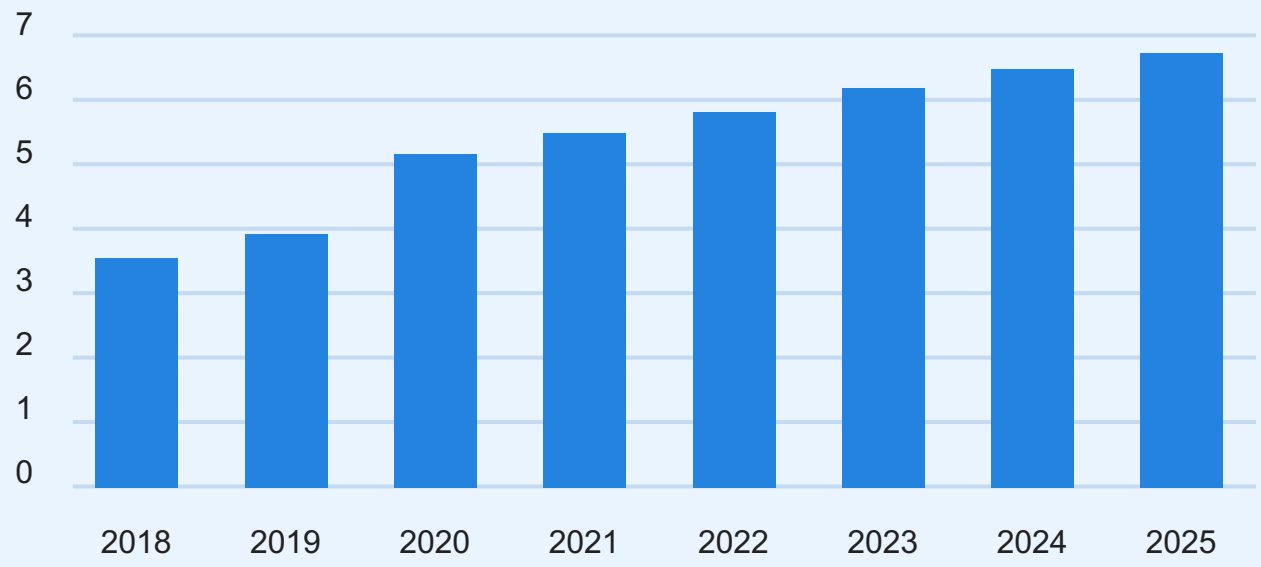
Air cargo accounts for approximately 35% of global trade value annually, worth an estimated USD 9.0 trillion dollars. In volume terms, this equates to more than 64 million metric tonnes.

E-commerce volumes have grown steadily over the last five years, and industry estimates indicate that it now accounts for over 12 million metric tonnes.

**Chart 1:**

## Growth of eCommerce

**Figure 1.1: Global Retail E-commerce Sales**
(%GDP)

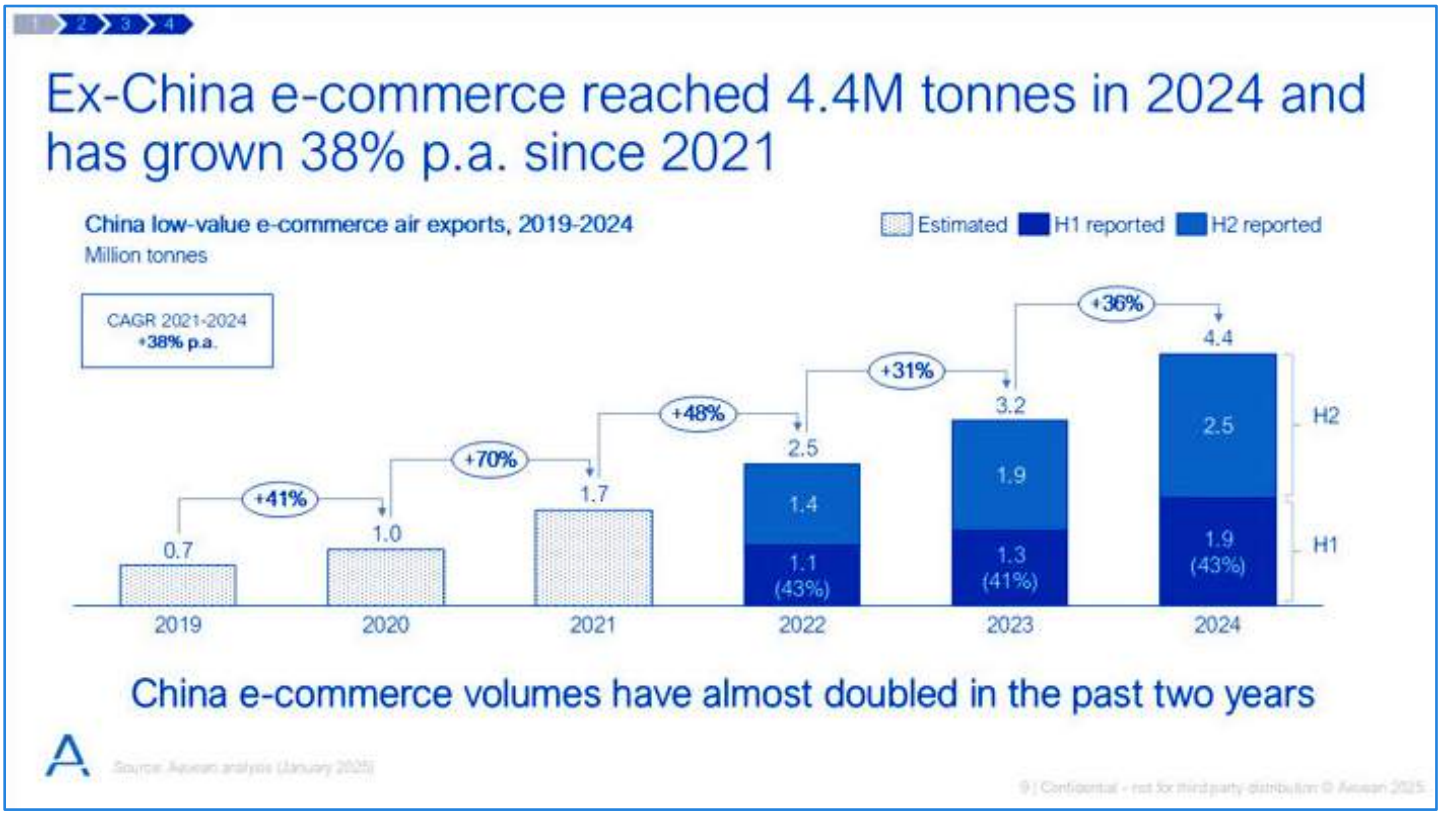



GDP = gross domestic product

Source: ADB calculations using data from Statista. Key Figures of E-Commerce. https://www.statista.com/statistics/379046/worldwide-retail-e-commerce-sales/; and International Monetary Fund. World Economic Outlook Database. https://www.imf.org/en/ Publications/WEO/weo-database/2021/October (both accessed 1 June 2022).

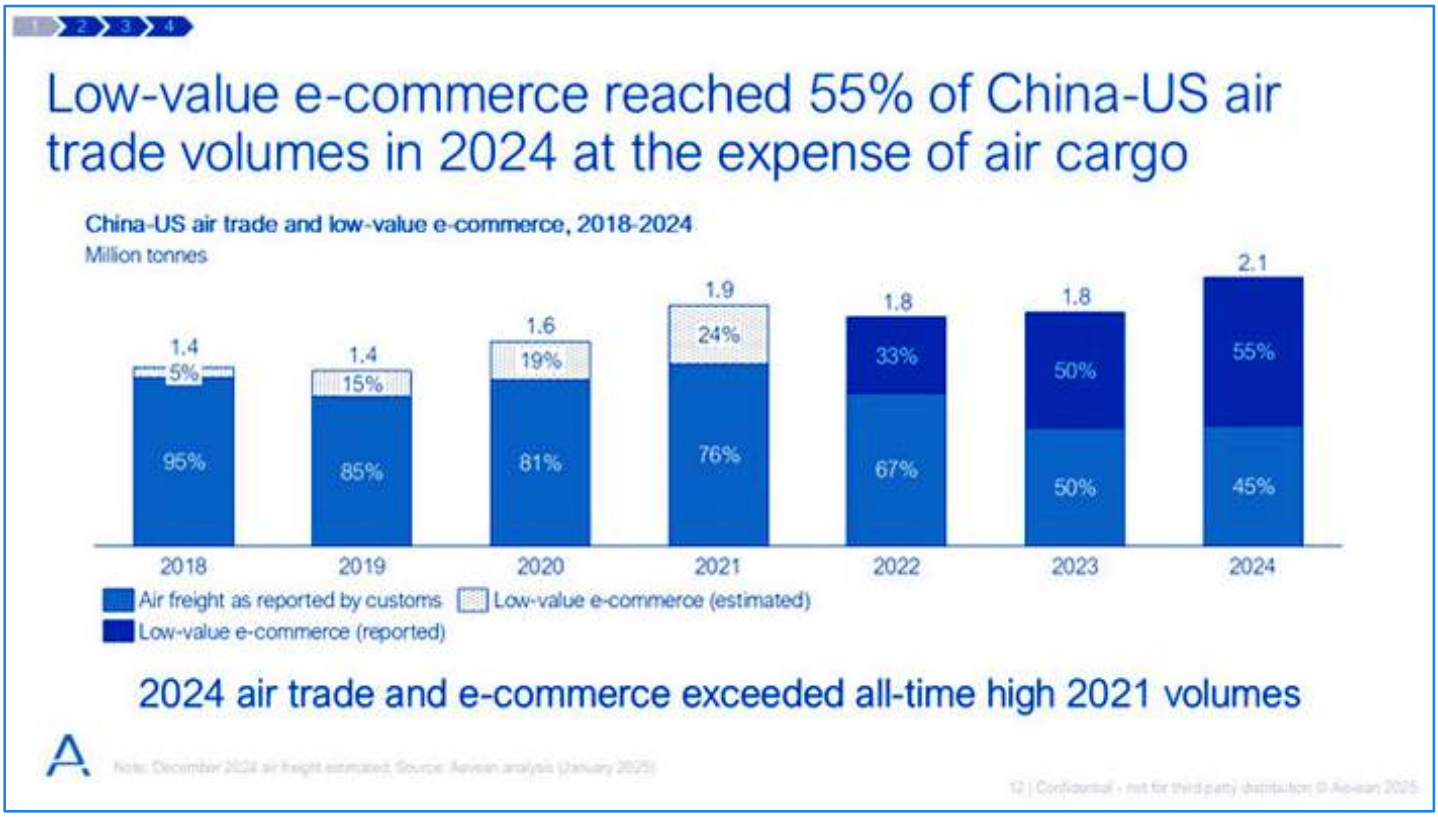
Changes in consumer behavior have shifted from traditional retail “brick and mortar” to online marketplaces, C2C platforms and direct sales channels. Social media based retail activity, via Instagram, Facebook and the growing TikTok shop amongst others are accelerating this evolution as retail is now available 24 hours a day and accessible via smart phone technology. Global payment systems support this “shop anywhere anytime” mindset.

**Chart 2:**



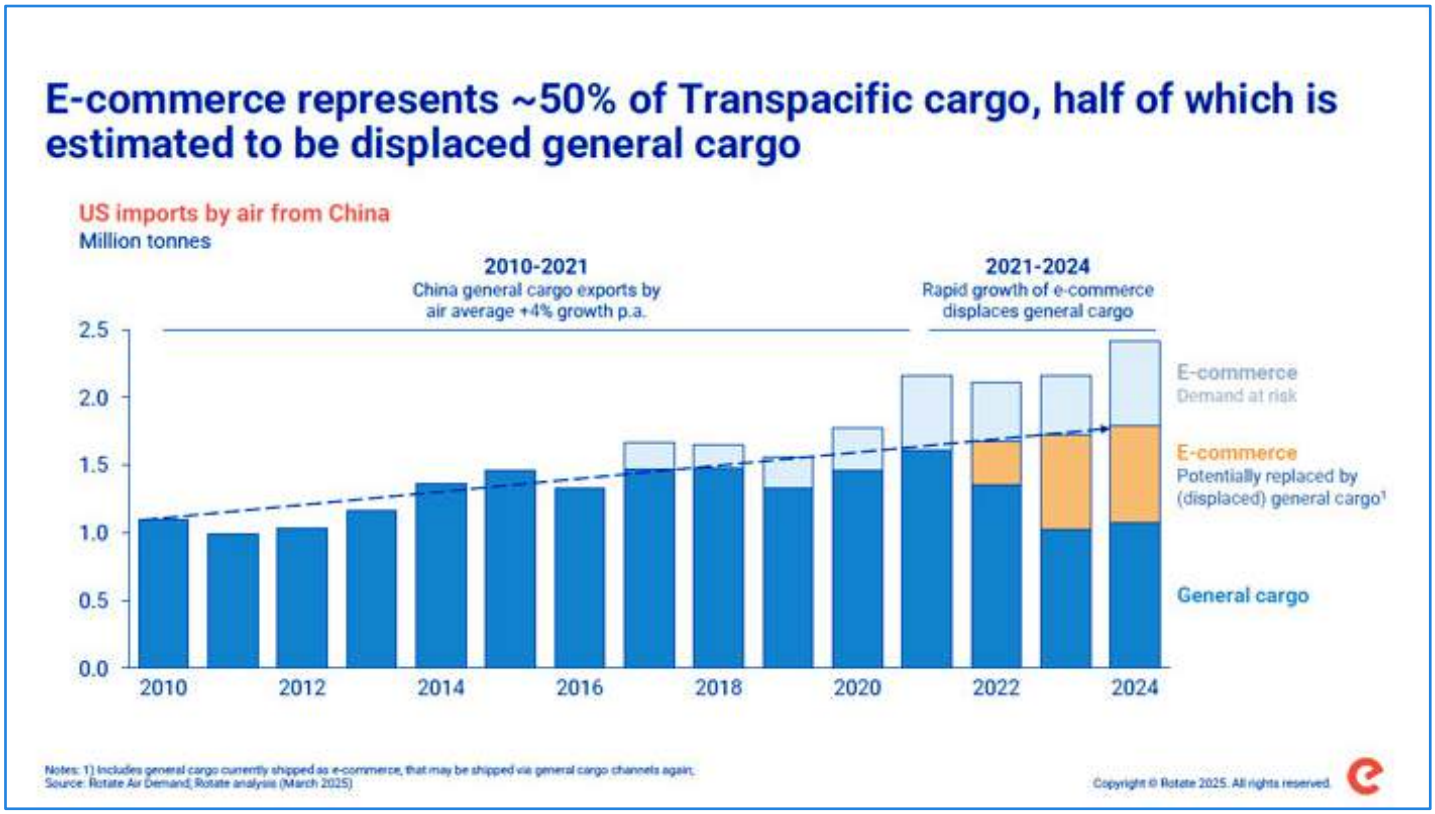

Ex-China e-commerce reached 4.4M tonnes in 2024 and has grown 38% per annum since 2021. China e-commerce volumes have almost doubled in the past two years.

