CILTNA Fall 2019 Conference

Drone Technology & UTM

New Technologies and Innovation in Transport & Logistics

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Happy Centenary!

- To improve transport efficiency, enable transport integration and encourage talent development in the science and art of transport and logistics.

The Chartered Institute of Logistics and Transport

Forces of disruption….

Changing customer expectations	Faster, flexibility, and at lower price B2B wants efficiency and transparency; B2C wants convenience
Technology	Digitalization and data analytics offer vast opportunities Automation will redefine work & reshape the workforce
New entrants	Asset light or asset-less competitors Exploiting digital technology and rise of the platform
Collaboration redefined	Horizontal collaboration Need for standardization to increase efficiency

In logistics, it's all about the data….

- Knowing where items are and where they are going
- Being able to act on the data at the right time
- New ways of collecting and handling data
- In air transport, digital processes have become the norm and paper is the exception
  - In 2008, the industry moved to 100% e-ticketing and the paper ticket became a thing of the past.
  - In 2019, the e-AWB became the default contract of carriage
- Global transport and logistics is being transformed by digitization

Delivery drones and driverless vans get much attention….

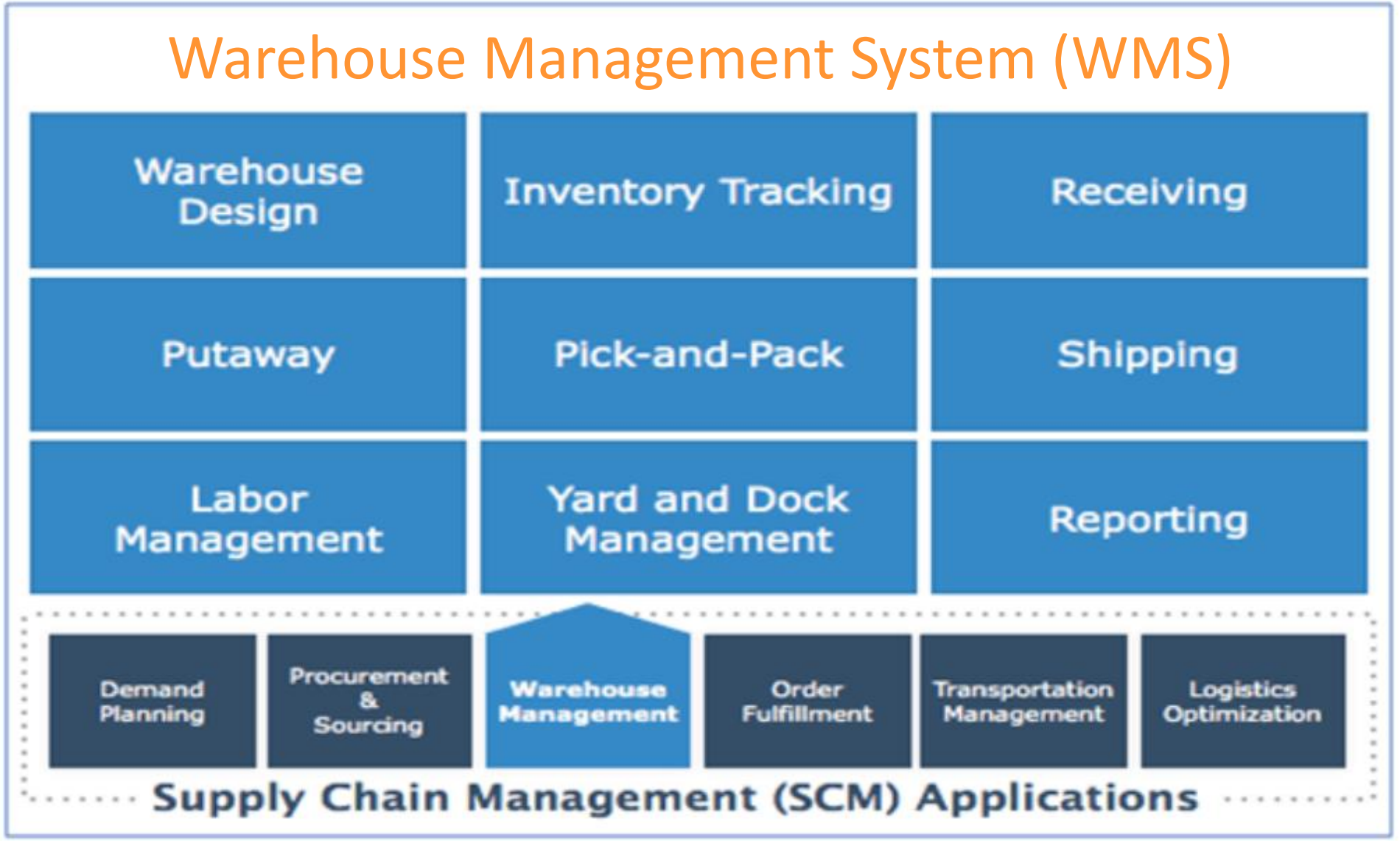
- Due to exponential growth of e-commerce
- Focus on “last mile” delivery and logistics
- **BUT**, supply chain logistics (i.e. factory-to-factory, facility-to-facility, or warehouse-to-warehouse) accounts for 90% of logistics’ industry’s global revenue
- It involves the integration of information flow, materials handling, production, packaging, inventory, transportation, warehousing, as well as security.

