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Mobile broadband internet access service is a commercial mobile service, and hence must be regulated as a common carrier service

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MOBILE BROADBAND INTERNET ACCESS SERVICE IS A COMMERCIAL MOBILE SERVICE, AND HENCE MUST BE REGULATED AS A COMMON CARRIER SERVICE

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Abstract

The FCC's recent *Restoring Internet Freedom Order* reclassified mobile broadband Internet access service from a *commercial mobile radio service* to a *private mobile radio service*. The result of this reclassification is to eliminate Title II common carrier regulation of mobile broadband Internet access service. In turn, elimination of common carrier regulation was used by the FCC to repeal most of the net neutrality protections on mobile broadband service.

The reclassification results in an incredible assertion: that the most important public mobile service of our time is classified under statute as a *private mobile service*. This paper asks: what led the expert agency to conclude that the public Internet is *not* part of the *public* switched network, and that mobile broadband Internet access service is a *private* mobile service?

The *Order* asserts that its reclassification is justified as a reinterpretation of relevant statute, and is bolstered by its reinterpretation of relevant precedent from Congress and the FCC. However, the *Order* is very limited in its consideration of precedent, and its discussion and understanding of the relevant technology is almost nonexistent.

In this paper, we first analyze the relevant precedent from Congress, the FCC, and the courts from the 1940s through 2017. We then analyze the reclassification of mobile broadband Internet access service in the *Order*.

We find that the *Restoring Internet Freedom Order's* lack of consideration of the relevant precedent and technology from the 1940s through the 1980s undermines its interpretation of the 1993 statute on which it relies. We further find that proper consideration of precedent and technology would lead to the opposite conclusion. In particular, we find that the *Order's* reversion to the 1994 definitions of *public switched network* and *interconnected service* ignores the growth of the public switched network to include the Internet, and is thereby contrary to both statute and precedent. We also find that the *Order's* conclusion that the public switched telephone network and the Internet are separate non-interconnected networks is factually wrong, on the basis of PSTN and Internet architecture. Critically, we find that the *Order's* justification for reclassification ignores the fact that in order for meaningful communication to occur, the users' devices and subscribed services must be compatible. This fact, which has formed the basis for many decades of statute and precedent, undermines the *Order's* statutory interpretation.

Finally, we find that a proper interpretation of relevant statute and precedent leads to the opposite conclusion of the *Order*, and that mobile broadband Internet access service is a commercial mobile service. Consequently, we find that statute mandates that mobile broadband Internet access service be classified as a commercial mobile service and regulated as a common carrier service. This finding lays the foundation for reinstatement of net neutrality protections on mobile broadband service.

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1. INTRODUCTION

In December 2017, in the *Restoring Internet Freedom Order* the Federal Communications Commission (FCC) reclassified mobile broadband Internet access service from a *commercial mobile radio service* to a *private mobile radio service*.[1] The result of this reclassification is to eliminate Title II common carrier regulation of mobile broadband Internet access service. In turn, elimination of common carrier regulation was used by the FCC to repeal most of the net neutrality protections on mobile broadband service.

A. The Restoring Internet Freedom Order's Examination of Statute and Precedent

The *Restoring Internet Freedom Order* asserts that its reclassification is justified as a reinterpretation of relevant statute, and is bolstered by its reinterpretation of relevant precedent from Congress and the FCC. As discussed below, the *Order* primarily looks to a limited set of relevant precedent: the relevant statute (the current version of Section 332(c) of the *Communications Act*), the FCC's 2007 classification of *wireless mobile broadband Internet access service* as a *private mobile radio service*, and the FCC's 2015 classification of *mobile broadband Internet access service* as a *commercial mobile radio service*.

Under Section 332(c), a mobile service is regulated as a common carrier service under Title II of the *Communications Act* if and only if it is classified as a *commercial mobile service*. One of the prerequisites for classification of a mobile service as a *commercial mobile radio service* is that it "make *interconnected service* available", where *interconnected service* is defined as "service that is interconnected with the public switched network (as such terms are defined by regulation by the Commission) …".[2] The FCC had first defined these terms in 1994, notably with reference to services that use networks which use telephone numbers. The FCC's *2015 Open Internet Order* redefined the term *public switched network* "to reflect

[1] *Restoring Internet Freedom*, Declaratory Ruling, Report and Order, and Order, 33 FCC Rcd 311 (2018) (*Restoring Internet Freedom Order*), Section III.B.
[2] 47 U.S.C. § 332(d).

current technology", in particular "the emergence and growth of packet switched Internet Protocol-based networks".[3] It also made a conforming change to the regulatory definition of *interconnected service*.[4]

The *Restoring Internet Freedom Order* characterizes the *2015 Open Internet Order* as having "manipulat[ed] these definitions" of *public switched network* and *interconnected service* in order to "engineer[] a conclusion that mobile broadband Internet access was interconnected with the public switched network and was an interconnected service under section 332", and hence satisfied one of the prerequisites for classification as a *commercial mobile service*.[5] The *Restoring Internet Freedom Order* then redefines *public switched network* to revert to its 1994 definition.[6] The *Order* gives two justifications for this reversal. First the *Order* asserts that the 1994 definition "was more consistent with the ordinary meaning and commonly understood definition of the term and with Commission precedent"[7] because, the *Order* asserts, *public switched network* refers only to the *public switched telephone network*.[8] Second, the *Order* asserts that the public switched telephone network and the Internet are "multiple networks whose users cannot necessarily communicate or receive communications across networks".[9] The *Restoring Internet Freedom Order* then redefines *interconnected service* to revert to its 1994 regulatory definition[10], asserting that this revision "ensures that the public switched network remains the single, integrated network that we find Congress intended."[11]

The *Restoring Internet Freedom Order* then finds that mobile broadband Internet access service "does not meet the regulatory definition of 'interconnected service' that the Commission originally adopted in 1994."[12] To justify this finding, the *Order* reiterates the finding in the 2007 *Wireless Broadband Declaratory Ruling* that "'[m]obile wireless broadband Internet access service in and of itself does not provide the capability to communicate with all users of the public switched network' because it does 'not use the North American Numbering Plan to access the Internet, which limits subscribers' ability to communicate to or receive communications from all users in the public switched network.'"[13] On this basis, the *Restoring Internet Freedom Order* reclassifies mobile broadband Internet access service as a *private mobile radio service*.

The *Restoring Internet Freedom Order* further finds that it is in the public interest to reclassify mobile broadband Internet access service as a *private mobile radio service*, because "if mobile broadband Internet access service were a commercial mobile service for purposes of section 332 and were also classified as an information service" (which the *Order* does for both fixed and mobile broadband Internet access service), "such a regulatory framework could lead to contradictory and absurd results."[14] By doing so, the *Order* eliminates Title II common carrier regulation of mobile broadband Internet access service.

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[3] *Protecting and Promoting the Open Internet*, Report and Order on Remand, Declaratory Ruling, and Order, 30 FCC Rcd 5601 (2015) (*2015 Open Internet Order*), para. 391.
[4] *2015 Open Internet Order*, para. 402 n. 1175.
[5] *Restoring Internet Freedom Order,* para. 70.
[6] 47 C.F.R. § 20.3 (1994).
[7] *Restoring Internet Freedom Order,* para. 75.
[8] *Ibid*, para. 76.
[9] *Ibid*.
[10] 47 C.F.R. § 20.3 (1994).
[11] *Restoring Internet Freedom Order,* para. 77.
[12] *Ibid*, para. 79.
[13] *Ibid*. (quoting portions of *Appropriate Regulatory Treatment for Broadband Access to the Internet Over Wireless Networks*, Declaratory Ruling, 22 FCC Rcd 5901 (2007) (*Wireless Broadband Declaratory Ruling*)).
[14] *Ibid*, para. 82.

B. Is Mobile Broadband Internet Access Service a Private Mobile Service?

The reclassification results in an incredible assertion: that the most important public mobile service of our time is classified under statute as a *private mobile service*. This paper asks: what led the expert agency to conclude that the public Internet is *not* part of the *public* switched network, and that mobile broadband Internet access service is a *private* mobile service?

Were Congress's definitions in the 1990s of *commercial mobile service* and *private mobile service* so badly written that the evolution of technology resulted in the most important public mobile service being properly classified as a *private mobile service*? Did the evolution of technology result in the Internet ceasing to be part of the *public switched network*? How did the statutory classification end up turning in part on whether mobile broadband service is an interconnected service?

We also ask whether the *Restoring Internet Freedom Order's* reversions to 1994 definitions of *public switched network* and *interconnected service* are reasonable in light of the evolution of the Internet. Is it true that mobile broadband service is not interconnected with the *public switched network*?

The purpose of this paper is to examine and evaluate this interpretation and reclassification in the context of a much richer set of relevant precedent. In doing so, we argue that the *Restoring Internet Freedom Order* critically errs in its interpretation of the relevant statute and precedent, and gravely errs in its understanding of the relevant technology.

C. A More Thorough Examination of Statute and Precedent

Although the relevant statute was revised in 1993, the history of statute and FCC Orders during the preceding 40 years should be used to inform interpretation of this statute. In Section 2, we review the formative FCC Orders regulating mobile services during the 1940s through the 1960s. We find that as early as the 1940s the FCC found it useful to distinguish between public and private mobile services. Public mobile services were offered to the public for a fee and allowed subscribers to "communicate or transmit intelligence of their own design and choosing between points on the system of that carrier and other carriers connecting with it."[15] Private mobile services were not offered to the public. Private mobile services dominated the landscape.

In Section 3, we review the relevant FCC Orders regulating mobile services during the introduction of cellular service in the 1970s and early 1980s. The introduction of cellular service dramatically changed the landscape of mobile service, and public mobile services would soon grow to be more popular than private mobile services. This shift in use of mobile services would trigger corresponding changes in regulatory policy, which required that commercial cellular systems be fully interconnected with the public switched telephone network, and placed restrictions on interconnection of private mobile services with the public switched telephone network. We discuss how in the early 1980s private dispatch services began to resemble public mobile telephone service, and how this triggered the FCC to relax the prohibition on interconnection of private mobile services with the public switched telephone network.

Although interconnection was of increasing interest, the determinant of whether a mobile service was public or private remained a two-part test. A mobile service remained a common carrier service only if the service be offered to the public, "be such that customers 'transmit intelligence of their own design and choosing'"[16], and the service provider "undertakes to carry for all people indifferently"[17]. A noncommon carrier (or

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[15] *Frontier Broadcasting Co. v. Collier*, Memorandum Opinion and Order, 24 FCC 251 (1958) (*Frontier Order*), para. 7.

[16] *Nat'l Assoc. of Regulatory Utility Comm'rs v. FCC*, 533 F.2d 601 (D.C. Cir. 1976) (*NARUC II*) 608.

[17] *Nat'l Assoc. of Regulatory Utility Comm'rs v. FCC*, 525 F.2d 630 (D.C. Cir. 1976) (*NARUC I*) 641.

"private") service remained "distinguished by its being set aside for the use of particular customers, so as not to be generally available to the public".[18]

In section 4, we discuss the initial version of Section 332 of the *Communications Act*, created by Congress in 1982 in response to the blurring lines between public and private mobile services. We show how, despite allowing limited interconnection of private mobile services with the public switched telephone network, Section 332's limitation of private mobile services to those that serve only a single company, industry, or group of industries is consistent with the precedent since at least the 1940s. Finally, we discuss how in the late 1980s and early 1990s, the FCC undermines this distinction between public and private mobile services by allowing some private mobile services to be offered to the public.

In Section 5, we lay out the technological landscape as mobile services expanded to include early forms of Internet access. Cellular service growing rapidly in popularity, the World Wide Web was starting, and early forms of mobile Internet access were in the design phase. We find that Congress's revision of Section 332(c) places into statute 50 years of thinking about the characteristics of mobile services that make it common carriage. Congress now recognized that the public switched network had become so central to public mobile services that a mobile service is offered to the public indifferently if and only if it is offered to the public and it is interconnected with the public switched network.

The 1993 statute was the starting point of the *Restoring Internet Freedom Order's* analysis of historical precedent. We find, however, that by ignoring the earlier 50 years of precedent, the *Order* gravely misinterprets the 1993 statute.

We then summarize and critically analyze the FCC's 1994 definitions of *public switched network* and *interconnected* to implement Section 332. Whereas the 1993 statute included technology agnostic definitions that would age gracefully as the Internet matured, we find that the FCC's regulatory definitions were not technology agnostic. We suggest that the FCC should have defined *public switched network* in a technology agnostic manner, rather than connecting it to use of telephone numbers, and we argue that the FCC impermissibly added requirements to the statutory definition of *interconnected service*.

In Section 6, we consider regulatory classification of early forms of mobile broadband Internet access service. By the late 1990s, cellular voice service was exploding, and dial-up Internet access service was blossoming. It would only be a matter of time before consumers wanted to access the Internet over their cell phones. Smart phones were introduced in the mid-2000s. Regulatory policy needed to confront the regulatory classification of mobile broadband Internet access service. We critically analyze the FCC's 2007 *Wireless Broadband Declaratory Ruling*. We argue that the *Declaratory Ruling* errs in its finding that mobile wireless broadband Internet access service is a noncommon carrier service, by failing to analyze whether it is an *interconnected service* under the statutory definition of the term. We further argue that the proper analysis would have found that mobile wireless broadband Internet access service is an *interconnected service*, and hence must be regulated as a common carrier service. We thus find that the *Restoring Internet Freedom Order's* reliance on the 2007 *Wireless Broadband Declaratory Ruling* is flawed.

Finally, we briefly summarize the 2015 *Open Internet Order's* classification of mobile broadband Internet access service as a common carrier service, including its revised definition of *public switched network* to reflect the rapidly growing use of mobile broadband Internet access service. We also review the Court's upholding of this classification.

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[18] *Ibid* 642.

D. Mobile Broadband Internet Access Service is a Commercial Mobile Service, and Hence Must be Regulated as a Common Carrier Service

In Section 7, we apply our more thorough examination of precedent to an analysis of the *Restoring Internet Freedom Order*.

First, we argue that the *Order* errs in its claim that the 1994 definition of *public switched network* was "more consistent with the ordinary meaning and commonly understood definition of the term and with Commission precedent" [19], both of which the *Order* neglected to analyze. By examining the 1993 statutory definition of *interconnected service* in the context of the 50 years of prior precedent and technological development, we find that Congress's use of the technology agnostic term *public switched network* rather than the technology specific term *public switched telephone network* was consistent with the introduction of early forms of Internet access. In particular, we explain that the Internet is clearly part of the public switched network.

Next, we argue that the *Order* errs in its conclusion that the public switched telephone network and the Internet are "multiple networks whose users cannot necessarily communicate or receive communications across networks". As a technological matter, the public switched telephone network and the Internet are not two separate networks, and their users can communicate with each other. We discuss that there is a single public switched network, even though the *Order* reverted to the outdated definition of *public switched network*. The architecture of the public switched telephone network and of the Internet did not change in December 2017 just because the *Order* dictated so. We explain that the existence of a single network rests on the characteristics of the network, not on the services provisioned over the network. We further explain that existence of a single public switched network does not necessitate that all devices utilize telephone numbers.

We then turn to the *Order's* finding that mobile Internet access service is not an *interconnected service*, and its reliance on the similar conclusion in the 2007 *Wireless Broadband Declaratory Ruling*. We argue that this finding was false in 2007, and was even more patently false in 2017.

We show that this finding ignores the required capabilities of the user's device and of the other party's subscribed services. As a matter of technology, we show that meaningful communication between end users requires that they acquire compatible services and devices. We discuss how this has always been true, and how 70 years of precedent (except for the 2007 *Wireless Broadband Declaratory Ruling* and the *Restoring Internet Freedom Order*) reflects these requirements. We further show that an *interconnected service* does not provide subscribers with the ability to meaningfully communicate with all other users on the *public switched network* absent the necessary telecommunications services and devices.

As a result, we argue that mobile broadband Internet access service is an *interconnected service*, despite the *Order's* reversion to outdated definitions, because it is *interconnected* with the *public switched network* and it gives subscribers the capability to communicate to or receive communication from all other users on the *public switched network*, providing that the parties have acquired the necessary telecommunication services and devices.

In addition, although analysis of the *Restoring Internet Freedom Order's* reclassification of mobile broadband Internet access service as an information service is outside the scope of this paper, we discuss how the *Order's* treatment of this classification undermines the *Order's* own logic.

Finally, we conclude that a proper consideration of 70 years of precedent and of the corresponding technology leads to a correct interpretation of the relevant statute. This proper interpretation mandates that

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[19] *Restoring Internet Freedom Order*, para. 75.

mobile broadband Internet access service be classified as a *commercial mobile service*, and thus be regulated as a common carrier service.

2. CLASSIFICATION OF PUBLIC AND PRIVATE MOBILE SERVICES BEFORE CELLULAR SERVICE (1940S THROUGH 1960S)

Although not defined in statute, as early as the 1940s the FCC found it useful to distinguish between public and private mobile services. From the 1940s through the 1960s, the distinction between public mobile service and private mobile service was based on whether the service was common carriage. Common carriage services are offered to the public for a fee and allow subscribers to "communicate or transmit intelligence of their own design and choosing between points on the system of that carrier and other carriers connecting with it."[20] The noncommon carriage mobile services at the time were not offered to the public. Private mobile services dominated the landscape.

A. Classification of Public and Private Mobile Services in the Late 1940s

The *Communications Act of 1934* conferred onto the FCC the responsibility to "[p]rescribe the nature of" each class of wireless service, "[a]ssign bands of frequencies to the various classes" of each class of wireless service, and "[m]ake such rules and regulations and prescribe such restriction and conditions … as may be necessary to carry out the provisions of" the *Act*.[21] The *Act* did not itself define public or private mobile services, but it did include a definition of a *common carrier*.

Already by the 1940s, the FCC had allocated spectrum to a long list of wireless services.[22] The services included federal governmental uses, state and municipal governmental uses[23], and non-governmental services. Our interest in this paper lies in non-governmental mobile services, called *general mobile radio services*, which included broadcast radio[24], commercial broadcast television[25], noncommercial broadcast television[26], fixed public services (radiotelegraph and radiotelephone)[27], amateur radio service[28], general mobile radio services (bus radio service, truck radio service, taxicab radio service, and common carrier general mobile radiotelephone service)[29], and rural telephone service[30], as well as others.

By the late 1940s, the FCC had more requests for spectrum allocation than it could satisfy, given the technological constraints of the time. In carrying out its responsibilities, the *Communications Act of 1934* requires that the FCC do so "as public convenience, interest, or necessity requires", and to "generally

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[20] *Frontier Order*, para. 7.
[21] 47 U.S.C. §s 303(b), 303(c), and 303(r).
[22] See *In the Matter of Allocation of Frequencies to the Various Classes of Non-Governmental Services in the Radio Spectrum from 10 Kilocycles to 30,000,000 Kilocycles,* 39 FCC 33 (1945) (*Low Frequency Allocation Report*); *In the Matter of Allocation of Frequencies to the Various Classes of Non-Governmental Services in the Radio Spectrum from 10 Kilocycles to 30,000,000 Kilocycles,* 39 FCC 68 (1945) (*High Frequency Allocation Report*).
[23] The state and municipal governmental uses included police radio services, fire radio service, forestry radio service, and public utility radio service, as well as others. See *Low Frequency Allocation Report*, sections 11-14 and *High Frequency Allocation Report*, sections 11-14.
[24] *High Frequency Allocation Report*, section 8.
[25] *Ibid*, section 10.
[26] *Ibid*, section 9.
[27] *Low Frequency Allocation Report*, section 2.
[28] *Low Frequency Allocation Report*, section 6; *High Frequency Allocation Report*, section 6.
[29] *High Frequency Allocation Report*, section 17.II.
[30] *Ibid*, section 17.V.

encourage the larger and more effective use" of wireless services.[31] To implement this statutory mandate, the FCC set forth principles it would apply to spectrum allocation decisions.[32] These principles included two types of prioritization. First, the FCC would prioritize services "for the safety of life and property" above those "which are more in the nature of convenience or luxury".[33] Second, the FCC would consider "the total number of people who would probably receive benefits from a particular service".[34]

In its *General Mobile Radio Services Order*, the FCC applied these two types of prioritization to *general mobile radio services*. The Order categorized mobile wireless services into *public safety radio services* (police radio service, fire radio service, and forestry radio service), *industrial radio services* (power utility radio service, petroleum radio service, forest product radio service, and other private industrial radio services), *domestic public radio services* (public radiotelephone service), and *land transportation radio services* (bus radio service, truck radio service, and taxicab radio service).[35]

Priority was given to public safety radio services over other services. Among non-safety radio services, priority was given to those likely to serve large numbers of people. The domestic public services (*public mobile services*) were offered on a common carrier basis and were likely to serve large numbers of people. In contrast, the industrial radio services and land transportation radio services (*private mobile services*) were offered on a noncommon carrier basis and served only a single company, industry, or group of industries. To the extent that domestic public services were thus likely to serve more people than the industrial radio services and land transportation radio services, public mobile service was prioritized over private mobile service.

The distinction between public mobile service and private mobile service was thus based on whether the service was common carriage.

B. Pre-Cellular Public Mobile Services

In the late 1940s and 1950s, the Bell Companies and some independent landline telephone companies introduced a radiotelephone service in limited geographical areas using a technology standard called *Mobile Telephone Service* (MTS). Some companies that did not offer landline telephone service also offered radiotelephone service called *Radio Common Carrier service* in limited geographical areas.