**Chart 3:**




Low-value e-commerce reached 55% of China-US air trade volumes in 2024 at the expense of air cargo. 2024 air trade and e-commerce exceeded all-time high 2021 volumes.

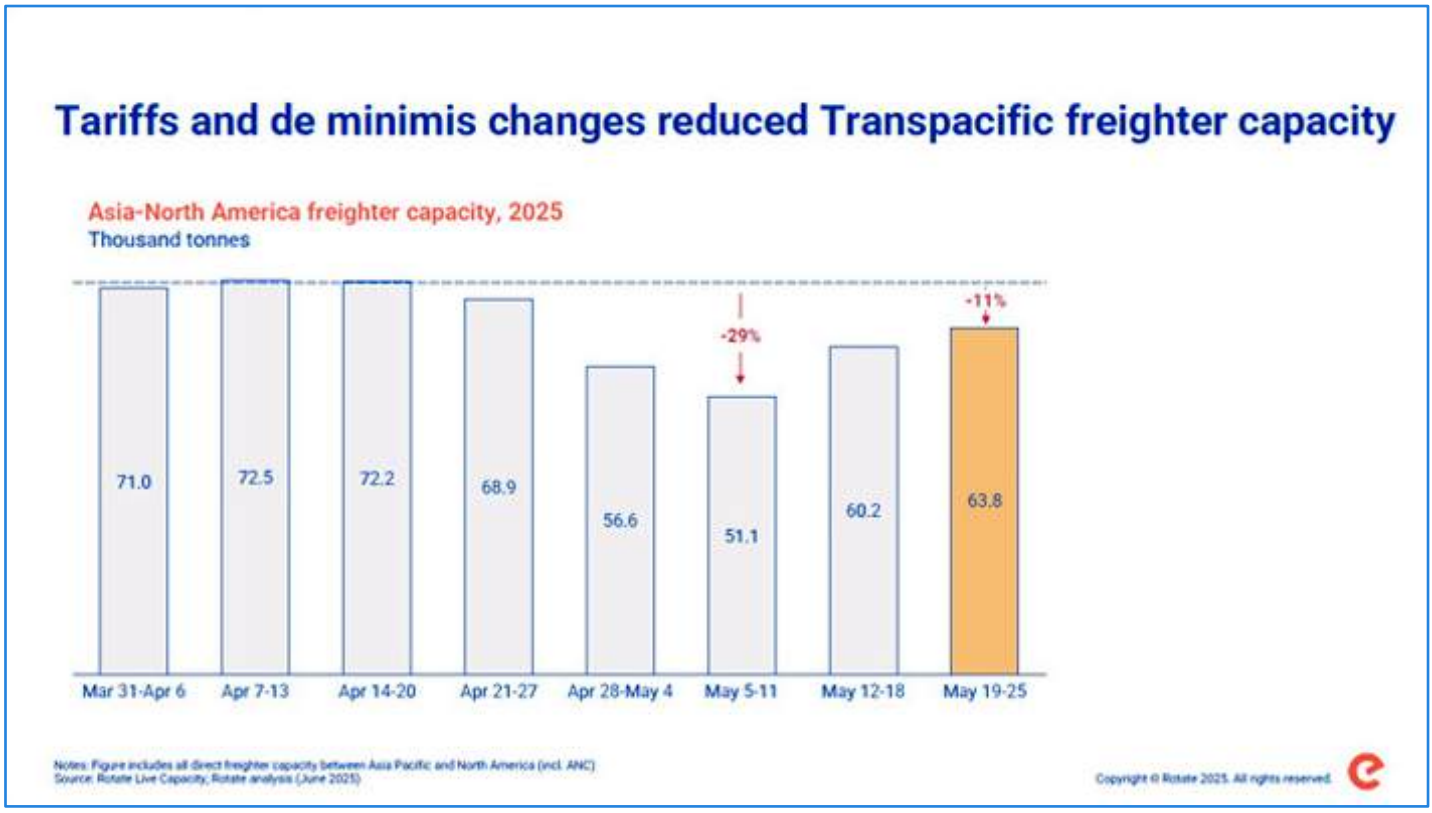
**Chart 4:**




The transpacific is one of the most important trade lanes for air cargo. In recent years, the trade lane has seen a major shift in demand carried with e-commerce demand significantly increasing since 2021.

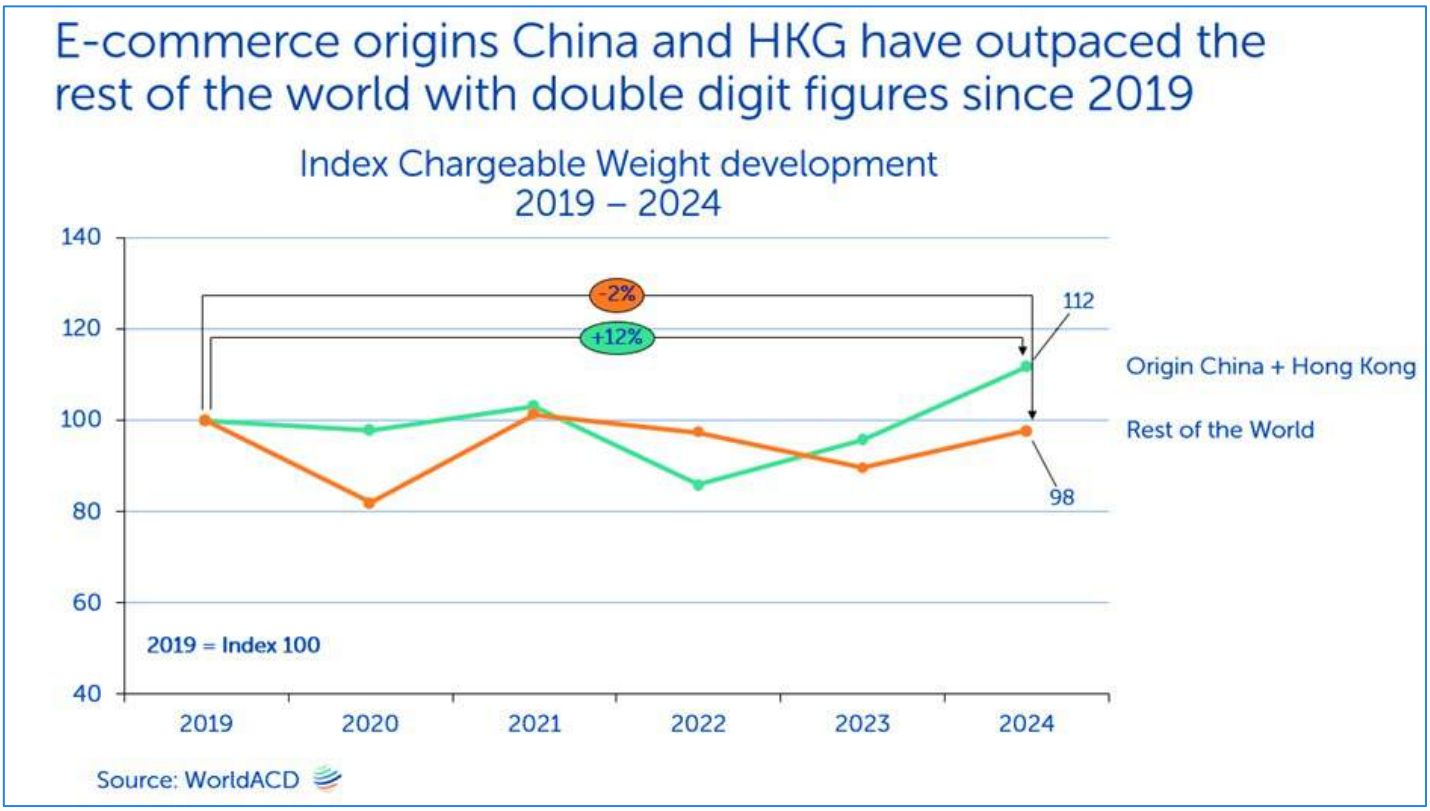
In 2024, it is estimated that ~50% of transpacific air cargo demand consisted of e-commerce (see chart above). This e-commerce demand has in part displaced general cargo (or contains general cargo shipped under de minimis rules), therefore in reality around ~25% of China-US demand may be at risk with changes to de minimis rules.

**Chart 5:**




When rules that exempted de minimis imports from duties were ended on May 2nd, 2025, that made the e-commerce business model used by major platforms such as TEMU and Shein unsustainable. Unsurprisingly then, capacity on the lane fell by ~30% (in line with the estimates above) illustrating the reliance on e-commerce and the link to freighter capacity.

**Chart 6:**




The e-commerce origins China mainland and Honk Kong have grown substantially since 2019, with volumes in 2024 at index 112 versus index 100 in 2019, while the rest of the world is just reaching pre-Covid levels.

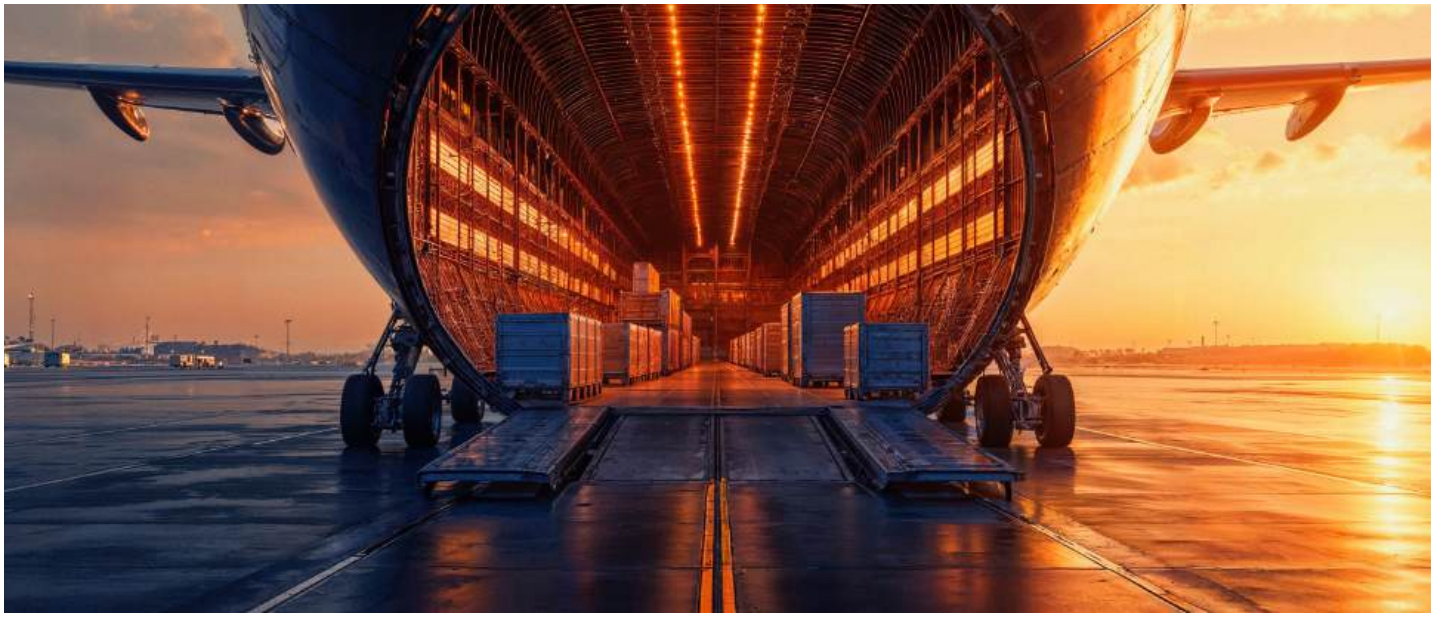
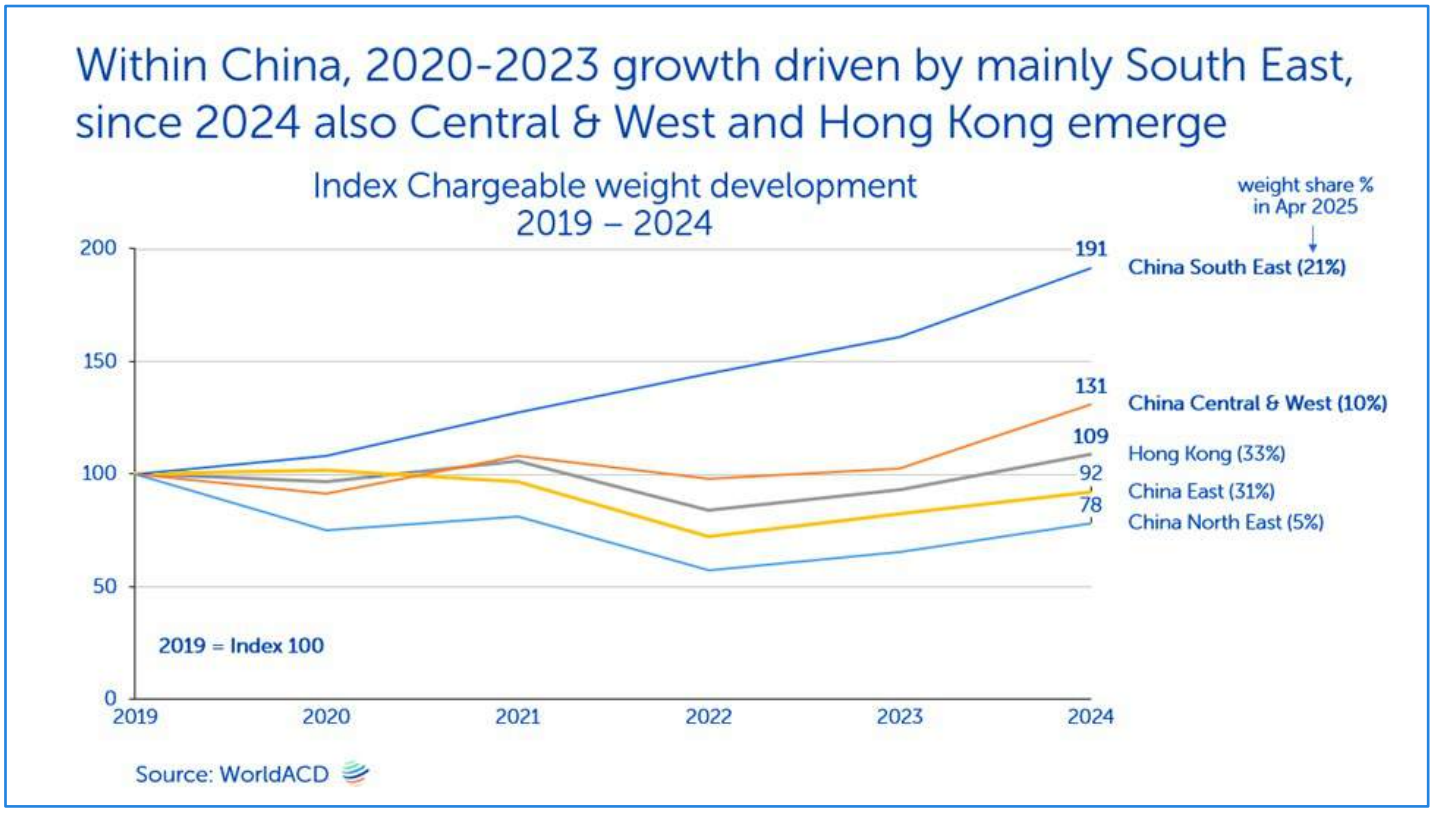


