



2026

INNOVATIONS IN SUPPLY CHAIN, LOGISTICS & FOOD SECURITY



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Innovations in Supply Chains

RECENT GLOBAL DISRUPTIONS HAVE PLACED UNPRECEDENTED STRAIN ON SUPPLY CHAINS

pushing them into the spotlight and forcing many to confront the complexity of the systems that deliver food, medicine, and essential goods.

Over recent decades, food value chains have expanded and lengthened significantly to serve rapidly growing urban populations while meeting rural demand. This expansion increased exposure to shocks. At the same time, rapid advances in logistics, processing, and wholesale practices created greater capacity to respond. As disruptions unfolded, innovations such as food e-commerce, improved worker protections, and automation helped bridge gaps across supply chains.

During the last few years, early disruptions either subsided or became more fragmented. During this time, many consumers continued the habits they had developed amid shifts in daily routines and changing shopping preferences, including a stronger reliance on food e-commerce and delivery services, particularly in countries such as China and India. Demand also rebounded as household incomes recovered compared to earlier declines. At the same time, challenges related to cargo shipping, container availability, and port congestion, initially seen as temporary, persisted longer than anticipated.

Food supply chains have also continued to face mounting pressure from weather-related events. For example, La Niña contributed to drought conditions in parts of South America and intensified tropical cyclones in Central America and Southeast Asia. More recently, severe flooding in Pakistan, prolonged heatwaves across Southern Europe, wildfires in Canada, and hurricanes impacting the Gulf Coast of the United States have disrupted agricultural production, damaged infrastructure, and delayed transportation flows.

Recent discussions at the World Economic Forum emphasize that supply chain disruptions are increasingly seen as ongoing structural challenges rather than short-term crises.¹

- Factors such as geopolitical tensions, labor shortages, and evolving trade regulations continue to reshape global value chains, requiring firms to rethink traditional operating models (Hong, 2026).
- The 2026 Davos reporting highlights that adaptability and resilience are now considered just as important as cost efficiency in maintaining competitiveness (Hong, 2026).
- This perspective supports the view that the shifts that began around 2020 were not temporary adjustments, but part of a broader, continuing transformation in supply chain strategy (Hong, 2026).

Supply chains are still quite vulnerable to external shocks, especially weather events and other natural disasters. When these occur, they can disrupt transport routes and port operations for extended periods, which in turn affects carrier reliability and overall network stability.

This report examines a range of forward-looking innovations, from simplifying business operations to developing new digital marketplaces. One thing is clear: supply chains are entering a new phase. Rather than reverting to previous models, they are evolving into systems designed to be more adaptive, resilient, and capable of responding to future uncertainty.

¹Source:

Hong, P. K. (2026, January 19). Global value chains enter era of structural volatility, says WEF. Business Today. <https://www.businesstoday.in/wef-2026/story/davos-2026/global-value-chains-enter-era-of-structural-volatility-says-wef-511432-2026>



Australia
**Trusted Trader
Partnership**



Australian Trusted Trader (ATT) is a free program administered by the Department of Home Affairs in collaboration with the Australian Border Force that certifies Australian firms as having compliant trade practices and a safe and recognized supply chain.

The ATT partnership aims to minimize red tape at the border, enhancing assurance in export markets, and expediting the movement of products into and out of Australia, resulting in quicker market access. Businesses that have been recognized have access to a growing number of incentives that streamline their customs operations. ATT companies are given preferential treatment at the border because they are considered lower risk. The partnership aims to deliver fewer interventions and quicker customs clearance as a result, with priority processing given if a cargo examination is necessary.

Administered by Home Affairs with the Australian Border Force, ATT is free and accredits Australian businesses with compliant trade practices and a secure supply chain. Once accredited, businesses have access to a growing range of benefits that simplify their customs processes.

When a business achieves a Trusted Trader accreditation, the benefits include:¹

- ➔ **Personal account manager:** An account manager will work with the business to improve compliance with border requirements and resolve border clearance issues.
- ➔ **Priority processing** through the National Trade Advice Center and the National Refunds Intervention. This includes advance rulings in relation to tariffs, valuation and origin, advance ruling reviews, duty drawback claims, and refund and remission applications for customs import duty.
- ➔ **Priority treatment of goods at the border:** Accredited businesses are seen as low risk and are given priority treatment at the border. This means faster customs processing and fewer interventions. If a cargo examination is required, they will receive priority processing.
- ➔ **A seat at the table and exclusive invitations** to work in partnership with the government on initiatives related to their industry. They are invited to exclusive events for accredited businesses only.
- ➔ Trusted Traders have use of the **Australian Trusted Trader logo**. This logo is recognized internationally and gives others confidence in the business. The ATT logo builds confidence in Australian traders and the security of their supply chain.
- ➔ Several countries recognize Australian Trusted Trader status under **Mutual Recognition Arrangements**. Trusted Trader exporters will receive trade facilitation benefits at the border of our partner countries, providing faster access to international markets.
- ➔ Businesses can request **monthly reporting** on all goods imported or exported under their Australian Business Number. This can help manage data and reduce the risk of fraud.

¹**Sources:**
Australian Border Force (n.d.), Australian Trusted Trader.
<https://www.abf.gov.au/att>

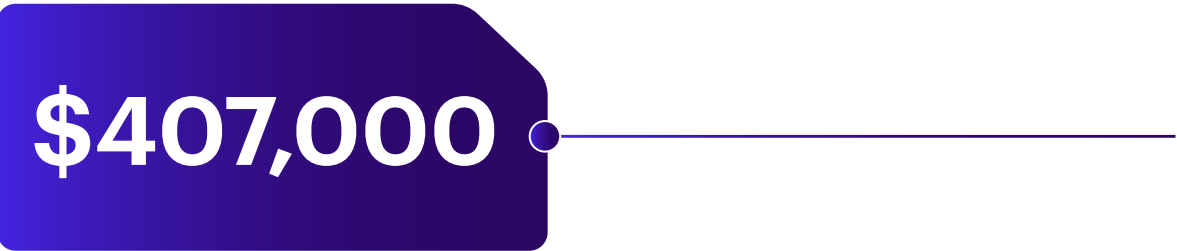
Office of Impact Analysis (2025), Customs (Australian Trusted Trader Programme) Rule 2025.

