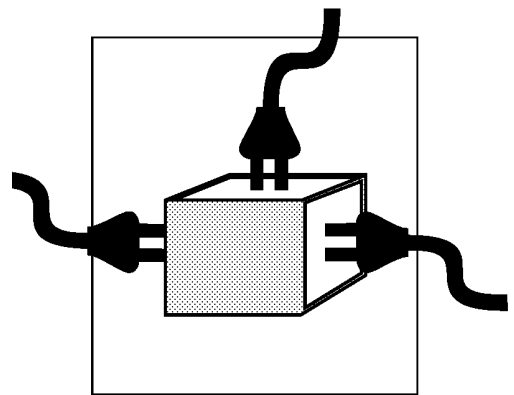


# Regulation of Interconnection 7

The nation's telecommunications industry consists of many independently operated networks. In order to create a seamless infrastructure, these networks must interconnect. The Federal Communications Commission (FCC) has long required local exchange carriers (LECs—the local telephone companies) to interconnect with cellular carriers, making it possible for cellular and wireline users to call each other. But as new wireless carriers—Personal Communications Services (PCS), Enhanced Specialized Mobile Radio (ESMR), and mobile satellite—enter the market, and as the wireless industry evolves from a niche player into a central component of the infrastructure, the interconnection rules will also have to evolve.

## FINDINGS

- **Ensuring wireless carriers fair and affordable interconnection to the public switched telephone network (PSTN) will be critical in determining what role they will play in the National Information Infrastructure (NII).** Wireless carriers pay interconnection charges for every minute of traffic they send to the LEC, and often these charges are above the cost the LEC incurs in providing interconnection. Interconnection charges are an important component of wireless carriers' cost structure. As new digital technology reduces the per-user cost of operating a wireless network, interconnection charges will assume even greater significance. Elevated interconnection charges would increase the price and reduce demand for both mobile and fixed wireless services. Interconnection charges priced too far above cost could keep mobile communication prices artificially high and stunt its potential growth. The level of interconnection charges could even determine



whether wireless carriers will be able to effectively compete in the local telephone service market, where bills have to remain affordable even if customers use their phones for hundreds of minutes per month.

Rethinking interconnection charges, however, is a complex problem. Under current law, the states have primary jurisdiction over interconnection charges and the process by which they are determined. State regulators have kept the price of wireless interconnection above cost in order to provide the LEC with additional revenues that support its universal service obligations. Before wireless interconnection charges can be reduced, policymakers would have to determine that universal service would not be affected if the contribution from wireless carriers were reduced. Alternatively, they would have to find a new mechanism to further universal service goals that did not disadvantage wireless carriers or other new competitors to the LECs.

- **To ensure that wireless systems can achieve their full potential as a mass-market service, regulators and policymakers may need to play a more active role in determining the cost of wireless carriers' interconnection to the LEC.** Congress has the option to establish guidelines for the states to follow in setting interconnection charges. Both S. 652 and H.R. 1555, the telecommunications bills currently being debated in Congress, provide a mechanism for carriers, including wireless, to ask state regulators to intervene in interconnection disputes. Congress could also expand the FCC's jurisdiction over mobile radio services by giving it more power to determine interconnection charges.

**Part of the problem in ensuring fair and affordable rates is the way in which interconnection charges are set.** In most states, the cost of interconnection is based on contracts

negotiated between the wireless carrier and the LEC. In negotiating these contracts, the LEC has considerable bargaining power because it has a near-monopoly in the provision of wireline telephone service. In addition, wireless systems depend critically on the LEC to complete the vast majority of calls made to and from wireless phones—wireless-to-wireless calls on the same system account for less than 2 percent of all wireless traffic.<sup>1</sup>

The FCC does not permit LECs to discriminate among wireless carriers in the price of interconnection or other terms of interconnection agreements. No wireless carrier should be disadvantaged because it is paying higher interconnection rates than its competitors. However, the new entrants in the wireless marketplace, especially smaller PCS carriers, fear that the established cellular carriers are more familiar with the process of negotiating interconnection agreements and will be able to obtain better terms, despite the requirement that the LECs not discriminate unreasonably.

One barrier to determining whether there has been discrimination is that not all states require that interconnection agreements be made public. It is difficult to enforce the nondiscrimination requirement without knowing the terms under which competing carriers are obtaining interconnection. **Regulators may have to require that interconnection agreements be made available for public inspection.** A public filing requirement would improve the bargaining position of new entrants by giving them access to the agreements that cellular carriers have been able to negotiate. Both S. 652 and H.R. 1555 would require that interconnection agreements between the LECs and other carriers, including wireless, be filed with state regulators and made public.

<sup>1</sup> 80 percent of all mobile calls are wireless to land line, 18 percent are land line to wireless, and 2 percent are wireless to wireless. The 2 percent, however includes wireless to wireless calls on the same system as well as to other cellular systems. Tim Rich, CTIA, personal communication, June 5, 1995.

- A key issue is whether wireless carriers should be required to provide their customers with *equal access* to long-distance services—allowing customers to choose a preferred long-distance carrier as they do now with their wireline telephone. Different rules govern wireless carriers' provision of long-distance service, depending on whether or not they are subject to equal access requirements. As a result, **some wireless carriers may be at a competitive disadvantage not only in providing long-distance services, but also in providing a wider variety of services and pricing plans.** Currently, only the wireless affiliates of AT&T and the Regional Bell Operating Companies (RBOCs) are subject to equal access rules. All other wireless carriers do not have to give their customers a choice of long-distance carrier, and are permitted to sell a bundled package of local and long-distance service. However, the FCC has recently launched a proceeding to determine if all wireless carriers should be subject to equal access rules.

**The entry of new competitors into the wireless market calls into question the need for equal access rules.** These rules were first developed in the wireline context because the LEC could use its local monopoly to also dominate the long-distance market. The cellular affiliates of the RBOCs and AT&T are subject to equal access rules in part because competition in the cellular industry was also limited, with only two carriers in each market. With the entry of ESMR and PCS carriers, however, the market power of any one wireless carrier will be substantially reduced. Both S. 652 and H.R.

