Illinois Department of Transportation

SAMPLE VERTIPORT REPORT

MEDIUM-SIZED FACILITY

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ILLINOIS AVIATION
ADVANCED AIR MOBILITY
SYSTEM PLAN

Purpose

This report is purely conceptual; the illustrations and demonstrations included are intended for planning and conceptualization purposes only and do not constitute a development recommendation from the Illinois Department of Transportation (IDOT) or the Village of Bolingbrook.

This vertiport report serves as a conceptual layout plan for future vertiport development at an existing aviation facility. The facility was selected based on its inclusion in the Illinois Aviation System Plan (IASP), public accessibility, expansion potential, proximity to the central business district, and adequate separation distance from an active runway. Bolingbrook's Clow International Airport (1C5) met these criteria and was identified as a potential location for vertiport development.

As shown in the figure below, the conceptual vertiport facility is depicted on the eastern edge of 1C5's property line. This area was selected for its position to the existing access road and proximity to the existing airport terminal building. The next page of this report is focused on six core vertiport components.

Aerial image of 1C5 that identifies the conceptual area of development for the vertiport.

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Overview

An example vertiport facility is illustrated in the figure below. In this example, six core vertiport components are highlighted: Takeoff & Landing Area, Aircraft Parking, Aircraft Charging Infrastructure, Vehicle Parking & Landside Access, Terminal Building, and Security Fencing. The following pages isolate each core component, detailing their purpose and potential qualities.

1 – TAKEOFF & LANDING AREA

2 – AIRCRAFT PARKING

3 – AIRCRAFT CHARGING INFRASTRUCTURE

4 – VEHICLE PARKING & LANDSIDE ACCESS

5 – TERMINAL BUILDING

6 – SECURITY FENCING
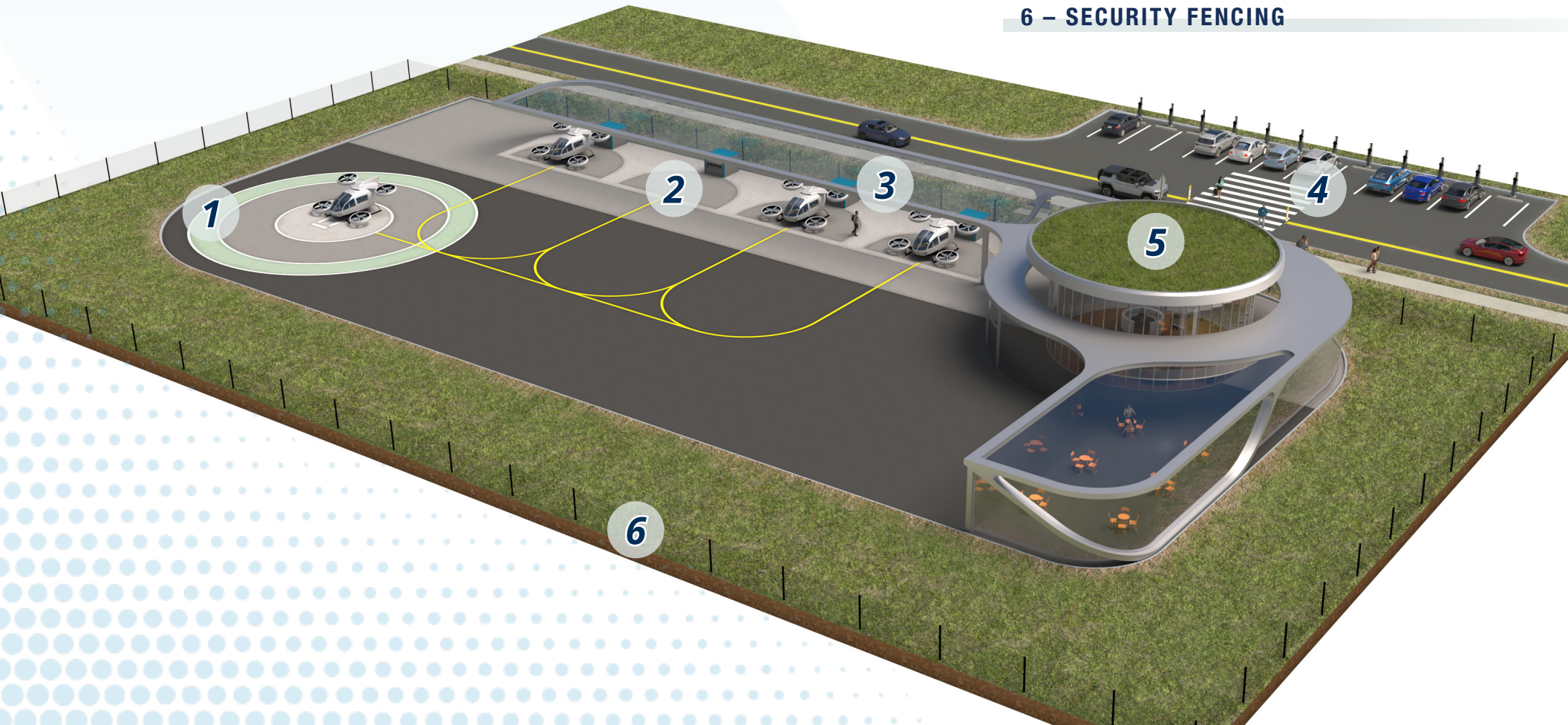
# SAMPLE VERTIPORT REPORT

