



# 5 services of Drones for increased airports and waterways safety and security

## D1.11 Preliminary Data Management Plan Document Summary Information

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## Project Summary

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**Work programme topic:** MG-2-8-2019 - Innovative applications of drones for ensuring safety in transport

**Grant Agreement n.** 861635

**Coordinating person:** Philippe Chrobocinski, Airbus Defence and Space (ADS)

**Duration in months:** 36

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**Requested grant:** € 3 497 475

Participant No.	Participant Organisation Name	Short	Type	Country
1(coord.)	Airbus Defence & Space	ADS	IND	FR
2	Future Intelligence Ltd.	FINT	SME	EL
3	Ecole Nationale de l'Aviation Civile	ENAC	RTO	FR
4	Air Force Institute of Technology	ITWL	RTO	PL
5	Vicomtech	VICOM	RTO	ES
6	Hellenic Mediterranean University	HMU	ACAD	EL
7	Ferrovial Corporacion SA	FERRO	USER	ES
8	Greek Water Airports	GWA	SME/USER	EL
9	AirMap Deutschland GmbH	AIRMAP	SME	DE
10	Eurocontrol	EUROC	USER	BE

## Executive Summary

The 5D-AEROSAFE Data Management Plan is a document that will be completed after the detailed design is completed to describe all the data sets that will be managed during the project. It will be updated where necessary during the lifetime of the project. It describes the way the data of the project will be managed during the project duration and beyond. The objective of the data management plans is that all types of data useful to the project (and other projects as well) are clearly identified, FAIR (easily Findable, openly Accessible, Interoperable and Re-usable), that they don't raise any ethical or security concern.

This version identifies the topics that need to be addressed in the data management plans for the next versions.

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## 1 Data summary

The project is built on three main pillars, namely:

- The UAV sub-system that performs the inspections,
- The 5D-AeroSafe platform that handles all the data, manages the missions (task orders and reports and manages the use of the airspace (deconfliction between UAVs and commercial flights),
- Monitoring of the airport status (control tower and ATM).

The data that will be collected and generated after processing fall in these domains.

An important aspect of 5D-AEROSAFE is the monitoring over the time of the events and their effects on the airport/waterport availability. So, both for deep learning method and for statistics, the data have to be kept for several years. Typically, we need data from the last 5 years and data over the whole duration of the project (3 years) to optimize the inspection of the infrastructure.

The origin of the data are the sensors and processing systems that can provide a description of the environment and detect events that can threaten the safety or the security. Among these sensors and processing systems, there are:

- UAVs: In 5D-AEROSAFE, the UAVs are equipped with various types of cameras depending on the defects that need to be detected. In the project, the sensors are mainly cameras and a calibration sensor. The size of the data base collected for the project will be quite huge because it will be thousands of high resolution pictures taken during the project and additionally pictures from external data bases to train the detection algorithms.
- Vulnerability data: these data will combine the descriptive data for the airport and supporting infrastructure (taxiways, runways, parking places, etc.). On the 3D map, the defects will be super-imposed (results of inspections and status assessment). The volume of data is once again dependent on the size of airports and waterports.

The project will create data through:

- WP4 that gathers airport data (pictures, calibration data and respective exploitations).
- WP5 will manage the missions of the UAVs and their reports
- WP6 will integrate all the data to ultimately update the infrastructure management system.

As the system capabilities are optimized with the data and statistics from previous events, the data have to stay in the archives for a very long period of time (at least during the whole life of the components).

The data related to the airports/waterports belong to the agencies that own or manages the infrastructure, namely FERROVIAL or Greek Water Airports in our case. Any additional use that could be done of these data has to be approved by them.

The data collected and processed from external services (e.g. maps, weather conditions) will be protected as per the respective contracts clauses with this external services.