1555 would allow wireless carriers to provide a weaker form of equal access than the wireline LECs.

## LEC INTERCONNECTION OBLIGATIONS

In order to guarantee that wireless users are linked to the PSTN, the FCC mandates that LECs interconnect with all wireless carriers (see box 7-1). Until recently, regulators were concerned primarily with ensuring that the right of interconnection was well defined and enforced. However, as wireless carriers become a more integral part of the NII and develop into potential competitors to the LECs, the cost of this interconnection is becoming a more central issue.

## ■ Regulation of Interconnection

The FCC began to develop the rules that govern wireless interconnection in the proceeding that created cellular telephone service.<sup>2</sup> These regulations were later clarified and strengthened in a series of rulings in the 1980s.<sup>3</sup> In 1993, Congress created the Commercial Mobile Radio Service (CMRS) regulatory classification, which brought most Specialized Mobile Radio (SMR), PCS, and mobile satellite carriers under the same regulatory umbrella as cellular.<sup>4</sup> All CMRS service providers are entitled to interconnect with the LEC on the same terms as cellular carriers.<sup>5</sup>

The FCC's policy on wireless interconnection has two main components. First, LECs must provide interconnection when it is requested by a wireless carrier.<sup>6</sup> Interconnection is critical because users of wireless services want to be able to call anyone on the PSTN; they do not want to be restricted to calling only other wireless users. A

<sup>2</sup> Federal Communications Commission, *An Inquiry Into the Use of the Bands 825-845 Mhz and 870-890 Mhz for Cellular Communications Systems*, Report and Order (Cellular Report and Order), 86 FCC 2d 469, 496 (1981).

<sup>3</sup> Federal Communications Commission, *The Need to Promote Competition and Efficient Use of Spectrum for Radio Common Carrier Services*, Memorandum Opinion and Order, 59 RR 2d 1275 (1986); Declaratory Ruling, 63 RR 2d 7 (1987); Memorandum Opinion Order on Reconsideration, 66 RR 2d 105 (1989).

<sup>4</sup> Omnibus Budget Reconciliation Act of 1993. Public Law 103-66.

<sup>5</sup> Federal Communications Commission, *Implementation of Sections 3(n) and 332 of the Communications Act*, Second Report and Order, GN Docket No. 93-252 (1994), pp. 87-88.

<sup>6</sup> Federal Communications Commission, *Cellular Report and Order*, op. cit., footnote 2.

## BOX 7-1: Interconnection to the Local Exchange Carrier

Interconnection requires a connection between the cellular carrier's switch and a nearby local exchange carrier (LEC) switch. This connection, which can be a microwave link or a high-speed digital line leased from the LEC, allows the cellular carrier to complete calls to the LEC's customers and connect calls originated in the wireline telephone network to its customers. Over time, a standard set of interconnection arrangements has evolved, designated as Type 1, Type 2A, or Type 2B, depending on the sophistication of the cellular switch and the type of LEC switch involved. These configurations are well known and described in reference documents published by Bellcore, the LECs' technical organization.

Similar interconnection arrangements will be used to connect other types of wireless services to the public switched telephone network (PSTN), including Personal Communications Service, Enhanced Specialized Mobile Radio, and satellite. Satellite networks are interconnected to the PSTN at earth stations known as gateways. User traffic is beamed down from the satellite to the earth station and routed through the satellite network's switch to the PSTN. While a cellular network may have several switches that are interconnected to the PSTN, there may only be a single earth station that handles all of the traffic from the satellite.

Interconnection also requires that the LEC provide wireless carriers with blocks of telephone numbers that they can assign to their customers. Wireless carriers are part of the PSTN's numbering plan, and, in each area code, the LEC is the code *administrator*, responsible for assigning numbers. Cellular numbers have the same 10 digit format as landline numbers, and, in most cases, they have the same area code as a landline number in the same region. When cellular numbers are assigned, the LEC programs its switches to recognize that calls to these numbers are to be routed to the wireless carrier.

SOURCE: Office of Technology Assessment, 1995

connection to the PSTN is necessary for wireless carriers to attract customers and survive in the marketplace. If the LECs, who have a near-monopoly in the provision of wireline telephone service, were able to withhold interconnection, wireless carriers would have no other way of connecting calls to wireline users and would likely go out of business.

The second part of the FCC's policy on wireless interconnection requires the LECs to provide independent wireless carriers with interconnection of the same quality and cost as they provide to their own wireless affiliates.<sup>7</sup> In order to police this requirement, the FCC requires structural separation of most LECs' wireline and cellular operations.<sup>8</sup> While the FCC recognized that there were

potential economies of scope in greater integration of the LECs' wireless and wireline operations, it also believed that integration could give the LECs' wireless affiliates an unfair competitive advantage. As a result, the LECs have to build their cellular networks independently of the wireline network, as would any other carrier. LEC and independent cellular carriers have similar interconnection requirements, making it easier to determine if the LEC is discriminating against the competing cellular carrier.

### *The Cost of Interconnection*

Wireless carriers are required to pay the LECs for interconnection.<sup>9</sup> The interconnection charges are

<sup>7</sup> Ibid.

<sup>8</sup> Ibid., p. 495.

<sup>9</sup> Charles H. Kennedy, *An Introduction to U.S. Telecommunications Law* (Norwood, MA: Artech House, 1994), pp. 44-46.

intended in part to cover the costs the LEC incurs in handling its part of the call. The most important charge is a per-minute fee paid by the wireless carrier for every call completed by the LEC. Typically, this charge is about three or four cents per minute, but it can be over 10 cents per minute, depending on the state, the duration of the call, and the distance of the call. In addition to the per-minute charge, the wireless carrier usually pays the LEC for a leased line between its switch and the LEC's switch. To minimize the cost of this leased line, some wireless carriers locate their switch across the street from a LEC central office or at another nearby location.

