

66th International Astronautical Congress 2015

SYMPOSIUM ON COMMERCIAL SPACEFLIGHT SAFETY ISSUES (D6)  
Enabling safe commercial spaceflight: vehicles and spaceports (3)

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DEVELOPMENT OF INTERNATIONAL URBAN SPACEPORTS

**Abstract**

Ten years ago, conventional thinking regarding spaceport site selection was that only remote locations with vast areas of uninhabited land were suitable as spaceport sites. Flying in the face of this widely held consensus, in 2006 the Jacksonville Aviation Authority began the engineering and safety analysis process to obtain FAA-AST approval of a Spaceport Operators License for Cecil Field, a closed Naval Air Station that had been transferred to JAA for operation as a general aviation airport. The license was granted in 2010, thereby providing an Existence Proof that a commercial suborbital spaceport could be located in an urban area with a population of over one million residents, and still meet the FAA-AST safety standards. This pioneering work by JAA has opened the door for commercial spaceport site selection on the international front in places with substantial existing tourist infrastructure and a local user community. The 2012 Tauri Group suborbital market study identified the population of likely candidate suborbital customers, and showed that the ultra high net worth individual customer base is split into roughly equal thirds between the Americas, Europe and Asia. Since the view of the Earth from a 100 km apogee is very regional at about a 1,000 km viewing radius, it is the author's hypothesis that suborbital customers will prefer to see familiar landscapes and landmark geographical features from space during their once in a lifetime spaceflight experience. Therefore, development of commercial suborbital spaceport sites in desirable urban locations in Europe and Asia is a key factor in market growth for the industry. This paper will examine case studies for three international urban spaceport locations with different classes of existing airport infrastructure and different market dynamics, as well as different air traffic control integration challenges. The spaceport sites are Glasgow Prestwick Airport, Barcelona Lleida Airport, and Singapore Changi Airport. Market drivers for each site's spaceport licensing; political, legal and regulatory issues and initiatives; and physical infrastructure and airspace considerations for each location will be reviewed and discussed, and a competitive assessment of each location will be performed which can then be applied to additional proposed spaceport locations around the world.