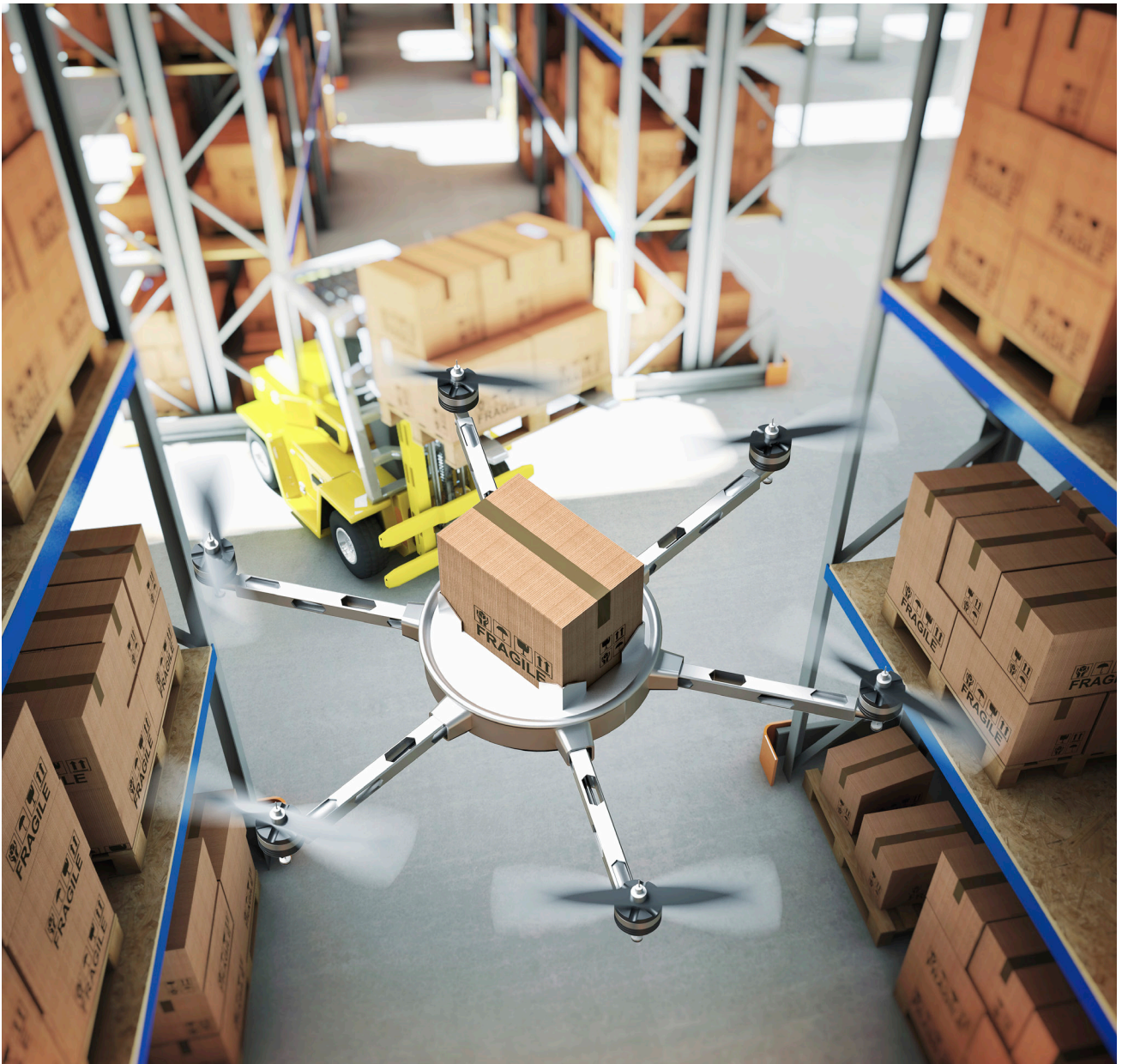


# Drones – a view into the future for the logistics sector?



Recent media attention has put the non-military use of unmanned aerial vehicles (UAVs), also known as “drones”, in the spotlight.

