

EX PARTE OR LATE FILED
COLE, RAYWID & BRAVERMAN, L.L.P.

ORIGINAL

ALAN RAYWID
(1930-1991)

OF COUNSEL
FRANCES J. CHETWYND
ELLEN S. DEUTSCH

FACSIMILE
(202) 452-0067

INTERNET
WWW.CRBLAW.COM

WRITER'S DIRECT DIAL
202-828-9857

WRITER'S E-MAIL ADDRESS
TZETERBERG@CRBLAW.COM

ATTORNEYS AT LAW

SECOND FLOOR

1919 PENNSYLVANIA AVENUE, N.W.

WASHINGTON, D.C. 20006-3458

(202) 659-9750

April 21, 2000

RECEIVED

APR 21 2000

FEDERAL COMMUNICATIONS COMMISSION
OFFICE OF THE SECRETARY

JOHN P. COLE, JR.
BURT A. BRAVERMAN
ROBERT L. JAMES
JOHN D. SEIVER
WESLEY R. HEPPLER
PAUL GLIST
DAVID M. SILVERMAN
JAMES F. IRELAND, III
MAURITA K. COLEY
STEVEN J. HORVITZ
CHRISTOPHER W. SAVAGE**
ANN FLOWERS
ROBERT G. SCOTT, JR.
SUSAN WHELAN WESTFALL
THERESA A. ZETERBERG
KARLYN D. STANLEY
JOHN DAVIDSON THOMAS
JOHN C. DODGE
JEREMY H. STERN
MARIA T. BROWNE
DONNA C. RATTLEY
EDWARD L. DONOHUE***
FREDERICK W. GIROUX
GEOFFREY C. COOK
THOMAS SCOTT THOMPSON
ADAM S. CALDWELL***
WILLIAM F. BLY*
SANDRA GREINER GIBBS
CHRISTIN S. MCMELEY
SARA J. KIERNAN*
HEIDI C. PEARLMAN
ERIK J. CECIL*
BRENDA J. BOYKIN
ROBERT JYSTAD*
DAVID N. TOBENKIN**
RACHAEL A. GALOOB**
LAURA G. SCHLOSS
BRIAN M. JOSEF*
KEVIN C. HALM*
TERENCE S. COOKE****
CHRISTOPHER W. HEMBREE*

* ADMITTED IN OKLAHOMA ONLY
** ADMITTED IN FLORIDA ONLY
° ADMITTED IN CALIFORNIA ONLY
* ADMITTED IN MARYLAND ONLY
** ALSO ADMITTED IN CALIFORNIA
*** ALSO ADMITTED IN MARYLAND
**** ALSO ADMITTED IN VIRGINIA

Magalie Roman Salas, Secretary
Federal Communications Commission
445 12th Street, SW
Washington, DC 20554

Re: **Notice of Permitted Ex Parte Contact**
WT Docket No. 97-82

Dear Ms. Salas:

The purpose of this letter is to advise the Commission of a permitted *ex parte* contact in the above-referenced proceeding. On April 20, 2000, Arthur Prest (Vice President and CTO) of Alpine PCS, Inc. ("Alpine") and the undersigned met with Mark Schneider of Commissioner Ness's office to discuss the issues raised in the Petition for Reconsideration filed on April 4, 2000 by US WEST Wireless LLC and Sprint Spectrum L.P. in the referenced proceeding, in addition to the record established in response the Public Notice DA 00-191.¹ Alpine is a qualified designated entity that holds 13 D, E and F block broadband PCS licenses and opposes any attempt to eliminate the designated entity rules for the July 26, 2000 C and F block reauction.

¹ Public Notice DA 00-191, released February 3, 2000.

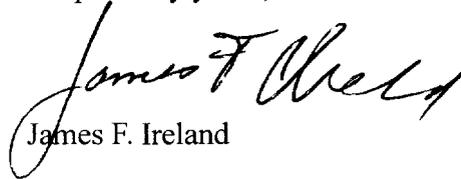
No. of Copies rec'd 0+1
List ABCDE

Magalie Roman Salas
April 21, 2000

Specifically, the attendees discussed Alpine's opposition to the various requests to waive or eliminate the FCC's designated entity rules for the upcoming reauction. The discussion focused on the number of designated entities that presently are interested in acquiring spectrum in major markets, the minimum spectrum necessary for DE's to offer competitive services and issues relating to the efficient use of spectrum. The attached letter and outline addressing these issues were also left with Mr. Schneider.

Please contact the undersigned if you have any questions about this matter.

Respectfully yours,



James F. Ireland

Cc: Mark Schneider (w/o enclosure)

Alpine PCS, Inc.
201 Calle Cesar Chavez, No. 103
Santa Barbara, CA 93103
April 20, 2000

Chairman William E. Kennard
Federal Communications Commission
445 12th Street, SW
Room 8-B201
Washington, DC 20554

Dear Chairman Kennard:

Alpine PCS, Inc. is a designated entity ("DE") currently constructing 13 broadband PCS systems in California, Massachusetts and Michigan. Alpine has long anticipated the reauction of DE spectrum that has been frozen due to the bankruptcies of a handful of DE licensees who failed to comply with FCC rules. The reauction of this spectrum to Alpine and other DE's is critical to the implementation of our business plan that relies upon the existence of viable DE roaming partners in markets, large and small, throughout the country, and upon the availability of adequate spectrum to compete against larger carriers in all markets.

Although Alpine and other DE's have relied upon the FCC's allocation plan and eligibility rules in acquiring spectrum and constructing their networks, I understand that the FCC is now considering changing its rules to eliminate the eligibility rules in whole or part for the licenses available in the reauction. Any such change will severely damage the ability of DE's to compete in the market while simply exacerbating the concentration of licenses in the hands of larger carriers, a trend that has accelerated in just the past year.

The purpose of this letter is to dispel a number of myths that have been promulgated by a few large CMRS carriers in their effort to accomplish their spectrum grab from DE's. The Commission must not base its decision in this critical proceeding on the unsupported and self serving claims of large carriers.

Myth #1: The large carriers need additional spectrum.

No large carrier has established factually that it is in need of additional spectrum. The fact is that the major carriers are spectrum rich, or their shortages are due to the continued mass marketing of spectrum inefficient analog services. For example, with respect to major PCS carriers, Sprint's Vice President of Technology and Advanced

Chairman William E. Kennard
April 20, 2000

Systems Development, Oliver Valente, reported in the February 28, 2000 issue of Telephony that in **most major metropolitan areas Sprint PCS currently uses only about 7.5 MHz of its 30 MHz**. See Attachment 1. Any additional spectrum acquisition by Sprint at this point in its existing markets will be for the purpose of warehousing to defer unwanted new competition.

Similarly, both Bell Atlantic and SBC have been telling the FCC and Congress that they need additional spectrum because they are spectrum constrained in major markets. If this is in fact true, why do both Bell Atlantic and SBC continue to push spectrum inefficient analog phone service in major markets such as Washington DC, New York City, and Dallas, Texas? As evidenced by Attachment 2, both Bell Atlantic and SBC continue to use analog phones for their lower tier service plans and for their prepaid service plan (which ironically is the market that is growing faster than traditional postpaid service plans – and to a large extent targeted at lower income customers). On the one hand these carriers complain that they are spectrum constrained, while on the other hand they continue to squander their existing spectrum by not providing all new users with more spectrum efficient digital technologies. These inefficient practices pervade the offerings of large cellular carriers in large as well as small markets and the FCC should not reward such inefficiency at the expense of DE's.

