Before the
Federal Communications Commission
Washington, D.C. 20554

In the Matter of	)	
	)	
Implementation of Section 6002(b) of the Omnibus Budget Reconciliation Act of 1993	)	WT Docket No. 02-379
	)	
	)	
Annual Report and Analysis of Competitive Market Conditions With Respect to Commercial Mobile Services	)	

NOTICE OF INQUIRY

Adopted: December 11, 2002 **Released: December 13, 2002**

Comment Date: January 27, 2003
Reply Comment Date: February 11, 2003

By the Commission: Commissioner Copps issuing a statement; Commissioner Adelstein not participating.

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I. INTRODUCTION

1. In 1993, Congress created the statutory classification of Commercial Mobile Services[1] to promote the consistent regulation of similar mobile radio services.[2] At the same time, Congress established the promotion of competition as a fundamental goal for CMRS policy formation and regulation. To measure progress toward this goal, Congress required the Federal Communications Commission ("Commission" or "FCC") to submit annual reports that analyze competitive conditions in the industry.[3] This *Notice of Inquiry* ("*NOI*") solicits data and information on the status of competition in the CMRS industry for our Eighth Annual Report and Analysis of Competitive Market Conditions with Respect to Commercial Mobile Services ("Eighth Report"). The Eighth Report will provide an

[1] Commercial Mobile Services came to be known by the Commission as the Commercial Mobile Radio Services, or "CMRS."

[2] The Omnibus Budget Reconciliation Act of 1993, Pub. L. No. 103-66, Title VI, § 6002(b), amending the Communications Act of 1934 and codified at 47 U.S.C. § 332(c).

[3] *Id.* codified at 47 U.S.C. § 332(c)(1)(C).

assessment of the current state of competition and changes in the competitive environment since the release of the *Seventh Report*.[4]

2. This *NOI* is part of the Commission's ongoing effort to improve its *CMRS Reports*. In February 2002, the Commission held a Public Forum to examine ways in which to better gather and analyze data for the *Seventh Report*, in particular data regarding the development of CMRS services in rural and underserved areas.[5] As a result of the forum, the Commission was able to integrate new data into the *Seventh Report* and adopted a number of suggestions made by forum participants on how to obtain and analyze data more effectively.

3. Commercial mobile telephone and mobile data services are provided by a large number of terrestrial CMRS operators as well as mobile satellite operators.[6] In an effort to provide the most complete picture of competition to Congress, the *CMRS Reports* analyze CMRS services from a consumer point of view. Therefore, some portions of our analysis include offerings outside the umbrella of "services" specifically designated as CMRS by the Commission.[7] Because providers of these services may, on some level, compete with CMRS providers, the Commission believes it is important to consider them in its analysis and collects information on specific product categories regardless of their regulatory classification.

4. In this *NOI*, we seek information that can be used to examine the status of competition in the CMRS industry. We note in our ongoing process of improving our data gathering process that we have taken the step of issuing this *NOI* in an effort to gather more detailed, comprehensive, and independent data for this year's report. We request data that will allow us to evaluate the extent to which consumers can choose among CMRS operators, services, and technologies. In particular, we seek the following data and ask commenters to address the following general questions:

- What is the current structure of the CMRS industry?[8]

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[4] 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 Services, *Seventh Report*, 17 FCC Rcd 12985 (2002) ("*Seventh Report*"). All of the Annual CMRS Competition Reports are referred to collectively hereinafter as "*CMRS Reports*."

[5] *See* Wireless Telecommunications Bureau Announces Agenda and Speakers For Public Forum For The 7th Annual Commercial Mobile Radio Services Competition Report, *Public Notice*, DA 02-422 (rel. Feb. 25, 2002). For access to participants' presentations and a forum transcript, *see* WTB, *Commercial Mobile Radio Services (CMRS) Competition Report Public Forum* <http://wireless.fcc.gov/cmrs-crforum.html>. The transcript of the forum can be found at WTB, *Public Hearing for 7th Annual CMRS Competition Report: Transcript of the Day's Event* (visited Mar. 14, 2002) <http://wireless.fcc.gov/services/cmrs/presentations/020228.pdf>.

[6] *See Seventh Report*, at 12987.

[7] For example, wireless local area network ("WLAN") services, such as WiFi, may compete with CMRS providers but are outside the umbrella of CMRS services. See ¶¶ 94-96, *infra*, for a discussion of WiFi.

[8] The *CMRS Reports* discuss CMRS as a whole because Congress called on the Commission to report on "competitive market conditions with respect to commercial mobile services." 47 U.S.C. § 332 (c)(1)(C). Any individual proceeding in which the Commission defines relevant product and geographic markets, such as an application for approval of a license transfer, may present facts pointing to narrower or broader product markets than any used, suggested, or implied in the *CMRS Reports*.

- Which entities compete to provide CMRS services?
- What have been the most significant changes or developments in the industry over the past year?
- What is the extent of deployment of CMRS services?
- What is the state of competition in the provision of CMRS services?
- How does competition in the CMRS marketplace vary across the United States, in particular between rural and urban areas?
- What metrics are available that will give us insight into the level of competition in the provision of CMRS services? We are interested in, but not limiting commenters to, information on service availability, the number of subscribers, penetration rates, usage, average revenue per subscriber, churn, quality of service, pricing data and trends, and profits.
- To what extent do key metrics, such subscribership and usage levels, vary among different demographic groups?
- How does CMRS providers' cost of capital[9] affect service availability, including entry into new geographic markets, the quality of service, and the introduction of new services? How is the cost of capital related to the level of competition in the provision of CMRS services? Is it possible to track the cost of capital that different CMRS providers have faced and will continue to face over time?
- How does competition in the CMRS industry in the United States compare to that in other countries? How do key CMRS industry performance metrics, such as subscribership, usage, pricing, quality of service, and service availability, vary between the United States and other countries?

5. Industry members, interested parties, and members of the public should submit information, comments, and analyses regarding competition in the provision of CMRS services. Commenters that wish confidential treatment of their submissions should request that their submission, or a specific part thereof, be withheld from public inspection.[10] In order to facilitate our analysis of competitive trends over time, we request that parties submit current data as well as data that are comparable over time. In addition to the comments submitted in this proceeding, the Eighth Report will also include information from publicly-available and FCC sources.

[9] The cost of capital is the firm's cost of using funds provided by creditors and shareholders. A firm's cost of capital is the cost of its long-term sources of funds: debt, preferred stock, and common stock. And the cost of each source reflects the risk of the assets the firm invests in. *See* Pamela Peterson, Florida State University, *The Cost of Capital* (visited Oct. 24, 2002) <http://garnet.acns.fsu.edu/~ppeters/ fin3403/readings/capbud/coc.html>.

[10] *See* 47 C.F.R. § 0.459.

II. MATTERS ON WHICH COMMENT IS REQUESTED

A. Competition in the Mobile Telephone Sector

1. Introduction

6. For purposes of the *CMRS Reports*, the mobile telephone sector is defined to include all operators that offer commercially available, interconnected mobile voice services. These operators provide access to the public switched telephone network ("PSTN") via mobile communication devices employing radiowave technology to transmit calls. The mobile telephone sector is dominated by providers using cellular radiotelephone, broadband Personal Communications Service ("broadband PCS"), and Specialized Mobile Radio ("SMR") licenses.[11] Because these licensees offer mobile telephone services that are essentially interchangeable from the perspective of most consumers, they have been discussed in the *CMRS Reports* and are discussed in this *NOI* as a cohesive industry sector.[12]

7. For purposes of the Eighth Report, we seek information on significant trends and developments that have occurred in the mobile telephone sector since the publication of the *Seventh Report*. Historically, the *CMRS Reports* have looked at the extent of service availability as well as the number of consumers using mobile telephone services. In addition, the *CMRS Reports* have looked at minutes of use, average revenue per unit, churn levels, and pricing trends as indicators of competition.

2. Service Availability

8. The *CMRS Reports* include an analysis of the availability of commercial mobile telephone service that the Commission uses to evaluate competition in the U.S. mobile telephone industry. This analysis has heretofore been based on publicly available information released by operators, such as news releases, Securities and Exchange Commission ("SEC") filings, coverage maps available on operators' web sites, and network buildout notifications filed with the Commission.[13] The statistics presented in the *CMRS Reports* based on this information include the number of providers operating in a given geographic area, the percent of the population living in areas with a certain number of competitors, and the extent of coverage of the various network technologies (*e.g.*, analog, CDMA, TDMA, GSM, and iDEN).[14] In the *Third* and *Fourth Reports*, the geographic area used as the basis for these analyses was Basic Trading Areas ("BTAs"); however, the subsequent *CMRS Reports* have been improved and present this information on a more disaggregated, county-by-county basis.

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[11] *See Seventh Report*, at 12993.

[12] Resellers and satellite operators also offer mobile telephone services, and are discussed separately at the end of this section.

