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DEPARTMENT OF COMMERCE

National Telecommunications and Information Administration

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FEDERAL COMMUNICATIONS COMMISSION

[Docket Number: ET Docket No. 14-99]

Model City for Demonstrating and Evaluating Advanced Spectrum Sharing Technologies

AGENCIES: National Telecommunications and Information Administration, U.S. Department of Commerce, and the Office of Engineering and Technology, Federal Communications Commission.

ACTION: Notice; request for comments.

SUMMARY: The National Telecommunications and Information Administration (NTIA) and the Federal Communications Commission's (FCC) Office of Engineering and Technology (OET) issue this Joint Public Notice to seek public comment on the President's Council of Advisors on Science and Technology (PCAST) recommendation that the Secretary of Commerce establish a public-private partnership to facilitate the creation of an urban test city that would support rapid experimentation and development of policies, underlying technologies, and system capabilities for advanced, dynamic spectrum sharing. The test services (referenced herein as a "Model City") for demonstrating and evaluating advanced spectrum sharing technologies could include large-scale sustainable facilities for systems-level testing in real-world environments across multiple frequency bands, including public safety and selected federal bands. Through this Joint

Public Notice, NTIA and OET seek to promote the Model City concept in conjunction with: (1) the new Center for Advanced Communications established by NTIA and the National Institute of Standards and Technology (NIST) and (2) the FCC's existing experimental licensing program.

DATES: Comments are due on or before [INSERT DATE 45 days AFTER PUBLICATION IN THE FEDERAL REGISTER].

ADDRESSES: Parties must file one copy of their written comments with the FCC, using one of the following addresses:

- U.S. Postal Service first-class, Express, and Priority mail must be sent to: Office of the Secretary, Federal Communications Commission, 445 12th Street SW, Washington, DC 20554. ET Docket No. 14-99.
- 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.

Parties must also file one copy with the FCC's copy contractor, Best Copy and Printing, Inc. (BCPI), Portals II, 445 12th Street SW, Room CY-B402, Washington, DC 20554, (202) 488-5300, or via email to fcc@bcpiweb.com.

Comments may also be submitted electronically by email to modelcity@ntia.doc.gov or by mail to: National Telecommunications and Information Administration, U.S. Department of Commerce, 1401 Constitution Avenue NW, Room 4096, Washington, DC 20230, Attn: Rangam Subramanian, Office of Spectrum Management. Written comments should be in standard Word or Adobe PDF format if submitted electronically.

FOR FURTHER INFORMATION CONTACT: Rangam Subramanian, NTIA, at (202) 482-4399 or rangam@ntia.doc.gov, or Matthew Hussey, OET, at (202) 418-3619 or mhussey@fcc.gov.

SUPPLEMENTARY INFORMATION:

Background

In July 2012, the President’s Council of Advisors on Science and Technology (PCAST) released a set of recommendations to the President on how to realize the full potential of government-held spectrum to spur economic growth by facilitating spectrum sharing as a mainline approach to spectrum management.¹ This report (herein *PCAST Report*) concluded that clearing and reallocation of federal spectrum is no longer a sustainable basis for spectrum policy due to the high cost, lengthy time to implement, and disruption to the federal mission.² Based on this finding, the PCAST called for a new spectrum architecture premised on spectrum sharing rather than exclusive use. To bridge the gap from today’s spectrum use model to such a new regime, one of the PCAST’s recommendations was to create an urban test city in a major U.S city to support realistic, rapid experimentation in spectrum management technology and practice.

Before and after the release of the *PCAST Report*, the Administration, NTIA, and the FCC launched several initiatives to facilitate research, development, testing, and evaluation of spectrum-sharing technologies. The 2010 Presidential Memorandum on “Unleashing the Wireless Broadband Revolution” directed the Secretary of Commerce, working through NTIA in consultation with NIST, the National Science Foundation (NSF), the Department of Defense, the Department of Justice, the National Aeronautics and Space Administration, and other agencies as

¹ See Report to the President: *Realizing the Full Potential of Government-Held Spectrum to Spur Economic Growth*, at 49-50 (July 2012), available at <http://go.usa.gov/k27R> (*PCAST Report*).

² See *id.* at vi.

appropriate, to create and implement a plan to facilitate research, development, experimentation, and testing by researchers to explore innovative spectrum-sharing technologies.³ NTIA, NIST, and NSF, with support from the National Information Technology Research and Development (NITRD) program, formed the Wireless Spectrum R&D (WSRD) Senior Steering Group (SSG) to coordinate spectrum-related research and development activities across the federal government, private sector, and academia.