How drones contribute….

- Ability to maneuver around and above difficult to reach places
- Tasks that were previously time-consuming, labour-intensive and hazardous can now be made more efficient and less expensive, improving worker safety
- Equipped with cameras and other sensors, make drones ideal for identifying and inspecting items
- In transport and logistics, a drone is a tool with many uses….

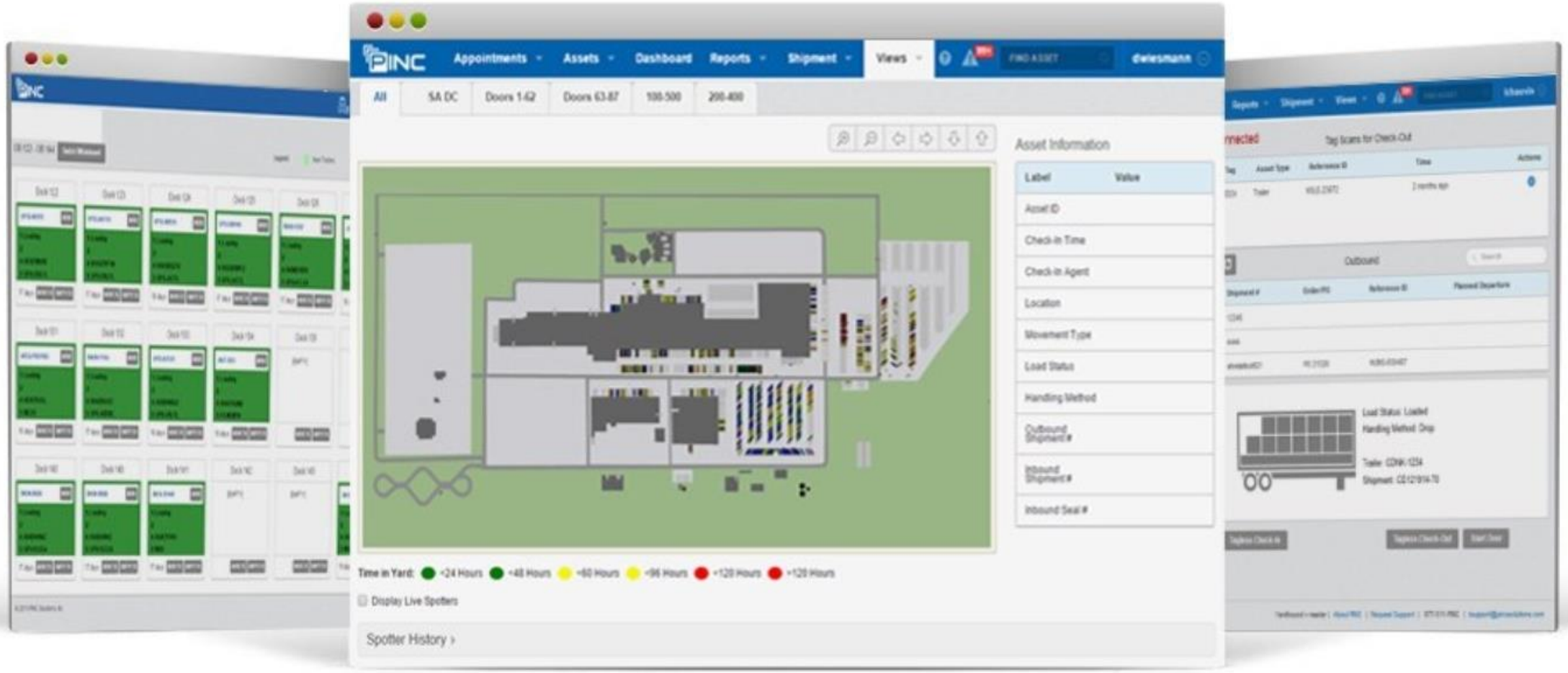
Warehouse & Inventory Management – Inspection & Yard Management – Drone Delivery – Urban Air Mobility (UAM)