[13] *See Seventh* Report, at 13007-8. For information on the buildout requirements for broadband PCS licensees see 47 C.F.R. § 24.203(a) (b); for information on the buildout requirements for cellular licensees, *see* 47 C.F.R. §§ 22.946, 22.947, 22.949, 22.951.; and for information on the buildout requirements for non-site based SMR licensees, *see* 47 C.F.R. §§ 90.665 and 90.685.

[14] Code Division Multiple Access ("CDMA"), Global System Mobile Communications ("GSM"), integrated Digital Enhanced Network ("iDEN"), and Time Division Multiple Access ("TDMA").

9. Previous *CMRS Reports* have included several notable caveats about our analysis of the service availability.[15] First, to be considered as "covering" a county, an operator need only be offering any service in a portion of that county. Second, multiple operators shown as covering the same county are not necessarily providing service to the same portion of that county. Consequently, some of the counties included in this analysis may have limited coverage from a particular provider. Third, the figures for POPs[16] and land area in this analysis include all of the POPs and every square mile in a county considered to have coverage.[17] Therefore, this analysis overstates to some degree both the level of competition and total coverage in terms of both geographic area and population covered. On the other hand, while newer broadband PCS and SMR licensees have less complete networks that may be overstated in our analysis, the original cellular licensees have extensive networks that provide almost complete coverage of the entire land mass of their license areas, and hence the entire land area of the continental United States.[18]

10. We ask for comment on how to improve the methodology we use to determine service availability and evaluate competition. As described above, the methodology inherently includes some undetermined degree of overcounting. Do commenters believe that this degree of overcounting is significant and materially affects the determination of mobile telephone service availability and competition? Is there an alternate methodology that could be used to determine service availability and competition?

11. In order to improve the accuracy of our analysis and to reduce overcounting in the Eighth Report, we ask service providers to submit as part of their comments to the Commission, in electronic format, the coverage maps that they already make available to the public. Specifically, we request carriers submit as part of their comments the maps they employ to advertise their coverage areas in brochures and on their web sites in a geo-referenced, mapable format, such as MapInfo table (.tab) or Tagged Image Format (.TIF) files, on a CD sent to the Commission.[19] The Commission has used the contours filed by 800 MHz cellular licensees to determine the availability of analog mobile telephone service, and therefore does not require additional maps showing analog coverage from cellular licensees.[20] However, the Commission requests that cellular licensees submit as part of their comments their publicly-available maps in the aforementioned format showing where they offer reliable digital service. In addition to the coverage maps that carriers make available to the public, do carriers have maps with more detailed coverage information that are not available to the public? In the alternative, we ask carriers to

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[15] *See Seventh Report*, at 13008. Previous *CMRS Reports* contain similar language.

[16] POPs is an industry term referring to population, usually the number of people covered by a given wireless license or footprint. One "POP" equals one person.

[17] All population figures are based on the Bureau of the Census's 2000 county population. *See Seventh Report*, at 13008.

[18] *Id*.

[19] For information on how these map files should be submitted, see ¶ 102, *infra*.

[20] Cellular licensees have submitted maps of their service contours as part of the filings required to establish Cellular Geographic Service Area (CGSA) boundaries. *See* 47 C.F.R. §§ 22.947(c), 22.953(a)(1)-(2).

please indicate in their comments if they do not have such maps. Would carriers or other parties be willing to submit such maps as part of their comments?[21]

12. Moreover, carrier provision of their publicly-available coverage maps in electronic, geo-referenced format with clearly-defined boundary lines, would enable the Commission to examine more precisely the smaller geographic areas underlying the coverage boundaries, such as zip code areas or census block groups.[22] These small geographic areas could therefore allow the Commission to make more accurate estimates of the population and land area covered by a certain number of carriers or served by a digital network.

13. In conducting our analysis of service availability and competition, we seek information about the extent to which consumers are able to, and do, purchase service plans from carriers whose networks do not cover their residential location or billing address. Carriers frequently query potential subscribers about the zip code of their billing address. Should this be taken as an indication that carriers do not provide service to consumers whose billing address zip codes are outside the range of the carriers' network coverage areas, even if such consumers wish to purchase service plans in order use their phones inside the coverage areas? To what extent are mobile telephone subscribers' residential locations or billing addresses located outside of their carrier's network coverage area? To what degree would an analysis of the population of smaller geographic areas that underlie carriers' network coverage boundaries undercount those subscribers? Furthermore, would the use of other, smaller geographic areas in addition to or in place of counties be appropriate in analyzing service availability? If so, which areas would be appropriate? Do data currently exist on this basis?

14. In order to continue to improve the accuracy of our analysis, we seek information on whether carriers market service to new customers in all of the geographic areas in which they have coverage. Do carriers provide coverage in certain areas, such as near major roads, where they do not also market service to residents?[23] If the latter is true, our analysis could be further improved if carriers indicated the parts of their coverage areas in which they compete to offer new service and the parts that are used only to provide coverage to traveling subscribers based in other locations. In addition to employing more accurate coverage maps, in what other ways could our analysis of service availability be improved?

15. We also seek data on the relationship between competition and the availability of roaming for wireless customers.[24] To what extent do carriers have agreements that enable their customers

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[21] Carriers can submit these maps pursuant to a request for confidentiality. *See* ¶ 5, note 10, *supra*.

[22] A census block group ("BG") is a cluster of census blocks within a census tract. BGs generally contain between 600 and 3,000 people, with an optimum size of 1,500 people. Most BGs were delineated by local participants as part of the U.S. Census Bureau's Participant Statistical Areas Program. *See* U.S Census Bureau, *Cartographic Boundary Files, Descriptions and Metadata* (visited Oct. 24, 2002) <http://www.census.gov/geo/www/cob/metadata.html>.

[23] In January 2002, Cingular Wireless and AT&T Wireless announced the formation of an infrastructure joint venture to build out a GSM/GPRS network along 3,000 miles of interstate highways predominantly in western and midwestern states. *See Seventh Report*, at 13001.

[24] In seeking comment on these issues, we note that the Commission has an outstanding *Notice of Proposed Rulemaking* seeking comment on the CMRS roaming rules, which is currently pending. *See* Automatic and Manual Roaming Obligations Pertaining to Commercial Mobile Radio Services, *Notice of Proposed Rulemaking*, 15 FCC

(Continue.…)

to use automatic roaming throughout the United States? Are there geographic areas in which some carriers do not have automatic roaming agreements? If so, where are those areas and is there any correlation to the number of wireless providers operating in those areas? Are rural customers more affected than non-rural customers? How many customers use manual roaming? Where are those customers located when they use manual roaming, and how frequent is their usage?

16. Finally, we seek comment on the fact that our service availability analysis relies on information reported by service providers, including their news releases, filings with the SEC, web site coverage maps, and network buildout notifications filed with the Commission. In addition, there are independent web sites and public reports that include some information about service coverage and dead zones.[25] There are risks to relying exclusively on data supplied by parties with a financial stake in the use of such data as part of Commission decisions. Since we, in some cases, report on information supplied only by one or two sources, we also seek comment on ways of obtaining independent verification of competition information provided for the report. Which independent sources can be reliably used to verify carrier-supplied coverage information? Do commenters believe such verification is necessary in analyzing service availability and competition?

17. In addition to analyzing service availability by all facilities-based mobile telephone carriers, previous *CMRS Reports* have discussed "nationwide" mobile telephone operators. Companies that analysts typically describe as being nationwide offer service in at least some part of the western, midwestern, and eastern United States.[26] This label does not necessarily mean that the operator's license areas, service areas, or pricing plans cover the entire land area of the United States. The *Seventh Report* listed six carriers that analysts typically describe as nationwide mobile telephone operators, all of which, with their affiliates and partnerships, have licenses covering between 230 and 285 million people.[27] We seek comment on whether it is appropriate to call these similarly situated operators "nationwide" mobile telephone operators. Is there other terminology that would better describe the carriers that have a relatively large number of licensed POPs and provide coverage in multiple large regions of the United States?

3. Market Performance and Key Metrics

18. The *CMRS Reports* have looked at a series of key metrics as indicators of the demand for and reliance on mobile telephone service. Examples of key metrics employed in the past include the number of subscribers and penetration rates, average minutes of use per subscriber per month ("MOUs"), average revenue per unit, and churn.[28] In addition, the *CMRS Reports* look at the prices for mobile

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Rcd 21628 (2000). Our inquiry here is not intended to delay or preclude our acting in that proceeding based on the record therein, nor should these questions be construed as prejudging the outcome of that proceeding.

[25] *See* FCC, Consumer and Governmental Affairs Bureau, *What You Should Know About Wireless Phone Service* <http://www.fcc.gov/cgb/wirelessphone.pdf> for a list of web sites.

[26] *See Seventh Report*, at 12997.

