

CASE STUDY

Altitude Angel and LVNL



Summary

Air Traffic Control the Netherlands (LVNL) connects the Netherlands to the rest of the world and ensures that (civil) air traffic is handled safely, efficiently and reliably. They believe that innovation is the key to success. That's why LVNL focuses on the trends and developments in aviation and tries to respond where possible.

In 2019 [LVNL](#) set out a number of core objectives which included engaging with the SESAR project 'PODIUM' (Proving Operations of Drones with Initial UTM), and to work with industry partners to implement a UTM system, which would enable LVNL to permit controlled drone flights in civil CTRs, while strongly advocating drone detection around airports in order to continue guaranteeing safety.

After a competitive tender process, it was announced in mid-December 2019 LVNL had chosen Altitude Angel, as the technology provider to provide a UTM platform which could be rolled out, not just through its managed airspace estate, but right across the Netherlands.

“It was clear they [Altitude Angel] are providing a ‘best in class’ solution, both functionally and technically, as well as having a high focus on safety. Altitude Angel were able to demonstrate how their production platform will seamlessly integrate with our current systems, but will flex and scale as the use of UAVs increases.”

Jurgen van Avermaete, General Manager Procedures, LVNL.



Why Altitude Angel

As a modern aviation technology company, Altitude Angel is the leading provider of open UTM systems which integrate with ATM technology. Altitude Angel produces several solutions, based on one platform – *GuardianUTM* - aimed at addressing and supporting different sectors of the emerging commercial drone industry.



Why Altitude Angel

On the news LVNL and Altitude Angel would partner, **Jurgen van Avermaete, LVNL, General Manager Procedures**, said: “Together with Altitude Angel, LVNL will deliver innovative functionality and facilitate new possibilities for the U-Space industry in the Netherlands.”

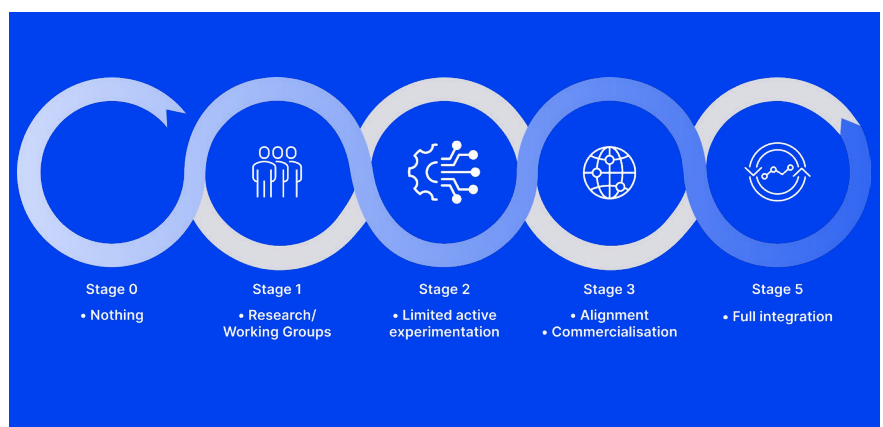
Altitude Angel's core solution, designed and developed for *air navigation service providers* (ANSPs), is *GuardianUTM O/S*. It is a next-generation airspace management operating system, designed to fully integrate drones safely into everyday ATM activities and systems, while remaining fully future-proof to evolve with the changes which are yet to come in this otherwise very emergent industry. It enables an ANSP to offer competitive, UTM foundation services to kick-start a competitive drone services economy in its country, while ensuring the ANSP can establish itself as the central and critical resource in the emerging field of UTM.

“The secret to getting ahead is getting started.” - **Mark Twain**.

Altitude Angel believes UTM concerns itself not with products or services, but with the question of integrating automated aircraft into global airspace. Fundamentally, solving for ‘UTM’ is solving for a next-generation sky: one which is more accessible, inclusive, and technologically available.

To this end, UTM is not a product, but best described as ‘the gradual introduction of more automation into the airspace.’