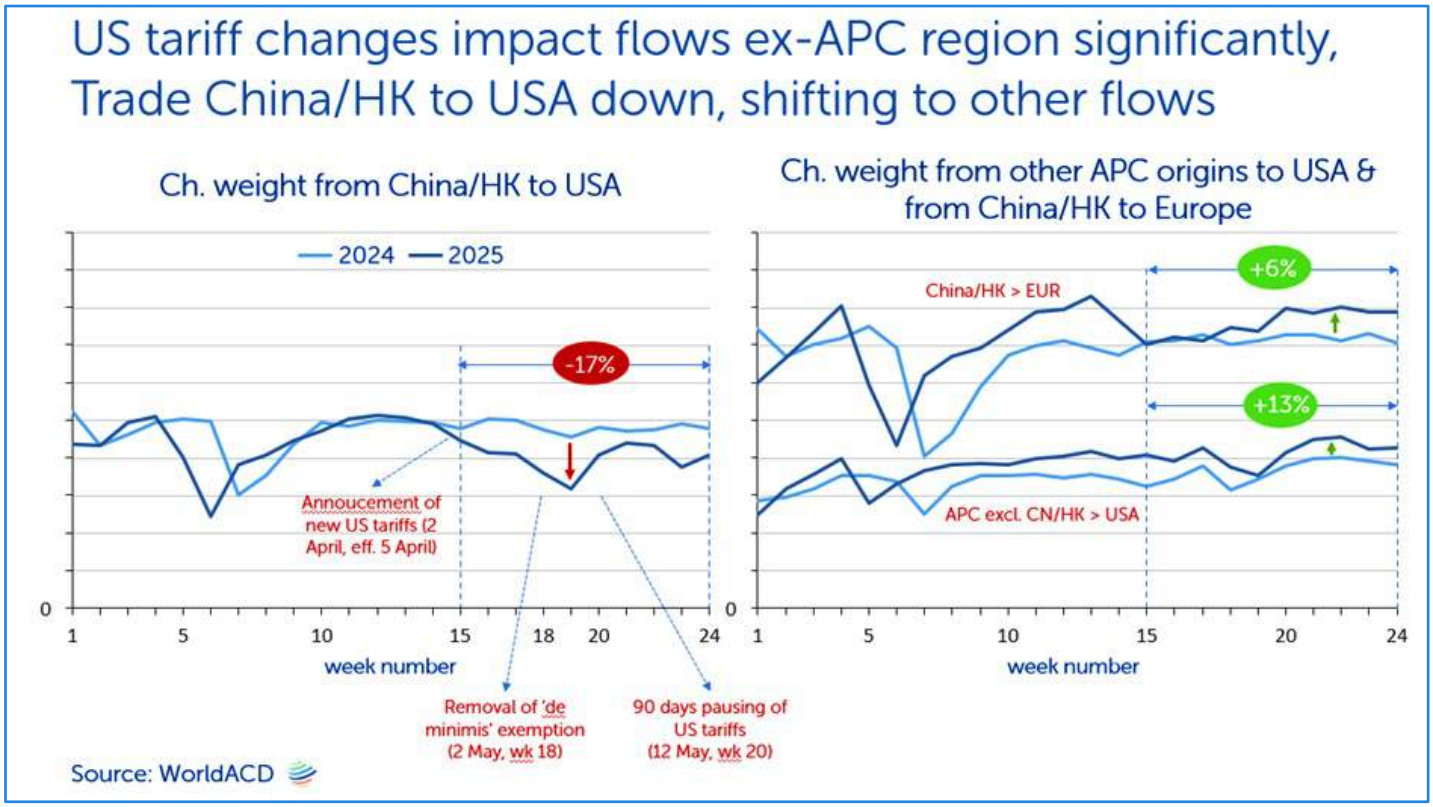
**Chart 7:**




Zooming in on the different origin regions within China, the main area driving this growth are China South East (Guangzhou, Shenzhen, Xiamen) at almost double its size of 2019, and in 2024 volumes from the area China Central & West (Zhengzhou, Ezhou, Chongqing, Chengdu) increased in one year by almost 1/3rd compared with 2019.

Hong Kong, the largest origin area within China grew also substantially in 2024, to +9% versus 2019.

**Chart 8:**




More recently, with the US tariff changes since the beginning of April and the removal of the 'de minimis' exemption since the start of May, a strong impact is observed on the e-commerce origins China/HK to the USA.

Also, we see that volumes are recovering more quickly from other origins in the Asia Pacific region to the USA and from Asia Pacific overall to Europe, suggesting a (partial) shift of (e-commerce) trade flows from China/HK to other markets.

**Chart 9:**


Projected growth across major e-commerce markets is remarkably consistent and illustrative of global changes in consumer behavior.

**Chart 10:**


The Products Growing Online Sales Fastest
Estimated share of e-commerce sales in selected product categories and increase over time (in percent)
2023
2027
Increase
Consumer electronics
44
+44%
DIY & Hardware
38
+31%
Furniture
35
+22%
Apparel
34
+29%
Household appliances
34
+36%
Accessories
29
+22%
Beauty & personal care
22
+24%
Luxury goods
18
+31%
Food
6
+43%
0
10
20
30
40
50
As of August 2023
Source: Statista Market Insights
statista

Chapter 02

# Safety Across the Supply Chain

Safety and security remain the air cargo industry's top priority, so it bears noting that the rapid growth of e-commerce has brought additional safety and security concerns, particularly with the low barrier to entry for global shippers and the proliferation of C2C and B2C environments.

## Key Industry Challenges

1. How can air cargo operators effectively screen and handle the high volume of small, individual e-commerce shipments to prevent safety risks?
2. What measures are needed to detect and regulate the transport of hazardous materials, such as undeclared lithium batteries?
3. How can air cargo security protocols adapt to prevent smuggling, counterfeiting and illicit shipments in e-commerce logistics?
4. What cybersecurity protections are necessary to safeguard digital cargo tracking, documentation, and customs processing systems?
5. How can international regulatory frameworks be harmonized to ensure consistent safety enforcement across global e-commerce supply chains?

## Main Changes in Air Cargo Safety

The rapid growth of e-commerce, projected to reach $8 trillion in global sales by 2027, has reshaped air cargo safety in three key ways:

1. Surge in Shipment Volume & Complexity, with small, high-frequency shipments complicating screening, labelling and compliance enforcement.
2. Hazardous Materials Risks – Lithium battery shipments, growing 30% annually, account for a significant portion of air cargo fire risks. In recent years, more than 50% of reported air cargo fire incidents involved lithium battery-related shipments.
3. Security & Cyber Threats – Smugglers exploit fragmented e-commerce logistics to ship counterfeit or illegal goods, while cyberattacks on air cargo tracking systems have risen by 15% annually, increasing risks of shipment fraud and data breaches.

## Consequential Risks

**E-commerce safety risks pose significant challenges to airlines, regulators, and logistics providers**:

- Lithium Battery Fires – Fire incidents involving undeclared lithium batteries threaten aircraft safety.
- Regulatory & Compliance Challenges – The lack of uniform global regulations increases compliance burdens for air cargo operators, leading to fines, delays, and operational inefficiencies.
- Cybersecurity & Fraud Risks – The digitization of air cargo logistics makes airlines vulnerable to hacking, data manipulation and shipment fraud, potentially disrupting entire supply chains.
- Financial & Liability Risks – Non-compliance with ICAO and state and operator based Dangerous Goods Regulations can result in legal penalties, reputational damage and financial losses for airlines and freight forwarders.

## Policy Recommendations

- Enhanced Lithium Battery Regulations – Require real-time tracking, fire-resistant packaging, and pre-shipment verification for lithium battery shipments
- Increase pressure on multi-state task forces to combat illegal, non-compliant production of lithium batteries
- AI-Powered Cargo Screening – Mandate the adoption of machine-learning-based scanning technologies to detect undeclared hazardous goods
- Global Regulatory Harmonization – Strengthen ICAO, IATA, and national aviation safety frameworks to ensure uniform compliance for e-commerce shipments
- Encourage the Universal Postal Union (UPU) to enhance training and awareness of counter staff to identify and detect potential hazardous cargo at point of entry into the supply chain
- Cybersecurity Standards for Air Cargo – Implement mandatory encryption, intrusion detection and security audits for digital cargo tracking systems
- Urge state authorities to support expanded use of canine screening programs to detect undeclared lithium battery shipments
- Stronger Shipper Accountability – Introduce strict compliance verification requirements and penalties for e-commerce retailers shipping via air cargo

Chapter 03

# Efficient and Effective Customs and Border Management

Border management has a critical role to play in protecting states from illegal and unapproved items crossing their borders. It ensures consumer safety and proper collection of any tariffs, taxes and duties that may be applicable to the importation of goods.

Effective border management should use risk-based methodologies, based on a multi -tiered approach and work closely with industry to effect policies and procedures that facilitate trade while protecting the border.

E-commerce supply chains have some distinct differences to traditional trade flows, as illustrated below, with new entrants, aggregators, and reliance on data integration.


## Key Industry Challenges

1. How can customs authorities effectively screen the high volume of small e-commerce shipments without causing delays?
2. What measures are needed to prevent fraud, undervaluation, and misclassification of goods in e-commerce air cargo?
3. How can customs agencies ensure compliance with import/export regulations across diverse international jurisdictions?
4. What role can automation, AI and blockchain play in improving customs compliance and enforcement in e-commerce logistics?
5. How can customs frameworks be harmonized globally to streamline e-commerce-related trade while maintaining security and tax compliance?