Both *Mobile Telephone Service* and *Radio Common Carrier service* operated on a set of frequencies allocated by the FCC for public mobile service.[36] The services included not only radiotelephone service, but frequently also dispatch service and message relay service. Each frequency band was allocated to an individual carrier in a geographical area, which either corresponded to an urban area or to a highway.

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[31] 47 U.S.C. §s 303 and 303(g).

[32] *General Mobile Radio Service; Allocation of Frequencies between 25 and 50 Megacycles; Allocation of Frequencies between 44 and 50 Megacycles, and between 152 and 162 Megacycles; Allocation of Frequencies between 72 and 76 Megacycles; Allocation of Frequencies in the Band 450-460 Megacycles; Revision of Part 10, "Rules and Regulations Governing Emergency Radio Service" to Change the Name of This Part to "Rules and Regulations Governing Public Safety Radio Services," and to Make Other Changes and Amendments; Promulgation of New Part 11 of the Commission's Rules – Rules Governing Industrial Radio Services; Promulgation of New Part 16 – Rules Governing the Land Transportation Radio Services; Amendment of Part 2 of the Commission's Rules and Regulations,* Report and Order, 13 FCC 1190 (1949) *(General Mobile Radio Services Order)* 1193 (summarizing the criteria used in the *Low Frequency Allocation Report* and the *High Frequency Allocation Report*).

[33] *Ibid*.

[34] *Ibid.*

[35] *Ibid* 1194.

[36] *General Mobile Services Order* 1212. A single base station covered an entire urban area, often with a radius of 10-40 miles. Calls were operator-assisted. Radiotelephones were most often installed in cars.

Roaming was often possible on MTS systems, but it required that consumers had separate contracts with the service providers on whose networks they would roam. In contrast, *Radio Common Carrier service* often provided limited roaming, as the technical standards used by these systems were often incompatible with each other and with MTS. The amount of spectrum allocated to any geographical region was small[37]. As a consequence, demand quickly outstripped system capacity in many areas, and it became common for users to have to wait several minutes for an unused channel in order to initiate or receive a call.

In 1964, a new mobile communication standard, called *Improved Mobile Telephone Service* (IMTS) was introduced to replace MTS.[38] Mobile phones were assigned seven-digit telephone numbers, and IMTS allowed landline telephone users to direct dial mobile telephone users, rather than having the call be connected through an operator. The FCC allocated additional spectrum for the service.[39] IMTS continued to require that each conversation be given the exclusive use of a channel throughout the entire geographical region for the duration of the call. As a consequence, demand continued to outstrip system capacity.

In the 1960s, both landline telephone companies and radio common carriers also introduced public paging services. The FCC had allocated spectrum for such services in 1949, but paging systems were slow to be commercialized, with the first commercial pager introduced in 1962.[40] However, through the 1960s growth was rapid, and in response the FCC allocated additional spectrum several times to both public paging and private paging.[41] Pages were only sent locally; nationwide paging would not begin until the 1980s. The mobile communication standard was packet-switched, unlike the circuit-switched mobile communications protocols of that era.

Early pagers (called *tone-only pagers*) notified the user that someone was trying to contact them but did not display the telephone number of the calling party; in some systems, users could call a messaging center to learn the identity of the calling party and a message.[42]

Some public mobile services (e.g. radiotelephone services offered by landline telephone companies) were interconnected with the public switched network. However, public dispatch services and message relay services were generally not interconnected with the public switched telephone network. In addition, radio common carrier services provided only "the radio-link portion of the service, but generally without interconnection to the public [switched telephone network]".[43] Private mobile services were not interconnected with the public switched telephone network; they enabled communication only between the users of the particular system.

The *General Mobile Radio Services Order* declined to require interconnection of public mobile services with the public switched telephone network, instead relying on the interconnection provisions of Title II of the *Communications Act* for those service providers who wished to interconnect.[44] Public mobile services

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[37] The initial allocation in 1946 for MTS was for only 6 channels in urban areas and 12 channels along highways. In 1963, the 6 channels in urban areas were expanded to 11 channels. The mobile communication standard required that each conversation be given the exclusive use of a channel throughout the entire geographical region for the duration of the call.

[38] IMTS was adopted by landline telephone companies, but not by most radio common carriers.

[39] A single base station continued to cover an entire urban area, often with a radius of 20-30 miles.

[40] *General Mobile Radio Services Order* 1215.

[41] Each frequency band could either be assigned to a single carrier or shared between multiple carriers, depending on the rules in effect for a particular frequency band. A single base station covered an entire urban area.

[42] We continue our discussion of pagers in the 1970s through 1990s below.

[43] *Ibid* 1228.

[44] *Ibid* 1231. Section 201(a) of the *Communications Act of 1934* requires common carriers to "establish physical connections with other carriers".

were not required to interconnect with the public switched telephone network, and private mobile service were not prohibited from interconnecting with the public switched telephone network.

The determinant of whether a mobile service was public or private was whether it was offered to the public for a fee, not whether it was interconnected with the public switched telephone network.

3. Classification of Public and Private Mobile Services During the Introduction of Cellular Service (1970s and Early 1980s)

The introduction of cellular service in the 1970s and early 1980s dramatically changed the landscape of mobile service. Public mobile services would soon grow to be more popular than private mobile services. This shift in use of mobile services would trigger corresponding changes in regulatory policy.

The pre-cellular radiotelephone systems required that each conversation be given the exclusive use of a channel throughout the entire geographical region for the duration of the call. Researchers had foreseen the inefficiency of this method in the late 1950s. They proposed that multiple base stations be deployed at semi-regular spacing within a geographical area (cells), that each base station use a subset of the allocated spectrum, and that a mobile phone be allocated a frequency channel amongst those allocated to the closest base station.[45] This approach would allow each frequency channel to be assigned to multiple base stations within the geographic region, providing that these base stations were far enough apart to limit interference. Early estimates were that a single base station could service a cell with a radius on the order of a mile or less, compared to tens of miles using IMTS. Reuse of frequency channels within the geographic region could thereby increase system capacity by a factor on the order of ten to one hundred.

The development of cellular service throughout the 1970s and 1980s would place increasing emphasis on interconnection of public mobile services with the public switched telephone network. However, although interconnection was of increasing interest, the determinant of whether a mobile service was public or private remained a two-part test. A mobile service remained a common carrier service only if the service be offered to the public, "be such that customers 'transmit intelligence of their own design and choosing'"[46], and the service provider "undertakes to carry for all people indifferently"[47]. A noncommon carrier (or "private") service remained "distinguished by its being set aside for the use of particular customers, so as not to be generally available to the public".[48]

A. First Land Mobile Service Order (1970)

In 1970, the FCC tentatively allocated additional spectrum for public land mobile service to landline telephone carriers and radio common carriers.[49] The *First Land Mobile Service Order* allowed the service

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[45] See H.J. Schulte Jr. and W.A. Cornell, 'Multi-Area Mobile Telephone System' (1960) 9 IRE Transactions on Vehicular Communications 49-53.
[46] *Nat'l Assoc. of Regulatory Utility Comm'rs v. FCC*, 533 F.2d 601 (D.C. Cir. 1976) (*NARUC II*) 608.
[47] *Nat'l Assoc. of Regulatory Utility Comm'rs v. FCC*, 525 F.2d 630 (D.C. Cir. 1976) (*NARUC I*) 641.
[48] *Ibid* 642.
[49] *An Inquiry Relative to the Future Use of the Frequency Band 806-960 MHz; and Amendment of Parts 2, 18, 21, 73, 74, 89, 91 and 93 of the Rules Relative to Operations in the Land Mobile Service Between 806 and 960 MHz,* First Report and Order and Second Notice of Inquiry, 35 Federal Register 108 (1970) (*First Land Mobile Service Order*); *Amendment of Parts 2, 89, 91, and 93; Geographic Reallocation of UHF-TV Channels 14 through 20 to the Land Mobile Radio Services for Use within the 25 Largest Urbanized Areas of the United States; Petition Filed by the Telecommunications Committee of the National Association of Manufacturers to Permit Use of TV Channels 14 and 15 by Land Mobile Stations in the Los Angeles Area*, First Report and Order, 23 FCC 2d 325 (1970); *Amendment of*

provider to determine the most beneficial use of the allocated spectrum, but the expectation was that public services would consist of public telephone services and public dispatch services.

Simultaneously, the FCC tentatively allocated additional spectrum for private mobile services, mostly to be used for public safety services and private dispatch services. As earlier, these services were available to limited sets of users and were not interconnected with the public switched telephone network.[50]

At the time of the *Order*, AT&T was still in early phases of the design of cellular networks. The *Order* invited AT&T and others to submit technical and marketing studies of such a system.

B. Second Land Mobile Service Orders (1974-1975)

By 1974, AT&T had submitted to the FCC plans for a proposed cellular system to be used to offer mobile telephone service and public dispatch service.

The FCC first had to make decisions about spectrum allocation to competing systems and for different purposes. The *Second Land Mobile Service Order* notes that "[i]n the past, the Commission has treated land mobile spectrum requirements from a service perspective, allocating blocks of spectrum, usually on a nation-wide basis, to each of the twenty or so radio service categories" [51], as described in Section 2 of this paper. The *Order* observes that this service-based spectrum allocation approach has resulted in "inequitable situations where spectrum shortage and abundance exist side by side in the same cities."[52] Thus, the *Order* takes a different approach than that used before, instead allocating spectrum "by system type" and "allow[ing] the market to determine ultimately how much spectrum is utilized by the various types of" services, e.g. mobile telephone service or dispatch service.[53]

The *Order* allocated to cellular systems in urban areas a portion of the spectrum previously allocated in the *First Land Mobile Service Order* to public land mobile services.[54] The *Order* stated that "common carrier-type regulation is appropriate for the large cellular land mobile radio systems" [55], thus effectively continuing to classify both mobile telephone service and public dispatch service as public mobile services.

The *Order* allocated to non-cellular systems a portion of the spectrum previously allocated in the *First Land Mobile Service Order* to private land mobile services, with the expectation that it would continue to be used primarily for private dispatch services.[56] The *Order* established four license classifications: *private systems*

Parts 21, 89, 91, and 93 of the Rules to Reflect the Availability of Land Mobile Channels in the 470-512 MHz Band in the 10 Largest Urbanized Areas of the United States, Second Report and Order, 30 FCC 2d 221 (1971).

[50] *First Land Mobile Service Order*.

[51] *An Inquiry Relative to the Future Use of the Frequency Band 806-960 MHz; and Amendment of Parts 2, 18, 21, 73, 74, 89, 91 and 93 of the Rules Relative to Operations in the Land Mobile Service Between 806 and 960 MHz,* Second Report and Order, 46 FCC 2d 752 (1974) (*Second Land Mobile Service Order*), para. 8.

[52] *Ibid*.

[53] *Ibid*.

[54] *Ibid*, para. 12. The FCC initially decided that only wireline telephone carriers had the expertise to deploy and operate cellular systems that would be interconnected with the public switched telephone network and that would allow for nationwide compatibility of mobile equipment, and thus only made the newly available spectrum for cellular systems available to them, see *Ibid*, para. 21. However, the following year, the FCC removed the restriction that spectrum for cellular systems only be available to wireline telephone carriers, thereby allowing radio common carriers to apply; see *An Inquiry Relative to the Future Use of the Frequency Band 806-960 MHz; and Amendment of Parts 2, 18, 21, 73, 74, 89, 91 and 93 of the Rules Relative to Operations in the Land Mobile Service Between 806 and 960 MHz,* Memorandum Opinion and Order, 51 FCC 2d 945 (1975) (*Second Land Mobile Service Order on Reconsideration*), para. 30.

[55] *Second Land Mobile Service Order*, para. 29.

[56] *Ibid*, para. 16.

that offer mobile services for the entity's own purposes; *shared systems* operated by non-profit cost-shared entities that offer private dispatch services to their member's entities; *common user systems* operated by for-profit entities that offer private dispatch services to limited sets of users; and *common user systems* operated by for-profit entities that offer mobile telephone services to the public.[57]

The *Second Land Mobile Service Order on Reconsideration* required that developmental cellular systems be fully interconnected with the public switched telephone network, the first such requirement.[58] The *Second Land Mobile Service Order* placed restrictions on interconnection of private mobile services with the public switched telephone network. Previously, private mobile services were not prohibited from interconnecting with the public switched telephone network, although few did since they were primarily private dispatch services that had no such need. The *Order* now prohibited private mobile services[59] offered over non-cellular systems from full interconnection[60] with the public switched telephone network. Although interconnection would later be used to distinguish between public and private mobile services, this was not the rationale here. The prohibition was justified based on engineering. It was judged that interconnection of dispatch services with the public switched telephone network would decrease the system efficiency of the non-cellular systems. As before, public mobile services were *not* required to interconnect with the public switched telephone network, although clearly it was expected that mobile telephone service would do so.

i. A brief challenge to the traditional distinction between public and private mobile services

The change from service-based to system-based spectrum allocation challenged the traditional distinction between public and private mobile services. Previously, the determinant of whether a mobile service was public or private was whether it was offered to the public for a fee. In the *Second Land Mobile Service Order,* mobile services offered through private systems, shared systems, or common users systems that offer services only to limited sets of users do not offer services to the public for a fee, and hence are private services.

In contrast, mobile services offered through common user systems that offer services to the public were historically classified as public mobile services. Common carriage services are those offered to the public for a fee which allow subscribers to "communicate or transmit intelligence of their own design and choosing between points on the system of that carrier and other carriers connecting with it."[61] The *Act* placed common carrier services under Title II.

However, the *Order* chose to regulate services offered in non-cellular systems as noncommon carrier services, regardless of whether they satisfied the criteria of a common carrier service. The *Order* stated that the FCC had "the discretion necessary to select the regulatory tools [it] believe[s] will most effectively promote the public interest".[62] Thus, although the FCC continued to expect that the non-cellular systems would be primarily used for private dispatch services, the *Order* opened the door for the first time to public mobile services being offered under noncommon carrier regulation.

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[57] 47 CFR 89.604 (1974).
[58] *Second Land Mobile Service Order on Reconsideration*, para. 33.
[59] Formally, the prohibition was placed on all licensees of the new spectrum allocated to non-cellular systems, except when "the licensee provides radiotelephone services, on a commercial basis, to the public." See *Second Land Mobile Service Order*, para 49.
[60] Interconnection with the public switched telephone network was allowed only if it was "accomplished manually, by a person in the employ of the licensee or user, at the licensee's or user's principal place of business." See *Second Land Mobile Service Order*, para 49.
[61] *Frontier Order*, para. 7.
[62] *Second Land Mobile Service Order*, para. 34.

This door was soon closed. The *Second Land Mobile Service Order on Reconsideration* eliminated the category of common user systems operated by for-profit entities that offer mobile telephone services to the public.[63] However, the FCC's claim that it has the discretion to regulate public mobile services as noncommon carrier services would soon be reviewed by the courts.

C. NARUC I and II (1976)

In a pair of decisions in 1976, the D.C. Circuit Court of Appeals reviewed the regulatory status assigned by the FCC to the various services considered in the *Second Land Mobile Service Order* and the *Second Land Mobile Service Order on Reconsideration*. The Court first stated that mobile telephone services offered over cellular systems are common carrier services.[64] It then considered the proper regulatory status of private mobile services. It accepted (as unchallenged) the noncommon carrier status of private services offered over private systems or shared systems, and thus focused on the proper regulatory status of services offered over common user (now called *specialized mobile radio*) systems.

The Court established a two-part test. The first part is specific to communications; a communications service is a common carrier service only if the service "be such that customers 'transmit intelligence of their own design and choosing'".[65] The second part is general to all common carrier services; a service is a common carrier (or "public") service only if it is offered to the public and the service provider "undertakes to carry for all people indifferently".[66] In contrast, a noncommon carrier (or "private") service "is distinguished by its being set aside for the use of particular customers, so as not to be generally available to the public".[67]

Furthermore, the Court explained that if a communications service passes both tests, then its classification as a common carrier communications service is not a matter of FCC discretion.[68] In contrast, if a communications service fails either test, the FCC retains the discretion to require the provider "to serve all potential customers indifferently, thus making [the service a common carrier service] within the meaning of the [Communications Act]", if doing so is in the public interest.[69]

NARUC I and *NARUC II* thereby set the framework for both discretionary and non-discretionary determinations by the FCC that a service is a common carrier service.

Applying this two-part test to specialized mobile radio services, the Court notes that, since such services were not yet in existence, it was speculative whether specialized mobile radio services would be offered to

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[63] *Second Land Mobile Service Order on Reconsideration*, para. 5 and Appendix B, section 10 (eliminating 47 CFR 89.604(d)). See also para. 8 n. 9 and para. 36 n. 19 (clarifying that common user systems no longer include radiotelephone service to the public).
[64] *NARUC I* 634.
[65] *NARUC II* 608.
[66] *NARUC I* 641.
[67] *Ibid* 642.
[68] *Ibid* 644. Of course, the FCC may exercise it forbearance authority, if appropriate under Title I.
[69] *Ibid* 644 n. 76. See also *Appropriate Framework for Broadband Access to the Internet Over Wireline Facilities et al.*, Report and Order and Notice of Proposed Rulemaking, 20 FCC Rcd 14853 (2005) (*Wireline Broadband Classification Order*), para. 41 n. 108 (describing *NARUC I* ("In the absence of an express statutory requirement that a particular service be offered on a common carrier basis, the Commission and the courts have interpreted whether the public interest requires a common carrier service based on a number of factors related to the service at issue.")), and *Virgin Islands Telephone Corp. v. FCC*, 198 F.3d 921 (D.C. Cir. 1999) (describing *NARUC I* and *NARUC II* ("a carrier has to be regulated as a common carrier if it will make capacity available to the public indifferently or if the public interest requires common carrier operation.")).

the public and, if so, whether they would undertake to carry for all people indifferently.[70] The Court thus concludes that there is no requirement that the service be classified as a common carrier service. It thereby falls to the FCC to conduct a public interest analysis to determine whether it is in the public interest to require that such services serve all potential customers indifferently. The Court accepts the FCC's public interest analysis, which does not find that such regulation would be in the public interest.[71]

D. Cellular Communications Systems Order (1981)

Since the 1975 *Second Land Mobile Service Order on Reconsideration,* the FCC had authorized two developmental cellular systems, in Chicago and in the Washington D.C. region. In 1981, the FCC was finally ready to promulgate regulations under which the first generation (1G) of cellular mobile voice service could be widely offered. The 1981 *Cellular Communications Systems Order* made available to cellular systems the spectrum allocated in the *Second Land Mobile Service Order*.[72]

The *Second Land Mobile Service Order on Reconsideration* had required that developmental cellular systems be fully interconnected with the public switched telephone network, the first such requirement.[73] The *Cellular Communications Order* similarly required that commercial cellular systems be fully interconnected.[74]

The first commercial cellular systems in the United States started operating in 1983, and quickly spread across the country's major metro areas. By 1987, there were over one million subscribers to public mobile telephone service operating over cellular systems.

E. Paging

In the 1960s, tone-only pagers only notified the user that someone was trying to contact them. By the 1970s, some pagers (called *tone/voice pagers*) could also automatically relay an audio message. By the 1980s, some pagers (called *numeric pagers*) displayed the telephone number of the calling party. By the mid-1980s, some pagers (called *alphanumeric pagers*) could also relay a text message.

The growth of paging was rapid through the 1970s and 1980s. In response to growing demand, the FCC allocated additional spectrum to both public paging and private paging.[75] Public paging was offered as a

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[70] *NARUC I* 643.
[71] *NARUC I* 645.
[72] *An Inquiry Into the Use of the Bands 825-845 MHz and 870-890 MHz for Cellular Communications Systems; and Amendment of Parts 2 and 22 of the Commission's Rules Relative to Cellular Communication Systems*, Report and Order, 86 FCC 2d 469 (1981) (*Cellular Communications Systems Order*). The spectrum was divided so that two carriers could operate in each geographical region; one of the carriers would be a wireline telephone carrier; see *Cellular Communications Systems Order*, paras. 38, 43. Formally, there was a 2-year period during which one of the licenses was available only to wireline telephone carriers. After the 2-year period, radio common carriers could apply for both licenses, but only if no wireline telephone carrier had applied or if the wireline carrier had not served the public interest; see *An Inquiry Into the Use of the Bands 825-845 MHz and 870-890 MHz for Cellular Communications Systems; and Amendment of Parts 2 and 22 of the Commission's Rules Relative to Cellular Communication Systems*, Memorandum Opinion and Order on Reconsideration, 89 FCC 2d 58 (1982), para. 27.
[73] *Second Land Mobile Service Order on Reconsideration*, para. 33.
[74] *Cellular Communications Order*, para. 94. Also see *An Inquiry Into the Use of the Bands 825-845 MHz and 870-890 MHz for Cellular Communications Systems; and Amendment of Parts 2 and 22 of the Commission's Rules Relative to Cellular Communication Systems*, Memorandum Opinion and Order on Reconsideration, 89 FCC 2d 58 (1982) (*Cellular Communications Order on Reconsideration*), paras. 47-51 (discussing interconnection).
[75] *Amendment of Parts 2 and 22 of the Commission's Rules to Allocate Spectrum in the 928-941 MHz Band and to Establish Other Rules, Policies, and Procedures for One-Way Paging Stations in the Domestic Public Land Mobile Radio Service*, First Report and Order, 89 FCC 2d 1337 (1982).

common carrier service. Private paging remained a service "for the [licensee's] internal use or to provide service to limited categories of eligible users".[76]

Prior to the introduction of numeric pagers, public paging service was not generally interconnected with the public switched telephone network, as pagers did not yet display the number of the calling party. Private paging services were prohibited from being interconnected with the public switched telephone network; thus, one could not call a private pager from the public switched telephone network.[77]

When numeric pagers were introduced, public paging systems became interconnected with the public switched telephone network. Numeric pagers also created a motivation for private paging services to be interconnected with the public switched telephone network.

