FEDERAL COMMUNICATIONS COMMISSION

47 CFR Parts 1, 9, and 25

[GN Docket No. 23-65, IB Docket No. 22-271; FCC 24-28; FR ID 210325]

Single Network Future: Supplemental Coverage From Space; Space Innovation

AGENCY: Federal Communications Commission.

ACTION: Proposed rule.

SUMMARY: In this document, the Federal Communications Commission (Commission) seeks comment on ways in which it can improve 911 service for supplemental coverage from space (SCS) connections. Specifically, the Commission seeks comment on how it can propel the industry toward a truly ubiquitous automatic location-based routing of all 911 calls to accelerate connections between first responders and those who need help, regardless of their location. Next, in recognition of the importance of safeguarding radio astronomy, the Commission seeks further comment on ways to improve the coordination process between Federal and non-Federal stakeholders in the SCS context and on whether additional rule changes or policies are necessary to avoid harmful interference to radio astronomy and related services beyond the SCS licensing process the Commission adopts today.

DATES: Interested parties may file comments on or before [INSERT DATE 30 DAYS AFTER DATE OF PUBLICATION IN THE *FEDERAL REGISTER*]; and reply comments on or before [INSERT DATE 60 DAYS AFTER DATE OF PUBLICATION IN THE *FEDERAL REGISTER*].

ADDRESSES: You may submit comments, identified by GN Docket No. 23-65 and IB Docket No. 22-271, by any of the following methods:

- *Electronic Filers:* Comments may be filed electronically using the internet by accessing the ECFS: http://apps.fcc.gov/ecfs/.
- *Paper Filers:* Parties who choose to file by paper must file an original and one copy of each filing.
- Filings can be sent by commercial overnight courier, or by first-class or overnight U.S. Postal Service mail. All filings must be addressed to the Commission's Secretary, Office of the Secretary, Federal Communications Commission.

- Commercial overnight mail (other than U.S. Postal Service Express Mail and Priority Mail) must be sent to 9050 Junction Drive, Annapolis Junction, MD 20701.
- U.S. Postal Service first-class, Express, and Priority mail must be addressed to 45 L Street NE, Washington, DC 20554.

- Effective March 19, 2020, and until FNPRM, the Commission no longer accepts any hand or messenger delivered filings. This is a temporary measure taken to help protect the health and safety of individuals, and to mitigate the transmission of COVID-19. See FCC Announces Closure of FCC Headquarters Open Window and Change in Hand-Delivery Policy, Public Notice, DA 20-304 (March 19, 2020). https://www.fcc.gov/document/fcc-closes-headquarters-open-window-and-changes-hand-delivery-policy.

People with Disabilities: To request materials in accessible formats for people with disabilities (Braille, large print, electronic files, audio format), send an email to fcc504@fcc.gov or call the Consumer & Governmental Affairs Bureau at 202-418-0530 (voice), 202-418-0432 (TTY).

FOR FURTHER INFORMATION CONTACT: For additional information on this proceeding, contact Jon Markman of the Mobility Division, Wireless Telecommunications Bureau, at Jonathan.Markman@fcc.gov or (202) 418-7090, or Merissa Velez of the Space Bureau Satellite Programs and Policy Division, at Merissa.Velez@fcc.gov or (202) 418-0751.

SUPPLEMENTARY INFORMATION: This is a summary of the Commission's further notice of proposed rulemaking (*FNPRM*) in GN Docket No. 23-65 and IB Docket No. 22-271; FCC 24-28, adopted and released on March 14, 2024. The full text of this document is available for public inspection online at https://docs.fcc.gov/public/attachments/FCC-24-28A1.pdf.

SYNOPSIS:

1. *Improving Public Safety Communications Over SCS.* In the further notice of proposed rulemaking (*FNPRM*), the Commission seeks comment on how and whether it should modify requirements for routing SCS 911 voice calls and 911 text messages, including whether we should require the use of location-based routing to route 911 SCS voice calls directly to an appropriate Public Safety Answering Point (PSAP), if technically feasible. In light of the Commission's existing requirement that Commercial Mobile Radio Service (CMRS) providers deploy and use location-based routing for wireless

911 voice calls and real-time text (RTT) communications to 911 when available location information meets certain requirements for accuracy and timeliness, it also seeks comment on how such a requirement would impact the availability of location-based routing for terrestrial wireless providers that use SCS to extend their coverage areas.

2. In the *Report and Order*, published elsewhere in this issue of the *Federal Register*, the Commission establishes on an interim basis that terrestrial providers must route all SCS 911 voice calls to a PSAP using either location-based routing or an emergency call center. In light of the ongoing deployment and continued innovation of SCS, the Commission seeks any new and updated information regarding technological or other developments in routing SCS 911 voice calls since the last round of filings. The Commission also asks whether there are any improvements to the 911 rules that apply to such terrestrial providers when using SCS to extend their coverage. Further, in recognizing that the technology likely used to identify the precise location of the device may be different when a terrestrial provider uses SCS to extend its coverage, as opposed to when it is using only terrestrial networks, it seeks comment on any such technological differences.