## Main Changes in Customs Compliance

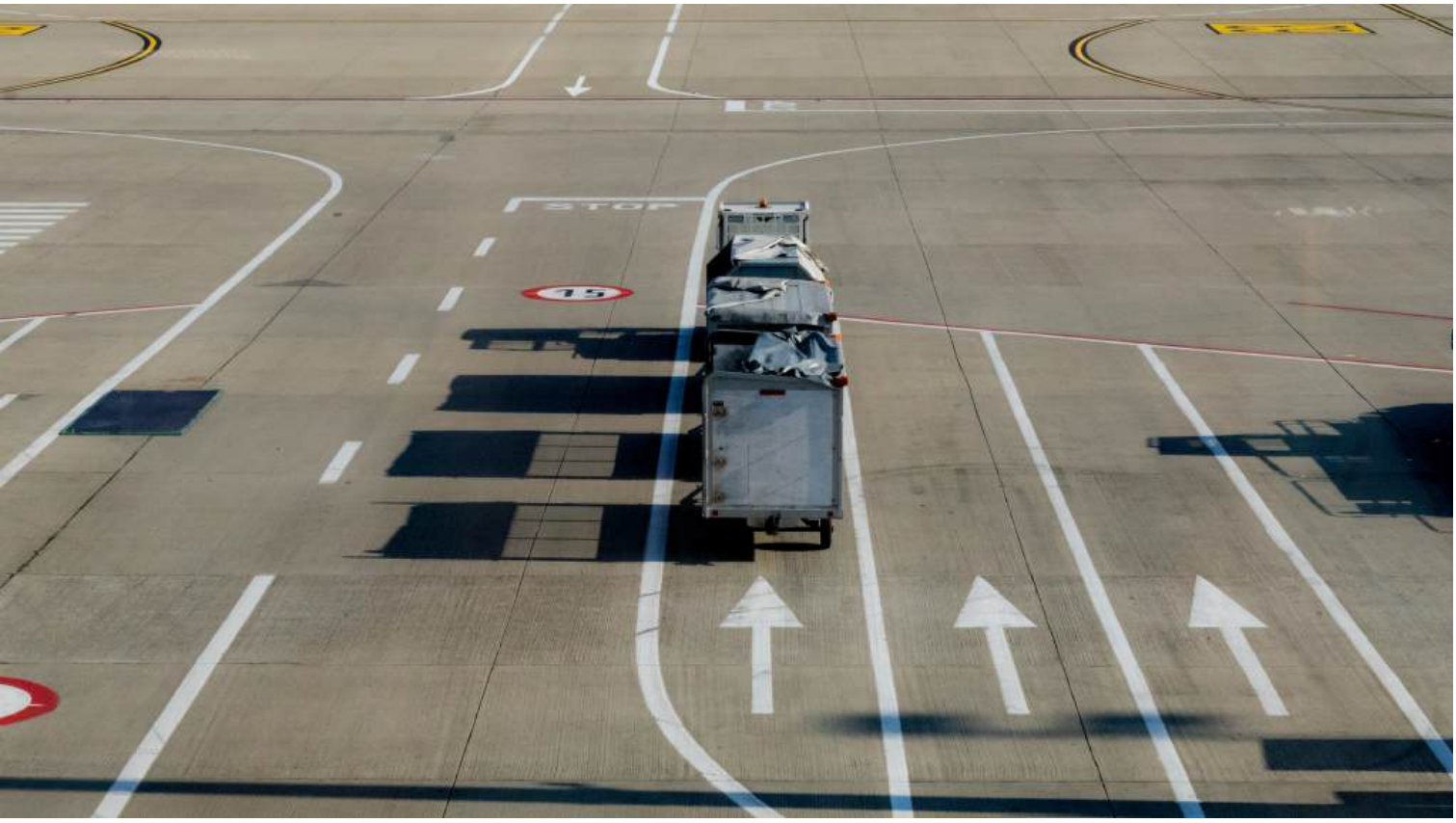
The exponential growth of e-commerce, projected to exceed $8 trillion in global sales by 2027, has reshaped customs compliance in air cargo, leading to three primary challenges:

1. Higher Shipment Volumes & Complexity – Traditional customs processes were designed for bulk shipments, not the millions of small parcels now entering air cargo networks daily. The World Customs Organization (WCO) reports that in some markets e-commerce shipments now make up 60-70% of total air cargo entries, although the application of de minimis limits in major markets exempts most low value items from the requirement to file. However, there are moves in certain markets to remove these exemptions which would dramatically increase the burden on customs clearance systems.
2. Increase in Fraud & Non-Compliance – Many e-commerce shipments involve mis-declared values, incorrect tariff classifications or avoidance of duties and taxes. The OECD estimates $500 billion in lost revenue globally due to undervaluation and fraudulent customs declarations in e-commerce.
3. Need for Digitalization & Automation – Traditional paper-based customs processes cannot handle the surge in e-commerce cargo. Many customs agencies are now adopting electronic declarations, AI-driven risk assessment and blockchain for data integrity, but implementation remains inconsistent.

## Consequential Risks

Customs compliance in e-commerce air cargo is a critical issue for governments, airlines, logistics providers and consumers.

- Revenue Loss & Trade Imbalances – Fraudulent declarations and undervaluation cause billions in lost tax revenue, impacting government budgets and fair market competition.
- Security & Counterfeit Goods – Weak customs enforcement enables the shipment of illicit
- goods, counterfeit, and restricted items, threatening public safety and intellectual property rights.
- Operational Delays & Costs – Inefficient customs clearance leads to air cargo bottlenecks, delaying shipments and increasing costs for logistics providers. IATA estimates customs delays add 24–48 hours to delivery times for improperly declared e-commerce goods.
- Regulatory Fragmentation – Differing customs policies across countries create compliance burdens for e-commerce platforms and freight forwarders, reducing supply chain efficiency.

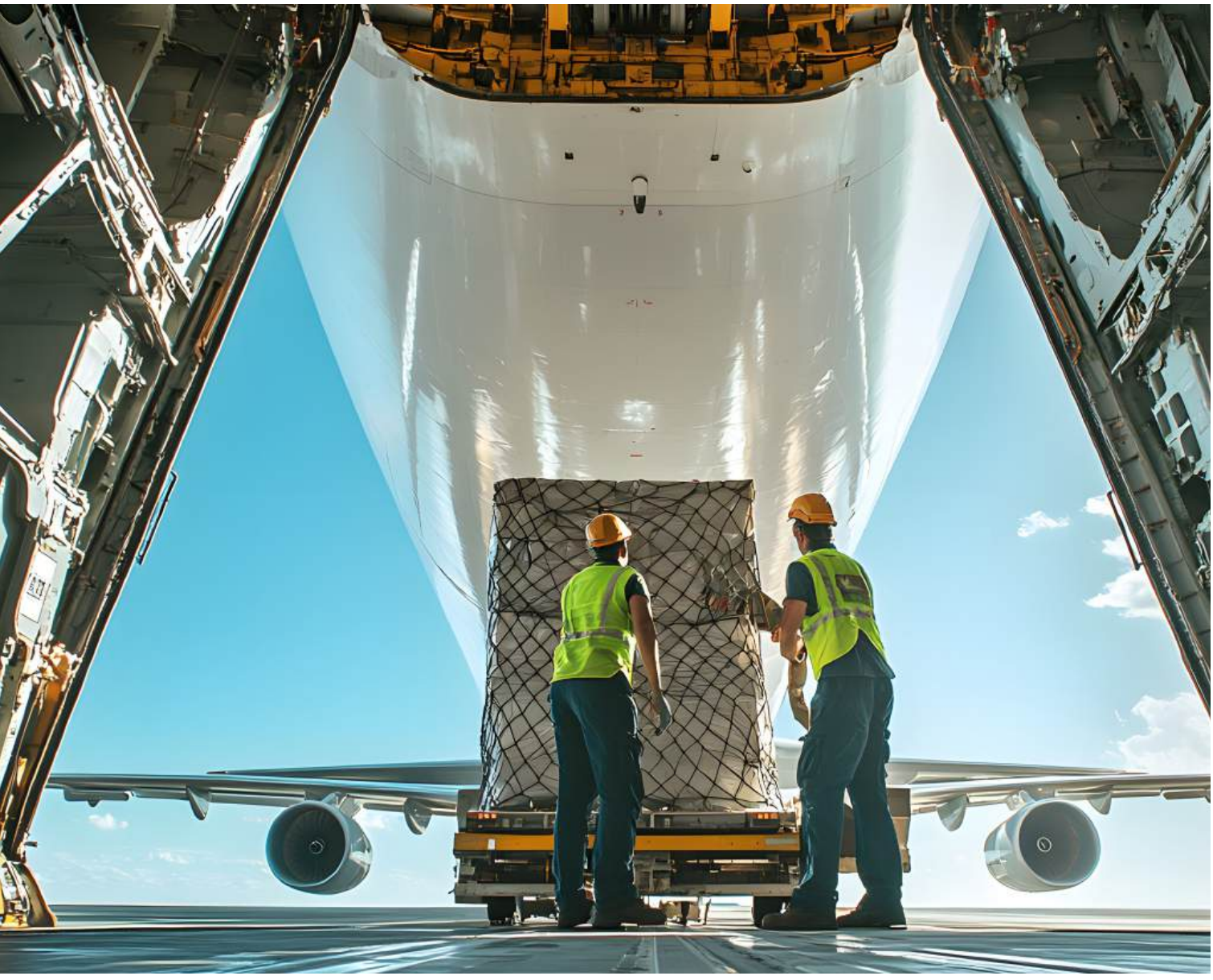



## Policy Recommendations

- Mandate Advanced Electronic Declarations – Require real-time electronic customs filings to speed up risk assessment and clearance, based on the WCO safe framework of standards to enhance global alignment and reporting consistency.
- Implement AI & Machine Learning for Fraud Detection – Deploy AI-driven risk analysis tools to identify undervaluation, misclassification, and fraud in customs filings.
- Standardize Global Customs Regulations – Harmonize WCO and national customs policies to create a unified framework for e-commerce trade compliance.
- Increase Penalties for Misdeclaration & Undervaluation – Enforce higher fines and stricter auditing for e-commerce retailers and shippers engaging in fraudulent customs practices.

Chapter 04

# Simplified and Aligned Processes



Air cargo is complex by nature as cargo is moved on behalf of millions of shippers across 193 countries, involving more than 20,000 connected points on the services of over 700 airlines with thousands of truckers, freight forwarders and ground handlers getting involved.

The compliance environment involves international and national regulations, trading bloc conditions and operator-specific instructions. For the industry to operate efficiently, we seek simplified and aligned processes wherever possible.

## Key Industry Challenges

1. How can air cargo processes be streamlined to accommodate the rapid growth of e-commerce?
2. What are the main challenges faced by air cargo logistics in handling e-commerce shipments?
3. How can technology be leveraged to improve efficiency and transparency in air cargo operations?
4. What role do regulatory frameworks play in facilitating or hindering the growth of e-commerce in air cargo?
5. How can stakeholders in the air cargo industry collaborate to create a more integrated e-commerce ecosystem?

## Main Changes to Industry Processes

The rise of e-commerce has necessitated several key changes in air cargo operations. Firstly, there is a need for standardized documentation and customs processes that expedite clearance times. Current practices often lead to delays, which are detrimental to e-commerce businesses that rely on quick delivery.

Secondly, the integration of advanced technologies, such as real-time tracking systems and automated sorting facilities, could significantly enhance operational efficiency.

Thirdly, collaboration among carriers, freight forwarders and customs authorities is crucial for creating aligned processes that improve the overall customer experience.

Lastly, adapting to fluctuating demand patterns, particularly during peak seasons, will require flexible capacity management strategies to ensure timely deliveries.

## Consequential Risks

The significance of simplifying and aligning air cargo processes cannot be understated, especially as e-commerce continues to expand globally. As online shopping becomes the norm, consumers expect faster shipping and greater reliability. Delays or inefficiencies in air cargo can lead to customer dissatisfaction, loss of business and diminished competitiveness for e-commerce retailers.

Furthermore, the air cargo industry plays a critical role in the global supply chain, and any disruptions can have far-reaching economic consequences. By facilitating smoother operations, stakeholders can enhance customer trust and improve profit margins, while contributing to the overall growth of the e-commerce sector.

## Policy Recommendations

- Standardization of Documentation: Implement universally accepted electronic documentation to streamline customs clearance
- Investment in Technology: Encourage investment in automation and data analytics for real-time tracking and inventory management
- Regulatory Collaboration: Foster partnerships between air cargo operators, customs authorities, and e-commerce businesses to align regulatory frameworks
- Capacity Management Protocols: Develop flexible capacity management strategies to adapt to seasonal fluctuations in demand
- Training and Development: Promote training initiatives for personnel in air cargo and logistics to enhance skills for handling e-commerce-related challenges

Chapter 05

# Harmonized Data
## Taxonomy / Nomenclature

Air cargo is a complex global ecosystem operating under stressed conditions with ever increasing pressures for regulatory compliance and ever more sophisticated and demanding customer expectations.

As we rely more heavily on data integration to meet these needs in a fast, efficient, transparent environment, we need to have aligned and consistent data taxonomy and nomenclature.

## Key Industry Challenges

1. What are the current discrepancies in data definitions and taxonomies across the air cargo sector?
2. How do misaligned data standards impact operational efficiency and customer experience in e-commerce?
3. What role do regulatory frameworks play in standardizing data definitions for air cargo logistics?
4. How can aligned data definitions enhance interoperability among various stakeholders in the air cargo ecosystem?
5. What metrics should be used to evaluate the effectiveness of a standardized data taxonomy in e-commerce?

## Main Changes in E-Commerce and Air Cargo

The rise of e-commerce has transformed air cargo operations, necessitating significant changes in data management practices. Traditionally, air cargo relied on fragmented data systems that varied by carriers, freight forwarders and customs agencies.

The surge in e-commerce has heightened the need for real-time tracking, efficient customs clearance and optimized last-mile delivery. Key changes include the adoption of standardized data formats (e.g., IATA Cargo-XML or ONE Record), the integration of advanced technologies like blockchain for data transparency and the implementation of automated data exchange protocols. These changes promote interoperability and enhance data accuracy, enabling stakeholders to respond swiftly to market demands.

## The Case for Alignment and Standards

Aligned data definitions and taxonomies are essential for several reasons. First, they improve operational efficiency by reducing discrepancies and errors in cargo handling data, which leads to faster processing times and reduced costs.

Second, standardized data enhances customer experience by providing accurate, real-time tracking information, thereby increasing transparency and trust.

Third, consistent data definitions facilitate regulatory compliance, simplifying customs procedures and reducing delays.

