THALES
Building a future we can all trust

SERVICES

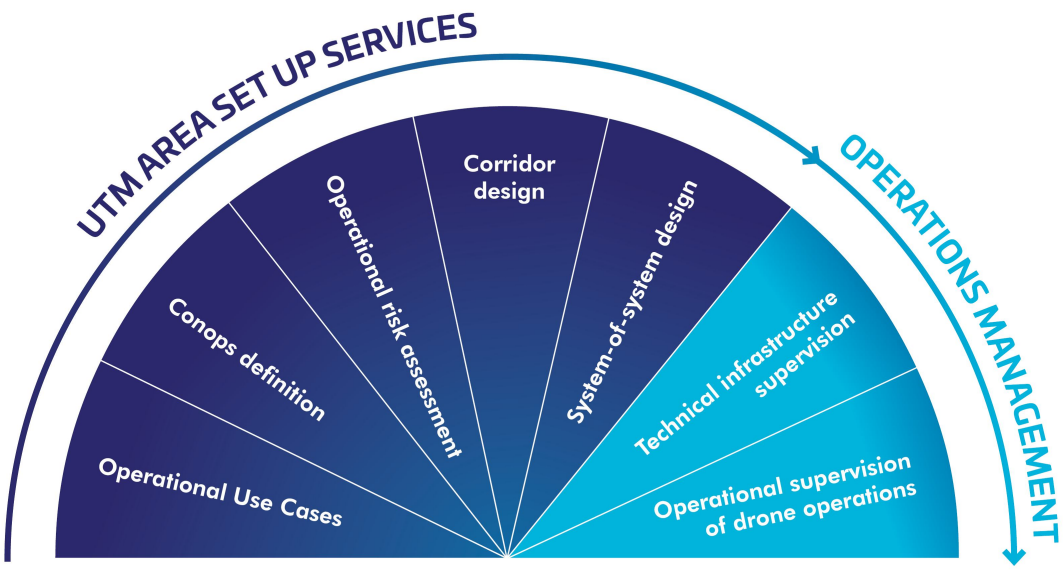
White Paper

To support drone airspace definition and implementation

Enabling BVLOS operations safely and at scale within urban, regional or national areas is a challenge for both authorities and drone operators.

From designing an airspace while assessing the risks to implementing the right solution for local CONOPS and use cases, integrating unmanned traffic with manned air traffic introduces unique economic and social development opportunities.

Leveraging extensive, real-world experience in designing, scaling, deploying and integrating aviation-grade UTM solutions at local, regional and national levels, Thales is your best partner to deliver integrated and harmonious UTM services.



UTM AREA SETUP SERVICES

UTM area setup services consist of the initialization phase of a UTM project

OPERATIONAL USE CASES

With projects across US, Europe and the Middle East, we work with our customers to evaluate and develop drone use cases that bring economic and social value.

HARBOR USE CASE

Your local harbor can benefit from a variety of drone use cases, including:

Security: Customs officers utilize drones to combat smuggling, while law enforcement agency leverages them for evidence collection.

Ships inspection: combining high infrastructures and a wide surface to monitor for potential damages, ships are complicated to inspect, and drones are the perfect solution for these inspections.

Waste / Fuel Dumping prevention: Port Authorities, Coast Guards or any other relevant authorities utilize drones to prevent waste or fuel dumping from ships entering territorial waters.

Environment impact monitoring: drones are employed for environmental monitoring tasks, such as verifying smoke emissions to curb atmospheric pollution or monitoring illegal discharge of effluents from ships tanks leading to prosecution.

Delivery: drones are used for transporting fuel samples for quality analysis, they also streamline port operations by delivering small packages or documents within the port area, enhancing efficiency and reducing ground and boat traffic.

Pipeline & gas terminal: with a grouping of pipelines around a gas terminal, the monitoring of gas infrastructure is critical for this area and drones allow this large-scale monitoring.

