



# Unmanned Traffic Management

How we are handling drones for the future

Axel Knutsen – Vice President UTM  
Avinor Air Navigation Services

# AIR NAVIGATION SERVICES EXPLAINED

Gate to runway

Take off and climb

En-Route

Approach and landing

Runway to gate





Safety in aviation is built over time and based on interaction between humans in the same system





The present and future of unmanned aviation has different requirement for both technology and airspace



Larger Craft

Smaller Craft

Helicopters

Small Drones



Package Delivery

eVTOLs

### Future Integrated Airspace

- > Safe
- > Scalable and flexible
- > Interoperable and compatible
- > Reliable
- > Secure
- > Open architecture
- > Open service
- > Future-proof
- > Performance-based standards
- > Fair
- > Cost-effective
- > Flight efficiency



# UTM Explained

## Unmanned Traffic Management (UTM)

- Ecosystem for handling drones
  - **First phase: smaller drones in lower airspace**
- Information to drone operators
- Information to air traffic control
- Access to airspace
- Information and integration to other relevant stakeholders
- Cloudbased architecture





## Current limitations

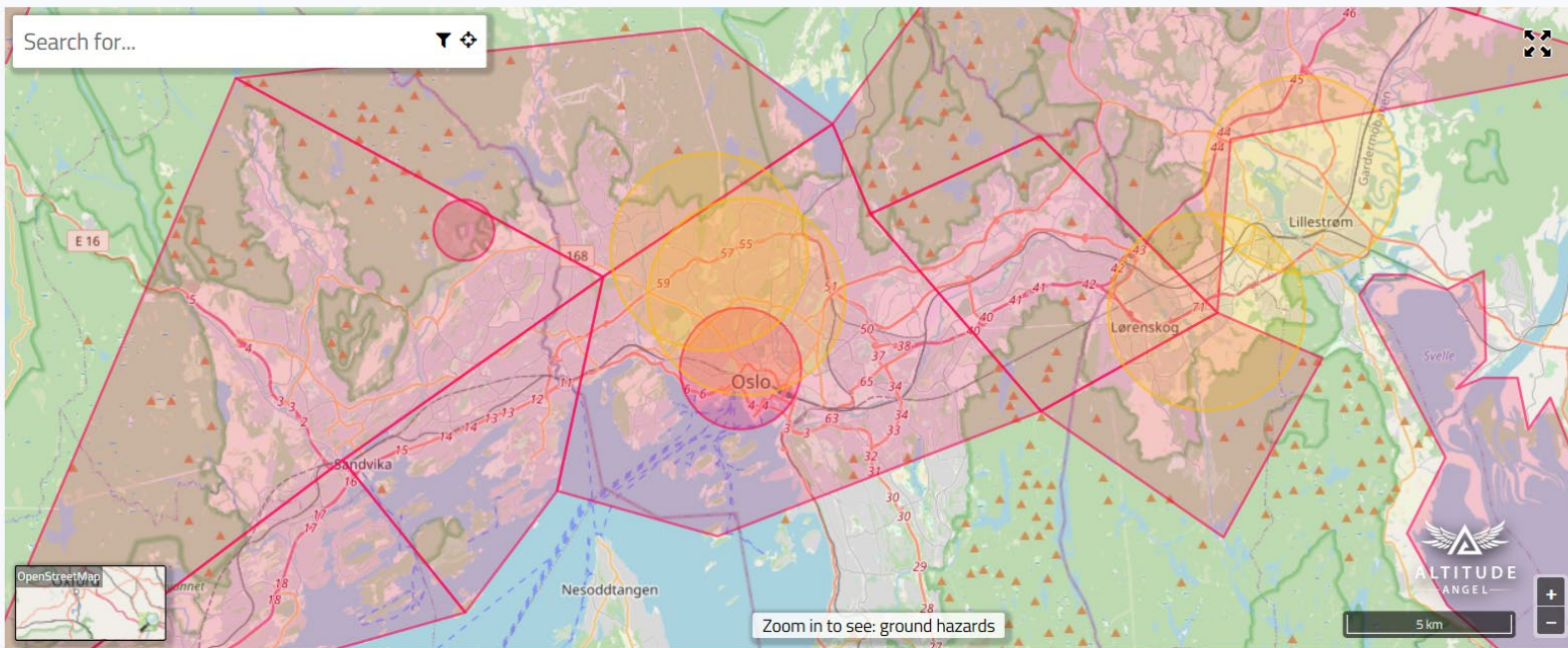
- No «control» of drones
- No anti-drone (C-UAS)
- Controlled airspace only
- Surveillance

# WHY UTM?



- Strong request from the drone community
- Increasing demand and complexity
- Increased safety
- Business development
- Future rules and regulations