By working closely together, Altitude Angel and LVNL were able to establish a strategic roadmap, or journey, to deliver several key UTM-focused projects for LVNL. But only after LVNL and Altitude Angel understood at which stage LVNL had reached in its existing journey.

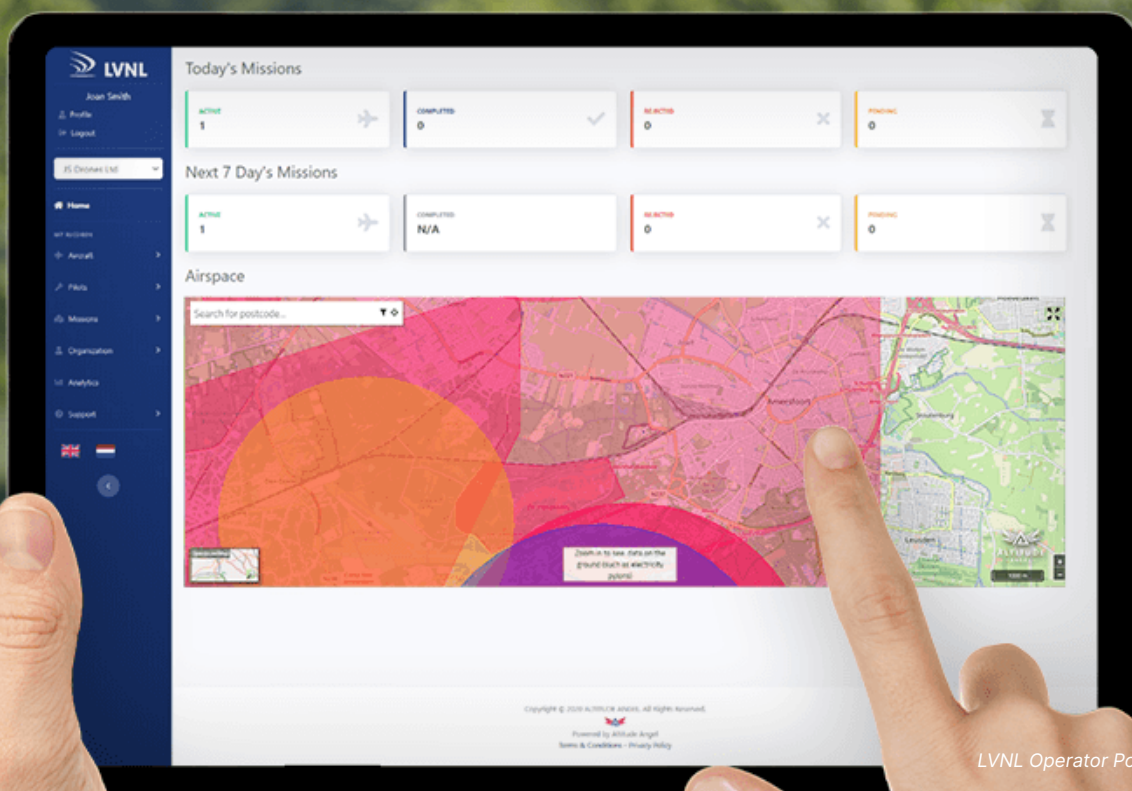


Visualisation of strategic roadmap.



A phased-roll out helped LVNL's controllers build confidence in the technology

Altitude Angel understood LVNL had already begun its UTM journey. "They understood the need for a platform which would integrate drones into managed and unmanaged airspace," Simon Wynn-Mackenzie, Altitude Angel, Product Director.



LVNL Operator Portal view on tablet

Phase 1 – App and web portal

The GoDrone mobile app (for iOS and Android) and companion website is a platform which provides vital safety information to recreational and commercial drone pilots in the Netherlands. The application gives users comprehensive airspace safety information critical to the operation of drones. Notice to Airmen (NOTAMs), ground hazards, terrain and current weather conditions are all displayed on an interactive map and as detailed area reports.

