

# The feasibility of implementing continuous decent approaches in highly congested ...

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## Feasibility of Implementing Continuous Descent Approaches in Highly Congested Airspace Presented Feasibility of Implementing Continuous Descent Approaches in Highly Congested Airspace

In the conventional aircraft approach towards landing, an aircraft is cleared by the air traffic Control from an attitude of between 7000 and 6000 feet to make a descend to an attitude of about 3000 feet, fly at this level for a few miles before intersecting the final 3 degrees grid path that takes the plane to the runway. This needs additional engine power resulting in noise pollution and exhaust gas pollution (Civil Aviation authority, 2009). However in the new principles of landing under Continuous Descent Approach (CDA), the aircraft has to stay higher for longer, and then to descend continuously from the level of bottom of stack, intercepting the 3 degrees grid path to runway (Civil Aviation authority, 2009). This method does not require any additional engine power. The approach involves much less noise and reduces environmental pollution. Therefore, though not widely embraced in aviation (Shresta, Neskovic & Williams, 2009), CDA promises much better environmental sustainability in the future of aviation industry, due to significantly reduced fuel consumption and much less noise pollution. However, CDA in densely populated and congested airspace may not be reality due to space constraints and the requirements of a clear flight path for each landing plane.

Alam et al (2010) in a study on dynamic CDA methodology of noise and emission reduction observed that there are 64 possible dynamic CDA routes at the Sydney airport. This implies at any one time, 64 airplanes can land on the airplane at different CDA routes. This was found to have a reduction of

14. 6% noise, 11. 6% nitrogen oxides, and 1. 5% reduction compared to standard CDA trajectory route. Such a model offers approach in highly congested airspace. However, Robinson & Kamagarpour (2011) stressed that traffic separation demands and airspace restrictions should not in any way interfere with flight decent path. On the other hand, Dinges (2007) explains there are only a few studies on involving large numbers of flights in an individual airport. Alcabin et al (2009) extrapolated a small number of flights to the entire NAS, to portray effect of mass decent by planes in different airports in both congested and uncontested periods. Tong (2006) investigated the benefits of new approach procedures using dual runaway operations at IAH airport. Moreover, Wat using flight recorder data estimated the benefits of about 150 continuous descent operations at Schipol (Wat, 2006). Reynolds (2009) while using flight recorded data tried to separate the vertical path and speed inefficiencies of current landing operations with about 1800 European airbuses A320. However, Morrell (2008) explains that busy airports may not be in a position to allow such flight approaches. These studies have limitations in mixing types of aircraft's, focusing on a single type of aircraft, and limits in uneven demand levels by aircrafts and airports.

#### Methodology

The issue of CDA in a highly congested airspace presents major challenges. While there has been an overall agreement on the benefits of CDA in a few numbers of landing aircrafts, several studies have tried to explain the effects of mass landing in busy airspace. This report will carry out a feasibility study of CDA in highly congested airspace to determine the viability of this approach, considering the limited space need to have a clear aircraft path

and other major restrictions in airspace. Thompsons (2003) explains a feasibility study as an attempt to explore the viability of an idea in determining opportunities, problems constraints, the plane landing principles and dynamics. This research will outline various studies that have been done on CDA particularly in high density airports, to examine the viability of the idea, which as (Shresta, Neskovic & Williams, 2009) argues has attracted much less analogous studies.

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