- ➔ **Simpler TSS visa processes:** If businesses want to offer work to a skilled person from overseas, ATT accreditation will make this process simpler. They will also receive priority processing through a streamlined process to become an accredited sponsor.
- ➔ **Easier access to APEC Business Travel Card:** ATT status makes the process of applying for an APEC Business Travel Card easier. An ABTC allows employees to visit certain countries in the Asia-Pacific region without applying for separate visas.
- ➔ **Consolidated Cargo Clearance:** Trusted Traders benefit from less red tape when importing consolidated cargo, as well as lodge a single cargo report (instead of one for each supplier) for cargo consolidated overseas.
- ➔ **Australian Government partnerships:** The Australian Government is progressing reforms to foster legitimate trade and provide Australian businesses with a seamless border experience. ATT works in partnership with the Known Consignor initiative. Known Consignor affects businesses that need to meet the United States of America air cargo requirements.
- ➔ **Duty Deferral Plus:** allows eligible Trusted Traders who defer Goods and Services Tax to defer the payment of duty, on most goods, to a consolidated monthly payment. A single invoice will be generated and sent electronically to the business and can be automatically deducted from a nominated bank account. This benefit assists Trusted Traders through increased cash flow and a reduction in administrative processes.
- ➔ **Origin advanced ruling**, which allows Trusted Trader importers to apply for a single advance ruling for goods under multiple tariff classifications and consignments, enabling the use of a Declaration of Origin.



Canada
Enhanced cybersecurity
system to protect the
Energy Supply Chain

The Canadian government granted the University of Waterloo a sum of



in funding to build an improved cybersecurity system to safeguard Canada’s vital national energy infrastructure.¹ The innovative hardware assurance system being developed by the University of Waterloo can detect compromised parts and devices, ensuring the safety and reliability of Canada’s energy delivery by mitigating risks in its supply chain.

The aim was to create an innovative hardware assurance system that can identify tainted components and equipment, assuring the security and dependability of Canada’s energy supply by reducing supply chain risks. This is particularly crucial because as supply chains get more complicated, enterprises find it harder to detect and manage possible risks since they may overlook the supply chain security procedures used by their vendors and suppliers.

Electricity generator Bruce Power is providing equipment, evaluating machine learning processes, and evaluating the overall performance of the new system, while Palitronica Inc., a Canadian cyber security hardware and software company and part of University of Waterloo’s innovation ecosystem, is providing hardware sensors to enable the technology development.

The University of Waterloo and Bruce Power also contributed financially to the project, bringing the total investment to over

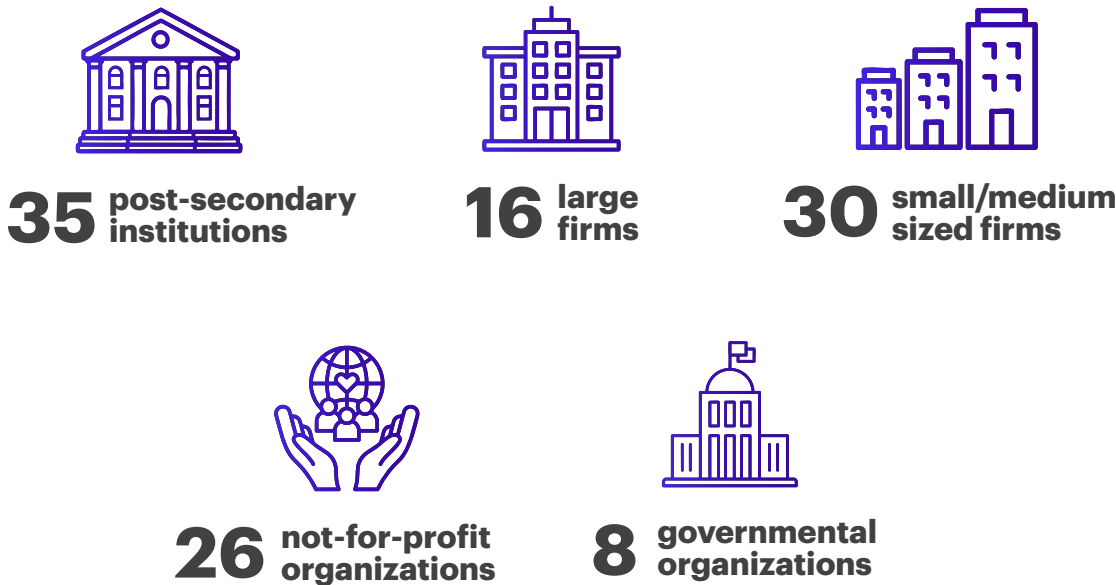


¹Source:
Natural Resources Canada. (2021). Protecting Canada’s energy supply chains from cyber threats.
<https://www.canada.ca/en/natural-resources-canada/news/2021/08/protecting-canadas-energy-supply-chains-from-cyber-threats.html>

The initiative is leveraging software bill-of-materials to promote transparency in both internal and external software development inside a business. The ability to use external code libraries in addition to internal application development would allow businesses, government agencies, or other organizations to keep an up-to-date list of the essential elements and sub-elements contained in any given piece of software within their IT environment.

This supply chain project is part of the larger National Cybersecurity Consortium, which the University of Waterloo is a founding member of. The University of Waterloo is one of five founding member entities working with public and private sectors to lead world-class cybersecurity innovation and talent development.

In its application to lead the Cyber Security Innovation Network, it works collaboratively across Canada with more than 140 researchers from:



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Netherlands
Customs acquires the
fastest rail scanner in
the world



The Port of Rotterdam has implemented a high-speed, non-intrusive X-ray scanning system capable of inspecting rail cargo while trains move through the terminal at speeds of up to 60 km/h. This is considerably faster than many conventional systems, which typically operate at around half that speed and often require trains to slow down or stop. The ability to scan containers without unloading them or interrupting rail operations has helped reduce delays while maintaining strong customs oversight in one of Europe's busiest logistics environments.¹

The system was introduced primarily to address the operational challenge of inspecting large volumes of rail-borne cargo without creating bottlenecks. Previously, inspections could involve stopping trains or physically off-loading containers for checks, which affected throughput and added complexity to terminal operations. The new approach automates much of the process. Each X-ray image is automatically linked to the container identification number and cargo manifest, allowing analysts to review the scans later in a secure inspection centre after the train has already passed through. This makes it possible to target physical inspections only where risk indicators are identified, rather than applying blanket interventions.