[27] *Id*. The six carriers are: Verizon Wireless, Cingular Wireless, AT&T Wireless, Sprint PCS, Nextel, and T-Mobile. The next largest provider of mobile telephone service had licenses covering less than 60 million POPs as of June 2002. *Id.*

[28] *Id.*, at 13004-7.

telephone services, including new developments in pricing plans; the extent of digital service; and wireless-wireline competition.[29] The sources of data and analysis of these metrics are discussed below. Are there other metrics or techniques that should be used to analyze competition in the mobile telephone sector? Are metrics available on a national and/or sub-national level? What types of conclusions can and cannot be drawn from the current and recommended metrics? For example, is service quality related to competition? How would the Commission measure service quality?

a) Subscribership

19. One of the key metrics that provides an indication of the demand for mobile telephone service is the total number of subscribers. Prior to the *Seventh Report*, the Commission relied on estimated national subscribership data from a semi-annual survey, started in 1985, conducted by the Cellular Telecommunications and Internet Association ("CTIA").[30] Beginning with the *Seventh Report*, however, the Commission was able to estimate the number of U.S. subscribers using information filed directly with the FCC. This information, the Numbering Report Utilization / Forecast ("NRUF") data, tracks phone number usage in the United States.[31] All mobile telephone carriers must report to the FCC which of their phone numbers they have assigned to end users, thereby permitting the Commission to make an accurate estimate of the total number of mobile telephone subscribers.[32] As stated in the *Seventh Report*, the Commission used NRUF data to estimate that there were 128.5 million subscribers in the United States as of December 31, 2001.[33] The CTIA estimate for the same time was 128.4 million subscribers.[34]

20. We seek comment on the use of NRUF data to estimate the total number of U.S. mobile telephone subscribers. We also seek comment on the continued use of CTIA's estimate from its semi-annual survey. Furthermore, we request information from commenters on other data sources that are available to determine the number of U.S. mobile telephone subscribers and whether parties are willing to

[29] *Id.*, at 13009-19.

[30] CTIA's survey is voluntary; it does not receive information from all carriers and must therefore estimate the subscribership of carriers not reporting. For example, in the survey for the period ending June 30, 2001, subscribers captured through survey response made up 109,674,358 out of a total subscriber estimate of 118,397,734, a difference of 8 percent (8,723,376). *Id.*, at 13004.

[31] The Commission has taken a number of steps to ensure that the limited numbering resources are used efficiently. Among other things, the Commission requires carriers to submit data on numbering resource utilization and forecasts twice a year. Carriers began reporting NRUF data biannually beginning with the period ending June 2000. Federal Communications Commission*, Numbering Resource Utilization in the United States as of June 30, 2001* (Nov. 2001), at 1, 2. This information is submitted to the FCC on Form 502. *Id.*

[32] *Id*. An assigned number is one that is in use by an end-user customer. *Id.*, at 3. Carriers also report other phone number categories, including: intermediate – numbers given to other companies; aging – numbers held out of circulation; administrative – numbers for internal uses; reserved – numbers reserved for later activation; and available – numbers available to be assigned. *Id*. Assigned numbers are not necessarily from facilities-based carriers. A reseller can assign a number to an end user. This does not double-count in the assigned total, since the facilities-based carrier only counts that number as an "intermediate" number given to the reseller.

[33] *See Seventh Report*, at 13004-5.

[34] *Id.*, at 13005.

provide the data. In addition, we request subscribership data that would assist in a greater understanding of the competitive landscape, such as penetration rates by age cohorts or household penetration rates.

21. The Commission also collects subscribership data as part of the local competition and broadband data gathering program.[35] Mobile telephone carriers with more than 10,000 facility-based subscribers in a state are required to report their number of subscribers in those states twice a year to the Commission. Using this data, the Commission reported that mobile telephone carriers had 122.4 million U.S. subscribers as of December 31, 2001.[36] For purposes of the Eighth Report, we seek comment on whether this data should be used to draw any conclusions about the mobile telephone sector, or whether it undercounts subscribership to such a degree that it should not be employed for such purposes.

22. NRUF data is submitted to the Commission on a rate center basis.[37] Rate center boundaries have in large part been determined by incumbent local exchange carriers for their own network management purposes. Because rate center boundaries are relatively small, the NRUF data allows the Commission to make sub-national or regional estimates of mobile telephone subscribership and penetration.[38] However, there are a number of disadvantages associated with using NRUF data for this purpose. First, because CMRS carriers have wide latitude in choosing to which rate center to assign a phone number across a large geographic area, rate center boundaries are not necessarily indicative of where a phone number assignee, and hence a mobile telephone subscriber, lives, works, or uses her phone. In addition, rate center boundaries are not coterminous with other boundaries frequently used in mobile telephone analyses, such as counties, Cellular Market Areas ("CMAs"), or BTAs.[39] Furthermore, in order to protect the confidentiality of the companies submitting NRUF data, the Commission does not report the number of subscribers for geographic areas in which there are three or fewer carriers.

23. For purposes of the *Seventh Report*, the Commission chose to use Economic Areas ("EAs") as the geographic unit for its sub-national subscribership analysis using NRUF data,[40] in part because it minimized many of NRUF's drawbacks, discussed above. EAs, which are defined by the Department of Commerce, consist of one or more economic nodes and the surrounding areas that are

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[35] *See* Local Competition and Broadband Reporting, *Report and Order*, 15 FCC Rcd 7717, 7743 (2000).

[36] *Local Telephone Competition: Status as of December 31, 2001*, Federal Communications Commission, July 2002 (Table 11: Mobile Wireless Telephone Subscribers).

[37] NRUF data is collected by the area code and prefix (NXX) level for each carrier, which enables the Commission to approximate the number of subscribers that each carrier has in each of the approximately 30,000 rate centers in the country. *See Seventh Report*, at 13004.

[38] Additional questions regarding the use of NRUF data to assist in the analysis of CMRS service availability in rural areas are included in ¶ 50, *infra*.

[39] Rate center boundaries generally do not coincide with county boundaries, and this makes geographic analyses imprecise. For purposes of geographical analysis, the centroid of a rate center can be determined, and all of the numbers used in that rate center can be associated with the centroid. All of the centoids that fall within a county boundary can be aggregated and then associated with even larger geographic areas based on counties, for which population and other data exists. However, aggregating centroids at the county level clearly misassigns the location of a number of customers. Aggregating to larger geographic areas based on counties can reduce the level of inaccuracy. *See Seventh Report*, at 13004.

[40] *See Seventh Report*, at 13005-6.

economically related to the node.[41] One of the main factors in determining the economic relationship between the economic node(s) and the surrounding areas is commuting patterns, so that each EA includes, as far as possible, the place of work and the place of residence of its labor force.[42] Because EAs are large enough to include many rate centers and because they attempt to capture both the rate centers in which subscribers have their numbers assigned and the larger area in which they use their phones, an EA-based analysis minimizes the pitfalls of the NRUF data while still providing useful sub-national penetration information.[43]

24. We ask for comment on how to determine which geographic area or areas should be used, for purposes of the Eighth Report, to calculate mobile telephone subscribership and penetration rates.[44] We request opinions on the appropriateness of using EAs for such calculations. Would other geographic areas be appropriate to use in place of or in addition to EAs, such as states, Major Trading Areas ("MTAs"), BTAs, CMAs, or counties, noting the caveats of the NRUF data discussed above? In addition, are there other ways to interpret existing national and sub-national subscribership data for purposes of the Eighth Report?

b) Minutes of Use

25. To analyze mobile telephone usage, the Commission has used MOUs as a key metric in the previous *CMRS Reports*. The *Seventh Report* includes MOU estimates from CTIA, Paul Kagan and Associates, and J.D. Powers & Associates.[45] All of these sources showed MOUs increasing substantially during 2001. We seek comment on the use of MOUs as an indicator of the demand for mobile telephone services as well as of the level of competition in the mobile telephone sector. For purposes of the Eighth Report, we ask for comment on the sources of the MOU data presented in the *Seventh Report* and request additional MOU data. In addition, should the Commission perform other analyses or draw additional conclusions from new or existing data?

26. All of the MOU sources presented in the *Seventh Report* estimate MOUs on a national basis. In order to increase the granularity of our analysis for the Eighth Report, we request data on MOUs on a sub-national basis and/or broken down by various demographic groups.

c) Average Revenue Per Unit

27. Average monthly revenue per subscriber, often referred to as average revenue per unit or "ARPU", is another key metric presented in the *CMRS Reports*. One source of this metric is the industry-

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41 *Id.*, at 13005.

42 *Id*.

43 *Id.*, at 13004-6.

44 The use of any geographic area to calculate mobile telephone subscribership and penetration rates for purposes of the Eighth Report does not imply that the same geographic area be used in any other Commission proceedings to define the relevant geographic markets. Such proceedings could include an application for a license transfer and may present facts pointing to a narrower or broader geographic market definition than any used, suggested, or implied in the *CMRS Reports*.