Currently, the states have primary jurisdiction over the cost of interconnection.<sup>10</sup> The FCC can only step in if the cost of interconnection is so high as to make wireless service prohibitively expensive.<sup>11</sup> As a result, the interconnection charges vary from state to state. In addition, the means by which states exercise their jurisdiction over interconnection charges differ.<sup>12</sup> In some states, such as New York and Florida, interconnection charges are specified by a tariff, a schedule of rates approved by state regulators. In most states, however, there is no formal tariff; instead, wireless companies and LECs negotiate an agreement with little or no involvement by state regulators. Some states require that these negotiated agreements be filed with state regulators, while others do not. Some states then make the agreement public, while others do not.

Regardless of whether interconnection charges are tariffed or negotiated, state regulators have generally allowed the LECs to impose intercon-

nection charges that are above the cost they incur in handling their part of the call. Moreover, the compensation arrangements are usually one-way: wireless carriers compensate LECs for completing their calls, while the reverse is not true. Above-cost interconnection charges and unbalanced compensation arrangements reflect the fact that most state regulators view interconnection charges as a way to transfer revenues from a premium niche market service to the LEC in order to subsidize residential telephone rates and support universal service goals.<sup>13</sup>

### *Interconnection to Long-distance Carriers*

Wireless users want to be able to make and receive long-distance as well as local calls. Since the breakup of the Bell System in 1984, the LECs have been restricted to providing local service within geographic regions known as Local Access and Transport Areas (LATAs). Calls that cross a LATA boundary are considered long distance and must be handled by a long-distance carrier. In most cases, a wireless carrier first hands long-distance calls to the LEC, which in turn hands them to a long-distance carrier. Interconnection to the LEC is all that is needed for wireless users to be able to place calls to any telephone user across the nation.

However, in recent years, long-distance carriers have begun to connect directly to wireless networks, bypassing the LEC (see box 7-2).<sup>14</sup> Direct connections permit long-distance carriers to avoid paying *access charges* to the LEC. Access charges are essentially interconnection charges paid by

<sup>10</sup> The Communications Act of 1934 has been interpreted to require that regulators allocate the costs of providing telecommunications services among interstate and intrastate jurisdictions. The states, therefore, regulate the price of interconnection for intrastate calls, while the FCC regulates the price of interconnection for interstate calls. Because most calls from wireless phones are intrastate, the states are largely responsible for determining the interconnection costs of wireless carriers.

<sup>11</sup> Federal Communications Commission, Declaratory Ruling, *op. cit.*, footnote 3, p. 15.

<sup>12</sup> Harry E. Young, *Wireless Basics* (Chicago, IL: Intertec, 1992), p. 90.

<sup>13</sup> Kennedy, *op. cit.*, footnote 9, p. 46.

<sup>14</sup> For example, in the Washington, DC market, both MCI and AT&T have direct connections to the Southwestern Bell Mobile Systems (Cellular One) network.

## BOX 7-2: Interconnection to Long-Distance Carriers

In most cases, wireless carriers hand off both local and long-distance calls to the local exchange carrier (LEC). The LEC then routes the long distance calls to a long-distance carrier (see figure 7-1). Increasingly, however, long-distance carriers are connecting directly to wireless carriers. The wireless carrier only routes local calls to the LEC, while long-distance calls are routed directly to a long-distance carrier (see figure 7-2). Although the link between the wireless network and the long-distance network is usually leased from the LEC, the LEC provides only simple transport and is not involved in setting up the call. In a few cities, long-distance carriers have bypassed the LEC entirely, using leased lines provided by new competitors to the LECs, called Competitive Access Providers.

FIGURE 7-1: Connection to Long-Distance Carrier Through Local Exchange Carrier

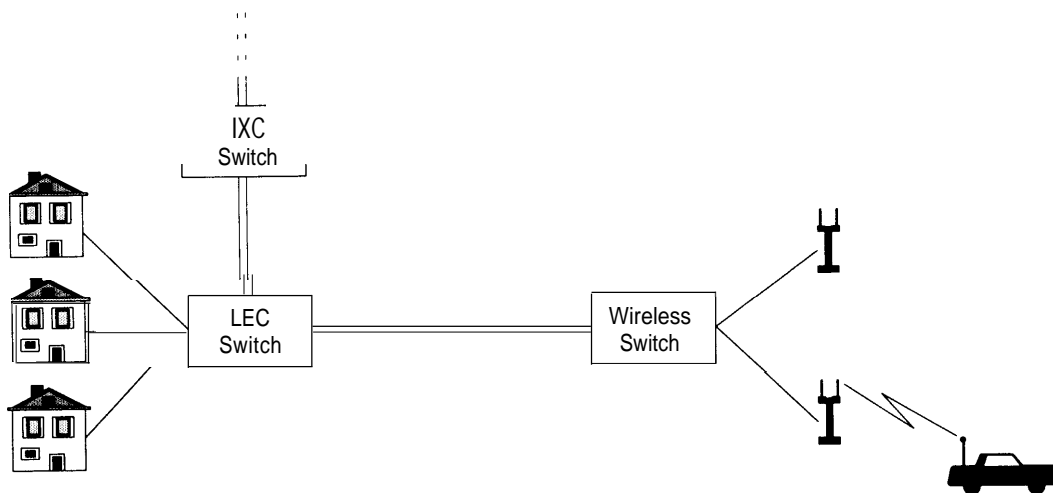
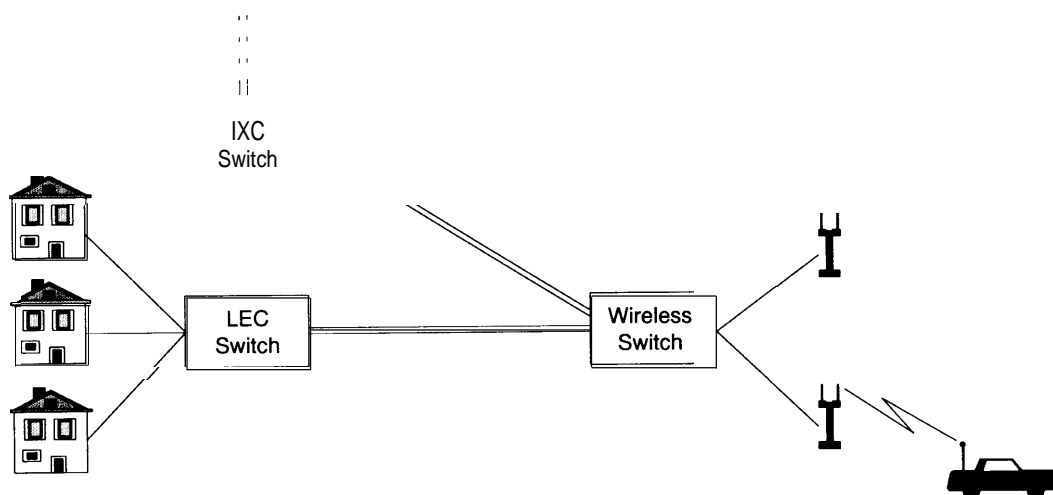