What we have here is a blatant attempt at spectrum grabbing! Not one of the large carrier petitioners has succeeded in proving that it needs additional spectrum in the markets where it currently owns spectrum. Other carriers who petitioned the FCC for waivers, are asking that the DE rules be waived in order that they can expand their national footprint, not because they are spectrum constrained in their existing markets. Most visible in this regard is SBC, who distinguished itself by its absence in the 1994 auctions! Sure the environment has changed, but SBC has only itself to blame for being so myopic in its spectrum planning. And if the large carriers really need additional spectrum in a handful of isolated markets (a fact not so far demonstrated), let them participate in the 700MHz auctions which are structured in a way that as a practical matter will not be available to small businesses.

Myth #2: Only large carriers have the wherewithal to build out larger PCS markets.

The large carriers claim to have the financial ability and capability to build out the PCS spectrum in large markets, and suggest that DE's will not have this capability. To the extent that larger carriers are building out major markets, it appears to be at the expense of suburban and more rural markets that are being neglected. For example, neither Sprint nor AT&T has yet to build out large areas in the US where they already own spectrum. A case in point is the rural area of Northern Michigan where Alpine is currently constructing a PCS network. Sprint's own homepage, which identifies existing and planned coverage, shows absolutely no plans to provide PCS coverage to this rural customer base. The same coverage maps show that Sprint is only building out in large markets and along certain highways that connect these large markets. The AT&T

Chairman William E. Kennard
April 20, 2000

Wireless homepage shows virtually the same pattern of existing and planned coverage. The large carriers should not be rewarded for building large markets while they neglect suburban and rural areas, a result contrary to the intent of Congress and harmful to America's rural population.

Similarly, there is absolutely no basis for the Commission to conclude that DE's will be unable to build out the larger markets. To the extent build outs in these markets do not exist today, this is obviously due to the bankruptcies of NextWave and a handful of other DE's that originally acquired the largest C block markets. As noted below, Alpine and other DE's are building out their markets, including Northcoast Communications in the major markets of New York City and Cleveland.

Myth #3: The DEs are inactive and unable to build out the markets that they currently own.

This is simply untrue! We are currently building out our California markets and Michigan markets. The same is true of many of the DEs such as Telecorp, Tritel, Northcoast, Leap, and many others. The Commission should not base its decisions in this critical process on vague and unsupported allegations by the very carriers that will benefit from the Commission being misinformed on this issue.

Myth #4: Carriers with 10 MHz of spectrum can be competitive with carriers with 30+ MHz of spectrum.

Carriers with only 10 MHz of spectrum can be successful on the initial launch of wireless service. However, the capacity constraints soon become apparent when the carrier is successful. In our analysis of providing so-called "all you can eat" service using CDMA technology, 10 MHz (i.e., 5 MHz in each direction) soon becomes insufficient in that not only do you need to use EVRC (Enhanced Variable Rate Coders), but you need to use all the available 1.25 MHz CDMA carriers (i.e., 3 carriers within 5 MHz), and significantly increase the density of your cell sites in order to provide sufficient network capacity to support the huge traffic loads that have been witnessed with such plans. In fact, in one case, our analysis revealed that the number of cell sites required to meet a five year traffic forecast was not economically viable. Beyond this voice capacity constraint, there is an additional major issue if the carrier also wants to dedicate one of those CDMA carriers for dedicated wireless data service. In addition, unlike cdmaONE, which uses a 1.25 MHz carrier, cdma2000 Phase 2 (in 2002) will use a 5 MHz carrier to provide voice plus 384+ Kbps packet data. Thus a carrier with only 10 MHz of spectrum who is providing voice services will not be able to provide true 3G services using cdma2000 Phase 2 technology.

A minimum of 20 MHz is required to offer "all you can eat" service and have the capability of providing 3G services in the future. Carriers with 30+ MHz of spectrum will have a significant competitive advantage by the year 2003. This probably explains the Sprint and US West petition – use spectrum as a competitive weapon. They will use the additional 10 MHz if necessary in conjunction with their existing spectrum, and in the

Chairman William E. Kennard
April 20, 2000

meantime prevent meaningful competition by carriers who would be constrained by the 10 MHz that they have. The last thing that the big carriers want is to see is the proliferation and expansion into their markets of the "all you can eat" programs.

Myth #5: Acquisition of DE spectrum by large carriers will best serve the public interest.

The reality is that the large carriers sense an opportunity in the current proceedings to undermine the very competition that the DE's promise to deliver to the wireless marketplace. Imagine the additional profits that BellSouth, GTE Wireless and Sprint would earn in Chattanooga and Nashville but for Leap's "all you can eat service" for just \$30 per month. If that kind of creative DE inspired service offering spreads to other large markets, the bottom line of the large carriers will be materially impacted to the direct benefits of consumers. However, as noted above, a minimum of 20 MHz of spectrum is needed to successfully market this service and to offer 3G services competitively for more than 2-3 years.

As Congress recognized, DE's are the last hope to introduce innovation and creative competition in an industry now dominated by a handful of giant conglomerates. It is inconceivable that at the very time that a series of corporate mergers have consolidated the PCS and cellular markets, that the Commission would seriously consider eliminating (or materially diminishing) the competition that the DE program was intended to foster. Given that the large carriers have not even come close to exhausting their existing spectrum (or are committed to inefficient uses), what is the harm of allowing the DE program to advance to the next stage and see how the marketplace is affected. Even in a worse case scenario, if the DE spectrum goes undeveloped in any significant way, the marketplace will react quickly to correct the situation. The Commission should certainly not premise any decision to gut the DE program based on the disingenuous myths and misinformation that underlie the large carriers' position.

I am available to answer any questions you may have concerning Alpine and the DE experience in the marketplace.

Respectfully submitted,



Robert Broz
President, Alpine PCS, Inc.
(805) 962-1894

cc: The Commissioners

ATTACHMENT 1

TABLE 1
A WIRELESS PROTOCOL PRIMER

On the TDMA side, Umesh Amin, AT&T Wireless Services' director of new technologies and planning, is quick to point out that, "TDMA is 85% compliant with the IMT 2000 requirements [for 3G]." AT&T is expected to skip GPRS and directly implement EDGE, but when it comes to 3G, Amin says, "EDGE/GPRS is as 3G as any network being discussed."

In fact, Amin indicates that AT&T is more focused on upgrading its voice capacity, which analysts agree is a major concern for many TDMA and GSM carriers because neither GPRS nor the first phase of EDGE provides operators with more voice capacity than current systems.