45 *See Seventh Report*, at 13006.

wide ARPU figure reported by CTIA in its semi-annual mobile telephone survey.[46] In addition, many carriers report their individual ARPU figures periodically in their SEC filings. We seek comment on the use of ARPU as a metric in our analysis of the mobile telephone industry. Is ARPU a useful metric when analyzing competition? Is there a link between changes in ARPU and changes in competition? Is additional ARPU data available that should be considered, in particular data depicting whether and how ARPU varies by region and/or demographic group? Are there additional analyses that can be performed or conclusions that can be drawn in the Eighth Report from new or existing data?

28. CTIA reported that ARPU declined almost continuously from 1987 to 1999, going from a peak of $98.02 in December 1988 to a low of $39.43 in December 1998. However, since 1999, ARPU has been increasing, rising to $47.37 in December 2001.[47] The *Seventh Report* concluded that the growth in ARPU might be the result of a variety of factors, including increased usage offsetting per-minute price declines, as well as the adoption of higher-priced monthly calling plans by consumers.[48] We request from commenters additional input on the possible causes for the recent rise in ARPU, as well as additional data that may support various hypotheses. What role, if any, do changes in ARPU have on competition?

d) Churn

29. Churn, a fourth key metric used in the *CMRS Reports*, refers to the number of customers an operator loses over a given period of time.[49] The *Seventh Report* discussed churn estimates from Merrill Lynch, Salomon Smith Barney, and Telephia.[50] Some of data included in these sources is reported by carriers, many of whom reveal their churn rates periodically in their SEC filings.[51] Are there other sources of churn data available that should be included in the Eighth Report?

30. We seek comment on the use of churn rates as a tool in our analysis of the mobile telephone industry, including to what extent churn rates are a reflection of competition in this industry. We ask if there are additional analyses that can be performed or conclusions that can be drawn from churn data in the Eighth Report. Do commenters believe the churn data we have included in previous reports is reliable?

31. The Telephia data presented in the *Seventh Report* included estimates of churn for selected metropolitan areas including Chicago, Los Angeles, New York, San Francisco, and Washington D.C. To improve our analysis of the mobile telephone industry in the Eighth Report, we request additional sub-national or regional churn data, as well as churn data by demographic groups.

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[46] *Id*. There are different ways of calculating ARPU. The measure reported in the *Seventh Report*, CTIA's "average local monthly bill," does not include toll or roaming revenues. CTIA defines an alternative measure of ARPU, which includes roaming revenues but not toll revenue, and is reported in their biannual survey results. *Id*.

[47] *Id*.

[48] *Id.*, at 13007.

[49] For example, an operator might report an average monthly churn of 2 percent in a given fiscal quarter. In other words, on average, the operator lost 2 percent of its customers in each of the quarter's three months. At this rate, the operator would lose roughly 24 percent of its customers in a single year. *Id.*, at 13007.

[50] *Id.*, at 13007.

[51] *Id*.

4. Pricing Data and Trends

32. The *Seventh Report* contained pricing data from a series of sources, all of which indicated that the average price of mobile telephone service has been decreasing over time. The *Seventh Report* cited information from the U.S. Department of Labor's Bureau of Labor Statistics ("BLS"), Econ One, and trends based on CTIA data.[52] Using CTIA data, we calculated a national average of revenue per minute ("RPM") by dividing ARPU by MOUs.[53] We used this RPM figure as an estimate of the average price per minute of mobile telephone service. RPM has been declining every year since 1995.[54] BLS began reporting a cellular telephone component of the Consumer Price Index ("CPI") in December 1997 ("cellular CPI"). The cellular CPI decreased 5.5 percent during 2001, and 32.8 percent between 1997 and 2001.[55] The CPI, which includes the cellular CPI, represents approximately 87 percent of the U.S. population, and includes expenditure patterns of some of the rural populations.[56] Do commenters believe the cellular CPI should be considered representative of national pricing trends? In contrast to our estimate of RPM and BLS's cellular CPI, which attempt to capture national pricing trends, Econ One analyzes pricing plans for the top 25 U.S. cities. The firm also calculates the average price of service across four different monthly usage levels and derives, from that data, an average for all users.[57] Econ One found that the average price of service (across all usage levels and 25 cities) declined 7.3 percent during 2001, following a 6.9 percent decline in 2000.[58]

33. We seek comment on the use of these various pricing estimates as a tool in our analysis of the mobile telephone industry, including to what extent price decreases are evidence of competition in the mobile telephone sector. We ask for feedback on the sources of the pricing data used in the *Seventh Report* and request additional national and sub-national pricing data for the Eighth Report. Are there additional analyses that can be performed or conclusions that can be drawn from new or existing pricing data?

34. The *CMRS Reports* have also examined new types of pricing plans introduced during the past year in order to report on major developments in the industry and to assess the new plans' impact on competition.[59] To what extent do new types of pricing plans both reflect a competitive industry and stimulate competition among providers? What are the major innovations that have occurred with pricing plans since the *Seventh Report*?

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[52] *Id.*, at 13012-14.

[53] *Id.*, at 13013-14.

[54] *Id*.

[55] *Id.*, at 13013.

[56] *Id*.

[57] *Id.*, at 13012-13.

[58] *Id*.

[59] *Id.*, at 13014.

35. We seek information on which carriers offer nationwide pricing plans,[60] particularly those that are not typically described as being nationwide operators, and request descriptions of the terms of such plans. We ask carriers that offer nationwide pricing plans whether they offer the same rates and terms to consumers throughout all parts of the country where they offer such plans, including Alaska, Hawaii, and Puerto Rico. Furthermore, do carriers charge different prices – both monthly and per minute – or offer different terms for their local and regional plans across the various areas that they serve? If so, are these geographic variations substantial, and what are the major reasons for such variations?

36. Is pricing data available on whether certain types of pricing plans are associated with specific demographic cohorts or types of users? For example, do subscribers with lower personal or household incomes tend to purchase pricing plans with lower monthly fees? Are particular plans associated with teenagers or college students? Are prepaid services used by a group of consumers with similar characteristics? Have the introduction of new types of pricing plans increased mobile telephone penetration among specific demographic groups or in certain geographic areas?

5. Geographic Comparisons: Urban versus Rural

37. Since the release of the *Sixth Report*, the Commission has attempted to obtain a better understanding of the state of competition below the national level, in particular in rural areas. To begin with, we ask commenters to address whether an urban/rural distinction is meaningful in the context of mobile telephone service, given the varying types of geographic areas in which consumers use their mobile phones and carriers offer plans.

38. To the extent that it is meaningful to analyze mobile telephone service availability in rural areas, we seek comment on how best to determine whether competition has developed successfully in rural areas. We invite parties to comment on what data is available to address this issue and whether they believe there is meaningful competition among mobile telephone providers in rural areas.

39. The primary difficulty for the Commission in examining the state of competition in rural areas has been the lack of sub-national data. Prior to the release of the *Seventh Report*, the Commission held a Public Forum to gather more insights into and data about CMRS service availability in rural areas.[61] Much of the information gathered was anecdotal. Therefore, additional data is needed, and we seek comment and information on three topics related to mobile telephone service availability in rural areas: 1) the definition of rural, 2) service availability and network deployment, and 3) market performance and key metrics.

40. Do services, pricing plans, and technologies differ between rural areas and urban areas? Do the providers who serve both areas offer the same products and prices in each type of area?

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[60] Nationwide pricing plans, also referred to as digital one rate ("DOR") plans, are described in the *Seventh Report* as plans that allow customers to purchase a bucket of MOUs to use on a nationwide or nearly nationwide basis without incurring roaming or long distance charges. *Id.*, at 13014. For a discussion of "nationwide" mobile telephone operators, see ¶ 17, *supra*.

[61] *See* note 5, *supra.*

a) Definition of Rural

41. In order to analyze mobile telephone service availability and competition in rural areas, it is necessary to first define what geographic area(s) constitutes "rural." The federal government has multiple ways of defining rural, reflecting the multiple purposes for which the definitions are used.[62] The Commission has used Rural Service Areas ("RSAs") to define "rural" in certain instances. In the CMRS spectrum cap proceeding, the Commission designated RSAs as rural areas and stated, "Other market designations used by the Commission for CMRS, such as [EAs], combine urbanized and rural areas, while MSAs and RSAs are defined expressly to distinguish between rural and urban areas."[63] Since passage of the Telecommunications Act of 1996, the Commission generally has used the statutory definition to determine which local exchange carriers can be classified as rural telephone companies. That definition uses a range of standards including the population of a jurisdiction and the number of access lines serving communities of various sizes.[64]

42. In the *Seventh Report*, we used three different proxy definitions of rural for purposes of analyzing the average number of competitors in rural versus non-rural counties. We compared the number competitors in 1) RSA counties versus MSA counties, 2) non-nodal EA counties versus nodal EA counties,[65] and 3) counties with population densities below 100 persons per square mile versus those with population densities above 100 persons per square mile.[66]

43. We request comment on whether and how the Commission should define rural for purposes of the Eighth Report. What elements should the Commission consider when defining "rural"? Should there be a single delineation between rural and non-rural areas, or should rural be defined on a continuum? For example, should the Eighth Report define different degrees of "ruralness" based on population density?