3. Furthermore, it seeks comment on whether there are other threshold requirements that the Commission should consider when requiring location-based routing, beyond accuracy and timeliness of available location information. Specifically, it seeks comment on the availability, reliability, and accuracy of the location information that terrestrial providers currently have access to when using location-based routing for SCS 911 voice calls. In addition, it seeks comment on how the Commission should address any potential inconsistencies between the 911 call routing requirements of terrestrial providers and satellite operators as SCS evolves.

4. Next, in the context of how SCS can function as an extension of a terrestrial network, the Commission noted that a satellite can be considered as a bi-directional "bent pipe," receiving and forwarding signaling and user payload to and from a user's device to a terrestrial network (e.g., 5G base station (gNB), 5G core network (5GC), and other terrestrial network elements). A satellite can also play a more active role in the network, connecting directly to the 5GC on the ground. In other words, the gNB and 5GC can belong to and be operated by either the terrestrial provider or the satellite operator. Regardless of deployment model, the SCS satellite should be able to send and receive the 5G signaling

information needed for placing an emergency call between the user equipment (UE) and 5G network along with the caller location information needed for call routing and dispatch. Given that 911 calls and texts would typically be placed outdoors with the user device having view of the Global Positioning System (GPS) satellites in the sky, and given that user devices typically have GPS receivers, user devices should be able to determine their location, and for Assisted GPS (A-GPS), SCS should be able to provide the needed assistance information. The Commission seeks comment on this tentative analysis and asked whether there are any existing or new standards that should apply.

5. The Commission in the *FNPRM* also seeks comment on establishing rules around interconnectivity between terrestrial providers and satellite operators in the context of SCS 911 connections. Specifically, it seeks comment on the standards currently in place related to this topic, and whether any future standards work is anticipated, or required, to enable disparate networks and systems to interconnect for the purpose of enabling SCS 911 connectivity. It also seeks information on satellite data capacities, satellite link budget, and optimization schemes for the initial SCS deployments and the impact on device-to-satellite connectivity as they relate to SCS 911 connectivity and functionality, including time for obtaining a location fix for automatic location-based routing of 911 calls. Regarding privacy and security, the Commission asks whether there should be an explicit requirement for satellite operators to protect customer proprietary network information of terrestrial provider subscribers when customers make 911 calls and texts, and disclose security breaches.

6. Given that typically a 911 caller would abandon the 911 call if it is not connected within a certain time period, the Commission asks how long should the network selection take before a 911 call is eventually attempted via SCS. Also, given the possibility that a 911 caller may be mobile and moving in and out of terrestrial network and SCS coverage, the Commission seeks comment on how the handoff between these networks should be handled to guarantee seamless call continuity and successful callback. In addition, the Commission understands that SCS is to be supplemental to terrestrial networks, including traditional terrestrial call paths, such as roaming, and additional technologies, such as Wi-Fi. However, in order to ensure that 911 calls utilize the best available path for delivery of both the message and location

information, it seeks comment on how terrestrial providers intend to select the order in which networks are selected.

7. Since the delivery of SCS 911 voice calls includes the possibility of using third party emergency call centers, to promote awareness and transparency, the Commission asks whether we should mandate that terrestrial providers conduct outreach to PSAPs, and, if so, what would such a mandate look like. In addition, it seeks comment on what the planned outreach to the PSAP community entails. For 911 calls that are delivered directly to PSAPs, rather than via an emergency call center, it seeks comment on how terrestrial providers envision delivering those calls with regard to current classes of service. Specifically, it asks how location will be represented to the PSAP, e.g., geodetic information, will there be confidence and uncertainty factors for that location, and are terrestrial providers considering a new class of service for SCS, and, if so, are terrestrial providers working with the public safety community presently.

8. *Radio Astronomy Considerations.* In the *Report and Order*, the Commission examined the record regarding whether existing rules addressing the protection of radio astronomy and space science services would be sufficient in the SCS context. Rather than adopt new SCS rules with respect to the protection of radio astronomy and space sciences, the Commission determined that it is in the public interest to address these concerns based on the facts of specific proposals. The Commission encourages SCS applicants to work with appropriate Federal agencies in advance, including conducting analyses of potential impacts to radio astronomy systems, and we direct applicants to contact the National Science Foundation (NSF) for more information to facilitate this coordination. The Commission expects that such advance engagement will facilitate the Commission's review of SCS applications.

9. While the Commission finds in the *Report and Order* that—at this stage—new rules to ensure protection of radio astronomy and space sciences are not required, the Commission recognizes the importance of ensuring effective and efficient coordination among Federal and non-Federal stakeholders related to SCS applications. In this *FNPRM*, the Commission seeks comment on whether there are additional ways to encourage and improve coordination among Federal and non-Federal stakeholders with

respect to the coexistence of radio astronomy and SCS and whether we should make any changes to our rules to facilitate this coordination.

