CASE STUDY
VANCOUVER GENERAL HOSPITAL HELIPAD

A case study was conducted for the site of an existing helipad at Vancouver General Hospital, Vancouver, British Columbia, Canada. The site was selected in support of a future use case of the existing helipad for VTOL takeoffs and landings in support of the delivery of cancer isotopes from Vancouver General Hospital to Victoria General Hospital, in Victoria, British Columbia, decreasing delivery time compared to surface transportation and as a cost-effective alternative to the use of helicopters and other transportation alternatives. The site is on the outskirts of a downtown core where low rise buildings surround the taller buildings of the hospital campus.

The objective of the case study was to assess wind conditions across and above the existing helipad. Local wind characteristics were assessed quantitatively in simulated atmospheric boundary layer flow conditions expected for the site in a boundary layer wind tunnel. The data collected in the wind tunnel were combined with local wind records and compared to a design criterion for gauging wind safety above helipads. The assessment focused on a vertical grid of sensor locations at varying heights above the helipad.

Heliport and vertiport assessments are conducted frequently at RWDI for unique, specific requirements. The following images show one example of a study conducted for an existing heliport at Vancouver General Hospital, Vancouver, British Columbia, Canada.

The site is on the outskirts of a downtown core where low-rise buildings surround the taller buildings of the hospital campus. Wind conditions were quantified above the final approach and takeoff area (FATO). The study site and the corresponding physical model are shown in the images below.

Figure 1: Aerial View of Vancouver General Hospital

Figure 2: 1:300 Scale model of Vancouver General Hospital in RWDI's Davies Boundary Layer Wind Tunnel instrumented with Cobra probes to measure the mean and fluctuating wind speeds.

Wind data were measured on a vertical grid of sensor locations at varying heights above the heliport. The data collected in the wind tunnel were combined with local annual and seasonal wind records and compared to a design criterion for gauging wind safety above heliports.

A sample of results from the wind tunnel assessment is shown below. The figures show an isometric view and plan view of the Vancouver General Hospital site where the results of the analysis are superimposed with color dots. Each dot marks the discrete location of the flow measurement and the color shows the frequency with which the design criterion is exceeded

This approach presented above can be adapted to any eVTOL/ VTOL aircraft when the aerodynamic performance envelope and stability criteria are known. The results are critical to inform the design of the vertiport, operational restrictions, energy management, and passenger ride comfort.

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Figure 3: Frequency of Exceeding Design Criterion above the FATO for Winds Blowing from 280° (Spring)

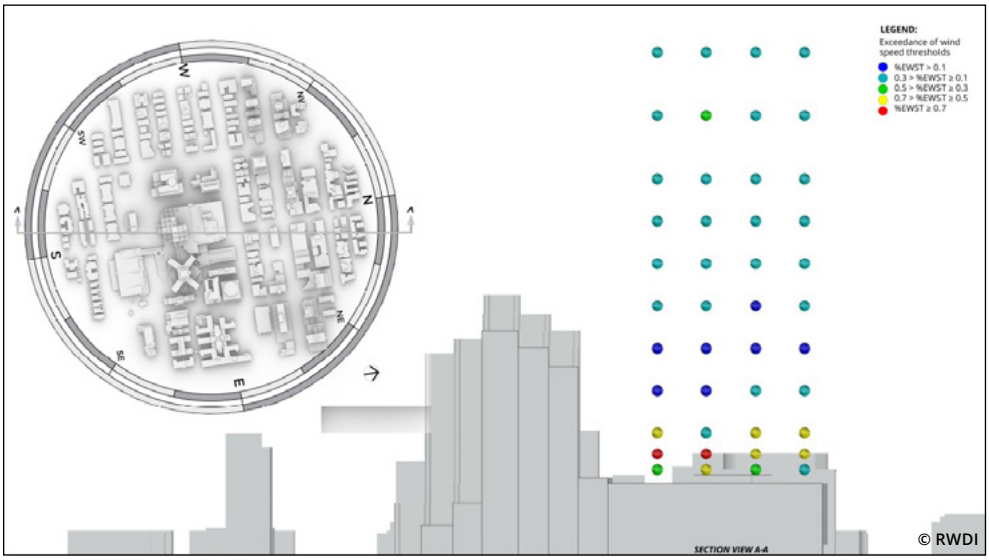

Figure 4: Frequency of Exceeding the Design Criterion above the FATO for Winds Blowing From 160° (Summer)