Warehouse Management System (WMS)



Warehouse & Inventory Management

Yard Management – the rise of the digital yard



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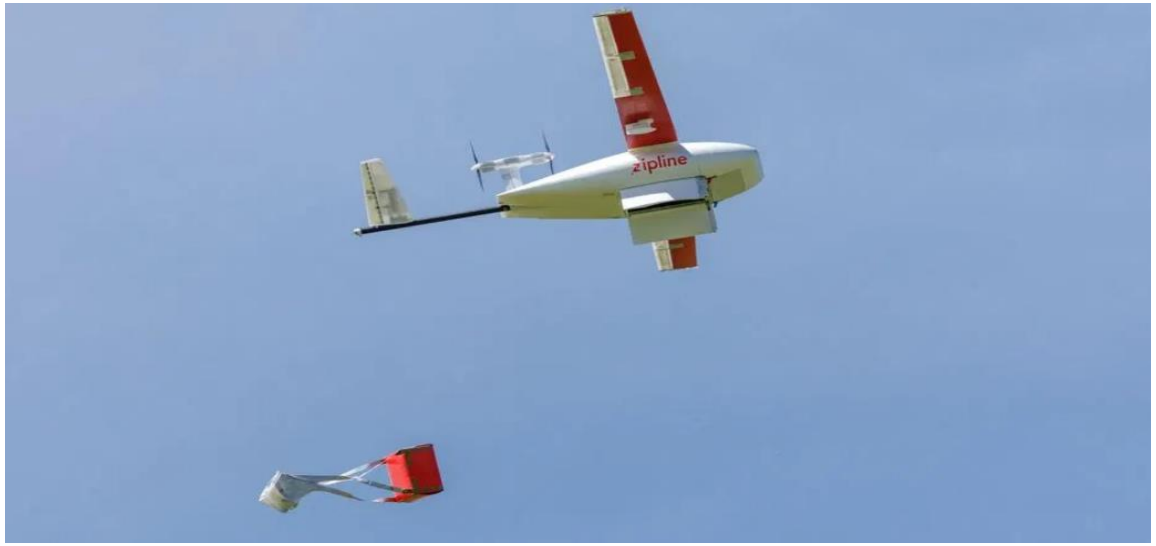
Just-in-time Delivery…..

