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IN THE MATTER OF THE APPLICATION)
OF QWEST CORPORATION FOR)
DEREGULATION OF BASIC LOCAL)
EXCHANGE RATES IN ITS BOISE, NAMPA,)
CALDWELL, MERIDIAN, TWIN FALLS,)
IDAHO FALLS, AND POCA TELLO)
EXCHANGES.)
_____)

CASE NO. QWE-T-02-25

EXHIBITS TESTIMONY OF WAYNE HART

IDAHO PUBLIC UTILITIES COMMISSION

MARCH 19, 2003

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Case No. QWE-T-02-25

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Difference Between Qwest and Wireless Service

Long Distance Comparison

	Average Residential Customer, with 28 Intralata and 36 Interstate Minutes			Average Business Customer with 117 Intralata and 151 Interstate minutes		
	Qwest Monthly Charges	Wireless Monthly Charges	Difference	Qwest Monthly Charges	Wireless Monthly Charges	Difference
Edge Wireless	\$31.30	\$165.99	\$134.69	\$71.16	\$149.99	\$78.83
US Cellular	\$31.30	\$159.20	\$127.90	\$71.16	\$140.00	\$68.84
Sprint PCS	\$31.30	\$100.00	\$68.70	\$71.16	\$100.00	\$28.84
Verizon Wireless	\$31.30	\$154.99	\$123.69	\$71.16	\$121.99	\$50.83
AT&T Wireless	\$31.30	\$169.19	\$137.89	\$71.16	\$149.99	\$78.83
T-Mobile	\$31.30	99.99	\$68.69	\$71.16	\$99.99	\$28.83
Nextel	\$31.30	89.99	\$58.69	\$71.16	\$89.99	\$18.83
Cricket	\$31.30	39.99	\$8.69	\$71.16	\$39.99	-\$31.17
ClearTalk (Magic Valley)	\$31.30	39.39	\$8.09	\$71.16	\$60.39	-\$10.77
ClearTalk (Eastern Idaho)	\$31.30	\$46.35	\$15.05	\$71.16	\$67.35	-\$3.81

For the long distance comparison, I used information from Qwest's report to the Administrator of the Idaho Universal Service Fund (IUSF) and the May 22nd, 2002, *Trends in Telephone Usage* (Trends) published by the FCC Industry Analysis and Technology Division. Using the data from Table 3.2 of the Trend's report, I divided the total number of Intrastate minutes from the IUSF report into residential and business customer classes. I then divided that by the number of customers in each class to determine an average number of intrastate minutes for an average residential and business customer. I then used the ratio of intrastate and interstate minutes from Table 11.2 of the Trends report to determine an amount of interstate minutes. The intrastate and interstate minutes were added to the peak local minutes from Exhibit 101 of the median flat rate customer for both residential and business customers.

For the calculation of wireless costs, I used the lowest cost "national" plan, to obtain the "free" long distance. For Clear Talk, which does not provide a "free" long distance plan, I simply used the per minute long distance rates published on their web site. The analysis assumes all long distance calls, both intrastate and interstate, are from locations within the Carriers network, but outside the carrier's home area. However, except in the case of ClearTalk, the bundled long distance minutes exceeded the average toll usage, so this assumption did not materially impact the analysis.

For the calculation of Qwest's costs, I used 10 cents a minute for interstate calls and 15 cents a minute for intrastate calls, and added this to the local costs from Confidential Exhibit 101.

Difference Between Qwest and Wireless Service

Long Distance Comparison with Directory Listing

	Average Residential Customer, with 28 Intralata and 36 Interstate Minutes			Average Business Customer with 117 Intralata and 151 Interstate minutes		
	Qwest Monthly Charges	Wireless Monthly Charges	Difference	Qwest Monthly Charges	Wireless Monthly Charges	Difference
Edge Wireless	\$31.30	\$167.49	\$136.19	\$71.16	\$155.99	\$84.83
US Cellular	\$31.30	\$160.70	\$129.40	\$71.16	\$146.00	\$74.84
Sprint PCS	\$31.30	\$101.50	\$70.20	\$71.16	\$106.00	\$34.84
Verizon Wireless	\$31.30	\$156.49	\$125.19	\$71.16	\$127.99	\$56.83
AT&T Wireless	\$31.30	\$170.69	\$139.39	\$71.16	\$155.99	\$84.83
T-Mobile	\$31.30	\$101.49	\$70.19	\$71.16	\$105.99	\$34.83
Nextel	\$31.30	\$91.49	\$60.19	\$71.16	\$95.99	\$24.83
Cricket	\$31.30	\$41.49	\$10.19	\$71.16	\$45.99	-\$25.17
ClearTalk (Magic Valley)	\$31.30	\$40.89	\$9.59	\$71.16	\$66.39	-\$4.77
ClearTalk (Eastern Idaho)	\$31.30	\$47.85	\$16.55	\$71.16	\$73.35	\$2.19

For the long distance comparison, I used information from Qwest's report to the Administrator of the Idaho Universal Service Fund (IUSF) and the May 22nd, 2002, *Trends in Telephone Usage* (Trends) published by the FCC Industry Analysis and Technology Division. Using the data from Table 3.2 of the Trend's report, I divided the total number of Intrastate minutes from the IUSF report into residential and business customer classes. I then divided that by the number of customers in each class to determine an average number of intrastate minutes for an average residential and business customer. I then used the ratio of intrastate and interstate minutes from Table 11.2 of the Trends report to determine an amount of interstate minutes. The intrastate and interstate minutes were added to the peak local minutes from Exhibit 101 of the median flat rate customer for both residential and business customers.

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THE WALL STREET JOURNAL

ONLINE

February 18, 2003

TELECOMMUNICATIONS

Cellphone Carriers Cut Back On Some Generous Call Plans

By **JESSE DRUCKER**
Staff Reporter of THE WALL STREET JOURNAL

The wireless gravy train is slowing down.

In the past few weeks, several mobile-phone carriers have pared some of their most generous calling plans, with some cutting back on minutes by as much as 60% and others getting rid of free-evening calling.

AT&T Wireless Services Inc. stopped offering a national plan with 1,000 "anytime" minutes for \$39.99. That promotional plan, started in September, was meant to get users on to its new, higher-speed network, which allows subscribers to send photos, check e-mail, and surf the Web at speeds comparable with dial-up.

Now, AT&T Wireless subscribers paying that much per month get as few as 550 "anytime" national minutes. (In some markets, it's 600.) The carrier also cut back minutes in several other plans, and raised rates some customers pay when they go over their allotted minutes and also raised some roaming rates.

Meanwhile, at the beginning of the month, T-Mobile USA Inc. stopped offering unlimited nighttime calling in one plan. The carrier has also pared back a national \$39.99 plan from 1,000 minutes to 600.

THE ABCS OF WIRELESS

How much is your monthly cellphone bill? Participate in the **Question of the Day**¹.



Can't keep your 3G straight from your CDMA? Our expanded glossary² will help you sort through wireless jargon.

Tangled in a web of woes, cellphone companies face increasing pressure to merge. Rumors are buzzing, but the big question is -- who will it be? Meet the players³ in the world of wireless.

Cingular Wireless also recently reduced the number of minutes in its \$39.99 local calling plan from 1,000 minutes to as little as 400 minutes in some markets. Customers in Los Angeles, New York, Las Vegas and some other markets are still in luck: They get 600 minutes in those places, as long as they have a phone that operates on its new network.

Experts think it is likely that price cutting will eventually return, given how competitive the industry remains. So unless you're desperate to sign up for a plan now, just wait a while for another round of promotions. Or, keep in mind that even with the heaviest discounting gone, many plans still offer more minutes than before the promotions.

If you're a super-heavy caller, some of AT&T Wireless's higher-end plans actually got more generous: a local plan that gave you 1,200 peak minutes for \$99.99 now offers 1,600 minutes.

Why are mobile-phone companies cutting back on their bargain plans now? Carriers worried about the continued slowdown in the wireless-industry growth rolled out generous plans late last year to help generate stronger growth in subscribers. Now, the industry wants to report strong cash positions at the expense of growth.

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A spokesman for AT&T Wireless said the company made the changes for simplicity's sake, and pointed out that in a few cases, service got a bit cheaper. "In some cases we've added minutes, in some cases we've reduced minutes," he said.

Write to Jesse Drucker at jesse.drucker@wsj.com⁴

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Updated February 18, 2003

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FEATURE REPORT

February 2002

The complete cell-phone guide

Illustration by Bek Shakirov

Service shortcomings

Why you can't always count on a cell phone when you need it. How to get better service.

Sept. 11 became a proving ground for emergency calling, especially from the cell phones on which 123 million Americans depend. On normal days cellular carries roughly 30 percent of 911 calls. Total cellular traffic nearly doubled in the hours following the terrorist attacks. That's when the thousands of people trying to make a call learned not only how vital cell phones have become, but how fickle cellular networks can be.

"We had the highest calling volume we've ever had," said Danielle Perry, a spokeswoman for AT&T Wireless. Many people in New York City and Washington, D.C., heard only the fast busy signal that means the network can't handle another call. Rescue workers using cell phones were as stymied as anyone.

CELLULAR BUSINESS, AS USUAL

The past two years have seen cellular subscribers soar by more than 40 percent, to 123 million. And Americans' cell-phone use has risen sharply, from 89 billion minutes in 1998 to nearly 200 billion in just the first six months of last year.

Americans are clearly willing to forgive a lot for those minutes. Telephia, a San Francisco company that measures network performance, pegs the chances of getting disconnected at 2 percent in a 2-minute cell-phone call. William E. Kennard, chairman of the Federal Communications Commission (FCC) from 1997 until last June, says that if a regular call on a landline phone cut out that often, outraged consumers would call the phone company. "But there is not the same expectation of quality for wireless," he says.

There are no service standards for cellular--minimal benchmarks for disconnects, clarity, or blocked calls, for instance. But then, landline phones grew up as a tightly regulated monopoly, not in the openly competitive market that distinguishes cellular.

"It's made wireless phones affordable for the majority of people," but not without problems, says Kennard. Indeed, Americans consistently rate their cellular-phone service as mediocre.

A national survey of households with wireless service conducted in 2000 by the Yankee Group, a Boston-based research firm, found that only 41 percent of the 2,910 respondents



Many people buy a cell phone for on-the-road emergencies, but the cellular 911 system can't locate callers.

- [Performance in rr cities](#)
- [Where providers licensed](#)
- [What the FCC sh require](#)

Expert Forum, [Ce phones -- service handsets](#), January, February 1, 2002

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said they are "very satisfied." A *Consumer Reports* survey of about 1,500 cell-phone users in 2000 found that half were very satisfied.

The reasons for such low levels of satisfaction--and what we can do to help you find better service--include:

► **Spotty coverage.** The maps carriers provide often show service that blankets entire regions. But accurate national maps for some carriers actually eliminate entire states or sizable swaths (see [Where providers are licensed](#)).

Accurate local maps are more like Swiss cheese, riddled with dead spots. Carriers map those spots regularly, but consumers never have a chance to see those maps. The maps consumers do see aren't independently audited by anyone, not even the FCC. Jim Schlichting, deputy chief of the commission's wireless bureau, echoes advice we've given: that a good way to find out about coverage is to ask neighbors and friends.

How we can help. In addition to the maps in [Where providers are licensed](#), we give an overall satisfaction score for cellular service in nine large metropolitan areas in [Performance in major cities](#), based on data provided by Telephia.

► **Surprisingly costly plans.** The Wireless Consumers Alliance, a California-based nonprofit organization at www.wirelessconsumers.org, receives two to three complaints a day. Recent ones include these:

A Gloucester Township, N.J., customer switched from prepaid cellular service to Sprint PCS, only to find that the new Sprint service wouldn't work at home; the area is a dead spot on Sprint's network. And the Sprint contract carries a \$150 early-termination fee.

A Sacramento, Calif., lawyer using AT&T Wireless is billed for long distance and roaming, but his plan includes both. "I always get credited, but they put me on hold for a long time," he says.

How we can help. The table in [A sample of calling plans](#) breaks down charges from the five leading carriers for four kinds of typical cell-phone users. You can use the data to help determine the best value for your calling pattern.

► **Billing problems.** Last fall, the FCC issued its first report on cellular complaints. Billing problems topped the chart, accounting for 55 percent of the 3,076 problems logged in over a three-month period. The FCC won't name companies that are the subject of those complaints. And though the FCC sends the complaints on to carriers--in the first 10 months of last year, it forwarded more than 10,000--the agency has no system to follow up.

The California Public Utilities Commission noted a 47 percent jump in cellular "complaints and inquiries" last year; billing disputes and service quality topped the list. The agency is now proposing a state consumer bill of rights for telecommunications, citing the "frustration many feel in dealing with carriers."

How we can help. When a problem arises, you will have to deal with the cellular company first, but don't hesitate to call state regulators or the FCC (see [What the FCC should require](#)). If the problem is with the telephone itself, go to one of the cell-company's stores, not an independent agent; the staff is likely to be better equipped to provide a remedy.

THE PATCHWORK NETWORK

Cell-phone carriers have built networks that handle most calls most days, but capacity isn't infinite. Adding a new cellular tower can cost carriers as much as \$300,000, a dubious investment if the additional capacity goes largely unused.

Because a major emergency can overwhelm the system, the government is pushing carriers to quickly set up a priority access system. It would give precedence to the cell phones that rescuers may carry; their calls would shoot to the front of a site's queue when an emergency

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is declared.

The industry expects to have 50,000 priority lines in place by the end of the year, says Kathryn Condello, a spokeswoman for the Cellular Telecommunications & Internet Association, a trade group.

But there is one formidable problem in the way of priority access, which also helps explain why everyday cell-phone service can be maddening. In 1986, the FCC dropped its requirement that carriers use one common analog standard, although cellular carriers must still support analog. And in 1993, when the FCC opened up the digital PCS band, the agency didn't require those carriers to carry analog signals at all.

As a result, different companies have erected their digital networks as technical fiefdoms; users can't easily cross from one to another. AT&T's TDMA system can't communicate with Verizon's CDMA system. Such incompatibilities mean that carriers can't pool resources, allowing, say, AT&T to tap some idle Verizon capacity.

Kennard says that the carriers' diverse technical standards "made for a more balkanized industry" that has difficulty coordinating, especially in emergencies.

ELUSIVE E911--WE COULD BE SAFER

Cellular's biggest failing may well be its limited usefulness in an emergency. If you call 911 from a cell phone, rescuers cannot readily find you. To give just one example: A *Consumer Reports* staffer who wanted to alert authorities to an accident on New York City's West Side Highway was taken aback when the 911 operator asked what town he was in. His emergency cellular call had somehow been routed to Totowa, N.J., 18 miles west, and been answered by New Jersey State Troopers. They quickly transferred the call back to a New York City call center.