One of the largest U.S. GSM players, Omnipoint

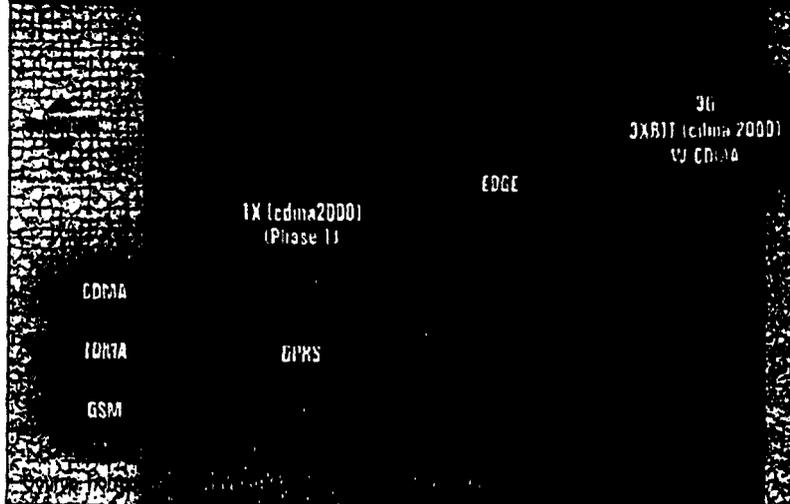
Communications, expects to improve its data speeds and efficiency using a commercial GPRS system by the end of June, says Chris Resavy, senior director of engineering, operations and facilities for Omnipoint. But Resavy estimates his company will not commercially implement W-CDMA technology in the U.S. until 2005. Analysts estimate that other U.S. operators are no further ahead (Figure 2). The U.S. time frame contrasts sharply with the expected commercial availability of W-CDMA systems in Europe or Japan, which is expected as early as 2001.

"GPRS and EDGE will get you to 384 kb/s. Enhancements in the protocol stack will get you to 1 Mb/s," Resavy says. "That will suffice through 2005 unless something happens to the data world that no one ever expected." Resavy expects the upgrade to GPRS to cost Omnipoint less than \$10 million total but has no cost figures yet on EDGE or W-CDMA.

However, the operator is taking part in W-CDMA tests in Canada sponsored by the GSM North America Association and spearheaded by Canadian carrier Microcell Connexions. The group currently is examining early results from the tests and expects to release them by early second quarter at the latest, says Anthony Schultz, vice president of network planning and operation at Microcell Connexions. Although Schultz would not release many results, he did say

continued on page 48

TABLE 2
THE SLOW EVOLUTION OF 3G



SPECTRUM



'3G is really an evolution and a direction rather than a discrete new technology.'

—Gerry Flynn, BAM

that the group has confirmed W-CDMA coverage areas and intends to compare them to GSM coverage areas. The performance of 3G exceeds that of GSM, Schultz says, but only at rates in the 30 to 40 kb/s range. He points

out that it is "still early days for the equipment."

One interesting note: Microcell Connexions conducts the tests in clear spectrum. While most industry players agree that clear spectrum is necessary to implement W-CDMA, U.S. operators would have to explore re-farming or overlay options unless the FCC allocates additional spectrum for 3G systems. "Having tried to overlay a TDMA network over an AMPS network, I know [overlay networks] are ripe with issues and problems," he says.

While the business case for 3G remains unclear, several of Omnipoint's current corporate wireless data customers are requesting faster data speeds and the ability to always be connected, Resavy says. "They're the drivers that are moving us into GPRS."

The narrowband alternative

While GSM 2.5G systems only increase data speed and capacity, on the CDMA side, the driver behind 2.5G implementation—what many CDMA operators are referring to as "3G 1X"—is simple: It's the desire to improve good old-fashioned voice capacity. While 1X is expected to multiply current data rates tenfold up to 144 kb/s, it also is expected to double voice capacity.

"Most of the CDMAOne operators are very interested in the 1X solution," says Perry LaForge, executive director for the CDMA Development Group. "3X is more out there—people aren't sure of what the market potential is."

"To go to 3G 1X is sort of a no-brainer," says Oliver Valente, Sprint PCS' vice president of technology and advanced systems development. "Going from 1X to 3X is more questionable." Perhaps one of the biggest roadblocks is that 3G 3X calls for operators to use a wider spectrum band to transmit data. Specifically, 3G 3X calls for operators to combine three of CDMAOne's current 1.25 MHz channels to transmit data. Many CDMA operators would have trouble even clearing three contiguous channels in which to implement 3X.

But this is not the problem in Sprint PCS' case. In most major metropolitan areas, Sprint PCS currently uses only about 7.5 MHz out of the 30 MHz it holds, Valente says. "There may be a more efficient way to get those data speeds using a smaller bandwidth."

One possibility is Qualcomm's High Data Rate technology, a data-only solution that operates across a sin-

gle clear 1.25 MHz channel and supports 2.4 Mb/s speeds, which can be achieved in a mobile environment, says Kimberly Koeber, Qualcomm's director of product marketing for HDR. HDR's claim of mobility at 2.4 MHz would provide a distinct advantage over 3X technology, where the top speeds of 2 Mb/s support basically fixed applications only. In addition, because HDR is designed with the same RF signaling as today's CDMAOne systems, the cost of deploying the solution is expected to be significantly less than the cost of 3XRTT.

Another option to achieve high-speed data rates at a potentially lower cost is simply attempting to enhance 3G 1X technology. Sprint PCS is looking at both options. "We've trialed [HDR] in the lab, and we're exploring whether HDR or enhancing the 3G 1X standard is a better move for Sprint PCS," Valente says.

That may be a smart move, especially given that many equity analysts still consider the value of spectrum when analyzing a company. "The opportunity cost of wideband operations could be huge," says



Jonathan Dorfman, an analyst at The Strategis Group. And Sprint PCS is not alone in its exploration of other technologies.

"We're looking at HDR as well as other technologies," says BAM's Flynn. "We're always looking at technologies that would be more spectrally efficient."

One big concern about HDR, however, is that Qualcomm is no longer in the infrastructure building business, meaning that another manufacturer will have to build equipment for the technology. So far, only Hitachi has signed a letter of intent to jointly develop equipment and support a field trial of Qualcomm's HDR technology, scheduled to begin this year. If successful, Hitachi intends to develop and manufacture HDR infrastructure equipment for commercial use.

The lack of a large manufacturing base makes at least one North American operator wary. "We're watching

Continued on page 50

'We're watching [Qualcomm's High Data Rate technology] very closely. As soon as someone says they're going to build it, we'll look at it even more closely.'

—Brian O'Shaughnessy, Bell Mobility

[HDR] very closely," says Brian O'Shaughnessy, vice president of technology development for Canadian carrier Bell Mobility. "As soon as someone says they're going to build it, we'll look at it even more

closely"—a statement he made just days before Qualcomm released the Hitachi announcement.

Many manufacturers are considering making HDR equipment. "We are looking at HDR seriously," says Graham Richardson, director of CDMA data solutions at Nortel Networks.

In this carrier-driven world, all HDR may need is

more logical choice to support higher data rates—on the GSM and the CDMA side. "The logical way of providing 2 Mb/s may not be wideband CDMA," says Lars Nilsson, manager of strategic marketing for Ericsson.