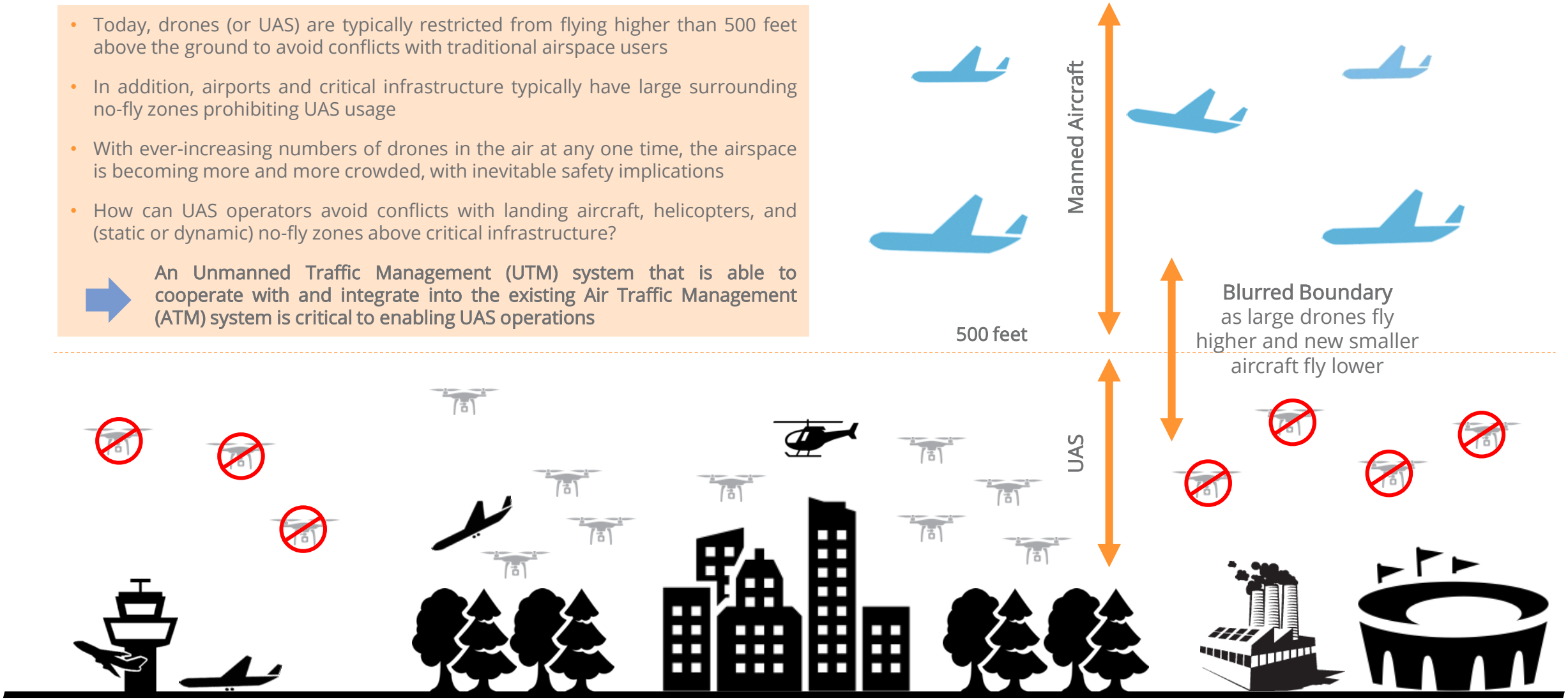


Medical Delivery….

MATTERNET

- Today, drones (or UAS) are typically restricted from flying higher than 500 feet above the ground to avoid conflicts with traditional airspace users
- In addition, airports and critical infrastructure typically have large surrounding no-fly zones prohibiting UAS usage
- With ever-increasing numbers of drones in the air at any one time, the airspace is becoming more and more crowded, with inevitable safety implications
- How can UAS operators avoid conflicts with landing aircraft, helicopters, and (static or dynamic) no-fly zones above critical infrastructure?

An Unmanned Traffic Management (UTM) system that is able to cooperate with and integrate into the existing Air Traffic Management (ATM) system is critical to enabling UAS operations



UTM System – Basic principles

INFORMATION

Airspace legislation

Local Regulations

No drone zones

Wildlife & Private areas

Densely populated areas

Etc.

VALIDATION

Can I fly?

- Yes
- No, because….

Recreational drone users

Commercial drone users

Autonamous drones

NOTIFICATION

Manual

Automatic

Airports

CAA & ANSP

Local authorities,

Police

Project SAFIR

- SAFIR – Safe And Flexible Integration of Initial U-space Services in a Real Environment
- An ambitious demonstration project to demonstrate several U-space services through the deployment of a multitude of UAS and the simultaneous deployment of several U-space service providers covering a complex operational airspace
- Hosted at the Port of Antwerp in a complex airspace