The 2013 Presidential Memorandum on “Expanding America’s Leadership in Wireless Innovation” directed the Secretary of Commerce, working through NTIA, to continue to facilitate greater discussions between government and commercial stakeholders on spectrum sharing.⁴ Pursuant to this memorandum, the NITRD WSRD SSG, on behalf of NTIA and NIST, published a comprehensive inventory of federal and non-federal test facilities.⁵ NTIA and NIST also created a new Center for Advanced Communications (CAC) to promote interdisciplinary research, development, and testing in several areas, including spectrum sharing and advanced technologies for broadband and public safety.⁶ The CAC will develop multiuser testbeds that allow government and industry researchers to measure and evaluate the performance of new advanced spectrum-sharing technologies.

The 2013 Presidential Memorandum also directed NTIA to design and conduct a pilot program to monitor spectrum usage in real time in selected communities throughout the country

³ See Memorandum for the Heads of Executive Departments and Agencies, *Unleashing the Wireless Broadband Revolution* (rel. June 28, 2010), published at 75 Fed. Reg. 38387 (July 1, 2010), available at <http://go.usa.gov/8nr3>.

⁴ See Memorandum for the Heads of Executive Departments and Agencies, *Expanding America’s Leadership in Wireless Innovation* (rel. June 14, 2013), published at 78 Fed. Reg. 37431 (June 20, 2013), available at <http://go.usa.gov/8nr3> (2013 Presidential Memorandum).

⁵ See WSRD SSG National Wireless Testbed Information Portal, available at <http://go.usa.gov/8ngh>.

⁶ See NIST and NTIA Announce Plans to Establish New Center for Advanced Communications, *Press Release* (June 14, 2013), available at <http://go.usa.gov/DTdG>.

to determine whether a comprehensive monitoring program in major metropolitan areas could disclose opportunities for more efficient spectrum access, including via sharing.⁷ In August 2013, NTIA published a Notice of Inquiry on the spectrum monitoring pilot program to solicit input from stakeholders, and has used some of the information collected from that inquiry to begin implementation of the pilot.⁸

The FCC recently modified its experimental licensing rules to provide a more flexible framework to keep pace with the speed of modern technological change, including advanced spectrum sharing concepts.⁹ The revised rules permit institutions to move from concept to experimentation to finished product as rapidly as possible using a new program experimental license that gives licensees more flexibility to conduct multiple experiments in certain locations without filing separate applications. Program licensees can also conduct specific types of experiments without individual authorizations in designated “innovation zones.” In March 2014, the FCC’s Technological Advisory Council (TAC) created a working group to study advanced sharing of federal and non-federal spectrum bands and enabling wireless technologies.¹⁰ This working group is developing key recommendations to support the creation of a Model City including scope, logistics, locations, frequency bands, and other operational issues and objectives.

⁷ See 2013 *Presidential Memorandum*.

⁸ See NTIA, Spectrum Monitoring Pilot Program, *Notice of Inquiry*, 78 Fed. Reg. 50399 (Aug. 19, 2013), available at <http://go.usa.gov/DWQw>.

⁹ See FCC, *Promoting Expanded Opportunities for Radio Experimentation and Market Trials under Part 5 of the Commission’s Rules and Streamlining Other Related Rules*, ET Docket No. 10-236, *Report and Order*, 28 FCC Rcd. 758 (Feb. 2013), available at http://hraunfoss.fcc.gov/edocs_public/attachmatch/FCC-13-15A1_Rcd.pdf.

¹⁰ See TAC, *Summary of Meeting* at 36 (Mar. 10, 2014), available at <http://transition.fcc.gov/bureaus/oet/tac/tacdocs/meeting31014/TACSummary3-10-14.pdf>.

Discussion

The purpose of this Joint Public Notice is to build upon the PCAST recommendations on test services necessary to demonstrate and evaluate advanced spectrum sharing technologies through the potential establishment of a Model City program. This program, if established, could facilitate large-scale sustainable facilities for systems level testing in real-world environments across multiple frequency bands, potentially including selected federal and non-federal frequency bands. NTIA and the FCC would work together in accordance with their respective areas of authority. The responses to this Joint Public Notice will help determine whether NTIA and/or the FCC may need to undertake additional actions or initiate formal proceedings.

Through this Joint Public Notice, NTIA and OET seek comment on the PCAST recommendation and on ways to establish, fund, and conduct the Model City program. We also welcome stakeholder input on other measures that NTIA and the FCC could employ to promote the program, for example, through independent public-private partnerships among federal and local government stakeholders and commercial interests. We are soliciting ideas on how to move the PCAST recommendation forward and therefore seek comment on the next steps that NTIA and the FCC could take to develop specific approaches for effectively demonstrating and evaluating sharing technologies in real-world environments. NTIA and OET also seek comment on the types of spectrum sharing innovations and supported applications that would be good initial candidates for such evaluations, including their potential benefits, recommended spectrum bands for sharing, and appropriate operational requirements.