Granted, it's hard to find a moving target, but the technology to do so has been around for years, most notably in the OnStar system built into many luxury cars, which relies on navigational satellites. Most cellular carriers plan to use the same system in what's known as Enhanced 911, or E911. But government and industry have been dragging their feet.

In 1996, carriers agreed to provide E911 in two steps over five years. Phase I would convey a cell phone's number for callbacks and the location of the cell tower handling the call, a rough indication of whereabouts. Carriers complied with Phase I, although most emergency call centers must still upgrade their facilities to handle the extra information. There is no timetable or dollar figure for the upgrade.

The cellular industry hasn't delivered on Phase II, which was supposed to take effect last October. By then, cell systems should have been capable of pinpointing callers to within a few hundred feet or better. But the industry apparently underestimated the technological challenge. For example, a Verizon spokeswoman says the company spent "a lot of money trying a network-based system that did not work well, especially in rural areas." So it adopted a handset solution. The big carriers asked the FCC for an extension and were given four years.

"My own view is that the carriers don't see this as a money-making proposition, locating people in emergencies" says Kennard. Michael K. Powell, the current FCC chairman, has said he is "disappointed and unsatisfied" with progress on E911.

Even when E911 finally arrives, the carriers' digital fiefdoms may well stymie its effectiveness if there is no legal requirement for them to accept a caller's location from other carriers. For example, an E911 call from a Verizon handset might not register your location if an AT&T cell site receives it (911 calls must travel over the first available circuit). Most E911 systems won't work on the older analog system, either. As of last fall, only St. Clair County, Ill., a suburb of St. Louis, Mo., had E911. The system now works only with phones that can access a Verizon tower.

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A CAPACITY FIX?

Calls can be lost as you move from one cellular site--the radius covered by a transmission antenna--into another.

In theory, more cell sites in an area may mean fewer disconnects and blocked calls. Carriers say they've invested billions to add sites, but that radio signals are inherently unreliable, affected by buildings, topography, weather, and even foliage.

The industry convinced the Federal Communications Commission that it needs a bigger wedge of frequencies for emergencies and to improve service. Last November, the commission removed the "spectrum caps" limiting the number of airwaves each carrier could own in a particular market.

Lifting the caps was unfortunate for two reasons:

First, those caps have fostered competition. Today 90 percent of Americans can choose from among three or more wireless carriers, and 75 percent from five or more.

Second, there's new technology that will also deliver relief without inhibiting competition. In coming years carriers plan to upgrade to 3G, or third generation, cellular. (1G was analog; 2G is today's system.) 3G technology can cram many more voice calls into airwaves and boost the speed at which wireless data travel.

After the vote to lift caps, Kennard told us: "This was not about spectrum but about mergers and acquisition. If you only have two or three carriers, there will be less incentive to compete on price and service."

Getting through in a pinch: Send text

Cell phones aren't totally hopeless in the kind of emergency that clogs lines and blocks calls. Many newer phones provide a second track to get through, using a text message.

Text messages stand a good chance of reaching their destination, even if voice circuits are overloaded. Text demands less from network resources. Voice calls must be transmitted right away, while text is broken into packets of data that squeeze through airwaves when there's a bit of room.

The short-messaging service (SMS) that cell phones offer limits you to 160 characters, entered from the keypad. Some handsets also offer canned messages, such as "I'll be late." You enter the recipient's cell-phone number and push Send. In a few minutes his or her phone beeps and delivers your message.

Until now, carriers haven't allowed messages to be sent outside their network. Now, carriers say they will open the system, perhaps sometime this year. Some also let anyone with a regular Internet connection send a note to a cell customer. SMS is different from full-fledged wireless e-mail, however.

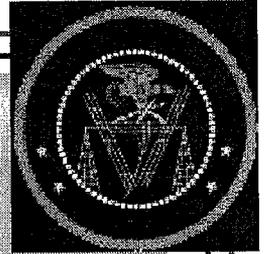
Pricing varies, but 10 cents a message is typical for senders; recipients might also pay a few cents.

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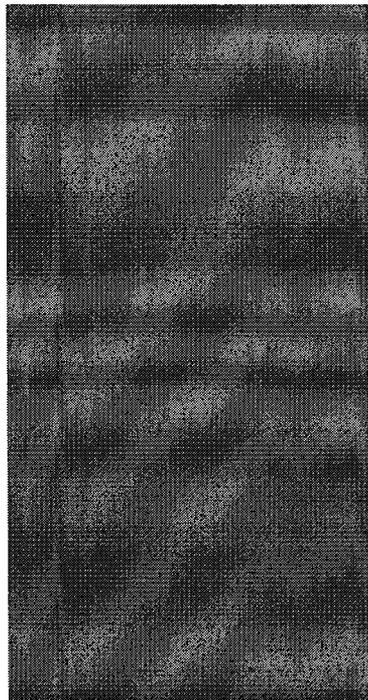
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what you should know *about*

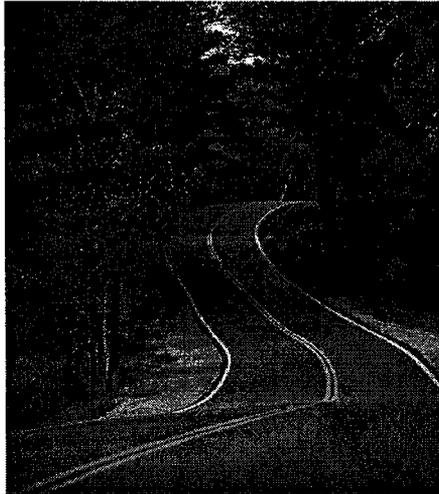


Wireless Phone Service



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Coverage...



“Coverage” refers to the geographic area where mobile telephone subscribers can use their cell phones. Cell phones must be able to receive or “pick up” a signal from a mobile telephone carrier’s network. Coverage varies by carrier and is determined by the extent to which carriers have built out their networks.*

■ ANALOG VS. DIGITAL

There are essentially two types of coverage: analog and digital. Calls made on digital networks are clearer, more secure, and more feature-rich than calls made on analog networks. Because analog technology has been in use since the 1980s, virtually every part of the country where people live has analog coverage. Carriers have deployed digital technology more recently and, therefore, digital service plans and coverage tend to be available in the more populated and highly-traveled areas of the country. The FCC estimates approximately 90 percent of the U.S. population lives in counties that have some digital coverage. Significant portions of the country’s land area do not have access to digital service. Carriers are constantly upgrading their networks to expand the areas where they can offer digital mobile telephone service.

■ A BRIEF HISTORY

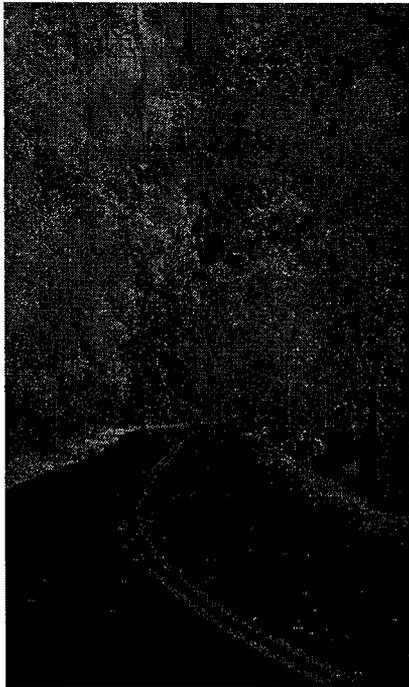
During the 1980s, the FCC licensed cellular spectrum in the 800 MHz band to two cellular carriers in virtually every market in the country. These carriers began building out their networks and offering analog cellular service. In 1995 the FCC began auctioning additional mobile telephone spectrum in the 1900 MHz band for Personal Communication Services (PCS). The carriers that purchased this spectrum began building out digital technology and offering digital mobile telephone services. Cellular carriers in the 800 MHz band have upgraded most of their networks from analog to digital technology in order to expand capacity and improve the quality of service. During the late 1990s, carriers operating in spectrum bands allocated for Specialized Mobile Radio (SMR) service began upgrading their networks with digital technology and offering mobile telephone service in competition with cellular and PCS operators. Mobile telephone carriers using these various spectrum bands continue to deploy digital technology in their networks today.

**The term “cell phones” generally refers to all mobile phones that operate on any of the three types of mobile telephone spectrum: cellular, PCS, or digital SMR.*

■ WHERE CAN I USE MY CELL PHONE?

This is determined mainly by where your carrier owns spectrum licenses and where it has built out its network within its license areas. Analog networks cover almost every area of the country, whereas digital networks, while extensive, are not everywhere. The extent to which individual carriers have built out their networks in a given market varies.

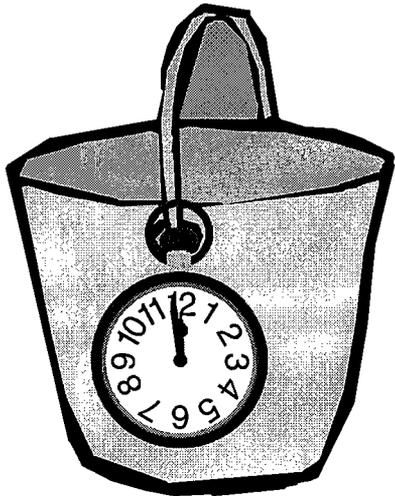
Even if your carrier has not built out its network in a given area, you may be able to connect to or "roam on" another carrier's network. If your carrier has an agreement with another carrier, and if you have a type of handset that allows roaming, you may be able to connect (see "The Handset," page 4). Most handsets that allow roaming have an indicator to let subscribers know when they are outside their home calling area and/or out of reach of their carrier's network. How much you will pay for calls in different areas depends on your pricing plan (see "Pricing," page 5).



■ DROPPED CALLS, DEAD SPOTS & BUSY SIGNALS

Even where a carrier offers coverage in a specific geographic area, you may not be able to complete a given call due to limitations in network architecture and capacity. When a carrier fails to hand off a call in progress, as you travel from one part of the carrier's network to another a "dropped call" results. When many customers use a carrier's network at the same time, it becomes capacity constrained. Other customers trying to connect will hear a busy signal instead of being able to complete their calls. Topography can also affect coverage causing "dead spots." A dead spot is an area where service is not available because the signal between the handset and the cell tower is blocked, usually by hilly terrain, excessive foliage, or tall buildings. Carriers are constantly improving and upgrading their networks in order to minimize these types of problems.

Pricing . . .



Most wireless pricing plans include a certain number of minutes per month (often called a "basket" or "bucket" of minutes) for a certain price, and any minutes over that specified amount are charged on a per-minute basis. Any unused minutes at the end of the month expire. Carriers generally offer several variations of these types of plans with increasing baskets of minutes at increasing monthly fees. Carriers also vary their service plans by where subscribers can use their phones without incurring additional roaming and long distance fees.

■ NIGHT & WEEKEND VS. "ANYTIME" MINUTES

Many carriers offer plans that include a basket of minutes that can be used anytime during the month plus a larger basket of minutes that can be used during certain times, generally nights and/or weekends. Which time periods constitute "night" and "weekend" vary by carrier.

■ PEAK & OFF-PEAK MINUTES

Before the advent of "bucket" pricing plans, carriers charged subscribers a per-minute fee for each minute of airtime on every call. Some carriers still offer these types of plans today. With these plans, calls made during certain "peak" times of the day - generally business hours - often cost more, and calls made during other "off-peak" times - generally nights and weekends - often cost less. Again, which times constitute "night" and "weekend" vary by carrier.

■ WHO PAYS FOR INCOMING CALLS?

With the majority of pricing plans, consumers pay for both outgoing and incoming calls. In the case of bucket plans, the minutes from both outgoing and incoming calls are usually deducted from a customer's monthly bucket of minutes. However, some carriers offer pricing plans where all or some of the minutes of incoming calls are free to customers.

■ MINUTES OR SECONDS?

In general, mobile carriers charge by the minute. When you use a fraction of a minute, many carriers round up to the next minute, charging or deducting subscribers a full minute when only a portion of it is used. However, some carriers offer plans that round to the nearest second instead of minute.

■ LONG DISTANCE

Cell phone users have traditionally had to pay additional fees for "long distance" calls. Long distance calls are generally calls made to locations outside of a customer's home coverage area. However, some carriers may define long distance calls differently for purposes of their pricing plans. Several carriers offer pricing plans that eliminate per-minute long distance fees. Some plans charge no long distance fees for calls made from a customer's home calling area, some for calls made from anywhere on a carrier's network, and some for calls made from anywhere in the United States. Whenever a long distance call is made, the mobile telephone carrier determines which long distance carrier will complete the call, unlike with landline service where the customer chooses the long distance carrier.

■ ROAMING

Carriers have traditionally charged per-minute roaming fees on calls made from the network of the carrier that has a roaming arrangement with your carrier from a location outside of a customer's home calling area. However, several carriers have eliminated these fees in their "nationwide" pricing plans.

■ "NATIONWIDE" PRICING PLANS

All of the major mobile carriers offer pricing plans that allow customers to purchase a bucket of monthly minutes to use on a nationwide basis without incurring roaming or long distance charges. Consumers should be aware that how carriers define "nationwide" varies. For some carriers, this means being able to use your phone anywhere in the country where any type of signal is available at no additional charge. For other carriers, it means being able to send and receive calls only on the carrier's network without incurring roaming and long distance fees. These carriers' networks generally extend through the country's more populated and highly-traveled locations but do not cover the entire United States.

■ PREPAID SERVICES

With prepaid service, consumers purchase a handset and pay for a fixed amount of minutes prior to making any calls. There is usually a set time period in which unused minutes will expire. Prepaid minutes are often subject to peak and off-peak airtime rates. When prepaid customers have used up their minutes, they can refill them. Carriers do not obtain credit history reports on prepaid subscribers as they generally do with other subscribers.

■ SPECIAL OPTIONS

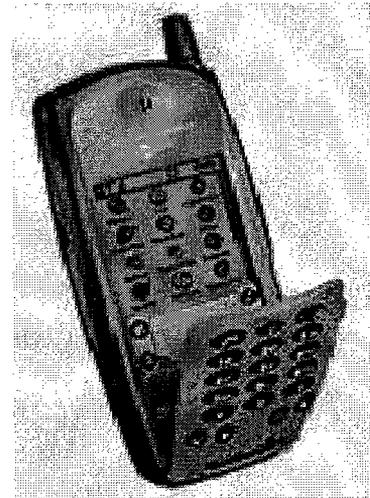
Special options (also known as vertical services) include such things as call waiting, CallerID, voicemail, call forwarding, and three-way calling. Carriers offer these to customers as add-on features beyond simply dialing and talking. Some of these options are included in the monthly price of most digital calling plans, while others are generally offered at an additional monthly or per-use charge. Many of these features may not be available on analog networks.