Using Altitude Angel's GuardianUTM O/S as the foundation technology, the mobile and web apps include:

- Multi Language support (English and Dutch)
- Netherlands specific information via local datasets e.g.
- Waterways and "Natura 2000" parks
- A custom set of map layers, indicating ground elevation

"With Altitude Angel we have built a qualitative app in short time. We are looking forward to our cooperation for the coming phases, to further develop the GoDrone web and mobile app to create value for the drone industry in the Netherlands."

Michiel van Dorst, CEO, LVNL.

Having only *announced the partnership* in late December 2019, Altitude Angel delivered the GoDrone web and mobile apps in a little over three months. With Phase One complete, Altitude Angel and LVNL started to work on the next phase, a pre-approval for drone flights in controlled airspace (CTR) as part of the procedural and collaborative interface with ATC through U-space.

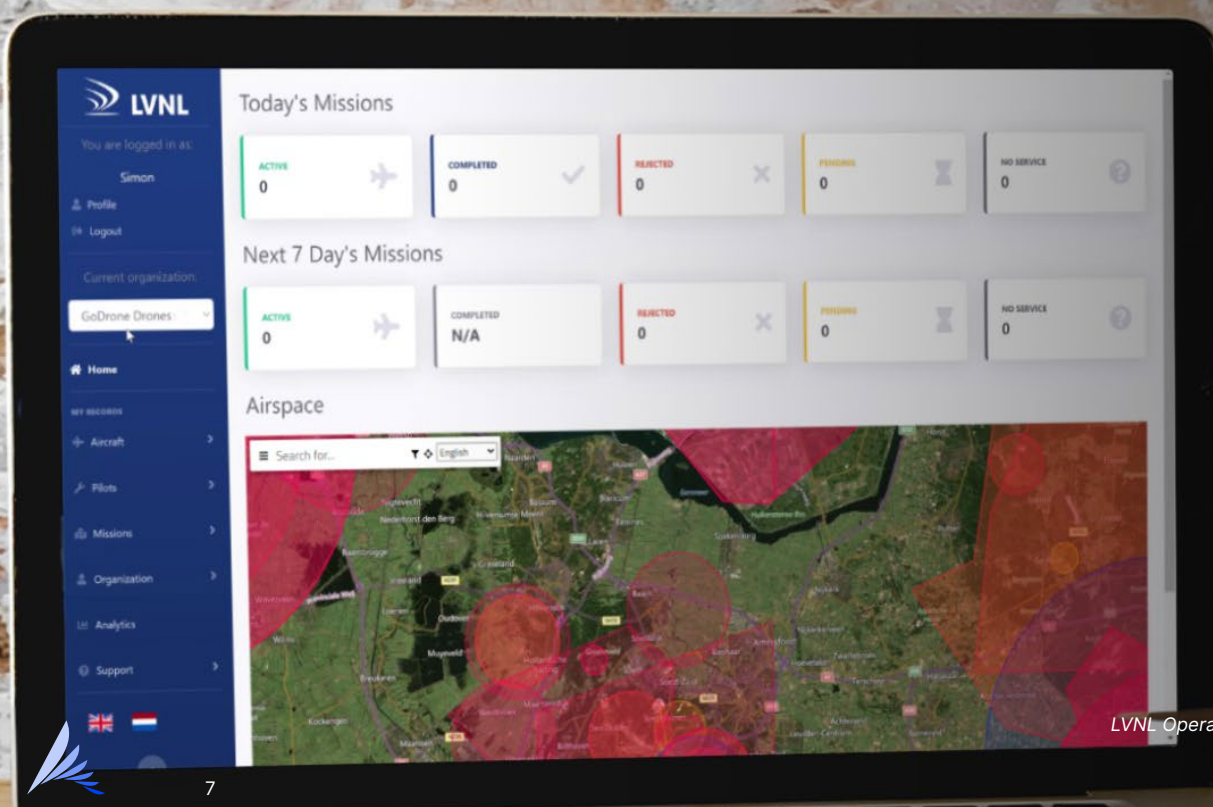
"I'm excited about this milestone," said **Michiel van Dorst, CEO of LVNL**. "The launch of the GoDrone mobile and web apps is the first step in enabling LVNL to build the Netherlands the infrastructure it needs to open Dutch airspace for special flight operations, to commercial drone use and ultimately BVLOS flight."