Initial throughput estimates suggested that the scanner could process close to 200,000 rail containers per year without disrupting normal port operations. A

standard 40-foot container can be scanned in under a second as it moves through the system, demonstrating how security checks can be integrated into logistics flows rather than treated as a separate step. This level of efficiency is particularly important given Rotterdam's scale, with total cargo throughput remaining near historic levels at approximately 435.8 million tonnes in 2024.

Although the scanner was initially considered among the most advanced rail inspection technologies available, similar solutions are now being introduced in other locations. Dutch Customs continues to enhance performance by refining detection algorithms and integrating additional technologies. The scanner also sits within a broader digitalisation effort across the port, including digital customs processes that have reduced container inspection turnaround times by more than 30 percent and enabled continuous remote analysis of scan data.²

Overall, the high-speed rail scanning system demonstrates how technology can support both security and trade efficiency simultaneously. By reducing inspection-related delays while maintaining oversight, it contributes to smoother freight movement across European supply chains and reinforces Rotterdam's position as a major global logistics hub.

Sources:

¹ Port of Rotterdam Authority (2024), Annual Report 2024.
<https://www.portofrotterdam.com>

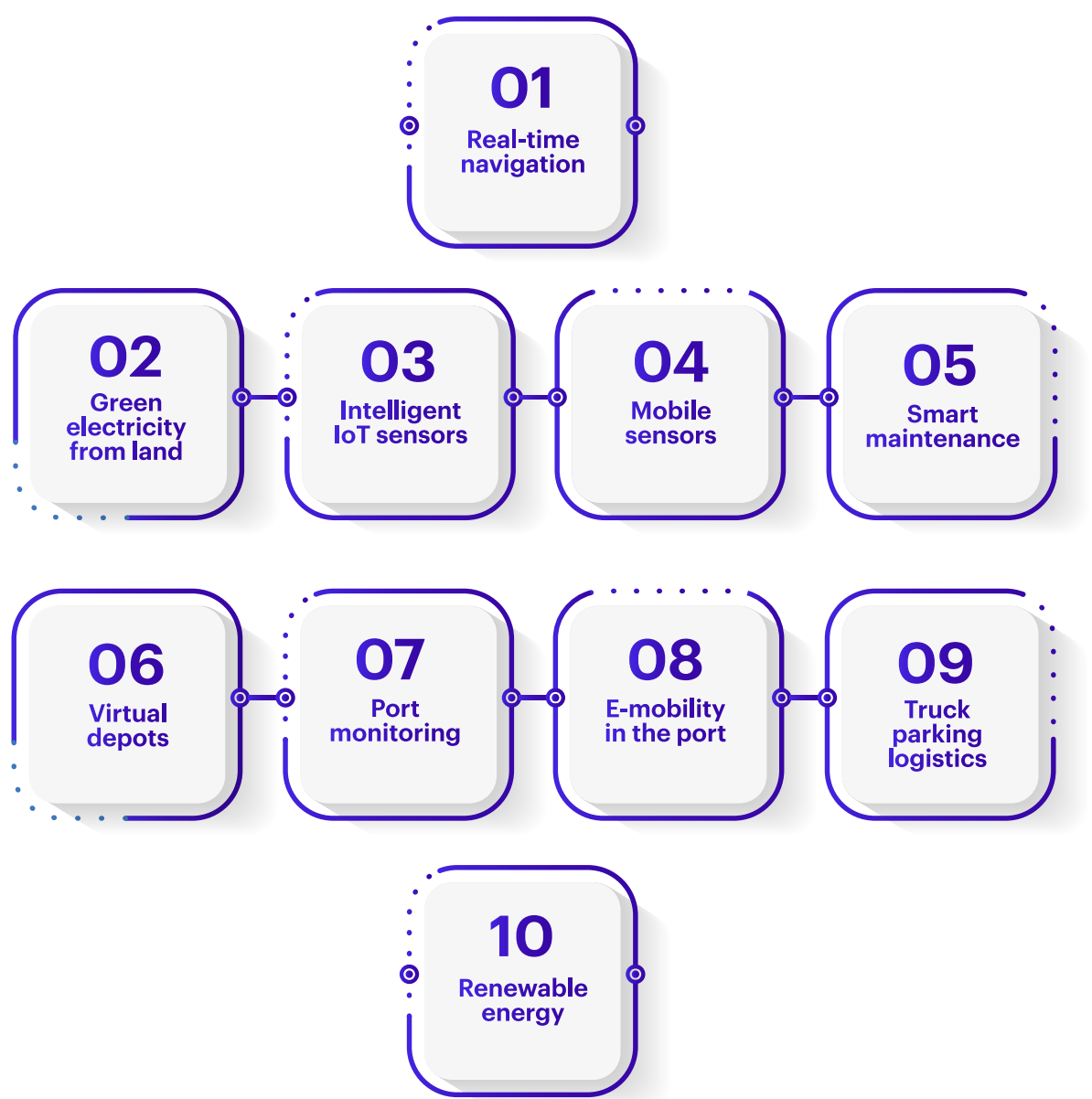
² Dutch Customs Administration (n.d.), Cargo scanning and supervision technologies.
<https://www.douane.nl>

A large, stylized number '41' is positioned in the background, rendered in a lighter shade of blue than the dark blue background. The '4' is composed of two overlapping shapes, and the '1' is a simple vertical bar.

Germany
Optimizing internal
port operations using
4IR technologies

The Port of Hamburg is one of Europe’s largest container ports and is often referred to as Germany’s “Gateway to the World” due to its strategic location on the Elbe River with direct access to the North Sea, serving as a vital link between Central and Eastern Europe and global trade routes. Updating and modernising the port for the Fourth Industrial Revolution (4IR) through digital infrastructure, sensor networks, automation, data-driven logistics, and intelligent traffic systems under initiatives such as smartPORT, has been a longstanding priority to enhance efficiency, sustainability, and global competitiveness. Rather than a single policy, Hamburg’s evolution into a smart port reflects the integration of multiple emerging technologies that add new capabilities to port operations.

According to the Hamburg Port Authority (HPA), the top 10 smart port attributes include:¹



¹Source:
Hamburg Port Authority. (n.d.). SmartPORT logistics.
<https://www.hamburg-port-authority.de/en/hpa-360/smartport>

To bring these goals to life, HPA started operating autonomous drones for various applications by partnering with HHLA Sky, a subsidiary of Hamburger Hafen und Logistik AG. The aim of this partnership was to work on the best ways of integrating drones into daily operations. One key area is emergency response: in the event of storm surges, accidents or other unforeseeable disruptions, flying, floating or self-driving robots can be on-site considerably faster and provide high-resolution videos and pictures for an exact overview of the situation. Furthermore, they make the maintenance and expansion of the port infrastructure significantly more efficient, for example, in the case of facilities that are difficult, time-consuming or dangerous to reach. HHLA Sky has developed a control center for the operation and monitoring of drones, which connects with a range of HPA applications specified within the scope of the technology partnership.

