

Drone Zone Austria – Design of a Web Portal for Safe Drone Mission Planning in Austria

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Extended Abstract

The major goal of this exploratory project “Drone Zone Austria” is to design a web portal prototype as innovative contribution to air traffic management in order to support safe Remotely Piloted Aircraft Systems (RPAS, also known as unmanned aerial systems (UAS) or “drones”) mission planning. The web portal will provide a map-based representation of the legally defined 4 areas of operation for professional and recreational drone missions in Austria (Fig. 1). Furthermore, it will include a flight plan safety check incorporating documentation functionality based on the requirements defined in the legal operation approval.

Area Of Operation				
	I undeveloped	II uninhabited	III populated	IV densely populated
Operating mass up to and including 5 Kg	A	A	B	C
Operating mass up to and including 25 Kg	A	B	C	D
Operating mass more than 25kg, up to and including 150 Kg	B	C	D	D

Fig. 1: Categorization for operating RPAS in Austria (LFG, 2013)

In Austria currently 4 areas of operation are defined depending on the building and population density as (I) undeveloped, (II) uninhabited, (III) populated and (IV) densely populated. These areas of operation are described in narrative form, but no spatial map- based delineation are provided (LFG, 2013; LFG, 2016). Any high-resolution and professional drone mission planning has the major goal to derive GPS waypoints used for navigation. Here the boundaries of the operational zones are of special interest as drone platforms are certified for specific operational areas as stated in legal issued drone individual drone operation approvals. Violation of such an approval may result in fines up to 22,000 €. Therefore a strong need for a scientific-based extraction and map representation of these 4 operational zones exists. Furthermore, commonly used data sources like Google Maps, Google Earth or Bing Maps have

no legal reliability and actuality, but are used very often as main base spatial information for Remotely Piloted Aircraft Systems mission planning.

The key foundation of the web portal is a geospatial “*Drone Zone Model*” derived from available and up-to-date high quality “trusted” geodata sources (e. g. address locations, road network, aviation control zones). These data are provided by the Austrian public administration and the Austrian Aviation Control as a result of the Open Government Data Initiative and the European INSPIRE Geodata Infrastructure directive.

Important goal of this project is the integration of RPAS-relevant aviation information as listed in the Aeronautical Information Package (AIP; “*Luftfahrthandbuch Österreich*”; AIP 2017). We are currently in the process of defining aviation data relevant for supporting RPAS mission planning in close collaboration with aviation domain experts.

The use of RPAS at professional as well as recreational level has been risen tremendously in the last years. This situation might cause an increased risk potential and probability for incidences. Based on an estimation of the Austrian Aeroclub there have been about 17,000 drones sold only for recreational use in 2015. We argue that there is not only in Austria an urgent need for awareness building due to the wide lack of missing knowledge and drone mission regulations. Consequently, the need for safe RPAS mission planning is now more relevant than ever before.

RPAS mission planning is a spatial task that needs high quality, accurate and up-to-date situational awareness information about the area of interest for safe planning and operation. Currently, no solutions respectively tools providing all necessary information needed for spatial RPAS mission planning exist – neither in Austria nor on the international level. Each nation in the EU has either no or its own regulations for RPAS below 150 kg maximum take-off weight.

Currently a proposal by the European Aviation Safety Agency (EASA) A-NPA 2015-10 (EASA, 2015) for introduction of a regulatory framework for the operation of drones representing an EU-wide regulation framework for RPAS for weight classes below 150 kg is in discussion. In this EASA announcement, different areas of operation depending on the population density are proposed additionally to geofences and no or limited drone zones (Fig. 2).

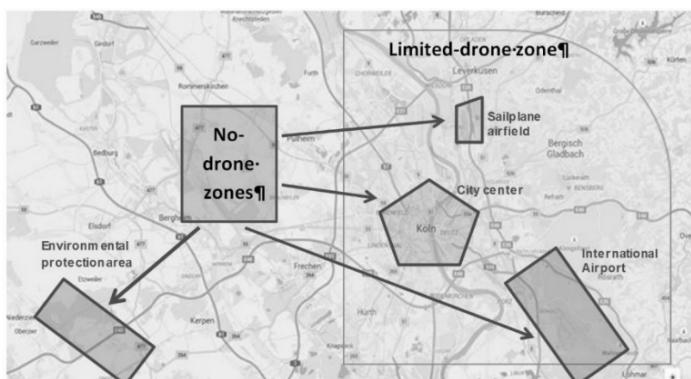


Fig. 2: Proposed EASA ‘no-drone zones’ and ‘limited-drone zones’ map (EASA, 2015)

Therefore, this exploratory project will make a conceptual and proof-of-concept approach for an adoptable map-based representation of different areas of operation as defined by UAS aviation regulations. We will present and critically discuss our approach and open issues of the new “Drone Zone Austria Model” at the conference.

The expected results of this project are intended to provide the foundation for designing an adaptable and unified “*Drone Zone Europe*” web portal in order to support unified, “*one-stop-shop*” spatial drone mission planning conformable to EU UAS legal aviation regulations.

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