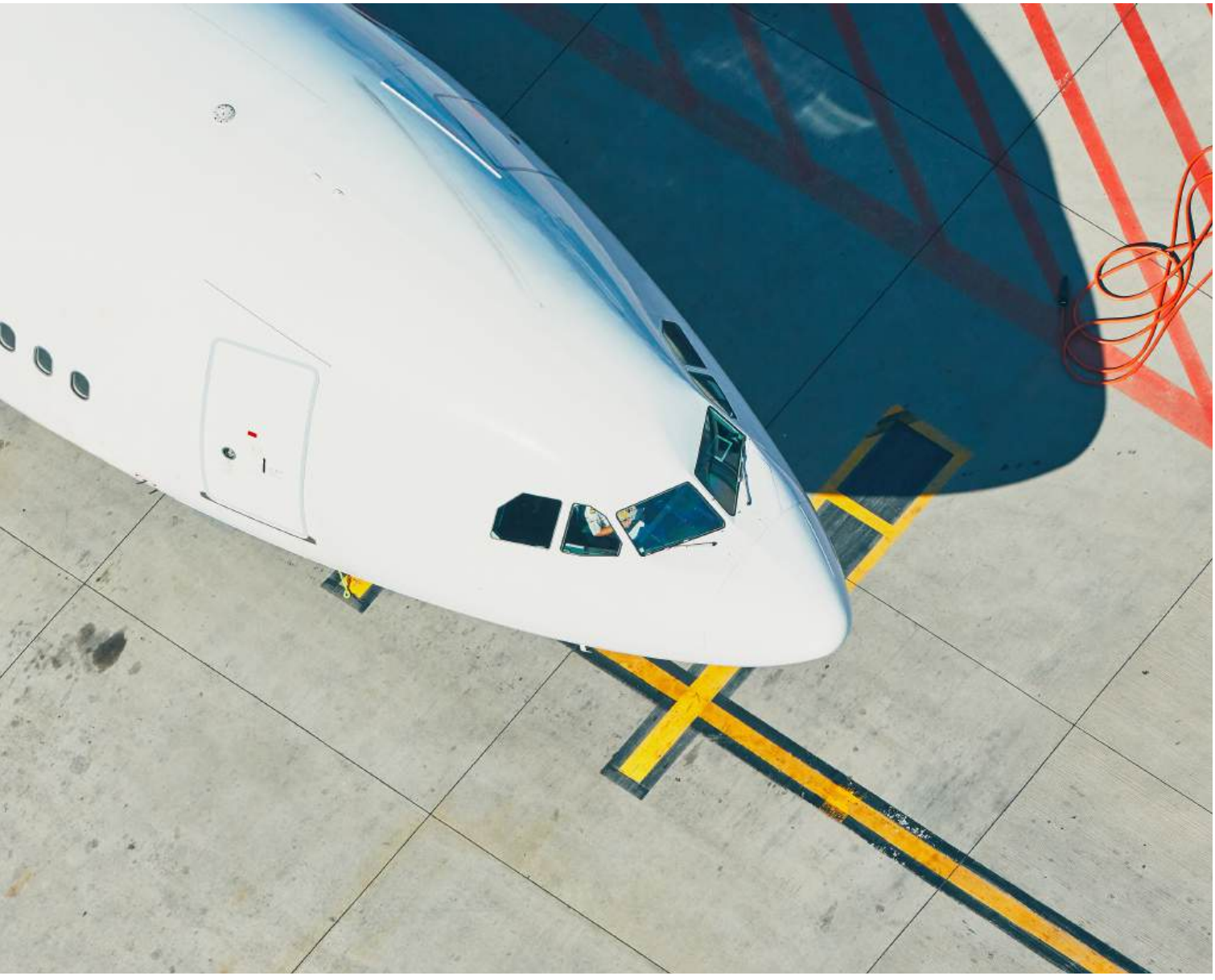
Finally, as the air cargo sector increasingly integrates with digital platforms, having a common data language becomes critical for collaboration among various stakeholders, including logistics providers, retailers, and government agencies. This alignment ultimately supports scalability and innovation in the rapidly evolving e-commerce landscape.

## Policy Recommendations

- Establish a Regulatory Framework: Create regulations that mandate the use of standardized data definitions and taxonomies across the air cargo industry to ensure compliance and interoperability
- Implement Industry-Wide Training Programs: Develop training for stakeholders on the importance of aligned data definitions and how to implement them effectively
- Promote Collaboration Among Stakeholders: Facilitate partnerships between airlines, freight forwarders and technology providers to design and adopt a unified data taxonomy
- Invest in Technology Solutions: Encourage the adoption of technologies that support automated data exchange, such as APIs and blockchain, to enhance data consistency and accuracy
- Monitor and Evaluate Data Standards: Establish a framework for ongoing assessment of data standards, ensuring they evolve with technological advancements and market demands

Chapter 06

# Airline Challenges



The airline industry collectively earns more than USD 150 billion annually from air cargo. Actual tonnage transported is equitably split between passenger bellies and main deck freighter aircraft, approximately 45%/55%, respectively.

Air cargo's contribution on many international passenger routes is crucial for its financial viability, thus enhancing global connectivity.

E-commerce is therefore playing an increasingly important role in overall airline economics.

## Key Industry Challenges

1. How can air cargo carriers adapt their operational models to accommodate the surge in small, high-frequency e-commerce shipments?
2. What infrastructure and fleet investments are required to handle the growing demand for express air freight services?
3. How can airlines ensure compliance with customs, security, and hazardous materials regulations amid increasing shipment volumes?
4. What technological innovations, such as automation and AI, can optimize air cargo handling and improve efficiency?
5. How can carriers balance profitability with the rising costs of compliance, security, and faster turnaround times?
6. What operational inefficiencies currently hinder airlines' ability to adapt to e-commerce demands?
7. How do regulatory and compliance challenges impact the integration of e-commerce within air cargo operations?
8. How can airlines enhance collaboration with other stakeholders in the air cargo ecosystem to support e-commerce growth?

**Air cargo's contribution on many international passenger routes is crucial for its financial viability, thus enhancing global connectivity.**

## Main Changes in Air Cargo Operations

E-commerce, projected to exceed $8 trillion in global sales by 2027, has significantly transformed air cargo carriers' operations in three key ways:

1. Surge in Shipment Volume & Demand for Speed – The rapid growth of online shopping has increased demand for express shipping, with e-commerce now estimated to be over 20% of global air cargo volume. Airlines must adapt to handling millions of small parcels rather than traditional bulk freight.
2. Infrastructure & Fleet Optimization Challenges – To meet demand, major carriers have expanded their freighter fleets, while passenger airlines increasingly convert aircraft for cargo operations.
3. Fleet Renewal – Combination carriers are benefiting from increased cargo capacity available in the new generation of big twin wide body aircraft offering significantly more payload capacity versus the aircraft they replace.
4. Regulatory & Compliance Pressures – The rise in undeclared lithium batteries, counterfeit goods and customs fraud has led to stricter ICAO and state regulations, increasing compliance costs and operational complexities.

## Consequential Risks

The impact of e-commerce on air cargo carriers has significant operational, financial, and regulatory implications:

- Capacity Management & Cost Pressures – Airlines must invest in dedicated freighters, automated sorting hubs and advanced tracking systems to remain competitive.
- Regulatory & Safety Risks – Mishandling of undeclared hazardous goods (e.g., lithium batteries) has led to fire incidents, forcing carriers to enhance screening and comply with stricter Dangerous Goods Regulations (DGR).
- Customs & Security Compliance – The rise in smuggling, misdeclarations and customs fraud has resulted in longer clearance times, increasing airline costs and shipment delays.
- Competitive Market Pressures – E-commerce giants like Amazon are expanding in-house logistics operations, reducing reliance on third-party carriers and disrupting traditional air cargo business models.
- Key changes include the need to streamline booking and tracking processes, as consumers now expect real-time updates on their shipments.
- Additionally, there is a growing requirement for last-mile delivery solutions, as airlines must collaborate with logistics providers to ensure timely deliveries from airports to consumers' doorsteps.
- Furthermore, airlines must adopt advanced technologies, such as data analytics and automation, to enhance operational efficiency and manage the surge in volume effectively.
- This transformation also involves revising capacity management strategies to accommodate fluctuating e-commerce demands and ensuring adequate infrastructure is in place for handling increased cargo loads.

## Policy Recommendations

- Invest in AI & Automated Cargo Handling – Airlines should adopt AI-powered screening, robotic sorting, and automated tracking to manage e-commerce shipments efficiently.
- Strengthen Lithium Battery Regulations – Implement mandatory real-time tracking and fire-resistant packaging for high-risk cargo.
- Enhance Global Customs Coordination – Work with customs agencies to standardize electronic filings, risk profiling and automated clearance.
- Expand Dedicated E-Commerce Air Networks – Develop freighter fleets and regional hubs specifically to handle high-speed e-commerce shipments.
- Enhance Infrastructure Investment: Airlines should invest in airport and logistics infrastructure to accommodate increased e-commerce cargo volumes and ensure efficient handling and processing.
- Standardize Regulations: Collaborate with regulatory bodies to establish standardized practices for e-commerce shipments, simplifying customs processes and enhancing compliance.
- Enhance Customer Service and Ease of Doing Business: Encourage the implementation of advanced technologies, such as automated booking systems and real-time tracking, to improve operational efficiency and customer service.
- Promote Public-Private Partnerships: Foster collaboration between airlines, e-commerce companies and logistics providers to develop integrated solutions that streamline the supply chain.
- Develop Training Programs: Implement training initiatives for airline staff focusing on e-commerce logistics, ensuring they have the skills necessary to adapt to the evolving market landscape.

Chapter 07

# Ground Handler Challenges

Ground handlers are the first line in customer service for carriers' customers and the last line of defence when it comes to safety, security and compliance. Ground handling activity is currently unregulated, with many differences existing between carriers in terms of standard ground handling operations and procedures.

As such, a ground handler who represents multiple carriers is faced with managing various operational standards and deviations.

As e-commerce grows, the role of the ground handler becomes even more important as volumes of small shipments often place additional burdens on facility and border management when compared to larger consolidated shipments.

## Key Industry Challenges

1. What operational inefficiencies do ground handlers face in adapting to the increased demands of e-commerce?
2. How do workforce skill gaps affect ground handling operations in the context of rising e-commerce volumes?
3. What technological advancements are necessary for ground handlers to improve their efficiency and responsiveness?
4. How can ground handlers enhance collaboration with airlines and logistics providers to streamline and even standardize e-commerce operations?
5. What regulatory and compliance challenges must ground handlers navigate to effectively support e-commerce growth?

**As e-commerce grows, the role of the ground handler becomes even more important as volumes of small shipments often place additional burdens on facility and border management when compared to larger consolidated shipments**

## Main Changes in Ground Handling Due to E-Commerce

The fast rise of e-commerce has fundamentally altered the landscape of air cargo operations, presenting both challenges and opportunities for cargo ground handlers. As online shopping increases, ground handlers must adapt to higher volumes of smaller, more varied shipments that require faster processing times.

Key changes include the need for enhanced operational flexibility to accommodate fluctuating demand patterns and the implementation of automated systems for tracking and handling parcels efficiently. Ground handlers also face the challenge of managing complex logistics networks, as partnerships with last-mile delivery services become essential for providing seamless end-to-end service.

Furthermore, there is a growing need for investment in training programs to equip staff with the skills necessary for handling diverse e-commerce products, including perishables and high-value items. This evolution requires not only improved infrastructure and technology, but also robust data management systems to ensure accurate inventory tracking and timely updates for customers.

## Consequential Risks

Addressing these challenges is crucial for cargo ground handlers as the e-commerce sector continues to expand. Effective adaptation to e-commerce demands directly impacts operational efficiency and customer satisfaction.

Delays in processing or mishandling of shipments can lead to significant financial losses and damage to reputation in an increasingly competitive market.

Moreover, as consumer expectations for rapid delivery rise, ground handlers must ensure they can meet these demands to retain business from airlines and logistics providers.

Compliance with regulatory requirements is also essential, particularly in handling diverse cargo types that may be subject to stringent safety and security standards. By overcoming these challenges, ground handlers can both improve their service quality and contribute to the overall growth and competitiveness of the air cargo industry in the e-commerce vertical.

## Policy Recommendations

- Invest in Technology Upgrades: Implement state-of-the-art tracking and automation technologies to enhance operational efficiency and reduce processing times for e-commerce shipments
- Develop Workforce Training Programs: Establish comprehensive training programs focused on e-commerce logistics, equipping staff with the necessary skills to handle diverse and high-volume cargo
- Foster Collaboration with Airlines and Logistics Providers: Create partnerships with airlines and last-mile delivery services to streamline operations and improve service reliability
- Standardize Processes Across the Industry: Advocate for industry-wide standardization of handling procedures and data formats to facilitate smoother operations and better communication among stakeholders
- Enhance Regulatory Compliance Training: Provide ongoing training for ground handling staff on regulatory requirements and best practices to ensure safe and compliant handling of e-commerce cargo.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Chapter 08

# Freight Forwarder Challenges

The freight forwarder has evolved its value proposition and now provides many potential services for the e-commerce sector. Forwarders deliver services ranging from strictly transport procurement, to consolidation solutions to integration into final-mile delivery options to destination deconsolidation and self-delivery or distribution, to near-final-mile options such as locker boxes or kiosk delivery outlets.

The ever-changing regulatory environment requires forwarders to be constantly aware of changes to filing requirements and de minimis levels.

## Key Industry Challenges

1. Addressing operational bottlenecks due to increased e-commerce demands.
2. Enhancing freight forwarders leverage of technology to enhance their service offerings in the e-commerce landscape.
3. Assessing implications of evolving business models in terms of logistics and customer expectations.
4. Ensuring compliance with regulatory requirements in the diverse e-commerce environment
5. Evaluating strategies to employ to improve collaboration with airlines, ground handlers and last-mile delivery services.
6. Addressing the need for increased customer digital communications while managing a proliferation of industry standards in data communications.