Another area in which drones can prove useful is port infrastructure, which can be extended faster and more effectively by using unmanned aerial vehicles, and other robots, instead of human labor. Also HPA introduced a location data and technology platform to better manage truck traffic in the Port of Hamburg. This solution is based on vehicle sensor data and utilizes services like Real-Time Traffic and Routing to provide fresh and flexible travel time information. Within the port, digital information boards provide truck drivers with traffic-relevant information to navigate them through the port.

With the Corridor Travel Time-as-a-Service solution, the HPA can now better monitor the traffic situation on relevant corridors and manage the flow of traffic. The existing information boards can then also show information on current travel times to key destinations such as cargo transfer points - all without the need for additional hardware in the road sections under consideration. These initiatives are a follow-up to a major tech overhaul that HPA underwent in 2016, when it started using IoT and sensors to analyze the traffic situation in the port and on waterways.

With intelligent solutions for the flow of traffic and goods, the HPA increases the efficiency of the port. Smart port logistics combines economic and ecological aspects in three sub-areas: traffic flows, infrastructure, and goods flows. An intermodal Port Traffic Center for ship, rail, and road traffic forms the basis for linking the traffic flows with one another. Intelligent networking is a prerequisite for smooth and efficient traffic in the Port of Hamburg and ultimately also for the flow of goods: Optimal data acquisition and a rapid exchange of information enable logisticians, forwarders, and agents to choose the most efficient mode of transport for the transport.

In addition, HPA promotes environmentally friendly mobility and is committed to reduced energy consumption. smartPORT energy helps to reduce dependency on conventionally generated energy, lower emissions and save money. The focus is on three core areas: renewable energies, energy efficiency and mobility.

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United States of America
**Business Transformation
& Innovation Division**
improves business
intelligence & capabilities

The CBP Office of Trade of the USA has created a Business Transformation and Innovation Division (BTID) to improve its operations and transactions. The mission of BTID is to actively engage in the future strategic vision of the Office of Trade to provide strong foundations of future technology investments, which will facilitate, secure, and reduce costs related to the movement of cargo. BTID focuses on assessing and analyzing new technologies within the parameters of CBP's business needs, and providing a futuristic vision on products and software so that the agency can proactively pursue advancements in the technical environment.

One technology with much fanfare is blockchain. Using blockchain proofs of concept (POC) with trade partners and key stakeholders serving on the Customs Operations Advisory Committee, the CBP continues to improve business intelligence capabilities for promoting trade facilitation, security, and enforcement objectives by utilizing cutting-edge technologies. A POC is a short assessment used to demonstrate the feasibility of a specific concept or theory, utilizing a fail-fast methodology. After a proof of concept, a 360-degree assessment is completed, evaluating four primary areas: Legal, Policy, Technical, and Operational.

Some of the potential advantages include

- Secure and effective data sharing between CBP, importers, manufacturers, merchants, and rights holders
- Preventing illegal items from entering U.S. commerce, cost savings are achieved.
- Greater supply chain visibility will improve data collection by enabling the identification of organizations not included on entries.
- Fewer physical import inspections would result in quicker delivery of products to customers.

Completed POCs thus far include projects with the North American Free Trade Agreement (NAFTA), cross-border tuna fish tracking, and intellectual property rights (IPR):

NAFTA: CBP tested the application of blockchain technology for the entry summary submission process for NAFTA/CAFTA entries. An assessment of the technology, along with the policy and legal issues raised by the POC, was conducted following the test. It found that use of the blockchain achieved almost instantaneous communications between CBP and trade, improved documentation of receipt, and expedited processing for CBP.

IPR: Early testing showed that blockchain technology can protect IPR on American imports as well as sensitive information transmitted between multiple parties using a single, streamlined platform. The technology is critical to combating IPR violations by allowing CBP to exchange data securely and efficiently with manufacturers, retailers, rights holders, and importers.

Using a single access point in blockchain, the proof of concept allowed the agency to leverage technology to connect the data correctly to the product and to the license, resulting in fewer physical examinations. This was accomplished via blockchain interoperability, which means that each organization participating in a transaction can communicate with others using their unique blockchain, regardless of different software used by each party, allowing companies the flexibility to select and customize technology that suits their unique needs. Companies participating in this interoperable system experience cost savings as the platform eliminates the need to rebuild a blockchain every time a new entity with different software participates.





Cross-border tuna fish tracking: Developed by Texas A&M University as part of the DHS Cross-Border Threat Screening and Supply Chain Defense Center of Excellence, it creates a realistic model of global tuna supply chain components, from fishing vessels through entry into the U.S. in a computational testbed environment. It also designs a testbed that will enhance visibility into complex tuna supply chains for airtight tuna, tracking tuna from origin to import.

Global Business Identifier (GBI) Evaluative Proof of Concept (EPoC): CBP is running a multi-year test of the GBI EPoC to develop a single unified identifier for businesses in global trade, improving supply chain visibility and data consistency across government and industry. This test was extended and expanded with updated criteria through 2027.

Blockchain Proofs of Concept with COAC Partners: CBP's Business Transformation and Innovation Division (BTID) has developed and completed blockchain POCs with trade partners serving on the Customs Operations Advisory Committee to test secure data sharing, documentation flows, and interoperability for trade processing.¹

¹Sources:

U.S. Customs and Border Protection (n.d.), Global Business Identifier test.
<https://www.cbp.gov/trade/programs-administration/gbi>

U.S. Customs and Border Protection (n.d.), Other projects.
<https://www.cbp.gov/trade/ace/Innovation/other-projects>



United States of America
Department of Agriculture (USDA)

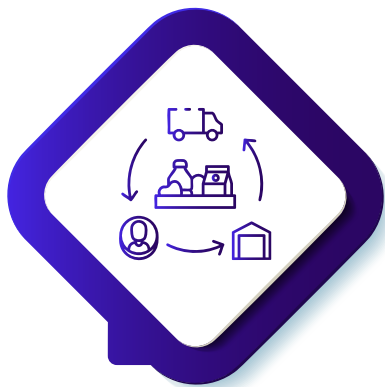
**Framework for Shoring
Up the Food Supply
Chain**



The U.S. Department of Agriculture (USDA) announced details of a framework to transform the food system to benefit consumers, producers, and rural communities by providing more options, increasing access, and creating new, more, and better markets for small and mid-size producers. The announcement builds on lessons learned earlier and supply chain disruptions caused by political instability in Ukraine, and it aims to strengthen critical supply chains and address longstanding structural challenges that were revealed and intensified by the pandemic.

