MITRE’s Low Cost Surface Awareness system is a low cost capability to provide enhanced situational awareness of airport surface operations. The system divides runways and taxiways on the airport surface into operationally relevant blocks. Above-ground magnetic sensors are used at the block boundaries to monitor aircraft and ground vehicle movements as they enter and exit these blocks. The sensor outputs are processed to determine when a block is occupied and status information is displayed to the controller via a user-friendly graphical interface. Controllers can use this information to validate and supplement visual surveillance and to provide safety alerts, such as for aircraft entering an occupied runway. The magnetic sensors can be installed in existing surface lighting fixtures, resulting in reduced installation and maintenance costs.

Applications

The system provides a cost-efficient, effective, and reliable surface surveillance capability designed for small and mid-sized airports. These airports may not be able to afford more sophisticated commercial systems. In addition to supplementing the out-the-window view at towered airports, the block occupancy-based system can be used to enhance operations at non-towered airports by displaying information to the approach controllers.

Benefits

This system is intended to improve airport capacity and enhance surface operations safety, especially during low visibility operations by increasing situational awareness, decreasing workload, and increasing throughput. The tools and concept have been validated through human-in-the-loop laboratory simulation and testing. This system, when installed, will benefit:

- The flying public, by improving safety at towered and non-towered airports that presently do not have any surface surveillance.
- Tower controllers, by providing tools needed to increase situational awareness and maintain safety, even when visibility is compromised.
- Traffic flow managers, enroute controllers and terminal controllers, by providing surface information at airports where it is not currently available.

For additional information and links:
http://www.mitre.org/work/areas/research/mipprojects.html#6535