10. Of particular importance on this question, on February 16, 2024, National Telecommunications and Information Administration (NTIA) filed a white paper prepared by NSF in this proceeding in which NSF describes the potential impacts from SCS on current and planned radio astronomy and other space science operations, particularly from satellite downlinks—SCS transmissions in the space-to-Earth direction—and suggests potential mitigations. In the white paper, NSF states that, in addition to the National Radio Quite Zone (NRQZ), additional sites have been chosen for radio astronomy facilities, and that such "facilities primarily employ remote locations, rather than allocated spectrum, to enable access to the relevant spectrum . . .." The white paper describes several locations of existing and planned radio astronomy observatories which NSF identifies as having potential to be impacted by SCS operations in bands identified for consideration for SCS in the *Notice* and describes technical details about the receivers at each facility. The white paper also identifies concerns related to impacts from SCS operations on radio astronomy, and potential recommendations to address those concerns.

11. While the Commission anticipates that the part 25 licensing process will provide an opportunity for the Commission to address concerns related to protecting radio astronomy in the context of specific SCS applications, it also plans to continue to evaluate our procedures as SCS—and the technology enabling it—evolves. To that end, the Commission seeks comment on whether the unique nature of SCS may warrant additional consideration, including rule changes, related to the protection of radio astronomy. The Commission asks that commenters provide as much specificity as possible. For example, should we consider rule changes to part 1, part 25, or another rule part that would require coordination of SCS applications? Section 1.924 of the Commission's rules—along with the NTIA Manual of Regulations and Procedures for Federal Radio Frequency Management—set forth procedures regarding coordination of certain applications within identified Quite Zones, including the NRQZ, the Arecibo Observatory, and other sites. The Commission asks commenters whether it would be appropriate to consider changes to § 1.924, to require a coordination process with regard to SCS applications. The Commission seeks comment only on whether to consider changes to § 1.924 related to SCS applications, and note that rule changes regarding other radio services are not a part of the SCS implementations which

are the focus of this proceeding. If the Commission were to consider rule changes specific to SCS, should coordination requirements apply only to SCS transmissions into the NRQZ, or also to SCS transmissions into other locations with sensitive scientific facilities and, if we should include other facilities, which should be included? For example, we note that in its white paper, NSF identified several locations of existing and planned radio astronomy observatories and the details of the receiver bands at each facility. Should any changes to our rules be band-specific or should they apply to all SCS operations? In lieu of or in addition to adopting new rules, are there other incentives the Commission could implement to encourage coordination and coexistence of radio astronomy operations and SCS?

12. The Commission notes that, while we are not adopting requirements for SCS applicants to coordinate with potentially-affected Federal users at this time, some stakeholders have already engaged in coordination efforts related to SCS applications and radio astronomy. For example, in a filing opposing SpaceX's application to modify its authorization for its Gen2 NGSO satellite system to add SCS, the National Radio Astronomy Observatory (NRAO) nonetheless notes "with appreciation SpaceX's continuing cooperation in coordination and field-testing their Ku-band [fixed-satellite service] operations." SpaceX also points out that it has been working closely with NRAO to coordinate and "looks forward to continuing its precedent-setting coordination discussions with NRAO that are finding ways to allow consumers to benefit from this new service, while coexisting with radio astronomy." To this end, the Commission notes that in its transmittal accompanying the NSF white paper, NTIA states that the white paper "highlights the value of early coordination efforts between potential applicants for such [SCS] authority and affected Federal spectrum users, ideally prior to applicants finalizing their system designs." The Commission seeks comment on whether such early coordination efforts by stakeholders are and can be successful to enable the coexistence of SCS and radio astronomy, and if so, under what circumstances. How can such early coordination efforts facilitate review and consideration of part 25 SCS license applications by Federal agencies? Would submission of other technical information by SCS applicants regarding the protection of radio astronomy operations—in addition to Monte Carlo analyses—be helpful in these coordination efforts?

PROCEDURAL MATTERS

Paperwork Reduction Act

13. The *FNPRM* may contain new or modified information collection(s) subject to the Paperwork Reduction Act of 1995. If the Commission adopts any new or modified information collection requirements, they will be submitted to the Office of Management and Budget (OMB) for review under section 3507(d) of the PRA. OMB, the general public, and other Federal agencies are invited to comment on the new or modified information collection requirements contained in this proceeding. In addition, pursuant to the Small Business Paperwork Relief Act of 2002, the Commission seeks specific comment on how we might "further reduce the information collection burden for small business concerns with fewer than 25 employees."

Regulatory Flexibility Act

14. The Regulatory Flexibility Act of 1980, as amended (RFA), requires that an agency prepare a regulatory flexibility analysis for notice and comment rulemakings, unless the agency certifies that "the rule will not, if promulgated, have a significant economic impact on a substantial number of small entities." Accordingly, the Commission has prepared an Initial Regulatory Flexibility Analysis (IRFA) concerning potential rule and policy changes contained in the *FNPRM*. The IRFA is contained in appendix D of the *FNPRM*.

Initial Regulatory Flexibility Analysis

15. As required by the Regulatory Flexibility Act (RFA), the Commission has prepared this Initial Regulatory Flexibility Analysis (IRFA) of the possible significant economic impact on a substantial number of small entities by the policies and rules proposed in the *FNPRM*. The Commission requests written public comments on this IRFA. Comments must be identified as responses to the IRFA and must be filed by the deadlines provided on the first page of the *FNPRM*. The Commission will send a copy of the *FNPRM*, including this IRFA, to the Chief Counsel for Advocacy of the Small Business Administration (SBA). In addition, the *FNPRM* and IRFA (or summaries thereof) will be published in the Federal Register.

