

# AIR TAP Briefings

A publication of the Airport Technical Assistance Program of the Center for Transportation Studies at the University of Minnesota

Summer 2013 Vol. 13, No. 3

## Sustainable solutions for airport operations

Airport sustainability encompasses a wide variety of airport management and maintenance practices. A recent Airport Cooperative Research Program study defines sustainability as practices that ensure protection and conservation of natural resources, social progress that recognizes the needs of all stakeholders, and maintenance of high and stable levels of economic growth and employment.

Both air and landside operations can incorporate more sustainable practices—from improving the energy efficiency of existing buildings and ground vehicles to collecting water and managing waste.

Assessing the sustainability of different operations requires setting performance goals and outcome measurements for sustainable features on both a daily and ongoing basis. Understand which repairs and upgrades have the most impact and are the most practical to implement, as some new methods have not been proven yet or may be too expensive to yield cost savings that warrant their implementation. The keys to the success of any airport sustainability program include:

- A highly motivated airport operator and owner
- Improvements to existing structures and systems that minimize energy use and loss
- Installation of renewable energy systems

- Highly integrated systems and controls
- Ongoing energy measurement and assessment

### Is it all about renewable energy?

Before installing any renewable energy system, you should first consider improving the energy efficiency of existing systems, which is often much more cost effective. This can be done with a simple energy audit, conducted by your local utility, a private provider, or yourself.

A building tune-up (BTUP) aims to increase a building's peak efficiency and reduce its energy use. The process identifies improvement measures with simple payback periods of less than five years; it may also include an energy management plan listing potential improvements along with their estimated benefits and costs. Examples of these measures are replacing an old or inefficient water heater or replacing incandescent light bulbs with higher efficiency lighting. [Note: MnDOT engineer John Schroeder ([john.schroeder@state.mn.us](mailto:john.schroeder@state.mn.us)) or Lou Dirks of Hali-brite ([loud@halibrite.com](mailto:loud@halibrite.com)) can provide informa-



Solar PV panels

tion on the use of LEDs on runways or taxiways.]

A more advanced solution that calls for the help of a consultant is retro-commissioning (RCx), which includes comprehensive and functional performance testing of a building and its energy equipment.

Many options exist for conducting a BTUP at your

airport; an online search of the term followed by your city or state will help you find companies or individuals providing the service.

A next step is to consider renewable energies. Solar photovoltaic (PV), which uses panels to absorb solar energy, is probably the most commonly implemented type of renewable energy. Solar PV panels can be ground-mounted, installed on building rooftops, or designed into building materials at the point of manufacturing. Despite a cold winter climate, the efficiency of solar PV is high in Minnesota because of its many sunny days. Solar PV modules can be grouped together as an array or series of

*Sustainability* continued on page 2

## An Airport's Story: Range Regional Airport

Located in northeastern Minnesota's Iron Range region just outside Hibbing, Range Regional Airport was officially dedicated in 1931. Formerly known as Chisholm-Hibbing Municipal Airport, the airport is owned and operated by the Chisholm-Hibbing Airport Authority.

Airport manager Shaun Germolus has been at Range Regional Airport since 2007. "I enjoy interacting with various tenants, the flying public, and the local communities," he says. According to the FAA, the airport had 30,365 aircraft operations, an average of 83 per day, in 2010. Of those, 82 percent were general aviation. The airport is serviced daily by Delta Connection (SkyWest) using CRJ-200 regional jets. In addition to Delta, other businesses that use or operate at the airport include Hibbing Fueling Facility, a Minnesota Department of Natural Resources fire suppression operation, maintenance provider TNT Airworks, Midwest Aircraft Refinishing, and air ambulance service Life Link III.

The airport has two runways, three 12-unit hangars, and more than 40 based aircraft. Throughout the last few years, the airport has undergone significant changes, including repaving both runways in 2009.

Germolus says that one of the biggest challenges facing the airport today is finding sufficient funding. The airport relies on federal grants to carry out airport construction projects. However, federal funding has become more difficult to obtain each year.

One need is to increase the capacity of the airline terminal, he says. The current terminal building was constructed in 1978, prior to service by larger aircraft—and prior to the required operational space now needed by the Department of Homeland Security Transportation Security Administration (TSA) for passenger and baggage screening. The FAA, MnDOT Office of Aeronautics, and airport authority will commit funds for the design of this project, with construction funding sources projected for 2013 and construction occurring in 2014, Germolus says.

In 2007 the Chisholm-Hibbing Airport Authority completed construction of a 30,000-square-foot building on a five-acre lot adjoining the airport with space for lease or purchase. The facility, Germolus says, was built as a showcase to attract light manufacturing and industries to the Iron Range. The airport took a loan from the Iron Range Resources and Rehabilitation Board to build the facility and is currently



Range Regional Airport

in the midst of a final negotiation with a tenant—the revenue from which will “absolutely benefit the airport,” he says.

The airport is active in the local community and an important economic development resource for the area, Germolus says. “We belong to five different chambers of commerce and stay involved with all five as a regional airport.”

The airport is also trying to engage with the community online through its website and Facebook. The website is often used by customers to book flights or find flight times, but expanding the airport's exposure on Facebook has been more of a challenge, Germolus says. He and the airport's assistant director maintain the Facebook page with regular posts and photos about promotions and happenings at the airport.

parallel-connected modules to provide any level of power requirements.