**Forwarders deliver services ranging from strictly transport procurement, to consolidation solutions to integration into final-mile delivery options to destination deconsolidation and self-delivery or distribution, to near-final-mile options such as locker boxes or kiosk delivery outlets.**

## Main Changes in Freight Forwarding Due to E-Commerce

As e-commerce continues to reshape the air cargo sector, freight forwarders must navigate several significant changes to remain competitive. The exponential growth in online shopping has led to increased demand for expedited shipping and efficient logistics solutions.

Consequently, freight forwarders must evolve their business models to accommodate smaller shipment sizes and higher frequency of orders, which necessitates enhanced operational flexibility. This may involve investing in advanced technologies such as data analytics, artificial intelligence, and automated booking systems to streamline processes and improve customer service.

Moreover, the rise of e-commerce has heightened the importance of end-to-end visibility in the supply chain. Freight forwarders must provide real-time tracking and transparent communication with customers to meet their expectations for timely deliveries.

Additionally, evolving partnerships with last-mile delivery services and integrating these solutions into their operations is essential for ensuring seamless delivery from warehouses to consumers. This shift requires not only operational adjustments but also a fundamental rethinking of pricing strategies to align with the new service demands of e-commerce.

## Consequential Risks

Addressing these challenges is crucial for freight forwarders as the e-commerce sector continues to grow. By adapting their own business models and operations, freight forwarders can enhance their service offerings and operational efficiency, which are vital for maintaining customer satisfaction and loyalty.

As consumers increasingly expect rapid and reliable delivery, failure to meet these demands can result in lost business opportunities and damage to reputation. Additionally, evolving regulations in international trade and e-commerce require freight forwarders to ensure compliance with various legal and safety standards.

Ultimately, successfully navigating these changes will position freight forwarders as essential partners in the air cargo ecosystem, enabling them to capture a larger share of the expanding e-commerce market.

## Policy Recommendations

- Invest in Technology Solutions: Encourage freight forwarders to adopt advanced technologies, such as AI and data analytics to improve operational efficiency and enhance customer service capabilities.
- Adapt Pricing Models: Encourage the development of flexible pricing strategies that reflect the operational costs associated with handling smaller, more frequent e-commerce shipments, allowing freight forwarders to remain competitive.
- Standardize E-Commerce Processes: Advocate for industry-wide standardization of practices for e-commerce shipments to simplify operations and improve communication among stakeholders.
- Foster Strategic Partnerships: Promote collaboration between freight forwarders and last-mile delivery services to create integrated logistics solutions that meet e-commerce demands.
- Enhance Training for Compliance: Develop training programs focused on regulatory compliance in e-commerce logistics, ensuring that staff are knowledgeable about legal requirements and best practices.

# Who Are We?

**Established in 1992, SONATRANS is a company based in Casablanca and in Tangiers, operating in international transport and logistics.**

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Over the years, we have successfully adapted to market demand, by diversifying the proposed modes of transport, along with the different logistics solutions matching the customers' expectations.

Currently, we have more than 60 employees, spread over 2 sites, between Casablanca and Tangiers, and a CBW (Custom Bonded Warehouse) of nearly 4000m² located in the Atlantic Logistic zone in Ain Sebaâ, Casablanca.


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Chapter 09

# Integrated
# Final Delivery

E-commerce has quickly generated highly complex supply chains, with individual shipments and consolidated shipments often needing to be integrated into final mile delivery networks.

As cost and speed of delivery become ever more crucial as a customer expectation and service provider differentiator, new technologies, such as drones, automation systems and advanced AI will need to be employed.

## Key Industry Challenges

1. How can final mile delivery and postal operations support the rapid growth of e-commerce in air cargo logistics?
2. What challenges do existing operational processes face when integrating new final mile solutions in air cargo systems?
3. What role do technological advancements (e.g., automation, data analytics) play in facilitating more efficient final mile delivery in air cargo?
4. How can postal networks collaborate with air cargo providers to enhance speed, accuracy, and cost efficiency in e-commerce deliveries?
5. What is the impact of regulatory and infrastructure limitations on the integration of final mile delivery solutions in air cargo logistics?
6. How do kiosk pick up points get integrated into the data cycle?
7. What role will common user locker box pick up points have?
8. How do non deliveries re-integrate into inventory or redelivery options?

## Main Changes in Final Mile Delivery for E-Commerce in Air Cargo

The rise of e-commerce has dramatically reshaped air cargo operations, with a notable shift towards integrating final mile delivery solutions into the broader logistics chain. Air cargo providers are increasingly collaborating with postal operations to handle the distribution of goods from airports to end customers. This shift allows for faster and more cost-effective deliveries, benefiting both consumers and businesses.

Key changes include the introduction of localized distribution hubs near major air cargo hubs, which facilitate more efficient sorting and delivery of packages to urban and rural destinations. Integration of advanced tracking technologies and automation systems enhances transparency and speed, improving customer satisfaction. Additionally, air cargo providers are leveraging data analytics to optimize delivery routes and reduce operational costs.

Moreover, postal networks are being optimized to handle higher volumes of small e-commerce packages, which often require more frequent deliveries than traditional goods. This collaboration enables air cargo companies to expand their service offerings while maintaining a high level of service consistency.

As a result, e-commerce businesses can provide faster and more reliable delivery to a wider customer base, meeting the growing consumer demand for speed and convenience.

**Integration of advanced tracking technologies and automation systems enhances transparency and speed, improving customer satisfaction. Additionally, air cargo providers are leveraging data analytics to optimize delivery routes and reduce operational costs.**

## Consequential Risks

Final mile delivery is the critical link between air cargo and the consumer. As e-commerce continues to grow, customers expect faster, more reliable delivery at lower costs.

Integrating final mile solutions with air cargo operations directly impacts customer experience by reducing delivery times and improving service reliability. Efficient air cargo and postal network integration ensure that goods are delivered quickly, especially for time-sensitive or high-demand products, thus providing a competitive edge to e-commerce businesses.

For air cargo providers, this integration is essential to maintain relevance in a rapidly changing market. With the rise of direct-to-consumer shipping, traditional freight operations must evolve to accommodate smaller, more frequent shipments, which are characteristic of e-commerce. Postal services, in collaboration with air cargo, can address these demands by improving last-mile logistics and expanding their networks.

The operational efficiency gained through data analytics, automation and more streamlined collaboration between air cargo and postal networks also helps reduce costs for all parties involved, enabling better profit margins. Without the successful integration of final mile solutions, the efficiency gains of air cargo cannot be fully realized, limiting the potential for growth in the e-commerce sector.

## Policy Recommendations

- Standardize data-sharing protocols between air cargo and postal networks to improve tracking, communication, and delivery optimization.
- Invest in infrastructure that supports localized distribution hubs, creating more efficient transitions from air cargo to final mile delivery.
- Assess the increased usage of multi-party common use delivery solutions.
- Incentivize and regulate collaboration between private logistics companies and national postal services to create seamless, cost-effective networks.
- Update regulations to support the use of automated vehicles and drones for last-mile deliveries, enhancing speed and reducing labor costs.
- Promote sustainability by encouraging eco-friendly practices in the final mile delivery process, such as electric delivery vehicles and optimized packaging solutions to reduce shipment sizes.
- Analyze and adapt to different needs emerging between urban, rural, and ultra rural delivery requirements.

Chapter 10

# Reverse Logistics

Aside from offers of free delivery, e-commerce companies' easy product return policies and processes have led to a steady increase in return e-commerce shipments.

Various solutions have been employed by e-commerce platforms based on their own cost to return goods to inventory, versus unit cost of purchase. Additional considerations taken into account by e-commerce companies include return logistics costs and complexity.

## Key Industry Challenges

1. How can reverse logistics be integrated into air cargo operations to support the growth of e-commerce?
2. What challenges arise from managing returns in air cargo, particularly with the increased volume of e-commerce transactions?
3. What role does technology play in streamlining the reverse logistics process in air cargo?
4. How can air cargo providers optimize return pathways without compromising delivery speed and cost-efficiency for forward logistics shipments?
5. What are the environmental and cost implications of reverse logistics in air cargo, and how can they be mitigated or managed effectively?

## Main Changes in Reverse Logistics for E-Commerce in Air Cargo

As e-commerce grows, the volume of product returns has surged, prompting the need for efficient reverse logistics solutions in air cargo operations. Reverse logistics—handling returns, exchanges and recycling of goods—has become a critical aspect of the logistics ecosystem.

Air cargo providers now need to develop systems that not only manage outbound shipments but also handle the efficient return of products from consumers back to retailers or manufacturers. The integration of reverse logistics into air cargo operations has led to the establishment of dedicated return processing hubs at key airports, enabling faster handling of returned items.

Technology, including data analytics and automated sorting systems, is being leveraged to optimize return routes and speed up processing. Air cargo companies are also collaborating with e-commerce platforms and third-party logistics providers to create seamless returns systems that reduce delays and associated costs.

Furthermore, businesses are rethinking packaging and inventory management strategies to accommodate returns more effectively, with an emphasis on sustainability. The growing use of data and AI tools allows for better forecasting of return volumes and more effective route optimization, leading to reduced transit times and enhanced cost efficiency.

These changes are essential for accommodating the surge in returns and supporting the increasingly complex logistics needs of e-commerce businesses.

## Consequential Risks

Reverse logistics is becoming an essential component of the e-commerce logistics ecosystem. As e-commerce sales rise, return rates are also increasing, especially in industries like fashion, electronics, and consumer goods, where returns can account for 20-30% of total sales.

This creates a significant operational challenge for air cargo providers, who must develop reverse logistics systems that can handle the volume and complexity of returns without compromising the efficiency of forward logistics.

Efficient reverse logistics can directly impact customer satisfaction, as consumers expect easy and fast return processes. If air cargo companies fail to streamline reverse logistics, delays and inefficiencies can result in frustrated customers and higher operational costs.

Additionally, the ability to effectively manage returns can improve inventory management, helping retailers recover valuable stock more quickly.

The environmental and financial implications of reverse logistics are also considerable. Managing the reverse flow of goods responsibly helps reduce waste and minimizes the carbon footprint associated with unnecessary transportation.

Air cargo providers who integrate reverse logistics effectively can enhance their service offering and position themselves as leaders in the evolving e-commerce landscape, where speed, flexibility and sustainability are increasingly prioritized.

## Policy Recommendations

- Standardize return processes across different e-commerce platforms and air cargo operators to ensure smoother integration and uniform customer experience.
- Promote the adoption of green logistics initiatives for reverse logistics, including eco-friendly packaging and carbon-offset programs to mitigate the environmental impact of returns.
- Invest in return-processing infrastructure at key airports and logistics hubs to streamline reverse logistics operations, minimizing bottlenecks and delays.
- Revise regulatory frameworks to support the efficient movement of returned goods, including customs processes and import/export regulations, which often delay the return process.
- Incentivize the use of technology such as AI, machine learning and automation in reverse logistics to improve operational efficiency and reduce costs associated with returns processing.

Chapter 11

# Innovation

E-commerce is widely predicted to grow significantly from the current industry level of about 25% of volumes, despite changes under way to global de minimis, filing requirements and trade policies.

E-commerce is a direct result of changing consumer behavior patterns which are centered on global choice, time value and ease of purchase decision and delivery.

For the air cargo industry to cater to the expected growth, new solutions, new processes, new ideas and new execution strategies will need to be developed and employed.

Innovation is critical for success.

## Key Industry Challenges

1. Does an adequate innovation-based culture exist today in air cargo?
2. With digitalized data accepted as the backbone for innovative solutions, is the industry where it needs to be as a starting point?
3. Does air cargo employ appropriate change management strategies?
4. How can drones and AI contribute to improving the efficiency of air cargo operations for e-commerce?
5. What are the specific operational and regulatory challenges in adopting drones and AI within air cargo logistics?
6. What types of innovations in AI and drone technology are needed to keep pace with the growing demands of e-commerce?
7. How can the integration of drones and AI enhance the last-mile delivery process in air cargo logistics?
8. What are the potential environmental and cost benefits of leveraging AI and drones in air cargo for e-commerce?

## Main Changes in Innovation for E-Commerce in Air Cargo

The rise of e-commerce has put immense pressure on air cargo systems to improve speed, efficiency, and cost-effectiveness. Innovations such as drones and Artificial Intelligence (AI) are becoming critical in reshaping air cargo operations.

Drones offer the potential for faster, more flexible last-mile delivery solutions, particularly for urban and hard-to-reach areas, bypassing ground traffic and reducing delivery times.

AI plays a key role in optimizing routes, managing inventories, and improving forecasting by analyzing vast datasets in real-time, leading to smarter decision-making.

The main changes being introduced include the use of drones for short-distance deliveries, reducing dependence on traditional delivery vehicles and enhancing delivery speed. AI-driven analytics are being employed to forecast demand, optimize load planning, and improve warehouse operations, leading to significant cost savings and more efficient resource allocation.

Additionally, AI is enabling better customer service through enhanced tracking and predictive delivery time estimates.

Moreover, automation in sorting and handling packages at air cargo hubs, powered by AI and robotics, is helping to speed up cargo processing. These advancements allow air cargo providers to handle increased volumes of e-commerce shipments, especially smaller and more frequent packages, which are typical of e-commerce.

## Consequential Risks

Innovation through drones and AI is crucial for the continued growth of e-commerce and its integration into air cargo logistics. As e-commerce demand increases, air cargo providers face heightened pressure to deliver goods faster and more efficiently.

Drones can revolutionize the last mile by cutting down delivery time, reducing congestion, and lowering delivery costs, particularly for high-demand or time-sensitive shipments.

AI is equally transformative, enabling better optimization of logistics networks by analyzing vast amounts of data for route planning, inventory management, and predictive analytics. With AI, air cargo providers can respond more flexibly to real-time events, such as delays or unforeseen demand spikes.

Additionally, AI-powered systems can offer better forecasting, leading to more accurate predictions of delivery windows, which enhances customer satisfaction.