A. Need for, and Objectives of, the Proposed Rules

16. Building on the interim 911 call and text routing requirements established in the *Report and Order*, the *FNPRM* will help the Commission move toward its objective of enabling automatic location-based routing of all emergency communications regardless of whether or not there is a terrestrial

connection available. As discussed in the *Report and Order*, the Commission takes a major step towards facilitating ubiquitous connectivity, by adopting rules that enable partnerships between terrestrial network operators and satellite operators, who will then utilize terrestrial spectrum to fill coverage gaps, thereby enabling communications with existing and future wireless devices without the need for hardware changes. This regulatory framework serves as a first step, focusing on particular supplemental coverage from space (SCS) implementations which present less complex legal and technical challenges in order to foster the rapid deployment and development of these exciting networks. Given the primary importance of emergency communications over SCS networks in the short term, the Commission seeks to further develop the record in the *FNPRM* on improving 911 service for SCS connections. The Commission seeks comment on a number of ways in which it can propel industry stakeholders towards achieving truly ubiquitous automatic location-based routing of all 911 calls to accelerate connection between first responders and those who need help, regardless of their location.

17. Further, the Commission seeks input from interested parties as to how and whether it should modify requirements for routing SCS 911 voice calls and 911 text messages, including whether it should require the use of location-based routing to route 911 SCS voice calls directly to an appropriate Public Safety Answering Point (PSAP), if technically feasible. The Commission also seeks to expand upon a number of technical issues relating to extending E911 rules to SCS that it sought comment on in the initial NPRM, 88 FR 21944 (April 12, 2023), from this proceeding. Additionally, in light of the Commission's existing requirement that Commercial Mobile Radio Service (CMRS) providers deploy and use location-based routing for wireless 911 voice calls and real-time text communications to 911 when available location information meets certain requirements for accuracy and timeliness, the Commission also seeks updated responses to the questions raised in the initial NPRM due to new requirements for CMRS providers to deploy and use location-based routing in certain situations.

18. Through its adopted rules in the *Report and Order*, the Commission establishes on an interim basis that terrestrial providers must route all SCS 911 calls to a PSAP using either location-based routing or an emergency call center. This approach will balance the need for SCS 911 voice calls and text messages to be routed to the appropriate PSAP with the need for terrestrial providers to have flexibility in their implementation of SCS. Because of the ongoing deployment and continued innovation of SCS, the

FNPRM requests any new and updated information regarding technological or other developments in routing SCS 911 voice calls since the last rounds of filing. In addition, the Commission seeks comment on improvements to the 911 rules that apply to such terrestrial providers when using SCS to extend their coverage.

19. In the *FNPRM*, the Commission also addresses direct-to-satellite connectivity, and acknowledges that a satellite can play a more active role in the network, by connecting directly to the 5G core network. Because 911 calls and texts would typically be placed outdoors with the user device having view of the Global Positioning System (GPS) satellites in the sky and because user devices typically have GPS receivers, user devices should be able to determine their location, and for Assisted GPS, SCS should be able to provide the needed assistance information. In the *FNPRM*, the Commission seeks comment on this tentative analysis. The Commission also seeks comment on establishing rules regarding interconnectivity between terrestrial providers and satellite operators as well as information on satellite data capacities, and satellite link budget, and optimization schemes for the initial SCS deployments and their impact on device-to-satellite connectivity, including time for obtaining a location fix for automatic location-based routing of 911 calls. The Commission also seeks comment on questions related to network selection and roaming in the *FNPRM*, focusing on a situation where a 911 caller would discontinue the 911 call if it is not connected within a certain time period. Finally, in the initial NPRM, the Commission asked whether terrestrial partners engaged in or planned any outreach or coordination with public safety entities in advance of implementation. Because the delivery of SCS 911 voice calls includes the possibility of using third party emergency call centers, to promote awareness and transparency, the Commission requests comment via the *FNPRM* regarding issues concerning PSAP outreach.

20. Finally, in recognition of the concerns raised by the National Telecommunications and Information Association (NTIA) and the National Science Foundation (NSF) related to potential impacts from SCS on radio astronomy the Commission seeks further comment on the coordination process between Federal and non-Federal stakeholders in the SCS context and on whether additional rule changes

or policies are necessary to avoid harmful interference to radio astronomy beyond the part 25 SCS licensing process adopted in the *Report and Order*.

B. Legal Basis

21. The proposed action is authorized pursuant to sections 1, 4(i), 157, 301, 303, 307, 308, 309, and 310 of the Communications Act of 1934, as amended, 47 U.S.C. 151, 154(i), 301, 303, 307, 308, 309, and 310.

C. Description and Estimate of the Number of Small Entities to Which the Proposed Rules Will Apply

22. The RFA directs agencies to provide a description of, and where feasible, an estimate of, the number of small entities that may be affected by the proposed rules, if adopted. The RFA generally defines the term "small entity" as having the same meaning as the terms "small business," "small organization," and "small governmental jurisdiction." In addition, the term "small business" has the same meaning as the term "small business concern" under the Small Business Act. A "small business concern" is one that: (1) is independently owned and operated; (2) is not dominant in its field of operation; and (3) satisfies any additional criteria established by the SBA.

