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Runway Energy Capturing System

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Runway Energy Capturing System

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Project Objective

The main purpose of this project is to capture the jet blast produced by aircraft. This shall be used to harness kinetic energy that will be transformed into electrical energy. The concept of this proposal is to use a series of wind turbines at the end of the runways of airports to capture wind energy. The wind turbines use a specialized design, with a smaller height than the traditional wind turbines to adhere to the FAA regulations.

Jet Blast Wind Energy Recuperation Research

The team found a patent by George A. Henson that depicts a combination of air recovery generator and blast deflector for generating energy on the ground from horizontally discharged air from an aircraft. The value of this patent is that it contains a study on the wind extraction/recovery from commercial jets.

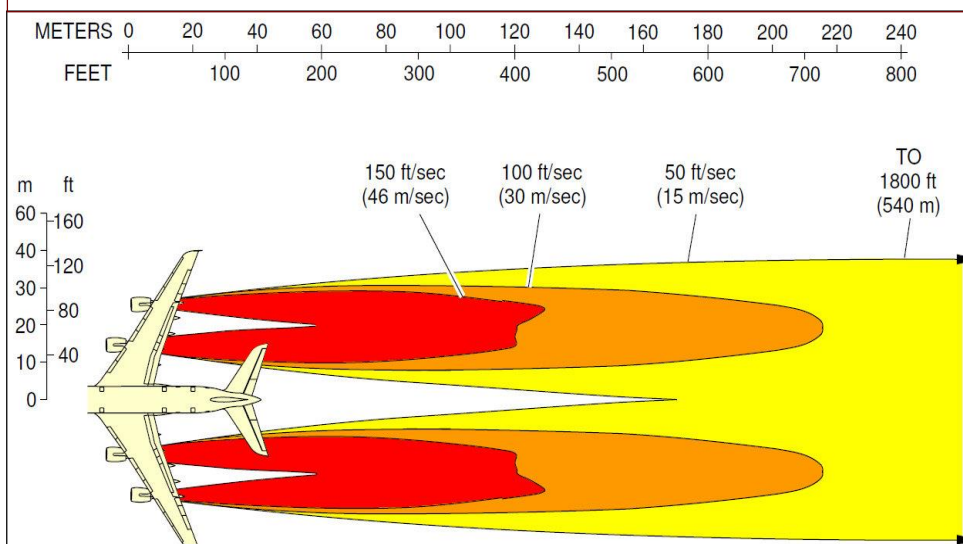


Figure 1.0: A graph representing the jet blast created by a 4 turbine commercial aircraft, Boeing 737.



Team R.E.C.S

Site Layout: Logan International Airport

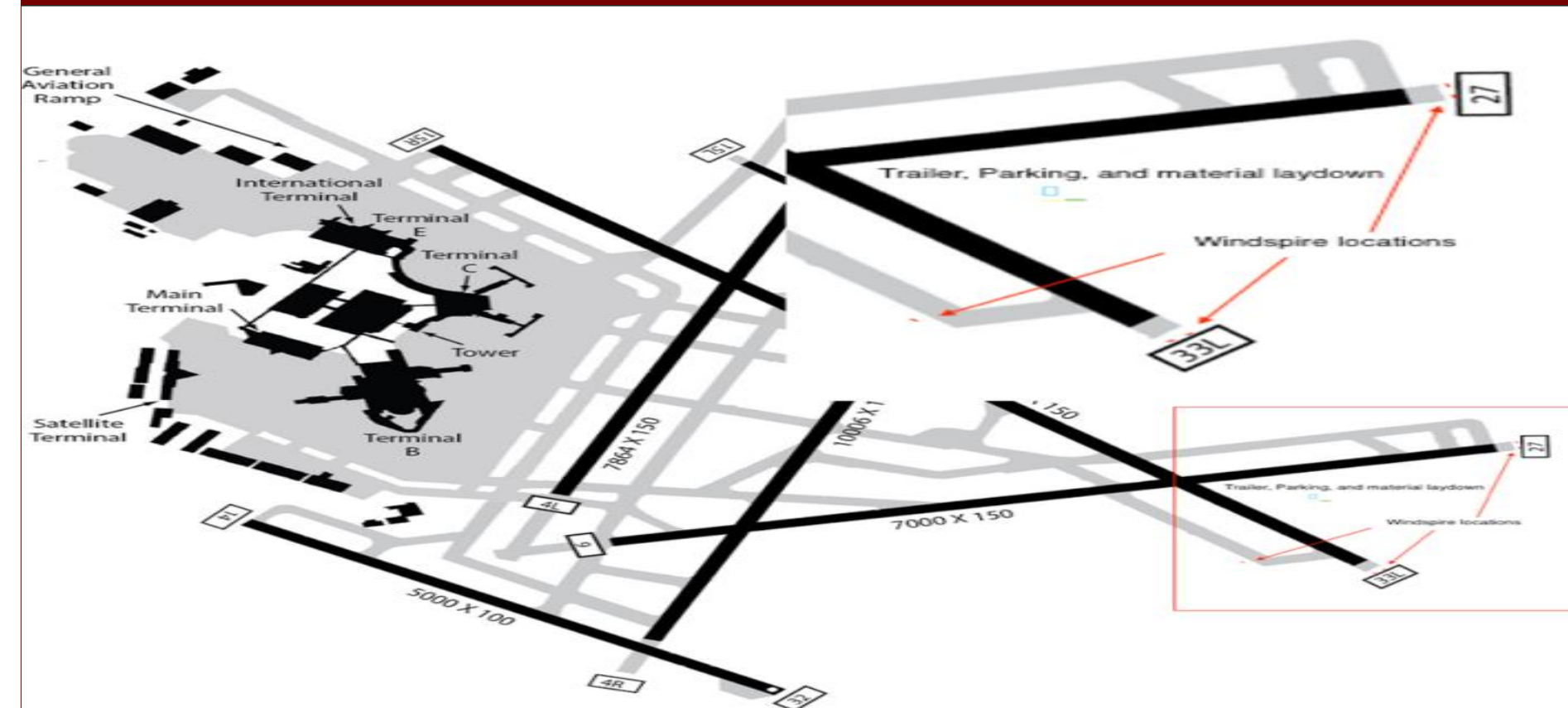


Figure 3.0: Logan International Airport Site Layout. Red arrows point to the optimal placement of the wind turbines behind the take-off zone.

Project Location: Logan International Airport

Logan International Airport was researched and handpicked by our engineer team, as it provides the highest wind speed annually and is already known for supporting renewable energy. The airport is located in the coast of Boston, where there are no wind obstructions as opposed to a gust of wind from the ocean. The most important factor to choose the ideal location was the annual average wind speed which Logan International Airport is the highest rated in the United States with over 11 mph annually.

Project Deliverables

The R.E.C.S's team deliverable is to place 6 Windspire IV at the end of runways at the International Logan Airport. This setup can produce a total of 12KW per hour and that energy is directly put back into the electric grid of the airport to be used. The estimated payback is 10 years and the projected total cost is \$112,024.77.

Series IV Windspire Custom Turbine

The wind turbine of choice to satisfy these requirements is the Windspire IV that is a cylindrical structure put together with three bars in the borders and two circular pieces, one on the top and one on bottom. This structure is lifted a few feet off the ground to be at the elevation of useful wind. Recuperated energy then is directly placed back into the airport electrical grid.



Figure 2.0: Windspire IV Horizontal Placement: The Windspire system is 30 ft wide and 5 feet tall to avoid violation of FAA regulation for safety and security.

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