Performance, Geometry and Procedures to Enable Safe Operations at Heliports

GAMA EPIC Infrastructure Subcommittee

Resource Paper, Version 1.0

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Record of Revisions

Revision Number	Date	Comments
Version 1.0	13-07-2021	First Edition – Original Release

Summary

The attached a resource paper aims to support FAA interim guidance to supplement the FAA's heliport design advisory circular, AC 150/5390-2D.

Adequate performance, geometry and procedures are necessary for safe heliport operations. This document suggests baseline flight performance expectations, informed by key learnings from the helicopter industry and the constraints of heliport airspace. Geometric conversions are provided to determine adequate facility sizing for aircraft other than helicopters. Finally, it reinforces the pilot's responsibility to determine whether their aircraft has the performance to operate safely at a particular takeoff and landing facility.

With several eVTOL aircraft progressing through type certification and advancing toward initial operations, it is more important than ever for the FAA to provide guidance to facility sponsors to support the safe utilization of existing and future aviation infrastructure.

This resource paper was developed and approved by consensus from Bell, Beta Technologies, Joby Aviation, Kittyhawk, Lilium, Overair, Volocopter, and Wisk and then reviewed and approved by the Infrastructure Subcommittee of GAMA's Electric Propulsion and Innovation Committee (EPIC) comprised of GAMA's broader membership.

EPIC

The Electric Propulsion & Innovation Committee (EPIC) of the GAMA Board of Directors enables hybrid & electric propulsion, increased automation and other key innovations into general aviation design, production, maintenance among the global aviation regulators in key states of design. The EPIC also supports concepts and changes to operational and licensing obstacles which may exist in key markets.

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Performance, **geometry** and **procedures** to enable safe operations at heliports

The following criteria are suggested as a baseline to evaluate the compatibility of an aircraft and a heliport built according to the standards provided in FAA AC 150/5390-2D.[1]

Performance

Element	**Demonstrated Capability**
Takeoff	Hover at relevant weight, CG and atmospheric conditions
Climb	Climb above 8:1 departure surface; H-V envelope and risk-minimizing procedures documented in AFM
Approach	Descent above 8:1 approach surface; hover margin available (surface: IGE, elevated: OGE)
Landing	Termination of approach to stationary hover, no braking loads applied to the pad
Controllability	17 knot all-azimuth performance

Shallower flight paths may be acceptable when sufficient object free airspace is available on an approach/departure path.

Geometry

Adequate TLOF, FATO and Safety Areas sizing is based on the following aircraft dimensions:

Dim	Item	5390-2D Table 2-1	Modified Value
A	TLOF Length	1 x RD	Greater of Width or 0.83 x Overall Length*
B	TLOF Width	1 x RD	Greater of Width or 0.83 x Overall Length*
C	FATO Length	1.5 x D	1.5 x (Greater of Width or Overall Length)
E	FATO Width	1.5 x D	1.5 x (Greater of Width or Overall Length)
F	Separation between TLOF and FATO perimeters	¾ D – ½ RD	0.4 x (Greater of Width or 0.83 x Overall Length)
G	Safety Area Width	⅓ RD but not less than 10 ft**	⅓ x (Greater of Width or 0.83 x Overall Length) but not less than 10 ft

*See 5390-2D Section 2.7.2.1 for provisions to size the TLOF according to undercarriage length or width.
**See 5390-2D Table 2-4; assumes PPR heliport with TLOF perimeter marked, standard H marking.

For any other use of RD or D, use the following conversions:

- Rotor Diameter (RD) = Greater of Width or 0.83x Overall Length
- Overall Length (D) = Greater of Width or Overall Length

Procedures

- The aircraft flight manual provides information necessary for the pilot to understand performance limitations and recommended schedules of maneuvers.
- The pilot considers heliport information alongside aircraft performance data, atmospheric conditions, and takeoff weight to determine whether the flight operation will be safe.

[1] As of June 2021, this edition is still in the draft stage and subject to revision