Solar thermal technology uses the sun to generate low-cost, environmentally friendly thermal energy to heat water or other fluids, which can then be used for heating or for washing. It can also power solar cooling systems. Solar thermal technology differs from solar PV in that it generates heat rather than electricity. Solar thermal may not be practical as a retrofit and so is recommended for new construction.

Geothermal energy systems typically use a heat pump to pull heat out of the air or ground to heat a home or office building, but they can be reversed to cool a building, operating much like an air conditioner.

One of the biggest advantages of a heat pump over a standard heating, ventilation, and air conditioning (HVAC) unit is that it eliminates the need for separate systems to heat and cool a building. Heat pumps are also extremely efficient, because they simply transfer heat rather than burn fuel to create it.

Determining if a heat pump is a good choice for your airport depends on location, building type, and availability of systems. The pump’s efficiency falls dramatically as the outside air temperature drops. According to the U.S Department of Energy, the efficiency factor for a heat pump in the Twin Cities is about 68 percent (compared with 93 to 95 percent for a high-efficiency gas furnace). So buildings heated with a heat pump require a secondary heating system to provide adequate heat on cold days.

Don't miss these upcoming AirTAP events!

AirTAP is sponsoring a **webinar on sustainable solutions** for GA airports in fall of 2013. Watch for additional details via e-mail announcements and the AirTAP website.

Registration is now open for the **2013 AirTAP Fall Forum**, to be held September 26 and 27 at the Metropolitan Airports Commission in Minneapolis. Visit [www.airtap.umn.edu](http://www.airtap.umn.edu) to register, or watch your mail for the forum brochure in August.

**Inside improvements**  
Improvements to a building’s interior, such as installing automatic lights with motion detectors, are easy and inexpensive. Changing incandescent bulbs to fluorescent and LED and installing timers for outside areas are also easy and efficient lighting improvements. And when new appliances or heating or cooling equipment is needed, consider using Energy Star energy-efficient equipment. Replacing smaller windows with larger ones also allows for passive solar energy to reach a building.

**Waste management**  
The challenges of managing the waste streams from airport operations include separating and recycling waste at the terminal and adhering to city or county ordinances. In addition, international airports are required to meet government disease control regulations for recycling and disposing of international waste. Some ways to address waste management sustainably include:

- Separating food and trash waste at concessionaires.
- Implementing airport-wide recycling of cardboard, wood pallets, scrap metal, batteries, and used oil.
- Choosing a waste disposal contractor that allows for separate waste containers (recycle, compost, and trash).
- Installing blow dryers in restrooms.
- Composting food waste when possible.

**Water conservation**  
Many airports are implementing water conservation methods in buildings and turfing areas. Ways to enhance water conservation and efficient use include:

- Installing low-flow/automatic fixtures and toilets and waterless urinals.
- Tracking water consumption and conducting water conservation audits (see [www.home-water-works.org/](http://www.home-water-works.org/)).
- Capturing and using gray/storm/recycled water for irrigation and car washes.
- Installing rain barrels and computer-controlled “smart” irrigation systems.
- Installing green roofs and landscaping that features drought-tolerant species (see [www.dot.state.mn.us/roadsides/vegetation/index.html](http://www.dot.state.mn.us/roadsides/vegetation/index.html)). Native grasses are especially drought tolerant but may

- not be suitable for runway safety areas because they tend to clump soil.
- Using water-efficient central heating and cooling systems.

**Ground vehicles**  
Making changes to your ground fleet can save money, especially as gas prices increase and vehicle prices drop. Consider vehicles that use clean or alternative fuels such as liquefied natural gas (LNG) or compressed natural gas (CNG). In addition, electric, hybrid, or biodiesel-fueled vehicles are more common and affordable. Several airports are incorporating electric vehicle charging stations into their parking lots to serve their customers and promote alternative energy.

**FAA Airport Sustainability and Airport Environmental Program**  
The FAA Airport Sustainability and Airport Environmental Program aims to make sustainability a core objective in airport planning. As part of this program, the FAA provides airports with funding to develop Sustainable Master Plans and Sustainable Management Plans. To date, 25 airports across the United States have developed sustainability plans (see [www.faa.gov/airports/environmental/sustainability/](http://www.faa.gov/airports/environmental/sustainability/)).

**Sources**

- “Sustainability in Airport Operations,” 2011 AirTAP Fall Forum.
- *Synthesis 10: Airport Sustainability Practices*, Airport Cooperative Research Program (ACRP), 2011.

**More information**

- “Fixit: Heat pump may not be right choice,” *Star Tribune*, October 3, 2008, [www.startribune.com/lifestyle/homegarden/30269734.html](http://www.startribune.com/lifestyle/homegarden/30269734.html).
- “Airports Implement Sustainable Practices,” *Airport Magazine*, August/September 2010, [http://issuu.com/aaae/docs/airport\\_augsept\\_2010?e=1039248/2665345](http://issuu.com/aaae/docs/airport_augsept_2010?e=1039248/2665345).
- Minnesota Energy Resources: Rebates and Programs, <http://www.minnesotaenergyresources.com/home/rebates.aspx>.
- Division of Energy Resources—energy tax credits: <http://energy.gov/energysaver>.

