# Wi-Fi And White Space Combo Promises Better Broadband Wireless

October 01, 2010 03:42 PM
Electronic Design
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Bringing broadband connections to underserved areas is high on the agenda for the National Broadband Plan. Wi major role in filling this need. For example, Wi-Fi is a good possibility as it is inexpensive and widely available wh rates.

The problem is its limited range. Data radios operating in the newly available white spaces below 700 MHz can ea restriction but lack the speed potentials of Wi-Fi. How about a combination of the two? That's what Rice Universi

Rice University researchers recently won a $1.8 million National Science Foundation (NSF) grant for one of the n tests of wireless communications technology that uses a broad spectral range, including dormant broadcast televis free, high-speed broadband Internet service.

The five-year project calls for Rice and Houston nonprofit Technology For All (TFA) to add "white space" technol Wi-Fi network they jointly operate in Houston's working-class East End neighborhood.

Launched in 2004 with a grant from the NSF, the TFA Wireless network uses unlicensed frequencies ranging fror new grant will allow researchers to take advantage of new federal rules that open the unused TV channels betwee called white spaces. The network will dynamically adapt its frequency usage to meet the coverage, capacity, and e of both the network and clients.

The new grant will pay for the development and testing of custom-built networking gear as well as smart phones, that can receive white-space signals and seamlessly switch frequencies in much the way that today's smart phones via either Wi-Fi or a cellular network. The grant will also allow Rice social scientists to conduct extensive studies i find out how people interact with and use the new technology.

"Ideally, users shouldn't have to be concerned with which part of the spectrum they're using at a given time," said the principal investigator on the project. "However, the use of white space should eliminate many of the problems zones,' so the overall user experience should improve."

White space has become a hot-button issue in recent years, with Congress and the Federal Communications Comr whether to auction or make freely available the broadcast frequencies that were opened up by the 2008 switch fr broadcasting.

As a result of the five-year NSF grant, all the information about the Rice/TFA tests—including how the equipment to operate, and how citizens use it—will be freely available. That should make it easier for companies and municip of setting up and operating their own wide-spectrum networks. It may also help regulators as they compare the p off white-space bandwidth or freeing it for unlicensed, Wi-Fi-style development.

The project marks the latest collaboration between TFA and Rice University. Led by Knightly, researchers from th

teamed with TFA to build TFA Wireless in 2004. The network uses custom access points to provide free high-spe
4000 East End Houston residents. It also serves as a technology test bed, a place where Rice researchers can con
new transmission platforms, custom-built mobile phones, in-home health-monitoring devices, and other wireless

The equipment is expected to be a combination of white space and Wi-Fi radios that will switch seamlessly to acc
conditions. This will help users extend battery life and get an improved connection. The researchers also will expl
savings from powering down Wi-Fi nodes and covering large portions of the network with a small number of whit
during off-peak hours.

Rice University

Technology For All