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[62] *See Seventh Report*, at 13021.

[63] *See* Biennial Regulatory Review, Spectrum Aggregation Limits for Wireless Telecommunications Carriers, *Report and Order*, 15 FCC Rcd 9219, 9256 at note 203 (1999). Consistent with this approach, the Commission recently applied this distinction between rural and urban areas in its review of the cellular cross-interest rule, deciding to maintain this rule in RSAs while eliminating it in Metropolitan Statistical Areas ("MSAs"). *See* 2000 Biennial Regulatory Review Spectrum Aggregation Limits For Commercial Mobile Radio Services, *Report and Order*, 16 FCC Rcd 22668, 22708 (2001), *petitions for reconsideration pending*. Based on data in its records, the Commission found that RSAs typically have fewer competitors offering two-way mobile service, and fewer nationwide service providers, than do MSAs. *Id.*, at 22705.

[64] *See* 47 U.S.C. § 153(37), 47 C.F.R. § 1.2110(c)(4).

[65] Each EA consists of one or more counties that are "Economic Nodes" and the surrounding counties that are economically related to it. An EA may have more than one economic node. The counties that are economic nodes are metropolitan areas or similar areas that serve as the EA's center(s) of economic activity. As a proxy for urban and rural geographic areas, we looked at counties which make up economic nodes, i.e. nodal counties, versus those counties that do not make up economic nodes, i.e. non-nodal counties. *See Seventh Report*, at 13022.

[66] *See Seventh Report*, at 13022-23.

b) Rural Service Availability

44. As mentioned above, the Commission analyzed service availability in rural areas in the *Seventh Report* using three different proxy definitions for rural. The analysis resulted in similar results for each definition. Non-rural counties had an average of 5.5 to 5.7 service providers, while rural counties had an average of 3.1 to 3.3 competitors.[67] We ask whether the existence of fewer facilities-based providers in rural areas necessarily indicates the existence of less meaningful competition in these areas.

45. When examining service availability in rural areas, should the Commission continue to use multiple definitions of rural for purposes of the Eighth Report? Were the three definitions employed in the *Seventh Report* appropriate proxies to use in assessing competition in rural areas? Are there other geographic definitions that should be employed in the Eighth Report? Is data available that would allow an analysis using other definitions?

46. In addition to addressing rural issues generally, we also take this opportunity to focus on access to telecommunications services by individuals living on tribal lands. In our *Report and Order* implementing auction bidding credits for those who commit to serving federally-recognized tribal lands, we noted that communities on tribal lands have had less access to telecommunications services than any other segment of the U.S. population.[68] According to the 1990 Census,[69] only 53 percent of those living on tribal lands had basic telephone service, as opposed to 94 percent for the United States as a whole.[70] Further, a 1999 study commissioned by the U.S. Department of Commerce's Economic Development Administration found that the average penetration rate for basic telephone service on reservation and trust lands in rural areas was just 39 percent.[71] Therefore, it may be appropriate to examine closely the state of telecommunications access not only in rural areas, but more specifically on tribal lands.

47. We seek comment on whether the Eighth Report should specifically address the state of mobile telephone competition on tribal lands. If so, what issues are present on tribal lands that warrant separate consideration from other rural areas with similar population levels? In examining services available on tribal lands, should we limit our consideration to services available to individuals who live within federally-recognized tribal lands, or should we also include other nearby areas where Native

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[67] Non-nodal counties had an average of 3.1 mobile competitors, while nodal counties had an average of 5.5 competitors. RSA counties had an average of 3.3 mobile competitors, while MSAs had an average of 5.7 competitors. The less densely populated counties had an average of 3.2 mobile competitors, while the more densely populated counties had an average of 5.5 competitors. *Id.*, at 13022-23.

[68] *See* Wireless Telecommunications Services to Tribal Lands, WTB Docket No. 99-266, *Report and Order and Further Notice of Proposed Rulemaking*, 15 FCC Rcd 11794 (2000).

[69] Statistics from the 2000 Census regarding telephone subscribership rates were not yet available as of the release date of this NOI.

[70] U.S. Bureau of the Census, "Housing of American Indians on Reservations; Equipment and Fuels," SB/95-11, April 1995.

[71] U.S. Department of Commerce, Economic Development Administration, and New Mexico State University, "Assessment of Technology Infrastructure in Native Communities," June 1999. This report notes that because 20 percent of those residing on tribal lands live on the Navajo Reservation, the low penetration rate of the total tribal population is affected by the 22 percent penetration rate found on the Navajo Reservation.

Americans may live? If so, we ask that commenters provide details regarding which areas should be included in our discussion, and provide information or information sources for obtaining sufficiently granular data about services in such areas.

c) Rural Metrics

48. As discussed above, the *CMRS Reports* have looked at key metrics as indicators of the demand for mobile telephone service and competition among mobile telephone providers. These metrics include the number of subscribers, MOUs, ARPU, churn, and pricing data. Historically, all of these metrics have been presented on a national basis, although sub-national subscribership and pricing data were included in the *Seventh Report.* Furthermore, we have requested sub-national or regional data for all of these metrics in Sections II.A.3. and II.A.4., *supra*.

49. At this point, we request data for all of these metrics on a sub-national level and ask what the data show about differences between urban and rural areas in terms of demand and competition. Does information currently exist demonstrating differences in subscribership, MOUs, ARPU, churn, and prices in urban versus rural areas? If so, would commenters be willing to provide such information?

50. Beginning with the *Seventh Report*, we presented subscribership figures on an EA basis using NRUF data. Should the Commission use NRUF data to determine subscribership and penetration rates in rural areas, however they may be defined? Would the NRUF data be able to provide accurate and meaningful statistics on rural subscribership given the limitations of the data discussed above?[72] Are there other sources of information that could be used to determine the number of subscribers and penetration rates in rural areas?

51. The Commission knows of few studies that have been done comparing mobile telephone pricing in urban versus rural areas. However, Econ One has completed one study, which it presented at the Public Forum and which we included in the *Seventh Report,* that compared pricing in the 25 largest U.S. cities (with an average population of 4.4 million) with 25 randomly-selected towns or cities (with an average population of 95,611) located in RSAs. For purposes of its analysis, Econ One considered the towns or cities located in an RSA to be rural areas. The company reported very similar pricing in these two groups of cities.[73] However, while the mean prices for monthly service in urban and rural areas were similar, there was a wider range of prices in rural areas than in urban areas.[74] We ask for additional information on whether there are meaningful pricing differences between urban and rural areas. To the extent that such differences exist, what are the reasons for such differences? Should additional analyses on the differences between urban and rural mobile telephone pricing be performed? What additional conclusions can be drawn, and what are the limitations of those conclusions?

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[72] *See* ¶ 23, *supra.*

[73] *See Seventh Report*, at 13023, and FCC, CMRS Competition Reports, *Presentation by Charles Mahla of Econ One*, <http://wireless.fcc.gov/services/cmrs/presentations/FCC_2002_mahla.pdf>.

[74] *Id.*

52. Finally, to what extent do nationwide carriers[75] affect prices and competition in rural areas, even if such carriers do not offer service in those areas? Do these carriers create the same competitive pressures in rural areas that they do in urban areas?

6. Wireless-Wireline Competition

53. Mobile telephone service has been considered both a complement to and a substitute for wireline services. Historically, most consumers used their mobile phones as a mobile complement to their wireline phones by using their mobile handsets only when away from their homes or places of work. However, as noted in the *Seventh Report*, an estimated 3 to 5 percent of consumers have "cut the cord," meaning they do not subscribe to wireline phone service.[76] The *Seventh Report* included information about consumers who consider their mobile phones their primary phone but may still continue to have a wireline phone.[77] Moreover, the *Seventh Report* noted that, due to the fact that several mobile telephone packages have extensive local service areas and/or include free long distance, many consumers now use their mobile phones instead of their wireline phones to make "long distance" calls.[78]

54. In order to track and analyze competition between mobile telephone and wireline services more effectively, we request data on 1) the number of mobile telephone subscribers who do not subscribe to residential wireline service, 2) the percentage of consumers' total monthly voice communication minutes that are made from mobile phones, 3) the percentage of consumers' total monthly long distance minutes that are made from mobile phones, 4) the percentage of mobile telephone subscribers' calls and minutes that occur in their homes using their mobile phones, 5) the percentage of both mobile telephone and wireline calls and minutes that terminate on mobile phones, and 6) demographic data on which groups of consumers have allocated a substantial portion of their voice communications to mobile telephone service. Should the Commission gather additional data, perform additional analyses, or draw new conclusions on wireless-wireline competition?