"It turns out that there is a lot of capability that can be delivered on enhancements to the 2.5G systems," says Dave Poticny, vice president of global wireless strategy at Lucent Technologies. "There's lots of work being done on advanced antennas and all the components that go into these systems, [such as] filters and amplifiers. You have to understand that no technology stands still."

one big customer. "What it may take is one big operator to invest in it," says Phillip Redman, associate director of wireless/mobile communications at The Yankee Group. "And then the rest will fall."

At the very least, Nortel and other manufacturers, which say they don't know their plans yet for HDR, agree that other technology options might be the

It's the applications, stupid!

When deciding to implement third generation, "carriers need to think about the applications before they think about the infrastructure," says Mark Zohar, research director at Forrester Research. He lists four key criteria for apps in a mobile world:

1. They must provide timely information.
2. Transactions must be simple to complete.
3. They should be relevant to location.
4. They should be personalized.

Zohar has rated several current mobile applications according to these categories.

"We fundamentally believe that 3G is about applications," says Brian O'Shaughnessy, vice president of technology development for Bell Mobility. "If you ignore the application side, you will have a big pipe sitting there that will be empty."

Bell Mobility slowly has been introducing services, such as text messaging and wireless modem capabilities, and applications, such as trading stocks and checking bank balances, since spring 1999. The carrier has sold 25,000 wireless modem kits in eight months and estimates that 5% of its digital subscribers use some form of wireless data—modem or text messaging. Data penetration among businesses even is higher at 15%.

One big application area carriers and equipment manufacturers are exploring is location-based information delivery—in the U.S. and elsewhere. "For the future, the main driver for mobile data is making the data service relevant to the user while they are mobile," says Patrick Waters, chief engineer at Vodafone AirTouch in the U.K.

The development of such applications already is taking place. "We're doing a lot of work on geolocation," says Dave Poticny, vice president of global wireless strategy at Lucent Technologies. "We actually believe a

lot of the content delivery will be based on geolocation."

With this in mind, Lucent developed the Wireless Data Gateway that allows applications to work with a network operator's proprietary wireless customer and network information to automatically personalize and customize wireless data services for consumers. Initial applications include location-based information services.

Zohar is quick to point out that 2.5G offers more than enough to address the infrastructure needs of these applications. "Others agree."

"There is no justification to go from 2.5G to 3G unless there is a big-time demand for wireless Internet services," says Jonathan Dorfman, an analyst at The Strategic Group.

While the demand for these services eventually might be larger, the speeds supported by 2.5G might be high enough anyway—for the next few years at least. "There is such a huge pent-up demand for 28.8 [kb/s] connections today for people who travel around," says Umesh Amin, AT&T Wireless Services' director of new technologies and planning. But the key part of that sentence may just be "28.8."

After all, Forrester Research estimates that subscribers using dial-up services—defined as 28.8 or 56.8 kb/s—in 1999 numbered around 41 million, while other, more high-speed options had less than 3 million users. Even by 2003, Forrester estimates that out of nearly 75 million Internet users, more than half—around 45 million of them—still will use dial-up services. If those speeds are good enough for more than half the households accessing the Internet via wireless technologies, in 2003, wireless 2G speeds will meet subscribers' needs.

—Lyle Meptrup

Building the 3G paradise

While many carriers are focused on finding narrowband alternatives for 3G, three (well, sort of three) U.S. wireless operators are working together to thoroughly test wideband alternatives and potential enhancements to

"We're looking for a dramatic reduction in the cost of moving bits around a digital network—an order of magnitude reduction."

—Craig Farrill, Vodafone AirTouch

that technology. Vodafone AirTouch, Bell Atlantic and GTE—the latter two are merging, which will create a new nationwide wireless business—are testing 3G CDMA solutions in Dallas/Fort Worth, Texas, to push the envelope on IP wireless networks and to ensure that different vendors' 3G equipment can successfully interoperate. According to The Strategis Group's survey, 41% of operator execs think that interoperability issues will negatively affect the adoption of 3G services (Figure 3).

"Our vision is to basically build a microcosm of the future of the industry," says Craig Farrill, chief technology officer for Vodafone AirTouch. Part of this involves testing some "unproven beliefs" about 3G CDMA solutions, Farrill says. For instance, the alliance is testing the differences between a direct sequence channel approach and a multicarrier approach to 3G.

The direct sequence approach involves the use of a single CDMA carrier, which then spreads the energy across a 5 MHz bandwidth. The multicarrier approach arranges the wideband channel based on the 1.25 MHz concept, centering one 1.25 MHz channel with one 1.25 MHz channel to the right and one to the left. In both cases, the mobile handset, or the uplink side, still relies on direct spread technology. CDMA experts believe that the multicarrier approach could lead to benefits such as better in-building penetration and lower power consumption, which would lead to longer battery life, Farrill says. However, these theories are untested.

In addition, when using the multicarrier approach, some CDMA players believe that the three 1.25 MHz carriers could be overlaid across and share three CDMAOne channels, Farrill says. Although this would take some capacity away from the CDMAOne channels, it would allow operators to transmit multimedia and voice in the same spectrum simultaneously and perhaps eliminate the need for operators to have three clear contiguous 1.25 MHz spectrum channels to implement 3G 3XRTT CDMA systems.

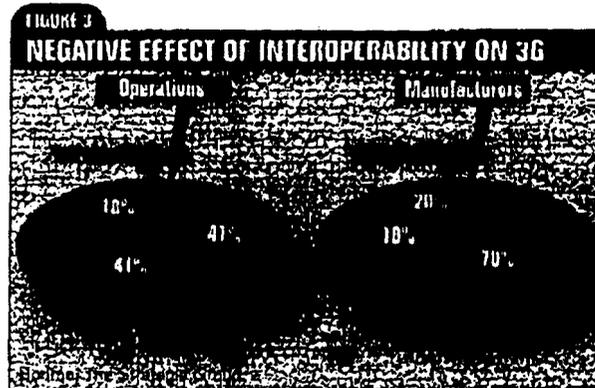
"These are unproven beliefs," Farrill says, pointing

out that Vodafone AirTouch and its partners also are looking at the economics of such solutions. For instance, the alternatives may provide operators with more flexibility but may cost too much in the long run. "These are some of the very fundamental strategic technological questions that face the whole CDMA industry," Farrill says.

In fact, the tests are as much about economics as they are about technology: they're about trying to realize a long-standing goal of Vodafone AirTouch. "We're looking for a dramatic reduction in the cost of moving bits around a digital network—an order of magnitude reduction," Farrill says. Today moving a bit across the wireless network can cost as much as 35¢ to 40¢ per megabit, which is expensive when compared with wireline technological solutions such as DSL or twisted pair. "Within four years, we want to divide that by 10," Farrill says.

Farrill isn't the only one with that goal. "If you look at transporting a megabit across the wireless network, it currently costs 37¢ per megabit," says Todd Etchieson, senior manager of UMTS product marketing at Nortel. "By 2004, we think we can take that down to 4¢ per megabit."

"The driver is to get the cost per bit down to something that is very cost-effective to deliver," says BAM's Flynn. But until costs come down or demand goes up, 3G implementation isn't guaranteed in the U.S. or Canada. "It's not a done deal yet. There are lots of questions among operators about whether they will be



upgrading to 3G," says The Yankee Group's Redman.