F. Private Land Mobile Radio Interconnection Orders (1978-1982)

In the late 1970s and early 1980s, the FCC revisited the 1974 prohibition on full interconnection of private mobile services with the public switched telephone network of private mobile services offered over non-cellular systems. The problem is that private dispatch services had since begun to resemble public mobile telephone service.

The 1978 *First Private Land Mobile Radio Interconnection Order* concluded that interconnection of private mobile services with the public switched telephone network would not "affect [the private mobile services] in some basic way so that the purposes for which those services were established or the manner in which private radio systems are employed would be altered to the detriment of the private services."[78] It concluded interconnection "need not change the basic character of the private radio services" if safeguards were in place to limit the use of that interconnection.[79] It also backed off the conclusion from the *Second Land Mobile Services Order* that using spectrum for mobile telephone service that was intended for dispatch service was an inefficient use of spectrum. The *Order* instead stated that dispatch service and mobile telephone service could be efficiently offered over the same system.[80] On this basis, the *Order* relaxed the prohibition on interconnection of some private mobile services with the public switched telephone network, now allowing interconnection providing that the licensee's control operator had supervision and control over the call.[81]

The 1982 *Second Private Land Mobile Radio Interconnection Order* further relaxed this prohibition for private services operating over non-cellular systems. It now allowed interconnection, provided that there was no "substantial likelihood that interconnection operation will impede the dispatch requirements of co-channel users."[82] As with justification of the *Second Land Mobile Service Order*'s earlier prohibition on

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[76] *Revision of Part 22 and Part 90 of the Commission's Rules to Facilitate Future Development of Paging Systems; Implementation of Section 309(j) of the Communications Act – Competitive Bidding*, Notice of Proposed Rulemaking, 11 FCC Rcd 3108 (1996), para. 5.

[77] *Amendment of Parts 89, 91, 93 and 95 (General Mobile Radio Service, only) of the Commission's Rules to Prescribe Policies and Regulations to Govern Interconnection of Private Land Mobile Radio Systems with the Public, Switched, Telephone Network*, First Report and Order, 69 FCC 2d 1831 (1978) (*First Private Land Mobile Radio Interconnection Order*), para. 57.

[78] *Ibid*, para. 21.

[79] *Ibid*, para. 23.

[80] *Ibid*, para. 53.

[81] *Ibid*, para. 40.

[82] *Amendment of Part 90 of the Commission's Rules to Prescribe Policies and Regulations to Govern the Interconnection of Private Land Mobile Radio Systems with the Public Switched Telephone Network in the Bands 806-821 and 851-866 MHz*, Second Report and Order, 89 FCC 2d 741 (1982) (*Second Private Land Mobile Radio Interconnection Order*), para. 38.

full interconnection, the new test is an engineering issue, namely system efficiency. However, showing some concern for the increasingly blurred lines between public and private mobile services, the rules require that the licensee of shared systems make arrangements for telephone service directly with a duly authorized carrier, and that users of specialized mobile radio services themselves make such arrangements.[83] This concern over what otherwise would have constituted resale of public telephone service would shortly become the dominant focus of interconnection.

4. Difficulties with the Classification of Public and Private Mobile Services (1980s to Early 1990s)

Under the FCC Orders during the 1970s and early 1980s, the test for whether a mobile service is public or private is still the two-part test given in *NARUC I* and *NARUC II*, namely whether the service is offered to the public indifferently and whether it transmits intelligence of the customer's design and choosing. However, with the functionality of private mobile services increasingly resembling that of public mobile services, this put additional weight on evaluating the two-part test.

The blurred lines between public and private mobile service caused Congress to act to define private mobile services in statute. Unfortunately, the ensuing FCC Orders effectively allowed noncommon carrier offerings of what heretofore had been considered public land mobile service, effectively undermining the Congressional direction.

A. Section 331 of the Communications Act (1982)

In 1981-1982, Congress turned its attention to private land mobile services. It was concerned that the *Communications Act* had no statutory definition of private land mobile services, and no statutory guidance on spectrum allocation.[84] It was also concerned that "[t]he distinction between private and common carrier land mobile services [was] the subject of considerable litigation between private land mobile operators and radio common carriers before the FCC and the courts." [85]

i. Definitions

The *Communications Amendments Act of 1982* created a new Section 331[86] of the *Communications Act* concerning private land mobile services. It first defined *mobile service* as:

> *"a radio communication service carried on between mobile stations or receivers and land stations, and by mobile stations communicating among themselves, and includes both one-way and two-way radio communications services".*[87]

The *1982 Act* then defined *private land mobile service* as:

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[83] *Second Private Land Mobile Radio Interconnection Order*, para. 40.
[84] *Committee Report on S.929*, United States Senate Committee on Commerce, Science, and Transportation, S. Rep. No. 97-191 (1981) (*Communication Amendments Act of 1982 Committee Report*).
[85] *Conference Report to Accompany H.R. 3239*, United States Congress, H.R. Conf. Rep. No. 97-765 (1982) (*Communication Amendments Act of 1982 Conference Report*) 54.
[86] After later revisions, the section was renumbered to be Section 332.
[87] The *Communications Act* (as amended) had already defined *radio communication* as "the transmission by radio of writing, signs, signals, pictures, and sounds of all kinds, including all instrumentalities, facilities, apparatus, and services (among other things, the receipt, forwarding, and delivery of communications) incidental to such transmission", *mobile station* as "a radio-communication station capable of being moved and which ordinarily does move", and *land station* as "a station, other than a mobile station, used for radio communication with mobile stations".

> *"a mobile service which provides a regularly interacting group of base, mobile, portable, and associated control and relay stations (whether licensed on an individual, cooperative, or multiple basis) for private one-way or two-way land mobile radio communications by eligible users over designated areas of operation."*

Dissecting the definition, presumably a *land mobile service* is "*a mobile service which provides a regularly interacting group of base, mobile, portable, and associated control and relay stations (whether licensed on an individual, cooperative, or multiple basis) for private one-way or two-way land mobile radio communications … over designated areas of operation"*.

We are interested, as Congress was, in the distinction between public and private land mobile services. In the definition of *private land mobile service*, what makes the service *private* is the restriction of the service to "eligible users". Congress recognized that the purpose of private land mobile services was to allow "government entities, large and small commercial enterprises, utilities, land transportation providers and other eligible entities to utilize the communication system best suited to their unique requirements."[88] The corresponding *Conference Report* clarified that eligible users consisted at the time of the groups to whom "local government, police, fire, highway maintenance, forestry conservation, special emergency, power, petroleum, forest products, motion picture, relay press, special industrial, business, manufacturers, telephone maintenance, motor carrier, railroad, taxicab, automobile emergency, and radiolocation" radio services were available.[89] However, the *Conference Report* also stated that the FCC was expected to modify this list consistent with the statutory text as future needs arose.

The *1982 Act* was more specific about the meaning of "eligible users" for the subset of land mobile services that existed at the time, namely "specialized mobile radio, multiple licensed radio dispatch systems, and all other radio dispatch systems".[90] The *1982 Act* dictates that such a radio dispatch service is a private land mobile service if[91]

> (a) the service does not provide a land station to multiple licensees or shared by authorized users;
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> (b) the service provides a land station on a nonprofit cooperative basis to multiple licensees or shared by authorized users; or
>
> (c) the service provides a land station on a for-profit basis to multiple licensees or shared by authorized users, and the radio dispatch system is either
>
> > (i) not "interconnected with a telephone exchange or interexchange service or facility for any purpose", or
> >
> > (ii) interconnected only because "each user obtains … or licensees jointly obtain such interconnection directly from a duly authorized [common] carrier."[92]

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[88] *Communication Amendments Act of 1982 Committee Report* 12.
[89] *Communication Amendments Act of 1982 Conference Report* 54.
[90] 47 U.S.C. § 331(c)(1) (1982).
[91] The statutory text does not state that radio dispatch services are classified as private land mobile services *only if* they satisfy these limitations on interconnection. However, the *Conference Report* states that the *1982 Act* "prohibits such shared systems from being interconnected with common carrier facilities if the licensees or entrepreneurs are engaging in the resale of telephone service or facilities", so the *Conference Report* apparently believes that radio dispatch systems are classified as private land mobile service *if and only if* they satisfy these limitations on interconnection.
[92] 47 U.S.C. § 331(c)(1) (1982). The statutory text is ambiguous on whether private land mobile services other than radio dispatch service may be interconnected with the public switched telephone network.

Part (a) is similar to private services over *private systems*, as authorized in the *Second Land Mobile Service Order*. Part (b) is similar to private services over *shared systems*, as authorized in the *Second Land Mobile Service Order*. Part (c) is similar to private services over *common user systems* operated by for-profit entities that offer private dispatch services to limited sets of users, as authorized in the *Second Land Mobile Service Order*. (We discuss parts (c)(i) and (c)(ii) below.)

Taken together, this description of *eligible users* for radio dispatch service is consistent with the historical interpretation of private mobile services since at least the 1940s, namely that such services serve only a single company, industry, or group of industries.

ii. Regulation of public and private land mobile services

Congress then turned to the regulatory status of public and private land mobile services. Since at least the 1950s, a common carrier communications service is one that is offered to the public and allows subscribers to "communicate or transmit intelligence of their own design and choosing between points on the system of that carrier and other carriers connecting with it."[93] In 1976, *NARUC1* and *NARUC2* more explicitly state that a communications service is a common carrier service if either (a) the service is offered to the public indifferently and transmits intelligence of the customer's design and choosing, or (b) the FCC determines that it is in the public interest that the service be offered in such a manner. It was unquestioned that land mobile services transmit intelligence of the customer's design and choosing.[94] In the *Telecommunications Act of 1996,* this test would later be written into statute in the term *telecommunications*, defined as "the transmission, between or among points specified by the user, of information of the user's choosing, without change in the form or content of the information as sent and received."[95]

Thus, prior to the *1982 Act*, a land mobile service was a common carrier service if and only if (a) it was offered to the public indifferently, or (b) the FCC determined that it was in the public interest that the service be offered in such a manner. Similarly, prior to the *1982 Act*, a land mobile service was a noncommon carrier service if it was not a common carrier service, namely if and only if (a) it was not offered to the public or offered to the public but not indifferently, and (b) the FCC did not determine that it was in the public interest that the service be offered in such a manner. During the 1940s through the 1970s, public mobile services were offered to the public indifferently, and hence public mobile services were classified as common carrier services. Similarly, private mobile services were not offered to the public, and the FCC did not determine that it was in the public interest that they be offered to the public, and hence private mobile services were classified as noncommon carrier services. However, in 1974 the FCC had briefly opened up the possibility that public mobile telephone service over common user land mobile systems could be offered as a noncommon carrier service, before it reversed course in 1975.

The *1982 Act* stated that a "person engaged in private land mobile service shall not, insofar as such person is so engaged, be deemed a common carrier for any purpose under this Act."[96] The *1982 Act* thus dictated that land mobile service offered to eligible users (namely, *not* to the public) be classified as a noncommon carrier service, thereby removing the FCC's discretion to determine that private land mobile service be offered to the public indifferently.[97] The *Conference Report* accompanying the *1982 Act* explained that a

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[93] *Frontier Order*, para. 7.
[94] In the 2000s, this would be questioned, as we discuss in Sections 5 and 6.
[95] 47 U.S.C. § 153(50).
[96] 47 U.S.C. § 331(c)(2) (1982).
[97] However, it remained in the FCC's discretion to determine that it is in the public interest to require land mobile service that is offered to the public but not indifferently to be offered indifferently. Similarly, the *1982 Act* neither

land mobile service is a common carrier service if and only if the entity offering the service "is engaged functionally in the provision of telephone service or facilities of a common carrier as part of the entity's service offering".[98]

Thus, under the *1982 Act*, *public land mobile service* is the common carrier offering or resale to the public of a telecommunications service as it was defined at the time, and *private land mobile service* is the noncommon carrier offering to eligible users of either non-interconnected service or service that is interconnected only when users individually obtain such interconnection from a duly authorized common carrier.[99] The *Conference Report* states that, for land mobile services, this test supersedes the two-part *NARUC* test.[100] Correspondingly, the *1982 Act* prohibits common carriers from providing dispatch service on any frequency allocated for common carrier service (which had been allowed under the *Cellular Communication Systems Order*), essentially requiring that all dispatch services qualify as private land mobile service.[101]

iii. Interconnection

The limitations on interconnection of private radio dispatch service are consistent with the limitations on interconnection of private land mobile service in the 1974 *Second Land Mobile Service Order*, as modified by the 1982 *Second Private Land Mobile Radio Interconnection Order*. However, whereas in the FCC Orders these limitations are placed on a service that has already been classified as a private land mobile service, under the *1982 Act* these limitations are a portion of the definition of private radio dispatch service, which will shortly lead to considerable confusion.[102] By requiring that all radio dispatch services be offered as private land mobile services, the *1982 Act* places these limitations on interconnection on all radio dispatch services.[103] The *Conference Report* explains that these limitations on interconnection "prohibit[] [radio dispatch] systems from being interconnected with common carrier facilities if the [operators of such systems] are engaging in the resale of telephone service or facilities."[104]

Although the *1982 Act* placed limitations on interconnection of radio dispatch service, it is worth noting that it did *not* replace the *NARUC* test of whether a service is offered to the public with a test of interconnection with the public switched telephone network, as others would later argue. The *1982 Act*

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requires nor prohibits that a land mobile service that is neither a public land mobile service nor a private land mobile service to be offered as a common carrier service, and thus presumably leaves this decision to the FCC.

[98] *Communication Amendments Act of 1982 Conference Report* 55. The *Conference Report* seems to apply this test to all land mobile services, but the statutory text only applies the corresponding limitations on interconnection to certain radio dispatch services.

[99] See *United States v. Am. Tel. & Tel. Co*., 552 F. Supp. 131 (D.D.C. 1982) (*MFJ*), which defined *telecommunications service* as "the offering for hire of telecommunications facilities, or of telecommunications by means of such facilities."

[100] *Communication Amendments Act of 1982 Conference Report* 55.

[101] 47 U.S.C. § 331(c)(2) (1982). It grandfathered such offerings prior to January 1, 1982, but believed they were de minimis.

[102] This change leaves open the question of the classification of a radio dispatch service that provides a land station on a for-profit basis shared by authorized users, and for which the radio dispatch system is interconnected with a telephone exchange or interexchange service or facility and in which users do not individually obtain interconnection directly from a duly authorized common carrier. Under the *1982 Act*, such a service is neither a public land mobile service (because it is not offered to the public) nor a private land mobile service (due to the method of interconnection).

[103] *Communication Amendments Act of 1982 Conference Report* 55. The *Conference Report* seems to apply this test to all land mobile services, but the statutory text only applies the corresponding limitations on interconnection to certain radio dispatch services.

[104] *Ibid*.

retained the historic distinction between public mobile services offering service to the public versus private mobile services offering service to eligible users (namely, *not* to the public).

B. The FCC's Undermining of the Statutory Distinction between Private and Public Mobile Services (1988-1993)

Following the *Communications Amendments Act of 1982*, the FCC liberalized the rules on eligible users of private land mobile service, in a manner that effectively allowed noncommon carrier offerings of what heretofore had been considered public land mobile service.

The *1982 Act* restricted *private land mobile service* to "eligible users". Eligible users of private land mobile service only included "businesses, emergency organizations, land transportation entities, and state and local government agencies", but excluded individuals.[105] The *Conference Report* accompanying the *1982 Act* clarified that eligible users consisted at the time of the groups to whom "local government, police, fire, highway maintenance, forestry conservation, special emergency, power, petroleum, forest products, motion picture, relay press, special industrial, business, manufacturers, telephone maintenance, motor carrier, railroad, taxicab, automobile emergency, and radiolocation" radio services were available.[106] However, the *Conference Report* also stated that the FCC was expected to modify this list consistent with the statutory text as future needs arose.[107]

In 1986, the FCC issued a *Notice of Proposed Rulemaking* asking whether under the *1982 Act* the FCC had the discretion to expand eligible users of *private land mobile service* to include individuals.[108] In the 1988 *SMR Eligible Users Order*, the FCC answered this question for specialized mobile radio service. It first interpreted the *1982 Act* as having "altered the test of common carriage in mobile radio", and having said that for private mobile radio services "the test became whether the service offering was interconnected with the public switched telephone network and, if so, whether the service was reselling telephone exchange or interexchange service."[109] In particular, the *Order* claims that the *1982 Act* dictates that "[t]hose who do not resell telephone exchange or interexchange service are classified as private carriers in this context."[110] This interpretation leads the *Order* to conclude that a land mobile service is a private service, and hence treated as a noncommon carrier service, if it does not resell telephone exchange or interexchange service, *regardless* of whether the service is offered only to eligible users (not to the public).

On this basis, the *Order* concludes that it is within the FCC's discretion to expand eligible users to include individuals.[111] The *Order* justifies this decision[112], in part, using a phrase within the *1982 Act* that dictates that a radio dispatch service is a *private land mobile service* "regardless of whether such service is provided indiscriminately to eligible users on a commercial basis"[113], if the service satisfies the limitations on interconnection.

Having concluded that it is within the FCC's discretion to expand eligible users to includes individuals, the *Order* does so, claiming that this "will increase the communication options available to individuals … and

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[105] *Amendment of Part 90, Subparts M and S, of the Commission's Rules*, 3 FCC Rcd 1838 (1988) (*SMR Eligible Users Order*), para. 15.
[106] *Communication Amendments Act of 1982 Conference Report* 54.
[107] *Ibid*.
[108] *Amendment of Part 90, Subparts M and S, of the Commission's Rules*, 1 FCC Rcd 809 (1986).
[109] *SMR Eligible Users Order*, para. 19.
[110] *Ibid*.
[111] *Ibid*, para. 25.
[112] *Ibid*, para. 24.
[113] 47 U.S.C. § 331(c)(1) (1982). The statutory text is ambiguous on whether private land mobile services other than radio dispatch service may be offered indiscriminately to eligible users on a commercial basis.

enhances spectrum efficiency", and thus that it is in the public interest.[114] The *Order* thereby allows private land mobile services to be offered to the public for a fee and yet retain noncommon carriage status.

In 1993, the FCC similarly decided in its *Private Carrier Paging Eligible Users Order* to expand eligible users of private paging service to include individuals.[115]

i. Critique of the FCC's expansion of private land mobile services to include services offered to the public

This interpretation of the *1982 Act* reads "eligible users" out of the statutory language. The *1982 Act's* distinction between public and private land mobile radio services (in general) rests entirely on the private services being available only to eligible users. Even the specific language in the *1982 Act* about radio dispatch services, which the *Order* quotes, is about indiscriminate commercial offering of services or facilities to eligible users, not about offering of service or facilities to the public as the *Order* would like to believe.[116]

By reading "eligible users" out of the statutory language, the *Order* inverts the historical relationship between common carriage and interconnection. Prior to this *Order*, a mobile service was common carriage if and only if it was offered to the public indifferently, and as a consequence of being a common carrier service it was obligated under Section 201 of the *Communications Act* to interconnect with other common carrier services. The *Order* inverts this, by claiming that a land mobile service is a common carrier service *only if* it interconnects with the public switched telephone network.

This misinterpretation of the *1982 Act*, and expansion of private services to the public, would shortly cause further trouble.

5. COMMERCIAL MOBILE RADIO SERVICE VS. PRIVATE MOBILE RADIO SERVICE (1990S)

In the early 1990s, cellular service growing rapidly in popularity, the World Wide Web was starting, and early forms of mobile Internet access were in the design phase.

In 1993, Congress revised Section 332(c), and placed into statute 50 years of thinking about the characteristics of mobile services that make it common carriage. Congress now recognized that the public switched network had become so central to public mobile services that a mobile service is offered to the public indifferently if and only if it is offered to the public and it is interconnected with the public switched network. Congress included technology agnostic definitions in this revised statute.

Unfortunately, the following year the FCC implemented the statute in a technology specific manner. This decision would cause problems as the Internet developed, eventually leading to the mistaken classification of mobile broadband Internet access service as a private mobile service.

A. Personal Communications Services Orders (1993-1994)

By the late 1980s and early 1990s, wireless communications technology was advancing on several fronts, enabling proposals for a variety of advanced wireless communications services, including telephone services that could route telephone calls to either a cell phone or a wireline cordless phone[117], data communications services to portable devices (precursors to smartphones) that could transmit and receive

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[114] *SMR Eligible Users Order*, para. 35.
[115] *Amendment of the Commission's Rules to Permit Private Carrier Paging Licensees to Provide Service to Individuals*, Report and Order, 8 FCC Rcd 4822 (1993) (*Private Carrier Paging Eligible Users Order*).
[116] *Communication Amendments Act of 1982 Conference Report* 55.
[117] Sadly, this technology has still not been deployed.

richer messages than did alphanumeric pagers, and wireless local area network services (a precursor to Wi-Fi). Most optimistically, the vision of personal communications services (PCS) was of a service that could provide an integrated wireless voice, paging, messaging, and data service that could follow the user as desired.[118]

In 1993, the FCC considered proposals for a wide range of personal communication services. Given the diversity of services, the FCC chose to allocate spectrum in small bandwidths appropriate for narrowband data service (called *narrowband PCS*) in the *Narrowband PCS Order*[119], and to allocate spectrum in large bandwidths appropriate for broadband data service (called *broadband PCS*) in the *Broadband PCS Order*[120].