55. The *CMRS Reports* have also discussed the effects of mobile telephone service on the operational and financial results of companies that offer wireline services. Such effects include a decrease in the number of residential access lines, a drop in long distance revenues, and a decline in payphone profits.[79] To what extent is the increase in mobile telephone usage a major cause of these developments, and why? Given these developments, we ask for comment on the extent to which mobile telephone service competes with wireline service. What other effects has mobile telephone service had on the provision of other telecommunications services by other service providers? What new developments in wireless-wireline competition have occurred since the *Seventh Report*? What are the major reasons for these developments?

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[75] For a discussion of nationwide carriers, see ¶ 17, *supra*.

[76] *See Seventh Report*, at 13017.

[77] *Id.*

[78] *Id.,* at 13018. The term "long distance" in the wireline industry generally refers to interLATA (Local Access and Transport Area) and intraLATA toll calls for which a per-minute fee is generally charged. In the wireless industry, the term does not have a specific definition but often refers to calls made to locations outside of a subscriber's home calling area.

[79] *Id.*, at 13017.

7. Satellite Operators

56. Satellite operators offer mobile telephone services which, from a consumer's point of view, have many of the same characteristics as terrestrial-based mobile telephone services. At least four carriers currently provide mobile satellite services ("MSS") in the United States: Globalstar Telecommunications LTD, Iridium Satellite LLC, Inmarsat Limited, and Mobile Satellite Ventures.[80] We request that these carriers submit as part of their comments information detailing the geographic areas of the United States in which they provide coverage as well as those areas in which they offer service to new customers. Taking into account such information on MSS service availability, we seek comment on the extent of competition among MSS providers. To what extent do MSS providers compete with terrestrial-based mobile telephone providers? Are MSS services substitutes for terrestrial-based mobile telephone and data services? Should MSS providers be considered an additional service provider in the analysis of service availability in the Eighth Report, or do they offer services that generally are not substitutes for services provided by terrestrial CMRS carriers, even though they fall under the legal umbrella of CMRS?

8. Resellers

57. Resellers offer service to consumers by purchasing airtime at wholesale rates from facilities-based providers and reselling it at retail prices. According to information provided to the Commission in its ongoing local competition and broadband data gathering program, the resale sector accounted for approximately 5 percent of all mobile telephone subscribers as of December 2001.[81] To what extent are resellers creating competitive pressures in the mobile telephone sector? In 2002, WorldCom, which claimed to be the largest reseller of post-paid wireless service the United States, announced that was abandoning the resale business.[82] Who are the remaining major resellers? How many subscribers do they have? From a consumer perspective, what are the benefits of buying from a reseller versus a facilities-based provider? Are resellers selling to specific demographic segments? The *Seventh Report* discusses "mobile virtual network operators" ("MVNOs") that are a type of reseller that focuses on brand development, with the intent to offer a niche product and to have better customer retention. An example of an MVNO is Virgin Group LLC ("Virgin"). Virgin has an arrangement with Sprint PCS whereby Virgin markets prepaid mobile telephone service using Sprint PCS's network. We ask for comment on how this resale model has affected the provision of resale services. We also ask for information about companies that have employed the MVNO resale model since the *Seventh Report*.

9. International Developments

58. The *Seventh Report* compared the mobile telephone sectors in the United States, Western Europe, and parts of the Asia-Pacific by examining a number of performance measures, including penetration levels, subscriber growth, MOUs, and pricing. The scope of international comparisons in the

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[80] *Id.,* at 13026; Mobile Satellite Ventures, *About MSV* (visited Oct. 8, 2002) <http://www.tmi.ca/about/index.cfm>; *Inmarsat mini-M Satellite Phone Soars to 100,000 Connections*, News Release, Inmarsat, Sept. 23, 2002. Inmarsat offers data as well as voice services; its customers connect to the network using units resembling laptop computers, and they can add voice service by attaching a phone to the laptop unit.

[81] *Local Telephone Competition: Status as of December 31, 2001*, Federal Communications Commission, July 2002 (Table 11: Mobile Wireless Telephone Subscribers).

[82] *See Seventh Report,* at 13025.

Seventh Report and previous *CMRS Reports* has been constrained by the availability of comparable international data. For the purposes of the Eighth Report, we seek data to update and possibly expand upon these international comparisons.

59. The international comparisons in the *Seventh Report* were based on various sources of data that were generally current as of the second half of 2001.[83] We request suggestions on sources of data for updating international comparisons of penetration levels, subscriber growth, and usage for the year 2002.

60. The *Seventh Report* used Organization for Economic Co-Operation and Development ("OECD")/Teligen mobile service baskets and revenue per minute ("RPM") estimates to compare mobile telephone pricing in the United States, Canada, and parts of Western Europe and the Asia-Pacific.[84] We request recommendations on alternative methods of comparing mobile telephone pricing in different countries and associated sources of data. We also seek suggestions on sources of data for updating the international comparison of RPM.

61. We also invite suggestions on additional performance measures and associated data sources for comparing the U.S. mobile telephone sector with those in other countries.

B. Competition in the Mobile Data Sector

1. Introduction

62. For purposes of its *CMRS Reports*, the Commission considers mobile data to be the delivery of non-voice information to a mobile device. Two-way mobile data services include not only the ability to receive non-voice information on an end-user device but the ability to send it from an end-user device to another mobile or landline device using wireless technology.[85] The *Seventh Report* concluded that competition within the mobile data sector is developing successfully, as evidenced by the multitude of dynamic services, service packages, and pricing plans available to consumers from a variety of providers.[86]

63. For purposes of the Eighth Report, we seek information on the significant changes and developments that have occurred in the mobile data industry since the publication of the *Seventh Report*. Do commenters believe that competition is continuing to develop successfully within the mobile data sector?

64. In analyzing competition within the mobile data industry, it is necessary to consider the relationship between mobile data and mobile telephone service. Both services are offered by many of the same providers using the same networks and end user devices, yet differences in the nature of the two services exist. Hence, to what extent are the mobile data and mobile telephone sectors separate, and to what extent are they converging?

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[83] *Id.*, at 13032-37.

[84] *Id.*, at 13035-37.

[85] *Id.*, at 13038.

[86] *Id.*, at 13039.

65. Related to this issue of convergence, the *Seventh Report* discussed the emergence of smartphone devices during 2001 and 2002 that combine the organization and data-centric features of personal digital assistants ("PDAs") with the voice capabilities of mobile telephones.[87] We seek comment on the extent to which the emergence of smartphones has signified a convergence between mobile data and mobile telephone service, and we seek data on the growth in the number of users of these devices. How many smartphones have been sold in the United States? What types of consumers purchase smartphones? What are the features and capabilities of the various devices? Finally, have there been any new developments related to smartphones since the *Seventh Report*?

2. Services & Content

66. The *Seventh Report* described three general categories of mobile data providers and their corresponding devices: 1) mobile telephone operators offering services primarily on mobile telephone handsets, 2) providers of mobile data access to handheld PDA devices and laptop computers, and 3) paging carriers offering services on pagers and two-way messaging devices.[88] However, in analyzing subsectors within the mobile data industry, for several reasons we have found it most effective to segregate the industry not along the lines of devices, spectrum bands, or network technologies, but instead along the lines of the types of services available to consumers. First, the types of mobile data services available to consumers have become increasingly similar across devices. Many of the same mobile data services are available on mobile telephone handsets, PDAs, smartphones, and laptop computers. With the exception of traditional one-way pagers, most mobile data devices have the ability to offer some form of text messaging, web browsing, and e-mail access.[89] Second, carriers use a variety of different spectrum bands – including broadband PCS, cellular, and SMR – and a variety of different network technologies – including CDMA, GSM, cdma2000 1xRTT ("1xRTT"), and General Packet Radio Service ("GPRS") – to provide many of the same mobile data services.

67. The types of services discussed in the *Seventh Report* include: paging, Short Messaging Service ("SMS") and instant messaging ("IM"), web browsing, e-mail and corporate server access, location-based services, and short range data transmissions.[90] Are there additional categories that should be analyzed in the Eighth Report? What new and innovative services are mobile data providers offering? In addition, we seek comment on the extent to which mobile data services are substitutes for or complements of one another? For example, do messaging services compete with e-mail services? Are web browsing services a complement to e-mail access? Which services are most often bundled together, and why?

68. In addition to seeking data on the level of competition among different mobile data services, we request information on the extent to which mobile data services compete with data services offered through wireline devices. For example, have mobile e-mail services been a substitute for e-mail access on a personal computer offered through a dial-up, Digital Subscriber Line ("DSL"), or cable modem connection?

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87 *Id.*, at 13047-48.

88 *Id.*, at 13039.

89 *Id*.

90 *Id.*, at 13051-63.

69. Furthermore, we request data on the growth and success of the various mobile data services. Which services are most popular with consumers and have the highest adoption rates? In what ways do services offered over 1xRTT and GPRS networks differ from those offered over 2G[91] networks?