The data cycle is the following one (defined by EUDAT – OpenAIRE):

# Research data lifecycle

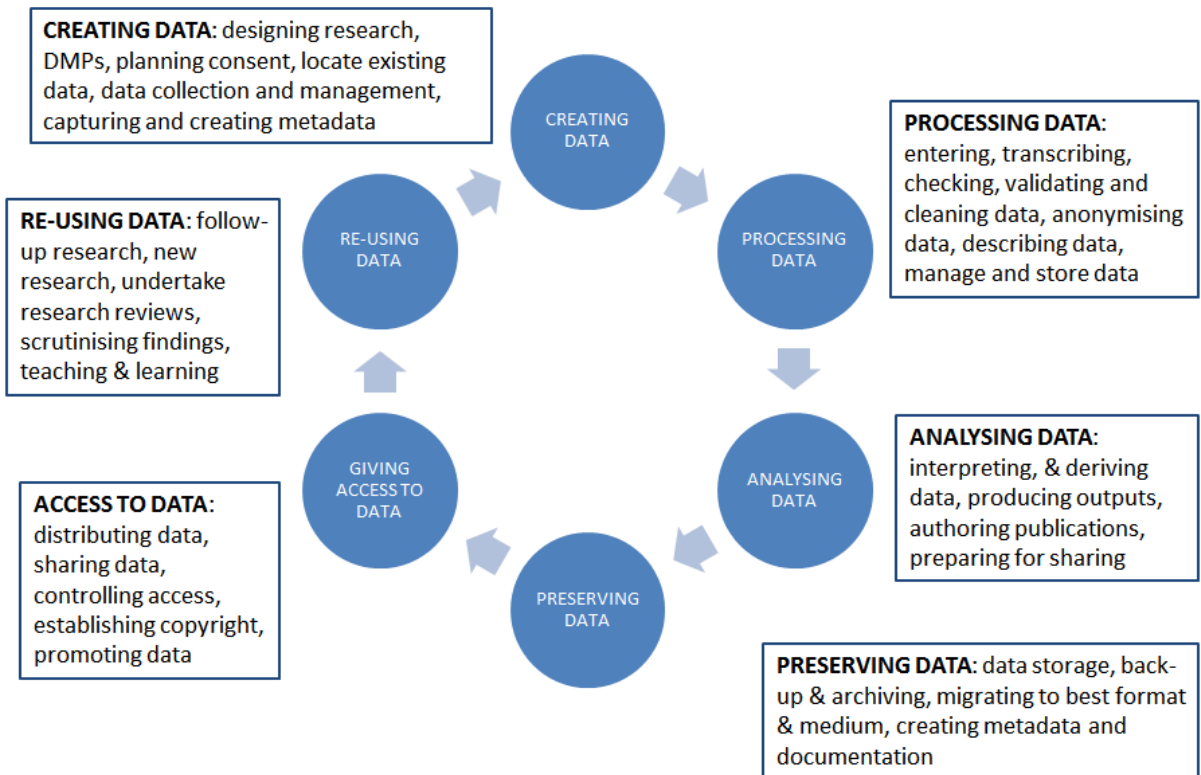


Figure 1 Research data lifecycle

At each step of the cycle, the IPRs and contractual clauses need to be respected. In particular: who owns these data, is the process applied to these data allowed, where will the data be stored and during how much time, who can have access to these data, to do what?

## 2 FAIR data

### 2.1 Making data findable, including provisions for metadata

The data produced in the project will be discoverable with metadata. The majority of the data used and produced by the project will be time-stamped, geo-referenced and classified (generally type of defects).

The UAV are equipped with cameras (EO/IR) so the data are images with their respective metadata. To create accurate 3D maps, the UAVs can also be equipped with Lidars and in this case, the data will be a cloud of points.

The detailed list of the data used and processed in 5D-AEROSAFE will be provided in the next versions of the Data Management Plan structured as per the template provided here-below (one table for each set of data).

<b>DATASET NAME</b>	
Data Identification	
Dataset description	
Source	
Partner owner of the data; copyright holder (if applicable)	
Partner in charge of data collection	
Partner in charge of data analysis	
Partner in charge of data storage	
Related WP(s) and task(s)	
Info about metadata (production and storage dates, places) and documentation?	
Standards, format, estimated volume of data	
Data exploitation (purpose/use of the data analysis)	
Data access policy / Dissemination level: confidential (only for members of the Consortium and the Commission Services) or Public	
Data sharing, re-use, distribution, publication (How?)	
Embargo periods (if any)	
Personal data protection: are they personal data? If so, have you gained (written) consent from data subjects to collect this information?	
Data storage (including backup): Where? For how long?	

