



# NASA Langley's Advanced Display Device for Aviation Safety and Operational Efficiency

Pilot head-worn display for  
enhanced situation awareness

Researchers at NASA's Langley Research Center are developing a head-worn display system for pilots to improve safety and efficiency in aviation operations, particularly taxiway and runway safety at airports. Airports are experiencing tremendous increases in traffic, leading to runway near-incursions and incursions, setting the stage for potentially tragic accidents. NASA's technology provides pilots using the device with a voice-controlled system that displays a real-time, virtual display of the airplane's surroundings. Initial testing shows that this system provides significant safety and operational benefits during aircraft surface operations by enabling pilots to taxi alertly without having to look down at a cockpit screen.

## Benefits

- Full-color display can show computer-generated airport view and aircraft state data in 3-D detail over an unlimited field of regard with minimal clutter
- Voice command simplifies operator interaction
- Head-worn display and voice interface minimizes the pilot's head-down time
- Head tracking enables the system to highlight key information for the pilot, using symbols to direct the pilot's attention to locations and objects outside the airplane
- Independent system – minimal impact on currently installed cockpit displays

partnership opportunity





## The Technology

The NASA system includes a head-worn display, a head tracker, computer hardware and software, and a voice recognition system. The system displays computer-generated images of the airport, taxi route, and traffic information on the head-up display, replacing traditional paper airport maps that pilots typically carry. Preliminary system trials managed by NASA suggest the system provides an increase in surface situational awareness, as well as reduced workload, compared to currently available technologies.

## Applications

The technology offers wide-ranging market applications, including:

- Avionics – pilot head-up displays
- Transportation – ground/marine vehicle operator display
- Varied applications – military vehicles/vessels, construction, and mining operations



Figure 1: Head-up display depicted roll-out, turn-off, and taxi guidance

## For More Information

If your company is interested in licensing or joint development opportunities associated with this technology, or if you would like additional information on partnering with NASA, please contact:

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