The narrowband personal communication services were envisioned to include advanced paging service and data messaging services, including email, image file transfer, low bitrate video, and many other data services.[121] Accordingly, the FCC allowed narrowband PCS spectrum to be used for a wide variety of *narrowband personal communications services*, which it defined as "[v]ery broadly defined and flexible radio services that encompass a wide array of mobile and ancillary fixed communication services, which could provide services to individuals and business, and be integrated with a variety of competing networks."[122]

The broadband personal communications services were envisioned to include mobile advanced voice and data communications services that would be interconnected with the public switched telephone network.[123] Accordingly, the FCC allowed broadband PCS spectrum to be used for a wide variety of *broadband personal communications services*, which it similarly defined as "[r]adio communications that encompass mobile and ancillary fixed communication services that provide services to individuals and businesses and can be integrated with a variety of competing networks."[124]

The 1992 *Personal Communications Services NPRM* had sought comment on whether PCS should be classified as a common carrier or private land mobile radio service.[125] It anticipated that PCS may include services "narrowly targeted to specific customer groups or niche markets"[126], which had been the traditional hallmark of private mobile services. However, the *NPRM* also repeated its misinterpretation of the *Communications Amendments Act of 1982* that "the test for private land mobile service is that a licensee

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[118] At times, it was also thought to potentially include wireless PBX and wireless local loop services. PCS was initially proposed as a separate system from both the public switched telephone network and the various cellular systems. Eventually, however, PCS would merge with cellular technology and principally offer mobile voice service and mobile broadband Internet access service.

[119] *Amendment of the Commission's Rules to Establish New Narrowband Personal Communications Services*, First Report and Order, 8 FCC Rcd 7162 (1993) (*Narrowband PCS Order*).

[120] *Amendment of the Commission's Rules to Establish New Personal Communications Services*, Second Report and Order, 8 FCC Rcd 7700 (1993) (*Broadband PCS Order*).

[121] *Narrowband PCS Order.*, paras. 1, 10. The data communication protocols were packet-switched, and included local area network addressing, acknowledgements, and packet retransmission. *Ibid*, para. 10 n. 10.

[122] *Ibid*, page 7191. Indeed, although PCS services were still in the experimental stage, it awarded preferential treatment in licensing processes to a 24kbps packet-switched data communications service using "terminals that will include a keyboard, display, and memory capable of being used for two-way transmissions of short or long data files and messages." *Ibid*, para. 59.

[123] *Broadband PCS Order*, para. 8 n. 11, para. 22.

[124] *Ibid*, para. 24. Also see 47 C.F.R. 99.5 (1993), 47 C.F.R. 24.5 (2018).

[125] *Amendment of the Commission's Rules to Establish New Personal Communications Services*, Notice of Proposed Rule Making and Tentative Decision, 7 FCC Rcd 5676 (1992) (*PCS NPRM*), para. 95.

[126] *Ibid*, para. 94.

not resell interconnected telephone service for profit,"[127] again allowing private mobile services to be offered to the public. The *NPRM* correspondingly sought comment on the ways in which PCS providers may obtain interconnection with the PSTN. Neither the *Narrowband PCS Order* nor the *Broadband PCS Order* classified personal communication services as either common carrier or private land mobile radio service, instead waiting for Congressional action.

At the same time as the *PCS Orders*, cellular communications technology was also advancing. The transmission technology would shortly change from 1G, in which mobile voice services were transmitted using an analog signal, to 2G, in which both mobile voice services and text messages were transmitted using a digital signal.

B. Revisions to Section 332(c) (1993)

In 1993, Congress faced a mobile communication services landscape that posed severe regulatory challenges. Historically, public land mobile services were offered to the public for a fee, and during the 1970s-1980s they consisted primarily of cellular voice service and public paging service. Historically, private land mobile services were "tailored to the needs of particular user groups, such as local governments, public safety organizations, and businesses requiring specialized services that common carriers could not readily provide"[128], and during the 1970s-1980s they consisted primarily of dispatch services.

However, after the FCC's expansion in the *SMR Eligible Users Order* of eligible users of private land mobile services to include individuals, the distinction between public and private land mobile services had become solely one of resale of telephone service for a profit, a test that was difficult to implement. As a consequence, private dispatch service increasingly resembled public cellular service, and private paging service increasingly resembled public paging service. The FCC would later admit that its decisions had "created the prospect of direct competition between private land mobile services and similar common carrier services under disparate regulatory regimes", and that it had become difficult for consumers to distinguish between private and public versions of similar services.[129]

In addition, the advances in wireless communications technology posed a variety of personal communications services and advanced cellular communication services that offered not only voice communications but also a wide variety of data communications services.

Congress was particularly concerned about the lack of regulatory parity between "services that are substantially similar", explaining that "[u]nder current law, private carriers are permitted to offer what are essentially common carrier services, while retaining private carrier status" and that "[f]unctionally, these 'private' carriers have become indistinguishable from common carriers but private land mobile carriers and common carriers are subject to inconsistent regulatory schemes."[130] As causes of this lack of regulatory parity, Congress cited the FCC's 1988 *SMR Eligible Users Order*, the NPRM that led to the 1993 *Private Carrier Paging Eligible Users Order,* and the FCC's interpretation that "the primary test for inclusion in the private and mobile radio service is that a licensee not resell interconnected telephone service for a profit".[131]

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[127] *Ibid*, para. 95.
[128] *Implementation of Sections 3(n) and 332 of the Communications Act*, GN Docket No. 93-252, Second Report and Order, 9 FCC Rcd 1411 (1994) (*Second CMRS Order*), para. 4.
[129] *Ibid,* para. 7.
[130] *Committee Report to Accompany H.R. 2264* (*Omnibus Budget Reconciliation Act of 1993)*, United States House of Representatives Committee on the Budget, H.R. Rep. No. 103-111 (1993) (*1993 Omnibus House Report*) 259-260.
[131] *Ibid* 260 n. 2 (in part quoting *Fleet Call, Inc.*, Memorandum Opinion and Order, 6 FCC Rcd 1533 (1991) (*Fleet Call Order*)).

In response, Congress desired to create regulatory parity by regulating "equivalent mobile services … in the same manner", regardless of whether they had been classified by the FCC as public or private mobile services.[132] The question was whether such equivalent mobile services should be regulated as common carrier or as noncommon carrier services. Congress viewed some private dispatch services and some private paging services were "essentially common carrier services".[133] It also found that "the disparities in the current regulatory scheme could impede the continued growth and development of commercial mobile services and deny consumers the protections they need if new services such as PCS were classified as private".[134] It thus decided that any private dispatch services, private paging services, and personal communication services that were "essentially common carrier services" should be regulated as such.

i. Statutory definition of commercial mobile service

There were multiple options for how to accomplish this in statute. The *Communications Amendments Act of 1982* had defined *mobile service* as "*a radio communication service carried on between mobile stations or receivers and land stations ...*". It then defined *private land mobile service* as "a mobile service … by eligible users …" The *Communications Amendments Act of 1982* had left *public land mobile service* as undefined in statute, but presumably considered public land mobile services to consists of all land mobile services that were not private land mobile service.

In 1993, Congress could have redefined *private land mobile service* to exclude the private dispatch services and private paging services that it perceived as common carrier services. However, facing the difficulties the FCC had created by interpreting eligible users to include individuals, Congress took the inverse approach, defining a new category of *commercial mobile services* that included both public and private land mobile services that should be regulated as common carrier services, and defining *private mobile service* as all other mobile services.

The *Omnibus Budget Reconciliation Act of 1993* first modified the definition of *mobile service* to consist of: (1) *mobile services* as previously defined in the *Communications Amendments Act of 1982*, (2) *private land mobile services* as defined in the *Communications Amendments Act of 1982*, and (3) PCS services.[135] This allowed its following actions to affect all *mobile services*, not just *land mobile services*.

Congress then introduced a new category of *commercial mobile services*, which it defined as:

> *"any mobile service ... that is provided for profit and makes interconnected service available (A) to the public or (B) to such classes of eligible users as to be effectively available to a substantial portion of the public, as specified by regulation by the Commission".*[136]

Commercial mobile service thus includes what heretofore had been considered to be either *public land mobile service* or *private land mobile service*, as well as other mobile services such as PCS, if the service has two characteristics. First, a prerequisite to classification as a *commercial mobile service* is that the service is "provided for profit" and must be available either "to the public" or "to such classes of eligible users as to be effectively available to a substantial portion of the public". The hallmark of public mobile services had historically been that they were offered to the public for a fee. The FCC had effectively

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[132] *Ibid* 259.
[133] *Ibid*.
[134] *Ibid* 260.
[135] 47 U.S.C. § 153(n).
[136] 47 U.S.C. § 332(d)(1).

dismantled this hallmark when it expanded eligibility of private services to individuals. The *Omnibus Budget Reconciliation Act of 1993* reinstates this hallmark.

Second, under the *Omnibus Budget Reconciliation Act of 1993*, another prerequisite to classification as a *commercial mobile service* is that the service be an *interconnected service*, which the Act defines as:

> *"service that is interconnected with the public switched network (as such terms are defined by regulation by the Commission) or service for which a request for interconnection is pending pursuant to subsection (c)(1)(B)"*[137]

We need to examine this requirement in detail. As discussed below, the *Restoring Internet Freedom Order* would later misinterpret this definition when applying it to mobile broadband Internet access service.

There had been no requirement in either statute or regulation that all public land mobile services be interconnected with the public switched telephone network. However, the 1982 *Cellular Communications Order* required that *commercial cellular systems* be fully interconnected with the public switched telephone network. In addition, public paging services had increasingly been interconnected with the public switched telephone network since the introduction of numeric pagers which could display the telephone number of the calling party. Thus, the two dominant forms of public land mobile service – cellular voice service and public paging service – were by 1993 interconnected with the public switched telephone network.

The *Omnibus Budget Reconciliation Act of 1993* places the common interconnection practices of public land mobile services into statute as a *prerequisite* for classification as a *commercial mobile service*. It thereby turns a *requirement* that cellular voice service be an *interconnected service* into a *prerequisite* for classification of any mobile service as a *commercial mobile service*. Notably, it does so in a technology agnostic manner, using the technology agnostic term *public switched network* in lieu of the technology specific term *public switched telephone network*, as is appropriate given the advent of personal communications services.

ii. Statutory definition of private mobile service

The *Omnibus Budget Reconciliation Act of 1993* then eliminated the 1982 statutory definition of *private land mobile service*, and defined *private mobile service* as:

> *"any mobile service … that is not a commercial mobile service or the functional equivalent of a commercial mobile service, as specified by regulation by the Commission"*[138]

Private mobile service thus includes what heretofore had been considered to be either *public land mobile service* or *private land mobile service*, as well as other mobile services such as PCS, if the service has either of two characteristics. First, any mobile service that is not "provided for profit … to the public or … to such classes of eligible users as to be effectively available to a substantial portion of the public" is classified as a *private mobile service*. The hallmark of private mobile services had historically been that they were offered only to a single company, industry, or group of industries, not to the public. The *Omnibus Budget Reconciliation Act of 1993* continues to classify such services as private mobile service.

Second, under the *Omnibus Budget Reconciliation Act of 1993*, any mobile service that is not an *interconnected service* is classified as a *private mobile service*. Historically, private mobile services had not been interconnected with the public switched telephone network, as they had they enabled communication only between the users of the particular system. Furthermore, with the introduction of cellular voice service, the *Second Land Mobile Service Order* prohibited private mobile services offered

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[137] 47 U.S.C. § 332(d)(2).
[138] 47 U.S.C. § 332(d)(3).

over non-cellular systems from full interconnection with the public switched telephone network. However, this prohibition was later relaxed in the *Second Private Land Mobile Radio Interconnection Order,* allowing interconnection provided that users or licensees made arrangements for telephone service directly with a duly authorized carrier and that there was no substantial likelihood that interconnection would impede the dispatch requirements of co-channel users. In addition, the *Communications Amendments Act of 1982* had dictated that a for-profit radio dispatch service be classified as a *private land mobile service* if it was either (1) not interconnected with a telephone exchange or interexchange service or facility or (2) interconnected only because each user obtains such interconnection directly from a duly authorized common carrier.

The *Omnibus Budget Reconciliation Act of 1993* places the common interconnection practices of private land mobile service into statute as two options for *private mobile service*. Any mobile service that is not an *interconnected service* is now classified as a *private mobile service*, even if that service is offered to the public. It thereby turns what was once a *prohibition* on interconnection of private mobile service into a *prerequisite* for classification of a mobile service that is offered to the public for a fee as a *private mobile service*.

Note, however, that the *Omnibus Budget Reconciliation Act of 1993* acknowledged but chose not to place into statute the FCC's interpretation of the prior Section 332(c)(1) that "the primary test for inclusion in the private and mobile radio service is that a licensee not resell interconnected telephone service for a profit."[139] Resale is not an element of the definition of *commercial mobile service*.

iii. Statutory definitions of interconnected and public switched network

The *Omnibus Budget Reconciliation Act of 1993* left the terms *interconnected* and *public switched network* up to the FCC to define in regulation. The FCC would initially define these terms in 1994, expand them in 2015 to reflect the development of the Internet, and revert in the 2017 *Restoring Internet Freedom Order* to the 1994 definitions.

The *House Report* accompanying the bill instructed the FCC when defining *interconnected* to "consider how that term is used and qualified in current section 332(c)(1)".[140]

The *Conference Report* notes that the use of the word "interconnected" in the definition of *commercial mobile service* in the House bill ("mobile services … that … are interconnected …") differed from that in the Senate bill ("mobile service … that … makes interconnected service available …"). The *Conference Report* adopts the Senate version, explaining that it is not sufficient that "only one aspect of the service needs to be interconnected", but that "the interconnected service must be broadly available" in order for a mobile service to be classified as a commercial mobile service.[141]

iv. Regulation of land mobile services

The *Omnibus Budget Reconciliation Act of 1993* did not determine the regulatory status of any particular mobile service, but it did require the FCC to determine the regulatory status of personal communications services within 180 days.[142]

The *Omnibus Budget Reconciliation Act of 1993* then turned to regulation of *commercial mobile services* and of *private mobile services*. It required that *commercial mobile services* be treated as common carrier services under Title II of the Communications Act. It also specified situations in which the FCC may

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[139] *1993 Omnibus House Report* 260 n. 2 (in part quoting *Fleet Call Order*).
[140] *Ibid* 262.
[141] *Conference Report to Accompany H.R. 2264* (*Omnibus Budget Reconciliation Act of 1993)*, United States Congress, H.R. Rep. No. 103-213 (1993) (*1993 Omnibus Conference Report*) 496.
[142] 47 U.S.C. § 332(c)(1)(D).

specify provisions of Title II other than sections 201, 202, and 208 as inapplicable.[143] The *Omnibus Budget Reconciliation Act of 1993* also required that *private mobile services* be treated as noncommon carrier services.[144]

Congress's rewriting of Section 332(c) finally places into statute 50 years of thinking about the characteristics of mobile services that make it either common carriage or noncommon carriage. Almost two decades earlier, the *NARUC* decisions had said that a communications service is a common carrier service only if the service is offered to the public, "be such that customers 'transmit intelligence of their own design and choosing'"[145], and the service provider "undertakes to carry for all people indifferently"[146]; and that a noncommon carrier (or "private") service "is distinguished by its being set aside for the use of particular customers, so as not to be generally available to the public"[147].

Congress now recognized that the public switched network had become so central to public mobile services that a mobile service is offered to the public indifferently if and only if it is offered to the public and it is interconnected with the public switched network. Congress also recognized that all commercial mobile services transmit intelligence of a customer's design and choosing. This latter conclusion had been unquestioned through 50 years of the history of regulation of mobile services, but would be questioned in the future.[148]

C. Second CMRS Order (1994)

In the 1994 *Second CMRS Order*, the FCC created definitions of *interconnected* and *public switched network*, and classified then-existing mobile services and personal communications services. The FCC's technology specific definition of *public switched network* would later impede the application of Section 332(c) to mobile broadband Internet access service.

i. Regulatory definitions of commercial mobile radio service (CMRS) and private mobile radio service (PMRS)

The *Order* first analyzes the statutory definition of *mobile services*, which includes (1) *mobile services* as previously defined in the *Communications Amendments Act of 1982*, (2) *private land mobile services* as defined in the *Communications Amendments Act of 1982*, and (3) PCS services. The *Order* concludes that *mobile service* included cellular voice service, public paging service, private land mobile service (principally, private dispatch services and private paging services), and licensed personal communications services, as well as others.[149]

The *Order* then analyzes the statutory definition of *commercial mobile service*, namely:

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[143] 47 U.S.C. § 332(c)(1)(A).
[144] 47 U.S.C. § 332(c)(2).
[145] *NARUC II* 608.
[146] *NARUC I* 641.
[147] *Ibid* 642.
[148] The *Telecommunications Act of 1996* also recognized that commercial mobile services is the offering of telecommunications. See *H.R. Conf. Rep. No. 104-458* (1996) 114 (explaining that the term *telecommunications service* "is intended to include commercial mobile service … to the extent that [it is] offered to the public or such classes of users as to be effectively available to the public").
[149] *Second CMRS Order*, para. 35. The *Order* also creates a regulatory definition of *mobile service*, but it is substantively identical to the statutory definition; see *Second CMRS Order* 1517.

> *"any mobile service … that is provided for profit and makes interconnected service available (A) to the public or (B) to such classes of eligible users as to be effectively available to a substantial portion of the public, as specified by regulation by the Commission".* [150]

Interpreting the phrase "for profit", the *Order* concludes that mobile services that are used by "businesses and other private entities … exclusively for internal use" and not-for-profit shared-use mobile services will be not be considered to be for profit services, and hence not considered to be *commercial mobile services*.[151] Interpreting the phrase "to such classes of eligible users as to be effectively available to a substantial portion of the public, as specified by regulation by the Commission", the *Order* concludes that this includes private mobile services which do not limit eligible users to "internal use or … to a significantly restricted class of eligible users", e.g. private dispatch services and private paging services that are offered to individuals.[152]

The *Order* not only interprets the statutory definition of *commercial mobile service* but also creates a regulatory definition of *commercial mobile radio service (CMRS)* that mirrors the statutory definition:

> "*A mobile service that is: (1)(A) provided for profit, i.e., with the intent of receiving compensation or monetary gain; (B) an interconnected service; and (C) available to the public, or to such classes of eligible users as to be effectively available to a substantial portion of the public; or (2) the functional equivalent of such a mobile service described in paragraph (1).*"[153]

The regulatory definition of *commercial mobile radio service* differs from the statutory definition of *commercial mobile service* by clarifying the meaning of "for profit", by replacing "a mobile service that … makes interconnected service available … to the public" with "a mobile service that is … an interconnected service", and by incorporating the functional equivalent test into the definition of CMRS itself[154].

The *Order* then analyzes the statutory definition of *private mobile service*, namely:

> *"any mobile service … that is not a commercial mobile service or the functional equivalent of a commercial mobile service, as specified by regulation by the Commission"*[155]

The *Order* creates a regulatory definition of *private mobile radio service (PMRS)* that mirrors the statutory definition:

> "*Private Mobile Radio Service. A mobile service that is neither a commercial mobile radio service nor the functional equivalent of a service that meets the definition of commercial mobile radio service …*"[156]

ii. Regulatory definitions of interconnected, interconnected service, and public switched network

The *Order* then analyzes the statutory definition of *interconnected service*, including the requirement that the FCC define the terms *interconnected* and *public switched network*.

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[150] 47 U.S.C. § 332(d)(1).
[151] *Ibid*, paras. 44, 47.
[152] *Ibid*, paras. 67-68.
[153] *Ibid* 1516.
[154] The inclusion of functionally equivalent services in CMRS addressed an ambiguity in the statute concerning whether a functionally equivalent service is a commercial mobile service. As a result, every mobile service is either a CMRS or a PMRS, but not both.
[155] 47 U.S.C. § 332(d)(3).
[156] *Second CMRS Order* 1517. The definition also states which existing (at the time) mobile services were included in the classification of PMRS.

The *CMRS NPRM* preceding the *Order* distinguished between *physical interconnection* of networks and *interconnected service*, stating that "Congress intended by use of the term 'interconnected service' to distinguish between those communications systems that are physically interconnected with the network and those systems that are not only interconnected but that also make interconnected service available".[157] The *Order* adopts this distinction.

