

Training on basics of GIS and use of QGIS for Aeronautical applications

Course Overview

The PANS–AIM (Doc 10066) document contains several provisions in support of the transition from the product based Aeronautical Information System (AIS) to the data centric Aeronautical Information management (AIM). The latest edition includes detailed requirements for the collection, management and provision of aeronautical data and aeronautical information we well as aeronautical information products and services.

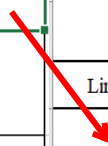
Doc 9881 states that Geographic Information Systems are to be used to produce digital terrain, obstacle and aerodrome databases for producing electronic aeronautical charts or supporting aeronautical applications as per the requirements defined in Annex 15 and PANS AIM (Doc 10066).

[Digital Dataset is the joining of a spatial and non-spatial dataset. Digital Dataset is called the electronic database, but electronic dataset is not a digital database i.e. electronic Aeronautical Information Publication is not digital database because this database is in a tabular format and is not linked to the location of any object. The AIP Data is a spreadsheet whereas Digital Dataset connects the location of an object or feature on earth and its related attributes by a unique location-based identifier]

This course covers Free and Open-Source Software QGIS V 3.40 LTR for compliance with Doc 9881 by ICAO.

Subject	Property	Sub-Property	Type
Runway			
	Designator		Text
	Nominal length		Distance
	Nominal width		Distance
	Geometry		Polygon
	Centre line points		
		Position	Point
		Elevation	Elevation
		Geoid undulation	Height

Type	Description	Data elements
Point	A pair of coordinates (latitude and longitude) referenced to the mathematical reference ellipsoid which define the position of the point on the surface of the Earth.	Latitude Longitude Horizontal reference system Horizontal accuracy achieved
Line	Sequence of Points defining a linear object	Sequence of Points
Polygon	Sequence of Points forming the boundary of the polygon. The first and last Point are identical.	Closed sequence of Points



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Module 1: Fundamentals of GIS

Duration: 2 Hours

- What is GIS?
- Components of GIS
- Spatial vs non-spatial data
- Vector data model
 - Points
 - Lines
 - Polygons
- Raster data model
 - Pixel
 - Image
 - Resolution
- Attribute tables and relational concepts
- Coordinate systems & projections
 - Geographic Coordinate System (WGS84)
 - Projected Coordinate Systems
 - UTM zones

Module 2: Introduction to QGIS software

Duration: 2 Hours

- Download and Install QGIS
- QGIS interface overview
 - Layers panel
 - Browser panel
 - Map canvas
 - Processing toolbox
- Loading data in QGIS
 - vector, raster and attribute
- Understanding CRS [Coordinate Reference System] in QGIS
 - On-the-fly reprojection
 - Geo reference existing map
- Layer styling and symbology
- Labelling and map visualization

Module 3: Spatial Data Management of Aerodrome Features

Duration: 1.5 Hour

- Sources of Satellite Data
- Shapefile vs Geo-Package
- Creating new layers
- Editing and digitizing features
- Attribute editing and Field calculations
- Data validation basics

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Practical Exercise:

Plot a runway with Runway Strip
Create attribute fields

Module 4: Basic Spatial Analysis

Duration: 1.5 Hours

- Buffer analysis
- Clip, intersect, dissolve
- Spatial and attribute joins
- Measuring distance and area
- Error sources and resolution

Practical Exercise:

Plot a buffer around a runway centreline for creation of runway
Extend Centreline for deviated coordinates and drawing strip

Module 5: Creation of Map layout

Duration: 1 Hour

- Layout manager
- Import Map from Canvas
- Update Extent from map canvas
- Adding scale bar, north arrow
- Coordinate Grid Pattern
- Exporting PDF maps
- Preparing maps for regulatory submission

Module 6: Assessment Test

Duration: 2 Hours

Certification Criteria

Participants are certified upon:

- Full attendance (10 hours total program)
- Completion of exercises
- Passing final assessment test

Support

Participants receive:

- Content covered in the sessions
- 30 days technical support