70. In addition to requesting comment on mobile data services generally and the economic relationship between these services, we also seek information related to specific mobile data services.

a) Paging

71. Traditional paging service consists of a one-way data communication sent to a mobile device that alerts the user when it arrives. The communication usually consists of a phone number for the user to call, but could also contain a short text message or information update.[92] As discussed in the various *CMRS Reports*, the number of subscribers to traditional one-way paging services has been declining over the past few years. In addition, all of the major paging carriers have filed for bankruptcy reorganization over the past two years.[93] Do commenters foresee continued demand for one-way paging services? If so, who are the major purchasers of one-way paging services? What specific advantages do one-way paging services offer for these consumers versus other services? How many paging subscribers also own a mobile telephone?

b) Web Content

72. As explained in the *Sixth* and *Seventh Reports*, mobile web browsing services allow users to access content from the World Wide Web on a mobile device. The web browsing services offered can vary by provider and by device in both the type and amount of content that users can receive.[94] For example, mobile web subscribers using laptops may be able to connect to any web page and view graphical content, while users accessing the web from a mobile telephone handset may be able to view only a limited number of text-based web pages that have been redesigned for mobile devices. Furthermore, some carriers limit the web sites that users can access to those with which they have a content agreement.[95]

73. We invite commenters to address the extent to which users have a choice of which content they receive. Can users of mobile web services access any web site, only those have been re-designed for access on mobile device, or only those with whom the carrier has a content agreement? Approximately how many web sites have been specially designed for use on a mobile device?

74. Have there been any notable technological developments in the past year that have facilitated a greater availability of mobile web browsing services?

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[91] The 2G mobile network technologies include the four digital technologies used by carriers in the United States: CDMA, TDMA, GSM, and iDEN. *Id.*, at 12990.

[92] *Id.*, at 13051.

[93] *Id.*, at 13049-50.

[94] *Id.*, at 13053-55.

[95] *Id*.

c) Text Messaging

75. As mentioned in the *Seventh Report*, SMS provides the ability for users to send and receive text messages to and from mobile devices with maximum message length ranging from 120 to 500 characters.[96] We seek data on the growth rate of SMS in the United States over the past several months. How many SMS messages have been sent in the United States over time?

76. Furthermore, as of mid-2002, most of the major mobile telephone carriers had introduced the ability to exchange text messages with subscribers on other carriers' networks.[97] We seek information on how this intercarrier interoperability has affected SMS adoption rates and the volume of SMS traffic.

77. In addition to offering SMS, some carriers offer IM services. Instant messaging services, such as AOL Instant Messenger ("AIM") and MSN Messenger, enable users to send and receive messages within a community of users, creating a chat-style atmosphere, whereas SMS is a communication between two individuals.[98] From their mobile devices, AIM users are able to tell whether or not someone from their "buddy list" – a list of other AIM users with whom the initial user communicates – is online. In addition, AIM users can communicate with their buddies regardless of whether they are on a desktop computer or a mobile telephone.[99] AT&T Wireless, Sprint PCS, T-Mobile, and Palm have offered AIM to their users, while Verizon Wireless and Cingular Wireless have offered MSN Messenger.[100] Unlike with SMS, open access or interprovider interoperability is not available with IM services; AIM users cannot exchange messages with users of MSN Messenger. To what extent have these access and interoperability issues affected demand for instant messaging services in the mobile data sector?

78. As mentioned above, the Commission invites comment of the extent to which the various mobile data services compete with each other. In particular, we ask to what extent text messaging and e-mail are substitutes for each other. In what ways do the features and capabilities of the two services vary?

d) E-mail & Corporate Server Access

79. As discussed in the *Seventh Report*, a variety of services are available to consumers that allow them to receive e-mail messages while mobile from an existing home- or work-based e-mail account.[101] We seek information from commenters on the specific capabilities of these various mobile e-mail services. To what extent are features such as forwarding and deleting integrated with consumers' other e-mail accounts? Are users able to view attachments? In addition, we seek information on the specific capabilities of services that allow users to access corporate intranets or files stored on corporate servers from a mobile device.

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96 *Id.*, at 13051.

97 *Id.*, at 13052.

98 *Id.*

99 *Id.*, at 13052-53.

100 *Id.*

101 *Id.*, at 13056-58.

80. With regard to both types of services, we seek information on how much data or content a user can download, and how quickly and reliably. Furthermore, are these services secure? What level of security and/or encryption is offered by these various services?

3. Devices

81. Mobile data services, and in particular mobile Internet services, are offered on a variety of end-user devices. Which devices are used most for mobile Internet access? Furthermore, do any of the features of mobile data devices – such as battery life, data storage capacity, and screen size – constrain the ability of users to access mobile Internet services, and therefore limit the demand for such services? Which features on which devices might limit mobile Internet access the most?

4. Subscribership

82. In addition to seeking information on the capabilities of the various mobile data services discussed above, we also request data on the number of subscribers to and users of mobile Internet services. How many people in the United States subscribe to or use any type mobile Internet service? Do most mobile Internet users also subscribe to mobile telephone service? How many people use the different types of mobile data services, including paging, SMS, IM, web browsing, e-mail, and corporate server access? In the *Seventh Report*, we used NRUF[102] data to estimate the number of paging subscribers at the end of 2001. Do commenters agree that this is a reliable method for calculating the number of subscribers to that particular service?

83. How many people subscribe to or use higher-speed mobile Internet services provided over 1xRTT and GPRS networks? How does subscribership to the various mobile data services vary by geographic region and among various demographic groups?

5. Service Availability

84. In preparation for the Eighth Report, we request information on the availability of mobile data services offered over 2G mobile networks, as well as higher-speed mobile data services offered over 1xRTT and GPRS networks.

85. Do carriers offer any type of mobile Internet service in any portion of their service areas? In what percentage of their license and network footprints[103] do carriers offer mobile Internet services? Are the same types of services available in all areas? What percent of carriers' licensed and network POPs are located in the areas where mobile Internet services are available? Does mobile data service availability vary between urban and rural[104] areas?

86. The *Seventh Report* summarized the deployment of next-generation network technologies 1xRTT and GPRS on a county-by-county basis as of March 2002.[105] For purposes of the Eighth Report,

[102] See ¶ 19, *supra*, for a description of NRUF data.

[103] Generally, "footprint" is an industry term of art referring to the total geographic area in which a wireless provider offers service or is licensed to offer service.

[104] *See* ¶¶ 41-43, *supra*, for a discussion of the definition of rural.

[105] *See Seventh Report*, at 13038-39.

we seek information on the extent to which carriers have continued to upgrade their networks with these next-generation technologies since March 2002. In what portion of their license and network footprints have carriers deployed 1xRTT or GPRS, and in what portion do they offer advanced wireless services[106] using these technologies? Are the same types of advanced wireless services available in all areas? Does the availability of advanced wireless services vary between urban and rural areas? What percent of carriers' licensed and network POPs are located in the areas where 1xRTT or GPRS-based mobile data services are available? Furthermore, what percent of the U.S. population has access to advanced wireless services provided by 1xRTT and/or GPRS?

87. Furthermore, we request comment on the actual data transfer speeds that most users experience with GPRS and with 1xRTT. Do the two technologies differ in this respect? To what degree are individual users' data transfer speeds depleted as more users log on to the network in a given area?

88. Finally, we request information on the extent to which mobile data providers are upgrading or plan to upgrade their networks with additional next generation technologies beyond GPRS and 1xRTT, such as EDGE, WCDMA, and 1X-EV.

6. Pricing

89. In analyzing competition in the mobile data industry and the general evolution of this sector, we have examined the prices charged by providers for various mobile data services. While the analysis of pricing in the mobile telephone sector includes an estimate of per-minute pricing, such an estimate is not feasible in the mobile data sector given the variety of services and the variety of pricing techniques used by carriers. Therefore, the previous *CMRS Reports* have summarized and compared, in some cases over time, the different prices carriers charge as well as various pricing methods they use.[107]

90. For the Eighth Report, we request data from providers on the prices they charge for the various mobile data services they offer. How have these prices changed over time?

91. In addition to asking for actual pricing data, we also seek comment on the general trends related to mobile data pricing. To what extent do providers bundle mobile data services with each other and with voice service? Do providers offer mobile data services as add-ons service to voice service or as standalone services? Are mobile data services offered on a per-use basis or on a monthly subscription basis? Finally, do providers charge for mobile data services by the megabyte of data, by the minutes of usage, by the incremental service, and/or do they offer a flat rate for unlimited usage?

92. In addition, we seek information on the degree to which mobile data providers, in their pricing plans and marketing efforts, distinguish between mobile Internet services offered over 2G networks and those offered over next-generation 1xRTT and GPRS networks.

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[106] The *Seventh Report* uses the term "advanced wireless services" to describe services offered over the interim technologies that carriers are using or plan to use in migrating from 2G to 3G technologies. In the United States, these technologies consist of GPRS and 1xRTT. *Id.*, at 13038.