■ SHORT MESSAGING SERVICES (SMS)

SMS provides the ability to send and receive short text messages to and from mobile handsets. Many carriers charge a flat monthly fee for a basket of messages, with additional messages costing a few cents per message.

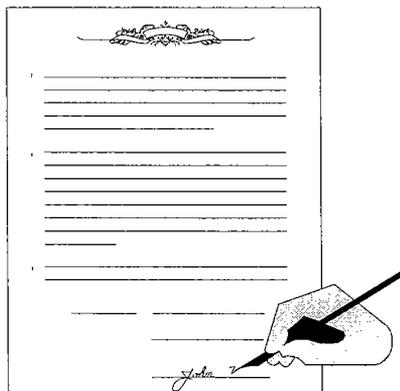
■ MOBILE DATA SERVICES

"Wireless Web" or "mobile Web" services allow customers to obtain a limited amount of text-based Internet content on their mobile phones. The type of content available generally varies from carrier to carrier. Some carriers charge a flat monthly fee for access to wireless Web content, while others offer the service at no additional charge beyond voice service. In addition, some carriers deduct wireless Web access minutes from their subscribers' basket of monthly voice minutes while others do not.



■ ACTIVATION FEES

Many carriers charge a one-time fee to customers when they initiate service, called an "activation fee." Carriers will sometimes waive this fee as part of a promotional pricing plan.



■ SERVICE AGREEMENTS

Most carriers require new subscribers to sign one-year contracts or service agreements when they sign up for a new service plan. Most charge an "early termination fee" to users who cancel their service plans prior to the end of that year. Some carriers offer additional incentives to subscribers who sign up for two-year service agreements. Consumers should carefully read any potential service contract prior to signing up for service.

WHAT TO CONSIDER WHEN BUYING A HANDSET

MODE

Is the phone single or multi-mode? Can it operate on analog or digital networks, or both? Does it indicate when it's roaming?

STORAGE

How many phone numbers and other data can the handset store?

SCREEN SIZE

This can be an important factor for viewing phone numbers and other stored data, as well as wireless web content.

SPECIAL OPTIONS

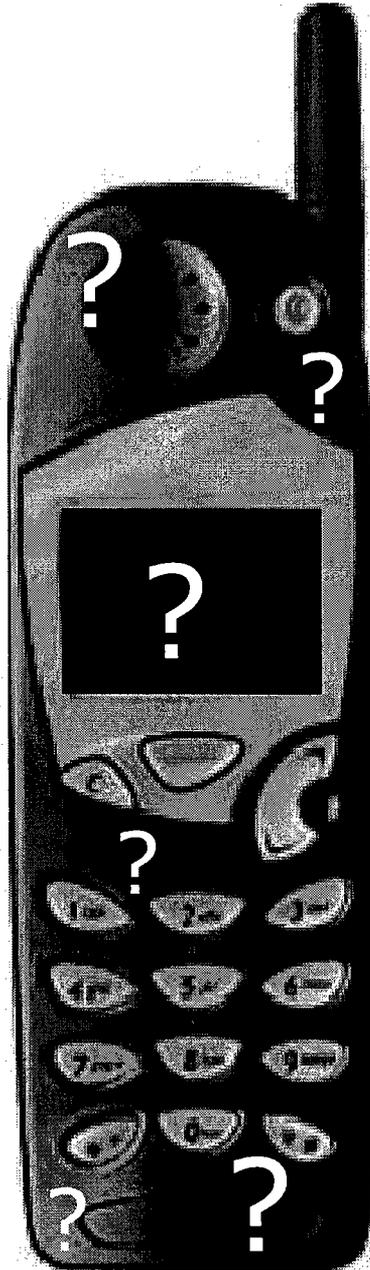
What types of "vertical features," such as CallerID, call waiting, and voicemail, are included with the handset and service plan?

VOICE FEATURES

Does the phone have voice-activated dialing?
Does it have a speaker phone?

BATTERY LIFE

What are the handset's talk time and standby time? Standby time is the number of hours or days the phone can stay on before the battery will run out. Talk time is the number of hours a user can talk on the phone before the battery will run out. These times can vary with analog and digital service. Also, a handset's battery will affect its size and weight.



SAR RATING

The Specific Absorption Rate (SAR) is a measure of the level of human exposure to radiofrequency (RF) emissions from a handset. You can obtain information on SAR ratings of specific handsets on the FCC Web site at: www.fcc.gov/oet/rfsafety/#sar.

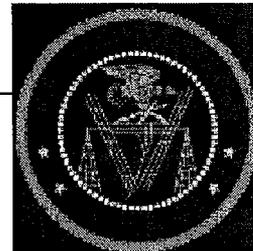
MOBILE DATA CAPABILITIES

Does the handset have the ability to access the carrier's wireless web services and/or send and receive text messages?

HEARING AID COMPATIBILITY

Hearing aids generally work with cellphones that use analog signals but not currently with those that use digital signals. More information about hearing aid compatibility is on the FCC's Consumer and Governmental Affairs Bureau webpage at: <http://www.fcc.gov/cgb/dro/hearing>

Where To Get More Information...



■ FEDERAL COMMUNICATIONS COMMISSION

WWW. FCC.GOV

1-888-225-5322 (CALL-FCC) - VOICE

1-888-835-5322 (TELL-FCC) - TTY

■ CARRIERS

The Web sites and toll-free numbers of mobile carriers with over 1 million subscribers in the United States (as of the end of 2001), listed below, provide information on where these carriers offer service, the extent of their network coverage, pricing plans and other services they offer, and the corresponding handsets and accessories they sell.

ALLTEL	www.alltel.com	(800) 255-8351
AT&T Wireless	www.attws.com	(800) 888-7600
Cellular One/Western Wireless	www.cellularonewest.com	(800) 635-0304
Cingular Wireless	www.cingular.com	(866) 246-4852
Leap Wireless/Cricket Communications	www.cricketcommunications.com	(866) 274-2538
Nextel	www.nextel.com	(800) 639-8359
Qwest	www.qwestwireless.com	(800) 899-7780
Sprint PCS	www.sprintpcs.com	(800) 480-4727
US Cellular	www.uscellular.com	(888) 944-9400
Verizon Wireless	www.verizonwireless.com	(866) 256-4646
VoiceStream	www.voicestream.com	(800) 937-8997

■ CONSUMER INFORMATION WEB SITES

The following Web sites provide consumer information on mobile telephone service, such as side-by-side comparisons of the service plans available in a given area, general advice on purchasing a mobile phone, educational information on wireless technology, user ratings of phones and pricing plans, and answers to commonly asked questions.

www.cellmania.com
www.dealtime.com
www.getconnected.com
www.point.com
www.wirelessadvisor.com

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■ OTHER CONSUMER INFORMATION

Consumer Reports (www.consumerreports.org) provides free consumer information on its Web site, including details on the various mobile service plans available in major U.S. markets and their accompanying handsets. With an online or print subscription, consumers can obtain a full ratings report and comparison of mobile service plans and handsets.

J.D. Power (www.jdpower.com) provides ratings on its Web site of all of the wireless carriers in major U.S. cities. The carriers are rated on various criteria, including call quality, cost, and customer service.

CTIA (www.wow-com.com) is a trade association representing the wireless industry. Its Web site contains tips for consumers on purchasing mobile service as well as an overview of all mobile handsets that have hands-free accessories.

AARP, the American Association of Retired Persons (www.aarp.com), provides on its Web site a published survey entitled *Understanding Consumer Use of Wireless Telephone Service* that discusses various issues related to wireless service and older consumers.

NOTE: The sources listed on this page represent a sample of the consumer information available to the public on wireless issues and is not meant to be a complete list. In addition, the FCC does not vouch for the accuracy of the information contained in these Web sites and publications.

Brochure Last Updated: 7/1/02

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12/13/2001 - Updated 08:25 AM ET

Spotty service angers cell phone users

By Andrew Backover, USA TODAY

Tom Bavolek's family is in cell phone hell. The three cell phones his family bought from Sprint PCS rarely work within 3 miles of their Southlake, Texas, home — in the center of Dallas/Fort Worth. Calls are dropped or rarely go through. That means no free long-distance calls — one of the perks Sprint PCS used to win his business. Bavolek's daughter can't use her cell phone to call home when she's late. His wife can't reach him to expand his honey-do list. Sprint PCS says it's trying to add cell towers to increase coverage. But that will likely take months. Bavolek feels trapped. His contract, with more than a year left, has an early-out fee of \$250. He also feels duped.

[Read more below](#)

Audio



- [Many cell phone users angered by coverage](#)

Related coverage

- [Cell phone free minutes drying up](#)
- [Cell phones may get own area codes](#)

"There was absolutely no mention that there was anyplace in and around Dallas/Fort Worth where you couldn't get coverage," Bavolek says. "You can consider it a type of fraud by omission. They know there are issues, and they don't make you aware of them."

Bavolek's displeasure is part of a wave of unrest rippling through the USA's estimated 127.5 million cell phone customers, a total that has nearly doubled in 3 years.

Despite advertisements that tout connectivity any time, anywhere, customers say the nation's wireless firms

Companies try to improve service
 Phone companies are

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aren't delivering. They're tired of dropped calls and busy signals caused by overburdened networks. They're angry at having to pay high "roaming" charges even if they're in their own neighborhoods because of network dead spots or weak signals. They often can't even get service in heavily populated areas. And, they're shocked by such hassles, because maps and other advertising used by wireless firms don't always show network holes or high-traffic areas that disrupt service.

They give people the impression that you have a ubiquitous service, just like a land-line phone," says telecom analyst Tom Friedberg. "It's just not true, and it probably won't be for 5 years."

Wireless phone companies are expanding networks to handle more traffic, quicker, in old and new markets (story, below right). "We're in there fighting to get cell sites on the air," says Dennis Huber, Sprint PCS senior vice president. He says local zoning laws can hold up the installation of cell sites for up to 16 months.

Yet some consumer advocates and legislators say the industry should be more accountable for its shortfalls. States are taking action.

Last year, Sprint PCS clarified its ads after New York State Attorney General Eliot Spitzer raised concerns that they were misleading. Spitzer objected to Sprint's claim to a nationwide network when its digital network didn't cover parts of New York City and other big cities. Sprint has since tweaked the ads to say that its digital network covers more than 300 metropolitan areas.

Sprint customers might have received service outside the digital network — but only at the more expensive analog roaming rate. Phones may go into "roam" mode when their users travel off the carrier's network and pick up service from another company's network. Roaming calls cost 25 cents to 45 cents a minute,

improving wireless service by:

- **Adding capacity.** Companies increased the number of cell sites, which handle cell phone traffic, nationwide by 19% between mid-2000 and mid-2001. They haven't stated plans for next year. Capacity will also rise as they secure the right to use more airwaves to build out networks that cover more than 160 million people in major markets.

VoiceStream Wireless, for example, plans to launch service next year in Cleveland, Buffalo and Richmond, Va. It also is building its own networks in California and Nevada, so it doesn't have to use someone else's. And it plans to expand in North Carolina and South Carolina.

- **Staying ahead of demand.** Earlier this year, Sprint PCS curbed advertising in Chicago for 4 months after it couldn't keep up with demand. Cingular is using mobile cell sites to handle rising traffic on college campuses. Verizon Wireless has a fleet of cars that test its network for congestion problems, so it can fix them.

- **Keeping customers informed.** Sprint PCS typically updates its coverage maps four times a year and uses its Web site to list cities where service is available. AT&T Wireless provides similar information.

- **Allowing test runs.** Although carriers charge \$150 to \$200 if consumers break contracts early, some let customers test phones and calling plans before contracts kick in. That way, customers can discover their calling patterns, find the right plan and gauge service quality before they are locked in. Sprint PCS gives customers 14 days. Verizon Wireless customers have 15 days. VoiceStream customers get 3 days. Exhibit No. 106

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By Andrew Backover

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compared with 10 cents to 15 cents a minute for regular calls, says Yankee Group analyst Knox Bricken.

Other carriers could face similar challenges. In March, 22 states, including Connecticut, Tennessee, Nevada and Colorado, asked Verizon Wireless, the nation's No. 1 carrier; No. 4 Sprint PCS; and at least one more carrier for information about their advertising and billing practices.

Legislative action

U.S. Rep. Anthony Weiner, D-N.Y., was so peeved by dropped cell phone calls that he reintroduced legislation this year to require the Federal Communications Commission to publish complaint statistics by company and market. That way, he says, consumers could judge wireless firms on quality as well as cost.

"They got so many people signing up, they were completely unready in spots around the country," Weiner says.

The legislation has stalled, in part because of an anti-regulatory climate, but also because Congress is focused on terrorism and the economy.

At Weiner's request, the U.S. General Accounting Office is studying the problem. "This is the kind of thing that more consumers are going to ask for," Weiner says.

For the most part, though, disgruntled consumers have few places to turn. Federal regulators dole out wireless spectrum but have no oversight of service quality. The FCC only recently started keeping in-depth statistics on wireless complaints. State regulators do so sporadically.

Consumers, though, register their displeasure on Web sites such as PlanetFeedback.com. Nearly 80% of letters PlanetFeedback gets about wireless firms are complaints. The average for other industries is 62%. Three of the site's 20 worst-rated companies are VoiceStream Wireless, Sprint PCS and WorldCom Wireless. The letters drip with frustration.

"The sky-high expectations set by the wireless carriers are a recipe for consumer disappointment," says PlanetFeedback founder Pete Blackshaw.

Behind the frustration:

- **High traffic.** The falling cost of cell phone service has sparked huge growth in cell phone users and cell phone use. The number of subscribers is 18 times what it was 10 years ago. The average monthly cell phone bill as of mid-2001 was \$45.56. It was \$74.56 in mid-1991. From mid-2000 to mid-2001, carriers added 19% more cell towers, which handle traffic. But subscribers grew 22%. Wireless minutes jumped more than 75%.

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Verizon Wireless, for one, says demand will exceed capacity in some big markets within 3 years — so it is trying to acquire more airwaves to expand service. If not, the result would be more call delays and dropped calls.

Consumers already suffer.

After he signed up with Cingular Wireless last year, Simone Gaddini says, 80% of the calls from his Berkeley, Calif., home or neighborhood didn't go through.

Despite Cingular's efforts to boost capacity, Gaddini says his phone works only half the time near his house, almost never inside it.

"It is still well below the standard that I expect," says Gaddini, founder of Firenze Antica, a Tuscan walking-tour company.

Jonas Geronimo endures network congestion almost daily during rush hour. The Anaheim, Calif., resident often dials 10 times before a call gets through on his Cingular service.

