



# Geospatial Data Validation and Correction for your Airport

## A necessary tool to comply with EUROCAE standards

### Organisation

EUROCAE

### Industry

Defence



### Key benefits for EUROCAE

- ▶ Reduction of costs and operational risks
- ▶ Effective management of data and enforcing procedures
- ▶ Accuracy and quality of AMDB maintained

EUROCAE, the European Organisation for Civil Aviation Equipment, formed in Lucerne on 24 April 1963, is a non-profit organisation whose membership exclusively comprises aviation stakeholders from Europe and elsewhere. His mission is to develop performance specifications and other documents exclusively dedicated to the Aviation community.

For EUROCAE, it was necessary to establish specifications for the mapping data in order to satisfy the user needs. AMDB (Aerodrome Mapping Data Base), specified by the EUROCAE, is the outcome of this initiative.

Operations at large aerodromes have become a complex combination of many activities being performed by many individuals. This group of individuals includes pilots, air traffic controllers, apron controllers, surface vehicle operators, construction/maintenance crews, emergency/security personnel, commercial and cargo airline operations personnel, and general and business aviation operations personnel.

All of these individuals must work collaboratively to ensure safe efficient flight operations at the aerodrome. For example, pilots, who traditionally navigate on the ground using visual aids such as airfield markings, signs, and lighting, in conjunction with a paper chart of the aerodrome layout. Radio communications between the air traffic control (ATC) and pilots is carried out to obtain the route that they should follow while on the ground.

### AMDB

An Aerodrome Mapping Database (AMDB) is a geospatial database to describe airports. AMDBs represent a collection of aerodrome information that is organised and arranged for ease of electronic storage and retrieval in systems that support aerodrome surface movements, training, charting, and planning.

Two standards have been defined by the EUROCAE and are specified in two documents:

- ▶ ED-99c: User requirements for aerodrome mapping information;
- ▶ ED-119: Interchange standards for terrain, obstacle, and aerodrome mapping data.

These documents provide minimum requirements and reference material applicable to the content, origination, publication, updating and standardisation exchanges of aerodrome mapping information. They should be used to support the development and application of AMDBs.

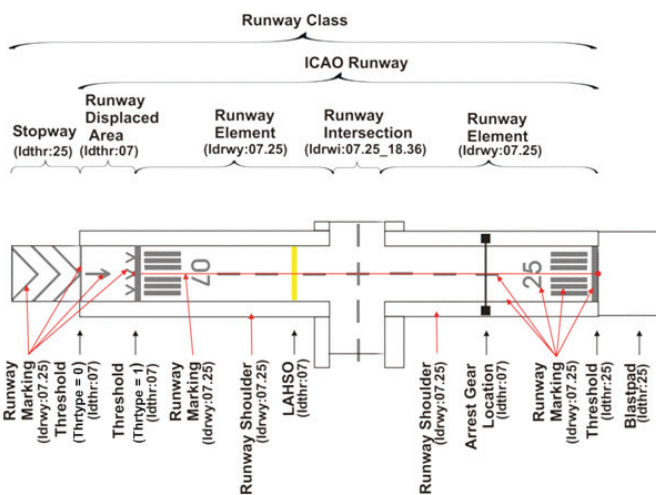


Figure 1: Overview of some runway data elements

## 1Integrate, the solution

Given the complex specifications described in the EUROCAE's standardisation documents, it is clear that collectors & integrators of airport geospatial information will face a significant demand for accurate, reliable and up to date data. In order to achieve this, the planning of field missions is required to be optimised, a capacity to carry out data integration and maintenance of geospatial data is needed including the ability to publish standardised information quickly and flexibly.

The technical solution that we recommend, 1Integrate, has been successfully implemented in numerous cartographic production organisations such as National Mapping Agencies and cadastral services worldwide. 1Integrate allows you to assess the quality of your source data sets, compared to geometric and functional specifications, and to apply transformations in order to make them compliant, through an automated processing service based on rules.