FIGURE 7-2: Direct Connection to Long-Distance Carrier



SOURCE: Office of Technology Assessment, 1995.

long-distance carriers whenever they receive traffic from a LEC, even when the calls originate on a wireless network. Long-distance carriers can avoid the access charges if they connect directly to the wireless carrier. In some cases, long-distance carriers pass on the access charge savings to wireless customers in the form of discounted long-distance calling.

Avoiding access charges, which can account for 40 to 50 percent of the cost of a long-distance call, is one reason for the recent interest shown by long-distance carriers in wireless communications. If the long-distance carriers can reach their customers without going through the LEC, they can cut access costs or put pressure on LECs to reduce the rates. However, these efforts raise questions about both the structure of local telephone rates and universal service. The access charge system was designed as a way to continue the Bell System's revenue transfer from long-distance to local service in the post-divestiture environment. If more long-distance carriers connect directly to wireless carriers—reducing the LECs' access charge revenue—they may undercut the system of subsidies that supports universal service.

## ■ Wireless/Wireline Interconnection Issues

Current rules for wireless interconnection focus on ensuring that wireless carriers are able to interconnect to the LEC. Now, however, existing and, especially, new wireless carriers are becoming concerned about the terms of interconnection agreements. First, new wireless entrants are worried that the present practice of negotiated interconnection agreements makes it possible for the LECs to discriminate among wireless carriers.<sup>15</sup> Second, as wireless technology becomes more efficient, interconnection charges will become a more significant fraction of wireless carriers'

overall cost structure. There may have to be reductions in interconnection charges if wireless carriers are to provide a mass market service or compete with the LEC in the market for local exchange service.

### *Nondiscriminatory Interconnection*

In most states, interconnection charges are determined through negotiations between the LEC and the wireless carrier. In the early years of cellular service, several cellular carriers complained that the LECs were not negotiating in good faith or had not granted them the type of interconnection they requested.<sup>16</sup> However, in recent years the number of disputes has declined substantially. This may be due, in part, to the fact that the interconnection rules have been clarified by the FCC and are now well established. It may also be due to the fact that, in most markets, the second cellular carrier is no longer a small independent company, but is often part of a large company that is better equipped to negotiate with the LEC.

The cellular carriers have stated that they are generally satisfied with the current system of negotiated interconnection. However, many of the new PCS entrants are concerned that, despite the requirement that the LECs not discriminate, the established cellular carriers can obtain better terms because they are more familiar with the negotiation process.<sup>17</sup> The main problem for new entrants is that the agreements between the LECs and the cellular carriers are not made public in all states. It is difficult to enforce the nondiscrimination requirement without knowing the terms under which competing wireless carriers are obtaining interconnection.

One way to guarantee that all carriers obtain interconnection on the same terms is to require the filing of interconnection tariffs, as is done in New York and Florida. This protects new market en-

<sup>15</sup> See discussion in Federal Communications Commission, *Equal Access and Interconnection Obligations Pertaining to Commercial Mobile Radio Services (Equal Access NPRM)*, Notice of Proposed Rule Making and Notice of Inquiry, CC Docket No. 94-54 (1994), pp. 46-47.

<sup>16</sup> U.S. Department of Justice, Antitrust Division, *The Geodesic Network* (Washington, DC: 1987), p. 4.13.

<sup>17</sup> Federal Communications Commission, *Equal Access NPRM*, op. cit., footnote 15, p. 50.

trants unfamiliar with the interconnection negotiation process because all competitors have to obtain interconnection at the tariffed rate. The argument against tariffing is that it may not allow sufficient flexibility in the terms of interconnection. Moreover, the tariffing process can cause considerable delay before a new service can be offered by the LEC. Another option is to continue the present system of negotiated contracts, but require that the contracts be made available for public inspection.

Under current law, the FCC has limited ability to require states to use tariffs or require that contracts be made public. This is based on the division of jurisdiction in the 1934 Communications Act, which gives states primary jurisdiction over intrastate charges. If Congress decided that entry of new wireless providers would be facilitated by tariffing or public filing of the terms of interconnection agreements, it could provide guidelines on this issue. A public filing requirement that applies to LEC interconnection with all carriers, including wireless, is included in both S. 652 and H.R. 1555, the telecommunications bills currently being debated in Congress.

### ***Local Exchange Competition***

The cost of providing service, and the prices that wireless carriers charge, will significantly affect the role wireless technologies can play in the NII—whether they will remain providers of a relatively high-cost niche service (mobile communications) or whether they can broaden their appeal to compete in the market for local telecommunications services. The high cost of today's cellular service—and the correspondingly high prices charged to consumers—is primarily the result of inefficient analog technology. Increasing numbers of customers have been willing to pay these prices because of the value being placed on mobile communications.