"Can you imagine the level of frustration if you are on the freeway and you are running late for a meeting?" the health plan case manager asks.

Cingular admits to problems in California — especially in Los Angeles and San Francisco. It has seen big demand in response to heavy marketing, and it's adding cell sites.

"In some ways, we have been a victim of our own success," says Ed Reynolds, Cingular's president of network operations.

• **Networks filled with holes.** None of the major carriers has a nationwide network. Each has areas it can't yet serve — or won't because it costs too much.

"People expect (phones) to work everywhere," Verizon spokeswoman Nancy Stark says. "You are not going to get service in the Grand Canyon or on top of a mountain."

AT&T Wireless, for example, doesn't offer any service — not even roaming — in parts of Colorado, Nebraska, North Dakota and South Dakota.

It would cost too much because "there's too much territory," says Greg Slemmons, an AT&T Wireless executive.

Don't miss the fine print

Yet, consumers often miss the fine-print warnings when they see ads hawking national calling plans.

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VoiceStream Wireless brochures and ads tout, "Whenever, Wherever." But that doesn't extend to such cities as Cleveland; Buffalo; Springfield, Mo.; Omaha and Little Rock. VoiceStream has no service in those cities.

VoiceStream spokeswoman Kim Thompson says the information is disclosed in a detailed map in its brochures. "It doesn't do us any good to mislead customers. If they are not happy, they will leave us."

Other consumers get confused by popular new flat-rate plans with no roaming charges. Carriers call them "nationwide" rate plans. But consumers often take that to mean they get nationwide coverage.

Verizon's Web site says its National SingleRate plan is "perfect if you talk and travel around the country." Promotional literature shows a map of the USA — with no gaps. Below the map, a disclaimer warns that it does not depict service availability — just where the rate is in effect.

Verizon doesn't produce service area maps for consumers, because they are obsolete as soon as they are printed, spokesman Brian Wood says.

Customers can get better information from sales agents, who should know about dead zones and problems, he says.

Verizon customer Mike Silver of Phoenix found such gaps in the foothills about 7 miles from the city's downtown.

"They sell it as if there is nowhere you are not going to receive coverage," says Silver, a sales manager at computer-memory maker Southland Micro Systems. "It's a bit of a misnomer."

Phone companies define network size by the number of people they reach, not by land mass. Sprint PCS won't reveal its geographic reach. Its coverage, including affiliates, is largely in bigger cities and along major highways and reaches 85% of the population.

Verizon says it doesn't have geographic statistics. Its network reaches about 80% of the population, it says.

• **Roaming hassles.** If customers go outside their carrier's network, they might not get service. Or, customers with versatile phones can roam on someone else's network. With Sprint PCS, for example, the cost of roaming can be huge.

Frequent business traveler Debi Fuller of Vancouver, Wash., a trainer for software firm Information Associates, says she was surprised to learn last year that her Sprint PCS phone worked only in analog roam mode when she was in Santa Barbara, Calif., which has a population of more than 90,000.

"Expensively for me, my teenage daughter picked that particular week to

need extra TLC from her mom," Fuller says. Sprint PCS says digital coverage in Santa Barbara is still "not built out as well as we would like it ... due to serious zoning issues."

Most big carriers have reduced customer fears of roaming charges with plans that don't charge for roaming within designated calling areas. Verizon, for one, has a 400-minute-a-month national plan — without roaming or long-distance charges — for \$55 a month.

A 400-minute plan that allows free roaming and long-distance in a 14-state region costs \$45.

Roaming even at home

There is yet another hassle: Roaming often renders features such as Caller ID and voice-mail alerts useless.

What's more, cell phones may go into roam mode — even though their users are in their local calling areas. That can happen if the digital signals are too weak, so the phone jumps to older analog networks or another carrier's digital network. High traffic also can bump a phone into roam mode.

Dan Finch of Raleigh, N.C., says his phone goes into analog roam in parts of his home, or he can't get any signal at all. That's a problem because he works from home. The manager for computer reservations service Amadeus sometimes walks his dog, Mollie, to the corner of his block to get a signal.

Such quirks infuriate Finch when he sees Sprint ads hyping its network: "Every time I see that commercial, my blood boils."

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Technology - Reuters

Wireless Operators Lose Short Text Messages-Study

Tue Jan 14, 11:55 PM ET

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CHICAGO (Reuters) - Millions of short text messages sent between mobile phones in the United States are lost every month, and the chance of two parties connecting depends on which networks they use, a study to be released on Wednesday says,

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Internet performance measurement company Keynote Systems Inc. (NasdaqNM:KEYN - [news](#)) says in its study that 7.5 percent of all short text messages sent between wireless telephone companies are lost.

The increasingly popular service known as SMS (Short Message Service) allows mobile phone users to send brief messages instantaneously to their friends and family. It typically costs 10 cents to send a message and pennies to nothing to receive one.

In Europe, where it is also known as "text messaging," 10 to 15 percent of wireless operators' revenue comes from SMS, but adoption of the service has been slower in the United States, where users were not able to send messages to networks other than their own until last year.

Still, industry group Cellular Telecommunications & Internet Association estimates that nearly one billion messages were exchanged during the month of June 2002, the latest figure it has. At a lost-message rate of 7.5 percent, this means millions of messages never reach the intended recipient.

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Business Front

Chuck Mount, general manager of Keynote's Wireless Perspective Service, said a significant lost-message rate will not only affect carriers' revenue but could affect customer usage of the still budding service.

ADVER



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Services

- [Daily Ema](#)

Equipment Maker Stocks Reuters (Jan 14, 2003)

• **Lucent Reaches Tentative Deal with Union** Reuters (Jan 14, 2003)

• **FCC's Powell Concerned by Media Concentration** Reuters (Jan 14, 2003)

Opinion & Editorials

• **Bell monopolies push to disconnect competition** USA Today (Jan 14, 2003)

• **Congress' phone hang-up** USA Today (Jan 9, 2003)

• **Ashcroft balks, a villain walks** NY Daily News (Jan 6, 2003)

Feature Articles

• **Satellites aid modern treasure hunt** Chicago Tribune (registration req'd) (Jan 3, 2003)

• **Requiem for the Pay Phone** Washington Post (Dec 30, 2002)

Related Web Sites

• **J.D. Power Communication Studies & Awards**

• **U.S. Federal Communications Commission (FCC)**

• **European Union Information Society Directorate General**

News Resources

Providers

Reuters

AP

TechWeb

USA TODAY

NewsFactor

Among the operators, the No. 3 U.S. wireless operator AT&T Wireless Services Inc. (NYSE:AWE - news) had the highest success rate in sending and receiving messages.

It was the top performer in terms of messages sent to users on other networks as well as messages sent within its network at 95.5 percent and 97.8 percent, respectively.

While rival Verizon Wireless (NYSE:VZ - news) (VOD.L), the largest wireless operator, scored the highest in terms of receiving messages at a 95 percent rate, AT&T Wireless trailed the largest wireless operator by only 0.2 percent.

T-Mobile USA, the sixth-largest wireless operator, was one of the worst performers. Only 86 percent of messages sent from a T-Mobile phone to a user on another network and 87 percent of messages sent to another T-Mobile phone were successfully received.

(Story continues after advertisement)

ADVERTISEMENT



The Deutsche Telekom unit (DTEGn.DE) received 92 percent of messages sent from other networks.

Keynote said it test-sent nearly 26,000 messages in cities around the country over a period of two weeks in December as part of the study.

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Next Story: [Wireless Operators Lose Short Text Messages-Study](#) (Reuters)



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WIRELESS SPECIAL REPORT:

Wireless Dead Zones, Echoes and Garble - Is Anyone Listening?

By Shane Peterson
Wireless NewsFactor
February 01, 2002

<http://www.wirelessnewsfactor.com/perl/story/16107.html>



Though new phones hold promise for clearing up some reception problems, whether the handsets will arrive first or the carriers will upgrade first is a chicken-and-egg question, IDC analyst Alex Slawsby told Wireless NewsFactor.

Dropped calls, garbled voices and echoes in the telecommunications ether plague people who use cell phones. Wireless carriers have been hearing complaints about poor reception and coverage lapses for some time, but they are not saying how long it will take to fix the problems.

Guessing how fast the carriers are able to build out their networks is difficult, analysts say, but it will happen.

Still, given the notoriously spotty customer service that carriers provide, they may not be in a big hurry to make upgrades and satisfy reception complaints.

"We think about a utopian world that has no dead spots, where everything is stable and the coverage is omnipresent, and whether we get there in anybody's lifetime is certainly up for debate," IDC analyst Alex Slawsby told Wireless NewsFactor.

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Going Wide

While the maturation of wireless networks to 2.5G will extend the coverage that major metropolitan areas now enjoy to more and more cities, the natural pitfalls facing carriers will not be eradicated. Challenging geography and technical complexities involved in providing wireless service will always result in dead spots and coverage lapses, Slawsby said.

Still, over time, the situation should get better.

"The coverage will improve through better technology and better network infrastructure," Slawsby said, "and as newer towers get rolled out that are either more powerful or have better ways to hold the signal."

He added, "As the phones themselves improve, in terms of their antenna capabilities, they'll be able to hold the same quality of service with a lesser signal."

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Chicken-and-Egg

Though new phones hold promise for clearing up some reception problems, whether the handsets will arrive first or the carriers will upgrade first is a chicken-and-egg question, Slawsby said.

For example, how fast the carriers upgrade their networks to intermediate steps, such as 1XRTT -- 2.5G for CDMA (code division multiple access) networks like Sprint's -- will impact how quickly companies such as Samsung and LG Electronics roll out compatible phones.

Other phone manufacturers, such as Nokia, will wait for the rollout of GPRS -- 2.5G (general packet radio service) for GSM (global system for mobile communications) networks, such as Cingular's -- before putting their GPRS-enabled phones on the market.

"As soon as the network infrastructure is there, the phones will be out there to meet it," Slawsby said.

No Worries?

Whether carriers will rush to upgrade networks in response to consumer complaints is a central issue, said Giga Information Group vice president and research leader Stan Schatt.

"None are doing a good job," Schatt said. "I think that carriers are concerned only with getting new customers and live with the 3 percent or so of churn they get. They do not really spend much time worrying about service, and that explains the horrible customer service evaluations they receive each year."

No Choice

Responding to complaints about coverage and reception issues is not necessarily high on the carriers' to-do lists because there is not a lot of competition to motivate them, the analyst said.

"People right now have little choice in certain regions," Schatt said. "If they want to have a cell phone, they have to go with whoever has coverage in that area. It's true that the FCC has created a competitive environment, but choices are not that plentiful, particularly in rural areas."

Mergers to the Rescue

The ultimate answer to cell-phone reception woes may come from moves the carriers are making to merge, Shatt said, pointing out that more mergers would result in the consolidation of spectrum licenses.

"Many leaders in this industry have spoken out and see consolidation as the only solution," he said. "I think that's what is going to happen, and it will happen this year or next."

Besides consolidation, carriers need more spectrum to solve the reception problem, and that means taking spectrum from other parties.

"More bandwidth is going to have to be taken from groups that will fight to keep it, such as the Defense Department and educational institutions," he said.

"The television broadcasting industry is likely to lose some of its spectrum in the 700 MHz range. I think the Defense Department will hold onto its very desirable spectrum. It argues that it needs the spectrum until the present generation of satellites expires, (which will not be) until at least 2020." **END**

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THE WALL STREET JOURNAL.
ONLINE

March 6, 2003

REAL TIME EXCHANGE
 By TIM HANRAHAN AND JASON FRY


Reader Shares Cellphone Tales, See Less of Need for PC Speed

Readers reacted strongly to our column Monday¹ about cellphone service and number portability. Some shared their tales of wireless frustration and success, while others said we were too soft on the cellphone service providers.

Other readers commented on our item concerning PC speed. Rather than faster processors, many said they would rather see computer makers focus on sleeker designs or easier upgrades.

On to the letters. Some comments have been edited. You can always drop us a line at realtime@wsj.com² -- comments will be posted here in Real Time Exchange on Thursdays. Remember: If you *don't* want your comments considered for Real Time Exchange, please make that clear.

* * *

Several readers shared horror stories about their cellphone experiences -- as well as tricks they discovered to cut their monthly bills.

Alan J. Jenkins writes: I couldn't stand getting cell bills that were double my expectations. So three years ago I moved to a nationwide, all-inclusive plan. As long as I watch my minutes I can predict my bill with great certainty each month.

Steven B. Fink writes: Last August, I bought an **AT&T Wireless** phone (cool Nokia model) with a basic \$39.95/month charge and more "free" minutes than I'll probably ever use. But my monthly bill kept coming in near \$60. Every time I called AT&T they gave me some song and dance about my having gone over my monthly limit. I saw all the minutes on the bill for each individual call but I never added them up. Plus, I didn't examine the bill that closely. My fault.

But, it turns out that they were also charging me \$14.95 a month for mobile-to-mobile minutes, which I never signed up for. When I pointed this out, AT&T told me that I must have signed up for it, otherwise I wouldn't be charged for it. My recollection was that the salesman said there were mobile-to-mobile minutes in the promotion plan but never mentioned there was a charge.

I asked AT&T to remove the charges retroactively to August. They refused. After much wrangling, they canceled that portion of the plan and gave me credit for \$24.95. They said if I signed up for another two years,

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FYI
 →
 fees

RECENT REAL TIME EXCHANGES

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 - February 20
 - Floppies Take Another Bow
 - February 12
 - Is the Floppy Drive Obsolete?
- MORE

ABOUT THE COLUMN

Tim Hanrahan and Jason Fry write Real Time Exchange every Thursday, posting responses from readers to their Real Time column⁶, published Mondays. Tim is technology editor of the Online Journal. Jason is an assistant managing editor, and also co-writes The Daily Fix⁷ sports column. Tim and Jason previously collaborated for several years on the Tech Week column. Write to them at realtime@wsj.com⁸

COMPANIES

	Dow Jones, Reuters
AT&T Wireless Services Inc. (AWE)	
PRICE	5.74
CHANGE	-0.06
U.S. dollars	9:40 a.m.

* At Market Close

they could increase the refund to -- are you sitting down -- \$25.00.

Harold Melnick writes: My only big complaint with cellphone billing: Use 'em or lose 'em minutes. I buy a bucket of 600 minutes each month. If I don't use 'em, I lose 'em. I usually use about half the 600 minutes each month. One month I ran over, about 200 minutes -- and my bill doubled.

