

A DARPA Perspective on Broadband Wireless Systems

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Wireless systems applications within the commercial segment have changed dramatically over the last decade. Evolving rapidly from voice only, through limited data applications, to limited wireless Internet service and to full wireless Internet much like what is available today over wired networks. New information transfer requirements will result in the need for extensive broadband wireless capabilities that will stress the technical and regulatory environment.

Future Department of Defense warfighting concepts leverage information superiority and will require vast improvements in information transfer, and hence higher bandwidth communications services. These services will in many ways parallel the throughput needs in the commercial sector but will also require higher levels of assured connectivity and low detectability in a minimally infrastructured mobile ad hoc operating environment. This will require availability and adaptability features that include access on demand, infrastructure independency, self-forming and self-maintaining networks, and robustness when components are lost or compromised. The military wireless communications system must provide seamless connectivity from the "last tactical mile" to a long haul connection when satellite capabilities are not available.

The DARPA Advanced Technology Office is pursuing a number of leading edge communications programs to meet the needs of the military customer. They include:

- 1) The Small Unit Operations Situational Awareness System (SUO SAS): an all terrain radio (software defined) with autonomous adaptive networking, continuous navigation and targeting, and distributed information management
- 2) Airborne Communications Node (ACN): a prototype airborne communications payload to provide enhanced theater communications capability for rapidly moving warfighters of all services.
- 3) Global Mobile (GloMo) Program: developing technologies and techniques at applications, networking and wireless link levels that will enable wireless users to access and utilize the full range of Defense Information Infrastructure communications services
- 4) Future Combat Systems (FCS): a joint Army/DARPA development program that will stress the capabilities of broadband wireless connectivity to the limit. It envisions the deployment of large numbers of robotic platforms in a widely dispersed area requiring assured broadband connectivity to all elements

Many of these needs are similar to those in the commercial marketplace. The rapid assimilation of leading edge information technology from the commercial market permits the government to leverage commercial items for its military and civil applications. Future military broadband wireless systems must be developed in such a way that the DoD can modularly integrate these developing technologies, as appropriate. DARPA encourages cooperative arrangements with industry that benefit both the US Government and the commercial sector. Details on how industry can establish a working relationship with DARPA are contained on DARPA's web page (www.darpa.mil).