Some organisations in the logistics sector are already testing the validity of UAV-based delivery, but what does the future really look like for the sector – will this emerging technology be seen as a game-changer in the future?

The UAV Drone Market for Commercial is estimated to grow to reach over

# US\$1.2 billion

by 2020<sup>1</sup>

The drone industry could create

# 150,000

jobs in the EU by 2050<sup>2</sup>

According to the Civil Aviation Authority more than

# 1,000

commercial groups have been granted permission in the UK

## ECONOMIC AND SOCIETAL BACKDROP

The possible adoption of UAVs in the sector is set against a backdrop of growing international freight volumes: The Organisation for Economic Co-operation and Development (OECD) has predicted that international freight transport volumes will grow more than fourfold by 2050, with average transport distances across all modes increasing by 12%.<sup>3</sup> Capacity constraints in the transport sector can act as a brake on economic growth as governments look to capacity utilisation and new modes of operation.

The growing world population and rapid concentration of people in urban areas in the developed and developing world will lead to congested roads, pollution, and also increased transportation times, caused by the delay in the transportation of goods.

Long-term urban transport planning will therefore have to keep pace with urbanisation and population growth, and may need to look to alternative modes of transport to meet a growing demand.

<sup>1</sup> Markets and Markets <http://www.marketsandmarkets.com/Market-Reports/commercial-drones-market-195137996.html>, accessed September 2015.

<sup>2</sup> House of Lords - European Union Committee. Civilian Use of Drones in the EU, 5 March 2015.

<sup>3</sup> <http://www.internationaltransportforum.org/Press/PDFs/2015-01-27-Outlook2015.pdf>.



Research from the National Aeronautical Centre revealed that

# 42%

of logistics carriers plan to use UAVs for the distribution of cargo in the future.

## UAV APPLICATION IN THE LOGISTICS SECTOR

The use of UAVs by the military and the media has been greatly documented, with many practical applications already being in use. Current usage in the logistics industry is, however, still very much in its infancy, with applications for the future largely unknown.

For UAVs to take hold in the sector it would need to be determined if they could be commercially viable and meet the needs of the logistics sector in the long term. For example, would they be cheaper to run and need less fuel than conventional aircraft to provide long-term savings? Concern would also surround the question as to how much could be transported at one time – could UAVs one day replace conventional air and marine transport?

Research from the National Aeronautical Centre (NAC) recently revealed that 42% of logistics carriers believe their business plans to use UAVs for the distribution of cargo in the future. With fuel prices identified as one of the most important perceived risks facing the logistics industry, industry participants may view UAVs as a way to provide cost savings in the long term.<sup>4</sup>

## THE IMMEDIATE FUTURE

A more likely near-term application is in the transportation of smaller parcels in that all important urban first and last mile, particularly as e-commerce volumes grow. DHL predicts that it could be in this market where UAVs could provide relief for inner cities, taking traffic off the roads and reducing congestion, with delivery times maintained, although mostly in the small parcel category.<sup>5</sup> Large corporates, such as Amazon and DHL, are experimenting with UAV technology to determine its future viability. Amazon's Prime Air<sup>6</sup> programme is awaiting regulatory clearance from the Federal Aviation Administration (FAA). However, while the urban first and last mile will have the most immediate application for the use of UAVs, it will be a challenge to adapt complex regulatory frameworks and existing infrastructure in order to facilitate this.

<sup>4</sup> World Cargo News, <http://www.worldcargonews.com/htm/w20140905.054532.htm>, accessed September 2015.

<sup>5</sup> DHL, Unmanned Aerial Vehicle - A DHL perspective on implications and use cases for the logistics industry, 2014.

<sup>6</sup> Amazon, <http://www.amazon.com/b?node=8037720011>, accessed September 2015.