Phase 2 – Preflight approval and flight planning

Phase 2 sees the introduction two significant upgrades for (professional) drone operators. These upgrades include creating an account in the (web)app and the ability for certified drone operators to submit a pre-application, and receive permission, to fly in controlled airspace (CTR) via the Altitude Angel powered GoDrone app and website.

With the new feature, LVNL is making the process for this kind of applications, which until now was conducted via telephone or e-mail, quicker and more efficient.



LVNL Operator Portal view on laptop

Phase 2 – Preflight approval and flight planning

By creating an account, the user gains access to the GoDrone Operator Portal. This portal is a pre-flight planning tool which provides information about the airspace and obstacles on the ground. It helps the operator to carefully prepare their mission, conduct the drone flight safely and efficiently, and comply with applicable laws and regulations.

In addition, certified drone operators can create a profile for their company in the app. This makes it possible to add other users to this organisation and assign them a role, such as 'drone operator' or 'observer'.

Planning and obtaining preliminary permission for a drone flight in a CTR involves submitting a mission plan via the app or web version. The submitted mission plan is then assessed by LVNL. The submitter of the mission plan will be kept informed of the progress of the assessment via SMS and e-mail. Currently, users can file their request 24 hours in advance.

In the case of a positive assessment, the applicant will be given provisional authorisation.

Crucially, the areas for which an operator has submitted a mission and which have been approved are also visible to all other users in GoDrone. This information will eventually also be used to inform manned aviation (such as low-flying emergency helicopters) about planned and actual drone flights, building a layer of safety into the airspace which wasn't previously there.

"We're excited by this upgrade in the GoDrone app and web portal. Certified drone pilots and organisations can register and create an account for free and in doing so are able to submit preliminary applications for drone flights in controlled airspace in the Netherlands. It is an important step in safely integrating drones in Dutch airspace." **Jurgen van Avermaete, General Manager Procedures, LVNL.**



Phase 3 – Test system

Building on the success and capabilities of the first phases, Altitude Angel and LVNL have *deployed a prototype advanced GoDrone UTM system*. This advanced prototype system puts ATCOs at the heart of drone operations around the major airports of the Netherlands, enabling trials for real time management of drone flight clearance and direct communications between ATCOs and the drone operators.

ATCOs are supported by a sophisticated situational awareness system, providing a birds-eye view of the controlled region with both manned and unmanned traffic displayed. Drone IDs are matched to mission plan and 'Rogue' drones, operating without a mission plan, flight approval or beyond the bounds of either, are flagged to Air Traffic Control. In the case of emergency the UTM zones can be totally or partially closed, with the goal to clear the skies for priority traffic such as Heli-med flights.

This test system is a key step towards the integration of manned and unmanned traffic into a controlled traffic region, giving ATCOs greater situational awareness and greater connectivity to the drone operators. The deployed phase 3 system is presently undergoing testing and acceptance by LVNL, facilitating ANWB Medical Air Assistance conduct BVLOS trials within the Rotterdam controlled traffic region. Further trials are expected to be announced through the Dutch Drone Delta project, committed to 'Creating sustainable social, economic and environmental impact through drones and Urban Air Mobility'.



Ready for the future

GoDrone and the Test system rollout are key milestones in the LVNL and Altitude Angel partnership.

Both organisations share a common objective: to help keep our skies safe. By deploying Altitude Angel's technology, LVNL can now offer dedicated, world-class services to the drone industry, and is able to open the (commercial) opportunities on the horizon.

Evidence shows as drones continue to evolve, they will demand greater access to airspace, further challenging today's aviation systems. ANSPs currently ensure traditional airspace users can access the country's airspace safely. Drones offer a new challenge; ANSP's will need to adapt to meet future needs of their country's aviation industry.



