



**YellowScan**

Designed to Innovate.

## SUCCESS STORY

# Avalanche Risk Detection

CRITICAL INFRASTRUCTURE

**“** This event was a unique opportunity to gain experience and valuable lessons about the requirements when collecting LiDAR data in harsh environment, and we were very impressed with the systems performance.

Martin Andersson – CEO,  
Scandinavian Drone



UAV USED  
**Velos V3**



SOLUTION  
**Vx20-300**

## Business challenge.

The Norwegian Public Roads administration Statens vegvesen and the Norwegian University of Science and Technology (NTNU) organized a proof-of-concept event in October of 2021 to bring together various government agencies to evaluate use of the latest LiDAR and drone technology to help with avalanche risk monitoring. They'd chosen the areas surrounding the iconic road called Trollstigen, Norway, as this has both steep mountains and snow coverage year around on the mountain.

The objective of this event was three-fold. First was to identify and show the capabilities of using drone/LiDAR combination in order to map avalanche risks on roads in real world setting of the mountains.

Second to gather data/point cloud maps of the test areas in order to compare to existing datasets taken using traditional airborne surveying methods at a different time. Lastly, they wanted to create a general benchmark of LiDAR technology available for drones.

 SCANDINAVIAN DRONE

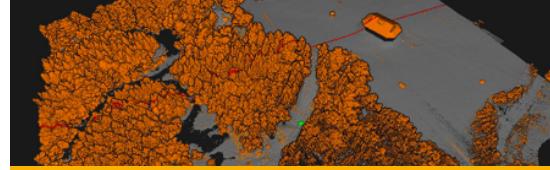
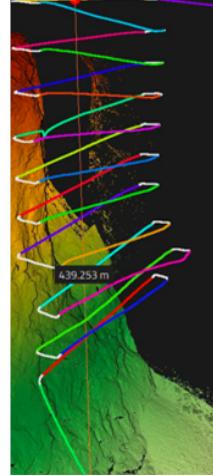
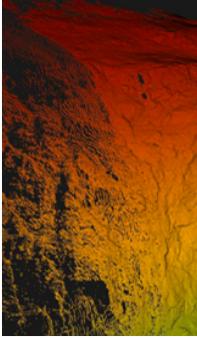
 Orbiton

**Company:** Orbiton

**Distributor:** Scandinavian Drone

**Website:** [scandinaviandrone.no](http://scandinaviandrone.no)

**Country:** Norway



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# SUCCESS STORY

# Solution

## Acquisition.

The event was divided into 3 different missions flown over 2 days. Site A was designed to be the easiest to fly collecting LiDAR data in ideal circumstances.

Site B was designed to replicate the collection of LiDAR data in realistic operational conditions in steep, mountainous terrain above a roadway.

Lastly, site C was designed to be a challenging site, with snow, to replicate a situation where the NPRA needs to collect information from a rugged site a considerable distance above a roadway.

## Solution.

The team flew a VelosV3 drone helicopter that had been customized and “Norwegianized” by Orbiton in order to withstand the challenging Norwegian weather conditions. They mounted the YellowScan Vx20-300 integrating a Riegl miniVUX 3 with an APX20 from Applanix, one of the most accurate fully integrated LiDAR solutions YellowScan offers.



YellowScan Vx20-300 on Velos V3

Flying through +20m/s wind gusts in order to map +600m of cliff vertical mapping was challenging to say the least. After completing the missions, they used the YellowScan CloudStation software to render their point cloud data.

## Mission parameters.

Given the nature of the event all 3 missions had different parameters, here is each set for sites A, B and C.

- **Site A:** <8min flight, 3 extracted strips, 60mAGL, 5m/s 4 ha coverage over field, house and forest, shooting at 300KHz, 120deg FOV
- **Site B:** 28min flight, 26 extracted strips, 690mAGL, 8m/s, level flight along cliff, 360m cliff coverage, Shooting at 200KHz, 180deg FOV
- **Site C:** C1 was an easy to reach area with snow, C2 was a hard-to-reach glacier with snow, 20min flight, 3 extracted strips, 790mAGL, 8m/s, Shooting at 200KHz, 180deg FOV

Since the other participants choose to opt for the easier C1 area or not fly at all, the only hope for collecting data on C2, was left was to our team. The Velos e-copter was sent on a long climb to reach the actual area of interest which was a snow field located approximately 2km horizontal and 700m vertical distance from the take-off point.

## Results.

The Norwegian Public Roads administration and the Norwegian University of Science and Technology were happy with the event because it gave them a good chance to see both drone and LiDAR solutions in the field, in a variety of conditions.

Our team proved they can meet the challenge of flying missions to support the ongoing effort to make avalanche risk detection more predictable and less reactionary as it has been in the past.

The Scandinavian Drone/Orbiton/YellowScan team was the only vendor to collect high quality data from the most challenging areas (B and C2) where the other participants did not attempt the flights.