The *Order* first examines the context in which the phrase *interconnected service* was used, namely that *commercial mobile service* "makes interconnected service available … to the public …". Noting the *Conference Report's* instructions that in order for an interconnected service to be classified as a *commercial mobile service* the "interconnected service must be broadly available" to the public, the *Order* states that "[t]he purpose underlying the congressional approach, we conclude, is to ensure that a mobile service that gives its customers the capability to communicate to or receive communication from other users of the public switched network should be treated as a common carriage offering …".[158] The *Order* also briefly considers services that are "interconnected through an intermediary that is interconnected to the public switched network"[159], and agrees that "[a] mobile service that offers service indirectly interconnected to the PSN through an interconnected commercial mobile radio service, such as a cellular carrier, will be deemed to offer interconnected service because messages could be sent to or received from the public switched network via the cellular carrier."[160]

The *Order*, however, goes further than this interpretation of the context in which the phrase *interconnected service* was used. First, it adds a prerequisite that an *interconnected service* not only give its users "the capability to communicate to or receive communication from other users of the public switched network" but that it "that allows subscribers to send or receive messages to or from *anywhere* on the public switched network."[161] In doing so, it clarifies that "anywhere" would be interpreted to include "a service that provides general access to points on the PSN [but] also restricts calling in certain limited ways".[162]

Second, despite that the statute had already defined *interconnected service* as:

> "s*ervice that is interconnected with the public switched network (as such terms are defined by regulation by the Commission) or service for which a request for interconnection is pending pursuant to subsection (c)(1)(B)"*[163],

the *Order* nevertheless creates a regulatory definition of the same term as:

> *"[a] service (1) that is interconnected with the public switched network, or interconnected with the public switched network through an interconnected service provider, that gives subscribers the capability to communicate to or receive communication from all other users on the public switched network; or (2) for which a request for such interconnection is pending pursuant to Section 332(c)(l)(B) of the Communications Act, 47 U.S.C. § 332(c)(l)(B). A mobile service offers interconnected service even if the service allows subscribers to access the public switched network only during specified hours of the day, or if the service provides general access to points on the public switched network but also restricts access in certain limited ways. Interconnected service*

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[157] *Implementation of Sections 3(n) and 332 of the Communications Act; Regulatory Treatment of Mobile Services*, Notice of Proposed Rule Making, 8 FCC Rcd 7988 (1993) (*CMRS NPRM*), para. 15.
[158] *Second CMRS Order*, para. 54.
[159] *Ibid*, para. 52.
[160] *Ibid*, para. 60.
[161] *Ibid*, para. 55 (emphasis not in original).
[162] *Ibid*, para. 55 n. 104.
[163] 47 U.S.C. § 332(d)(2).

> *does not include any interface between a licensee's facilities and the public switched network exclusively for a licensee's internal control purposes."*[164]

This definition substitutes "all other users" for "anywhere", and incorporates the FCC's guidance regarding the interpretation of "anywhere", interconnection via an interconnected service provider, and private use of interconnection. The *Order* does not justify why it believes that Congress intended *interconnected service* to enable communication with all other users on the public switched network, nor does it comment on the prerequisites for such communication, a topic to which we will shortly return as it will feature prominently in future proceedings.

The *Order* then turns to the statutory mandate that the FCC define the terms *interconnected* and *public switched network*. The *Order* notes that the term *interconnection* had been defined differently by the FCC in the context of public versus private land mobile service. In the context of interconnection between a cellular carrier's network and another common carrier's network, the FCC had previously (for the purposes of enforcing the Section 201 interconnection requirement for common carriers to "establish physical connections with other carriers") defined *physical interconnection* as:

> "*the facilities connection (by wire, microwave or other technologies) between the end office of a landline network and the mobile telephone switching office (MTSO) of a cellular network or the hardware or software, located within a carrier's central office, which is necessary to provide interconnection.*"[165]

However, in the context of interconnection between a private land mobile service's network and a common carrier's network, the FCC had previously defined *interconnection* as:

> "*Connection through automatic or manual means of private land mobile radio stations with the facilities of the public switched telephone network to permit the transmission of messages or signals between points in the wireline or radio network of a public telephone company and persons served by private land mobile radio stations."*[166]

The *Order* adopts language similar to the latter definition, defining *interconnection or interconnected* for the purposes of Section 332(c) as:

> "*Direct or indirect connection through automatic or manual means (by wire, microwave, or other technologies such as store and forward) to permit the transmission or reception of messages or signals to or from points in the public switched network.*"[167]

The *Order* does not explain why it chose this definition, other than to explain that it intends for this language to "encompass mobile service providers using store and forward technology".[168]

The *Order* then defines the term *public switched network*. It notes that the FCC had "frequently used the term 'public switched telephone network' (PSTN) to refer to the local exchange and interexchange common

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[164] *Second CMRS Order* 1516-1517.
[165] *Ibid*, para. 56 n. 106, citing *Need To Promote Competition and Efficient Use of Spectrum for Radio Common Carrier Services*, Declaratory Ruling, 2 FCC Red 2910 (1987) 2918 n.27.
[166] *Ibid*, para. 56 n. 107, citing 47 C.F.R. § 90.7. The definition also states that "[w]ireline or radio circuits or links furnished by common carriers, which are used by licensees or other authorized persons for transmitter control (including dial-up transmitter control circuits) or as an integral part of an authorized, private, internal system of communication or as an integral part of dispatch point circuits in a private land mobile radio station are not considered to be interconnection for purposes of this rule part."
[167] *Ibid* 1516.
[168] *Ibid*, para. 57.

carrier switched network, whether by wire or radio."[169] Drawing upon the *Order's* regulatory definition of *interconnected service* as a "service … that gives subscribers the capability to communicate to or receive communication from all other users on the public switched network", the *Order* states that "[t]he purpose of the public switched network is to allow the public to send or receive messages to or from anywhere in the nation."[170]

The *Order* then states that there are two key elements to defining *public switched network*. First, it claims that "use of the North American Numbering Plan by carriers providing or obtaining access to the public switched network is a key element in defining the network because participation in the North American Numbering Plan provides the participant with ubiquitous access to all other participants in the Plan."[171] Second, it states that switching should encompass "any common carrier switching capability, not only a local exchange carrier's switching capability".[172]

On this basis, it defines *public switched network* as:

> "*Any common carrier switched network, whether by wire or radio, including local exchange carriers, interexchange carriers, and mobile service providers, that use the North American Numbering Plan in connection with the provision of switched services.*"[173]

iii. Classification of mobile services

To implement its statutory mandate, the *Order* classified then-existing mobile services and personal communications services.

With respect to specialized mobile radio services, the *Order* notes that most licensees offer for-profit service to the public, and that existing FCC rules allowed but did not require the service to be interconnected. Thus, it classifies a specialized mobile radio service as CMRS if and only if it is an interconnected service.[174]

With respect to private paging services, the *Order* notes that those services used for private internal paging systems are not offered to the public and are thus classified as PMRS, while those services offered for-profit to the public are interconnected service and are thus classified as CMRS.[175] The *Order* also finds that cellular services and public paging services are for-profit interconnected services offered to the public, and are thus classified as CMRS.[176]

With respect to personal communications services, the *Order* first notes that the prior *PCS Orders* had defined personal communications services as "radio communications … that provide services to individuals and businesses …" and had set high build-out requirements, and hence concludes that there should be a presumption that PCS is a service available to the public.[177] The *Order* also notes that the prior *PCS Orders* had defined personal communications services as "radio communications … that … can be integrated with a variety of competing networks", and hence concludes that there should be a presumption that PCS is an interconnected service.[178]

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[169] *Ibid*, para. 59.
[170] *Ibid.*
[171] *Ibid*, para. 60.
[172] *Ibid.*
[173] *Ibid* 1517.
[174] *Ibid,* para. 90.
[175] *Ibid*, para. 97.
[176] *Ibid*, para. 102.
[177] *Ibid*, paras. 118-121.
[178] *Ibid*, para. 119.

D. Critique of the Second CMRS Order

The *Second CMRS Order* was sloppy in several respects that would cause problems in future proceedings, as the Internet matured.

i. Commercial mobile service vs. commercial mobile radio service

The *Omnibus Budget Reconciliation Act of 1993* defines *commercial mobile service*, and requires that a *commercial mobile service* be treated as a common carrier service. The *Order* not only interprets the statutory definition of *commercial mobile service* but also creates a regulatory definition of *commercial mobile radio service (CMRS)* that mirrors the statutory definition. To the extent that these two definitions differ, the statutory definition remains the only pertinent definition for the purposes of Section 332(c)'s requirement that a *commercial mobile service* be treated as a common carrier service. As discussed below, this will become an issue due to the differences between the statutory and regulatory definitions of *interconnected service*.

ii. Interconnected

The *Order* started by creating a regulatory definition of *interconnected service*, which Congress had *not* asked the FCC to do, as the *Omnibus Budget Reconciliation Act of 1993* had already created a statutory definition of *interconnected service*. The *Order* then defined *interconnection* and *public switched network* so that its regulatory definition of *interconnected service* satisfied what it believed was Congress's intent.

A more logical approach would have been to first define *interconnected*, then define *public switched network* as those public networks that are interconnected, and then finally interpret (but not redefine) *interconnected service*. We follow that approach here.

In defining *interconnected*, the *Order* looked back to the FCC's own prior use of the term *interconnection*. It properly noted its different definitions of *interconnection* in the context of interconnection between a cellular carrier's network and another common carrier's network and in the context of interconnection between a private land mobile service's network and a common carrier's network. It then blended the two definitions to define *interconnection or interconnected* for the purposes of Section 332(c) as "[d]irect or indirect connection through automatic or manual means (by wire, microwave, or other technologies such as store and forward) to permit the transmission or reception of messages or signals to or from points in the public switched network."[179]

The *Order* should have also looked at the way in which the term *interconnection* was used in statute (namely in the Section 201 of the Communications Act and in the *Communications Amendments Act of 1982*). However, in the end the definition is consistent with those statutes.

iii. Public switched network

There is a long history of both Congress and the FCC using technology agnostic terms whenever possible. Congress's use of the technology agnostic term *public switched network,* instead of the technology specific term *public switched telephone network,* is consistent with this history. In addition, Congress's delegation to the FCC of the definition of this term should be interpreted as a grant of authority intended to allow the expert agency to periodically adapt the definition as technology requires.

The *Order* recognized the value of a technological agnostic definition:

> "The Commission has frequently used the term 'public switched telephone network' (PSTN) to refer to the local exchange and interexchange common carrier switched network, whether by wire

[179] *Ibid* 1516.

> or radio. … We agree with commenters that the network should not be defined in a static way. We believe this interpretation is also more consistent with the use of the term 'public switched network,' rather than the more technologically based term 'public switched telephone network.' The network is continuously growing and changing because of new technology and increasing demand. The purpose of the public switched network is to allow the public to send or receive messages to or from anywhere in the nation."[180]

The *Order* is exactly right here. Indeed, mobile technology had been rapidly progressing in the early 1990s to expand beyond telephone-based services (cellular voice service, paging, and dispatch) to data communications services, as Congress was well aware of when it explicitly included personal communications services in its redefinition of *mobile services*. Both the telephone-based services and the data communication services were offered over the same switched networks, namely local exchange networks, interexchange networks, and mobile service provider networks. The *Order* properly recognized this when it started its definition of *public switched network* with "[a]ny common carrier switched network, whether by wire or radio, including local exchange carriers, interexchange carriers, and mobile service providers …".

However, then the *Order* made a critical mistake. It continued the definition of *public switched network* with "… that use the North American Numbering Plan in connection with the provision of switched services." This limitation of the *public switched network* to networks that use the North American Numbering Plan (NANP) is a technology specific formulation.

The *Order* explains that its intent in doing so was that "use of the North American Numbering Plan by carriers providing or obtaining access to the public switched network is a key element in defining the network because participation in the North American Numbering Plan provides the participant with ubiquitous access to all other participants in the Plan" and that "'this approach to the public switched network is consistent with creating a system of universal service where all people in the United States can use the network to communicate with each other."[181]

However, the limitation to networks that use NANP is neither necessary nor appropriate to provide users with such access. The goal is to provide users with interconnected service. Interconnected service merely requires that networks be interconnected in a manner that allows users to transmit messages to or receive messages from other users of interconnected services, providing users have compatible devices. No specific addressing scheme, such as NANP, need be specified. Indeed, existing paging services used a combination of NANP and proprietary addressing schemes to route messages to pagers. Furthermore, emerging personal communications services used Internet Protocol (IP) or other data communications addresses for such purposes, and yet the FCC would in the very same *Order* conclude that personal communications services are presumptively classified as commercial mobile radio services.[182]

The *Order* should *not* have added "… that use the North American Numbering Plan in connection with the provision of switched services" to the definition of *public switched network*. It should have instead defined the *public switched network* as "the network consisting of interconnected common carrier switched networks, whether by wire or radio, including local exchange carriers, interexchange carriers, and mobile service providers". This approach would have been technology agnostic, and would have included the personal communications services that were already being classified as *commercial mobile radio services*.

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[180] *Ibid*, para. 59.
[181] *Ibid*, para. 60.
[182] *Ibid*, para. 118.

iv. Interconnected service

The *Omnibus Budget Reconciliation Act of 1993* defined *interconnected service* as "service that is interconnected with the public switched network (as such terms are defined by regulation by the Commission) or service for which a request for interconnection is pending pursuant to subsection (c)(1)(B)"[183]. That *Act* required that the FCC define the terms *interconnected* and *public switched network*. It neither required nor invited the FCC to redefine the term *interconnected service*. Nevertheless, the *Order* did so, creating a regulatory version of that term. This creates two problems.

First, in the FCC's regulatory definition of *interconnected service*, it not only requires that an interconnected service be "interconnected with the public switched network" but also "give[] subscribers the capability to communicate to or receive communication from all other users on the public switched network."[184] This requirement goes beyond the substitution of the definition of *interconnected*, which had only required that a connection "permit the transmission or reception of messages or signals to or from points in the public switched network".[185]

It thus adds two new requirements: (1) that an interconnected service not only "permit" the transmission or reception of messages or signals, but that it also "gives subscribers the capability", and (2) that it not only provide that capability "to or from points in the public switched network" but that it also provide that capability "to or … from all other users on the public switched network". The FCC was not permitted by the *Omnibus Budget Reconciliation Act of 1993* to add these requirements. Furthermore, neither of these new requirements are justified in the *Order*. Finally, neither requirement is consistent with the actual operation of interconnected services. As discussed in Section 7, an interconnected service does not by itself give the subscribers the capability to communicate to or receive communications from all other users on the public switched network. This communication requires that other users have compatible interconnected service and compatible devices.

Second, by creating regulatory definition of *interconnected service*, the statutory and regulatory versions of the term have relevance in different scopes. The regulatory definition applies where it appears in the FCC's regulatory definition of *commercial mobile radio service* and correspondingly in the FCC's rules pertaining to *commercial mobile radio service*. The statutory definition, however, remains the only pertinent definition for the purposes of interpreting the statutory term *commercial mobile service* and correspondingly in Section 332(c)'s requirement that a *commercial mobile service* be treated as a common carrier service.

6. MOBILE BROADBAND INTERNET ACCESS SERVICE

By the late 1990s, cellular voice service was exploding, and dial-up Internet access service was blossoming. It would only be a matter of time before consumers wanted to access the Internet over their cell phones. Smart phones were introduced in the mid-2000s. Regulatory policy needed to confront the regulatory classification of mobile broadband Internet access service.

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[183] 47 U.S.C. § 332(d)(2).
[184] *Second CMRS Order* 1516-1517.
[185] *Ibid* 1516.

A. The Introduction of Mobile Internet Access Service (mid-1990s to 2006)

By the early 1990s, *commercial mobile radio service* already included a number of data communications services, including paging, two-way text messaging, e-mail, and faxes.[186]

During the late 1990s, dial-up Internet access service was blossoming. As a consequence, equipment providers created "circuit-switched" cellular modems which could connect a personal computer to a dial-up Internet access service via a user's cellular voice service, much as wireline modems connected a personal computer to a dial-up Internet service via a user's wireline voice service. This technology, however, required the user to dial the Internet Service Provider, and was limited by the usable bandwidth of the cellular voice service, which generally offered only a 19.2 kbps connection.[187] Routing was provided using a combination of NANP telephone numbers and Internet Protocol (IP) addresses; a user first dialed a NANP telephone number corresponding to the Internet Service Provider (ISP) to establish a voice connection, and then the applications that a user runs transmitted packets to the intended destination IP address. The information was transmitted over at least two interconnected networks: the mobile service provider's wireless network and the ISP's network.

In response, "packet-switched" data transmission services were created over broadband PCS and cellular networks.[188] Packet-switching technology transmits data in packets over network capacity not used by voice calls. It offered an "always-on" connection, without requiring the user to dial an Internet service Provider. Early versions offered 19.2 kbps connections[189]. Packet-switched data transmission uses Internet Protocol (IP) addresses to route data. In addition, because no dial-up connection need be established, NANP telephone numbers were no longer required to establish a connection. These packet-switched data transmission services were classified as *commercial mobile radio services*, regardless of their lack of use of NANP in connection with provision of the packet-switched service.[190] The information is transmitted over at least two interconnected networks: the mobile service provider's wireless network and the ISP's network. The mobile service provider's network used to transmit data transmission services overlaps with the mobile service provider's network used to transmit mobile voice services; at a minimum, they share the same wireless network and a portion of the wired network.

By the late 1990s, cellular technology progressed from 1G, in which mobile voice services were transmitted using an analog signal, to 2G, in which both mobile voice services and text messages were transmitted using a digital signal. The conversion from analog to digital transmission improved the speeds of packet-switched data transmission over cellular networks above that possible using circuit-switched cellular modems, often to 56 kbps.[191] Common carriers started offering mobile Internet access service to laptops

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[186] *Implementation of Section 6002(b) of the Omnibus Budget Reconciliation Act of 1993; Annual Report and Analysis of Competitive Market Conditions With Respect to Commercial Mobile Service,* 13 FCC Rcd 19746 (1998) (*Third CMRS Competition Report*) 55.
[187] *Ibid* 57.
[188] *Ibid* 58.
[189] See e.g. *Ibid* 58 (describing services utilizing the cellular digital packet data (CDPD) data communications protocol).
[190] See e.g. *Application of Motorola, Inc. Transferor, and American Mobile Satellite Corporation, Transferee, For Consent to Transfer Control of Ardis Company,* Memorandum Opinion and Order, DA-980514 (1998), para. 4 (stating that Ardis's data transmission service is regulated a commercial mobile radio service).
[191] See e.g. data transmission services using the Generalized Packet Radio Service (GPRS) data communications protocol.

using compatible packet-switched wireless modems, as well as to feature phones.[192] Webpages intended for viewing on mobile devices at these relatively low speeds blossomed.[193] Feature phones offering email access and rudimentary web browsing also blossomed. Consumers could either purchase only a mobile voice plan (for basic phones), a mobile voice plus data plan (for feature phones), or only a mobile data plan (for laptops). Mobile Internet access service (whether bundled with a mobile voice plan or offered as a standalone data plan) was classified as a *commercial mobile radio service*, regardless of its lack of use of NANP in connection with provision of the packet-switched service.[194]

By 2006, cellular technology was progressing from 2G to 3G. The principal improvement was an increase in the speed of data communications, with download speeds typically exceeding 200 kbps. Common carriers widely offered mobile Internet access service to laptops using compatible packet-switched wireless modems, as well as to smartphones.[195] With the increase in download speeds, more webpages were intended for viewing on mobile devices, and they shared more content with the version of those webpages intended for viewing on fixed devices. Feature phones offering email access and rudimentary web browsing had become more popular than basic voice-only cell phones. Smartphones (e.g. Blackberry devices) offering email access and web browsing were becoming popular, and the first iPhone was about to be introduced. Consumers could either purchase only a mobile voice plan (for basic phones), a mobile voice plus data plan (for feature or smartphones), or only a mobile data plan (for laptops), but mobile voice-only plans were now the minority.[196] Mobile Internet access service (whether bundled with a mobile voice plan or offered as a standalone data plan) continued to be classified as a *commercial mobile radio service*, regardless of its lack of use of NANP in connection with provision of the packet-switched service.[197]

B. Wireless Broadband Declaratory Ruling (2007)

i. Background: classification of cable modem service and wireline broadband Internet access service

In the 2002 *Cable Modem Declaratory Ruling*, the FCC considered an early version of broadband facilities-based Internet access service offered by cable companies. The service, called *cable modem service*, is defined as "a service that uses cable system facilities to provide residential subscribers with high-speed Internet access, as well as many applications or functions that can be used with high-speed Internet access."[198] In turn, *high-speed Internet access* is defined as a service that "enables consumers to communicate over the Internet at speeds that are many times faster than the speeds offered through dial-up telephone connections".[199] Finally, the Internet is defined as the global information system that -- (i) is

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[192] *Implementation of Section 6002(b) of the Omnibus Budget Reconciliation Act of 1993; Annual Report and Analysis of Competitive Market Conditions With Respect to Commercial Mobile Service,* 17 FCC Rcd 12985 (2002) (*Seventh CMRS Competition Report*), Section II.B.

[193] The format was called Wireless Markup Language, and the communications protocol was called Wireless Application Protocol (WAP).

[194] *Implementation of Section 6002(b) of the Omnibus Budget Reconciliation Act of 1993; Annual Report and Analysis of Competitive Market Conditions With Respect to Commercial Mobile Service,* 18 FCC Rcd 14783 (2003) (*Eighth CMRS Competition Report*) 61-63, 71-73.

[195] *Seventh CMRS Competition Report*, Section II.B.

[196] *Implementation of Section 6002(b) of the Omnibus Budget Reconciliation Act of 1993; Annual Report and Analysis of Competitive Market Conditions With Respect to Commercial Mobile Service,* 21 FCC Rcd 10947 (2006) (*Eleventh CMRS Competition Report*) 72.

[197] *Eleventh CMRS Competition Report* 12-13.

