

Planned Wireless Internet Network Threatens GPS

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WASHINGTON — A new, ultra-fast wireless Internet network is threatening to overpower GPS signals across the U.S. and interfere with everything from airplanes to police cars to consumer navigation devices.

The problem stems from a recent government decision to let a Virginia company called LightSquared build a nationwide broadband network using airwaves next to those used for GPS. Manufacturers of GPS equipment warn that strong signals from the planned network could jam existing navigation systems.

A technical fix could be expensive — billions of dollars by one estimate — and there's no agreement on who should pay. Government officials pledge to block LightSquared from turning on its network as scheduled this year unless they receive assurances that GPS systems will still work.

The stakes are high not only for the GPS industry and its users, but also for those who would use LightSquared's network. In approving it, the Federal Communications Commission seeks to boost wireless competition and bring faster and cheaper Internet connections to all Americans — even in remote corners of the country.

LightSquared and the FCC both insist the new network can co-exist with GPS systems. But device makers fear GPS signals will suffer the way a radio station can get drowned out by a stronger broadcast in a nearby channel.

The problem, they say, is that sensitive satellite receivers — designed to pick up relatively weak signals coming from space — could be overwhelmed when LightSquared starts sending high-power signals from as many as 40,000 transmitters on the ground using the airwaves next door.

"The potential impact of GPS interference is so vast, it's hard to get your head around," said Jim Kirkland, vice president and general counsel of Trimble Navigation Ltd., which makes GPS systems. "Think 40,000 GPS dead spots covering millions of square miles in cities and towns throughout the U.S."

One of the biggest risks is to the GPS navigation systems used by about 40 percent of commercial and private planes. Backup systems that rely on ground-based radio signals are not as accurate and have coverage gaps. Some older private planes have no backup at all.

With GPS interference, a pilot "may go off course and not even realize it," said Chris Dancy, a spokesman for the Aircraft Owners and Pilots Association.

LightSquared's network could also undermine the Federal Aviation Administration's multi-billion-dollar program to upgrade the nation's air-traffic control system, which is based on World War II-era radar technology.

The new GPS-based system is more precise and lets planes fly more direct routes. That will save airlines time, money and fuel and cut pollution. It is also key to accommodating projected increases in airline traffic by enabling planes to fly safely closer together.

Public-safety officials, too, are nervous about LightSquared because they rely on GPS to track and dispatch police cars, fire trucks and ambulances. Many 911 systems also use GPS to help locate people. Disruptions could delay responses to emergencies, said Harlin McEwen, an official with the International Association of Chiefs of Police.

Even the Pentagon has expressed concern as it relies on GPS to guide planes, ships, armored vehicles, weapons and troops.

LightSquared plans to compete nationally with super-fast, fourth-generation wireless services being rolled out by the likes of AT&T and Verizon Wireless. It won't sell directly to consumers, though. Instead, LightSquared will provide network access to companies including Leap Wireless, parent of the Cricket phone service, and Best Buy, which will rebrand the service under its own name.

LightSquared has its roots as a satellite-phone operator, so its airwaves historically have been reserved primarily for satellite communications. FCC rules adopted in 2003 allowed the company to back up those signals with ground-based wireless service, but only to fill in coverage gaps.

In January, however, the FCC gave LightSquared permission to use its airwaves for a broader, conventional wireless data network. Although the company will continue to offer satellite service, it plans to cover at least 92 percent of Americans by 2015 with high-power wireless signals transmitted by base stations on earth.

Until now, GPS receivers haven't had much trouble filtering out noise in the adjacent air-

waves because it consisted mostly of low-power signals beamed from space. But GPS manufacturers warn that will change once there is a major ground-based broadband network.

Both LightSquared and the FCC say further testing is needed to determine the true extent of any interference. The FCC is requiring LightSquared to participate in a study group with GPS manufacturers and users.

LightSquared won't be allowed to turn on its network until the government is satisfied that any problems are addressed, FCC

spokesman Rob Kenny said.

"We have every reason to resolve these concerns because we want to make sure there is a robust GPS system," LightSquared executive vice president Jeffrey Carlisle said.

Dan Hays, a consultant with the firm PRTM, insists the technical solution is straightforward: GPS devices need to include better filters to screen out the LightSquared signals.

Estimates on the costs of a fix, however, range widely.

Hays believes it will cost no more than \$12 million — or 30

cents per device — to install better filters in roughly 40 million standalone GPS units made worldwide each year. Cell phones, he said, will be fine because they don't rely solely on GPS to determine location and have better filters anyway.

But Tim Farrar, a consultant with TMF Associates, insists cell phones need upgrades, too — raising the annual cost to as much as \$1 billion.

Tens of billions of dollars of existing equipment may also need to be replaced, Farrar said.

GPS manufacturers insist that

neither they nor their customers should have to pay.

That's because GPS receivers were designed to screen out low-power signals next door, and now the government is changing the rules, said Scott Burgett, software engineering manager with Garmin Ltd.

But Hays said GPS receivers are "eavesdropping on signals outside of where they are supposed to be" — in LightSquared's space.

That was not a problem — until now.

Moreover, LightSquared and

the FCC say the GPS industry should have been preparing for a ground-based network nearby since the FCC first allowed back-up wireless systems in that space in 2003.

The real dilemma, Hays said, is this: "This is a situation where the neighbor built the fence too far over the property line and may not have realized it at the time. Now the other neighbor wants to build a pool and there isn't enough space. So the question is: who has to pay to move the fence?"

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