23. *Small Businesses, Small Organizations, Small Governmental Jurisdictions*. Our actions, over time, may affect small entities that are not easily categorized at present. We therefore describe here, at the outset, three broad groups of small entities that could be directly affected herein. First, while there are industry specific size standards for small businesses that are used in the regulatory flexibility analysis, according to data from the Small Business Administration's (SBA) Office of Advocacy, in general a small business is an independent business having fewer than 500 employees. These types of small businesses represent 99.9% of all businesses in the United States, which translates to 33.2 million businesses.

24. Next, the type of small entity described as a "small organization" is generally "any not-for-profit enterprise which is independently owned and operated and is not dominant in its field." The Internal Revenue Service (IRS) uses a revenue benchmark of $50,000 or less to delineate its annual electronic filing requirements for small exempt organizations. Nationwide, for tax year 2020, there were

approximately 447,689 small exempt organizations in the U.S. reporting revenues of $50,000 or less according to the registration and tax data for exempt organizations available from the IRS.

25. Finally, the small entity described as a "small governmental jurisdiction" is defined generally as "governments of cities, counties, towns, townships, villages, school districts, or special districts, with a population of less than fifty thousand." U.S. Census Bureau data from the 2017 Census of Governments indicate that there were 90,075 local governmental jurisdictions consisting of general purpose governments and special purpose governments in the United States. Of this number there were 36,931 general purpose governments (county, municipal and town or township) with populations of less than 50,000 and 12,040 special purpose governments - independent school districts with enrollment populations of less than 50,000. Accordingly, based on the 2017 U.S. Census of Governments data, we estimate that at least 48,971 entities fall into the category of "small governmental jurisdictions."

26. *Satellite Telecommunications*. This industry comprises firms "primarily engaged in providing telecommunications services to other establishments in the telecommunications and broadcasting industries by forwarding and receiving communications signals via a system of satellites or reselling satellite telecommunications." Satellite telecommunications service providers include satellite and earth station operators. The SBA small business size standard for this industry classifies a business with $38.5 million or less in annual receipts as small. U.S. Census Bureau data for 2017 show that 275 firms in this industry operated for the entire year. Of this number, 242 firms had revenue of less than $25 million. Additionally, based on Commission data in the 2022 Universal Service Monitoring Report, as of December 31, 2021, there were 65 providers that reported they were engaged in the provision of satellite telecommunications services. Of these providers, the Commission estimates that approximately 42 providers have 1,500 or fewer employees. Consequently, using the SBA's small business size standard, a little more than half of these providers can be considered small entities.

27. *Wireless Telecommunications Carriers (except Satellite)*. This industry comprises establishments engaged in operating and maintaining switching and transmission facilities to provide communications via the airwaves. Establishments in this industry have spectrum licenses and provide services using that spectrum, such as cellular services, paging services, wireless Internet access, and wireless video services. The SBA size standard for this industry classifies a business as small if it has 1,500 or fewer employees.

U.S. Census Bureau data for 2017 show that there were 2,893 firms in this industry that operated for the entire year. Of that number, 2,837 firms employed fewer than 250 employees. Additionally, based on Commission data in the 2022 Universal Service Monitoring Report, as of December 31, 2021, there were 594 providers that reported they were engaged in the provision of wireless services. Of these providers, the Commission estimates that 511 providers have 1,500 or fewer employees. Consequently, using the SBA's small business size standard, most of these providers can be considered small entities.

28. *600 MHz Band*. These wireless communications services are radiocommunication services licensed in the 617-652 MHz and 663-698 MHz frequency bands that can be used for fixed and mobile flexible uses. 600 MHz Band services fall within the scope of the Wireless Telecommunications Carriers (except Satellite) industry where the SBA small business size standard classifies a business as small if it has 1,500 or fewer employees. U.S. Census Bureau data for 2017 show that there were 2,893 firms that operated in this industry for the entire year. Of this number, 2,837 firms employed fewer than 250 employees. Thus under the SBA size standard, the Commission estimates that a majority of licensees in this industry can be considered small.

29. Based on Commission data as of November 2021, there were approximately 3,327 active licenses in the 600 MHz Band service. The Commission's small business size standards with respect to 600 MHz Band services involve eligibility for bidding credits and installment payments in the auction of licenses for these services. For purposes of bidding credits, the Commission defined "small business" as an entity with average gross revenues not exceeding $55 million for each of the three preceding years, and a "very small business" as an entity with average gross revenues not exceeding $20 million for each of the three preceding years for the 600 MHz band auction. Pursuant to these definitions, 15 bidders claiming small business status won 290 licenses.

30. In frequency bands where licenses were subject to auction, the Commission notes that as a general matter, the number of winning bidders that qualify as small businesses at the close of an auction does not necessarily represent the number of small businesses currently in service. Further, the Commission does not generally track subsequent business size unless, in the context of assignments or transfers, unjust enrichment issues are implicated. Additionally, since the Commission does not collect data on the number of employees for licensees providing these services, at this time we are not able to

estimate the number of licensees with active licenses that would qualify as small under the SBA's small business size standard.

