

## **Executive Summary**

This report addresses the Runway Safety / Runway Incursions Challenge of the FAA Design Competition for Universities, 2007 – 2008 academic year. The research and proposed technology presented in this report focuses on a growing segment of runway incursions, vehicle deviations. Vehicle deviations are the primary segment of overall vehicle/pedestrian incursions (V/PD's) which account for nearly 17% of the total runway incursions between 2003 and 2006.

A solution designed to minimize the likelihood of a vehicle incursion by achieve improving airside ground vehicle drivers' situational awareness, particularly during times of reduced visibility, is proposed. The solution proposed is an enhancement of currently market-available GPS moving map devices, installed in vehicles operating around the airfield, adapted to the airfield environment and equipped with visual and aural warnings when approaching a runway environment. The solution was developed by way of a thorough literature review, empirical research, initial development and testing, interactions with airport operators, the FAA, technology experts, and members of academia in the fields of flight training, business, and human factors. Operational models, development and maintenance strategies, and cost-benefit analyses were performed to justify the applicability of this proposed technology.

Outcomes of research, development, and testing revealed highly successful results. In addition, cost estimates of implementation on a wider scale are found to be significantly less than alternative technologies. It is hoped that the technology proposed in this research be considered for further development.