When the COVID-19 pandemic began, USDA made significant investments through its Pandemic Assistance Program, providing immediate relief to producers, businesses, food workers and others. As the pandemic has evolved and Russia's war in Ukraine has caused supply chain disruptions, it has become clear the country cannot go back to the food system they had before: the Biden-Harris Administration and USDA recognize they must strengthen the food system across the supply chain, from how our food is produced to how it is purchased, and all the steps in between.

THE GOALS OF USDA'S FOOD SYSTEM TRANSFORMATION FRAMEWORK INCLUDE:



BUILDING A MORE RESILIENT FOOD SUPPLY CHAIN

Providing more and better market options for consumers and producers while reducing carbon pollution. Different recent supply chain disruptions have revealed the perils of a national food system that depends on capacity concentrated in a few geographic areas and requires many steps to get from farm to fork. In order to be more resilient, the food system of the future needs to be more distributed and local. Having more capacity to gather, process, move and store food in different geographic areas of the country will provide more options for producers to create value-added products and sell locally, which will support new economic opportunities and job creation in rural communities. Additional regional capacity will also give consumers more options to buy locally produced products, helping ensure food is available to consumers, and reduce the climate impact of our food supply chain.



CREATING A FAIRER FOOD SYSTEM THAT COMBATS MARKET DOMINANCE

Helping producers and consumers gain more power in the marketplace by creating new, more and better local market options. Just 14 cents of the food dollar go to producers on average – in large part because producers’ power in the marketplace has declined over the past 50 years with increased consolidation in the food system. Today, just a handful of companies dominate meat and poultry processing, and just a few multinational companies produce most brands and products on supermarket shelves. Right now, input prices and food prices are up, but so are the profits of major food companies and national supermarket chains. Covid has revealed the perils of a food system dominated by a few corporate players. USDA's investments will deliver a better deal for farmers, ranchers, growers, and consumers.



MAKING NUTRITIOUS FOOD MORE ACCESSIBLE AND AFFORDABLE FOR CONSUMERS

Various challenges such as weather-related challenges and pandemics can expose and exacerbate the challenges of food and nutrition insecurity in this country. Various challenges such as weather-related challenges and pandemics can expose and exacerbate the challenges of food and nutrition insecurity in this country. A family in the United States not having access to affordable, nutritious foods is unacceptable. Hard-pressed families, including those who depend on school meals, SNAP, and seniors on fixed incomes, may have limited food options, and some communities have been underserved by grocery stores and food retailers, making it difficult to access healthy food. USDA is committed to ensuring every American family has access to affordable, nutritious foods. That is why USDA's Food System Transformation framework includes programs to ensure all consumers are able to access fresh, healthy, nutritious food.



EMPHASIZING EQUITY

For too long, rural communities, underserved communities, communities that experience persistent poverty, and the people who live there have been left behind. For too long, rural communities, underserved communities, communities that experience persistent poverty, and the people who live there have been left behind. Where you live should not determine a fair shot to economic opportunity. It is in these communities where most of our food comes from; where most of the water that we drink comes from; and where most of the energy we consume comes from. USDA's Food System Transformation investments will create more economic opportunities for these communities and allow them to retain more of the food system dollar. This will speed the transition to more equitable growth, with the wealth created from these communities remaining in small towns and underserved communities, helping to lift them out of poverty.

A large, stylized number '67' in a light blue color serves as a background element. The '6' is a simple circle, and the '7' has a horizontal top bar and a diagonal stem.

Latvia

**Mobile slaughterhouses
for common use**

In the district of Madona in Latvia there was an increased industry for breeding animals for meat, with a fast-growing demand for slaughterhouse services. At the same time, one of the main constraints that meat producers were facing was the lack of certified slaughterhouses in the region. The services of the few existing slaughterhouses were relatively expensive and bringing animals to distant slaughterhouses substantially raised the cost of the meat which became uncompetitive in price. It was more profitable for farmers to sell their animals to buyers at a low price. In this environment of increasing competition and shortage of affordable services, farmers needed to find ways to remain competitive. A solution was needed to enable producers to market their own meat products at higher prices rather than selling animals to slaughterhouses at a lower price. The idea of a mobile slaughterhouse was pitched by farmers.

The idea was to reduce the monopoly status of slaughterhouses and to give meat producers the option to sell their meat by live weight, carcasses or refined products to the local markets. In addition, the project aimed to ensure

that the meat produced by the farmers is certified for the local market. EU support enabled the farmers to buy a mobile slaughterhouse and the necessary equipment. They set up a non-profit association to manage the service and now the farmers can choose whether to sell processed meat to retailers or slaughterhouses or meat products directly to the local markets.

The service itself was not provided in order to financially benefit the association but to support the business activities of its members. One of the main outcomes of the project was greater cooperation among farmers. Members of the association became actively involved in the management of the service. Trainings and regular meetings held by the association also added to the cooperative spirit generated among farmers. Local inhabitants gained the possibility to consume locally produced meat products at competitive prices. Local catering services can also offer locally produced meat, e.g., in schools and kindergartens. The group gained valuable experience and knowledge of complying with laws and regulations, along with other legal aspects related to the processing and selling of agricultural products on the market.





Kenya

Digitising Food Supply Chains Through a Digital Platform

A TOTAL OF

96%

OF FOOD AND CONSUMER PRODUCTS IN URBAN SUB-SAHARAN AFRICA ARE SOLD BY SMALL AND MEDIUM-SIZED 'ROAD-SIDE' VENDORS.

There are more than 130,000 of them in Nairobi alone. These vendors access their stock by waking up at 4:00am, traveling to open-air markets, and getting a push-cart, taxi, or shuttle to bring their stock back to their shops once a day. Trapped in this logistics and pricing monopoly, the vendors are limited in their ability to grow or diversify.