New digital technology, however, will allow wireless networks to serve many more users at a lower cost per user (see chapter 3). As this happens, interconnection charges will become a larger fraction of the wireless carriers' overall cost structure and a more important determinant of the prices carriers can charge. The lower the interconnection charges, the lower the price at which wireless carriers will be able to provide service. The level of interconnection charges could even determine whether wireless carriers are limited to serving the mobile telephone market, for which consumers are willing to pay a higher price, or are also able to compete in the local exchange market. The cable companies, and others who view wireless local loop technologies as a way to compete in the local telephone services market, are arguing most strongly for reduced interconnection charges.

It is likely that some form of regulatory intervention would be required to reduce interconnection charges. Under the present system of negotiated interconnection agreements, wireless carriers could only obtain more favorable terms if they had equal bargaining strength. For the foreseeable future, however, wireless carriers will continue to be much more dependent on the LEC than the reverse.<sup>18</sup> Very few calls from LEC customers are to wireless users, while almost all wireless calls are to users of the landline network. Because of this imbalance, the LEC would have an incentive to maintain high interconnection charges even if wireless carriers were allowed to charge the LEC for completing calls.

As a result, regulators who want to bring interconnection charges down are faced with two difficult tasks. First, they may need to determine how much it costs the LEC to provide interconnection—a notoriously difficult task. Prices could then be set accordingly, allowing the LEC a reasonable margin of profit. Second, however, regu-

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<sup>18</sup> For more discussion of this issue, see Rob Frieden, "Wireline vs. Wireless: Can Network Parity Be Reached?" *Satellite Communications*, July 1994, p. 20.



lators and policymakers must also determine the extent to which interconnection charges should continue to subsidize universal service. As the telecommunications industry has evolved from a single monopoly carrier into one with many participants, above-cost interconnection charges have been used to provide the LECs with revenues that subsidize local residential service. To reduce interconnection charges, regulators may need to find alternative funding sources to make up for the drop in revenues. The most common proposal for replacing interconnection charges as a source of subsidies is to create an expanded Universal Service Fund to which all carriers would contribute, and from which eligible carriers could withdraw funds to help them provide service.<sup>19</sup>

Regulators trying to encourage competition in the local telephone market will also have to determine whether to designate wireless carriers as *co-carriers* with the LEC. Today, although cellular carriers must pay the LEC to have wireless calls delivered to PSTN users, the reverse is not true—the LEC usually does not pay cellular carriers for completing calls that come from the PSTN. The FCC has stated several times that cellular carriers should be compensated for completing calls from the LEC, but most state regulators have chosen not to follow this recommendation.<sup>20</sup> In order to redress this imbalance, wireless carriers are petitioning states to be formally recognized as co-carriers. Co-carriage involves *mutual compensation*, in which each carrier compensates the other for calls completed. Today, most LECs only recognize other LECs, such as those with neighboring service areas, as co-carriers. Co-carrier status

would give wireless carriers greater bargaining power in negotiating with the LECs.

Another issue that potentially could affect the ability of wireless carriers to compete in local telecommunications markets involves the assignment of telephone numbers. While there has been longstanding concern on the part of cellular carriers that the LEC manages numbers in a way that disadvantages them, the issue is attracting more attention as existing area codes start to run out of numbers. When this happened in the past, area code regions were *split*, assigning part of the old area to a new number. But in recent years, LECs have proposed relieving the pressure for numbers by creating *overlay* area codes just for wireless carriers. Wireless carriers have argued that assigning different area codes to the LEC's potential (wireless) competitors could lead to discrimination in how different carriers (and their customers) are treated by the LEC.<sup>21</sup> The FCC has recently launched a proceeding to examine numbering issues in detail.<sup>22</sup>

In most respects, the interconnection issues that concern wireless operators are similar to those that concern new wireline competitors in the market for local telecommunications services. The primary difference is that wireless carriers have long had the right of interconnection, while state regulators have only recently begun to certify competitive local wireline carriers and grant them the interconnection rights they need to enter the market.<sup>23</sup> Regulators granted wireless carriers the right of interconnection more readily because they were seen as serving a separate, niche market (mo-

<sup>19</sup> The current version of S. 652, for example, specifies that only carriers designated as “essential telecommunications carriers” can withdraw from the fund. Section 104.

<sup>20</sup> Kennedy, *op. cit.*, footnote 9, p. 44.

<sup>21</sup> See, for example, *Reply Comments of the Personal Communications Industry Association*, before the Federal Communications Commission, CC Docket No. 92-237, June 30, 1994, pp. 1-5.

<sup>22</sup> Federal Communications Commission, *Administration of the North American Numbering Plan*, Notice of Inquiry, 7 FCC Rcd 6837 (1992).

<sup>23</sup> See, for example, Richard L. Cimerman and Geoffrey J. Waldau, “Local Exchange Competition: Alternative Models in Maryland,” in *Proceedings of the 22nd Annual Telecommunications Policy Research Conference*, Solomons, Maryland, Oct. 1-3, 1994, p. 221.

bile telephony) that did not threaten the local monopoly.

Under current law, the level of interconnection charges is primarily a state responsibility. Congress may choose to give more guidance to the states on the terms under which interconnection has to be provided. For example, both S. 652 and H.R. 1555, the telecommunications bills currently being debated in Congress, would require the LECs to treat all other carriers as co-carriers. In addition, if Congress determined that state regulation of interconnection charges was slowing the development of the wireless communications industry, it could either give the FCC a greater role or preempt the states entirely. However, a reduction in interconnection charges is likely to require coordinated action on the part of both state and federal regulators because these charges are entangled in the larger question of universal service subsidies.