John Parsons writes: I, too, see all the plans for "Five zillion minutes for \$9.95," but figured out long ago that I'm generally not awake from midnight to 5 a.m. to use them! There's only one reason the companies use and advertise such plans: They bring in customers. For nearly the last four years, I've used a very simple plan from AT&T -- the National One Rate plan. You get 450 anytime minutes anywhere in the country (no roaming, no long-distance charges) for \$60. Thirty-five cents for extra minutes, ten cents per text message. Very simple. No problems reading the bill, no figuring out what minutes go where, etc. Simple plans are out there if we want to use them. Evidently, too many of us are consumed by the idea of getting something for a nickel less, and the companies play to that desire -- quite successfully.

Alexander Sudarma writes: I am heavily dependent upon my mobile phone to stay in touch with my account management and support team. I am an atypical user of the AT&T \$99.99 per month plan, having used no less than 3,700 minutes every single month since signing up (most are peak).

My bill has dropped from \$300 to \$100 a month since switching. I have no regrets about signing up for the two-year contract and losing my previous number. The GPS phone network from AT&T is very reliable. In addition, I don't need a bill of rights since my bill has been a constant \$120 a month, inclusive of the data, tax, and phone plan. I don't see any gimmicks or tricks. Just reliable and good service.

I am sure there are other users that have had positive experiences. I hope this e-mail helps with some positive perspective.

Donald Eldridge writes: When I purchased my cellphone from Sprint PCS, they promised, among other things, that I had coverage from my home, and I could return my phone for any reason within 2 weeks and get a full refund. When I returned the phone explaining it didn't inside my home, Sprint said read the fine print, and insisted I pay an activation fee. I refused to pay. They proceeded to harass me with phone calls on a biweekly basis for several months. In the meantime I wrote to customer service several times about my problem, and could not get them to respond in writing. This, over a \$35 charge. Finally the calls stopped, but I have no idea why.

Several readers sent in creative solutions to the portability problem.

Barry Tucker: I give out only my home office line, which forwards calls to my cellphone. While I'm stuck with a never-ending "land line" bill, I gladly pay the \$25 monthly, as I have the freedom to choose a new cellphone and/or service any time as my needs and provider services evolve, without having to inform anyone who needs to reach me. I know my method won't work for everyone, but for what it's worth, it works for me.

John R. Henry writes: I agree that I would like my cell number to be portable, but it is not that big an issue. I have a land line that I use when in my office. When not in my office, I simply activate call forwarding to my cellphone. If my number changes, as it has eight to ten times since my first cellphone in 1989, I simply change the call forward info, which takes less than a minute.

Others took us to task for being too easy on the cellphone carriers.

Bob Tack: Has WSJ also been lobbied by the big three carriers? Your article misses the mark. Why should we

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accept mediocre service as you suggest? Having number portability is technically very feasible and would save in time and convenience to the consumer. The benefits far outweigh the short-term costs mentioned.

Blake Allen: You inadvertently and successfully argued why number portability is so important: carriers pushing the billing envelope.

Aside from noncompetitive voice service, widespread data use won't occur if the carriers can charge fees based on arcane and outrageous billing structures, which is exactly what they will do in the market vacuum created by the lack of number portability. The market will respond by simply underutilizing the technology.

Ali Vahdat writes: I just read your article on number portability and was disappointed with the conclusions reached. You imply that neither the additional cost of NP nor network quality is as important as issues involving "truth in advertising." As a frequent user of my wireless device for business travel and personal use (I have no land line), I find your prioritization of problems with wireless carrier reversed. In my experience and the great majority of those around me, network quality is by far the most relevant issue.

I look at NP as a means for the consumer to "voice" issues with the quality of service provided by wireless carriers. Yes, a one- or two-year contract may impact my decision of "when" I can switch carriers, but the fact that I have had "my" number for the past four years and have provided that to countless business and personal contacts "decides" whether I leave wireless carriers. When I was a student, I switched carriers three times, each time based on network quality issues. It didn't matter that I had "great deal" on a service plan. It mattered whether I could actually use all those minutes.

I appreciate your discussion of the matter, but I believe that you are out of touch with consumer needs and more in touch with the wireless carriers. When has the cost associated with providing a service (i.e. local number portability) not been passed on to the consumer? Last time I checked, most companies don't look out for the consumer, but their bottom line.

Thank you for your time.

We said a kilobyte was 1,024 bytes. One reader added a footnote.

Chris Inacio writes: Nice little explanation of what a kilobyte is, except that sometimes it isn't -- and sadly, you should double check the literature from the carrier to make sure. That's because a kilobyte is 2 to the tenth power (1,024) and a megabyte is 2 to the 20th power (1,048,576), except that sometimes a megabyte is just 1,000,000 when you want to buy a hard-disk drive. Of course, I once had a teaching assistant tell me the difference between a Ph.D. and a master's in the computer industry is about the same as the difference between 1,000 and 1,024. (Strangely, he worked on hard-drive subsystems.)

* * *

Readers also wrote in about the declining importance of speed in the computer world, and had their own wish lists.

David Turnbull writes: Nice article on PC styling. I live in a PC world but long for better design, not more processing power. Give me an Apple Powerbook-like PC notebook with a slot drive DVD-R at 1" or thinner and I'd pay a big premium.

Kevin Hickey: More important than the design and look of the next PC, or its speed above a certain level, is QUIET. They seem to get noisier all the time, and it has become almost impossible to avoid the sound of PCs in

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many rooms in our house, even if the PC is in the next room.

Jeff Smith: I agree with most of what you say, but at least in my case, the speed is relatively important. While I don't do any one thing that requires massive amounts of CPU, I do like to do lots of things at once. Then, I can use all the power I can get. I guess what I really need is a powerful multitasking OS. While I find that Mac OS X does very well in that regard, Mac processors are a bit behind Intel's speed. It's a vicious circle (no, I don't particularly want to move to Linux).

Tara C. Woods writes: I would like PC makers to focus on making it extremely easy to switch to a new computer, taking all of your files with you. Currently, while there may be an easy way of doing this, I, your average consumer, am not aware of it. The thought of trying to transfer all of my important files, all of my important e-mails, all of my software to a new computer is so overwhelming that I won't buy a new one even though I'd like one.

I can't be alone in this.

* * *

And lastly, a letter about the spam of the week.

Robert G. Doucette writes: At least Gevalia has a real product and a real offer. If I must get spam, I prefer a coffee ad rather than pix or information on how I can expand some body part. Now as for the offer itself, \$15 a pound for mediocre coffee is a little high, but throw in a coffee maker and I'm interested.

* * *

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Updated March 6, 2003

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Complete Cell-phone guide

You can get a cell phone free (after a generous rebate), and a plain corded phone for less than \$10. A long-distance call can cost less than a nickel a minute; a cellular call, about a dime. And when once only a single matronly company handled all your calls, now dozens compete to provide services Ma Bell never imagined. Sure sounds like a bargain. But a different picture emerges when you take a closer look, as we did to prepare this special section. Not only do we cover every major aspect of cell phones—safety, service, rates, and phones—we also help you compare conventional long-distance rates.

CELLULAR, THE SERVICE YOU LOVE TO HATE

The cell-phone industry has exploded: There were 135 million customers in June 2002, compared with a mere 8.9 million a decade earlier. Monthly bills for local service declined in that same period, from an average of \$68 down to \$47. But some companies haven't mastered customer service. Little wonder that as many as one-third of all cell-phone users say they're ready to switch carriers.

Getting a better deal is as easy as 1,2,3:

- ① **Find a carrier, page 15.** Our survey of 21,000 subscribers provided our first Ratings of carriers. One company consistently topped the list.
- ② **Choose a plan, page 18.** Find the best deals among the ever-larger buckets of airtime minutes that companies offer.
- ③ **Select a phone, page 21.** Which new cell phones have fine voice quality? Long battery life? Buttons that your fingers can easily push? Check the Ratings.

THE 911 EMERGENCY, page 12

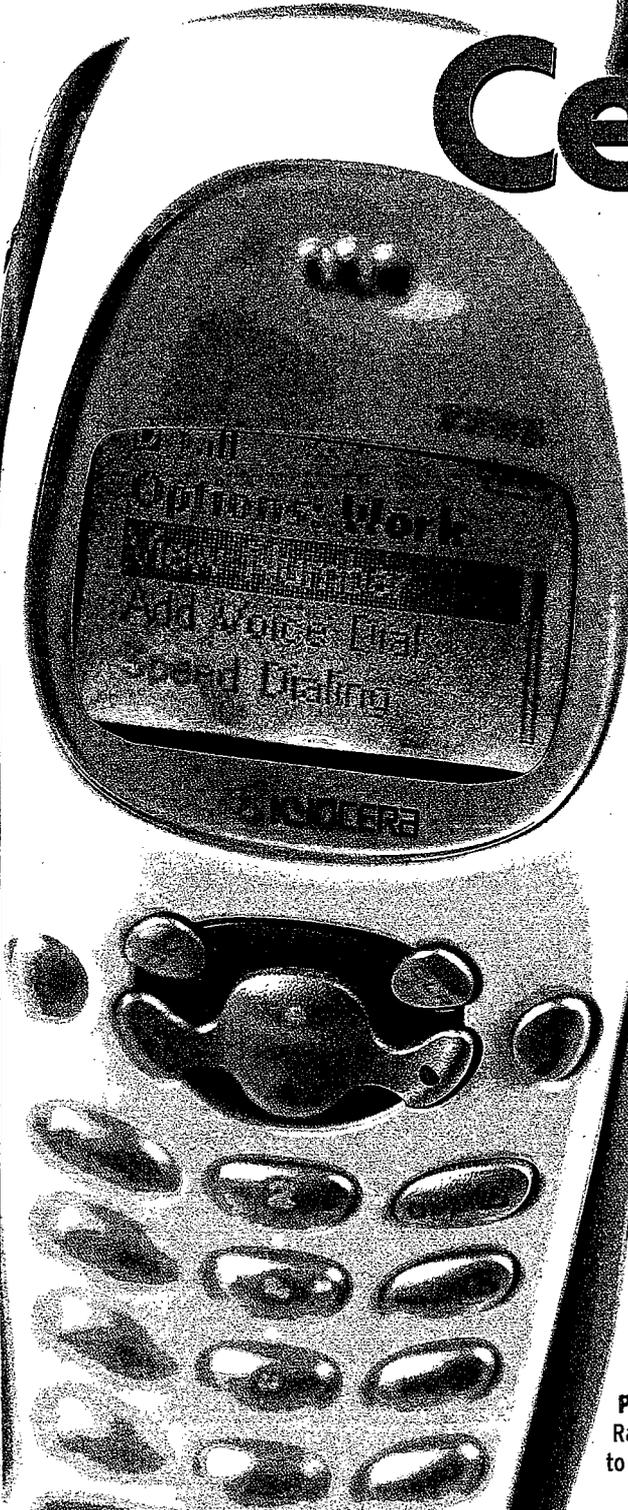
Many people buy a cell phone just to have it on hand in an emergency. But the system doesn't always work. We know. We tried it. We explain why cell phones don't always connect a 911 call and how you can better the chances of your emergency call going through.

ARE CELL PHONES SAFE? page 24

For more than a decade, researchers have been trying to determine whether radiation from cell phones increases the risk of cancer or other diseases. The answer so far: a resounding "we don't know." The report describes the smartest ways to minimize exposure to radiation for you and your children.

PLUS: WHERE ARE THE BEST HOME LONG-DISTANCE DEALS? page 25

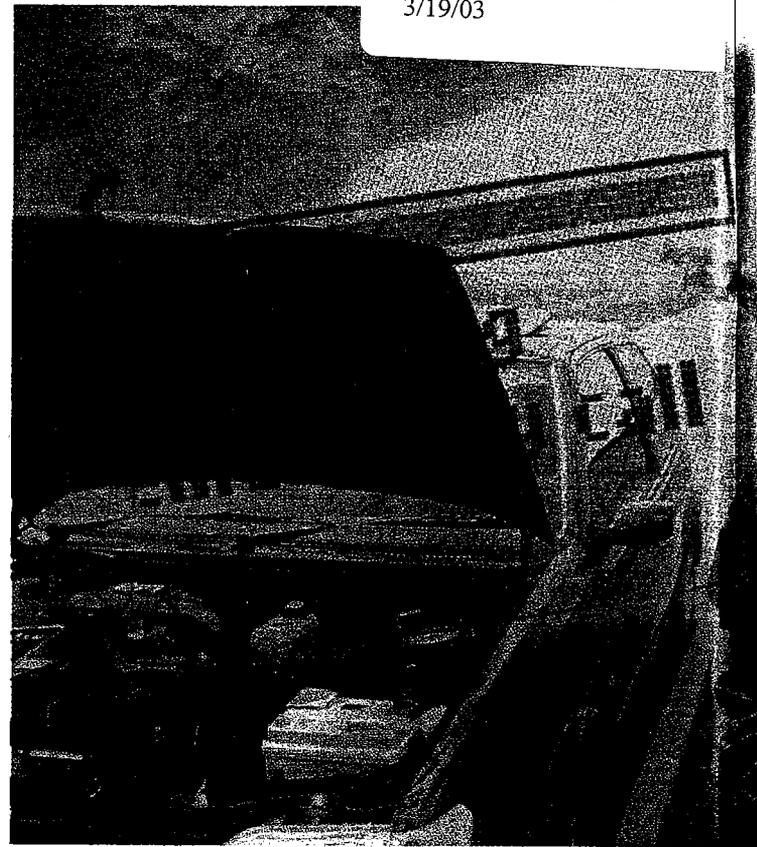
Rates and deals abound, but they can change at any time. We give you a survival guide to the new world of long distance: the best kind of service for you, and the best rates.



Cellular • Companies • Handsets • Emergencies • Safety • Long distance • Rates

Will your cell phone reach 911?

You can't be sure. Our research produced some disturbing results.



One in three people who own a cell phone say they bought it mainly for safety—to have if they need to call 911 from the side of the road or a dark street at night. And at least one-third of all 911 calls are now made on cell phones—just under 57 million calls in 2001, according to the Cellular Telecommunications & Internet Association (CTIA), a trade group.

As large as that number is, it's not the total. Some cellular calls to 911 never get through. The number of failures can't be known; a call that goes nowhere can't be tracked. Our research does give some dimension to the problem, however.

When we surveyed 11,500 subscribers to ConsumerReports.org last fall, 1,880 said they had tried to call 911 using a cell phone in the previous year. Some 15 percent of them, or 280 people, said they had trouble connecting; that includes 4 percent who never got through at all.

For most of those, a weak signal, a bad connection, or some other phone-system problem seemed to have caused the trouble. Trouble for the remaining respondents apparently involved the emergency system: excessive rings, unanswered calls, or being left on hold.

Wireless 911 calls in California seem especially problematic, according to our

survey. There, nearly 12 percent of calls to 911 never succeeded; one-third of our California respondents said they encountered some difficulty getting through to 911.

When we went into the field, we found problems with the system. With a significant number of the calls we made to real 911 centers, the phones did not do all we believe they could to make calls connect.