From an environmental standpoint, both drones and AI can help reduce carbon emissions by optimizing routes, reducing vehicle usage, and improving fuel efficiency.

The technological advancements reduce waste in the system and contribute to sustainable practices, which are becoming increasingly important for consumers and regulatory bodies.

For e-commerce businesses and air cargo providers, embracing these technologies helps meet customer expectations for speed and reliability and provides a competitive edge in the rapidly evolving logistics landscape.

## Policy Recommendations

- Create clear regulatory frameworks for drone operations, including safety standards, airspace management and certification processes to ensure seamless integration into existing air cargo systems.
- Encourage governments to consider incentivized investments in AI and drone technology by offering tax breaks or grants to air cargo companies that invest in sustainable and innovative solutions.
- Foster collaboration between air cargo providers, tech companies and regulatory authorities to develop industry-wide standards and protocols for AI and drone integration, ensuring interoperability and safety.
- Support infrastructure development that accommodates drones, such as drone landing pads, charging stations and secure return-to-base facilities at key air cargo hubs.
- Encourage the use of data-sharing platforms to help companies in the supply chain collaborate more effectively, using AI to improve demand forecasting and route optimization across the entire logistics network.

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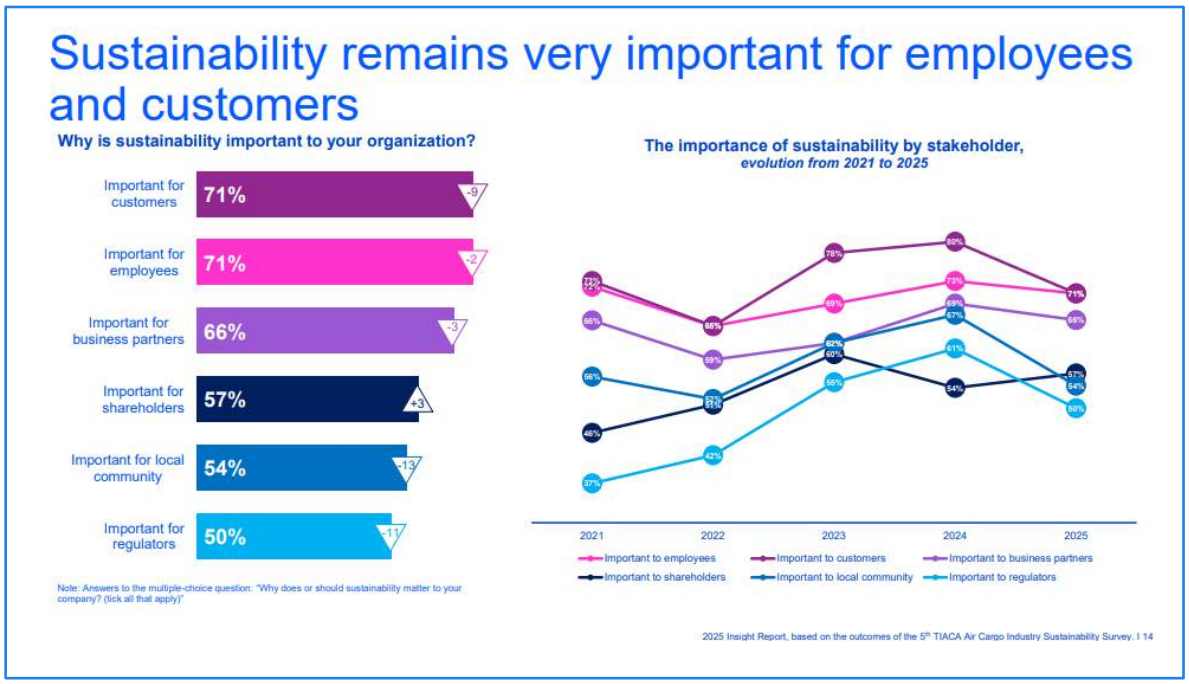
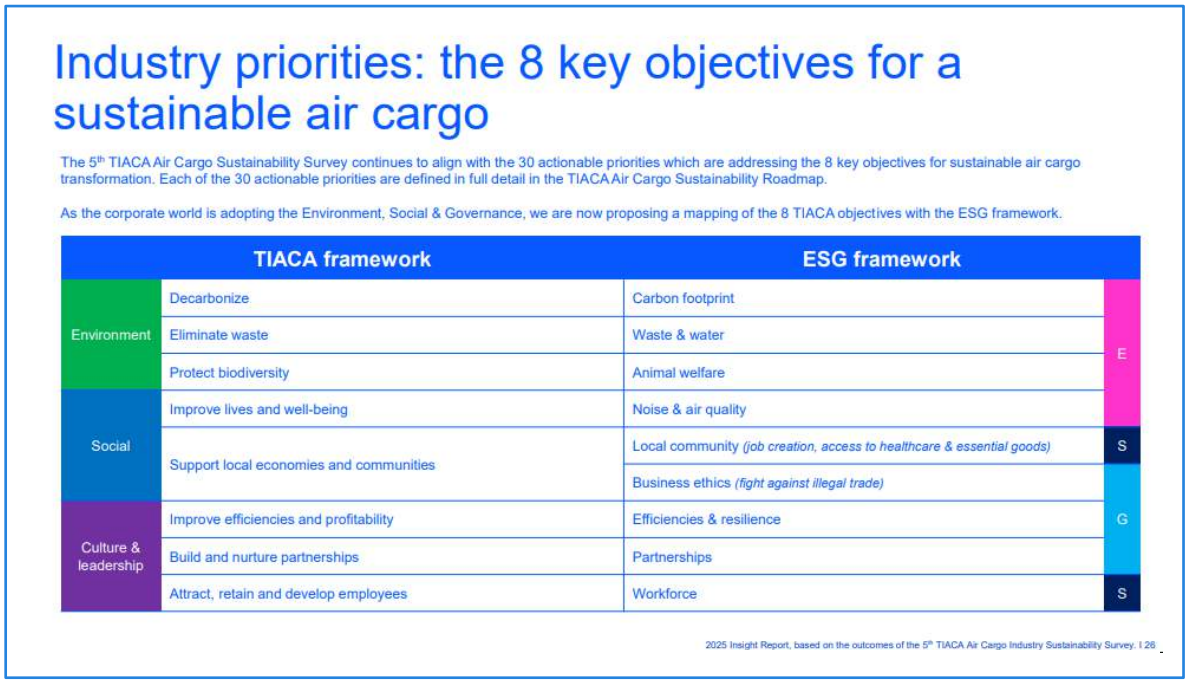
Chapter 12

# Sustainability

Sustainability considerations are becoming increasingly critical for air cargo and, consequentially, e-commerce logistics. The TIACA annual Sustainability survey illustrates that sustainability considerations are important for many industry stakeholders, as illustrated in the chart below.




The industry has embraced the need for environmental responsibility as part of a broad focus on addressing the United Nations 17 Sustainable Development Goals (SDG). Action has been broadly identified across 8 key pillars, outlined below.



## Key Industry Challenges

1. How does the rise of e-commerce impact sustainability, particularly in terms of environmental and waste management, in air cargo?
2. Will customer demand for sustainability improvements exceed industry capabilities?
3. What are the key areas in air cargo logistics where sustainability improvements are needed to support the growth of e-commerce?
4. How can air cargo providers reduce their carbon footprints and manage waste more effectively amid the rising demand for faster deliveries?
5. What role does technology play in improving sustainability in air cargo operations for e-commerce?
6. How can regulatory frameworks support and incentivize sustainability in air cargo logistics without impeding e-commerce growth?
7. Will governments seek to regulate sustainability expectations within e-commerce logistics?

## Main Changes in Sustainability for E-Commerce in Air Cargo

As e-commerce continues to grow, its impact on air cargo operations has raised concerns about sustainability, particularly in terms of environmental impact and waste management.

The rapid rise in parcel volumes has led to increased air freight traffic, contributing to higher carbon emissions and energy consumption. The environmental challenges are compounded by the growing demand for expedited deliveries, often requiring higher frequency and shorter lead times.

To address these challenges, air cargo companies are focusing on reducing their carbon footprints through various measures. The shift toward more fuel-efficient aircraft, investment in sustainable aviation fuels (SAF) and the use of electric ground support equipment (GSE) are key changes aimed at minimizing emissions.

Additionally, air cargo providers are working on waste reduction strategies, such as optimizing packaging, reducing single-use plastics and recycling materials.

Technology plays a significant role in improving sustainability by enabling better route optimization and energy management systems. Advanced data analytics and AI are being used to forecast demand, optimize flight schedules, and minimize excess fuel consumption.

Furthermore, the integration of sustainable practices in last-mile delivery through electric vehicles, drones and optimized packaging further enhances the sustainability of e-commerce logistics.

These changes are crucial in balancing the increased demand for air cargo with the growing need to reduce environmental and waste management impacts.

## Consequential Risks

Sustainability in air cargo is critical to supporting the rapid growth of e-commerce while minimizing its environmental impact. As consumers demand faster deliveries, the air cargo sector faces pressure to reduce its carbon footprint and improve waste management practices.

With aviation being one of the highest contributors to global emissions, the sector's role in addressing climate change is crucial. If air cargo providers fail to adopt sustainable practices, the environmental costs associated with increased air traffic could significantly offset the benefits of e-commerce growth.

From a consumer perspective, sustainability is also becoming an increasingly important factor. Consumers are more likely to support brands and logistics providers that prioritize eco-friendly practices. Failure to meet these expectations could lead to reputational risks for companies in the e-commerce supply chain.

Moreover, sustainability in air cargo helps future-proof the industry by ensuring compliance with tightening environmental regulations and international carbon reduction goals.

Reducing waste and emissions not only aligns with environmental objectives but also brings financial benefits by reducing fuel costs, minimizing waste disposal fees, and improving operational efficiency.

Incorporating sustainability practices across the entire air cargo and e-commerce supply chain ensures that growth can continue without compromising environmental health, leading to a more resilient and responsible logistics ecosystem.

## Policy Recommendations

- Prepare for potential implementation of carbon pricing and emissions trading schemes for air cargo providers to incentivize the adoption of sustainable aviation fuels (SAF) and more fuel-efficient aircraft.
- Encourage collaboration between e-commerce companies and air cargo providers to develop shared sustainability targets, focusing on waste reduction, energy efficiency, and carbon footprint tracking.
- Urge governments to introduce incentives for air cargo companies to invest in electric ground support equipment, renewable energy sources and other environmentally friendly technologies.
- Prepare for possible regulations covering waste management in air cargo, which could include a mandate for the reduction of single-use plastics.
- Encourage supply chain partners to increase the use of recyclable materials.
- Assess the implication of possible government action to impose penalties for excessive waste generation.
- Support research and development of sustainable aviation technologies, such as electric or hybrid aircraft, and create funding programs to help air cargo companies transition to greener technologies.

Chapter 13

# Online Platforms and Marketplaces: Logistical Impacts

Online marketplaces have been around since the early 1980's and were initially focused on specialized areas of activity. Then in the early 1990s, websites such as Amazon and eBay established the notion of any to any selling as millions of consumers and retailers, including C2C transactions, started the current wave of significant shifts in retail activity.

Today, online shopping will be the first choice of over 2.5 billion consumers worldwide. With the increasing number of online shoppers, there are estimated to be around 30.7 million e-commerce stores. This number reflects a 3-fold increase since pre-COVID.

Combined, online retailers and marketplaces will generate an estimated USD 8.0 trillion in sales by 2026.

The drive to online retail channels is based on a compelling value proposition;


Air cargo and accelerated logistics are key enablers of this form of retail value creation and enhanced customer experience.

The top 5 marketplaces by Gross Merchandise Value (GMV) according to Channel Engine data analytics are:

| | |
|---|---|
| **Amazon** | **USD 692 bn** |
| **TaoBao** | USD 616 bn |
| **Tmall** | USD 597 bn |
| **JD.com** | USD 570 bn |
| **Pinduoduo** | USD 541 bn |

Another measure based on monthly visits sees a slightly different picture:

| | |
|---|---|
| **Amazon** | **4,790 million** |
| **eBay** | 1,210 million |
| **Rakuten** | 563 million |
| **Shopee** | 560 million |
| **AliExpress** | 525 million |

Many of the established market leaders have sophisticated multi-channel logistical supply chains and fulfilment strategies employed, combining air, sea, and road distribution with regional and national distribution centers.

Two newer entrants, TEMU and SHEIN, are growing rapidly with significant reliance on air cargo as they seek to establish multi-channel distribution networks.

Shifts in consumer behavior looking for enhanced value of their time and increased choice and convenience will ensure the growth of online retail activity will continue.

## Key Industry Challenges

1. How do logistics costs affect the pricing strategies of online retailers?
2. What role does logistics play in customer satisfaction and retention for online marketplaces?
3. How do shipping times influence consumer purchasing decisions?
4. What technologies are reshaping logistics operations for online retailers?
5. How can sustainability in logistics impact the reputation of online retailers?
6. What are the challenges of last-mile delivery in urban versus rural areas?
7. How do supply chain disruptions affect online inventory management?
8. What metrics are most critical for measuring logistics efficiency in e-commerce?

## Main Changes in Retail Logistics

The logistics landscape for online retailers and marketplaces has evolved significantly, driven by technological advancements and changing consumer expectations. The adoption of automation, data analytics and artificial intelligence has streamlined operations, reducing lead times and costs.

Furthermore, the rise of e-commerce has led to increased demand for faster delivery options, prompting retailers to rethink their fulfilment strategies.

Collaborations with third-party logistics providers (3PLs) have become commonplace, allowing for enhanced flexibility and scalability. In addition, there is a growing emphasis on sustainability, with retailers focusing on eco-friendly packaging and efficient transportation methods to minimize their carbon footprint.

The integration of omnichannel logistics solutions has also gained traction, enabling retailers to provide seamless shopping experiences across various platforms.

