

Sustainable Building at a General Aviation Airport in Central Kentucky

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This research is a focused case study on the integration of feasible sustainable systems for a local general aviation airport in Madison County Kentucky. In a 2012 asset report the Federal Aviation Administration of the United States Department of Transportation describes the benefits of local general aviation airports. Benefits listed in the FAA report of general aviation airports include their vital role in transporting medical patients and disaster relief efforts, as well as providing an essential connection for rural residents to population and commerce centers. Despite these many benefits, the combination of relatively small amounts of air traffic, inefficient buildings and a lack of sustainable technology often makes running a local general aviation airport a financial burden. The purpose of this study is to investigate ways to reduce the operational cost of local general aviation airports over time by using site-specific sustainable building techniques and technologies. In achieving this objective, the airport can become an economic and environmental benefit, rather than a burden to the local communities they serve. Additionally, these techniques and technologies are being evaluated for their effectiveness in reducing the airport's carbon footprint and storm-water runoff from the massive open and paved spaces. Emphasis is placed on sustainable strategies that offer synergies between airport operations, its buildings and the space the airport inhabits. A review into the airport's budget and expansion plans in light of potential revenue streams and cost savings has provided the initial direction for research into the sustainable technologies that would be the most economical, effective and beneficial to the first phase in the airport's expansion and long term managerial goals. The sustainable building techniques being considered for use on the site include super insulation, passive heating/cooling, geothermal in conjunction with large, low velocity fans in the hangars. Sustainable systems and techniques include photovoltaic systems in a solar grove, permeable asphalt, and bio-swales. The combination of sustainable technologies, building techniques and financial investigations will provide a the local general aviation airport in Madison County Kentucky with a strategy to limit their overhead, while helping to ensure the essential services the airport provides for its community.

Key Words: Airport, Sustainability, Construction, Buildings, General Aviation, Kentucky