The bottom line? Although Asia and Western Europe are technically leading the way for 3G worldwide, these international players are being driven to 3G by capacity constraints in areas such as Japan and regulatory events, such as auctions in the U.K. and other European countries, says Heather Henyon, an analyst with the international wireless practice at The Strategis Group.

In contrast, "U.S. operators are still paying off their 2G costs, so why would they refinance and go into more debt when there's not necessarily a demand?" she asks. That's exactly the question that U.S. operators are struggling to answer. ☐

Lara Menlop is a freelance writer based in Chicago.

ATTACHMENT 2

*TalkAlongSM Plus exclusively
from Bell Atlantic Mobile*

Enhanced Services

Ask your Wireless Sales Consultant about these additional Enhanced Services to get the most from your wireless phone—all for an affordable monthly access fee.

TalkDial[®]—Voice Activated Dialing
Just say a number, a name or a phrase like “my home” and Bell Atlantic Mobile TalkDial service automatically dials it for you, for a low monthly access fee.

Voice Mail Services
It's Voice Mail for your wireless phone, so you never miss a message. Or get Enhanced Voice Mail that alerts your pager when you have an urgent message. Voice Mail services are available for a low monthly fee. Airtime charges apply.

Bell Atlantic Mobile IQ[™] Services
Call Forwarding, Call Waiting, 3-Way Calling and No Answer/Busy Transfer are available for a low monthly fee. Airtime charges apply.

Information Services

***BAM—Customer Service**
Just press *BAM (*226) SEND 24 hours a day, seven days a week from your wireless phone, toll and airtime free, to reach one of our customer service specialists. Or call 1-800-922-0204 from any phone.

411—InfoAssist[®]
Dial 411 SEND to obtain phone numbers and get automatic call completion for no additional charge. You can get addresses, movie times or even do category searches (towing, restaurants, etc.) for just 75¢ per call (airtime rates apply). Rates may vary by region.

*For more information,
talk to a Bell Atlantic Mobile
Representative or call Customer
Service at 1-800-922-0204.*

\$175 early cancellation fee. Peak hours 7 am–8:59 pm Monday through Friday except certain holidays. Off-peak hours all other times. Calls to 911 and certain other emergency services are toll and airtime free. Airtime is rounded to the next full minute, so actual allowance may vary. Airtime is charged on calls to “800,” “877” and “888” numbers. Monthly allowance does not apply to roaming. All calls subject to wireless long distance, wireless regional calling, toll, landline fee of \$.10 or \$.12 per call, taxes and surcharges, including the Federal Universal Service and Regulatory Fee resulting from our costs of Federal Government assessments. These charges are in addition to airtime.

If long distance or toll charges are incurred while roaming on other carriers' systems in the United States, a long distance/toll rate of \$.30 per minute will apply, in addition to roaming airtime charges, which are not affected. This long distance/toll rate does not apply to SingleRate price plans while traveling in the SingleRate calling area. Calls placed to points outside your wireless calling area within Canada, Puerto Rico and the Virgin Islands may be billed the rate set by the visited system.

Wireless local calling areas are defined by the Company and are subject to change. Wireless long distance charges may apply when roaming for calls completed through enhanced network services. Automatic roaming may not be available in all areas and rates may vary. Rates may vary for calls placed while roaming.

Wireless Regional Calling rates apply to all nonlocal wireless calls placed through a Bell Atlantic Mobile system to points within the wireless regional calling area, which consists of Maryland, Virginia and Washington, D.C. Wireless Regional Calling charges may apply to calls completed through enhanced services. These charges may apply to calls placed while in other Bell Atlantic Mobile systems.

Price Plan is subject to the terms of the Cellular Service Agreement, which applies to all lines in an account. Please read and understand it before activating. Bell Atlantic Mobile's calling areas, rates, agreement provisions, business practices, procedures and policies are subject to change as specified in the Cellular Service Agreement. Our liability is significantly limited.

There are instances where a call is completed from a wireless phone to certain fax/data modems or other call-routing devices. When the device “answers” the incoming call automatically, it may sound as if it is still ringing and the call was unanswered. Such calls have been completed and will be billed.

It's for you.®

ⓐ Bell Atlantic Mobile

www.bam.com



CON2045

WBMAP-2/00
©2000 Bell Atlantic Mobile

**TalkAlongSM and
TalkAdvantage**

an affordable calling plan



The affordable way
to talk coast to coast.

Washington/Baltimore

ⓐ Bell Atlantic Mobile

TalkAlongSM
Home Airtime Rate Area

Get the coverage you want at a truly affordable price.

Coverage

With Bell Atlantic Mobile, one of the largest wireless carriers on the East Coast, you can make and receive calls virtually anywhere in the U.S. Our East Coast Network, stretching from Maine to Northern Virginia, in the Carolinas and Northeast Georgia, offers low per-minute roaming rates.

Affordability

Select a calling plan that fits your budget and satisfies your needs.

TalkAlongSM

	TalkAlong	TalkAlong Plus20	TalkAlong Plus100
Monthly Access	\$14.99	\$19.99	\$39.99
Home Airtime Minutes Included	Not Included	First 20	First 100
Additional Home Airtime Minutes	35¢ anytime	30¢ anytime	30¢ peak

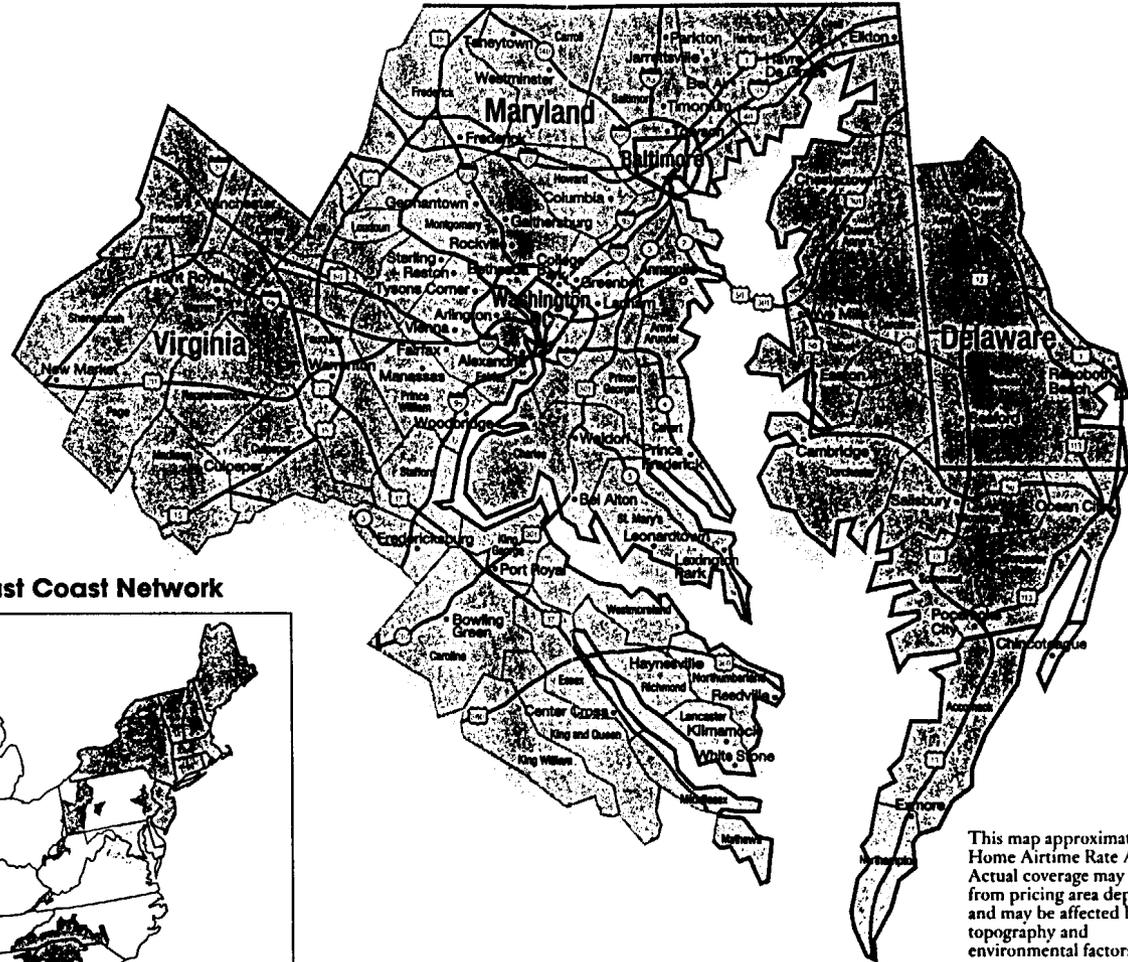
Long Distance and Wireless Regional Calling Per Minute 21¢ peak 9¢ off-peak