## INTERCONNECTION OBLIGATIONS OF WIRELESS CARRIERS

The question of whether a carrier should be obliged to interconnect with other carriers has been one of the constant themes of telecommunications policy debates over the past two decades.<sup>24</sup> Today, only the LECs have interconnection obligations. As a result of their control of the bottleneck local exchange, they are required to interconnect with long-distance carriers and with wireless carriers. A key issue is whether wireless carriers should have interconnection obligations of their own. In 1994, the FCC began examining whether some or all wireless carriers have sufficient market power to justify the imposition of interconnection obligations, or if, on a more fundamental level, interconnection obligations are

required of all carriers in order to hold today's more fragmented and competitive "network of networks" together.<sup>25</sup> The interconnection obligations of wireless carriers are also being debated in Congress.

## ■ Interconnection with Long-Distance Carriers: *Equal Access*

As a result of the breakup of the Bell System in 1984, the relationship between wireline local and long-distance service providers changed. Current rules require LECs to provide "equal access" to all long-distance carriers—allowing wireline users to choose a preferred company to carry their long-distance calls. LATA boundaries define the limits of local service—whenever a call crosses a LATA boundary, it must be handed off by the LEC to the user's chosen long-distance carrier. The equal access rules were first applied by the Modified Final Judgment (MFJ) to the RBOCs after the breakup of the Bell System, and later extended by the FCC to apply to all other LECs.<sup>26</sup>

There are no FCC rules that require *wireless* carriers to provide equal access. However, the wireless affiliates of AT&T and the RBOCs are subject to consent decrees that require them to provide equal access, regardless of the fact that they are not required to do so under FCC rules. The restrictions on the RBOCs' cellular affiliates were imposed by the court that oversees the MFJ. The restrictions on AT&T were imposed as part of the settlement to an antitrust action brought by the Department of Justice (DOJ) when AT&T acquired McCaw.<sup>27</sup> Wireless carriers not subject to these consent decrees, such as GTE and Sprint, are not required to allow their customers a choice of long-distance carriers.

<sup>24</sup> See, for example, Gerald W. Brock, *Telecommunication Policy for the Information Age* (Cambridge, MA: Harvard University Press, 1994).

<sup>25</sup> Federal Communications Commission, *Equal Access NPRM*, op. cit., footnote 15.

<sup>26</sup> *Ibid.*, pp. 6-7.

<sup>27</sup> U.S. Department of Justice, "Proposed Final Judgment and Competitive Impact Statement; United States of America v. AT&T Corp. and McCaw Cellular Communications, Inc.," notice, Federal Register 59 (165): 44158, Aug. 26, 1994.

Over time, more cellular systems have been converted to equal access. At first, all of the independent, or *A-side*, cellular carriers were free of the equal access restrictions, as were the *B-side* affiliates of GTE and other non-RBOC LECs. But in recent years, the RBOCs have begun buying *A-side* systems outside their home region. In Washington, DC, for example, the *A-side* system is controlled by an RBOC cellular affiliate. The court that oversees the MFJ has ruled that these out-of-region systems must also be converted to equal access. More recently, systems operated by the largest *A-side* carrier, McCaw, were required to convert to equal access after McCaw was acquired by AT&T. It has been estimated that over 60 percent of cellular customers are now served by equal access carriers.<sup>28</sup>

### ***Implications of Equal Access Restrictions***

The nature of the equal access restrictions imposed on a wireless carrier affects several aspects of its operations, including service packaging and system design and construction.

#### **Bundled local and long-distance service**

Unlike the wireless affiliates of the RBOCs and AT&T, carriers not subject to equal access rules do not have to give their customers a choice of long-distance carrier. They can even set up their own long-distance operation and funnel all of their customers' traffic to it, selling their customers a bundled package of local and long-distance service. Few wireless carriers have extensive long-distance networks of their own, but most resell long-distance service purchased at "wholesale" rates from one of the long-distance carriers.

Carriers that are allowed to sell bundled packages of local and long-distance service can market their services very differently from equal access carriers. They have the flexibility to create expanded "local" calling areas, much larger than a

LATA, because they do not have to distinguish between intra- and interLATA calls.<sup>29</sup> They are able to incorporate the cost of the interLATA part of the call into the basic airtime charge, which applies to all calls within the larger calling area. Some carriers have even eliminated the concept of "long distance" entirely, offering calls to any location in the nation as part of the basic airtime charge.

On the other hand, equal access rules prevent the wireless affiliates of AT&T and the RBOCs from automatically funneling their wireless customers' traffic to their own long-distance operation. They must give their customers a choice of long-distance carrier. For many years, the RBOCs' cellular affiliates were, like their wireline telephone companies, prohibited from providing long-distance service at all. However, the court that oversees the MFJ recently approved a waiver request that allows the RBOCs' cellular affiliates to resell long-distance service, as long as they provide equal access and comply with several other restrictions. Both S. 652 and H.R. 1555 would codify and somewhat liberalize this exemption.

In general, the wireless affiliates of AT&T and the RBOCs may not offer wide-area "local" calling because the equal access rules require them to hand off interLATA calls to the customer's chosen long-distance carrier. However, there are several exceptions to this rule. The court that oversees the MFJ has often waived the equal access rules when it found that a "community of interest" crossed a LATA boundary and the RBOC's competitor was able to offer regional calling. The DOJ exempted AT&T from complying with equal access rules in those areas where the RBOCs are exempt, and also grandfathered 19 other systems operated by McCaw that crossed a LATA boundary.

The nature of the equal access restrictions under which a wireless carrier operates affects the configuration of the interconnection between it

<sup>28</sup> McCaw Cellular Communications, comments before the Federal Communications Commission, *Equal Access NPRM*, op. cit., footnote 15, p. 34.