## 2.2 Making data openly accessible

At this time of the project, we can make the hypotheses that the data will be stored:

- In the project web site repository.
- At the end-user premises/maintenance systems,
- In the integration platform (system repository),
- At the partners premises.

Some of the data will be collected from external data bases (open) so as to develop system capabilities. It is especially true for images of defects on airports and roads or images of foreign objects that need to be detected. These images will be used to calibrate the detection/analysis algorithms as several modules will use deep-learning techniques. So, the more images will be available, the more accurate the results should be.

In the other way round, some data collected and processed in the project should be made accessible to researchers outside the consortium so they can use them for similar purposes. The WP leaders will therefore decide after the trials which data should be made accessible from outside the consortium in respect of the IPRs and of the data owners decisions.

The repository that will be used for the open data will be accessible through the project website hosted by ITWL.

## 2.3 Making data interoperable

5D-AEROSAFE is dealing with data that describe an environment which is the same all over Europe (and over the world). The type of data is in general standardised but the interpretation that is done from them to produce alerts can vary. The approach in 5D-AEROSAFE is to use as much as possible existing standards and propose standardization efforts in the domain where the standards are not widely used or not yet existing.

For the airport/waterport risks, although not completely standardized, there are very similar approaches in Europe to define them and to define the risk thresholds. The taxonomy and the ontology of the airports will be produced in 5D-AEROSAFE.

For the infrastructure management system, the objects displayed in the situation will be exchanged using pre-standardised or widely spread formats: XML documents collection. Using these formats, the situation elaborated in 5D-AEROSAFE can easily be exchanged with other parties involved in the safety/security of the airports/waterports.

## 2.4 Increase data re-use (through clarifying licences)

The data will start to be available when the first version of the system is integrated and validated (From month 24).

From all the data collected and processed by the system, the data related to the Airport Infrastructure can be confidential. They belong to the owneroperators (respectively FERROVIAL and GWA), so if any third party outside the consortium wants to use them, a case by case authorization is needed from the operators.

The data should be accessible after the end of the project;

The web site of the project will be maintained one year after the project,

Academic and Research partners of the project will continue to use it after the project.

### 3 Allocation of resources

The costs for making data FAIR in 5D-AEROSAFE are related to WP1 (all data) and WP4 (sensors data), managed by ADS and VICOM, with the support of the other partners and the end-users.

The maintenance of these data after the project life-time will be decided within WP1 after the system architecture (especially data models) completion.



## 4 Data security

The data security will be assured by:

- The project data repository (controlled access);
- The partners secured accesses to their data bases.

5D-AEROSAFE data are sensitive, especially for the security aspects. The infrastructure data owners (FERROVIAL and GWA) want to control the use of their data and be sure that they are not used in improper ways.

## 5 Ethical aspects

5D-AEROSAFE data mainly concern physical infrastructures. No part of 5D-AEROSAFE system manipulates personal data.

However, during the tests, trials or dissemination events, pictures of persons can be taken, either by the system sensors (UAV cameras) to illustrate reports or to put in the project galleries. In addition, persons from or outside the consortium can be interviewed.

Any time there will be a collection of personal data (images, CVs, etc.), the persons will sign a consent form under which they accept the use of these data in the context of the project and provided that their use cannot go beyond what is specified in the consent form.

## 6 References

The following documents define the contractual requirements that all project partners are required to comply with:

References used in the development of this plan are:

- Grant Agreement 861635-Research and Innovation Action\_(which includes DOA, Grant Preparation Forms and annexes)
- Consortium Agreement  
This defines the partners obligations towards each other.
- Projects In Controlled Environments-PRINCE2 Methodology
- ISO 31000:2009

Each of the above documents was established at the start of the project, and copies were supplied to each partner. Each document could potentially be updated independently of the others during the course of the project following a prescribed process. In the event of any such update, the latest formal issued version shall apply.

In the event of a conflict between this document and any of the contractual documents referenced above, the contractual document(s) shall take precedence.

## 7 List of Figures

Figure 1. Research data lifecycle