Polish freight carrier PKP Cargo has trialled security drones to help protect goods on the rail network. PKP Cargo believes the drones have been responsible for a

# 44%

reduction in the number of thefts on the network in the first half of 2015<sup>7</sup>



## REMOTE DELIVERY AND DISASTER RESPONSE

The application of UAVs in disaster relief situations or for the supply of pharmaceutical supplies in difficult-to-reach locations could be invaluable in cutting the cost and time involved in non-standard delivery networks. UPS recently announced its participation in a study for the use of UAVs for humanitarian disaster relief operations where they can be utilised for delivery to difficult-to-reach locations. DHL is experimenting with delivery services for urgent packages, having gained regulatory agreement for the experimentation of its Parcelcopter<sup>8</sup> to the German North Sea island of Juist. Swiss Post is working with Swiss WorldCargo – the air freight division of Swiss International Air Lines – to test the use of UAVs in emergency situations where supplies have been cut off to remote areas following weather-related incidents. It is also considering the urgent transport of consignments, such as laboratory tests. Applications for UAVs could also have far-reaching implications for emerging economies in Africa and Asia, where poor levels of infrastructure often limit the growth of the logistics sector.

## MAINTENANCE AND SUEVILLANCE OF INFRASTRUCTURE

As in the energy industry, UAVs may have an application in monitoring logistics and transport infrastructure. This may include the security and surveillance of warehousing and port facilities, where vast facilities and difficult-to-reach areas present a security concern for operators. Last year, the Abu Dhabi Ports Company (ADPC) reported that it is using two UAVs to strengthen security, safeguarding ships with high-value or sensitive cargos<sup>9</sup>. A UAV's camera can capture full HD video and still photographs, and is equipped with its own Wi-Fi network for data transfer.

The Fraunhofer IML research project with InventAIRy is exploring how warehousing and inventory maintenance could be transformed with the use of UAVs. The UAVs would be able to find objects, both in warehouses and exterior areas, and be able to track barcodes and radio-frequency identification (RFID) tags, enabling them to be integrated into warehouse administration systems, automated lines, and pre-despatch, saving time and money and reducing the number of errors.<sup>10</sup>

<sup>7</sup> Global Rail News, <http://www.globalrailnews.com/2015/09/02/security-drones-to-be-used-by-polish-rail-freight-operator>, accessed September 2015.

<sup>8</sup> DHL, [http://www.dhl.com/en/press/releases/releases\\_2014/group/dhl\\_parcelcopter\\_launches\\_initial\\_operations\\_for\\_research\\_purposes.html](http://www.dhl.com/en/press/releases/releases_2014/group/dhl_parcelcopter_launches_initial_operations_for_research_purposes.html), accessed September 2015.

<sup>9</sup> The National Business, <http://www.thenational.ae/business/industry-insights/shipping/eye-in-the-sky-abu-dhabis-ports-now-protected-by-drones>, accessed September 2015.

<sup>10</sup> Fraunhofer-Gesellschaft, <https://www.fraunhofer.de/en/press/research-news/2014/december/the-flying-inventory-assistant.html>, accessed September 2015.

## SECURITY, SAFETY AND REGULATORY CONCERNS

The main barrier to the widespread adoption of UAVs, in the short term at least, is a lack of regulation surrounding their use and the fact that the little that does exist is still evolving and varies from country to country. Strict airspace management and/or improved technology will be needed to minimise the collision risk with other UAVs or, indeed, manned aircraft. Operation of UAVs may not be allowed based upon GPS coordinates, with restrictions introduced to ensure adherence with no-fly zones, particularly over nuclear, security, and military facilities.

Public anxieties concerning UAV safety will be a critical factor in the development of requirements to adopt safe methods of operation and training in the licensing regime. Training schemes are currently being developed and accredited by licencing authorities to ensure that UAVs will be operated by competent individuals.

Privacy concerns will undoubtedly be another major public consideration for the use of UAVs. In the UK, the Information Commissioner's Office has included the use of UAVs within its 2014 CCTV Code<sup>11</sup>, as it believes that they have the potential for collateral intrusion by recording images of individuals unnecessarily. The code calls for privacy assessments to be carried out, which could form part of the authorisation procedures for applications to operate UAVs. The House of Lords' EU Committee also recently called for the compulsory registration of all commercial and civilian UAVs, amid growing concern over their use by private individuals with little knowledge of aviation rules.

## RISK AND INSURANCE IMPLICATIONS

UAV risks are currently being written worldwide, with insurance products being developed to meet the needs of UAV manufacturers, distributors, and operators. The wider application for the use of UAVs presents a variety of risks for consideration, which is particularly important for those operators whose operations have previously been rooted on the ground.