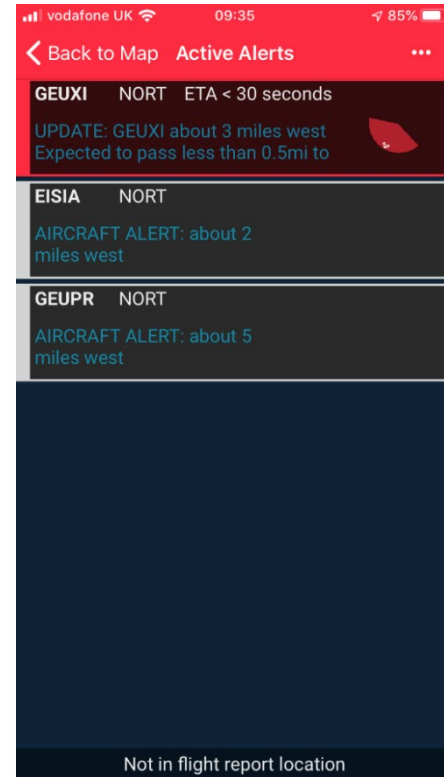
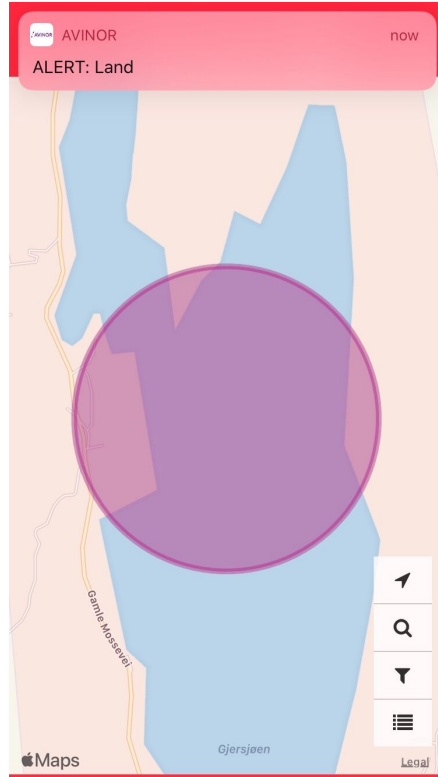
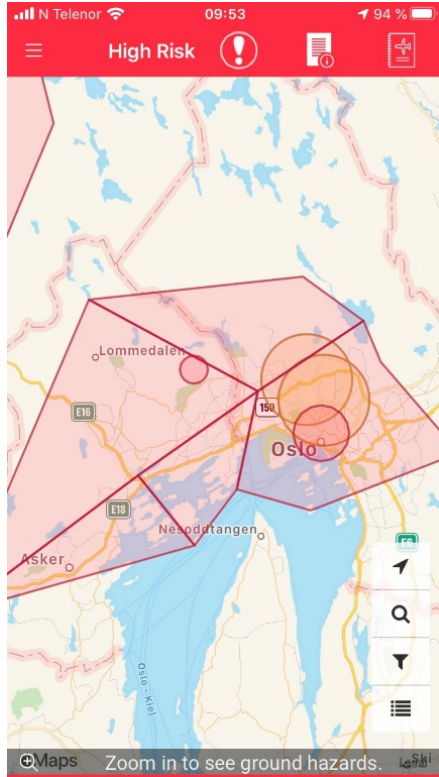


Copyright © 2020 ALTITUDE ANGEL. All Rights Reserved.



Powered by Altitude Angel

[Terms & Conditions](#) - [Privacy Policy](#)



iOS / Android

2 km

RA\_ENKB\_C

ENKB

RA\_ENKB\_B

RA\_ENKB\_A

RA\_ENKB\_D

0

PENDING PLANS

0

APPROVED PLANS

0

ACTIVE PLANS

0

UPCOMING PLANS

0

NDZ

0

ALERT MESSAGE

Restrict AOR

0:0 H:m

2021-03-09 07:23 UTC

Layout:

Map Layers

OK 07:23:55 UTC



# UTM - Today

- Day by day handling of unmanned flights at the 17 largest airports
- Almost 1.000 flights processed during the last 30 days
- Active community



Foto: Anders Martinsen / UAS Norway



# UTM – Phases

## Phase 1: -2021

UTM is implemented at all controlled airports in Norway, served by Avinor ANS

- *Lower airspace*

## Phase 2: 2021-2025

Uncontrolled airspace, cities, industrial areas, new infrastructure etc

- *Increased coverage and airspace*

## Phase 3: 2025-2035

Full integration between manned and unmanned

- Increased coverage and airspace



## FUTURE ROADMAP

- Uncontrolled airspace / AoR
- Surveillance
- BVLOS
- Automation / Automatic
- Use-cases
- API – Third party





**AVINOR**

**AIR NAVIGATION SERVICES**