As anyone who has used a cell phone knows, dropped calls and bad connections are a part of everyday life. "Consumers know when they pick up a wireless phone they're making a trade-off between mobility and service quality," says Travis Larson, a CTIA spokesman.

But shouldn't 911 calls be different? After all, the landline phone system has

been especially designed to put through essentially every 911 call. And the Federal Communications Commission (FCC) has a regulation designed to be a kind of safety net for cellular (otherwise known as wireless) 911 calls, to improve your chances of getting through.

SYSTEM REALITIES

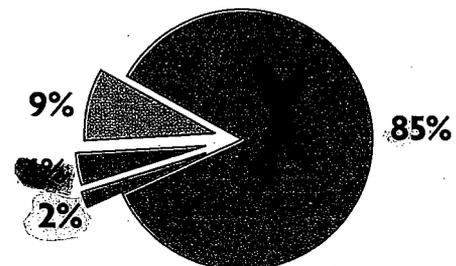
The wireless phone system in the U.S. often handles a call to 911 just like any nonemergency call. Here's how:

The phones can be all-digital or, more typically, digital with analog calling as a backup. Analog is the common wireless language, compatible with any carrier that provides such service. (Phones with analog and digital modes are known as

Who failed to reach 911?

The experiences of 1,880 ConsumerReports.org subscribers who tried to call 911 on a cell phone in the previous year.

- No trouble reaching 911
- Reached 911 with difficulty on own phone
- Never reached
- Reached 911 on another cell phone





dual-band, tri-mode, or multinetwork.) Most wireless phones in the U.S. use one of four incompatible digital modes.

When your phone is in digital mode, it can work only with your home carrier (the company you use for service) for any call—including those to 911—unless the home carrier has a roaming agreement with another carrier.

Phones that can work in both digital and analog modes give you more options. Analog provides that safety net for emergency calling. Indeed, the principal FCC regulation governing wireless 911 recognizes the importance of the analog mode.

The regulation, which took effect in 2000, says that whenever a wireless phone dialing 911 in analog mode can't get through via its home carrier, that phone must seek another signal, even if it's from a competing carrier, to quickly establish a voice connection.

The FCC concedes its rule is only a small step toward improving 911 service. Multinetwork phones, which are normally in a digital mode, aren't required to switch to analog to make a 911 call. There are no regulations for digital-only phones, such as the kind offered by T-Mobile and Nextel.

TESTING THE SYSTEM

Last summer, an engineer working for the

Wireless Consumers Alliance, a nonprofit advocacy group, used our labs to demonstrate that wireless phones dialing 911 in analog mode and covered by the FCC regulation may still fail to connect.

That led us to conduct our own real-world tests to find out what would happen in places where a home carrier has a weak signal but competing carriers have strong signals.

We ran two rounds of trials making 911 calls to active emergency-communications centers. We had the full cooperation of local officials in Steuben County, Ind., and Sullivan County, N.Y., and were assured that our testing did not interfere with response to real emergencies.

Both areas receive a heavy influx of travelers and vacationers, people who are likely to be far from a home calling area. Major highways cut through both counties. Steuben County is well served by a local carrier that uses the same digital system as AT&T Wireless; service from Verizon Wireless and Sprint PCS, however, is marginal. In the area of Sullivan County where we ran our tests, the reverse is true: Verizon and Sprint have strong signals, but AT&T is marginal.

All the phones we used in the tests have analog and digital capability. According to FCC registration data, only one of the phones we used was made before the 911 calling regulation took effect. The manufacturers certified that the phones meet all applicable FCC rules.

In Steuben County, we made 14 test calls on 12 different phones with accounts from Sprint and Verizon. In Sullivan

County, we made 7 test calls on 6 phones with accounts from AT&T and Cingular. Overall, of the 18 phone-and-service combinations tested, 9 calls failed to connect to 911. In every instance, there was a strong signal from another carrier the phones could have used.

In a separate test, some phones connected to 911 on a strong analog signal from a competing carrier when they couldn't find any home-carrier signal.

Our two field tests represent a small picture of a situation that can change with time and location. But we believe that the results illustrate a significant problem—a phone's inability to switch from a too-weak home-carrier's signal to a strong signal available from another carrier.

WHAT NEEDS TO BE DONE

The 911 system needs fixing. The FCC's 911 regulation is out of date for today's wireless phones, which increasingly depend on digital—not analog—technology. When the rule was written, fewer than half of the wireless customers used a dual-mode phone; that has now surpassed 87 percent.

The FCC's regulation also defies "general common sense," says Roger Hixson, technical issues director for the National Emergency Number Association, the nonprofit umbrella organization for U.S. emergency call centers. Hixson explained that phones that can't connect in a digital mode or don't automatically roll over to analog for an emergency call "subvert the idea that any call dialed to 911 has to be handled by the wireless carrier and brought into the call delivery network."

The FCC needs to impose higher standards for the wireless 911 system. A reasonable way to start could be to change the current regulation to apply as well to multinetwork phones dialing 911 in digital mode. If the call can't be quickly completed through the home carrier, the phone should seek another signal.

Manufacturers and carriers need to invest in safety. We think carriers should make the existing 911 system work more effectively, which may require some reprogramming of the phones.

The FCC must ensure that digital phones are more compatible. The FCC voted last fall to phase out its require-

Who provides an analog safety net?

Only some major national wireless-service providers offer an analog safety net as well as digital calling.

COMPANY	DIGITAL FORMAT ¹	ANALOG BACKUP
AT&T Wireless	TDMA; GSM	Yes
Cingular	TDMA; GSM	Yes
Nextel	IDEN	No
Sprint PCS	CDMA	Yes
T-Mobile	GSM	No
Verizon Wireless	CDMA	Yes

¹ Digital-format abbreviations are defined on page 16.

Inching toward Wireless E911

Margie Braden, a 51-year-old schoolteacher, picked up her daughter Angela at Houston's Galleria mall one night last summer and headed for the freeway. Several minutes later, Angela felt their car swerving.

"Mama, what's going on?" she asked. Angela, who is 28 and blind, feared a heart attack or stroke. Her mother couldn't speak but somehow pulled the car over and stopped. Angela reached for the ignition key—and her cell phone.

The Greater Harris County 911 Emergency Network, the third largest in the nation after New York and Chicago, picked up Angela's call; the operator asked for her location. Angela could say only that she was on Interstate 10 eastbound, about 5 minutes from The Galleria. "Can't you just track me?" she asked.

They couldn't. It took the efforts of a passing good Samaritan to help rescue the Bradens. Margie Braden had suffered a stroke.

The Bradens' experience typifies a problem with cell phones and emergency calls, one that government and industry have tried to address for the past six years. Known as Wireless Enhanced 911, or Wireless E911 for short, its goal is to ensure that emergency workers can precisely locate callers using a cell phone.

Wireless E911 has been on the drawing board since 1996, but it's still not functional. In October 2001, the Federal Communications Commission granted delays to six major carriers. The FCC's latest deadline is now December 2005.

Harris County, where the Bradens live, implemented Wireless E911 last August, but only for properly equipped phones connected to Verizon Wireless. The Bradens didn't have such a phone. By press time, the county expected Wireless E911 to work with all carriers.

Wireless E911 also covers Rhode Island and some counties in Illinois, Indiana, North Carolina, and Pennsylvania. But two-thirds of the nation's 5,000 primary call centers haven't yet implemented the preliminary

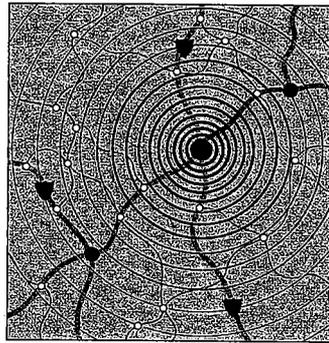
phase, which supplies the caller's number and location of the cell tower relaying the call.

WHAT'S TAKING SO LONG?

► **Technological difficulties.** A few carriers had to drop systems they'd hoped to adopt because they weren't precise enough. Not all carriers are using the same technology to make Wireless E911 work. Some will have phones that can use positioning data from satellites. Other carriers will triangulate a caller's location from the strength and timing of signals at different towers. Still others may use a hybrid system.

But there is no requirement that the different technologies work on more than one carrier's system. That means emergency call centers must prepare for all approaches. For consumers, it means some phones won't work well—or work at all—with other carriers' systems.

► **Call-center upgrades.** Many emergency call centers need substantial updating first. They must also come up with the money to modernize, typically through taxes and surcharges whose funds are often raided. In 2001 in California, \$63 million allocated for 911 use was borrowed to help balance the state budget. In New York, an audit last year revealed that \$162 million earmarked for Wireless



HERE I AM Wireless E911 will be able to pinpoint a caller's location, something that isn't a reality now.

E911 had been diverted.

► **Lack of coordination.** Local phone companies and equipment manufacturers have been slow to do their part. No one is effectively coordinating industry, calling centers, and carriers on a national level, according to a recent report commissioned by the FCC.

The Wireless E911 system has become a complicated puzzle, made more complex by the carriers' different transmission technologies and approaches to finding callers. It will take strong leadership from the FCC and a great deal of effort from industry to solve the puzzle on time.

ment that some wireless providers offer an analog backup signal. We think that was a mistake because the agency did not also require companies to make their digital technologies talk with one another. Simply allowing analog to fade away removes the principal common wireless language. In the end, you will have less assurance than you do now that your phone will get through to 911.

The industry needs more diligent oversight. The FCC has the industry on an honor system. The agency does no testing to monitor compliance with its 911 rule, says Steven Dayhoff, an electronics engineer at the FCC labs. Of wireless companies and 911, he says, "We assume that they have the software or firmware for call-handling that they're supposed to have." He noted, however, "We have not tried it out."

At a minimum, the FCC should run its own tests to see that phones perform as

they should—and as manufacturers have certified—when dialing 911.

Last November the Wireless Consumers Alliance filed a series of class-action suits in federal and state courts against various wireless phone manufacturers and service providers, maintaining that they knowingly sold phones that did not comply with the FCC's regulations. The suits seek injunctions against the sale of the phones, as well as monetary damages. Consumers Union, publisher of CONSUMER REPORTS, is not a party to those suits.

WHAT YOU CAN DO

- Do not dial 911 to test the system. It's unethical and, in many areas, illegal.
- Avoid digital-only phones or carriers if you want a cell phone for emergencies. See the table on page 13.
- Some phones that use the Code Division Multiple Access (CDMA) digital

format can be forced into analog by the user. Check the user's manual.

► If you don't use your cell phone every day, make sure that its battery stays charged.

► While driving, leave the phone on and its antenna extended. That may shorten the time needed to reach 911.

► If you have trouble connecting to 911 from inside a car, get out, if possible, and call from the side of the road; that may help you get a better signal.

► In an emergency, ignore a "no service" message on the phone's display. Try the call anyway.

► Tell the FCC what you think of the present wireless 911 system. To register a complaint or voice your opinion, contact the agency at 888-225-5322.

For more information about wireless calling and advice on how and where to complain about service, go to our advocacy web site, www.consumersunion.org. 

Three steps to better cellular

HOW TO USE THIS GUIDE

Whether you're buying your first cell phone or looking for something better, follow these basic steps:

- 1 First, pick a company that delivers good service in your area. This report addresses service and includes Ratings of the major providers in six metropolitan areas.
- 2 Second, determine which calling

plan suits your needs. The report on page 18 will help you pick the right plan by identifying key cost factors and describing expensive extras you may want to avoid.

- 3 Only after you've picked a carrier and a plan, buy the phone. The report on page 21 will help you find the best one for your needs.

CHOOSE your cellular service



More and more, people are treating their cell phone like any other phone. A Roper survey last year found that 3 in 10 Americans ages 18 to 29 use a wireless phone as their primary phone.

But for all the mobility and flexibility that wireless offers, it can clearly be expensive and problematic. The average wireless-phone bill is now about \$47 a month. The amount of discontent with cell-phone companies is high by all the measures we've seen—most recently, our survey of 21,944 subscribers to ConsumerReports.org conducted last fall. One-third said they are seriously considering a change in wireless-phone companies. Most subscribers who already had switched said they wanted better service or a better price.

Sound familiar?

HOW CARRIERS COMPARE

Our survey yielded our first brand-name

Ratings of cell-phone companies: AT&T Wireless, Cingular, Nextel, Sprint PCS, T-Mobile, and Verizon Wireless. The survey covered the Chicago, Dallas, Los Angeles, New York, San Francisco, and Washington, D.C., metro areas.

Consistently good. Verizon Wireless landed at the top of the rankings in each area covered. However, the overall satisfaction with the companies—Verizon included—is lower than for most other business and services we rate, such as auto insurers or hotel chains. The highest overall score any wireless company received was 72; the lowest, only 54.

Quirks among carriers. All six companies showed significant problems in our survey. Here are some examples:

- ▶ Cingular customers (and to a lesser extent, AT&T customers) complained of overloaded circuits.
- ▶ Nextel complaints included lack of service in New York and Los Angeles, poor customer support, and billing problems.
- ▶ Sprint had problems with dropped

calls, plus the worst customer support.

- ▶ T-Mobile customers in Chicago and New York cited problems connecting.

We expect to repeat this survey in the future, tracking changes in satisfaction scores and ranking carriers in other cities.

USING OUR FINDINGS

We can't say how good any of the wireless companies are in other cities. Still, if you're after better service, consider looking first at Verizon or one of the other companies ranked high by our respondents. As the report on page 18 explains, rates are fairly competitive among the big companies; that makes good service paramount.

Also, it's important to follow these steps to increase your odds of getting good service:

- ▶ Before you sign up with any company, seek recommendations from friends, neighbors, or business associates who drive the same roads and walk the same sidewalks you do. That remains the best way to find a company that provides good

service in your part of the world.

► Next, pick the right calling plan. Focus less on the big bucket of minutes trumpeted in ads and more on details about night and weekend calling, roaming, and other specifics. The report that follows (see page 18) offers details.

► Take advantage of the trial period. Most carriers offer at least two weeks for a test drive before a stiff early-termination fee kicks in. Don't hesitate to cancel the contract if performance falls below your expectations during the trial.

WHERE THINGS GO WRONG

Overall, our survey results track closely in three areas with what other private research and government agencies have been finding.

Billing problems persist. Eleven percent of our respondents said they had serious or persistent billing problems in the past year, such as overcharges or mistakes. And 30 percent said they had called the company because of a question or complaint about billing. Of the readers who switched wireless companies, 20 percent said that billing and other customer-service problems were key reasons.

Customers of Cingular, Nextel, and Sprint said those carriers were less responsive than others to problems.