The founders of Twiga Foods realized the system was broken and the problem was big. Kenya's distribution challenges are similar across the entire continent, parts of the Middle East, Southeast Asia, and beyond. And none of the big global tech players were even looking at it. What, they wondered, if someone could build efficient, data-sophisticated logistics to directly deliver to vendors' shops? And because every farmer and vendor has at least a mobile device, and has been long comfortable transacting digitally – Kenya's mobile money capability, mPesa, is used by more than two-thirds of the country, what if someone built a digital marketplace with dynamic pricing to benefit both farmers and vendors? The ramifications were clear: vendors could get better pricing, better quality products, delivered to their shop] so they don't have to go to markets. And farmers get better, transparent pricing and a guaranteed market to sell into.

Twiga's initial job was fairly simple: build a digital marketplace, and build fulfillment logistics for it to operate upon. For the medium and long term, sitting on unique data sets of farmers' pricing and vendors' ability to pay, opened a host of new business services such as micro credits.

As the founders explained, the role of marketplaces – Uber, OpenTable, Ebay, Deliveroo, or Airbnb – was to connect fragmented players onto a single platform. In fact, that's really been the heart of the last 20 years of the Silicon Valley tech boom. Twiga is what that looks like in any emerging market. Get products moved around efficiently, and provide the data to know where the market is going months in advance. As with other tech marketplaces, and even the last 500 years of commodities market developments, the more users on that platform the more efficient the marketplace.

The future for Twiga, no doubt, will be geographic market expansion. But it will, at its essence, continue to be a data company. The company sits on some very interesting data, indeed. They have a live map of every shop (regardless of shop type) in the areas where the app is active. In the past, that data had only been collected by big retail operations and market research firms performing block-walking sample surveys every few years. Twiga's is live, and can explain consumer trends in various states, getting pictures of the micro-economies.

The other data Twiga sits on is basically the only food pricing index across Kenya, beyond the statistics bureau's monthly sample used to calculate inflation. With the economy so dependent on agriculture, this means they're getting better at predicting pricing, inflation, and incomes than the government itself.

Finally, as Twiga moves from offering third-party products across fruits and vegetables to any basic retail goods, it has data points on every vendor that can help them determine what they want to stock, in what volumes, and how frequently, if they're creditworthy, and so on. This is similarly true on the supplier side of the market.

Twiga's competition is primarily the traditional open-air markets it is seeking to disrupt. Twiga beats them by being cheaper, more convenient, and by providing higher quality products and services (up to 15% cheaper than the traditional wholesale market). It's not a hard sell. Therefore, nearly all of Twiga's challenges are operational; it can only get the needed infrastructure and people in place so fast. They have also attracted some of the best logistics and tech talent in Africa.

United Arab Emirates
**Innovations in
Supply Chain**

1 | CARDS PLATFORM : ENHANCING THE SUPPLY CHAIN IN THE AIR CARGO SECTOR

CONTEXT AND CHALLENGE

In the UAE's pursuit of solidifying its position as a global hub for trade and logistics services, the air cargo sector faces a major challenge in managing and analyzing its rapidly growing data. This has created difficulties in gaining a comprehensive and real-time view of market performance, affecting the sector's ability to analyze trends, make timely decisions, and fully realize its competitive potential.

SECTOR SIZE AND IMPORTANCE

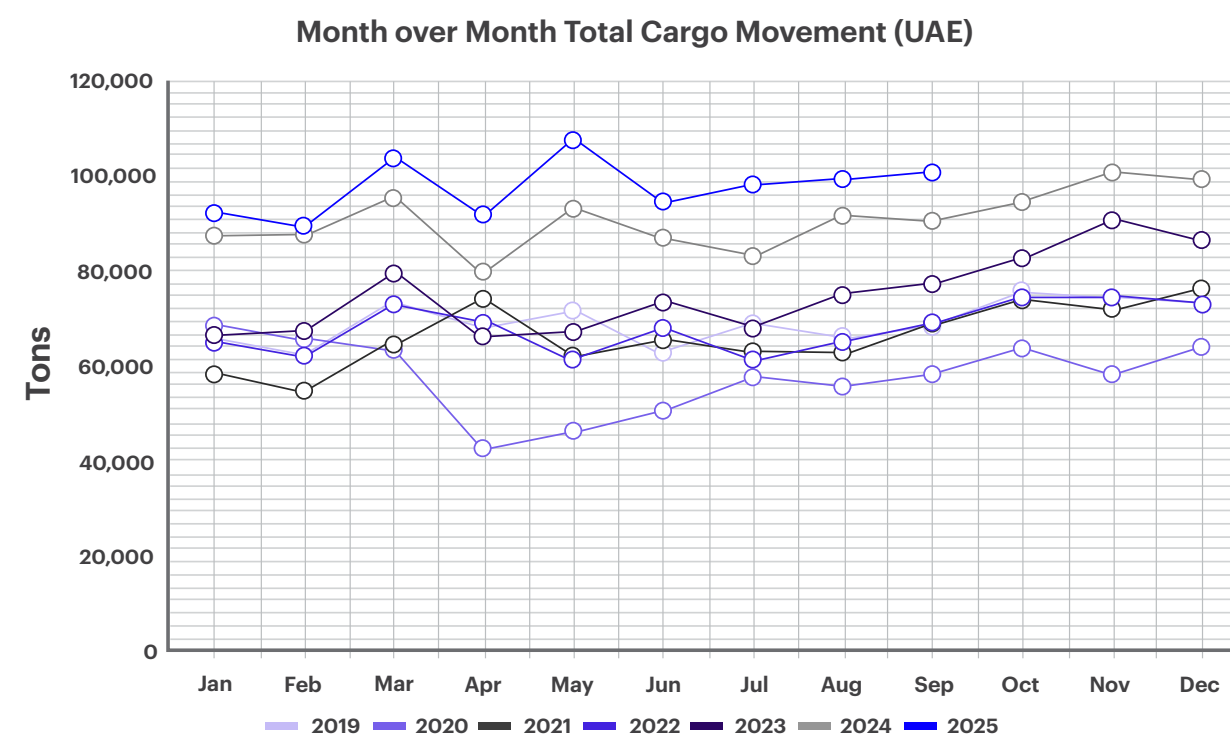
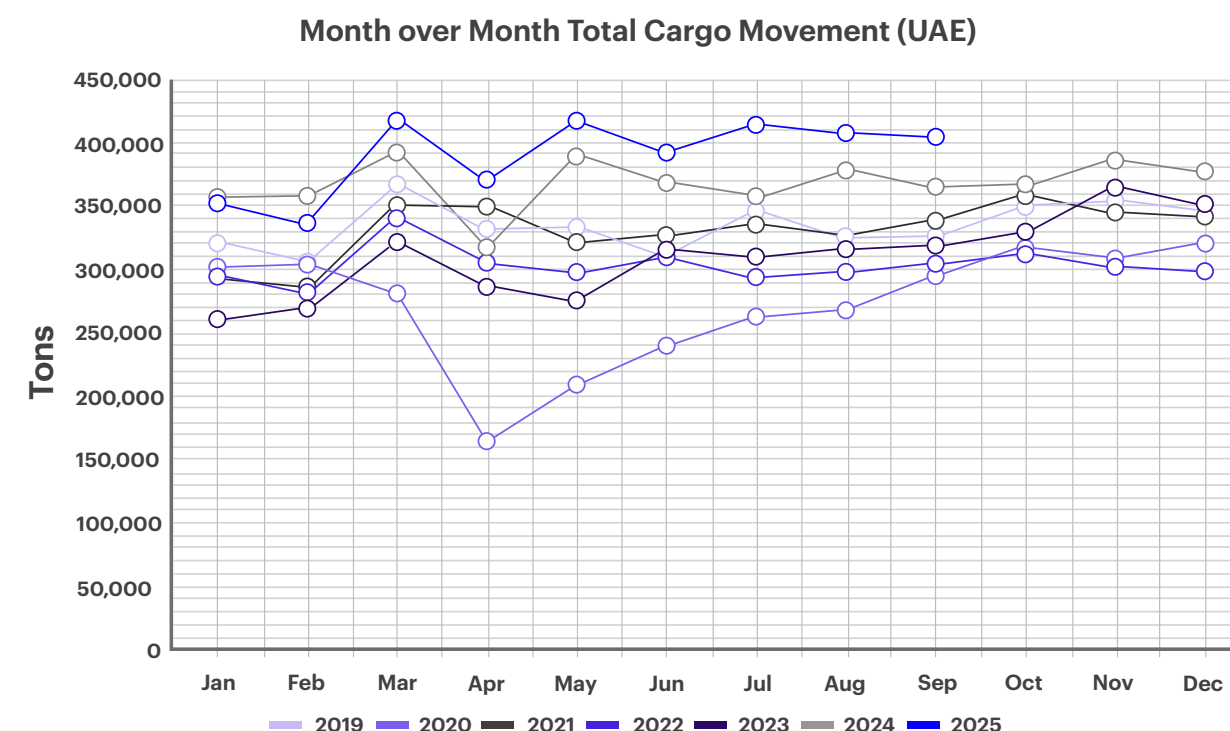
Air cargo is one of the vital pillars of the national economy, leveraging the UAE's strategic geographic location linking East and West. This aligns with a national vision to position the UAE among the top three countries globally in the Logistics Performance Index by 2031, highlighting the strategic importance of developing this critical sector and enhancing its operational efficiency.