[198] *Internet Over Cable Declaratory Ruling et al.,* Declaratory Ruling and Notice of Proposed Rulemaking, 17 FCC Rcd 4798 (2002) (*Cable Modem Declaratory Ruling*), para 31.

[199] *Ibid*, para 1 n. 1.

logically linked together by a globally unique address space based on the Internet Protocol (IP) or its subsequent extensions/follow-ons; (ii) is able to support communications using the Transmission Control Protocol/Internet Protocol (TCP/IP) suite or its subsequent extensions/follow-ons, and/or other IP-compatible protocols; and (iii) provides, uses or makes accessible, either publicly or privately, high level services layered on the communications and related infrastructure described herein."[200]

The *Declaratory Ruling* found that cable modem service was solely an information service.[201] However, its finding contained several errors, including failing to analyze the characteristics of the transmission of data provided as part of the service in order to determine which parts constitute telecommunications; failing to analyze whether the offering of a capability for generating, acquiring, storing, transforming, processing, retrieving, utilizing, or making available information falls within the telecommunications systems management exception; and providing an analysis claiming the underlying telecommunications is inseparable from the information service capabilities that conflicts with the factual particulars of how Internet technology works.[202] These errors undermine the *Declaratory Ruling's* classification of *cable modem service* as solely an information service.

In the 2005 *Wireline Broadband Classification Order*, the FCC reconsiders the early version of broadband facilities-based Internet access service offered by telephone companies using DSL and packet switching technology, which had in the 1998 *Advanced Services Order*[203] been classified as a telecommunications service. *Wireline broadband Internet access service* is defined as "a service that uses existing or future wireline facilities of the telephone network to provide subscribers with Internet access capabilities."[204] In turn, *Internet access service* is defined as "a service that always and necessarily combines computer processing, information provision, and computer interactivity with data transport, enabling end users to run a variety of applications such as e-mail, and access web pages and newsgroups."[205]

The FCC sought to determine the regulatory classification of *wireline broadband Internet access service*. The *Order* found that *wireline broadband Internet access service* was solely an information service.[206] However, its finding contained the same errors as did the *Cable Modem Declaratory Ruling*, undermining the *Order's* classification of *wireline broadband Internet access service* as solely an information service.[207]

ii. Classification of wireless broadband Internet access service as solely an information service

In 2007, the FCC considered a version of mobile Internet access service offered by mobile service providers. It states that "[t]he Commission has not previously considered the appropriate classification of wireless broadband Internet access service"[208], ignoring the provider's own classifications of similar services as *commercial mobile radio services* ever since common carriers started offering mobile Internet access service.

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[200] *Ibid*, para 1 n. 1.
[201] *Ibid*, para. 38.
[202] S. Jordan, 'Broadband Internet Access Service is a Telecommunications Service' Federal Communications Law Journal (forthcoming) https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3239632 (*Jordan Title II paper*), section 6.B.
[203] *Deployment of Wireline Services Offering Advanced Telecommunications Capability*, Memorandum Opinion and Order and Notice of Proposed Rulemaking, 13 FCC Rcd 24012 (1998) (*Advanced Services Order*).
[204] *Appropriate Framework for Broadband Access to the Internet Over Wireline Facilities et al.*, Report and Order and Notice of Proposed Rulemaking, 20 FCC Rcd 14853 (2005) (*Wireline Broadband Classification Order*), para. 9.
[205] *Ibid*, para. 9.
[206] *Ibid*, paras. 14, 104.
[207] *Jordan Title II paper*, section 6.D.
[208] *Wireless Broadband Declaratory Ruling*, para. 3.

The FCC's 2007 *Wireless Broadband Declaratory Ruling* defines *wireless broadband Internet access service* as "a service that uses spectrum, wireless facilities and wireless technologies to provide subscribers with high-speed (broadband) Internet access capabilities."[209] For purposes of the proceeding, *broadband* is defined as "services with over 200 kbps capability in at least one direction".[210] The *Declaratory Ruling* does not define "high speed (broadband) Internet access capabilities", but it claims that Internet access is a service "that inextricably combines the transmission of data with computer processing, information provision, and computer interactivity, for the purpose of enabling end users to run a variety of applications".[211] The *Declaratory Ruling* does not discuss the various components of *wireless broadband Internet access service.* The brief discussion of applications simply states that these applications are "identical to those provided by cable modem service, wireline broadband Internet access, or BPL-enabled Internet access."[212] Recall that the *Wireline Broadband Classification Order* described these applications as including e-mail, web browsing, and newsgroups.

The FCC first sought to determine whether *wireless broadband Internet access service* should be classified as a *telecommunications service*, as an *information service*, or as a combination of both. The *Declaratory Ruling* found that wireless broadband Internet access service is solely an information service.[213] This finding relies on the similar findings in the *Cable Modem Declaratory Ruling* and the *Wireline Broadband Classification Order*. Correspondingly, this finding contained the same errors as did the two earlier proceedings, undermining the *Declaratory Ruling's* classification of *wireless broadband Internet access service* as solely an *information service*.

iii. The Declaratory Ruling's finding that mobile wireless broadband Internet access service is not an interconnected service

Our focus in this paper, however, lies in the regulatory classification of mobile wireless broadband Internet access service as either a commercial or private mobile service. The *Declaratory Ruling* defines *mobile wireless broadband Internet access service* as "wireless broadband Internet access service that meets the 'mobile service' definition contained in the Act and the Commission's rules."[214]

It then finds that *mobile wireless broadband Internet access service* does not meet the regulatory definition of *interconnected service*, because "[m]obile broadband Internet access service in and of itself does not provide this capability to communicate with all other users of the public switched network."[215] The *Declaratory Ruling* explains that:

> "Mobile wireless broadband Internet access services do not use the North American Numbering Plan to access the Internet, which limits subscribers' ability to communicate to or receive communications from *all* users in the public switched network. Instead, users of a mobile wireless broadband Internet access service need to rely on another service or application, such as certain voice over Internet Protocol (VoIP) services that rely in part on the underlying Internet access service, to make calls to, and receive calls from, 'all other users on the public switched network.' Therefore, mobile wireless broadband Internet access service itself is not an 'interconnected service' as the Commission has defined the term in the context of

[209] *Ibid*, para. 19.
[210] *Ibid*, para. 19 n. 55.
[211] *Ibid*, para. 26.
[212] *Ibid.*
[213] *Ibid*, paras. 26, 31.
[214] *Ibid*, para. 37 n. 96.
[215] *Ibid*, para. 45.

section 332."[216]

The *Declaratory Ruling* makes several errors in this finding.

First, the *Declaratory Ruling* fails to analyze whether *mobile wireless broadband Internet access service* meets the statutory definition of *interconnected service*. It is, after all, the statutory definition (not the regulatory definition) that is used to determine whether mobile broadband Internet access service is a *commercial mobile service*, and thus whether it is a common carrier service under Section 332(c). The *Declaratory Ruling* should thus have asked whether *mobile wireless broadband Internet access service* is a "service that is interconnected with the public switched network (as such terms are defined by regulation by the Commission)."

Recall that *public switched network* had been defined by the FCC as "[a]ny common carrier switched network, whether by wire or radio, including local exchange carriers, interexchange carriers, and mobile service providers, that use the North American Numbering Plan in connection with the provision of switched services." If a mobile wireless broadband Internet access service provider also offers mobile voice service, then at least a portion of its network[217] is a common carrier switched network. Furthermore, this portion of its network uses the North American Numbering Plan in connection with the provision of switched services (at a minimum, mobile voice service). Thus, at least this portion of such a mobile wireless broadband Internet access service provider's network is a part of the public switched network.

Substituting the regulatory definition of *interconnected* into the statutory definition of *interconnected service* yields:

> "a service that is direct[ly] or indirect[ly] connect[ed] through automatic or manual means (by wire, microwave, or other technologies such as store and forward) to permit the transmission or reception of messages or signals to or from points in the public switched network …"

If a mobile wireless broadband Internet access service provider also offers mobile voice service, then users of mobile wireless broadband Internet access service are "points in the public switched network". Furthermore, mobile broadband Internet access service is directly connected through automatic means (by store and forward) to permit the transmission and reception of messages to and from other users of mobile wireless broadband Internet access service (not to mention users of fixed broadband Internet access service). It follows that mobile wireless broadband Internet access service (at least when offered by a provider that also offers mobile voice service) satisfies the statutory definition of *interconnected service*.

Second, even using the regulatory definition of *interconnected service*, the *Declaratory Ruling* fails in its analysis. As before, at least a portion of a mobile wireless broadband Internet access service provider's network is a part of the public switched network if it also offers mobile voice service. And thus, as before, mobile wireless broadband Internet access service is interconnected with public switched network. The question of whether it is an *interconnected service*, under the regulatory definition of the term, thus comes down to whether it is a "service … that gives subscribers the capability to communicate to or receive communication from all other users on the public switched network".

Recall that this regulatory definition of *interconnected service* adds two requirements above that of the statutory definition of *interconnected service*: that an interconnected service not only "permit" the transmission or reception of messages or signals, but that it also "gives subscribers the capability", and that

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[216] *Ibid.*

[217] At a minimum, the wireless portion of the network and the wireline portion of the network between the wireless network and a Mobile Switching Center.

it not only provide that capability "to or from points in the public switched network" but that it also provide that capability "to or … from all other users on the public switched network". Ignoring for the moment that the FCC was not permitted by the *Omnibus Budget Reconciliation Act of 1993* to add these requirements, these requirements must be interpreted in the context of other commercial mobile services.

As discussed in more detail in Section 7, an interconnected service does not by itself give the subscribers the capability to communicate to or receive communications from all other users on the public switched network. This communication requires that other users have compatible interconnected services and compatible devices. For example, paging service does not by itself gives subscribers the capability to receive communication from all other users on the public switched network; this capability requires that the source has subscribed to telephone exchange service, that the source party has a device capable of transmitting a paging message (e.g. a wireline or mobile phone), and that the destination party has a device capable of receiving a paging message (e.g. a pager). The *Declaratory Ruling's* finding that "mobile wireless broadband Internet access service itself is not an 'interconnected service'" if it relies on "another service or application, such as certain voice over Internet Protocol (VoIP) services", would if applied to paging service render paging service *not* an interconnected service. This interpretation is thus clearly not reasonable.

iv. The Declaratory Ruling's finding that mobile wireless broadband Internet access service is not a commercial mobile service

Having found that mobile broadband Internet access service is not an interconnected service under the regulatory definition of the term, the *Declaratory Ruling* then argues that mobile wireless broadband Internet access service is not a *commercial mobile service* even if it were an *interconnected service*.[218]

Its rationale for this argument is that classification of a mobile service as both an *information service* and a *commercial mobile service* "results in an internal contradiction in the statutory framework" because Section 332(c) would require that the mobile service be regulated as a common carrier service while Section 3 would preclude such regulation.[219] The *Declaratory Ruling* resolves this contradiction by concluding that a mobile service that is an *information service* is not a *commercial mobile service*, even if it satisfies the definition of *commercial mobile service*.

That way out of the contradiction, however, is problematic to say the least. As the *Declaratory Ruling* itself recognizes[220], there is no reasonable basis for giving more weight to Section 3 over Section 332. Furthermore, as the *Declaratory Ruling* itself also recognizes[221], under the *Telecommunications Act of 1996*, *telecommunications service* was intended to include *commercial mobile service*. In other words, the *1996 Act* requires that if a mobile service satisfies the definition of a *commercial mobile service*, it must also be classified as a *telecommunications service*. The *1996 Act* did this because Congress recognized that all commercial mobile services constitute telecommunications (namely, the transmission, between or among points specified by the user, of information of the user's choosing, without change in the form or content of the information as sent and received), and thus a mobile service satisfies the definition of a

[218] *Wireless Broadband Declaratory Ruling*, para. 48.
[219] *Ibid.*
[220] *Ibid*, para. 52.
[221] *Ibid*, para. 40.

telecommunications service if it is offered to the public or such classes of users as to be effectively available to the public.[222]

This gives a much more reasonable way to resolve the apparent contradiction. A mobile service that satisfies the definition of a *commercial mobile service* is a *telecommunications service*, because the 1996 Act dictates this outcome. The *Declaratory Ruling's* finding that wireless broadband Internet access service is solely an *information service* is trumped by the statutory requirement that it be a *telecommunications service*.

The *Declaratory Ruling* should have conducted this analysis, and it should have recognized that what it viewed as an apparent contradiction indicated an error in either its finding that mobile broadband Internet access service is solely an *information service* (e.g. because it got the factual particulars of how Internet technology works wrong) and/or its finding that mobile broadband Internet access service is a *commercial mobile service* (because it analyzed it under the regulatory definition of *interconnected service* rather than the statutory definition of *interconnected service*).

C. The Evolution of Mobile Broadband Internet Access Service (2007-2018)

After 2007, both the technology and deployment of mobile data services continued to evolve rapidly. By 2010, 3.5G technologies had been widely deployed, with typical download speeds of 600 kbps – 1.4 Mbps.[223] By 2014, 4G technologies had been widely deployed, with median download speeds of 1 Mbps – 9 Mbps.[224] By 2017, median LTE download speeds reached 15 Mbps.[225]

By 2009 mobile data traffic in the United States exceeded mobile voice traffic[226], by 2014 mobile data generated over ten times the volume of mobile voice[227], and by 2018 mobile data generated over fifty times the volume of mobile voice[228]. By 2012, the majority of mobile phone users in the United States had a smartphone, and by 2018 87% did.[229] By 2012, the average mobile phone user in the United States spent

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[222] See *H.R. Conf. Report 104-458* 114 (explaining that the term *telecommunications service* "is intended to include commercial mobile service … to the extent that [it is] offered to the public or such classes of users as to be effectively available to the public").

[223] *Implementation of Section 6002(b) of the Omnibus Budget Reconciliation Act of 1993; Annual Report and Analysis of Competitive Market Conditions With Respect to Commercial Mobile Service,* 26 FCC Rcd 9665 (2011) (*Fifteenth Mobile Wireless Competition Report*), Section IV.B.1.a.

[224] *Implementation of Section 6002(b) of the Omnibus Budget Reconciliation Act of 1993; Annual Report and Analysis of Competitive Market Conditions With Respect to Commercial Mobile Service,* 29 FCC Rcd 15311 (2014) (*Seventeenth Mobile Wireless Competition Report*), Sections VI.B.3, VI.C.1.

[225] *Implementation of Section 6002(b) of the Omnibus Budget Reconciliation Act of 1993; Annual Report and Analysis of Competitive Market Conditions With Respect to Commercial Mobile Service,* 32 FCC Rcd 8968 (2017) (*Twentieth Mobile Wireless Competition Report*), para. 90.

[226] Jenna Wortham, 'Cellphones Now Used More for Data Than for Calls' *The New York Times* (May 13, 2010) <http://www.nytimes.com/2010/05/14/technology/personaltech/14talk.html> accessed 27 August 2018.

[227] Ericsson, 'Ericsson Mobility Report' (February 2015) <https://www.ericsson.com/assets/local/mobility-report/documents/2015/ericsson-mobility-report-feb-2015-interim.pdf> accessed 27 August 2018.

[228] Ericsson, 'Ericsson Mobility Report' (February 2018) <https://www.ericsson.com/assets/local/mobility-report/documents/2018/emr-interim-feb-2018.pdf> accessed 27 August 2018.

[229] Statista, 'Smartphone user penetration as share of mobile phone users in the United States' (2018) <https://www.statista.com/statistics/201184/percentage-of-mobile-phone-users-who-use-a-smartphone-in-the-us/> accessed 27 August 2018.

more time using mobile data than using mobile voice, and by 2017 the average user spent 87% of time on a mobile device using mobile data.[230]

The mobile service plans offered by providers correspondingly changed. Basic phones with a voice-only plan largely disappeared. By 2010, most mobile service plans included allotments of both mobile voice usage and mobile data usage.[231] By 2012, most mobile broadband Internet access service plans included an allotment of mobile data usage and unlimited mobile voice usage.[232] By 2014, mobile data service revenue surpassed mobile voice revenue.[233]

D. Open Internet Order (2015)

In the 2015 *Open Internet Order*, the FCC considers the classification of *broadband Internet access service*. Unlike *cable modem service*, *wireline broadband Internet access service*, or *wireless broadband Internet access service*, *broadband Internet access service* is technology agnostic. It includes "services provided over any technology platform, including but not limited to wire, terrestrial wireless (including fixed and mobile wireless services using licensed or unlicensed spectrum), and satellite".[234]

Broadband Internet access service is defined as "as a mass-market retail service by wire or radio that provides the capability to transmit data to and receive data from all or substantially all Internet endpoints, including any capabilities that are incidental to and enable the operation of the communications service, but excluding dial-up Internet access service", and it "encompasses any service that the Commission finds to be providing a functional equivalent of the service described".[235] The *Order* finds that *broadband Internet access service* is a *telecommunications service*.[236]

The *Order* then turns to the question of whether mobile broadband Internet access service is a *commercial mobile service*.

It first updates the regulatory definition of *public switched network* pursuant to FCC's authority granted in section 332. The 1994 definition of *public switched network* was "[a]ny common carrier switched network, whether by wire or radio, including local exchange carriers, interexchange carriers, and mobile service providers, that use the North American Numbering Plan in connection with the provision of switched services".

The 2015 *Open Internet Order* explains that the 1994 *Second CMRS Order* had "concluded that the term 'public switched network' should not be defined in a static way, recognizing that the network is continuously growing and changing because of new technology and increasing demand", and an update to the definition was required "so that our definition reflects the current network landscape rather than that existing more than 20 years ago."[237] The *Order* then explains that the *Second CMRS Order* noted that "[t]he purpose of the public switched network … is 'to allow the public to send or receive messages to or

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[230] Statista, 'App share of total mobile minutes in leading online markets as of May 2017' (May 2017) <https://www.statista.com/statistics/692752/app-share-of-mobile-minutes-countries/> accessed 27 August 2018.
[231] *Fifteenth Mobile Wireless Competition Report*, Section IV.A.
[232] *Implementation of Section 6002(b) of the Omnibus Budget Reconciliation Act of 1993; Annual Report and Analysis of Competitive Market Conditions With Respect to Commercial Mobile Service,* 28 FCC Rcd 3700 (2013) (*Sixteenth Mobile Wireless Competition Report*), Section IV.A.
[233] Chetan Sharma Consulting, 'US Mobile Market Update – Q2 2014' (2014) <http://www.chetansharma.com/publications/us-mobile-market-update-q2-2014/> accessed 27 August 2018.
[234] *2015 Open Internet Order*, para. 337.
[235] *Ibid*, para. 336.
[236] *Ibid*, para. 356.
[237] *Ibid*, para. 391.

from anywhere in the nation'".[238] The *Order* notes that by 2014 "73.6 percent of the U.S. age 13+ population was communicating with smart phones", and that "[m]obile broadband subscribers … can also send or receive communications to or from anywhere in the nation, whether connected with other mobile broadband subscribers, fixed broadband subscribers, or the hundreds of millions of websites available to them over the Internet."[239]

The *Order* states that in 1994 NANP was viewed as a proxy for ubiquitous access and as a method to distinguish between *commercial mobile services* such as cellular voice service and *private mobile services* such as the traditional dispatch services employed by taxi services and other private fleet, but that "today's broadband Internet access networks use their own unique addressing identifier, IP addresses, to give users a universally recognized format for sending and receiving messages across the country and worldwide."[240]

On this basis, the *Order* adds public IP addresses to the definition of *public switched network*, so that it was defined as "[t]he network that includes any common carrier switched network, whether by wire or radio, including local exchange carriers, interexchange carriers, and mobile service providers, that uses the North American Numbering Plan, *or public IP addresses*, in connection with the provision of switched services."[241]

The *Order* is exactly right here. However, as we mentioned in section 5.D.iii, a technology agnostic definition such as "the network consisting of interconnected common carrier switched networks, whether by wire or radio, including local exchange carriers, interexchange carriers, and mobile service providers" would accomplish the same goal, and technology agnostic definitions are generally preferred.

The *Order* then finds that mobile broadband Internet access service is an *interconnected service* under the statutory definition of the term, because it is a service that is *interconnected* with the *public switched network,* as redefined.[242]

The *Order* also considers whether mobile broadband Internet access service is an *interconnected service* under the 2015 regulatory definition of the term. The 1994 regulatory definition was "[a] service … that gives subscribers the capability to communicate to or receive communication from all other users on the public switched network …". The 2015 *Open Internet Order* strikes the word "all".[243] As we discussed in section 5.D.iv, the addition of the word "all" to the statutory definition of *interconnected service* was not permitted by the *Omnibus Budget Reconciliation Act of 1993*. The *Order* finds that mobile broadband Internet access service is also an *interconnected service* under the regulatory definition of the term.