The Federal Communications Commission receives its share of complaints about cellular service. Its data show that Sprint receives a higher rate of billing complaints than do larger companies. For the year ending last September, the FCC

received 1,488 billing complaints concerning Sprint and 1,013 concerning Verizon. And Verizon has more than twice as many customers as Sprint.

Other billing issues involve sharp practices. In one instance, Alltel, a regional carrier, had been padding bills in North Carolina with a \$2.47 monthly "network surcharge." A consent agreement with the state attorney general ended that practice. Alltel, admitting no wrongdoing, also gave the state \$750,000 in equipment and service. Customers could choose between dropping the surcharge or having extra minutes added to their calling plan.

Service remains spotty. A significant number of respondents reported repeated problems with their cellular service in the week before our survey: 10 percent said they couldn't get service; 14 percent said they experienced dropped calls, and 11 percent said their calls were marred by severe static or difficulty hearing the other party clearly.

Poor phone service was the leading reason our respondents switched providers; 45 percent cited it as important.

The FCC receives more than 100 complaints about service each month. Sprint alone was the subject of 975 complaints relating to service last year.

In California, the Public Utilities Commission is investigating allegations that Cingular had inadequate coverage and call capacity in the state.

Companies make it hard to switch. One-third of our survey respondents said they were seriously considering changing cellular companies. Most hadn't done so, they said, because they didn't want to get a new phone number or because they were still under contract to their wireless company and may have faced a large early-termination fee.

The inability to keep a cell-phone number if you change companies is a longstanding annoyance that the FCC has announced will end in November.

But early-termination fees remain a common practice that deters people from changing companies.

Iowa sued U.S. Cellular, the state's largest cellular provider, over early-termination fees of as much as \$300. An out-of-court settlement has capped the fee at \$150 and has the company prorating it. The carrier admitted no wrongdoing but agreed to pay \$400,000, which went in part toward consumer refunds.

Continued on page 18

Key words

ANALOG The original type of wireless technology. Although largely supplanted by various digital formats, analog remains the common format supported by cellular providers and is essential for emergency calling, in our view.

CDMA Code Division Multiple Access. The digital calling format used by Sprint, Verizon Wireless, and some regional carriers. CDMA is incompatible with other digital formats. It assigns a digital code to each caller to identify that person and keep the calls separate.

CELLULAR Also known as mobile or wireless. It's a call-handling system composed of a network of antennas, each covering a small area or cell. A call from your cellular phone is relayed from antenna to antenna as needed.

CELLULAR BAND The original part of the radio spectrum allocated by the Federal Communications Commission for mobile-phone transmissions. Companies using this band must provide some analog service, under FCC regulations. See also PCS band.

DUAL BAND Denotes a phone that can operate in the cellular frequency band as well as the PCS band.

DUAL MODE, TRI-MODE, OR MULTINETWORK Denotes a phone that can use at least one digital format as well as analog. Tri-mode phones operate digitally in both the cellular and PCS frequency bands.

GSM Global System for Mobile Communications. A digital format used widely in Europe and Asia. In the U.S., only T-Mobile and some AT&T and Cingular phones use GSM. It keeps calls separate by assigning a slice of time to each caller.

HOME CARRIER The company you selected to provide wireless phone service.

IDEN Integrated Digital Enhanced Network. A digital technology that's similar to, but incompatible with, GSM and TDMA. Used only by Nextel in the U.S.

PCS BAND Personal Communications System band. A portion of the radio spectrum allocated to mobile-phone transmissions. PCS is a different set of frequencies from the cellular band. Sprint and T-Mobile are the largest companies operating solely in the PCS band, although other carriers use it for some customers. Companies using the PCS band are not required to provide analog service, although Sprint provides it via roaming agreements.

ROAMING The common practice of seeking a signal from a "partner" carrier to handle a call when you're outside your home carrier's area.

SAR Specific Absorption Rate. The number, available for every cell phone, refers to the relative amount of radio-frequency energy absorbed by the body of a person using a wireless handset. How meaningful is the SAR? See the report on page 24.

SMS Short Message Service, also known as text messaging. A rapidly growing new use for cell phones. SMS lets you send short text messages from one cell phone to another or from the Internet to a cell phone. You can compose a message without being on the wireless network, thus saving airtime minutes.

TDMA Time Division Multiple Access. The digital format used mainly by AT&T Wireless and Cingular. Incompatible with other digital formats, TDMA is similar to GSM.

Cellular service

RATINGS

THE BIG PICTURE

The table at the right summarizes our findings from the six-city survey we conducted early last fall. The companies are ranked in order of the highest satisfaction scores they received in any of the metro areas.

As the tables on page 20 indicate, rates are competitive among the major carriers. That makes finding good service all the more important. Use these findings as a starting point to find a carrier that can provide the kind of service you want.

COMPANY	SATISFACTION: RANGE OF READER SCORES		COMMENTS
	HIGH	LOW	
Verizon Wireless	72	69	Consistently at the top of the Ratings. One of the better companies for customer support. No noteworthy service problems.
AT&T Wireless	69	63	One of the better companies for customer support. Overloaded circuits in three cities; Otherwise, middle-of-the-road performance.
Nextel	67	62	Availability of service an issue in New York and Los Angeles. Most billing problems. Low score for customer support.
T-Mobile	67	62	Connection problems in Chicago and New York. One of the better companies for customer support. Company formerly known as VoiceStream.
Cingular	67	54	The greatest variation in scores. Problems with overloaded circuits. Low score for customer support.
Sprint PCS	65	58	Worst customer support. Dropped calls an issue in five of six areas.

CITY-BY-CITY CLOSE-UPS

Fewer problems ← → More problems

San Francisco

CARRIER	OVERALL SATISFACTION	NO SERVICE	DROPPED CALLS	STATIC	CIRCUITS FULL
Verizon Wireless	70	●	○	○	●
AT&T Wireless	68	○	○	○	○
Sprint PCS	61	○	●	○	●
Cingular	54	●	○	○	○

Chicago

CARRIER	OVERALL SATISFACTION	NO SERVICE	DROPPED CALLS	STATIC	CIRCUITS FULL
Verizon Wireless	69	●	○	○	○
Cingular	67	○	○	○	○
T-Mobile	66	○	○	○	○
Nextel	66	○	○	○	○
AT&T Wireless	66	○	○	○	○
Sprint PCS	58	○	○	○	○

New York

CARRIER	OVERALL SATISFACTION	NO SERVICE	DROPPED CALLS	STATIC	CIRCUITS FULL
Verizon Wireless	71	○	○	○	○
AT&T Wireless	68	○	○	○	○
T-Mobile	62	●	○	○	○
Nextel	62	○	○	○	○
Sprint PCS	58	○	○	○	○

Los Angeles

CARRIER	OVERALL SATISFACTION	NO SERVICE	DROPPED CALLS	STATIC	CIRCUITS FULL
Verizon Wireless	69	○	○	○	○
AT&T Wireless	63	○	○	○	○
Sprint PCS	63	○	○	○	○
Nextel	62	○	○	○	○
Cingular	59	○	○	○	○

Dallas

CARRIER	OVERALL SATISFACTION	NO SERVICE	DROPPED CALLS	STATIC	CIRCUITS FULL
Verizon Wireless	70	○	○	○	○
AT&T Wireless	69	○	○	○	○
T-Mobile	67	○	○	○	○
Cingular	67	○	○	○	○
Sprint PCS	65	○	○	○	○

Washington, D.C.

CARRIER	OVERALL SATISFACTION	NO SERVICE	DROPPED CALLS	STATIC	CIRCUITS FULL
Verizon Wireless	72	○	○	○	○
Nextel	67	○	○	○	○
AT&T Wireless	66	○	○	○	○
Cingular	65	○	○	○	○
Sprint PCS	61	○	○	○	○

The survey behind the Ratings

The tables are based on 21,944 responses to a survey of ConsumerReports.org subscribers conducted in September 2002. We asked subscribers about experiences with their wireless service provider over the previous 12 months. Overall satisfaction covers all the factors related to costs, service, and problems. A score of 100 would mean that all respondents were completely satisfied; 80, that all were very satisfied on average; 60, fairly well satisfied on average. Differences in overall satisfaction scores of less than 5 points are not meaningful. Scores for service problems are based on the

percentage of respondents who said they experienced the problem at least once in the previous seven days (adjusted for usage). No service means a call failed because no wireless service was available. Dropped calls means that a call was inexplicably interrupted while in progress. Static refers to a bad connection that caused difficulty hearing or being understood. Circuits full reflects respondents who said they heard a "fast busy" signal that means the call could not be put through. (Note that ConsumerReports.org subscribers may not be representative of the U.S. population.)

WHO'S MINDING THE STORE?

The FCC has never regulated the wireless-phone industry as closely as it has other phone services. Thomas J. Sugrue, head of the FCC Wireless Telecommunications Bureau, says the agency is philosophically opposed to regulating cellular service with too heavy a hand. "Competition works better than a ton of regulation," he told us in an interview.

Last fall, however, the FCC scrapped two regulations that have little to do with fostering competition and that may hurt consumers. Companies operating in the cellular frequency band can phase out analog service in favor of all-digital technology. As the report on page 12 explains, analog service is a common cellular language, making it especially crucial for emergency calls. Also, carriers are no longer obliged to supply coverage maps.

Maps can help consumers choose among carriers. Senator Charles E. Schumer (D-N.Y.), in a recent letter to FCC Chairman Michael K. Powell, called the decision to stop requiring maps "a step in the wrong direction." He called on the FCC to work with wireless providers to devise a standardized map showing signal strength throughout a city "to allow consumers to compare which provider has the best service in areas of greatest import to them."

Absent strong FCC oversight, states' attorneys general and private lawyers have stepped into a void. More than a score of states are looking into billing, marketing, and advertising practices at several national carriers. The companies say they are cooperating.

California is the state everyone is watching. In 2000, its Public Utilities Commission began drafting a consumers' "bill of rights" for all telecommunications services, including wireless. Among other provisions, the bill would require carriers to:

- ▶ Fully disclose rates, terms and conditions in clear language and readable type on the Internet in downloadable form.
- ▶ Protect privacy by shielding personal information and customer records.
- ▶ Provide accurate bills that label services and fees clearly and offer prompt and fair resolution for billing problems.

If the bill is adopted, it could well change the carriers' business policies everywhere they operate. CR

CHOOSE a plan that fits



The person who uses a cell phone to make calls close to home mainly on nights and weekends needs a very different calling plan from the person who calls everywhere day or night. Family members who want to stay in touch via cell phone need yet another kind of plan.

The typical calling-plan ad headlines the bottom line: the total number of minutes you get. But you want to get past that and into the details—where and when those minutes apply and where you face extra charges. With most plans, expect at least a one-year contract with a hefty early-termination fee.

The chart on page 20, developed with the help of the TeleBright Corp., a Maryland-based phone-rate tracking company, provides some examples of how actual per-month costs vary for seemingly similar plans. Here's a run-down of the main points to consider when you're shopping around:

"Anytime" minutes. If you use a cell phone throughout the day, and on weekdays as much as on weekends, then you'll want to choose a plan that's generous with airtime you can use anytime.

As a rule, the more anytime minutes included in the basic monthly charge, the better.

Night and weekend minutes. If most of your cell-phone calls happen after the workday ends and on the weekend, then look for a plan that includes ample night and weekend minutes. Many calling plans, even inexpensive ones, provide at least 15 hours (900 minutes in cell-phone parlance) of night and weekend calling per month. Some offer unlimited usage.

Nights don't always begin when the sun sets, days don't start at sunup, and weekends may not begin at 12:01 a.m. on Saturday. For example, AT&T Wireless and Verizon Wireless both say that nighttime calling applies from about 9 p.m. to 6 a.m. the following day; Cingular's nighttime period ends at 7 a.m.

If you exceed your allotment of minutes, you'll run a tab of 20 to 60 cents per minute, depending on the plan.

Besides knowing when you'll use the cell phone, you need to settle on the correct calling area. Here are the choices:

Local. The most limited type of plan, this typically encompasses a metropolitan area and its environs. It usually includes more anytime minutes than

NEEDED: Straight talk about cell-phone calling plans

Turn over any credit-card solicitation you get in the mail and you'll find a government-mandated box that lays out, in standard format and readable type, the offer's essential rates and terms. That box, which originated in 1988, eliminates the need to decode esoteric financial and legal terms, and it simplifies the process of comparing competing offers. Given the complexity of cell-phone calling plans, a similar box would seem to make sense. Perhaps something like our prototype, shown at right.

NATIONAL 300-MINUTE PLAN

Calling from area	Nationwide
Monthly base charge	\$39.95
MINUTES INCLUDED	
Mon-Fri, 6 a.m.-9 p.m.	300
Other times	4,000
Overtime minutes	45¢ per minute
Long-distance minutes	Included
Roaming on other carriers	69¢ per minute
Directory assistance	\$1.25 per call
CONTRACT TERMS	
Length	1 year
Early-termination penalty	\$175
Tryout period (no penalty)	30 days
Start-up fee	\$35 (nonrefundable)

similarly priced plans covering a wider area, but it imposes a roaming charge outside the home calling area and an extra charge for long distance.

Regional. This covers a multistate area, such as the Northeast. It typically includes fewer anytime minutes than a local plan, but waives roaming and long-distance charges for calls made within the home area. For calls outside the home area, roaming charges range from about 50 cents to 79 cents per minute.

Overall, a regional plan may be a better deal than a local plan for people who don't use a cell phone enough to take advantage of a local plan's time allotment. That's why, in the examples on page 20, we don't show local plans.

National. Designed for people who travel a lot, national plans are the most expensive. Included anytime minutes vary. Roaming and long-distance charges are waived within the home area, but not in places where you must gain access through another provider's network. Depending on your calling patterns, a provider's national plan may occasionally end up costing less per month than its competing regional plans.

Family plans. These let parents and kids pool their monthly minutes for use on several phones as long as the total for everyone's calling doesn't exceed the monthly quota. Typically, the monthly charge for the first phone is commensurate with the minutes of airtime; you add more phones for, say, \$10 a month each. Some family plans offer a discount on a second or third phone. Depending on the provider, you can choose from plans that have a national, regional, or local scope to reflect your family's calling patterns. To avoid overcharges, you'd need to keep track of the time each family member uses—not a simple matter.

Prepaid calling. Similar to using a long-distance phone card, prepaid calling does not involve a long-term contract. You buy a phone and then buy time as you need it. It's most useful if you just want a phone for an emergency, don't want to enter into a contract, or have problematic credit. Verizon FreeUp, AT&T's Free2Go, Virgin Mobile Top-Up, and other plans offer fairly mainstream phones, although features such as three-way calling may not work with a prepaid

phone. TracFone, sold in retail stores for \$100 or less, uses replenishable cards in various denominations: A 30-minute card costs \$18 (or 60 cents a minute); a 2½-hour card, \$40 (27 cents a minute). Long distance is included. With most plans, you have up to 60 days to redeem minutes.