Monthly or annual agreements available. \$25 activation fee may apply for new activations only.

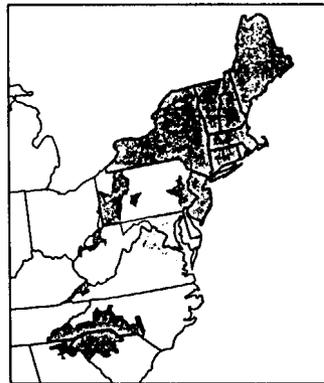
The Weekender Option

Unlimited local weekend airtime for only \$8 per month.*

*Standard price plan must be selected. Weekender Option is not available with \$14.99 TalkAlong Plan. Local weekend airtime refers to calls made between 12 am Saturday and 11:59 pm Sunday. \$8 charge is in addition to monthly access charge.



East Coast Network



Airtime Costs

-  Home Airtime Rates
-  59¢ per Airtime minute
-  99¢ per Airtime minute

If you're roaming in the Carolinas, Northeast Georgia and Southwest Virginia, you can take advantage of reduced rates by switching your phone to the "A" system. (See Travel Guide for more details.)

This map approximates the Home Airtime Rate Area. Actual coverage may vary from pricing area depicted and may be affected by topography and environmental factors.



Simple. Affordable. National.

verizon wireless

Verizon Wireless Home Page

Online Store

Products and Services

Customer Services

Send a Digital Numeric Page or Text Message

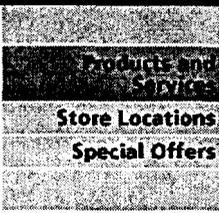
About Us

Quick Find

Contact Us

Products & Services

NY/NJ Metro



• **View Your Bills Online**

• **Accessibility**

• **Cellular Phones**

Analog Portable Phones
Reliable, established technology for the casual user

Digital Portable Phones
Great sound quality and flexible, convenient calling plans -- the latest technology

Transportable Phones
Mobile from car to car, a dependable companion when you're on the move

Installed Mobile Phones
Convenience on the go, installed right into your car's dashboard

• **Paging Products & Services**
Pagers

• **Cellular Accessories**
Batteries

Car Adapters

Car Kits

Leather Cases

• **Wireless Data**
The latest in cutting-edge data product and service technology.

• **Corporate Accounts**
Management solutions for your business challenges.

• **National Accounts**
Wireless Solutions for a changing business environment

• **Cellular Services / Price Plans**

SingleRatesm New!

SingleRatesm East New!

DigitalChoice[®]

MobileMinutes[®]

Rate Area Maps (57KB)

• **Cellular Service Enhancements**

Roaming

International Traveling

Text Messaging

Digital Numeric Paging

Cellular Long Distance

InfoAssist
411 Information. It's more than a phone directory.

Info Services
* and # numbers.

TalkDial[®]
Voice Activated Dialing

IQ Services with Quick Reference Guide
Call Waiting, Call Forwarding, 3-Way Calling and No Answer/Busy Transfer services.

MobileReach[®] Network
Reduced Rate Roaming

Voice Mail Service and User Guide

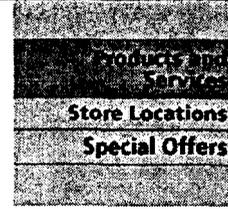


Simple. Affordable. National.

verizon wireless

- [Verizon Wireless Home Page](#)
- [Online Store](#)
- [Products and Services](#)
- [Customer Services](#)
- [Send a Digital Numeric Page or Text Message](#)
- [About Us](#)
- [Quick Find](#)
- [Contact Us](#)

Cellular
Phones
 Analog Portable



- [Audiovox MVX-485](#)
- [Motorola Profile 300](#)
- [Motorola MicroTac 650](#)
- [Motorola StarTac 3000](#)
- [Motorola StarTac 6500](#)
- [Nokia 918](#)
- [Nokia 252](#)

[Back to Products and Services](#)

[Homepage](#)
[For Your Home](#)
[For Your Business](#)
[For Government](#)
[About Us](#)
[Privacy](#)

Copyright © 2000 Bell Atlantic Mobile

SELECTED PLAN

Verizon Wireless (formerly Bell Atlantic Mobile)
MobileMinutes (prepaid)

Baltimore, MD / Washington, DC region

- PHONES
- COVERAGE MAP
- DEALERS

Phones

Phones displayed below are featured by the plan you've chosen and are normally stocked by the carrier or authorized dealers. Click on a phone below to see details about that phone.

Compare Phones

Check up to five boxes and click Compare, or click on a phone for details.

SIDE BY SIDE



Audiovox
MVX-480XL



Technology AMPS (Analog)
Weight 7.3 oz. with NiMH battery
Talk Time 80 mins.
Standby Time 17 hrs.
Price \$89.99
Price includes \$25 prepaid card.

SELECTED PLAN

Verizon Wireless (formerly Bell Atlantic Mobile)
TalkAlong 20 Plus

Baltimore, MD / Washington, DC region

- PHONES
- COVERAGE MAP
- DEALERS

Phones

Phones displayed below are featured by the plan you've chosen and are normally stocked by the carrier or authorized dealers. Click on a phone below to see details about that phone.

Compare Phones

Check up to five boxes and click Compare, or click on a phone for details.