In addition, the *Order* considers whether mobile broadband Internet access service is an *interconnected service* under the 1994 regulatory definition of the term (i.e. with the word "all" preserved). The *Order* finds that mobile broadband Internet access service is also an *interconnected service* under the 1994 regulatory definition of the term because it gives subscribers this capability through the use of VoIP applications.[244] The *Order* recognizes that the *Wireless Broadband Declaratory Ruling* had "previously concluded that mobile [wireless] broadband Internet access, in and of itself, does not provide the ability to reach all other users of the public switched network", but the *Order* finds that "[t]oday, mobile VoIP, as well as over-the-top mobile messaging, is among the increasing number of ways in which users

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[238] *Ibid.*
[239] *Ibid*, para. 398.
[240] *Ibid*, para. 391.
[241] *Ibid* 290 (emphasis added).
[242] *Ibid,* para. 391.
[243] *Ibid* 290.
[244] *Ibid*, para. 400.

communicate indiscriminately between NANP and IP endpoints on the public switched network", and "mobile broadband Internet access service today, through the use of VoIP, messaging, and similar applications, effectively gives subscribers the capability to communicate with all NANP endpoints as well as with all users of the Internet."[245]

Finally, the *Order* finds that mobile broadband Internet access service is a *commercial mobile service*, because it is a mobile service, it is provided for profit, it is widely available to the public, and it is an interconnected service.[246]

E. USTA v. FCC (2016)

The classification in the 2015 *Open Internet Order* of *broadband Internet access service* as a *telecommunications service* and of mobile broadband Internet access service as a *commercial mobile service* was reviewed by the D.C. Circuit Court in *USTA v. FCC*.

The Court first upheld the *Order's* classification of *broadband Internet access service* as a *telecommunications service*. The Court then turned to the *Order's* classification of mobile broadband Internet access service as a *commercial mobile service*. The Court notes that there is no dispute that mobile broadband Internet access is a mobile service, is provided for profit, and is widely available to the public. Based on those characteristics, the Court states that "[i]n those respects, mobile broadband bears the hallmarks of a commercial—and hence not a private—mobile service."[247]

The Court thus turns to the issue of whether mobile broadband Internet access service "makes interconnected service available". The Court notes that mobile broadband Internet access service did not yet exist when the FCC created the 1994 definition of *public switched network*. The Court also notes that it was a nascent service at the time of the 2007 *Wireless Broadband Declaratory Ruling*, and states that this was presumably the reason that the FCC "gave no evident consideration to expanding its definition of the 'public switched network' so as to encompass IP addresses in addition to telephone numbers."[248] The Court accepts the FCC's finding that mobile broadband Internet access service makes *interconnected service* available as reasonable.

The Court also accepts the FCC's resulting classification of mobile broadband Internet access service as a *commercial mobile service* as reasonable, stating that it was "supported by record evidence demonstrating the 'rapidly growing and virtually universal use of mobile broadband service' today."[249]

The Court rejected two arguments that mobile broadband Internet access service must be classified as a *private mobile service*. First, the Court rejected an argument that "'public switched network' is a term of art confined to the public switched *telephone* network"[250], explaining that "Congress elected to use the more general term 'public switched network,' which by its plain language can reach beyond telephone networks alone", that "Congress 'expected the notion [of the public switched network] to evolve and therefore charged the Commission with the continuing obligation to define it", and that it was not under dispute that "a networking using both IP addresses and telephone numbers is 'public' and 'switched.'"[251]

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[245] *Ibid*, paras. 400-401.
[246] *Ibid*, paras. 389-390.
[247] *United States Telecom Ass'n v. FCC*, 825 F.3d 674 (D.C. Cir 2016) (*USTelecom*) 57.
[248] *Ibid* 58.
[249] *Ibid* 61.
[250] *Ibid.*
[251] *Ibid* 64-65.

Second, the Court rejected an argument that "even if the Commission can expand the definition of public switched network to encompass users with IP address in addition to users with telephone numbers, mobile broadband still fails to qualify as an 'interconnected service.'"[252] The Court notes that it is not disputed that mobile broadband Internet access services gives subscribers the capability to and receive communications from other users on the public switched network, including at a minimum other mobile broadband Internet access users, thus implicitly accepting that mobile broadband Internet access service is an *interconnected service* under the statutory definition of the term. The Court then accepts as reasonable the *Order's* argument that mobile broadband Internet access service is also an *interconnected service* using the 1994 regulatory definition (which included the word "all") because it gives subscribers this capability through the use of VoIP applications, explaining that the widespread availability of such applications enables this capability.[253] In particular, the Court rejects the argument that mobile broadband Internet access service must itself provide this capability without the use of an application, explaining that "[n]othing in the statute, however, compels the Commission to draw a talismanic (and elusive) distinction between (i) mobile broadband alone enabling a connection and (ii) mobile broadband enabling a connection through use of an adjunct application such as VoIP."[254]

7. ANALYSIS OF THE RESTORING INTERNET FREEDOM ORDER

Whether mobile broadband Internet access service is a *commercial mobile service* depends on whether it is an *interconnected service*, which in turn depends on whether it is *interconnected* with the *public switched network*. Section 7.A analyzes the *public switched network*, and Section 7.B analyzes *interconnected service*.

A. The Order Improperly Concludes That the Internet and the Public Switched Telephone Network Do Not Constitute a Single Public Switched Network.

As discussed in more detail below, the *Restoring Internet Freedom Order* redefines *public switched network* to revert to its 1994 definition[255]:

> "*Any common carrier switched network, whether by wire or radio, including local exchange carriers, interexchange carriers, and mobile service providers, that use the North American Numbering Plan in connection with the provision of switched services.*"[256]

The *public switched network* is thus a *common carrier switched network* that uses particular addressing plans in connection with the provision of *switched services*. Although the *Order* fails to do so, before analyzing the *public switched network* it is worthwhile to discuss the meaning of *switched services* and of *common carrier switched network*.

i. Telephone exchange service, telephone toll service, mobile voice service, and broadband Internet access service are switched services, and the networks used to provision them are common carrier switched networks.

In electrical engineering and computer science, there is a critical distinction between network elements, functions provided by network elements, and services composed of such functions. A *communications*

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[252] *Ibid* 61.
[253] *Ibid* 66-70.
[254] *Ibid* 70-71.
[255] 47 C.F.R. § 20.3 (1994).
[256] *Second CMRS Order* 1517.

network is composed of a set of communications links and devices.[257] Each network device (e.g. a router) provides a set of *network services*.[258] By combining such network services, a telecommunications services provider may offer *telecommunications*. The communications network is used to provision a network service; the network is not itself the service.

In networking, *switching* refers to the function that interconnects network elements, a *switch* refers to the module (e.g. routing) or device (e.g. a router) that performs switching, and a *switched service* correspondingly refers to a service that offers transmission between multiple parties.

Circuit-switching and *packet-switching* are common families of technologies used in the provision of switched services. However, they are only a means to an end. A service provider may choose among several competing technologies to provision a service. For instance, voice service may be provided using a circuit-switched network, using a packet-switched network combined with a "virtual circuit" protocol that mimics a circuit (e.g. using the MPLS protocol or using a Virtual Private Network), using a packet-switched network combined with software that mimics a circuit (e.g. most VoIP software), or using any combination of these technologies.

Under the *Communications Act* and a long string of Commission Orders, there is a similar distinction between the communications network used to provision a telecommunications service and the telecommunications service itself. The communications network is used to provision a telecommunications service; the network is not itself the telecommunications service.

There is no doubt that telephone exchange service, telephone toll service, and mobile voice service are switched services. All of these services provide *telecommunications*, namely the transmission, between or among points specified by the user, of information of the user's choosing, without change in the form or content of the information as sent and received. All of these services are *telecommunications services*, namely the offering of *telecommunications* for a fee directly to the public, or to such classes of users as to be effectively available directly to the public, regardless of the facilities used. All of these services are *switched services*, namely services that offer transmission between multiple parties by interconnecting (i.e. switching) these parties.

It is irrelevant whether telephone exchange service, telephone toll service, or mobile voice service are provided using a circuit-switched network, using a packet-switched network combined with a "virtual circuit" protocol that mimics a circuit (e.g. using the MPLS protocol or using a Virtual Private Network), using a packet-switched network combined with software that mimics a circuit (e.g. most VoIP software), or using any combination of these technologies. Indeed, service providers use a wide variety of such technologies to offer these services. Mobile voice providers are currently in the process of converting the wireless transmission protocol underlying mobile service from a circuit-switched technology (used in 3G) to a packet-switched technology (used in 5G). Even the Commission's 1994 *Second CMRS Order* explicitly incorporated store and forward technology in the definition of *interconnected.*[259] Store and forward technology is the cornerstone of packet switching.

Similarly, there is no doubt that broadband Internet access service is a switched service. As discussed in Section 6, broadband Internet access service provides *telecommunications*, and it is a *telecommunications service*. In addition, it is a *switched service*, namely a service that enables communication between multiple

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[257] See e.g. James F. Kurose and Keith W. Ross, *Computer Networking: A Top-Down Approach* (7th edn Pearson, 2017) (*Kurose*), Section 1.1.2.

[258] Not all network services are offered to the public. A provider may implement network services that it only makes available to itself.

[259] *Second CMRS Order*, para 57.

parties by interconnecting (i.e. switching) these parties. The underlying technology is again irrelevant. Broadband Internet access service may be provisioned solely using packet-switching or using a combination of circuit-switching and packet-switching.

The *Communications Act* does not define the term *common carrier switched network*. Presumably, it is a switched network operated by a common carrier. The Commission's definition of *public switched network* includes the networks of local exchange carriers, interexchange carriers, and mobile voice service providers that are used in the provision of switched services. There is thus no doubt that the networks used to provision telephone exchange service, telephone toll service, and mobile voice service are common carrier switched networks. As argued in Section 6, broadband Internet access service is a *telecommunications service*, and thus the networks used to provision broadband Internet access service are also common carrier switched networks.

ii. The public switched network includes the networks used to provision telephone exchange service, telephone toll service, mobile voice service, and broadband Internet access service.

In the 1994 *Second CMRS Order*, the *public switched network* was defined by the Commission as "[a]ny common carrier switched network, whether by wire or radio, including local exchange carriers, interexchange carriers, and mobile service providers, that use[s] the North American Numbering Plan in connection with the provision of switched services."[260] The *2015 Open Internet Order* updated the definition to "the network that includes any common carrier switched network, whether by wire or radio, including local exchange carriers, interexchange carriers, and mobile service providers, that use[s] the North American Numbering Plan, or public IP addresses, in connection with the provision of switched services"[261] to reflect the emergence and growth of public networks using IP addresses.[262]

The *Restoring Internet Freedom Order* regresses to the earlier outdated definition.[263] It gives two rationales for this regression.

First, the *Order* "find[s] that the Commission's original interpretation of 'public switched network' was more consistent with the ordinary meaning and commonly understood definition of the term and with Commission precedent".[264] It explains that "[o]n multiple prior occasions before section 332(d)(2) was enacted, the Commission used the term 'public switched network' to refer to the traditional public switched telephone network", and that "[b]ased on this history of usage of the term, the Commission, in 1994, tied its definition of the term 'public switched network' to the traditional switched telephone network."[265]

However, the Commission's reasoning when adopting the original definition leads to the opposite conclusion. In the *Second CMRS Order*, the Commission rejected the view that the term *public switched network* should be based on a specific technology, and thus explicitly rejected equating it with the "more technologically based term 'public switched telephone network'"[266]. The Commission explicitly rejected interpreting the term *public switched network* "in a static way", and stated that "[t]he network is continuously growing and changing because of new technology and increasing demand".[267] Instead, the *Second CMRS Order* declared that "[t]he purpose of the public switched network is to allow the public to

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[260] *Ibid,* Appendix A: Final Rules, section 20.3.
[261] 47 CFR § 20.3.
[262] *2015 Open Internet Order,* para. 391.
[263] *Restoring Internet Freedom Order*, para. 74.
[264] *Ibid*, para. 75.
[265] *Ibid.*
[266] *Second CMRS Order*, para 59.
[267] *Ibid*.

send or receive messages to or from anywhere in the nation."[268] For that reason, the *Second CMRS Order* expanded the definition of *public switched network* from *public switched telephone network* (which had referred to "the local exchange and interexchange common carrier switched network[s]") to a definition that also incorporated the common carrier switched networks used in the provision of mobile services.[269]

As discussed in in the previous subsection, there is no doubt that mobile broadband Internet access service uses a common carrier switched network in connection with the provision of switched services. It remains to determine whether the *Restoring Internet Freedom Order's* claim that restricting the *public switched network* to common carrier switched networks *that use the North American Numbering Plan* (and excluding those that use public IP addresses) is truly "more consistent with the ordinary meaning and commonly understood definition of the term and with Commission precedent".[270]

The 1994 *Second CMRS Order* explained that its intent in limiting the *public switched network* to networks that use the North American Numbering Plan (NANP) was that "use of the North American Numbering Plan by carriers providing or obtaining access to the public switched network is a key element in defining the network because participation in the North American Numbering Plan provides the participant with ubiquitous access to all other participants in the Plan" and that "'this approach to the public switched network is consistent with creating a system of universal service where all people in the United States can use the network to communicate with each other."[271]

However, as discussed in section 5.D.iii, the limitation to networks that use NANP is neither necessary nor appropriate to provide users with such access. The goal is met by networks that are interconnected in a manner that allows users to transmit messages to or receive messages from other users of interconnected services, providing users have compatible devices. No specific addressing scheme, such as NANP, need be specified.

Furthermore, as discussed in section 6.A, packet-switched mobile Internet access services allow the public to send and receive messages to or from anywhere in the nation. Indeed, as discussed in section 6.C, today 87% of mobile phone users have smartphones, the average user spends 87% of time on a mobile device using mobile data, and mobile data generates over fifty times the volume of mobile voice. It is nonsensical to claim that mobile broadband Internet access services do not allow the public to send or receive messages to or from anywhere in the nation. Indeed, as the *2015 Open Internet Order* found, today the "public switched network [that] allow[s] the public to send or receive messages to or from anywhere in the nation"[272] includes common carrier switched networks that use public IP addresses in connection the provision of broadband Internet access service.[273]

iii. There is a single public switched network, even though the Order reverted to the outdated definition.

The second rationale the *Restoring Internet Freedom Order* gives for regressing to the outdated definition of *public switched network* is the claim that "the Commission's prior interpretation is more consistent with the text of section 332(d)(2), in which Congress provided that commercial mobile service must provide a service that is interconnected with '*the* public switched network'."[274] The *Order* places great meaning on

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[268] *Ibid.*
[269] *Ibid.*
[270] *Restoring Internet Freedom Order*, para. 75.
[271] *Second CMRS Order*, para. 60.
[272] *Ibid*, para 59.
[273] *2015 Open Internet Order,* para. 391.
[274] *Restoring Internet Freedom Order*, para. 76.

the word "the". It finds that "the use of the definite article 'the' and singular term 'network' shows that Congress intended 'public switched network' to mean a single, integrated network."[275] It further states that the public switched network "was not meant to encompass multiple networks whose users cannot necessarily communicate or receive communications across networks", and that the reversion to the 1994 definition "reflects that the public switched network is a singular network that 'must still be interconnected with the local exchange or interexchange switched network as it evolves,' as opposed to multiple networks that need not be connected to the public telephone network."[276]

The *Order* would thus have one believe that (1) there is a single common carrier switched network (*the* public switched *telephone* network) that includes local exchange carriers, interexchange carriers, and mobile voice service providers, and that uses the North American Numbering Plan in connection with the provision of switched services; (2) there is a separate common carrier switched network (the Internet) that includes mobile data service providers, and that uses public IP addresses in connection with the provision of switched services; and (3) that the public switched telephone network and the Internet are not interconnected.

However, all of these assertions are factually wrong. Common carrier switched networks are connected to form larger communications networks, such as the *public switched network*. The networks used to provision telephone exchange service and telephone toll service were connected to form a larger communications network. Later, the networks used to provision paging service were connected to those earlier networks to form yet a larger communications network. Later yet, the networks used to provision mobile voice service were connected to these earlier networks to form an even larger communications network. Today, the networks used to provision broadband Internet access service are connected to all of these other networks to form the *public switched network*. The resulting public switched network is a single network that includes the networks used to provision telephone exchange service, telephone toll service, mobile voice service, fixed broadband Internet access service, and mobile broadband Internet access service.

The public switched network is a single network ("*the* public switched network"). First, it is a physically connected network. All of the network elements are connected. The PSTN and the Internet are not two physically separate networks. They share network elements, including access networks. To the degree to which they have dedicated network elements, the dedicated PSTN elements are connected to the dedicated Internet elements via other network elements.

Second, the public switched network is used to provision common carrier switched services that offer transmission between multiple parties. Furthermore, as explained below, any pair of end user users may communicate, providing that they have obtained the necessary services and the necessary hardware and/or software.

The public switched network is thus a single network. The *Order's* regressed definition does not remove the networks used to provision broadband Internet access service from being a part of that single network.

1. The existence of a single network rests on the characteristics of the network, not on the services provisioned over the network.

It is important to correct several misconceptions in the record. One misconception is that whether there is a single public switched network depends on the services provisioned over the network(s). However, the *public switched network* is *not* defined by the switched services provisioned over it. As discussed above, a

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[275] *Ibid.*
[276] *Ibid.*

communications network is *not* itself a telecommunications service, but rather it is used to *provision* a telecommunications service. The PSTN is not telephone exchange service or telephone toll service. These services are provisioned over parts of the PSTN, but they are not the PSTN. Indeed, the *Communications Act* explains that "'[t]elecommunications equipment' means equipment, other than customer premises equipment, used by a carrier to provide telecommunications services, and includes software integral to such equipment".[277] Under the *Act*, telecommunications equipment is used to provide *telecommunications service*.

The same communications network may be used to provision multiple telecommunications services, as well as other services. The public switched network is *not* the set of networks that use the North American Numbering Plan (NANP) in connection with the provision of telephone exchange service, nor telephone toll service, nor mobile voice service. The public switched network is the network that includes any common carrier switched network that uses the North American Numbering Plan, or public IP addresses, in connection with the provision of switched services. Multiple switched services are provisioned over the same public switched network. The existence of a single network rests on the characteristics of the network, not on the services provisioned over the network.

2. A single network does not necessitate that all devices utilize a uniform addressing space.

Another misconception is that whether there is a single *public switched network* depends on whether all end users can be reached using a single addressing space (e.g. NANP). However, networks using different addressing spaces can be connected to form a larger single network.

A *network address* is an identifier of a device (or a network interface on a device) used by a communication protocol to communicate with other devices running that protocol. A *network address space* is the set of potential network addresses of devices using a particular format of network address. Network address spaces can be *public* or *private*. A network address space is *public* if the space is partitioned among multiple organizations, and is *private* otherwise. The set of North American Numbering Plan (NANP) telephone numbers is a public address space. The set of public IP addresses is a public address space.[278] There are also multiple network address spaces used by Media Access Control (MAC) protocols, e.g. DOSCIS, LTE, and various paging protocols.

The purpose of network addresses is to enable routing among connected communications networks. However, different communications networks use different communications protocols, and each communication protocol typically defines its own address space. For instance, the PSTN uses NANP addresses in the wireline portion of the PSTN, paging MAC addresses in paging networks, and a variety of formats of cell phone MAC addresses in cell phone networks. In addition, a device often implements several communications protocols, and hence is often assigned multiple network addresses. For instance, a mobile smartphone will often be assigned a NANP address, a private IP address, and an LTE MAC address.

The variety of network addresses does not, however, fragment the public switched network. Use of a combination of network addresses enables routing of messages through different parts of the public switched network. When a page is sent, the telephone number of the pager is translated into the pager's MAC address so that the paging message may be routed from the wireline portion of the PSTN onto a paging network. Similarly, when a call is placed to a mobile phone, the telephone number of the mobile

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[277] 47 U.S.C. § 153(45).

[278] See *2015 Open Internet Order*, para. 391 n. 1115 (defining "public IP addresses" for the purpose of the regulatory definition of PSN as "globally routable unicast IP addresses").

phone is translated into the mobile phone's MAC address so that the call may be routed from the wireline portion of the PSTN onto the cell phone network.

The same is true in the Internet. Mobile broadband Internet access service providers often assign private IP addresses to mobile devices including smartphones. The private IP address only identifies the device *within* the mobile broadband Internet access provider's network. In order for the mobile device to transmit messages to and from devices outside that provider's network, that private IP address must be combined with the public IP address of the broadband provider (and with an additional type of address called a *network port*). A device thus need not be assigned a public network address to be reachable on the public network.

It follows, as a direct consequence of network architecture, that a single public switched network does not require that all devices on the network utilize a uniform addressing space (e.g. NANP). Networks using different addressing spaces are connected to form a larger single network.

3. A single network does not necessitate that all users of the network may communicate with all other users.

Neither the Commission's prior definition of *public switched network* nor the *Order's* regression to the old definition includes a requirement that all users of the network be able to communicate with all other users. As discussed above, the ability to communicate depends on the services subscribed to and on the functionality of end user devices.

The issue of who may communicate with whom over the public switched network arises not in the question of whether there is a single *public switched network*, but in the question of whether a particular service is an *interconnected service*. We now turn to that question.

B. The Restoring Internet Freedom Order Improperly Determines that Mobile Broadband Internet Access Service is Not an Interconnected Service by Ignoring the Required Capabilities of the User's Device and of the Other Party's Subscribed Services.