31. *Lower 700 MHz Band Licenses*. The lower 700 MHz band encompasses spectrum in the 698-746 MHz frequency bands. Permissible operations in these bands include flexible fixed, mobile, and broadcast uses, including mobile and other digital new broadcast operation; fixed and mobile wireless commercial services (including FDD- and TDD-based services); as well as fixed and mobile wireless uses for private, internal radio needs, two-way interactive, cellular, and mobile television broadcasting services. Wireless Telecommunications Carriers (except Satellite) is the closest industry with a SBA small business size standard applicable to licenses providing services in these bands. The SBA small business size standard for this industry classifies a business as small if it has 1,500 or fewer employees. U.S. Census Bureau data for 2017 show that there were 2,893 firms that operated in this industry for the entire year. Of this number, 2,837 firms employed fewer than 250 employees. Thus under the SBA size standard, the Commission estimates that a majority of licensees in this industry can be considered small.

32. According to Commission data as of December 2021, there were approximately 2,824 active Lower 700 MHz Band licenses. The Commission's small business size standards with respect to Lower 700 MHz Band licensees involve eligibility for bidding credits and installment payments in the auction of licenses. For auctions of Lower 700 MHz Band licenses the Commission adopted criteria for three groups of small businesses. A very small business was defined as an entity that, together with its affiliates and controlling interests, has average annual gross revenues not exceeding $15 million for the preceding three years, a small business was defined as an entity that, together with its affiliates and controlling interests, has average gross revenues not exceeding $40 million for the preceding three years, and an entrepreneur was defined as an entity that, together with its affiliates and controlling interests, has average gross revenues not exceeding $3 million for the preceding three years. In auctions for Lower 700 MHz Band licenses seventy-two winning bidders claiming a small business classification won 329 licenses, twenty-six winning bidders claiming a small business classification won 214 licenses, and three winning bidders claiming a small business classification won all five auctioned licenses.

33. In frequency bands where licenses were subject to auction, the Commission notes that as a general matter, the number of winning bidders that qualify as small businesses at the close of an auction

does not necessarily represent the number of small businesses currently in service. Further, the Commission does not generally track subsequent business size unless, in the context of assignments or transfers, unjust enrichment issues are implicated. Additionally, since the Commission does not collect data on the number of employees for licensees providing these services, at this time we are not able to estimate the number of licensees with active licenses that would qualify as small under the SBA's small business size standard.

34. *Upper 700 MHz Band Licenses*. The upper 700 MHz band encompasses spectrum in the 746-806 MHz bands. Upper 700 MHz D Block licenses are nationwide licenses associated with the 758-763 MHz and 788-793 MHz bands. Permissible operations in these bands include flexible fixed, mobile, and broadcast uses, including mobile and other digital new broadcast operation; fixed and mobile wireless commercial services (including FDD- and TDD-based services); as well as fixed and mobile wireless uses for private, internal radio needs, two-way interactive, cellular, and mobile television broadcasting services. Wireless Telecommunications Carriers (except Satellite) is the closest industry with a SBA small business size standard applicable to licenses providing services in these bands. The SBA small business size standard for this industry classifies a business as small if it has 1,500 or fewer employees. U.S. Census Bureau data for 2017 show that there were 2,893 firms that operated in this industry for the entire year. Of that number, 2,837 firms employed fewer than 250 employees. Thus, under the SBA size standard, the Commission estimates that a majority of licensees in this industry can be considered small.

35. According to Commission data as of December 2021, there were approximately 152 active Upper 700 MHz Band licenses. The Commission's small business size standards with respect to Upper 700 MHz Band licensees involve eligibility for bidding credits and installment payments in the auction of licenses. For the auction of these licenses, the Commission defined a "small business" as an entity that, together with its affiliates and controlling principals, has average gross revenues not exceeding $40 million for the preceding three years, and a "very small business" an entity that, together with its affiliates and controlling principals, has average gross revenues that are not more than $15 million for the

preceding three years. Pursuant to these definitions, three winning bidders claiming very small business status won five of the twelve available licenses.

36. In frequency bands where licenses were subject to auction, the Commission notes that as a general matter, the number of winning bidders that qualify as small businesses at the close of an auction does not necessarily represent the number of small businesses currently in service. Further, the Commission does not generally track subsequent business size unless, in the context of assignments or transfers, unjust enrichment issues are implicated. Additionally, since the Commission does not collect data on the number of employees for licensees providing these services, at this time we are not able to estimate the number of licensees with active licenses that would qualify as small under the SBA's small business size standard.

37. *Cellular Radiotelephone Service*. This service is radio service in which licensees are authorized to offer and provide cellular service for hire to the general public and was formerly titled Domestic Public Cellular Radio Telecommunications Service. Cellular Radiotelephone Service falls within the scope the Wireless Telecommunications Carriers (except Satellite) industry, where the SBA small business size standard classifies a business as small if it has 1,500 or fewer employees. U.S. Census Bureau data for 2017 show that there were 2,893 firms that operated in this industry for the entire year. Of this number, 2,837 firms employed fewer than 250 employees. Thus under the SBA size standard, the Commission estimates that a majority of licensees in this industry can be considered small.

