

UBER

# VTOL & Vertiports - A look at the Future

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Rex Alexander

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[https://www.youtube.com/watch?v=JuWOUFEB\\_IQ](https://www.youtube.com/watch?v=JuWOUFEB_IQ)

# Recent developments

**Los Angeles** will be uberAir's second launch market and the mayor and local real estate companies are very supportive of this type of new technology.

**NASA** continues to be a key partner and enabler; existing Space Act Agreement focusing on UTM will be expanded to support urban air mobility airspace simulations and CONOP validation

**Common Reference Vehicle 001** was recently introduced to socialize technologies and design concepts that we believe will help accelerate eVTOL aircraft systems development



# Operational design principles

- **Safety:** achieve ops 2x safer than driving; non-negotiable -- the leading concern in every aspect of ops design
- **Customer Experience:** create value through reliable, comfortable and intuitive end-to-end convenience
- **Airspace Harmony:** be responsible airspace users, proactively deconflict operations and develop cooperative systems
- **Efficiency:** maximize network throughput; minimize energy consumption
- **Positive Community Impact:** develop trust, reduce negative perceptions; deliver benefits that far outweigh objections
- **Scalability:** design for scale today - high density, high frequency, autonomy

# Infrastructure & Vertiport Design



# What is a eVTOL vertiport

A location designed to specifically support the operations, eg. landing, takeoff, parking and taxiing of eVTOL (electric Vertical Takeoff and Landing) aircraft.

Different than an airport or heliport in that a eVTOL aircraft:

- Does not use liquid fuel
  - Does not require a foam fire suppression system
  - Does not require a fuel spill kit
  - Does not require a fuel water separator
- Are all electric aircraft
  - Will use onsite electrical rapid charging stations

# Guiding criteria

## American Society of Testing and Materials International (ASTM)

- F38 Committee on Manned and Unmanned Vehicles

Currently in Draft

Expected final document by June 2018

## Federal Aviation Administration (FAA)

- Heliport Design Guide AC 150/5390-2C

In an 18 month revision cycle starting in Nov 2017

- Flight Standard Information Management System (FSIMS) 8900.1

VOLUME 8 / CHAPTER 3 / Section 3 / Evaluation and Surveillance of Heliports (2015)

- FAA Form 5010 Airport Master Record

In the works to create a heliport specific form

## National Fire Protection Association (NFPA)

- NFPA-418, Heliport Standard (2016)

Next revision to be published in 2021

# Design aircraft

## Concept vehicle

No single main rotor

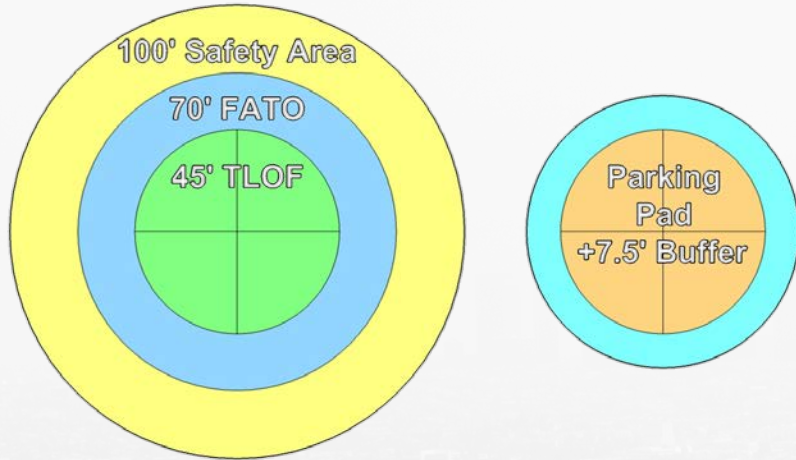
Overall width greater than overall length



*Recommending using the greatest dimension  
Overall Width or Overall Length as the  
“Controlling Dimension” for Vertiport Design.*