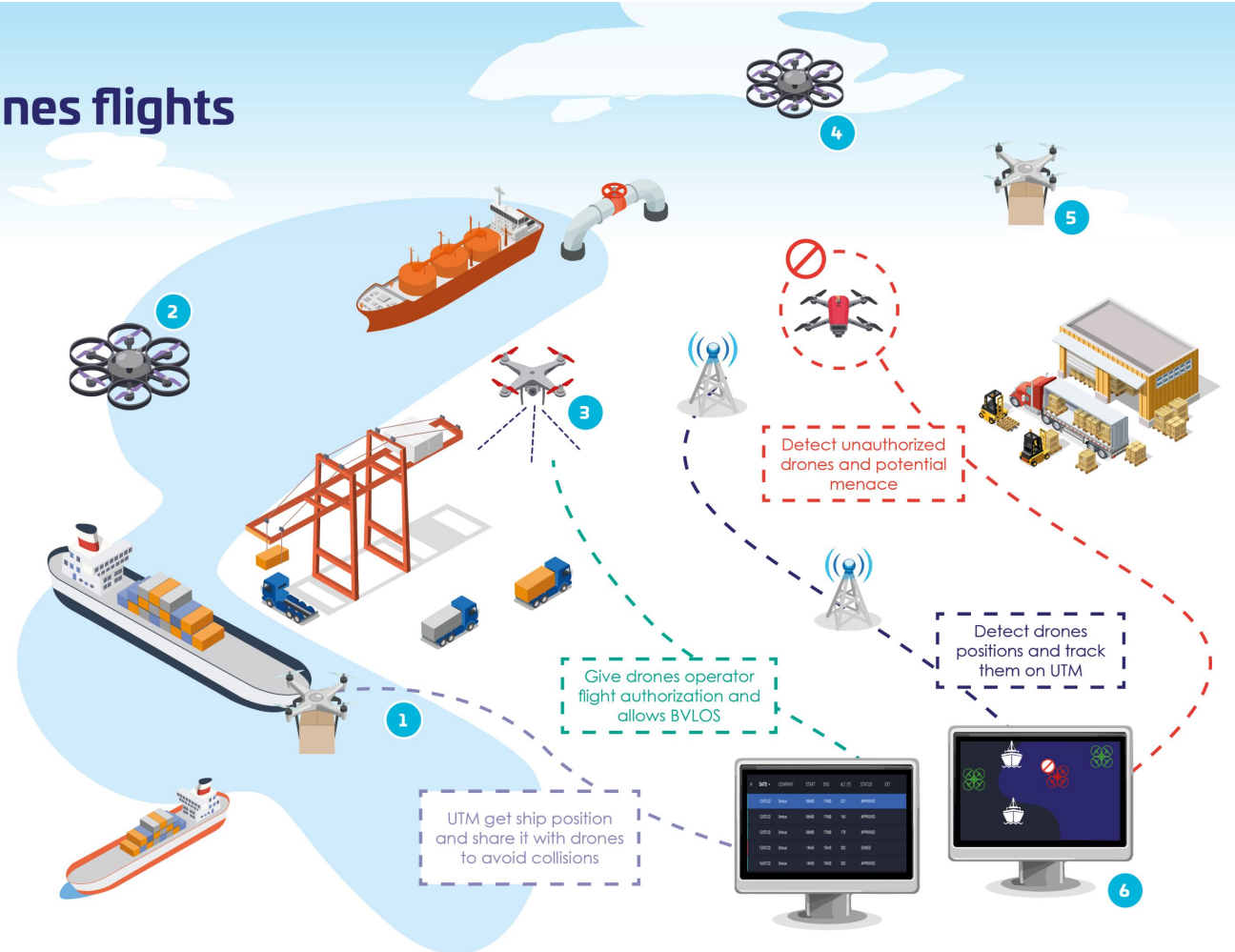
Canal & ship traffic monitoring: thanks to a view from high above, drones make it possible to monitor and manage maritime traffic while controlling surrounding canals.

Ship to Shore: drones are able to provide assistance in supporting logistics operations whereby goods or high value items are transferred to the shore from vessels waiting to enter the port

Disaster Relief: in emergencies drones are able to support operations such as search and rescue; traffic management; medical logistics and security services

How to enable drones flights in a port area

1. Ship to shore delivery
2. Drones inspection, maintenance and environmental impact monitoring
3. Drones surveillance
4. Gas and petrol pipeline/ terminal inspection
5. Logistic Drone
6. Monitor and track drones before and during their missions



AIRPORT USE CASE

Runway inspection: assessing the runway condition is fully doable by drones. With routine missions, the drones identify damage or obstacles as well as checking on the ground infrastructure such as lighting.

Sensor calibration: to reduce manned aircraft flight checks and the associated costs, drones inspect and calibrate flight navigation systems such as ILS (instrument landing system).

Aircraft inspection: by identifying damages and defects faster than through manual inspection, drones allow traceability of the inspection activities through data collection and storage.

Security: Airport security agency utilizes drones to prevent intrusion and non-authorized drones operations in approach corridor.

Emergency Operations & Disaster Relief: drones are able to provide situational awareness and critical items logistics support to the emergency services in high-tempo situations

Perimeter Inspections: perimeter fence routine inspections are necessary especially to counter known threats including protests and terrorism

Logistics Support: whereby there is a time critical need to transfer a spare part or special tool from one side of the airport to another

CONOPS DEFINITION

Today, drone operators must define a concept of operations to reach adequate ground / air risk level and properly use risk mitigation means for each and every unique drone mission. For drone operations that are variable in time, location, duration, and other characteristics,the ConOps process is can be burdensome.

To answer this challenge, Thales supports ANSPs in defining a standard concept of operations for each phase of flight: Preparation of the mission days in advance / Pre-flight phase / In-Flight phase / Post-flight phase and post operations days after the flight.