38. Based on Commission data, as of November 2021, there were approximately 1,908 active licenses in this service. The Commission's small business size standards with respect to Cellular Radiotelephone Services involve eligibility for bidding credits and installment payments in the auction of licenses for these services. For purposes of bidding credits, the Commission has defined "small business" as an entity that either (1) together with its affiliates and controlling interests has average gross revenues of not more than $3 million for each of the three preceding years, or (2) together with its affiliates and controlling interests has average gross revenues of not more $15 million for each of the three preceding years.

39. In frequency bands where licenses were subject to auction, the Commission notes that as a general matter, the number of winning bidders that qualify as small businesses at the close of an auction

does not necessarily represent the number of small businesses currently in service. Further, the Commission does not generally track subsequent business size unless, in the context of assignments or transfers, unjust enrichment issues are implicated. Additionally, since the Commission does not collect data on the number of employees for licensees providing these services, at this time we are not able to estimate the number of licensees with active licenses that would qualify as small under the SBA's small business size standard.

40. *Advanced Wireless Services (AWS) - (1710–1755 MHz and 2110–2155 MHz bands (AWS-1); 1915–1920 MHz, 1995–2000 MHz, 2020–2025 MHz and 2175–2180 MHz bands (AWS-2); 2155–2175 MHz band (AWS-3); 2000-2020 MHz and 2180-2200 MHz (AWS-4))*. Spectrum is made available and licensed in these bands for the provision of various wireless communications services. Wireless Telecommunications Carriers (except Satellite) is the closest industry with a SBA small business size standard applicable to these services. The SBA small business size standard for this industry classifies a business as small if it has 1,500 or fewer employees. U.S. Census Bureau data for 2017 show that there were 2,893 firms that operated in this industry for the entire year. Of this number, 2,837 firms employed fewer than 250 employees. Thus, under the SBA size standard, the Commission estimates that a majority of licensees in this industry can be considered small.

41. According to Commission data as of December 2021, there were approximately 4,472 active AWS licenses. The Commission's small business size standards with respect to AWS involve eligibility for bidding credits and installment payments in the auction of licenses for these services. For the auction of AWS licenses, the Commission defined a "small business" as an entity with average annual gross revenues for the preceding three years not exceeding $40 million, and a "very small business" as an entity with average annual gross revenues for the preceding three years not exceeding $15 million. Pursuant to these definitions, 57 winning bidders claiming status as small or very small businesses won 215 of 1,087 licenses. In the most recent auction of AWS licenses 15 of 37 bidders qualifying for status as small or very small businesses won licenses.

42. In frequency bands where licenses were subject to auction, the Commission notes that as a general matter, the number of winning bidders that qualify as small businesses at the close of an auction does not necessarily represent the number of small businesses currently in service. Further, the

Commission does not generally track subsequent business size unless, in the context of assignments or transfers, unjust enrichment issues are implicated. Additionally, since the Commission does not collect data on the number of employees for licensees providing these services, at this time we are not able to estimate the number of licensees with active licenses that would qualify as small under the SBA's small business size standard.

43. *All Other Telecommunications*. This industry is comprised of establishments primarily engaged in providing specialized telecommunications services, such as satellite tracking, communications telemetry, and radar station operation. This industry also includes establishments primarily engaged in providing satellite terminal stations and associated facilities connected with one or more terrestrial systems and capable of transmitting telecommunications to, and receiving telecommunications from, satellite systems. Providers of Internet services (e.g. dial-up ISPs) or voice over Internet protocol (VoIP) services, via client-supplied telecommunications connections are also included in this industry. The SBA small business size standard for this industry classifies firms with annual receipts of $35 million or less as small. U.S. Census Bureau data for 2017 show that there were 1,079 firms in this industry that operated for the entire year. Of those firms, 1,039 had revenue of less than $25 million. Based on this data, the Commission estimates that the majority of "All Other Telecommunications" firms can be considered small.

D. Description of Projected Reporting, Recordkeeping, and Other Compliance Requirements for Small Entities

44. The *FNPRM* may impose new or additional reporting or recordkeeping and/or other compliance obligations on small entities if rules discussed therein are adopted. For example, small and other entities are likely to be subject to the requirement of routing SCS 911 voice calls and 911 text messages, including the use of location-based routing to route 911 SCS voice calls directly to an appropriate PSAP, if technically feasible. Additionally, those entities are also likely to be subject to compliance rules concerning the proposed requirement that all devices utilizing SCS should be able to determine their location. For Assisted GPS (A-GPS), SCS should be able to provide the needed assistance information for 911 calls and texts, if adopted. In addition, small and other entities could be subject to coordination

requirements or required to submit additional technical information related to the protection of radio astronomy.

45. The Commission also seeks comment on questions regarding improvements in location-based routing, device-to-satellite connectivity, interconnectivity between terrestrial providers and satellite operators, network selection and roaming, and PSAP outreach. Because of the ongoing deployment and continued innovation of SCS, the Commission seeks any new and updated information regarding technological or other developments in routing SCS 911 voice calls since the last rounds of filing. Entities should report any additional information regarding routing SCS 911 voice calls since their last filings.

