911 CALLS

More trouble ahead?

If you bought a cell phone because you thought you could count on it for emergency calls to 911, think again. Seven years ago the Federal Communications Commission ordered the creation of the so-called wireless Enhanced 911 system (E911). But it's still not clear that this expensive, technologically challenging project will ever be completed—let alone finished—by the FCC's November 2005 deadline.

There is some progress. As of October 2003, 18 percent of the nation's estimated 6,000 emergency call centers reported that they had the most up-to-date wireless E911 systems, with the capability to locate wireless callers. That's up from 8 percent a year earlier. After several well-publicized tragedies, including the case of four New York City teenagers who drowned after rescuers couldn't trace the cell-phone call they made from their floundering dinghy, House and Senate legislators introduced bills authorizing hundreds of millions of dollars to help local public safety agencies buy the equipment needed for wireless E911.

But 35 percent of the call centers still haven't reached the first phase of wireless E911—the ability to display the number of an incoming cell-phone call and the location of the tower to which it's connected.

A November 2003 U.S. General Accounting Office report on wireless E911 predicted "piecemeal availability of this service across the country for an indefinite number of years to come."

Furthermore, the FCC has done nothing to resolve a related problem: uncooperative phone networks and phones that don't take full advantage of the available signals to put through a 911 voice call.

CR Quick Take

Most of the nation's 6,000 emergency call centers still aren't equipped with the latest wireless Enhanced 911 systems, so that they can locate people who make a call from a cell phone.

- **The carriers have adopted two different systems for locating callers.**
- **Surcharges on cell-phone bills are supposed to help defray the cost of wireless E911. But cash-strapped states have raided those funds for other uses. Only recently did Congress authorize funds to help.**
- **Even if E911 technology worked perfectly, other incompatibilities in the cell-phone system may mean that your call to 911 never gets through. Your phone may not be able to complete the call using any available network.**
- **The Federal Communications Commission has not done enough to ensure that cell phones work in the most reliable way with 911 calls.**
- **For tips to increase the chances that your call to 911 will get through, see page 26.**

E911: WHY SO HARD?

"A lot of consumers assume that a 911 call from a cell phone is just as accurate as from a landline phone," says Gregory Rohde, executive director of the E9-1-1 Institute, a nonprofit organization established to support the Congressional E-911 Caucus, a House-Senate group promoting the development of the E911 system. "It comes as a surprise to them that it is not."

Cell-phone users learn the realities of 911 calling the hard way. As we reported in February 2003, 15 percent of the 1,880 subscribers we surveyed who dialed 911 had trouble connecting, and 4 percent never got through at all.

Because landline phones by definition are installed in fixed physical locations, the vast majority of 911 call centers have long had "enhanced" service, which automatically displays the phone number and street address of any call. But the same technology won't work for cell phones. Indeed, equipping the wireless networks to pinpoint the location of callers has turned out to be a monumental task involving several layers of government, local phone companies, and carriers. Here's what those players have accomplished so far:

Carriers. They seem to be the farthest along. But they've chosen two different technologies to locate callers.

Verizon, Sprint, and Nextel offer handsets with the ability to locate you by using global positioning system satellites. AT&T, Cingular, and T-Mobile triangulate a location from the strength and timing of signals from nearby cell-phone towers.

If you have a GPS handset and you are

calling on a triangulation system, that system may be able to find you. But the reverse isn't true: a non-GPS handset connected to a GPS-using system can't be located. Both systems are designed to deliver latitude and longitude coordinates to the emergency call center; the centers don't need duplicate systems to handle all the calls.

Both systems have shortcomings, according to the experts we consulted. The GPS systems work accurately when at least three GPS satellites can "see" the handset. But anything that blocks the line of sight, such as tall buildings or heavy vegetation, can keep the GPS signal from reaching the handset.

Triangulation systems also work fine with multiple towers. Accuracy diminishes with few towers available. "There are plenty of places where cell sites are so spread out you can barely hit one," says Steven Marzolf, E911 coordinator for Virginia and president of the National Association of State 911 Administrators.

Even the best systems don't match the accuracy of landline E911. "The best the FCC expects with a GPS solution is an accuracy to within 50 meters at least two-thirds of the time," Marzolf says. "There are places in Richmond where that radius could put you inside of any one of five high-rise buildings."