<sup>29</sup> RBOCs can offer similar larger calling areas, but must get a waiver from the court to do so.

and a long-distance carrier. Long-distance carriers, if selected to provide wholesale long-distance service to a non-equal access carrier, nearly always arrange for a direct connection to the wireless carrier's switch. The volume of traffic is usually high enough to justify the cost of the leased line, especially when the savings on access charges are taken into account. When connecting to an equal-access carrier, on the other hand, long-distance carriers are more likely to connect through the LEC. Because the long-distance traffic is divided among several long-distance carriers, the volume of traffic is often insufficient to justify a direct link.

#### **Impact of equal access on wireless system design**

Equal access restrictions bring with them the requirement that wireless networks be designed to operate within LATA boundaries.<sup>30</sup> For example, they prevent a wireless carrier from connecting its switch to a cell site in a different LATA. Equal access rules would require that this link be open to competition from other providers of interLATA service. Because it is not technically feasible to design a wireless network in such a way that these internal operations are open to competition, wireless networks have to be contained within the LATA boundary. Non-equal access systems, on the other hand, can gain efficiencies by integrating functions across a wider area that includes several LATAs.

Because LATA boundaries were drawn with the landline network in mind, it has often been difficult to design wireless networks in a way that conforms to the LATA boundaries. One problem was that the FCC drew its cellular licensing map without regard to LATA boundaries. In many cases, cellular licensing areas include parts of more than one LATA, preventing an equal access carrier from serving the entire licensing area from a

single switch, which may be the most efficient configuration. The court that oversees the MFJ has, on several occasions, granted waivers that permit the RBOCs to build networks that cross a LATA boundary.<sup>31</sup>

In addition, LATA boundaries and equal access have not been easily reconciled with the requirements of a mobile service. It is possible, for example, that a call will change from local to long-distance in mid-call if a user drives across a LATA boundary. Because it is technically impossible to transfer the call to the user's chosen long-distance carrier during this *intersystem hand-off*, the MFJ court has granted a waiver that permits RBOC wireless affiliates to continue these calls.

Finally, there may be significant advantages in network construction and operation, as well as other economies of scope, that may not be possible with continued segmentation of local and long-distance services. The cellular industry argues that users value large local calling areas. In addition, if a cellular carrier is reselling long-distance service, it can buy service at bulk rates that are cheaper than the retail rates that most individual users could obtain on their own. This has particular implications for satellite providers because it is likely that a call made by a mobile satellite system user will be headed outside the LATA in which the gateway is located. For this reason, satellite carriers intend to purchase long-distance service in bulk and then bundle it with their usage charges at a flat per-minute rate, regardless of the destination of the call.

#### ***Proposed Changes to Wireless Equal Access Restrictions***

In 1994, the FCC proposed requiring all cellular carriers to observe the equal access rules. In part, this proposal was intended to ensure that all companies in a competitive industry are subject to the same rules.<sup>32</sup> The FCC does not currently have the

<sup>30</sup> Kennedy, op. cit., footnote 9, pp. 102-108.

<sup>31</sup> Kennedy, op. cit., footnote 9, p. 106.

<sup>32</sup> Federal Communications Commission, *Equal Access NPRM*, op. cit., footnote 15, p. 20.

power to ensure competitive parity by removing the equal access restrictions from AT&T or the RBOCs because these conditions are a consequence of antitrust law and can only be modified by the courts or Congress. The FCC is only able to ensure competitive parity by imposing the equal access restrictions on the remaining wireless carriers. While preferring that competitive parity be achieved by removing their restrictions, the RBOCs supported this effort. The FCC has not yet acted on its equal access proposal.

Because of the problems associated with applying LATA boundaries to a mobile service, the FCC suggested that the larger Major Trading Areas (MTAs) be used instead of LATAs to distinguish between local and long-distance calls.<sup>33</sup> Long-distance carriers have opposed this proposal because it would reduce the amount of traffic considered to be long distance. The use of MTAs would also create competitive parity issues because the RBOCs' wireless affiliates would still be required to observe LATA boundaries, unless Congress or the courts altered the terms of the MFJ.

Wireless equal access has been an issue in recent congressional debates on revising the nation's telecommunications laws. Both S. 652 and H.R. 1555 would supersede the consent decree provisions that impose equal access restrictions on the wireless affiliates of AT&T and the RBOCs. Both bills would also require wireless carriers to allow their customers to reach all long-distance carriers. However, carriers could require their users to dial five-digit access codes to reach most long-distance carriers,<sup>34</sup> while reserving the more convenient "1+" access for calls routed through their own long-distance network. In the past, equal access has meant giving users the ability to *presubscribe* to their choice of 1+ carrier, as

they are able to do with their wireline telephone service.

In discussions concerning equal access rules, the key issue is whether wireless carriers have the ability to restrict competition in the market for long-distance service. Equal access rules were imposed on wireline LECs because their control over the local exchange *bottleneck* allowed them to also dominate the long-distance market. Wireless carriers, by contrast, do not control a bottleneck. The market for wireless communications has always been capable of supporting competition and has never been viewed as a natural monopoly. If there were several competing wireless carriers, there would be competition in wireless long distance even if each carrier did not offer a choice of other long-distance carriers.

To the extent that competition in the market for mobile telephone service is limited, it is because the FCC initially licensed only two cellular carriers. The DOJ imposed equal access restrictions on AT&T's cellular operations because it believed that AT&T would have sufficient market power, as one of only two cellular carriers in a market, to reduce competition in the market for cellular long-distance service.<sup>35</sup> The DOJ also required rigorous equal access restrictions as a condition of RBOC entry into the cellular long-distance market. Proponents of extending the equal access rules have pointed to the DOJ's actions to argue that these safeguards are required. However, the market for local mobile telephone services is about to become significantly more competitive with the entry of an ESMR carrier and three to six PCS carriers.

### Conflicting Models

Although economic arguments may indicate that equal access requirements should not be imposed on wireless carriers, the sale of integrated local

<sup>33</sup> Ibid., p. 32.

<sup>34</sup> This is similar to the procedure by which users access long-distance carriers other than the one to which a payphone is presubscribed. The codes are of the form "10XXX," where the last three digits denote the carrier.