The 1994 *Second CMRS Order* created a regulatory definition of *interconnected service* as a "service that is interconnected with the public switched network, or interconnected with the public switched network through an interconnected service provider, that gives subscribers the capability to communicate to or receive communication from all other users on the public switched network …"[279] The *2015 Open Internet Order* removed the word "all" from the definition[280] to clarify that a service is interconnected even if it is made available only to a substantial portion of the public.[281]

Furthermore, the *Second CMRS Order* defined *interconnected* as "direct or indirect connection through automatic or manual means (by wire, microwave, or other technologies such as store and forward) to permit the transmission or reception of messages or signals to or from points in the public switched network."[282] That definition was unchanged by the *2015 Open Internet Order.*

The *Order* regresses to the earlier regulatory definition of *interconnected service*.[283] The rationale given for this regression is that "the best reading of 'interconnected service' is one that enables communication between its users and all other users of the public switched network" and that "[t]his reading ensures that the public switched network remains the single, integrated network that we find Congress intended in

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[279] *Second CMRS Order*, Appendix A: Final Rules, section 20.3.
[280] 47 CFR § 20.3.
[281] *2015 Open Internet Order,* para. 402 n. 1175.
[282] *Second CMRS Order*, Appendix A: Final Rules, section 20.3.
[283] *Restoring Internet Freedom Order,* para. 77.

Section 332(d)(2).”[284] However, as explained below, even with the regression to the earlier definition, mobile broadband Internet access service is an *interconnected service.*

i. A telecommunications service offers transmission between points specified by the user, but in order to meaningfully communicate end users must acquire the necessary services and CPE.

Before analyzing interconnection of mobile broadband Internet access service with the *public switched network*, it is worthwhile to be precise about the meaning of the phrase “that gives subscribers the capability to communicate to or receive communication from all other users on the public switched network”.

The *Restoring Internet Freedom Order* asserts that “the service in question must itself provide interconnection to the public switched network using the NANP to be considered an interconnected service.”[285]

However, a telecommunications service does not by itself offer subscribers the ability to meaningfully communicate. A telecommunications service is the offering of *telecommunications*, namely the transmission, between or among points specified by the user, of information of the user's choosing, without change in the form or content of the information as sent and received. However, in order for end users to meaningfully communicate, they must (i) obtain the services that entitle them to transmit information between each other, and (ii) obtain customer premises equipment (CPE) sufficient to address messages to each other and to encode and decode these messages.

The *Restoring Internet Freedom Order* asserts that “[o]ur interpretation is consistent with Commission precedent that, prior to the *Title II Order*, had classified a service based on the nature of the service itself.”[286]

The *Order* misconstrues precedent. The requirement *to acquire the necessary services* in order to engage in meaningful communication is as old as communication networks are. For example, meaningful voice communication between two parties in different telephone exchanges requires that both parties have subscribed to telephone exchange service and that the calling party has subscribed to telephone toll service. Similarly, successful transmission of a paging message requires that the source has subscribed to telephone exchange service and that the destination has subscribed to paging service.

The *Restoring Internet Freedom Order* only briefly addresses the role of CPE in giving subscribers the capability to communicate to or receive communication from all other users on the public switched network, mentioning that “[w]ith traditional CMRS, even where consumers obtain their premises equipment or mobile devices separately, the function of interconnection is provided by the purchased mobile service itself.”[287]

The *Order* again misconstrues precedent. The requirement *to acquire the necessary devices* to engage in meaningful communication is also as old as communication networks are. For example, meaningful voice communication between two parties requires that each party has CPE capable of establishing connections, allowing for entry and transmission of the called party’s telephone number, encoding voice into a transmittable signal, and decoding a received signal into voice. Without the capability of transmitting the called party’s telephone number, one can’t actually engage the telephone exchange service. Without the capability of encoding voice into a transmittable signal, one can’t transmit anything. Without the capability of decoding a received signal into voice, the received signal can’t be heard. As another example, successful transmission of a paging message requires that the source party has a device capable of transmitting a paging

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[284] *Ibid.*
[285] *Ibid*, para. 80.
[286] *Ibid.*
[287] *Ibid*, para. 80 n. 298.

message (e.g. a wireline or mobile phone) and that the destination party has a device capable of receiving a paging message (e.g. a pager). As yet another example, successful transmission of a fax requires that that the source party has a device capable of transmitting a fax (e.g. a fax machine) and that the destination party has a device capable of receiving a fax (e.g. a fax machine).

The necessary CPE always includes hardware, namely the device. Today, almost all CPE also includes software, namely the application an end user is running on the device. Whereas once upon a time CPE for voice communication consisted of devices dedicated exclusively to that application, today one may use a voice app on a smartphone, a tablet, or a PC. The CPE necessary for meaningful communication has thus become the combination of hardware and/or software that includes functionality to generate and/or process content, to address communicating parties, and to set up and maintain connections with communicating parties.

For example, email communication between two parties requires that each party run an email application (whether standalone or through a webpage), instant messaging between two parties requires that each party run an interoperable instant messaging application, video chat between two parties requires that each party run a compatible video chat application, and web browsing requires the web browser and the webserver to both implement the http protocol.

ii. An interconnected service does not provide subscribers the ability to meaningfully communicate with all other users on the public switched network, absent the necessary telecommunication services and CPE.

Because meaningful communication has always required end users to acquire the necessary telecommunication services and CPE, and because mobile voice service is an *interconnected service*, it follows as a direct consequence that an interconnected service does not provide subscribers the ability to meaningfully communicate with all other users on the public switched network *absent the necessary telecommunication services and CPE*.

First, an interconnected service does not by itself provide subscribers the ability to meaningfully communicate with all other users on the public switched network *absent the necessary telecommunication services*. Two subscribers to telephone exchange service that reside in different telephone exchanges cannot call each other, and yet it would be nonsensical to say that telephone exchange service is not an interconnected service. Subscription to an interconnected service does not guarantee an end user that he will be able to communicate with *every other service* operated over the public switched network. Given that end users subscribe to a variety of interconnected services, subscription to an interconnected service does not guarantee an end user that she will be able to communicate with *all other subscribers of all services* operated over the public switched network. The ability of a pair of end users to communicate depends on the telecommunication services to which they have subscribed.

Second, an interconnected service does not by itself provide subscribers the ability to meaningfully communicate with all other users on the public switched network *absent the necessary CPE*. For example, a subscriber to mobile voice service cannot engage in meaningful communication with a fax machine on the public switched network (without utilizing a fax app). As another example, a subscriber to a one-way paging service may not transmit messages to or from another subscriber to a one-way paging service. The ability of a pair of end users to meaningfully communicate depends on CPE they are using.

iii. Mobile broadband Internet access service is an interconnected service, because it is interconnected with the public switched network and it gives subscribers the capability to communicate to or receive communication from all other users on the public switched network, providing that the parties have acquired the necessary telecommunication services and CPE.

A service is an *interconnected service* if it is *interconnected* with the *public switched network* and it gives subscribers the capability to communicate to or receive communications from other users on the public

switched network, *providing that the parties have acquired the necessary telecommunication services and CPE*.

Under the 2015 regulatory definitions of *public switched network* and *interconnected service*, there is no doubt that mobile broadband Internet access service is an *interconnected service*. The definition of *interconnected* is "direct or indirect connection through automatic or manual means (by wire, microwave, or other technologies such as store and forward) to permit the transmission or reception of messages or signals to or from points in the public switched network."[288]

Mobile broadband Internet access service is connection through technologies such as store and forward that permits the transmission and reception of messages to and from points in the public switched network. Without doubt, these points include (but are not limited to) the devices of other subscribers to broadband Internet access service, since by definition broadband Internet access service provides the capability to transmit data to and receive data from all or substantially all Internet endpoints. It similarly follows that mobile broadband Internet access service gives subscribers the capability to communicate to or receive communications from other users on the public switched network. These users include (but are not limited to) those who are subscribers to broadband Internet access service and are using devices capable of using that service.[289]

1. This conclusion remains true through the Order regressed to the old definition of interconnected service.

Under the *Order's* regression to the old regulatory definition of *interconnected service*, a service is an *interconnected service* if it is interconnected with the public switched network and it gives subscribers the capability to communicate to or receive communications from *all* other users on the public switched network, *providing that the parties have acquired the necessary telecommunication services and CPE*.

Even under that definition, mobile broadband Internet access service is still an *interconnected service*. As above, mobile broadband Internet access service is *interconnected* with the public switched network, because it is connection through technologies such as store and forward that permits the transmission and reception of messages to and from points in the public switched network. As before, without doubt these points include (but are not limited to) the devices of other subscribers to broadband Internet access service.

Mobile broadband Internet access service also gives subscribers the capability to communicate to or receive communications from *all* other users on the public switched network, *providing that the parties have acquired the necessary telecommunication services and CPE*. An end user who has subscribed to mobile broadband Internet access service clearly has the capability to communicate to and receive communications from all other users who are subscribers to broadband Internet access service and are using devices capable of using that service.[290]

In addition, an end user who has subscribed to mobile broadband Internet access service also has the capability to communicate to and receive communications from all other users who are subscribers to other interconnected services (e.g. telephone exchange service, telephone toll service, and mobile voice service), *providing that the parties have acquired the necessary services and CPE*. There are many options for doing so. First, the mobile Internet access service subscriber may simply obtain and utilize an app that is capable of address communicating parties and of setting up and maintaining connections with communicating parties.[291] Several such apps are available today, including Skype, Google Voice, Cisco WebEx, and

[288] *Second CMRS Order*, Appendix A: Final Rules, section 20.3.
[289] *USTelecom* 67.
[290] *Ibid.*
[291] *Ibid.*

GoToMeeting. Second, the party with which the mobile Internet access service subscriber wishes to communicate may obtain and utilize a voice forwarding service, such as an email-to-voice service. In either case, the requirement for end users to obtain interoperable CPE is nothing new. Addressing and maintaining connections with communicating parties is the traditional functionality of CPE. A subscriber to mobile voice service cannot engage in meaningful communication with a fax machine on the public switched network, and yet mobile voice service is an interconnected service. A subscriber to a one-way paging service may not transmit messages to or from another subscriber to a one-way paging service, and yet one-way paging is an interconnected service. Similarly, mobile broadband Internet access service is an interconnected service, because it gives subscribers the capability to communicate to or receive communications from *all* other users on the public switched network, providing that the parties have acquired the necessary services and CPE.

Finally, it is worth noting that mobile voice service remains an interconnected service. An end user who has subscribed to mobile voice service has the capability to receive communications not only from subscribers to telephone exchange service and mobile voice service, but also from subscribers to broadband Internet access service. One option for doing so is for a subscriber to broadband Internet access service to use an app that is capable of address communicating parties and of setting up and maintaining connections with communicating parties, as discussed above. Another option for doing so, offered by most major mobile service providers, is an email-to-text feature of the service, in which a subscriber to broadband Internet access service may send an email to a mobile service subscriber and that message will be received as a text message.[292] Yet another option, which works with any mobile service provider, is to use an operating system such as Windows 10 that offers the ability to send text messages.[293] Finally, it is worth noting that the major mobile service providers no longer offer voice-only cell plans. Even their most basic plans include data.[294] Thus, anyone with almost any cell phone[295] on almost any recent cell phone plan has access to mobile broadband Internet access service.

2. This conclusion remains true even though the Order regresses to the outdated definition of public switched network.

Under the *Order's* regression to the outdated definition of *public switched network*, a service is an interconnected service if it is interconnected with the public switched network and it gives subscribers the capability to communicate to or receive communications from all other users on the public switched network, where the *public switched network* reverted to being defined as "[a]ny common carrier switched network, whether by wire or radio, including local exchange carriers, interexchange carriers, and mobile

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[292] See e.g. AT&T, 'Send email as text message' <https://www.att.com/esupport/article.html#!/wireless/KM1061254> accessed 23 August 2017 ("Send an email message to anyone with an AT&T wireless number that will be received as a text message on their phone or device"); T-Mobile, 'Learn about text and picture messaging' <https://support.t-mobile.com/docs/DOC-3309> accessed 23 August 2017) ("You can send messages to any email address, and you can have email sent to your mobile device via text message"); Verizon, 'How to send text messages to Verizon customers from your PC' <http://www.verizon.com/about/news/vzw/2013/06/computer-to-phone-text-messaging> accessed 23 August 2017 ("Here's how to send a text message from a computer to fellow Verizon Wireless customer").

[293] See e.g. Microsoft, 'Send a text message' <https://support.microsoft.com/en-us/help/17266/windows-10-mobile-send-text-message> accessed 23 August 2017 ("To send a text, on Start, select Messaging, and then New message . Enter a phone number or contact, type your message, and then select Send.").

[294] See e.g. Sprint, 'Sprint single line cell phone plans' <https://www.sprint.com/en/shop/plans/single-line-cell-phone-plans.html> accessed 23 August 2017 ("2GB plan - $40/mo./line. The lowest price entry plan among national carriers."); Verizon, 'Single Basic Phone Plan' <https://www.verizonwireless.com/plans/single-device-plan/> accessed 23 August 2017 ("Unlimited Talk & Text, plus 500MB of data for $30/mo.").

[295] Today, even most basic (or "feature") phones are capable of transmitting and receiving data.

service providers, that use[s] the North American Numbering Plan in connection with the provision of switched services."

Even under that definition, mobile broadband Internet access service is still an *interconnected service*. As above, mobile broadband Internet access service is *interconnected* with the public switched network, because it is connection through technologies such as store and forward that permits the transmission and reception of messages to and from points in the public switched network. This remains true for two independent reasons.

First, even though the Commission reverted to the outdated definition of *public switched network*, the network remains the same. As discussed in section 7.A, there is a single public switched network that includes the networks used to provision telephone exchange service, telephone toll service, mobile voice service, fixed broadband Internet access service, and mobile broadband Internet access service. Limiting the definition to common carrier switched networks that use the North American Numbering Plan does not change the network itself. The networks remain physically connected. The access networks remain identical.

Second, as discussed in the previous subsection, an end user who has subscribed to mobile broadband Internet access service has the capability to communicate to and receive communications from all other users who are subscribers to other interconnected services over common carrier networks that use the North American Numbering Plan (e.g. telephone exchange service, telephone toll service, and mobile voice service), providing that the parties have acquired the necessary services and CPE. It similarly follows that mobile broadband Internet access service gives subscribers the capability to communicate to or receive communications from other users on the public switched network.

C. Mobile Broadband Internet Access Service is a Commercial Mobile Service

Having analyzed the terms *public switched network* and *interconnected service*, we return to the issue of whether mobile broadband Internet access service is a *commercial mobile service*.

i. Mobile broadband Internet access service is a commercial mobile service under the statute, under both the 1994 and 2015 definitions of public switched network

Recall that under Section 332(c) of the *Communications Act*, a mobile service is a *commercial mobile service* if it is provided for profit and makes *interconnected service* available to the public. There is no disagreement that mobile broadband Internet access service is provided for profit and is made available to the public. It remains to determine whether it is an *interconnected service*.

Recall that the *Act* defined *interconnected service* as:

> *"service that is interconnected with the public switched network (as such terms are defined by regulation by the Commission) or service for which a request for interconnection is pending pursuant to subsection (c)(1)(B)"*[296]

As discussed in section 6.B.iii, substituting the regulatory definition of *interconnected* into the statutory definition of *interconnected service* yields:

> "a service that is direct[ly] or indirect[ly] connect[ed] through automatic or manual means (by wire, microwave, or other technologies such as store and forward) to permit the transmission or reception of messages or signals to or from points in the public switched network …"

[296] 47 U.S.C. § 332(d)(2).

If a mobile broadband Internet access service provider also offers mobile voice service, then users of mobile broadband Internet access service are "points in the public switched network". Furthermore, mobile broadband Internet access service is directly connected through automatic means (by store and forward) to permit the transmission and reception of messages to and from other users of both fixed and mobile broadband Internet access service. It follows that mobile broadband Internet access service satisfies the statutory definition of *interconnected service*, when offered by a provider that also offers mobile voice service.

Furthermore, as discussed in section 7.A.iii, even if a mobile broadband Internet access service provider does *not* offer mobile voice service, there is a single public switched network that includes users of such services. These users are thus also "points in the public switched network" that are directly connected to permit the transmission and reception of messages to and from other users of both fixed and mobile broadband Internet access service, and thus it similarly follows that these forms of mobile broadband Internet access service also satisfy the statutory definition of *interconnected service*.

Note that this analysis under the statutory definition of *interconnected service* is consistent with the Court's finding in *USTA vs. FCC*, in which it found that it is not disputed that mobile broadband Internet access services gives subscribers the capability to and receive communications from other users on the public switched network, including (at a minimum) other mobile broadband Internet access users.

Since mobile broadband Internet access service is a mobile service provided for profit that makes *interconnected service* available to the public, it follows that it is a *commercial mobile service* under the *Act*. Per Section 332(c), mobile Internet access service must thus be treated as a common carrier service under the *Act*.

It is also worth noting that the *Restoring Internet Freedom Order* repeated the discussion in the *Wireless Broadband Declaratory Ruling* about the contradiction if mobile broadband Internet access was classified as a *commercial mobile service* and broadband Internet access service was classified as an *information service*. The *Restoring Internet Freedom Order* states that such simultaneous classifications would give "the absurd result of singling out mobile providers of broadband Internet access service for such common carrier regulation while freeing fixed broadband Internet access services from such regulation."[297] However, there is no such contradiction, and no such absurd result. The *1996 Act* recognized that all commercial mobile services constitute telecommunications, and thus a mobile service satisfies the definition of a *telecommunications service* if it is offered to the public or such classes of users as to be effectively available to the public.[298] A mobile service that satisfies the definition of a *commercial mobile service* is a *telecommunications service*, because the *1996 Act* dictates this outcome.

ii. Mobile broadband Internet access service is a commercial mobile service, even using the regulatory definition of interconnected service

Although the statutory classification of mobile Internet access service mandates that mobile Internet access service be treated as a common carrier service because it is a *commercial mobile service*, we conclude this paper with an analysis of whether mobile Internet access service is also a *commercial mobile radio service* under the Commission's rules.

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[297] *Restoring Internet Freedom Order*, para. 82.

[298] See *H.R. Conf. Report 104-458* 114 (explaining that the term *telecommunications service* "is intended to include commercial mobile service … to the extent that [it is] offered to the public or such classes of users as to be effectively available to the public").

Recall, as discussed in section 5.C, that the 1994 *Second CMRS Order* created a regulatory definition of *commercial mobile radio service (CMRS)* that mirrors the statutory definition of *commercial mobile service*:

> "*A mobile service that is: (1)(A) provided for profit, i.e., with the intent of receiving compensation or monetary gain; (B) an interconnected service; and (C) available to the public, or to such classes of eligible users as to be effectively available to a substantial portion of the public; or (2) the functional equivalent of such a mobile service described in paragraph (1).*"[299]

Again, there is no disagreement that mobile broadband Internet access service is provided for profit and is made available to the public. It remains to determine whether it is an *interconnected service,* under the *regulatory* definition of *interconnected service*.

Recall that the 1994 regulatory definition of *interconnected service*, to which the *Restoring Internet Freedom Order* regressed, is:

> *"[a] service (1) that is interconnected with the public switched network, or interconnected with the public switched network through an interconnected service provider, that gives subscribers the capability to communicate to or receive communication from all other users on the public switched network; or (2) for which a request for such interconnection is pending pursuant to Section 332(c)(l)(B) of the Communications Act, 47 U.S.C. § 332(c)(l)(B). A mobile service offers interconnected service even if the service allows subscribers to access the public switched network only during specified hours of the day, or if the service provides general access to points on the public switched network but also restricts access in certain limited ways. Interconnected service does not include any interface between a licensee's facilities and the public switched network exclusively for a licensee's internal control purposes."*[300]

As discussed in section 7.B, mobile Internet access service is an *interconnected service* under the regulatory definition of the term, because it is interconnected with the public switched network and it gives subscribers the capability to communicate to or receive communications from all other users on the public switched network, providing that the parties have acquired the necessary telecommunication services and CPE.

Note that this analysis under the regulatory definition of *interconnected service* is consistent with the Court's finding in *USTA vs. FCC*, in which it rejected the argument that mobile broadband Internet access service must itself provide this capability without the use of such necessary telecommunication services and CPE.

Since mobile broadband Internet access service is a mobile service, is an interconnected service, and is provided for profit, it follows that it is a *commercial mobile radio service* under the Commission's rules. Although mobile broadband Internet access service must be treated as a common carrier service under the *Act* because it is also a *commercial mobile service*, simultaneous classification as a *commercial mobile radio service* makes mobile broadband Internet access service subject to any other Commission rules that apply to commercial mobile radio services.

8. CONCLUSION

The *Restoring Internet Freedom Order's* reclassification of mobile broadband Internet access service from a *commercial mobile radio service* to a *private mobile radio service* had the peculiar effect of declaring that

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[299] *Second CMRS Order* 1516.
[300] *Ibid* 1516-1517.

the most important and pervasive public mobile communications service is a *private* service. In this paper, we have asked what led the expert agency to conclude that the public Internet is *not* part of the public switched network, and that mobile broadband Internet access service is a *private* service.

We examined the relevant precedent from Congress, the FCC, and the courts from the 1940s through 1980s, which the *Order* neglected to do. We thus found that the *Order's* reversion to the 1994 definitions of *public switched network* and *interconnected service* ignores the growth of the public switched network to include the Internet, and is thereby contrary to both statute and precedent.

We also examined the relevant technology, which the *Order* also neglected to do. We thus found that the *Order's* conclusion that the public switched telephone network and the Internet are separate non-interconnected networks is factually wrong.

Ultimately, we found that the *Order's* justification for reclassification ignores the fact that in order for meaningful communication to occur, the users' devices and subscribed services must be compatible.

Proper interpretation of relevant statute and precedent leads to the opposite conclusion of the *Order*. Mobile broadband Internet access service is a commercial mobile service. The statute thus mandates that mobile broadband Internet access service be regulated as a common carrier service.