Security

Security fencing should be approximately 8 feet high and fully enclose the vertiport operating area to limit access to people and wildlife. In addition to security fencing, vertiports that offer commercial passenger services are likely to require Transportation Security Administration (TSA) services within the main terminal building to ensure passenger safety and compliance with regulations. However, charter services likely will not require TSA service.

Terminal Building

The vertiport terminal building serves as an inviting facility where passengers transition between eVTOL aircraft and other modes of transportation. These terminals may be integrated with existing airport infrastructure, such as traditional terminal buildings, Fixed-Base Operators (FBOs), and airport access roads. The size and design of the vertiport terminal should be scaled according to projected demand to ensure smooth and efficient passenger flow.

## Vehicle Parking & Landside Access

Last-mile services will likely be necessary, requiring car parking and convenient access to the vertiport facility. These parking facilities may also serve as an additional revenue stream for the vertiport sponsor. The number of parking spaces should be based on projected demand and include electric vehicle (EV) charging stations to support sustainable transportation. vertiport sponsors should prioritize locating parking facilities close to the terminal building. In some cases, shared use of existing airport passenger parking with vertiport users may help optimize space and resources.
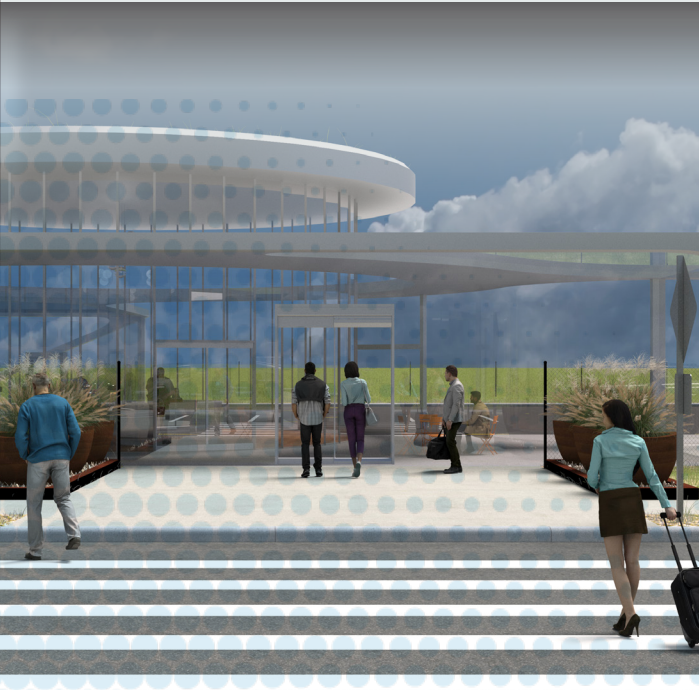
Takeoff & Landing Area

Similar to a traditional helicopter, eVTOLs should use a designated takeoff and landing area for arrivals and departures. These areas typically consist of three paved sub-sections designed to provide load-bearing support during the initial and final phases of flight. At the center is the Touchdown and Liftoff (TLOF) area, surrounded by the Final Approach and Takeoff Area (FATO). Additionally, a safety area, measuring 2.5 times the size of the TLOF, is included to protect aircraft that unintentionally deviate from the TLOF or FATO, thereby enhancing overall operational safety. Vertiports with lower activity levels may only necessitate one takeoff and landing area. This approach can reduce both land requirements and development costs.
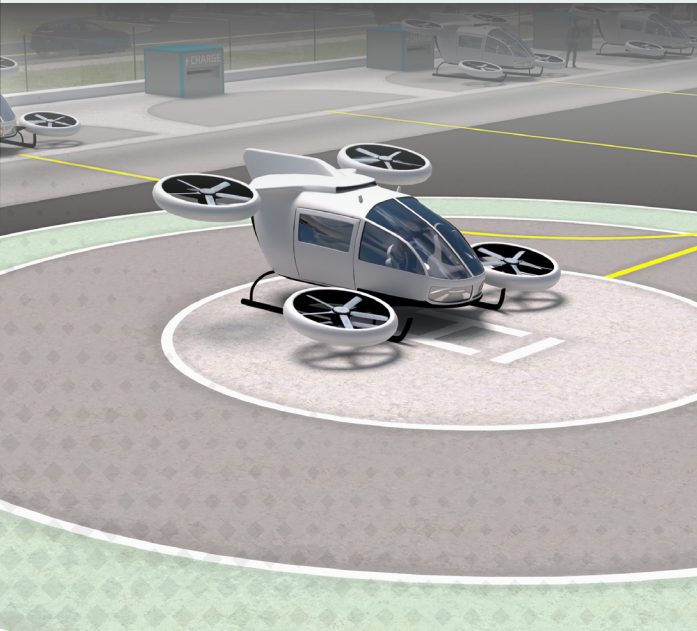
Aircraft Parking