<sup>35</sup> U.S. Department of Justice, op. cit., footnote 27, at 44169.

and long-distance wireless service would be at odds with the telecommunications industry model that has been established over the past decade for the much larger wireline market. From a functional perspective, wireless can be used to provide access to a long-distance network in much the same manner as a wireline local exchange network. There is considerable pressure to structure the market so that long-distance carriers can sell service to wireless users in the same way that they sell to wireline users.

Without equal access, long-distance carriers cannot sell their service directly to end users, as in the wireline model. Instead, they have sell to the wireless carriers, who then resell the long-distance service to their customers as part of a bundled package. From the long-distance carriers' perspective, it is difficult to market services that can be used with both wireless and wireline access because there is no guarantee that their services would be accessible from all wireless carriers. In particular, *virtual private networks* that include volume discounts and custom features cannot necessarily be accessed from a corporate customer's chosen cellular carrier.

As the amount of wireless traffic grows, the conflict between the two models of the telecommunications industry could become more significant. Long-distance carriers have been the main supporters of the FCC's equal access proposal, preferring to sell directly to end users rather than ceding control over the packaging of services to the networks that originate the call. However, both AT&T and Sprint have acquired wireless interests of their own and may have an interest in permitting a greater degree of bundling. Long-distance carriers that have wireless access networks of their own would have a competitive advantage over long-distance carriers that do not.

Aside from economic considerations, another set of arguments in favor of equal access relies on

the general NII concept of a network of networks. According to this argument, the future telecommunications infrastructure will be made up of many different networks, and users should be able to choose their telecommunications services from many different providers, mixing and matching as needed. They should not have to switch wireless carriers in order to change their long-distance service, for example. For this to be possible, all networks would have to interconnect, regardless of market power.

### ■ Interconnection of Wireless Carriers

Today, calls between customers of different wireless carriers are almost always routed through the local exchange network. Because the LEC is required to interconnect with all wireless carriers, it provides a common link between them. However, in the same way that a wireless carrier can circumvent the LEC and connect directly to a long-distance carrier, it can also choose to connect directly to another wireless carrier. This configuration avoids the interconnection charges that would have to be paid if the traffic were routed through the LEC. Direct connections are used only rarely, however because the volume of wireless to wireless traffic is usually too small to justify the cost of the leased line.

In 1994, the FCC proposed that wireless carriers be required to interconnect with other wireless carriers. Most wireless carriers opposed this proposal, arguing that interconnection through the LEC was sufficient to guarantee connectivity. They also pointed to the fact that there are relatively few direct connections between wireless carriers today. Others, however, argued that the amount of wireless to wireless traffic will soon increase, and that clear rules should be established now. In part, the FCC appeared to be concerned that purely voluntary interconnection arrangements would lead to a lack of connectivity or inef-

ficiencies in network design.<sup>36</sup> After studying the issue, however, the Commission tentatively concluded that it would be premature to require wireless carriers to interconnect with other wireless carriers.<sup>37</sup>

A related question is whether roaming agreements (see chapter 3) should continue to be voluntary or if wireless carriers should be required to negotiate them. Today, it is in the interest of cellular carriers to negotiate roaming agreements with each other because all carriers benefit from being able to advertise wide area service and from the increased use of their systems. The cellular industry also voluntarily negotiated roaming agreements with a new provider of mobile satellite services, American Mobile Satellite Corp. (AMSC) allowing calls to be forwarded to users through AMSC's satellite network when they are outside cellular coverage areas (see chapter 3).

However, new wireless entrants have expressed concern that the incumbent cellular carriers will choose not to negotiate roaming agreements with them. Until there are PCS networks throughout the nation, new PCS providers might want to offer their customers a *dual-mode* phone that would use PCS-band service in their home market and cellular service when roaming. But it might be in the cellular industry's interest to refuse to negotiate roaming agreements, limiting their new competitors to isolated islands of service that could not compete with nationwide cellular roaming.

The location information that wireless carriers collect to facilitate roaming is also becoming in-

creasingly valuable to other wireless and wireline carriers. There are many possible services that can be offered based on knowledge of a user's current location. For example, if LECs and long-distance carriers had access to cellular carriers' location information, they could deliver calls more efficiently and less expensively to roamers. Today, if a user is visiting another city and someone in that city wants to call them, the call is first sent to the user's home cellular system—incurring a long-distance charge to the caller. The cellular carrier determines that the user is roaming and then sends the call back to the LEC in the same city it came from—incurring a long-distance charge for the cellular subscriber. Thus, even if the two individuals are literally in the same building, the call must travel to the cellular user's home system and back again—turning an inexpensive call into a very expensive one. Ideally, local telephone companies and cellular companies could share information about roamers that would allow the visited LEC to deliver the call directly to the visited cellular carrier—eliminating all the unnecessary long-distance transfers and charges. In comments on the FCC's interconnection proceeding, a major interexchange carrier argued that it should be guaranteed access to information about its customers in the cellular industry's location databases.<sup>38</sup> The cellular industry believes that location information is proprietary and that it should not be required to share the information with other carriers.<sup>39</sup>

<sup>36</sup> "We ask commenters to focus on whether interconnection requirements would advance competition and encourage efficiencies and lower rates in the mobile services marketplace. We do not wish to encourage a situation where most traffic from one CMRS service subscriber must pass through a LEC switch for its traffic to reach a subscriber to another CMRS service, if such routing would be inefficient or unduly costly." Federal Communications Commission, *Equal Access NPRM*, op. cit., footnote 15, p. 54.

<sup>37</sup> Federal Communications Commission, *Interconnection and Resale Obligations Pertaining to Commercial Mobile Radio Services*, Second Notice of Proposed Rule Making, CC Docket No. 94-54, April 20, 1995.

<sup>38</sup> Federal Communications Commission, *Equal Access NPRM*, op. cit., footnote 15, p. 58.

<sup>39</sup> Ibid.