SIDE BY SIDE

COMPARE CLEAR

- | | | | |
|-------|---|---|---|
| └ | <p>Audiovox
<u>MVX-480/485</u></p> |  | <p>Technology <u>AMPS (Analog)</u>
 Weight <u>7.3 oz. with NiMH battery</u>
 Talk Time <u>80 mins.</u>
 Standby Time <u>17 hrs.</u>
 Price <u>\$39.99</u></p> |
| <hr/> | | | |
| └ | <p>Motorola
<u>Profile 300</u></p> |  | <p>Technology <u>AMPS (Analog)</u>
 Weight <u>7.4 oz. with NiMH battery</u>
 Talk Time <u>70 mins.</u>
 Standby Time <u>11 hrs.</u>
 Price <u>\$39.99</u>
 <u>Check stores for availability.</u></p> |
| <hr/> | | | |
| └ | <p>Motorola
<u>StarTAC 3000</u></p> |  | <p>Technology <u>AMPS (Analog)</u>
 Weight <u>3.8 oz. with NiMH battery</u>
 Talk Time <u>60 mins.</u>
 Standby Time <u>14 hrs.</u>
 Price <u>\$69.99</u></p> |
| <hr/> | | | |
| └ | <p>Motorola
<u>StarTAC 6500</u></p> |  | <p>Technology <u>AMPS (Analog)</u>
 Weight <u>3.8 oz. with NiMH battery</u>
 Talk Time <u>60 mins.</u>
 Standby Time <u>14 hrs.</u>
 Price <u>\$99.99</u></p> |
| <hr/> | | | |
| └ | <p>Nokia
<u>Nokia 918</u></p> |  | <p>Technology <u>AMPS (Analog)</u>
 Weight <u>6.2 oz. with NiMH battery</u>
 Talk Time <u>75 mins.</u>
 Standby Time <u>15 hrs.</u>
 Price <u>\$39.99</u></p> |

SELECTED PLAN

Verizon Wireless (formerly Bell Atlantic Mobile)
MobileMinutes (prepaid)

New York, NY region

- PHONES
- COVERAGE MAP
- DEALERS

Phones

Phones displayed below are featured by the plan you've chosen and are normally stocked by the carrier or authorized dealers. Click on a phone below to see details about that phone.

Compare Phones

Check up to five boxes and click Compare, or click on a phone for details.

SIDE BY SIDE



COMPARE CLEAR

Audiovox
MVX-480/485



Technology AMPS (Analog)
Weight 7.3 oz. with NiMH battery
Talk Time 80 mins.
Standby Time 17 hrs.
Price \$99.99
Price includes \$25 MobileMinutes card.

SELECTED PLAN

Verizon Wireless (formerly Bell Atlantic Mobile)
Plan 40

New York, NY region

PHONES COVERAGE MAP DEALERS

Phones

Phones displayed below are featured by the plan you've chosen and are normally stocked by the carrier or authorized dealers. Click on a phone below to see details about that phone.

Compare Phones

Check up to five boxes and click Compare, or click on a phone for details.

SIDE BY SIDE

COMPARE CLEAR

Audiovox
MXV-480/485



Technology AMPS (Analog)
Weight 7.3 oz. with NiMH battery
Talk Time 80 mins.
Standby Time 17 hrs.
Price \$19.99

Motorola
Profile 300



Technology AMPS (Analog)
Weight 7.4 oz. with NiMH battery
Talk Time 70 mins.
Standby Time 11 hrs.
Price \$49.99

Motorola
StarTAC 3000



Technology AMPS (Analog)
Weight 3.8 oz. with NiMH battery
Talk Time 60 mins.
Standby Time 14 hrs.
Price \$159.99

Motorola
StarTAC 6500



Technology AMPS (Analog)
Weight 3.8 oz. with NiMH battery
Talk Time 60 mins.
Standby Time 14 hrs.
Price \$209.99
Check stores for availability.

Nokia
Nokia 252



Technology AMPS (Analog)
Weight 6.5 oz. with NiMH battery
Talk Time 125 mins.
Standby Time 30 hrs.
Price \$79.99

Nokia
Nokia 918



Technology AMPS (Analog)
Weight 6.2 oz. with NiMH battery
Talk Time 75 mins.
Standby Time 15 hrs.



	Coverage Maps	Products and Services	On-Line Ordering	News Center	Careers at SWBW	Customer Service
---	-------------------------------	---------------------------------------	----------------------------------	-----------------------------	---------------------------------	----------------------------------

Southwestern Bell Wireless

[Home](#) [Site Map](#)

Dallas/Fort Worth, TX

Most Popular Phones

[Current Numbers](#)

[Buy](#)
[Get coverage](#)
[for your](#)
[Phone](#)

[Add a Text Message](#)

[Most Popular Phones](#)

[New Plans](#)
[New Services](#)
[Mobile Services](#)
[Access](#)
[Features](#)
[Voice Mail](#)
[Prepaid](#)
[Wireless](#)
[Digital Edge](#)
[InfoPak](#)
[Services](#)
[Traditions](#)
[Wireless](#)
[Set up your](#)
[voice Mail](#)



Nokia 918
(analog/traditional)



Nokia 5120
(digital)



Nokia 6120
(digital)

SELECTED PLAN
Cellular One
 Economy

Baltimore, MD /
 Washington, DC region

[PHONES](#) [COVERAGE MAP](#) [DEALERS](#)

Phones

Phones displayed below are featured by the plan you've chosen and are normally stocked by the carrier or authorized dealers. Click on a phone below to see details about that phone.

Compare Phones

Check up to five boxes and click Compare, or click on a phone for details.

SIDE BY SIDE

COMPARE CLEAR

Motorola
MicroTAC 650e (DPC 650e)



Technology AMPS (Analog)
 Weight 7 oz. with NiMH battery
 Talk Time 90 mins.
 Standby Time 24 hrs.
 Price \$9.99

Motorola
StarTAC 3000



Technology AMPS (Analog)
 Weight 3.8 oz. with NiMH battery
 Talk Time 60 mins.
 Standby Time 14 hrs.
 Price \$39.99

Motorola
StarTAC 6500



Technology AMPS (Analog)
 Weight 3.8 oz. with NiMH battery
 Talk Time 60 mins.
 Standby Time 14 hrs.
 Price \$129.99

Motorola
V3620



Technology AMPS (Analog)
 Weight 2.7 oz. with NiMH battery
 Talk Time 65 mins.
 Standby Time 24 hrs.
 Price \$199.99

Nokia
Nokia 252



Technology AMPS (Analog)
 Weight 6.5 oz. with NiMH battery
 Talk Time 125 mins.
 Standby Time 30 hrs.
 Price \$29.99

Nokia
Nokia 282



Technology AMPS (Analog)
 Weight 4.5 oz. with lithium ion battery
 Talk Time 100 mins.
 Standby Time 24 hrs.
 Price \$49.99

└─ **Nokia**
Nokia 918



Technology AMPS (Analog)
Weight 6.2 oz. with NiMH battery
Talk Time 75 mins.
Standby Time 15 hrs.
Price \$9.99

Copyright © 1998-2000 Point.com, Inc. All Rights Reserved. [Disclaimer](#)

SELECTED PLAN

Cellular One

Cellular One-2-3 Prepaid

Baltimore, MD /

Washington, DC region

PHONES | **COVERAGE MAP** | **DEALERS**

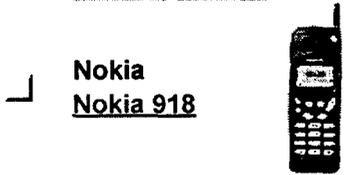
Phones

Phones displayed below are featured by the plan you've chosen and are normally stocked by the carrier or authorized dealers. Click on a phone below to see details about that phone.