46. The Commission also seeks comment on whether there are additional ways to encourage and improve coordination among Federal and non-Federal stakeholders with respect to the coexistence of radio astronomy and SCS and whether the Commission should make any changes to its rules to facilitate this coordination. If such rules are adopted, operators could be required to provide reports regarding coordination efforts or additional technical information in addition to the existing underlying reporting, recordkeeping, and compliance requirements adopted in the *Report and Order*.

47. At this time, the record does not include a detailed cost/benefit analysis that would allow us to quantify the costs of compliance for small entities, including whether it will be necessary for small entities to hire professionals in order for them to comply with the rules proposed in the *FNPRM*, should they be adopted. The Commission invites comment on the costs and burdens of the proposals in the *FNPRM* and expects the information received in comments including, where requested, cost and benefit analyses, to help the Commission identify and evaluate relevant compliance matters for small entities, including compliance costs and other burdens that may result if the proposals and associated requirements discussed in the *FNPRM* are adopted.

E. Steps Taken to Minimize the Significant Economic Impact on Small Entities, and Significant Alternatives Considered

48. The RFA requires an agency to describe any significant, specifically small business, alternatives that it has considered in reaching its proposed approach, which may include the following four alternatives (among others): "(1) the establishment of differing compliance or reporting requirements or

timetables that take into account the resources available to small entities; (2) the clarification, consolidation, or simplification of compliance and reporting requirements under the rule for such small entities; (3) the use of performance rather than design standards; and (4) an exemption from coverage of the rule, or any part thereof, for such small entities."

49. In the initial NPRM, the Commission took steps to minimize significant economic impact to small and other entities by obtaining information from interested parties on a number of technical issues relating to extending E911 rules to SCS, and it expands upon those actions in the *FNPRM*. In the *FNPRM*, the Commission considered how best to improve our 911 rules that apply to terrestrial providers when using SCS to extend their coverage. The Commission also considered whether it should require terrestrial providers to use location-based routing for SCS 911 voice calls when information about the location of the device is available to the CMRS provider's network at the time of routing. Alternatively, the Commission considered whether it should require terrestrial providers to use location-based routing for SCS 911 voice calls only when location information meets certain thresholds for accuracy and timeliness. The information obtained from commenters could provide the Commission with opportunities to ultimately adopt threshold-related rules that serve to lessen the burden on small providers.

50. The Commission also considered whether threshold requirements should be changed when requiring location-based routing, beyond accuracy and timeliness of available location information and, if changes are needed, what form they should take. Given the nature of SCS to extend coverage, cell tower information is unlikely to be available as a fallback when location-based routing does not meet whatever threshold requirements should be in place for using location-based routing. Therefore, the Commission requests comment on several questions involving what threshold requirements should be considered for SCS 911. In considering changes to the threshold requirements, we will consider the potential economic impact to small entities.

51. Additionally, in the *FNPRM*, the Commission seeks comment on ways to establish rules around interconnectivity between terrestrial providers and satellite operators within the context of SCS 911 connections. The rules that are ultimately adopted could lessen the compliance requirements for small and other entities. The *FNPRM* requests information involving both the current standards and anticipated future standards. These standards will be important to consider for informing discussions of future

advances to SCS 911 connections and requires consideration of alternatives that take into account the potential impact of the adopted rules on small entities. Lastly, the Commission asked how long the network selection should take before a 911 call is eventually attempted via SCS. The Commission acknowledges that SCS is to be supplemental to terrestrial networks, including traditional terrestrial call paths, such as roaming, and additional technologies, such as Wi-Fi. The Commission seeks comment on ways to minimize the economic burden on small providers

52. Furthermore, the Commission seeks comment on what, if any, coordination requirements should be adopted. In the alternative, to possibly lessen the compliance burdens on entities, the Commission asks if there are other incentives the Commission could implement to encourage coordination and coexistence of radio astronomy operations and SCS. Likewise, the Commission asks about the effectiveness of early coordination efforts when considering whether to adopt additional requirements and whether the submission of additional technical information would be helpful in these coordination efforts. While the Commission does not explicitly propose that additional coordination requirements be adopted, the Commission inquires as to whether additional requirements would be necessary given existing coordination efforts and the unique nature of SCS as the information obtained from commenters could provide the Commission with opportunities to ultimately adopt threshold-related rules that serve to lessen the burden on small providers.

53. The Commission is hopeful that the comments it receives will specifically address matters impacting small entities and include data and analyses relating to these matters. Further, while the Commission believes the rules that are eventually adopted in this proceeding should benefit small entities, the Commission expects to more fully consider the economic impact and alternatives for small entities following the review of comments filed in response to the *FNPRM*. The Commission's evaluation of this information will shape the final alternatives it considers, the final conclusions it reaches, and any final actions it ultimately takes in this proceeding to minimize any significant economic impact that may occur on small entities.

F. Federal Rules that May Duplicate, Overlap, or Conflict with the Proposed Rules

54. None.

Federal Communications Commission.

Marlene Dortch,
Secretary.

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