The example below is the AMDB data evaluation result for the Toulouse airport (data kindly lent by the SIA) to Rule 6 specified in the document ED- 99c: "A taxiway element feature adjacent to a RunwayElement should be attached to the corresponding RunwayElement feature".

1Integrate offers a user-friendly web interface to construct rules specified by EUROCAE using topological and attribute functions. Automated sessions can then be run using these rules to evaluate and validate the data returning the non-conformances to the user or alternatively automatically fixing/transforming the geometry and attribute elements of the AMDB. This is an automated process, efficient, accurate and delivers reliable and consistent results.

1Integrate allows automatic updating for datasets as a result of changes made in the field. 1Integrate can also be used for other tasks such as re-engineering of data, data migration to a new system, creation, conflation, inference (automatic deduction of new geometries) or transformation and processing of multiple data sources. The rules are Cloud enables or can be integrated in ArcGIS.

“1Integrate is the ideal solution to meet the user requirements for aerodrome mapping information.”

## About 1Spatial

1Spatial provides the software solutions and services that manage the world's largest spatial big data.

1Spatial works with users and creators of the largest geospatial databases, helping them collect, store, manage and interpret location-specific information.

1Spatial's clients include national mapping and cadastral agencies, utility and telecommunications companies, and government departments including emergency services, defence and census bureaus.

1Spatial provides 1SMS (1Spatial Management Suite), a suite of products to efficiently and consistently plan, maintain and publish your data, whilst also automating your production workflows.

Black cell : geometrical connection is recommended and explicit rule is given below

	RunwayElement	RunwayIntersection	RunwayDisplacedArea	RunwayShoulder	Stopway	RunwayMarking	TaxiwayElement
RunwayElement							
RunwayIntersection	1						
RunwayDisplacedArea	2						
RunwayShoulder	3	3					
Stopway	4	4	3				
RunwayMarking	5	5	3	5			
TaxiwayElement	6	8					15
TaxiwayShoulder							16

Figure 3: ED-99c geometrical constraints table

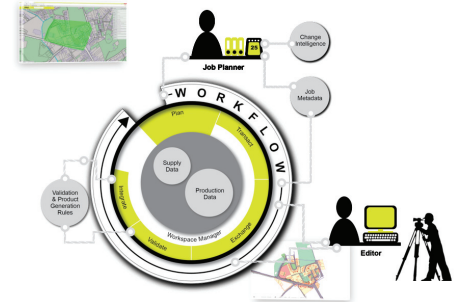


Figure 4: Data management cycle in 1SMS

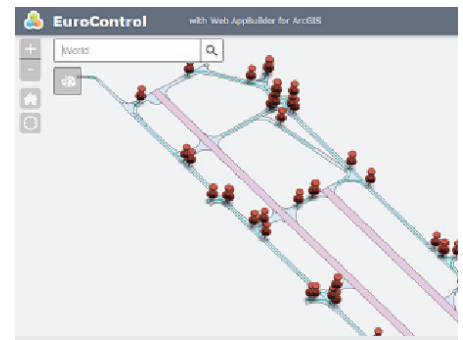


Figure 5: The power of 1Integrate packed into an easy to use widget in the ArcGIS Server environment



Figure 2: violation of rule 6 of ED-99c and corrective action

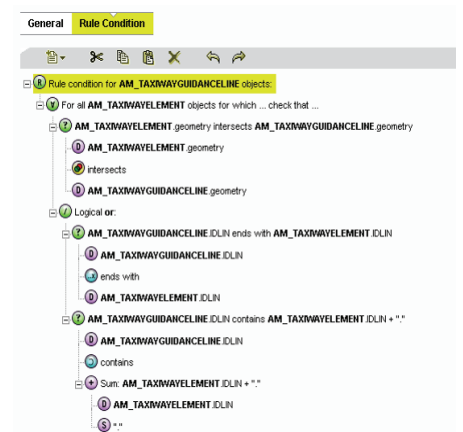


Figure 6: Rule 6 setting in 1Integrate