



U.S. ARMY  
**RDECOM**

## Automated Vehicle Routing

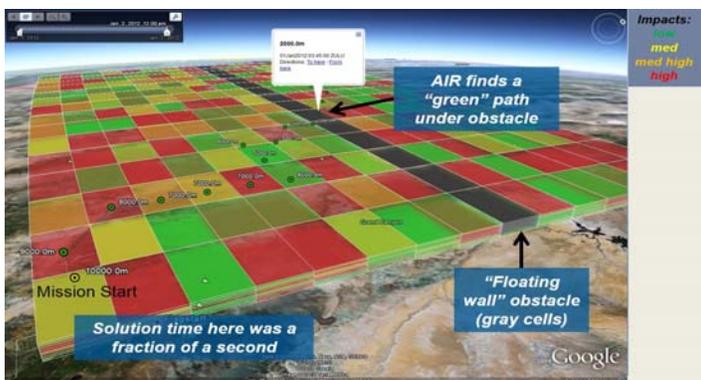


### S&T Campaign: Information Sciences System Intelligence and Intelligent Systems

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### Research Objective

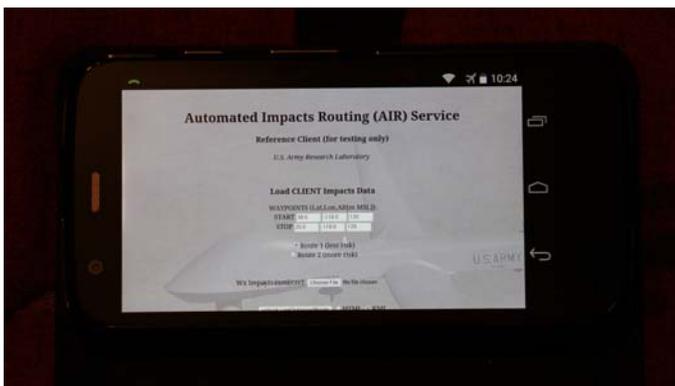
- Provide optimized air and ground movement solutions through complex adverse environments, impacts, or conditions at all echelons using ARL-developed Automated Impacts Routing (AIR) technology
- Data agnostic input and Open Geospatial Consortium (OGC)-compliant output



AIR's fast execution path-finding solutions for complex weather or other impact arrays and obstacles.

### Challenges

- Application of technology to dynamic (spatial and temporal) 4D data sets
- Develop as fast/efficient execution web service and standalone desktop applications
- Test deployment within simulated operational environment



Browser-based AIR Client on Android smartphone sending requests to AIR web service.

### ARL Facilities and Capabilities Available to Support Collaborative Research

- ARL White Sands Missile Range (WSMR) web application servers and in-house cluster
- ARL WSMR expertise in computer modeling and atmospheric science
- References/Patent:
  - Johnson, Jeffrey O., "Automated Impacts Routing (AIR): Standalone Desktop Application User's Guide," ARL-TR-7398, Aug 2015
  - Brandt, et al., "Second Generation Weather Impacts Decision Aid Applications and Web Services Overview," ARL-TR-6525, Jul 2013
  - Brandt, et al., "Second Generation Weather Impacts Decision Aid User's Manual," ARL-TR-6620, Sep 2013
  - Johnson, Jeffrey O., "Atmospheric Impacts Routing (AIR)," ARL-TR-5792, Nov 2011
  - US Patent application: Johnson, Jeffrey O., "Software Design and Implementation of Optimized Routing to Avoid Adverse Conditions and Obstacles in 3D Space," 2013
- Tests, validation and verification show fast/efficient execution against complex input data sets

### Complementary Expertise/ Facilities/ Capabilities Sought in Collaboration

- Existing NRL collaboration
- New collaborations/investigations with Air Force regarding Environmental Data Cube Support System (EDCSS)
- Prototype cloud/crowd-sourcing being developed in-house (WSMR) for test deployment of AIR
- Seeking access to simulated operational environment - this will allow elevation of AIR's Technology Readiness Level (TRL) to transition to operational deployment
- Seeking operational testing and deployment of AIR technology. Seeking collaboration with Air Force Weather Agency (AFWA) – Web Service (AFW-WEBS) for testing and deployment of AIR web service technology within AFW-WEBS