THE PROBLEM IN NUMBERS

Before the platform's launch, collecting and analyzing cargo data took weeks, causing delays in understanding market trends and making informed decisions. This lag negatively impacted supply chain efficiency, as analytical visibility of cargo movements (import, export, and transit) was incomplete and lacked the accuracy needed for strategic planning and opportunity identification.

THE INNOVATIVE SOLUTION: CARDS PLATFORM

In response to these challenges, the General Civil Aviation Authority (GCAA) launched CARDS, an advanced digital system that unifies air cargo data from all sector partners into one integrated platform. The platform includes data submitted by globally leading national carriers such as Emirates SkyCargo and Etihad Cargo, which together connect the UAE to more than 270 destinations worldwide, in addition to data from ground handling companies and express couriers. This integration provides an unprecedented, comprehensive analytical view of the sector's performance.

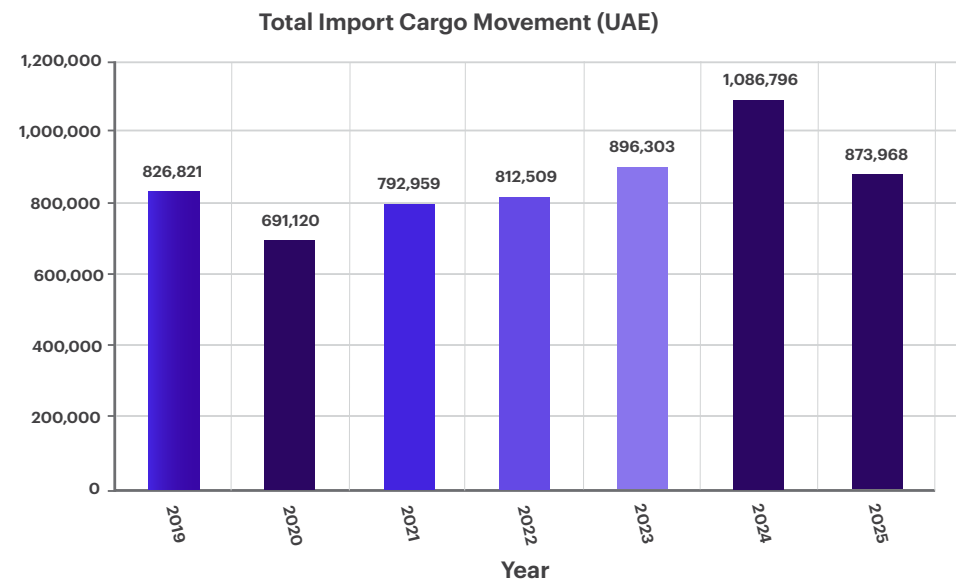
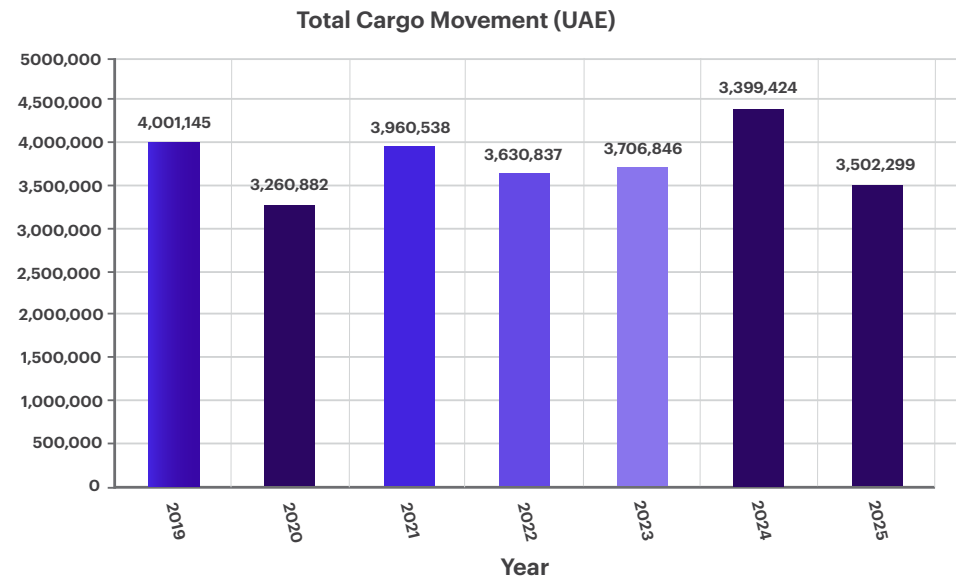