# Vertiport overview



## Proposed Dimensional Standard: *Based on Controlling Dimension (CD)*

Touchdown and Liftoff (TLOF) area:

$$\text{Dimensions} = 1(X) \text{ CD} = 45' \times 45'$$

Final Approach and Takeoff (FATO) area:

$$\text{Dimensions} = 1.5(X) \text{ CD} = 70' \times 70'$$

Safety Area:

$$\text{Dimensions} = \text{CD} \times 2 + \text{FATO} = 100' \times 100'$$

Parking Pad

$$\text{Dimensions} = 1(X) \text{ CD} = 45' \times 45'$$

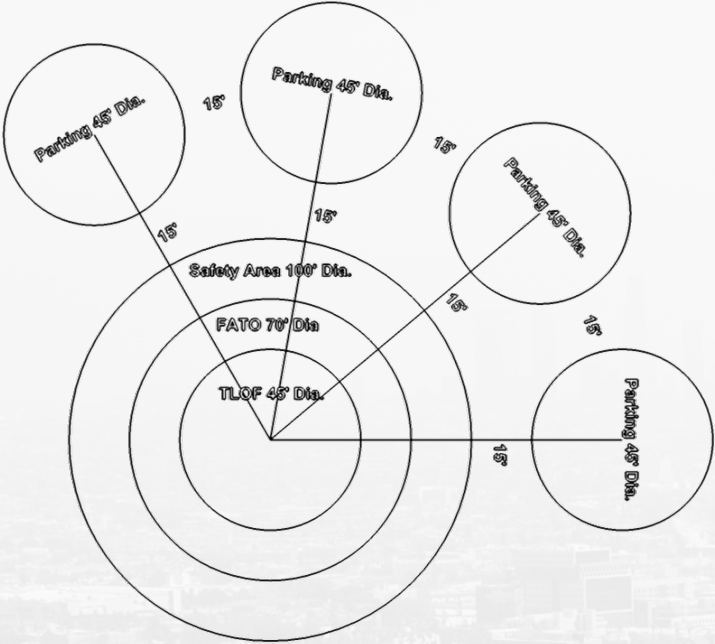
Separation between parking pads

15' for "Hover Taxi"