[107] *Id.*, at 13052, 13055-58.

93. Are the prices of mobile data services generally the same across all the geographic areas in which carriers offer them? Do the prices vary by region, in particular between urban and rural areas? To the extent that they do vary by region, what are the reasons for this?

7. WiFi

94. Over the past year, the WLAN technology, Wireless Fidelity or WiFi, has begun to play an increasingly important role in the mobile data industry. WiFi operates in the unlicensed spectrum bands using primarily the 802.11 wireless technology standards and allows data transfer speeds of up to 11 Mbps.[108] While WiFi is not a CMRS service per se, we included a discussion of it in previous *CMRS Reports* because of its potential to affect the provision of CMRS services.[109]

95. Users of mobile devices with WiFi capabilities or attachments can establish a high-speed, wireless connection to the Internet within a variety of settings, including restaurants, coffee shops, hotels, airports, convention centers, office buildings, and college campuses.[110] These buildings or campuses generally connect to the Internet via a high-speed wireline technology such as a T-1 line, and WiFi users lose their high-speed wireless connections once they exit these settings. Given both the advantages and limitations of WiFi, do commenters believe that it competes with commercial, interconnected mobile data services? Does WiFi have the potential to compete with these services to a greater extent in the future?

96. For purposes of the Eighth Report, we request data on the current extent of WiFi deployment and usage. How many people or what percent of the U.S. population subscribes to or uses WiFi services? In how many locations is WiFi currently available, and in which types of locations do most users establish WiFi connections? What data transfer speeds do most users experience with the various WiFi technology standards, including 802.11a, 802.11b, and 802.11g? In addition, what are the major drawbacks of WiFi access? To what degree are WiFi connections secure for end users? What, if any, interference problems are associated with WiFi access? Are voice services possible and available using WiFi connections?

97. Finally, we seek information on the other uses of unlicensed spectrum besides WiFi. Are both voice and data services available through these other types of connections? What is the extent of deployment of these other services?

III. FIXED VOICE AND DATA SERVICES

98. In addition to providing an analysis of competition in the commercial mobile services industry, the *CMRS Reports* have also included an appendix providing an overview of the current state of the fixed wireless industry. Some licensees of spectrum bands traditionally used for CMRS are using that spectrum to provide fixed wireless services. Furthermore, because most fixed wireless carriers have typically offered two-way, high-speed data services, the fixed wireless sector is discussed in greater detail

[108] *Id.*, at 13062.

[109] *Id.*, at 13062-63.

[110] *Id.*

in the Commission's annual report on the deployment of broadband services, pursuant to Section 706 of the Telecommunications Act of 1996.[111]

99. With this *NOI*, the Commission seeks the data from commenters on the state of the fixed wireless industry to incorporate into the Fixed Wireless Appendix of the Eighth Report. Who are the major providers of fixed wireless services? Have the carriers that experienced financial difficulties over the past two years[112] made progress towards recovery and formed new business strategies? Which spectrum bands are currently being used by operators to deploy fixed services, including the unlicensed spectrum bands? In what portion of the United States, measured by both population and land area, are fixed wireless services available? To what extent have fixed wireless networks been deployed in rural areas? How many fixed wireless systems employ unlicensed spectrum? How many businesses and households currently subscribe to fixed wireless services? What are the typical data transfer rates offered by the various fixed wireless systems? Have there been in any major technological innovations that have affected the fixed wireless industry over the past year?

IV. PROCEDURAL MATTERS

A. Ex Parte Presentations

100. This is an exempt proceeding in which ex parte presentations are permitted (except during the Sunshine Agenda period) and need not be disclosed.[113]

B. Filing of Comments and Reply Comments

101. We invite comment on the issues and questions set forth above. Pursuant to sections 1.415 and 1.419 of the Commission's rules, 47 C.F.R. §§ 1.415, 1.419, interested parties may file comments on or before January 27, 2003, and reply comments on or before February 11, 2003. Comments may be filed using the Commission's Electronic Comment Filing System (ECFS) or by filing paper copies. See Electronic Filing of Documents in Rulemaking Proceedings, 63 Fed. Reg. 24121 (1998).

102. Comments filed through the ECFS can be sent as an electronic file via the Internet to <http://www.fcc.gov/e-file/ecfs.html>. Generally, only one copy of an electronic submission must be filed. If multiple docket or rulemaking numbers appear in the caption of this proceeding, however, commenters must transmit one electronic copy of the comments to each docket or rulemaking number referenced in the caption. In completing the transmittal screen, commenters should include their full name, U.S. Postal Service mailing address, and the applicable docket or rulemaking number. Parties may also submit an electronic comment by Internet e-mail. To get filing instructions for e-mail comments, commenters should send an email to ecfs@fcc.gov, and should include the following words in the body of the message: "get form." A sample form and directions will be sent in reply. Parties who choose to file by paper must file an original and four (4) copies of each filing. Parties choosing to submit, as part of

[111] *See* Inquiry Concerning the Deployment of Advanced Telecommunications Capability to All Americans in a Reasonable and Timely Fashion, and Possible Steps To Accelerate Such Deployment Pursuant to Section 706 of the Telecommunications Act of 1996, *Third Report*, 17 FCC Rcd 2844 (2002).

[112] *See Seventh Report*, at 13070-73, for a discussion.

[113] 47 C.F.R. § 1.1204(b)(1).

their comments, map files in response to requests in ¶¶ 11-14, ¶ 56, or ¶ 86, *supra*, should submit a CD (compact disc) containing one copy of the maps of their service areas, with the various distinctions described above, in a format, either MapInfo table (.tab) or Tagged Image Format (.TIF), that will allow Commission staff to open and use these files in MapInfo Professional software, version 6.0. If you have questions about submitting map files, please contact Chelsea Fallon at (202) 418-7991. Paper filings and CDs containing map files can be sent by hand or messenger delivery, by commercial overnight courier, or by first-class or overnight U.S. Postal Service mail (although we continue to experience delays in receiving U.S. Postal Service mail). The Commission's contractor, Vistronix, Inc., will receive hand-delivered or messenger-delivered paper filings for the Commission's Secretary at 236 Massachusetts Avenue, N.E., Suite 110, Washington, D.C. 20002. The filing hours at this location are 8:00 a.m. to 7:00 p.m. All hand deliveries must be held together with rubber bands or fasteners. Any envelopes must be disposed of before entering the building. Commercial overnight mail (other than U.S. Postal Service Express Mail and Priority Mail) must be sent to 9300 East Hampton Drive, Capitol Heights, MD 20743. U.S. Postal Service first-class mail, Express Mail, and Priority Mail should be addressed to 445 12th Street, SW, Washington, D.C. 20554. All filings must be addressed to the Commission's Secretary, Office of the Secretary, Federal Communications Commission. Parties also should send four (4) paper copies of their filings to Chelsea Fallon, Federal Communications Commission, Room 4-A335, 445 12th Street, S.W., Washington, DC 20554.

V. ORDERING CLAUSES

103. Accordingly, IT IS ORDERED that, pursuant to the authority contained in Sections 4(i), 4(j), and 403 of the Communications Act of 1934, as amended, this Notice of Inquiry is ADOPTED.

FEDERAL COMMUNICATIONS COMMISSION

Marlene H. Dortch
Secretary

STATEMENT OF COMMISSIONER
MICHAEL J. COPPS

RE: 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 Services.

The CMRS Competition Report serves as the factual foundation of many Commission decisions. It is therefore extremely important that Commission staff have the best possible data available to them when composing this Report. I have noted in the past that our Report and our decisions would greatly benefit from better data.

For example, I have been particularly worried that past Reports have defined an entire county as being served by a carrier if any part of the county is served. This means we have counted an entire county as served even though only a highway that runs through it is actually served. We also have found competition in a county even where two apparent competitors do not venture into each other's territory to actually compete. This situation occurs because Commission staff do not have access to more granular data. This NOI asks the questions needed to solve this problem and I urge carriers to help us produce more granular, aggregated, non-company-specific data on this point by submitting coverage information and seeking confidential treatment.

In addition, better understanding the state of competition and deployment in rural America must be a top priority of the next CMRS Competition Report. This NOI dedicates an entire section to rural issues. Combined with what we learn from the Rural Spectrum NOI that we also are issuing today, we have the potential to be in a better position to analyze rural service soon. Again, the submission of detailed comments from a wide range of sources will be the key to success here.

I am also hopeful that this NOI will also help us better understand if and how churn, service quality, pricing, innovation, and ARPU relate to our analysis of competitive market conditions. Making conclusions about increasing or decreasing competition from evidence about these and other metrics is tricky business. The NOI seeks input on how we should make these conclusions.

To conclude, I want to thank the staff for going through this extra step in the Competition Report process. I know that you work hard on this Report already and I believe that you produce admirable results. I hope that these NOIs will begin to give you the data you need each year to further advance this critical resource.