Ready for the future

In the Netherlands we've seen a successful partnership develop; Altitude Angel providing the cutting-edge technology platform needed by LVNL to integrate drones safely into its airspace. This successful partnership has demonstrated how Altitude Angel's technology can be utilised; a model which can be adopted by other ANSPs across the world.

“Our partnership with LVNL demonstrates how we are committed to working with global ANSPs to provide the best solutions, which in turn will allow the ANSP to unlock the potential of drones and energise its country's drone economy. We believe partnerships like this are the future for unlocking the potential for UAVs on a national scale, routinely and safely.”

Richard Parker, CEO, Altitude Angel.

The GoDrone App is available in the Apple Store and Google Play store.



About Altitude Angel

Altitude Angel is an award-winning provider of UTM (Unified Traffic Management) software, enabling those planning to operate, or develop UTM/U-Space solutions, to quickly integrate robust data and services with minimum effort.

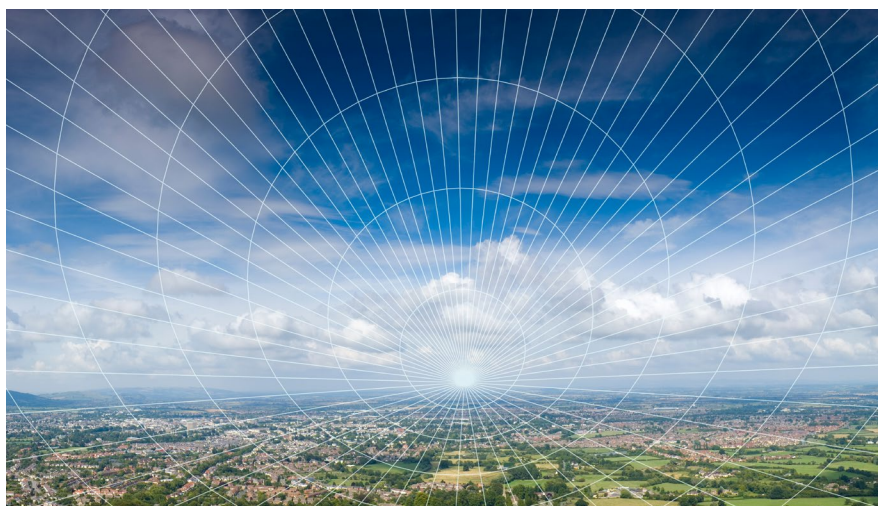
Today, Altitude Angel's market-defining technology is providing a critical, enabling service on which the future of UTM will be built across the globe. Altitude Angel is leading a consortium of businesses to build and develop 165 miles (265km) of 'drone superhighways' connecting airspace above Reading, Oxford, Milton Keynes, Cambridge, Coventry, and Rugby over the next two years. The Skyway superhighway network, enabled using Altitude Angel's patented ARROW technology, will unlock the huge potential offered by unmanned aerial vehicles and be a catalyst to enable growth in the urban air mobility industry.

Altitude Angel's first party solutions also power some of the world's leading ANSPs, aviation authorities and Enterprises, including LVNL (Netherlands) and Avinor (Norway), empowering them with new capabilities to safely manage and integrate drone traffic into national operations.

By unlocking the potential of drones and helping national aviation authorities, ANSPs, developers and enterprise organisations, Altitude Angel is establishing new services to support the growth in the drone industry.

Altitude Angel was founded by Richard Parker in 2014 and is headquartered in Reading, UK.

Altitude Angel's developer platform is open and available to all at <https://developers.altitudeangel.com>.



Contact

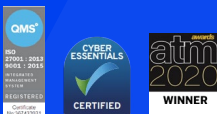
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The information outlined in this document is intended to provide a general overview of Altitude Angel's GuardianUTM™ solution. Details and specifications are correct at the time of publication and may be subject to change. The information in this document may not be used without written permission of Altitude Angel.