HOW IT WORKS & KEY FEATURES

The platform collects monthly data from partners through a unified electronic portal. The system then automatically analyzes the data and presents it through interactive dashboards showing key performance indicators such as:

- Growth rates and month-to-month comparisons
- Market share of carriers
- Analysis of import, export, and transit cargo movements

The platform features a secure data-sharing system where each partner can only view their own data and performance, ensuring full confidentiality and reinforcing trust and integration among supply chain stakeholders.



RESULTS AND DIRECT IMPACT

The platform created an immediate and tangible impact. Partners praised its role in enhancing transparency and operational efficiency, Several key stakeholders , such as Dnata, Emirates Sky Cargo, Air Arabia, Etihad Airlines, DHL, Fujairah international airport and UPS, shared highly positive initial feedback on the platform. They highlighted its value as an innovative and effective analytical tool, noting that it provides a more transparent picture of the market and significantly supports data analysis and decision-making. Stakeholders also emphasized that the platform offers a single, reliable source of information that was previously not easily accessible to all, and that the additional visibility will greatly help in assessing market size and market share. This positive feedback reflects the success of CARDS in accelerating data analysis and enabling partners to make timely, data-driven decisions.

CONTRIBUTION TO NATIONAL GOALS

CARDS directly supports the UAE Vision 2031 by enabling a more efficient regulatory environment. The platform provides accurate data needed by the UAE Council for Logistics Integration to help increase the air cargo sector’s contribution to the national GDP, reinforcing the UAE’s status as a flexible and globally competitive trade hub.

FUTURE VISION

The GCAA aims to evolve the platform into the next generation of intelligent analytics by integrating artificial intelligence and predictive analysis to provide proactive insights on cargo flows and global demand.

The GCAA is also working on developing national talent through specialized training programs and preparing to adopt emerging air-mobility technologies such as (eVTOL) aircraft, ensuring the UAE’s digital infrastructure and workforce are ready to lead the future of civil aviation.

2 | DRONE DELIVERY TRIAL PROGRAM TO SUPPORT URBAN SUPPLY CHAIN OPERATIONS IN THE UNITED ARAB EMIRATES

CONTEXT AND CHALLENGE

With the rapid growth of the logistics sector and the increasing demand for faster and more efficient delivery solutions, the need emerged to test innovative methods that enhance the “last-mile” phase of the urban supply chain.

Traditional ground transportation faces heavy congestion and unpredictable delays, particularly in densely populated cities. This created a strong motivation to explore the potential of integrating low-altitude aerial capabilities through the use of drones as a viable and efficient delivery option.

SECTOR SIGNIFICANCE AND DRIVERS FOR DEVELOPMENT

The last-mile phase constitutes a major portion of delivery costs and represents one of the most challenging stages in supply chain operations.

As a global leader in testing advanced mobility solutions, the UAE aims to:

- Improve delivery efficiency in urban areas
- Reduce traffic congestion and pressure on ground infrastructure
- Support national sustainability goals by reducing emissions
- Strengthen regulatory readiness for the emerging low-altitude economy

INNOVATIVE SOLUTION: DRONE-BASED DELIVERY TRIALS

The General Civil Aviation Authority (GCAA) launched an experimental program to conduct drone-based delivery operations within designated low-altitude corridors and under direct oversight from aviation safety and air navigation teams.

The program includes drone delivery of light commercial items—such as food and small parcels—to evaluate performance in comparison with traditional ground transportation.

The program is built around four key objectives:

- Reducing delivery times in densely populated urban areas
- Measuring operational efficiency, including time, cost, and environmental impact
- Testing regulatory compatibility and integrating operations with the national drone permit platform
- Developing a scalable operational model to support the future low-altitude economy

IMPLEMENTATION METHODOLOGY AND STAKEHOLDERS

The trial required coordination between multiple local and operational entities to ensure safe and successful flights. Key participants included:

- Local authorities in the relevant emirate
- Contracted drone operators
- Public delivery platforms
- End users (recipients)
- Air navigation service providers

The program followed a structured operational methodology, including the selection of appropriate delivery zones, allocation of low-altitude air corridors, establishing communication channels, and testing system integration.

ACHIEVED RESULTS

Initial findings from the trial demonstrated promising outcomes:

- Successful completion of 5 drone delivery flights with no safety incidents.
- Reduction of average delivery time compared with ground delivery.
- Demonstrated suitability of drone delivery for high-congestion zones.

DELIVERED OUTPUTS

The program significantly enhanced understanding of the role drones can play within national supply chains. Key outputs include:

- Integration of low-altitude aerial operations into the national supply chain concept.
- Provision of an alternative delivery mode during emergencies or disruptions in traditional networks.
- Support for sustainability objectives by reducing reliance on ground vehicles for short distances.
- Reduced delivery times and improved flexibility of the logistics network.

IMPACT ON THE CIVIL AVIATION SECTOR AND SUPPLY CHAIN

The pilot program produced notable impacts on both the civil aviation sector and supply chain operations:

- Strengthened regulatory readiness to govern urban drone delivery operations.
- Provided reliable operational data to support future performance metrics (time, cost, compliance, incidents, emissions, etc.).
- Enabled new business models within the logistics and mobility sectors.
- Supported national innovation efforts by adopting advanced technologies that enhance supply chain resilience.



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