NTIA and OET seek comment on the extent to which the Model City can and should be a largely self-organizing effort to establish independent public-private partnerships by industry,

municipalities (or other political subdivisions), and other non-federal stakeholders. Particularly in light of the recent modifications to the FCC's experimental licensing rules, how could the Model City take advantage of these rule changes without having to establish or fund a new federal program? What type of formal or informal agreements or arrangements among the non-federal parties would be necessary to effectuate the Model City relationships and understandings between, for example, an industry consortium and the participating city? Beyond the FCC's formal role in administering the experimental licensing process, NTIA and OET seek comment on how it could further expedite or streamline the process for Model City participants and more effectively ensure compliance with the rules and any license conditions.

In addition to coordinating experimental license applications to use bands implicating federal spectrum assignments, to what extent should NTIA be involved in particular initiatives to facilitate federal agency participation in a Model City program? NTIA and OET seek input from commenting parties on whether the Model City program should be managed by the federal government or whether the FCC and NTIA could, on top of their existing licensing and coordination roles, help initiate and facilitate a dialogue between the key stakeholders who will directly develop, participate in, and benefit from a successful Model City program within the scope of existing rules or other requirements.

The new CAC established by NTIA and NIST could be a potential vehicle to advance the Model City concept. As noted above, a core function of the CAC is to promote interdisciplinary research, development, and testing in radio frequency technology and spectrum sharing. NTIA and OET seek comment on the potential role of the CAC in managing the activities within one or more Model Cities, such as working directly with NTIA and the FCC to coordinate the interests of incumbent spectrum users to avoid harmful interference, while ensuring that innovators have

access to adequate spectrum resources and other facilities in cooperation with city officials.

While we would expect private sector stakeholders to drive the design and development of innovative wireless technologies and business models that could be tested in a Model City, NTIA and OET seek comment on how the CAC could work as an impartial facilitator with the federal and non-federal stakeholders and local governments to develop feasible test plans, minimize regulatory issues and constraints, monitor experimental deployments, and evaluate and report the test results.

The FCC's experimental licensing program makes spectrum available to any non-federal party interested in experimenting with new radio technologies, equipment designs, radio wave propagation characteristics, and innovative service concepts (including market trials), especially in new innovation zones. NTIA and OET seek comment on how this program can be effectively used as a platform for the establishment of the Model City. For example, how can the FCC and NTIA facilitate stakeholder deployment of innovation zones in one or more Model Cities?

NTIA and OET invite commenters to suggest opportunities for collaboration among wireless service providers, hardware vendors, academia, federal agencies, and other researchers and developers. How would such collaboration in a Model City better facilitate more rapid experimentation of advanced spectrum sharing techniques between new commercial systems and incumbent or new federal systems? How would such collaborative use within Model City innovation zones enhance stakeholders' ability to try various sharing concepts? For example, what kind of flexibility would stakeholders need to make adjustments as needed when developing sharing protocols under real-world scenarios while ensuring protection of other services and operations?

The host community for a Model City could play a crucial and collaborative role by expediting access to rights-of-way and other facilities (*e.g.*, fiber, conduits, poles, towers, buildings, rooftops, park spaces, tunnels, *etc.*) for short- and long-term wireless infrastructure and monitoring deployments. The *PCAST Report* suggests that regional clusters of local industry associations, government, and academia could develop proposals to host the Model City in their particular regions to leverage their own innovation investments, local suppliers, terrain characteristics, nearby federal installations, and other unique features and benefits.¹¹ NTIA and OET seek comment on the most appropriate approach for soliciting or identifying eligible cities interested in hosting Model City deployments. What particular factors, accommodations, commitments, or benefits would be important? For example, how should local permitting processes, accessibility to city lands and facilities, or incentives be considered? What features of a Model City would be most attractive for candidate cities to participate in the program?

Finally, NTIA and OET seek input on the potential funding mechanisms and other processes for establishing and maintaining one or more Model City deployments in a manner that facilitates potentially resource-intensive collaborative efforts among a wide range of stakeholders while minimizing expenditure of taxpayer (both federal and local) dollars. How should funding be addressed in Model City proposals and what minimal commitments should be required for such proposals to go forward? How would existing mechanisms, such as federal Cooperative Research and Development Agreements, be used to expand opportunities for private stakeholder funding, collaboration, and information protection, and what other alternative methods could be used to formalize the parties' roles and responsibilities, including funding? What incentives might be provided, and by whom, to increase participation in a Model City program? What other

¹¹ See *PCAST Report* at 71.

factors should be considered in a process to solicit interest in and successfully initiate Model City proposals?

Dated: July 10, 2014.

/S/

Milton Brown,
Deputy Chief Counsel, National Telecommunications and Information Administration.

Dated: July 10, 2014.

/S/

Julius P. Knapp,
Chief, Office of Engineering and Technology, Federal Communications Commission.