ADDING IT ALL UP

As the chart on the following page shows, you can save money on a plan by considering charges other than the basic monthly fee. For example, among the family plans, the AT&T plan has a monthly fee of \$90; the comparable T-Mobile plan, \$70. But the AT&T plan would cost our typical family of four \$71 more per month than

28% of the subscribers we surveyed last fall said they had a regional plan. Only 15% had a local plan.

the T-Mobile plan (\$161 vs. \$90), mainly because the AT&T plan has additional roaming charges plus higher fees for the third and fourth family members.

Among the regional plans, which were chosen to suit the needs of casual users, the \$50 T-Mobile plan ended up costing more than all the other plans, even though it offered 3,000 peak minutes; casual users, who were assumed to use only 150 peak minutes monthly, wouldn't use most of those minutes.

READ THE FINE PRINT

When you examine the details in a calling-plan contract, you may find provisions that can nickel and dime you. Here are some examples:

Downsizing minutes. By billing in whole minutes—counting even a fraction of a minute at the end of a call as a full minute—wireless providers pad your calling time and deplete your monthly time allotment. They can also increase usage times by billing you from the moment you push the Send button rather than when the call is actually answered, and by continuing to bill for a few seconds after you push the End button. When such increases also incur long-distance and roaming charges, costs can rapidly multiply. Some providers, such as Cingular, may also charge for unanswered calls if you let the

phone ring for more than 30 seconds.

Mixed signals. Determining which rates and services are in effect when traveling can be trying. Verizon literature, for example, offers the following convoluted explanation of how to interpret the indicators on your phone's display:

When the Roam Indicator isn't displayed or the banner display reads Verizon Wireless, home rates apply. When the Digital Indicator is on, digital features and services are available. But when the Roam Indicator flashes or the banner display reads Extended Network, then "your home airtime rates still apply, but other additional features and services may not be available." When the Roam Indicator is solid or the display reads Roaming, then "roam rates apply and features and services are not available."

Icing on the cake. Other small add-ons can increase your monthly bill. These include directory assistance (about \$1.25 per call, plus airtime charges), unlimited calling to cell phones using the same provider that aren't covered by a family plan (\$4 per month or more), wireless Internet (\$5 and up per month plus airtime), text messages (10 cents each or \$3 per 100), roadside assistance (\$3 per month), wireless-phone insurance (\$4 per month), customized ring tones (99 cents each) and on-demand games (99 cents each).

USE THE GRACE PERIOD

Some wireless providers offer a grace period during which you can try the service and cancel, paying only the activation fee and for the airtime you've used. Take advantage of the grace period even if it lasts only a week to 10 days. If you can't get good service where you want it, cancel and look elsewhere.

RECOMMENDATIONS

Use the examples shown on page 20 if you're new to cellular and want to find the right calling plan. If you want to change an existing plan, some carriers let you without paying a penalty for early termination if you commit to a full term for the new contact. When your contract is up, you have some negotiating power. Carriers are often willing to offer deals if you threaten to switch. If you do change carriers, however, you'll have to get a new number and phone. 

What's the best plan for you?

This table can help you home in on the most economical cell-phone plan by seeing how closely our examples fit your calling patterns. We asked TeleBright, a leading source of information on wireless service plans, to calculate typical monthly costs. We are not rating the calling plans. The figures shown here are meant as examples for three types of user:

- **The casual user** who makes 5 hours of calls monthly, including 45 minutes of long distance.
- **The frequent user** who spends 20 hours per month on a cell phone, with 80 minutes of that time long distance.
- **The family of four** who together make more than 30 hours of calls monthly, 160 minutes of which are long distance.

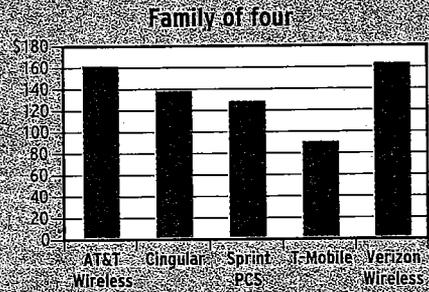
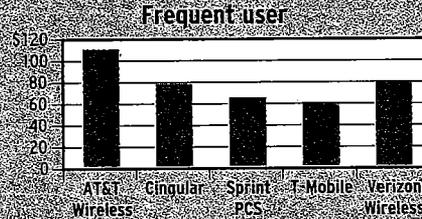
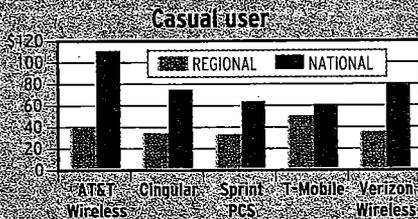
We assumed that all three types of users made most of their calls

from within their home area. The resulting cost differences, shown in The Details chart below, underscore the importance of carefully matching your expected calling patterns with a plan's quota of peak and off-peak minutes as well as with its long-distance and roaming provisions. In The Bottom Line bar graphs, we show the cost of both national and regional plans for the casual user. That's because for some wireless service providers, the national plan is not much more expensive than the regional one. For the frequent user or family of four, that's not the case.

The rates and plans below are for customers in the Chicago metropolitan area as of mid-November 2002. The particulars for each plan will change, and rates may differ in other areas.

THE BOTTOM LINE The bar graphs show how the plans listed below compare in total monthly costs. While most of the plans are competitive, there can be differences, as the bars show. For example,

the AT&T family plan we chose is nearly twice as expensive as the T-Mobile family plan, even though the two plans' basic monthly fees differ by only \$20.



THE DETAILS

SERVICE PROVIDER & PLAN WITHIN TYPES, IN ALPHABETICAL ORDER	MONTHLY FEE	INCLUDED MINUTES		COST PER EXTRA MINUTE	START-UP FEE	EARLY CANCEL FEE
		PEAK	OFF-PEAK			
REGIONAL PLANS						
AT&T Wireless Regional Advantage \$9.99	\$40	200	Unlimited	40¢	\$36	\$175
Cingular Preferred Network 280	30	250	1,000	45	36	150
Sprint Free and Clear 800	30	300	Unlimited	40	35	150
T-Mobile Get More 3000	50	3,000		35	35	200
Verizon Wireless America's Choice 300	35	300		45	35	175
NATIONAL PLANS						
AT&T Wireless Unlimited Rate \$9.99 (unlimited off-peak minutes for additional \$9.99)	110	900	1,000	35	36	175
Cingular Preferred Network 300 (with rollover)	70	900	3,000	39	36	150
Sprint PCS Free and Clear 800	60	800	Unlimited	40	35	150
T-Mobile Get More 300	60	800	Unlimited	40	35	200
Verizon Wireless America's Choice 900 (unlimited off-peak minutes for additional \$4.99)	80	900	Unlimited	35	35	175
FAMILY PLANS						
AT&T Wireless Shared Advantage \$9.99	90	1,000	1,500	35	36	175
Cingular Preferred Network 300 With Rollover Family Share	70	900	3,000	39	36	150
Sprint PCS Free and Clear 800 Minutes to Share	60	800	Unlimited	40	35	150
T-Mobile Family Line \$9.99	70	800	Unlimited	35	35	200
Verizon Wireless America's Choice Family Share 900 (unlimited off-peak minutes for additional \$4.99)	75	900	Unlimited	35	35	175

What the numbers mean

Monthly fee is the monthly cost for included peak use (typically during business hours) and off-peak use. **Cost per extra minute** is the per-minute charge for calls exceeding the airtime included in the plan. **Start-up fee** is what it costs to activate a new account. **Early cancel fee** is what it costs for early termination of a one-year

contract. These figures are based on rates in effect in mid-November in Chicago and do not take into account extra minutes included in promotions or special offers; all the rates are subject to change. Various carriers define peak and off-peak periods differently.

Comparison of Wireless Data Plans

Approximate Monthly Price	\$20.00	\$30.00	\$40.00	\$60.00	\$75.00	\$80.00	\$100.00
AT&T Wireless	8 MB	10 MB	20 MB	40 MB	60 MB	na	100 MB
	\$6/MB	\$3/MB	\$2/MB	\$1.50/MB	\$1.30/MB		\$1/MB
Roaming @0.127/KB							
Sprint PCS	na	na	20 MB	40 MB		70 MB	Unlimited
			\$2/mB	\$2/mB		\$2/mB	
Verizon	Verizon Wireless does not provide full Internet Access to Idaho Locations						
Nextel		5 MB	10 MB	20 MB			
	Nextel only provides access via an Internet capable phone. No laptop access						
T-Mobile	5 MB		20 MB	50 MB			200 MB
	\$5/MB		\$3.50/MB	\$3/MB			\$2/MB

Percent of Households with Internet Access, by State, 2001

State	Total Households	Percent with Internet	90% Confidence Interval
Alabama	1,731	37.6	2.85
Alaska	221	64.1	2.96
Arizona	1,891	51.9	2.79
Arkansas	1,017	36.9	2.73
California	12,260	55.3	1.24
Colorado	1,659	58.5	2.85
Connecticut	1,297	55.0	3.27
Delaware	300	52.5	3.20
Florida	6,302	52.8	1.52
Georgia	3,064	46.7	2.66
Hawaii	391	55.2	3.52
Idaho	496	52.7	2.76
Illinois	4,608	46.9	1.73
Indiana	2,391	47.3	2.82
Iowa	1,137	51.0	2.93
Kansas	1,032	50.9	2.94
kentucky	1,609	44.2	2.85
Louisiana	1,663	40.2	2.79
Maine	521	53.3	3.10
Maryland	2,030	57.8	3.03
Massachusetts	2,407	54.7	2.21
Michigan	3,806	51.2	1.88
Minnesota	1,922	55.6	2.79
Mississippi	1,081	36.1	2.83
Missouri	2,177	49.9	2.97
Montana	369	47.5	2.82
Nebraska	654	45.5	2.99
Nevada	732	52.5	3.02
New York	7,089	50.2	1.35
New Jersey	3,106	57.2	1.92
New Hampshire	477	61.6	3.29
New Mexico	696	43.1	2.88
North Carolina	3,077	44.5	2.11
North Dakota	248	46.5	3.00
Ohio	4,439	50.9	1.80
Oklahoma	1,362	43.8	2.74
Oregon	1,326	58.2	3.09
Pennsylvania	4,652	48.7	1.69
Rhode Island	401	53.1	3.23
South Carolina	1,542	45.0	3.06
South Dakota	288	47.6	2.87
Tennessee	2,251	44.8	2.92
Texas	7,666	47.7	1.51
Utah	705	54.1	3.08
Vermont	250	53.4	3.25
Virginia	2,678	54.9	2.79
Washington, DC	237	41.4	3.03
Washington	2,345	60.4	3.00
West Virginia	756	40.7	2.61
Wisconsin	2,064	50.2	2.82
Wyoming	197	51.0	2.92

Exhibit No. 109
Case No. QWE-T-02-25
W. Hart, Staff
3/19/03

High Speed Services for Internet Access: Status as of June 30, 2002

Industry Analysis and Technology Division
Wireline Competition Bureau
December 2002



This report is available for reference in the FCC's Information Center at 445 12th Street, S.W., Courtyard Level. Copies may be purchased by calling Qualex International, Portals II, 445 12th Street, S.W., Room CY-B402, Washington, DC 20554, telephone 202-863-2893, facsimile 202-863-2898, or via e-mail qualexint@aol.com. The report can also be downloaded from the **FCC-State Link** Internet site at www.fcc.gov/wcb/stats.

Exhibit No. 110
Case No. QWE-T-02-25
W. Hart, Staff Page 1 of 2
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Table 8
High-Speed Lines by Type of User as of June 30, 2002
(Over 200 kbps in at Least One Direction)

	Residential & Small Business	Other ¹	Total
Alabama	152,425	19,940	172,365
Alaska	43,046	3,745	46,791
Arizona	287,954	20,667	308,621
Arkansas	80,444	3,791	84,235
California	2,193,137	405,354	2,598,491
Colorado	217,903	25,907	243,810
Connecticut	223,128	13,362	236,490
Delaware	32,501	4,118	36,619
District of Columbia	31,690	23,507	55,197
Florida	958,937	160,756	1,119,693
Georgia	426,944	85,191	512,135
Hawaii	*	*	*
Idaho	37,631	5,488	43,119
Illinois	454,577	98,865	553,442
Indiana	127,595	31,797	159,392
Iowa	98,306	4,626	102,932
Kansas	143,271	6,462	149,733
Kentucky	64,034	26,250	90,284
Louisiana	189,850	17,407	207,257
Maine	56,317	5,089	61,406
Maryland	259,394	57,272	316,666
Massachusetts	493,882	89,745	583,627
Michigan	490,624	47,792	538,416
Minnesota	252,225	21,682	273,907
Mississippi	50,064	7,531	57,595
Missouri	205,716	18,566	224,282
Montana	15,644	2,325	17,969
Nebraska	90,301	2,548	92,849
Nevada	118,453	19,589	138,042
New Hampshire	75,580	10,620	86,200
New Jersey	578,039	114,997	693,036
New Mexico	39,577	5,365	44,942
New York	1,217,818	243,076	1,460,894
North Carolina	405,618	56,118	461,736
North Dakota	13,105	1,059	14,164
Ohio	509,733	70,345	580,078
Oklahoma	140,430	10,783	151,213
Oregon	173,314	26,235	199,549
Pennsylvania	425,676	90,812	516,488
Puerto Rico	*	*	*
Rhode Island	64,820	7,733	72,553
South Carolina	155,778	19,310	175,088
South Dakota	11,309	1,246	12,555
Tennessee	259,493	35,080	294,573
Texas	940,185	110,326	1,050,511
Utah	83,306	10,622	93,928
Vermont	26,669	3,321	29,990
Virgin Islands	*	*	*
Virginia	301,448	59,274	360,722
Washington	360,522	61,826	422,348
West Virginia	54,004	4,205	58,209
Wisconsin	235,542	21,557	257,099
Wyoming	9,786	1,204	10,990
Reported Total	13,984,287	2,218,253	16,202,540

* Data withheld to maintain firm confidentiality.

¹ Other includes medium and large business, institutional, and government customers.

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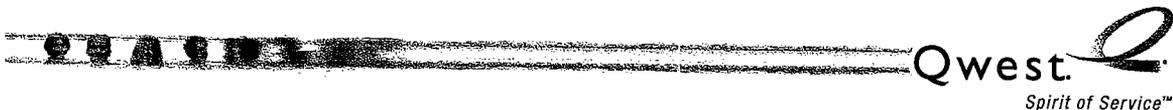
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