A vertiport facility of this size should have four to five designated eVTOL parking spaces. Designated parking spaces for aircraft promote the safe movement of aircraft within the apron. Considerations should be made relative to eVTOL size to accommodate specific aircraft, taking into account the distance between wingtips and/or rotor blades. Aircraft parking spaces should be located near the terminal building for increased convenience and access for passengers. The vertiport sponsor should also consider constructing shade hangar-type facilities, as illustrated, to protect eVTOL and charging infrastructure battery cells from potential heat exposure.

Aircraft Charging Infrastructure

Charging facilities should be located near aircraft parking spaces for charging between arrival and departure. It is likely that these charging stations will be offered in both stationary and portable models and be accessible to aircraft through cables designed to be compatible with the airfield's environment. This ensures that eVTOLs can be efficiently charged and ready for their next flight.

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Local Obstacle Map

Similar to traditional airport planning, vertiport sponsors should be aware of potential obstacles and hazards to arriving and departing eVTOLs. The Federal Aviation Administration's (FAA's) digital obstacle file identified the obstacle shown below.

All obstacles under 50 ft have been excluded from the obstacle map below.

Conceptual vertiport at 1C5

● 100' to 250' obstacles

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Sponsor Checklist

The checklist provided below serves as a comprehensive guide for airports planning to develop vertiport facilities on site. It outlines essential considerations and steps to ensure the successful integration of Advanced Air Mobility (AAM) operations.

Site Selection and Layout

Space Availability: Ensure there is sufficient space for vertiport facilities, including takeoff/landing areas, parking, and terminal buildings.
Proximity to Runways: Maintain appropriate distance from existing runways to avoid interference with traditional aircraft operations.
Integration with Existing Infrastructure: Plan for seamless integration with current airport infrastructure, such as terminal buildings, access roads, and parking facilities.

Safety and Security

Security Fencing: Install fencing to enclose the vertiport area, limiting access to unauthorized personnel and wildlife.
TSA Services: Implement TSA services for vertiports offering commercial passenger services.
Safety Standards: Adhere to safety standards for eVTOL operations, including downwash and outwash protection areas.
Aircraft Firefighting: Ensure availability of aircraft firefighting services and equipment to handle emergencies.

Infrastructure and Facilities

Terminal Building: Design terminal buildings to facilitate passenger transfers between eVTOLS and other transportation modes as well as to include dedicated pilot breakrooms, employee spaces, and administrative offices.
Parking for eVTOLs: Provide designated parking spaces for eVTOLs, considering aircraft size and safe movement within the apron.
Takeoff/Landing Areas: Designate takeoff and landing areas with appropriate geometry and load-bearing capacity.
Charging Facilities: Install both stationary and portable charging stations near eVTOL parking spaces.
Utility Access and Capacity: Ensure access to essential utilities, including water, electricity, and waste management.
Three-Phase Power: Provide three-phase power supply to support high-demand electrical equipment and charging stations.
Alternative Fuels: Consider and plan for the implementation of hydrogen fuel sources, following additional research and development.
Backup Generators: Install backup generators to maintain operations during power outages.

Connectivity & Accessibility

Transport Links: Ensure connectivity with other transport modes (cars, buses, trains, traditional aircraft).
Parking Facilities: Provide adequate parking with electric charging stations and prioritize proximity to the terminal building.
Passenger Flow: Design terminal buildings and access points to facilitate smooth passenger flow and transfers.

Technological Integration

Wi-Fi and LTE Connectivity: Ensure reliable internet connectivity for operational efficiency.
Advanced Navigation Systems: Integrate advanced navigation and communication systems compatible with eVTOL operations.
Autonomous Operations: Plan for compatibility with autonomous and semi-autonomous eVTOLs.

Environmental Considerations

Sustainable Practices: Implement eco-friendly designs and practices in vertiport development.
Electric Charging Stations: Provide charging stations for eVTOLs and vehicles to support sustainable transportation.
Minimize Environmental Impact: Design facilities to minimize noise and other environmental impacts.

Regulatory Compliance

FAA Guidelines: Adhere to FAA guidelines for vertiport design, safety, and operations.
Local Regulations: Ensure compliance with local, state, and federal regulations.
Stay Updated: Keep abreast of evolving regulations and standards for AAM.