Call centers. These government offices, often little more than a few operators inside a local police station, must install sophisticated equipment to receive the location information from the wireless carrier and display it in a usable form. Small centers can expect to pay tens of thousands of dollars for the equipment; large centers, hundreds of thousands.

A few states, including Indiana, Vermont, and Virginia, have rolled out wireless E911 to all or most of their territory by providing money and centralized technical help to the call centers. In other states, the call centers have been left to do the job themselves; those places are typically lagging behind, according to the GAO report.

Some states have collected E911 funds, through a surcharge on customer bills, but then raided them for other purposes. In New York State, a 2002 audit found that some of the tens of millions of dollars collected each year had gone for expenses such as state-police body armor and flight-safety training, even as local call centers delayed E911 for lack of funds.

Local phone companies. Deploying wireless E911 requires upgrading the local landline system to become an intermediary between the cell-phone carrier and the 911 call center. In some areas, disputes over who should pay for these upgrades have delayed wireless E911.

The federal government. The FCC has created the E911 Coordination Initiative to help solve problems and mediate squabbles. But the agency has yet to address a more fundamental issue: improving your ability to reach 911 from a wireless phone in the first place.

WHY YOU MAY NEVER REACH 911

Neither GPS tracking nor tower triangulation will guarantee that your cell-phone call to 911 will get through. Part of the problem—as we documented in our own tests last year—is lack of service, either because there are no cell towers nearby or because your service is incompatible with the service in the area through which you're passing. "If you can't call your grandmother, you can't call 911," says Marzolf.

Another problem is "lock-in," which arises because your cell phone is programmed to preferentially seek out the signal from the home carrier even if another carrier's signal is stronger.

Phones that have both digital and analog capability are required by the FCC to abandon the home carrier's signal in favor of another if they can't get through while in the analog mode on a 911 call. However, the FCC no longer requires carriers to provide an analog signal, and the agency has not updated its emergency-calling rules to cover digital-only phones. In fact, in response to a class-action lawsuit over the emergency-calling issue, carriers are challenging some parts of the FCC's existing rule on wireless 911 calls.

Requiring companies to make their digital technologies talk with one another—as CU has advocated—would help ensure that when someone dials 911, the phone would quickly switch to whatever usable signal is available to make the connection.

what you can do

With reliable, nationwide wireless E911 service years away, you should take these steps now to maximize your chances of reaching a 911 operator:

- When driving, always keep your phone on and its antenna extended. This helps make the phone visible to the greatest number of cell towers.
- When you're driving in an unfamiliar area, note landmarks such as exit numbers, mile markers, river crossings, or even a big mall so that you can help an emergency operator locate you.
- If you can't reach 911 on the first try, hang up and try again. Your call may be picked up by another tower.
- If you get through, assume that the operator won't know your number or location. Give your cell-phone number immediately—even before trying to explain your problem—so the operator can call back if the call is dropped. Then give your location as best you can.
- If, like many people, you want a cell phone to use in an emergency, choose a phone that maximizes the chance that you'll get through to 911: a dual-band or tri-mode handset. Those are terms you'll see in ads and store displays, which mean that the phone works in more than one frequency band or that it can use more than one network. The best cell phones for emergencies are ones that can receive an analog signal and operate in two frequency bands. In ads and brochures, you'll see such phones described as dual-band, tri-mode, or multinetwork.

  As the Ratings on page 23 indicate, half the phones we tested are tri-mode. Here's a recap: for Verizon, all but the LG (1) and Samsung (2); all four Sprint phones; and all the AT&T and Cingular TDMA phones.

  All but one of the tested GSM phones available from AT&T, Cingular, or T-Mobile are GSM-only. The exception is the Siemens (12), which can also use the TDMA network.
- If you're a Nextel, Sprint, or Verizon customer, choose a phone that includes GPS technology. Phones more than approximately a year old are unlikely to have this feature.
- Know the status of your local wireless E911 service. The National Emergency Number Association, a nationwide 911 resource organization, has a searchable wireless deployment map on its Web site at *dot.nena.org/index.asp.*