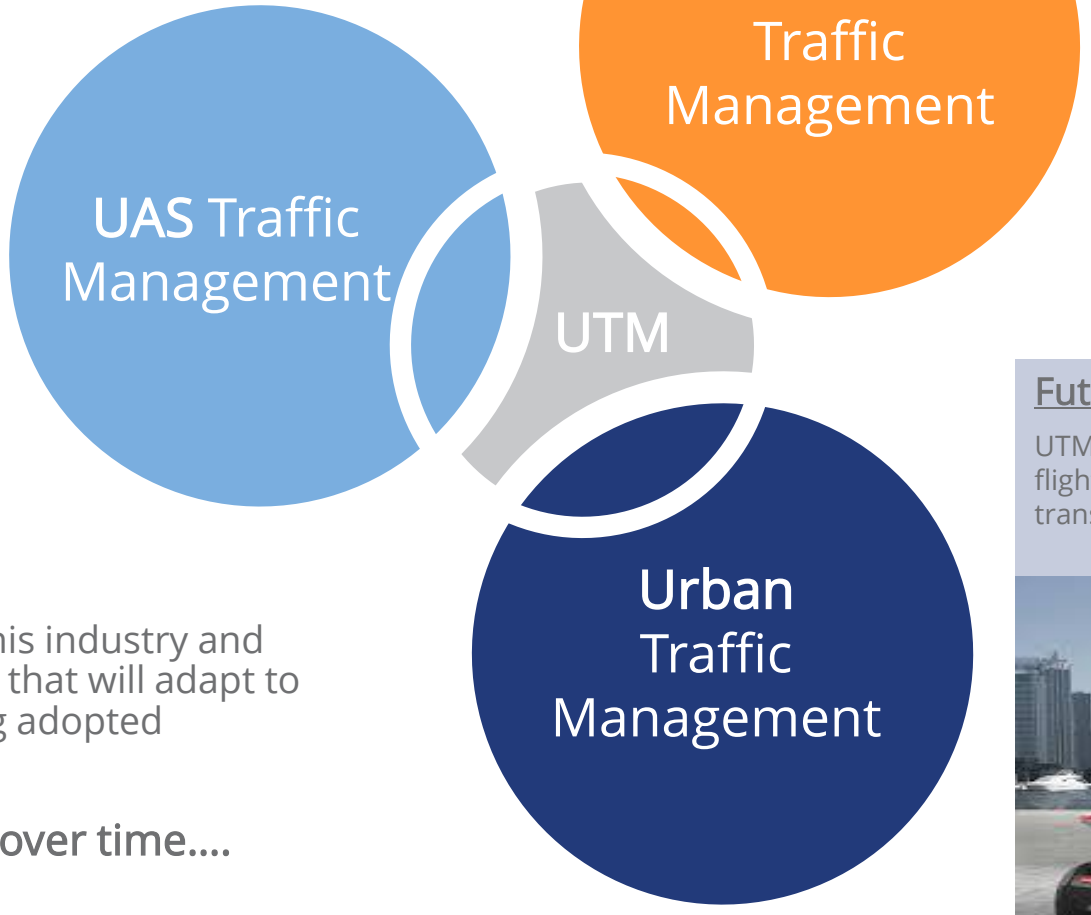
SAFIR
SESAR
JOINT UNDERTAKING
U-space
UNIFLY
amazon
Prime Air
AVEILLANT
A Thales company
C-ASTRAL
AEROSPACE Ltd
DRONEPORT
Sint-Truiden N 50°47'20" E 05°12'06"
elia group
Elia | 50Hertz | EGI
EXPLICIT
HELICUS
Port of
Antwerp
proximus
SABCA
skeyes
nice to
guide
you
TE-KEVER

Antwerp Flight Paths

The UTM ecosystem will grow as the transport industry evolves

Today

UAS traffic management with a high degree of automation and a high level of integration with manned air traffic



The UAS industry is rapidly evolving
UTM is helping to guide and shape this industry and provides a flexible software platform that will adapt to the standards and conventions being adopted

UTM as an acronym will change over time....

Tomorrow

UTM will evolve traditional ATM systems to a highly automated traffic management system for all users of a common airspace

Future

UTM will enable combined surface travel and flight into single integrated journeys as urban transport becomes multi-modal

Urban Air Mobility (UAM)

Implications for policy-makers

- Support **innovation and development** of a nascent industry that can provide commercial benefits and other spin-offs for Canada – *involve other Ministries*
- Develop a **national vision and roadmap** for UTM that will enable BVLOS drone operations and UAM – *in progress*
- Encourage the **development of an ecosystem** where stakeholders can collaborate, coevolve and compete – *in progress*
- Encourage **demonstrations of use cases** that address real needs of society – *in progress*
- Develop **enabling legislation and performance-based regulations** that address safety, security, privacy, environmental sustainability – *significant work ahead*
- Canada is in a unique position: technical know-how; wide open spaces and wide range of applications; involvement and leadership in international standard-setting

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