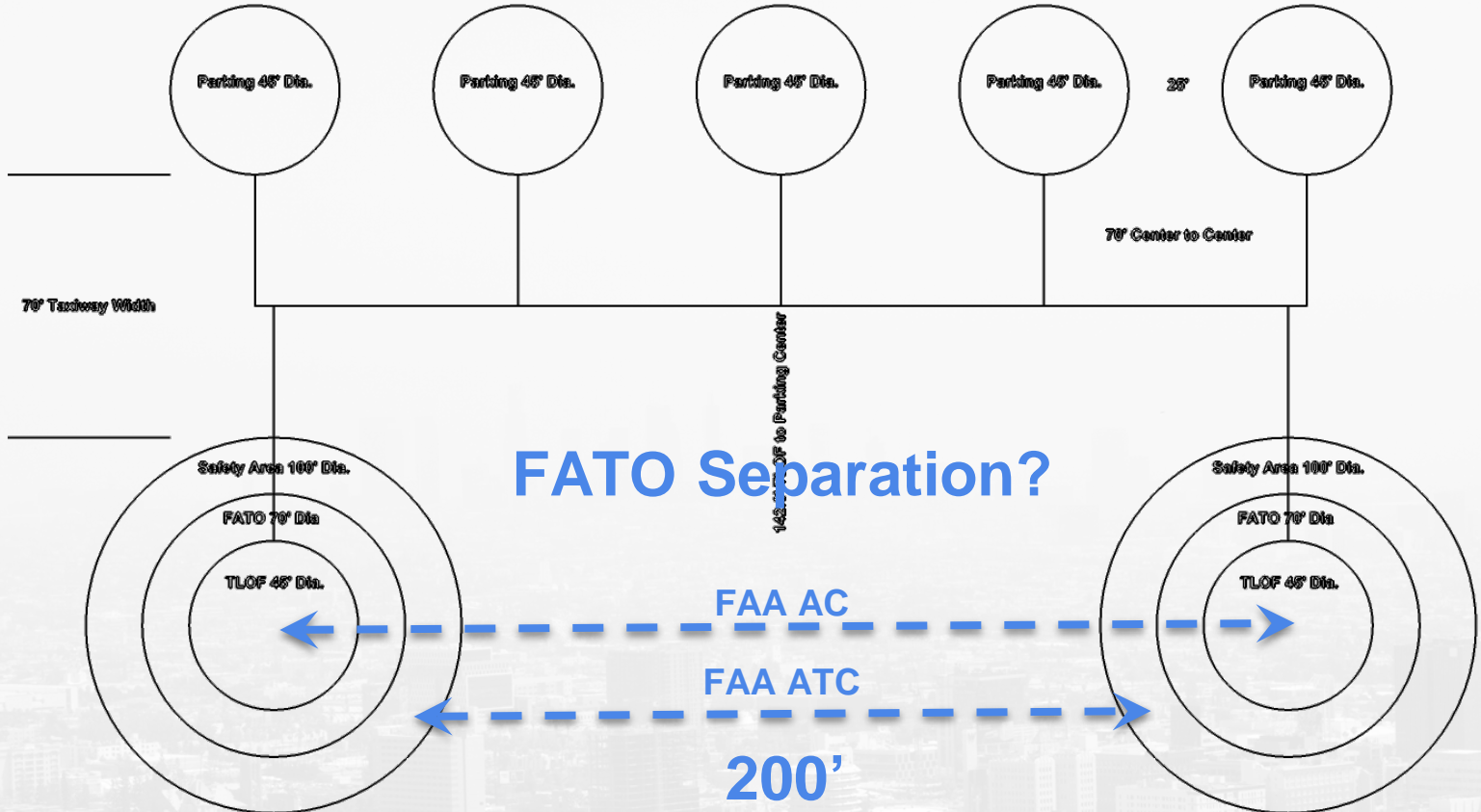
10' for "Ground Taxi"