UAVs could present the characteristics of an aviation risk and/or a liability risk. Standard UAV insurance programmes cover third-party liability, physical loss, and damage to system components during operation or transit. More specialist covers may be required depending upon the nature of operations undertaken, and could include directors and officers liability, professional indemnity, employers liability, and product liability. Third-party risks are an immediate concern and are particularly wide-ranging, with potential incidents involving collisions with other aircraft or airborne vehicles, property, or even people, and should be considered together with all associated legal costs.

With the increasing use of UAVs, vulnerability to cyber-attack could develop into a new risk as most civilian aircraft are controlled by unencrypted data for command, control and navigation, meaning they are particularly vulnerable to jamming, interception, and manipulation.<sup>12</sup>

Effective risk management will be critical for the integration of UAVs into everyday life. The extent of cover may also change over time; as operations and the feasibility of UAV use changes, so additional levels of cover or new covers may be required as operational requirements alter.

Public liability policies may not cover the operation of UAVs. Clarity should be sought to determine if specialist aviation cover is required.

Effective risk management will be critical for the integration of UAVs into everyday life.

<sup>11</sup> Information Commissioner's Office (ICO), In the picture: A data protection code of practice for surveillance cameras and personal information, 21 May 2015.

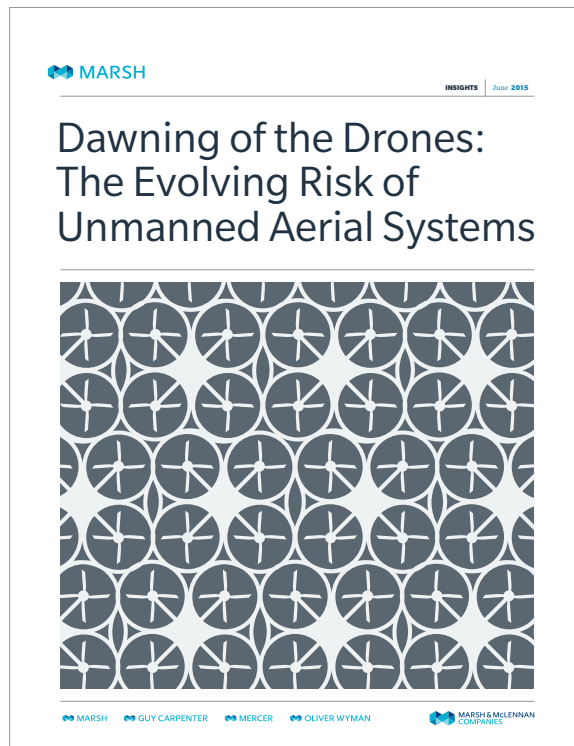
<sup>12</sup> BBC, <http://www.bbc.com/future/story/20140206-can-drones-be-hacked>, accessed September 2015.

## DAWNING OF THE DRONES: THE EVOLVING RISK OF UNMANNED AERIAL SYSTEMS

### The latest thought leadership

from Marsh's Aviation and Aerospace Practice examines in more detail how insurers are using their manned aircraft experience to assess key UAV risks, deliver underwriting capacity, and develop coverage.

Practical applications for UAVs are already underway, with some of the major logistics players investigating the way forward to assist in future growth. This developing technology can reduce risk, increase response times, and enhance efficiency to drive profitable growth. Insurance markets will keep a watching brief on the sector as applications develop and legislative frameworks keep pace.





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## About this report

This report examines how the emergence of drones as a new technology could have an important application in the logistics industry. The Transportation Practice believes understanding and keeping at the forefront of technological change as key to providing best client advice and enhancing the benefits we can deliver to clients businesses.

This report was prepared by Marsh's UK Transportation Practice. The practice is part of a global team of over 500 professionals bringing intellectual capital and service delivery to all Marsh's transportation clients across the whole industry spectrum.

For more information:

**ANTHONY MONAGHAN**

UK Transportation Practice

020 7357 2563

[anthony.monaghan@marsh.com](mailto:anthony.monaghan@marsh.com)

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