## Consequential Risks

The logistics efficiency of online retailers directly correlates with their competitive advantage and profitability. Effective logistics management not only reduces operational costs but also enhances customer satisfaction by ensuring timely deliveries and accurate order fulfilment.

In an era where consumers expect rapid shipping and hassle-free returns, businesses that can optimize their logistics stand to gain a significant market share.

Ultimately, the logistics strategies adopted by online retailers influence consumer behavior, brand loyalty and the overall sustainability of their operations. As e-commerce continues to grow, the need for robust logistics solutions will only become more critical for long-term success.

## Policy Recommendations

- Promote investment in logistics technology.
- Develop a framework for standardized logistics best practices across the industry.
- Encourage collaboration between retailers and logistics providers to enhance service levels.
- Urge states to implement programs and policies that support sustainable transportation options.
- Facilitate training programs for logistics professionals to improve skill sets.
- Establish public-private partnerships to improve infrastructure for last-mile delivery.
- Enhance data-sharing protocols to improve supply chain visibility and efficiency and compliance with Pre-Loading Advance Cargo Information (PLACI) programs.
- Evaluate participation in trusted trader programs such as ICAO Regulated Agent (RA), Known Consignor (KC) or WCO Authorized Economic Operator (AEO).
- Advocate for policies that support small retailers in accessing logistics resources.

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Chapter 14

# Postal Operators

Mail volumes, particularly traditional letter mail, have been steadily decreasing due to the widespread adoption of email, online bill payments and digital communication tools. For example, Statista reported a decrease of 27% in the number of letters distributed worldwide between 2011 and 2020.

## Shift to Parcel Delivery

As e-commerce has grown, so has the demand for parcel delivery services. Postal services are adapting by focusing on this growing market, which can help offset the decline in traditional mail volumes.

## Impact on Post Offices

The decline in letter volumes has led to a reduction in post office visits, as fewer people are sending or receiving physical mail. Some post offices are facing financial challenges and are exploring ways to adapt to the changing landscape, such as reducing delivery frequency or exploring alternative service offerings.

## Global Trend

The reduction in postal usage is a widespread phenomenon, with many countries experiencing similar trends.

## Examples of Adaptation

Some postal services are diversifying into e-commerce logistics, financial services, and digital innovations to counter the decline in traditional mail volumes. Others are exploring strategies like reducing delivery frequency or focusing on higher-value services.

## Key Industry Challenges

1. How has the rise of e-commerce changed the volume and nature of postal services?
2. What are the key challenges faced by postal operators in adapting to e-commerce demands?
3. How do consumer expectations for delivery speed and reliability impact postal operations?
4. In what ways has e-commerce influenced the pricing structures of postal services?
5. How are postal operators integrating technology to enhance their service offerings?
6. What role do partnerships with e-commerce platforms play in the sustainability of postal operators?
7. How does the shift to e-commerce affect employment within postal services?
8. What are the environmental implications of increased parcel delivery due to e-commerce growth?

## Main Changes in Postal Operations

The surge in e-commerce has drastically altered the landscape for postal operators, leading to a significant increase in parcel volumes as traditional letter mail declines. This transformation is characterized by the need for faster delivery times, with a growing emphasis on same-day or next-day delivery services.

Postal operators are investing in technology and logistics infrastructure to manage the increased demand and improve efficiency. Additionally, many are expanding their service offerings to include warehousing and fulfilment solutions, thereby diversifying their revenue streams.

The shift towards digitalization has also necessitated the adoption of advanced tracking systems, enabling better customer service and transparency.

## Consequential Risks

Understanding the impact of e-commerce on postal operators is crucial for several reasons. Firstly, it highlights the necessity for postal services to innovate and adapt in a rapidly changing market. Failure to do so may result in loss of market share to private carriers.

Secondly, the economic implications are significant, as postal operators contribute to job creation and support local economies. Moreover, the environmental aspects of increased parcel deliveries warrant attention, as they can lead to higher carbon footprints.

Policymakers must recognize these dynamics to support the postal sector in transitioning effectively, ensuring that it remains a viable and sustainable option for consumers and businesses alike.

## Recommended Policy Changes

- Encourage investment in technology and infrastructure for postal operators to meet the demands of e-commerce shipments.
- Facilitate partnerships between postal services and e-commerce platforms.
- Implement training programs to upskill postal workforce for new demands.
- Promote sustainability initiatives to mitigate the environmental impact of increased deliveries
- Evaluate and implement structures to reflect the costs of e-commerce-related services.
- Advocate for regulatory frameworks that support fair competition between postal and private services.
- Increase funding for research on innovative delivery models and practices.
- Foster collaboration between public and private sectors to enhance service delivery.

Chapter 15

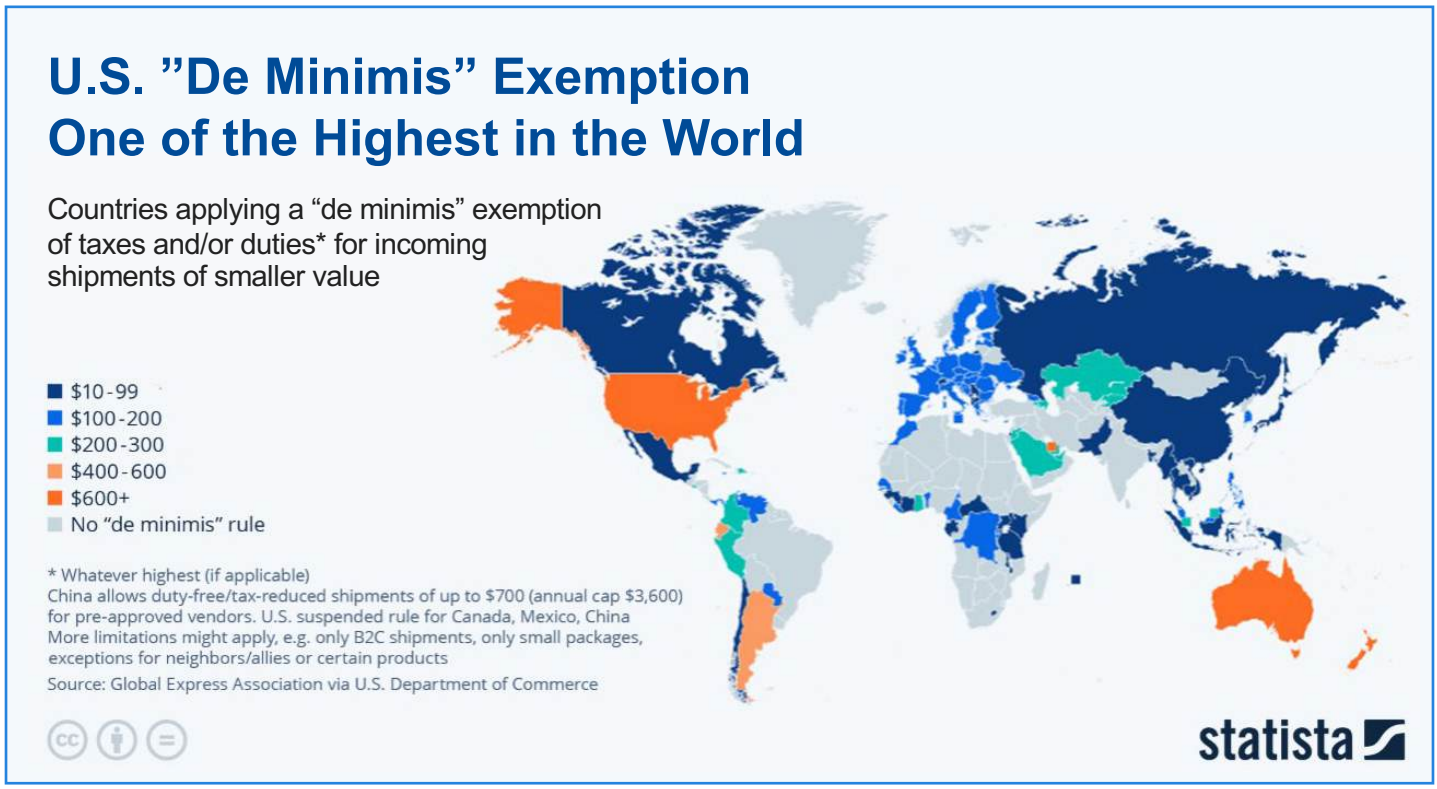
# De Minimis Explained

De minimis refers to a legal concept that allows for certain low-value shipments to be exempt from customs duties and taxes normally at import and occasionally at export. In the context of e-commerce logistics, this means that packages valued below a specific threshold can enter a country without incurring additional fees such as customs duty and/or import VAT, simplifying the import process for consumers and businesses.

The de minimis concept is set out within World Trade Organization (WTO) and World Customs Organization (WCO) instruments as it is seen as a trade facilitation measure.

The de minimis value varies by country; for example, in the United States, the de minimis threshold is set at $800, meaning that shipments valued below this amount do not require formal customs entry.  However, from May 2025 this level has been removed for shipments emanating from China and Hong Kong with further scale backs impacting imports from other countries coming later in the year.  Australia also operates with a similarly high de minimis level, which is being challenged by local domestic retail businesses.

Conversely, Indonesia, China, Canada, and Iceland apply a zero de minimis level. In the European Union (EU) there are also zero de minimis levels for Value Added Tax (VAT) in respect to consignments at import. However, the de minimis for customs duty currently remains at the €150 threshold. It is likely that the customs duty de minimis in the EU will be adjusted in the future.



This concept has significant implications for operational demands related to filing and documentation in e-commerce logistics. When shipments fall under the de minimis threshold, the requirements for filing customs declarations are reduced, resulting in less administrative burden for e-commerce businesses and logistics providers.

However, businesses must still comply with regulations from government agencies, such as the U.S. Customs and Border Protection (CBP) in the United States, which requires shipment information for all imports, regardless of value (e.g. provision of Advance Cargo Information for security purposes). As e-commerce continues to grow, understanding the de minimis rules and related operational requirements becomes essential for efficient logistics management.

It is also imperative that full awareness of Harmonized System (HS) Codes, administered by the World Customs Organization (WCO), is embraced by all involved in border declarations.

The Harmonized System is a standardized numerical method of classifying traded products. It is used by countries around the world to uniformly identify and describe products for purposes such as assessing duties and gathering statistics.

It is equally important to ensure that accurate goods descriptions are used for e-commerce packages to assist customs administrations apply risk management measures to facilitate legitimate trade and identify bad actors.

Overall, lack of compliance, with ever changing border requirements, can result in fines, penalties, seizures, and/or shipment delays.

Chapter 16

# Summary and Conclusion

# Summary

The TIACA Ecommerce White Paper outlines the transformative impact of e-commerce on the global air cargo industry, driven by shifting consumer behavior, technological advancements, and the rapid growth of online retail. By 2024, e-commerce comprised around 20% of air cargo volumes and is projected to double within a decade. This growth has stressed existing systems and created new complexities, including the lack of unified handling standards, inconsistent customs regulations, and inefficiencies across logistics networks.

Key chapters explore challenges and solutions across the air cargo value chain. Market data show robust growth in cross-border e-commerce, especially between China and the U.S., often relying on de minimis thresholds to reduce customs friction. However, regulatory changes threaten to upend this model, as seen in the immediate capacity drop in early Q2 due to U.S. policy shifts.

The e-commerce sector will continue to evolve as consumer behavior, business operations and regulatory environments change.  Air cargo will remain ideally placed to capitalize on these evolutions from lower value B2C and C2C as well as growing values in the B2B sectors. Although more stringent formal customs entries can be anticipated.

Safety is a critical concern, especially with lithium battery risks and increased cyber threats. Recommendations include stricter compliance, enhanced screening, and global regulatory harmonization. Customs management must address fraud and processing delays, calling for digitalization, AI-driven risk analysis, and global standards.

Process simplification is essential for improving efficiency, with technology investment and inter-stakeholder collaboration identified as key enablers. The paper emphasizes the need for harmonized data taxonomy to reduce errors and improve transparency. Airlines face operational and compliance challenges due to small, frequent shipments and must invest in automation and fleet adaptation.

The need for common data infrastructure based on industry standard communication and data protocols architected for next level use in data analytics, AI agents and large language models (LLMs) is crucial.

Infrastructure challenges remain a critical growth factor as demand for investment often exceeds that which is available within supply chain partners.  It is expected that private capital investment targeting real estate development will need to be leveraged to ensure new facilities are available to address the growing demand.

The paper illustrates the need for cascading end-to-end lean processes across industry divides of first, middle and last mile solution providers.

Ground handlers are burdened by fragmented standards and rising parcel volumes, requiring training and digital upgrades. Freight forwarders must adjust to smaller shipments and customer-centric models while ensuring compliance and technological integration. Final-mile delivery is a vital link, benefiting from automation, localized hubs, and drone use to meet customer expectations.

Reverse logistics is becoming increasingly critical due to high return rates in e-commerce, necessitating streamlined systems and green logistics. Innovation, particularly through AI and drones, will reshape efficiency, cost-effectiveness, and sustainability. Sustainability concerns cut across all operations, prompting calls for carbon reduction, waste minimization, and green technology adoption.

Online marketplaces and postal operators are evolving to meet the demands of rapid delivery and growing parcel volumes. Lastly, the concept of de minimis—low-value shipment exemptions—plays a pivotal role but is under scrutiny globally.

## Conclusion

The white paper underscores that e-commerce is not just a new cargo segment but a paradigm shift in air logistics, demanding coordinated industry-wide innovation, regulatory reform, and sustainability focus. By adopting standardized practices, investing in digital infrastructure, and strengthening global cooperation, the air cargo industry can align with the future demands of e-commerce while ensuring safe, efficient, and environmentally responsible operations. TIACA's strategic guidance offers a roadmap for stakeholders to navigate this evolution collaboratively and proactively.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