# Conceptual layout

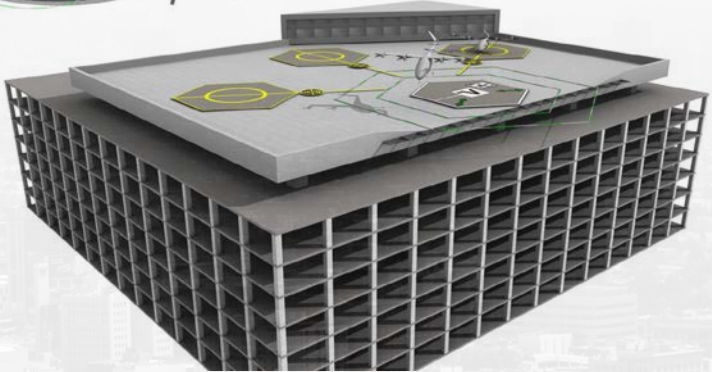
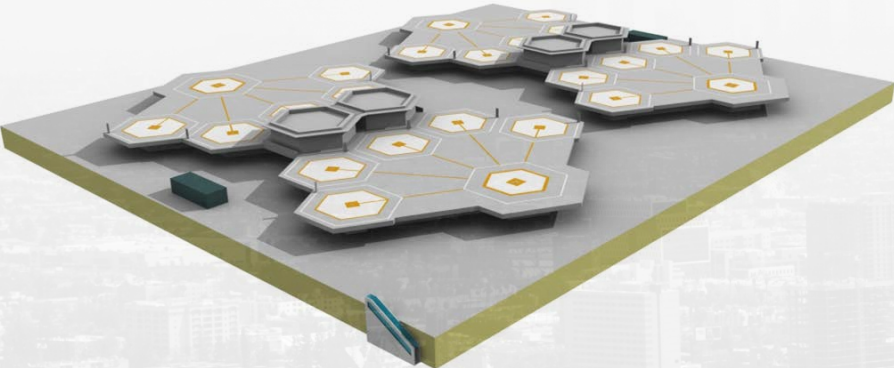
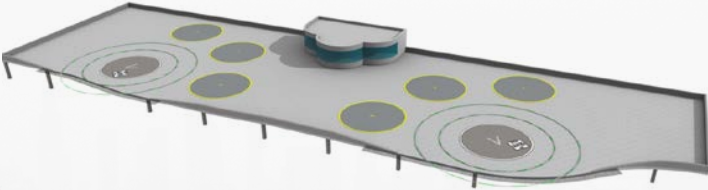
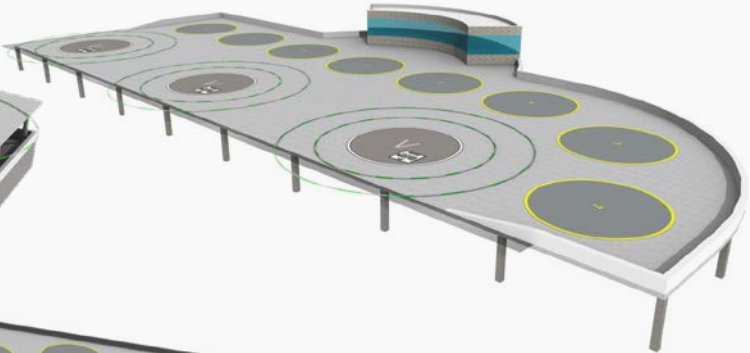
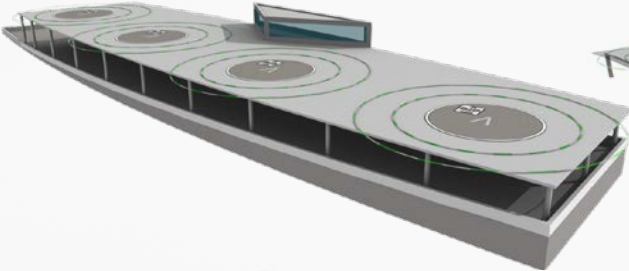
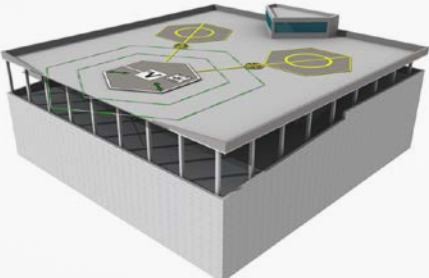
Portland, OR  
Portland Downtown Public Heliport (61J)



# Conceptual layout



# Conceptual Designs



# Infrastructure Needs



# eVTOL Infrastructure Needs & Recommendations

Key areas to help streamline future infrastructure integration

## **FAA Advisory Circular**

Add Vertiport standards to current FAA Heliport Advisory Circular AC 150/5390

## **NFPA/IBC/IFC Code**

Add Vertiports to current fire and building code standards

## **FAA Form 7480**

Add Vertiport information to current 7480 submission form

## **FAA Form 5010**

Design a 5010 that more accurately supports Heliports and Vertiports



# eVTOL Infrastructure Needs & Recommendations

Key areas to help streamline future infrastructure integration

## **Data Integrity**

Improve data capture, currency and accuracy standards

## **Airspace Protection**

Provide better airspace protection for private facilities

## **Dimensional Confusion**

Standardize acceptable dimensions between FATO's

## **Simultaneous Operations**

Better define what simultaneous operations are

# eVTOL Infrastructure Needs & Recommendations

Key areas to help streamline future infrastructure integration

## **Improve FAA Review Process**

Decreases time to conduct FAA reviews and airspace studies

- Create a VFR PEP Program for 3rd party inspectors to augment FAA inspectors
- Add 7480 submissions to the OE/AAA system similar to the 7460 submissions
- Award points to FAA inspectors for heliport and vertiport work

**UBER** Elevate