For each phase of flight the conops describes the different steps that must be performed by the drone operators and by the authorities, i.e. which information should be checked, using which tool or element of infrastructure...

It also defined the triggers to start emergency and contingency procedures to follow.

The Conops ensures the safety case of the system and operations.

OPERATIONAL RISK ASSESSMENT

Operational Risk Assessment enables UAS Operators and authorities to obtain a quantitative and qualitative estimation of air risk in a specific airspace by using historical and simulated data. By doing a statistic assessment of the probability to encounter manned traffic at each point of the airspace, we are able to determine the type of surveillance infrastructure required. This study is conducted by using local available sources or by deploying temporarily sensors for traffic measurement.

The air risk analysis is also complemented with a ground risk assessment to determine, based on population density, nature of overflown infrastructure and impact of the fall-down of a drone if restrictions or specific No Fly Zones are required.

These analyses provide the estimation of air and ground risk to support UAS Operators in obtaining approval to perform BVLOS operations.

CORRIDOR DESIGN

The operational risk assessment coupled with the surveillance infrastructure already existing in your territory and the analysis of additional radar coverage need will allow us to design safe drone corridors. We combine this assessment with the drone specific use cases to find the best corridor design.

The UTM area setup services will enable [LOCAL AUTHORITIES] to set up a preliminary UTM area adapted to local Use Cases and Conops for an initial test area like a BVLOS Corridor.

Thales has done such set up in France for a BVLOS corridor in the south of Paris. The area is equipped with UTM and detection means enabling local drone operators to access a secured area for testing purposes. The “Hub Drone” site in Bretigny has federated the drone regional ecosystem around a common place.

In the UK Thales is working with local ANSPs and the UK-CAA to establish a Temporary Reserved Area (TRA) in the locality of Cranfield Airport. The TRA, when activated, will provide a volume of airspace under local supervision by Cranfield Air Traffic Control. The Cranfield authorities will define CONOPS and entry requirements; this will allow mixed-traffic (i.e. both crewed and uncrewed aircraft) to operate within a defined airspace volume with UTM and surveillance assets in-situ.

SYSTEM-OF-SYSTEM DESIGN

To scale up from a corridor to a regional or national area, BVLOS operations as well as manned and unmanned traffic integration require physical infrastructure for a safe, cybersecured, reliable and comprehensive view of the airspace.

Thales offers to architect and engineer an aviation-grade solution for large coverage volumes. By adapting the solution for a given airspace based upon actual and forecastedunmanned (and manned) aircraft traffic, we design the right infrastructure with the right level of performance, from cloud to detection and communication means.

We combine the assessment of your existing coverage with necessary additional solutions. We handle the system design from finding the right partner and solution to integrating these solutions.

In North Dakota, USA, Thales is the technology partner for Vantis, an aviation-grade system of services enabling BVLOS flights across the state. From market assessment and technical evaluation to system-of-system design and solution implementation, we worked with the Northern Plains UAS Test Site (NPUASTS) and local companies and strategic partners to unlock industrial innovation and autonomy for the State.

As ATM expert, cyber, safety and quality insurance are at the heart of our system design, managing complexity as system maker and aeronautic safety expert it at the core of our expertise.

OPERATIONS MANAGEMENT

Operation management services cater for the run phase to manage a UTM airspace.

To reduce the burden of authorities with traffic management while ensuring end-to-end safety on the system, Thales also proposes Operations management services.

TECHNICAL INFRASTRUCTURE SUPERVISION

To handle traffic in real time with a reliable view of the airspace, the system in place should be operational at any time and authorities should be able to monitor it without burden. Thales proposes a system health monitoring solution looking after the accurate performance of the entire UTM system, including ground infrastructure (Ground Surveillance and Air/Ground Communication), and alerting stakeholders of deviations or problems.

OPERATIONAL SUPERVISION OF DRONE OPERATIONS

To let authorities focus on their main missions and be informed only when necessary, Thales offers drone operations supervision services. By approving, rejecting & managing authorizations for drone flight on authorities' behalf, we will handle day-to-day traffic while keeping you informed only in case of emergency.

To conclude, we propose a tailored services offer to accompany local authorities from the setup of a UTM area - from test zone to regional or national system -, to running a complete system and managing operations; in order to unlock the economic and societal potential of drones with a safe integration in the airspace.

As a legacy ATM provider and system-of-systems architect, Thales is uniquely positioned to deliver an integrated airspace capability for UAS while working on ATM – UTM integration challenges as we foresee a future where manned & unmanned are handled by the same system in the same airspace.

THALES

Building a future we can all trust

Thales LAS France SAS
3, avenue Charles Lindbergh
BP 20351 - 94628 Rungis cedex
marketingams@thalesgroup.com

thalesgroup.com