Compare Phones

Check up to five boxes and click Compare, or click on a phone for details.

SIDE BY SIDE



Nokia
Nokia 918

Technology AMPS (Analog)
Weight 6.2 oz. with NiMH battery
Talk Time 75 mins.
Standby Time 15 hrs.

Copyright © 1998-2000 Point.com, Inc. All Rights Reserved. [Disclaimer](#)

SELECTED PLAN

Southwestern Bell
Southwestern Bell Security

Dallas/Fort Worth, TX
region



PHONES COVERAGE MAP DEALERS ORDERING FAQs BUY ONLINE

Phones

Phones displayed below are featured by the plan you've chosen and are normally stocked by the carrier or authorized dealers. Click on a phone below to see details about that phone.

Compare Phones

Check up to five boxes and click Compare, or click on a phone for details.

SIDE BY SIDE



Motorola
2950 Carry



Technology AMPS (Analog)
Weight 3.1 lbs. without battery
Talk Time 70 mins.
Standby Time 20 hrs.
Price \$242.00
\$99 with one-year contract
\$49 with two-year contract

Motorola
2950 Mobile



Technology AMPS (Analog)
Weight 3.1 lbs. without battery
Talk Time 70 mins.
Standby Time 20 hrs.
Price \$227.00
\$149 with one-year contract
\$99 with two-year contract
Price includes installation.

Motorola
MicroTAC 650e (DPC 650e)



Technology AMPS (Analog)
Weight 7 oz. with NiMH battery
Talk Time 90 mins.
Standby Time 24 hrs.
Price \$131.00
\$39 with one-year contract
\$0 with two-year contract

Motorola
Profile 300e



Technology AMPS (Analog)
Weight 7.4 oz. with NiMH battery
Talk Time 90 mins.
Standby Time 24 hrs.
Price \$115.00
\$19.95 with one year contract
\$0 with two year contract

Motorola
StarTAC 3000



Technology AMPS (Analog)
Weight 3.8 oz. with NiMH battery
Talk Time 60 mins.
Standby Time 14 hrs.
Price \$180.00
\$135 with one-year contract
\$79 with two-year contract

Nokia
Nokia 252



Technology AMPS (Analog)
Weight 6.5 oz. with NiMH battery
Talk Time 125 mins.
Standby Time 30 hrs.
Price \$150.00
\$99 with one-year contract
\$29 with two-year contract
Check stores for availability.

Nokia
Nokia 918



Technology AMPS (Analog)
Weight 6.2 oz. with NiMH battery
Talk Time 75 mins.
Standby Time 15 hrs.
Price \$130.00
\$39 with one year contract
\$0 with two year contract

SELECTED PLAN

Southwestern Bell
Southwestern Bell 50

Dallas/Fort Worth, TX
region



- [PHONES](#)
- [COVERAGE MAP](#)
- [DEALERS](#)
- [ORDERING FAQs](#)
- [BUY ONLINE](#)

Phones

Phones displayed below are featured by the plan you've chosen and are normally stocked by the carrier or authorized dealers. Click on a phone below to see details about that phone.

Compare Phones

Check up to five boxes and click Compare, or click on a phone for details.

SIDE BY SIDE

COMPARE CLEAR

Motorola
2950 Carry



Technology AMPS (Analog)
Weight 3.1 lbs. without battery
Talk Time 70 mins.
Standby Time 20 hrs.
Price \$242.00
\$99 with one-year contract
\$49 with two-year contract

Motorola
2950 Mobile



Technology AMPS (Analog)
Weight 3.1 lbs. without battery
Talk Time 70 mins.
Standby Time 20 hrs.
Price \$227.00
\$149 with one-year contract
\$99 with two-year contract
Price includes installation.

Motorola
MicroTAC 650e (DPC 650e)



Technology AMPS (Analog)
Weight 7 oz. with NiMH battery
Talk Time 90 mins.
Standby Time 24 hrs.
Price \$131.00
\$39 with one-year contract
\$0 with two-year contract

Motorola
Profile 300e



Technology AMPS (Analog)
Weight 7.4 oz. with NiMH battery
Talk Time 90 mins.
Standby Time 24 hrs.
Price \$115.00
\$19.95 with one year contract
\$0 with two year contract

Motorola
StarTAC 3000



Technology AMPS (Analog)
Weight 3.8 oz. with NiMH battery
Talk Time 60 mins.
Standby Time 14 hrs.
Price \$180.00
\$135 with one-year contract
\$79 with two-year contract

Nokia
Nokia 252



Technology AMPS (Analog)
Weight 6.5 oz. with NiMH battery
Talk Time 125 mins.
Standby Time 30 hrs.
Price \$150.00
\$99 with one-year contract
\$29 with two-year contract
Check stores for availability.

Nokia
Nokia 918



Technology AMPS (Analog)
Weight 6.2 oz. with NiMH battery
Talk Time 75 mins.
Standby Time 15 hrs.
Price \$130.00
\$39 with one year contract
\$0 with two year contract

SELECTED PLAN

Southwestern Bell
Start Talkin' Prepaid Wireless (analog)

Dallas/Fort Worth, TX  **Southwestern Bell**
region Wireless

- [PHONES](#)
- [COVERAGE MAP](#)
- [DEALERS](#)

Phones

Phones displayed below are featured by the plan you've chosen and are normally stocked by the carrier or authorized dealers. Click on a phone below to see details about that phone.

Compare Phones

Check up to five boxes and click Compare, or click on a phone for details.

SIDE BY SIDE

[COMPARE](#) [CLEAR](#)

Motorola
[MicroTAC 650e \(DPC 650e\)](#)



Technology [AMPS \(Analog\)](#)
 Weight [7 oz. with NiMH battery](#)
 Talk Time [90 mins.](#)
 Standby Time [24 hrs.](#)
 Price [\\$131.00](#)
[Check stores for availability.](#)

Motorola
[Profile 300e](#)



Technology [AMPS \(Analog\)](#)
 Weight [7.4 oz. with NiMH battery](#)
 Talk Time [90 mins.](#)
 Standby Time [24 hrs.](#)
 Price [\\$115.00](#)

Motorola
[StarTAC 3000](#)



Technology [AMPS \(Analog\)](#)
 Weight [3.8 oz. with NiMH battery](#)
 Talk Time [60 mins.](#)
 Standby Time [14 hrs.](#)
 Price [\\$180.00](#)

Nokia
[Nokia 252](#)



Technology [AMPS \(Analog\)](#)
 Weight [6.5 oz. with NiMH battery](#)
 Talk Time [125 mins.](#)
 Standby Time [30 hrs.](#)
 Price [\\$150.00](#)
[Check stores for availability.](#)

Nokia
[Nokia 918](#)



Technology [AMPS \(Analog\)](#)
 Weight [6.2 oz. with NiMH battery](#)
 Talk Time [75 mins.](#)
 Standby Time [15 hrs.](#)
 Price [\\$130.00](#)