



PUBLIC NOTICE

Federal Communications Commission
445 12th St., S.W.
Washington, D.C. 20554

News Media Information 202 / 418-0500
Internet: <http://www.fcc.gov>
TTY: 1-888-835-5322

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**FCC SEEKS COMMENT AND DATA ON ACTIONS
TO ACCELERATE ADOPTION AND ACCESSIBILITY OF BROADBAND-ENABLED
HEALTH CARE SOLUTIONS AND ADVANCED TECHNOLOGIES**

GN Docket No. 16-46

Comment Date: May 24, 2017
Reply Comment Date: June 8, 2017

Broadband networks are increasingly important to our national well-being and everyday lives. As such, we must maximize their availability and ensure that all Americans can take advantage of the variety of services that broadband enables, including 21st century health care. In this Public Notice, the Federal Communications Commission (FCC or Commission) seeks information on how it can help enable the adoption and accessibility of broadband-enabled health care solutions, especially in rural and other underserved areas of the country. We expect to use this information to identify actions that the Commission can take to promote this important goal.

Ensuring that everyone is connected to the people, services, and information they need to get well and stay healthy is an important challenge facing our nation.¹ Technology innovations in clinical practice and care delivery coupled with burgeoning consumer reliance on mHealth² and health information technology (or healthIT)³ are fundamentally changing the face of health care, and a widespread, accessible broadband infrastructure is critical to this ongoing shift. Indeed, the future of modern health care appears to be fundamentally premised on the widespread availability and accessibility of high-speed connectivity.⁴ By some estimates, broadband-enabled health information technology can help to improve the quality of health care and significantly lower health care costs by hundreds of billions of dollars in the

¹ See, e.g., *Healthy People 2020*, U. S. Department of Health and Human Services (which takes as its overarching vision, “a society in which all people live long, healthy lives”), available at <http://www.healthypeople.gov/sites/default/files/HP2020Framework.pdf>.

² While “mHealth” traditionally stands for “mobile health,” the term also has been applied more broadly to refer to mobile health, wireless health, and e-Care technologies that improve patient care and the efficiency of health care delivery. See mHealth Task Force-Findings and Recommendations, at 1 (Sept. 24, 2012) (*mHealth Task Force Report*), available at <http://transition.fcc.gov/cgb/mhealth/mHealthRecommendations.pdf>.

³ The term “health IT” is defined herein as information-driven health practices and the technologies that enable them; it includes billing and scheduling systems, e-care, EHRs, telehealth, and mobile health.

⁴ See The Office of the National Coordinator for Health Information Technology (ONC), Office of the Secretary, United States Department of Health and Human Services, *Federal Health IT Strategic Plan, 2015-2020*, at 28 (2015) (*Federal Health IT Strategic Plan*), available at http://www.healthit.gov/sites/default/files/9-5-federalhealthitstratplanfinal_0.pdf.

coming decades.⁵ However, the United States remains behind some advanced countries in the adoption of such technology.⁶

As discussed in this Public Notice, the Commission plays an important role in improving the quality of health care and enabling health care innovation through the universal service program, spectrum licensing, and other activities.⁷ In order to perform these and other important roles in the health technology space, the Commission should continue to evaluate the nation's broadband health

⁵ See *FDASIA Health IT Report: Proposed Strategy and Recommendations for a Risk-Based Framework*, at 3 (April 2014) (*FDASIA Report*) (concluding that “[a] nationwide health information technology (health IT) infrastructure can offer tremendous benefits to the American public, including the prevention of medical errors, improved efficiency and health care quality, reduced costs, and increased consumer engagement.”), available at <http://www.fda.gov/downloads/AboutFDA/CentersOffices/OfficeofMedicalProductsandTobacco/CDRH/CDRHReports/UCM391521.pdf>. See also CMS Telehealth, *Remote Monitoring Technologies Could Shave Health Care Costs by \$197 Billion* (March 6, 2015) (“The United States could cut \$197 billion from its health care bill over the next 25 years by widespread use of remote monitoring to track the vital signs of patients with chronic diseases such as congestive heart failure and diabetes, according to a new study released today by economist Robert Litan.”), http://www.cmstelehealth.com/index.php?option=com_content&view=article&id=32&Itemid=11.

⁶ See *FDASIA Report*, *supra* note 5, at 3; *mHealth Task Force Report*, *supra* note 2, at 2. See also BusinessWire, *First Future Health Index Research Indicates Americans feel U.S. Healthcare Paradigm Needs Radical Shift Over Next Decade* (June 8, 2016) (“[A]lthough interest in connected care technology is high, the U.S. is not yet taking advantage of opportunities to realize the full benefits of these devices in powering integrated healthcare, signaling areas of improvement and opportunities for radical change in the American healthcare system.”), <http://www.businesswire.com/news/home/20160608005152/en/Future-Health-Index-Research-Americans-feel-U.S.>; Max Green, *Where does the US rank among countries for high-tech healthcare adoption?*, Becker's Health IT and CIO Review (June 9, 2016) (“The Future Health Index for 2016 ranks the U.S. 6th out of 13 in ‘perceived readiness . . . to realize the benefits of integration and connected care,’ behind the United Arab Emirates, the Netherlands, China, Australia and Singapore. The score is based on a number of metrics, including measurements of access to care, integration and tech adoption.”). See also World Health Organization, *World Health Organization Assesses the World's Health Systems* (observing that the U.S. ranks 37th in the world for health care system performance, yet spends more on health care per capita and more on healthcare as a percentage of its GDP than any other nation), http://www.who.int/whr/2000/media_centre/press_release/en/ (last visited March 13, 2017).

⁷ With respect to the universal service program, the FCC established the Rural Health Care Program, which includes the Healthcare Connect Fund. See generally *Rural Health Care Support Mechanism*, WC Docket No. 02-60, Report Order, 27 FCC Rcd 16678, (2012) (*Healthcare Connect Fund Order*). The Healthcare Connect Fund supports the cost of broadband—including new construction—for healthcare providers, especially in rural areas. See *id.* Over the years, the FCC has also addressed spectrum needs for the development of next-generation health technologies and medical devices, such as the allocation of spectrum for Medical Body Area Networks (or MBANs), which can transmit data on a patient's vital health indicators to his or her doctor or hospital. See *Amendment of the Commission's Rules to Provide Spectrum for the Operation of Medical Body Area Networks*, ET Docket No. 08-59, First Report and Order and Further Notice of Proposed Rulemaking, 27 FCC Rcd 6422 (2012) (*MBAN First Report and Order*). In addition, the FCC has been active in various interagency coordination efforts related to health IT. As an example, the FCC has an ongoing commitment under Section 618 of the Food and Drug Administration Safety and Innovation Act (FDASIA) (see Public Law 112-144), and the resulting Memorandum of Understanding, executed in April 2014, to work with the Office of the National Coordinator for Health Information Technology (ONC) and the Food and Drug Administration (FDA) “to promote a health information technology (IT) framework that promotes innovation, protects patient safety, and avoids regulatory duplication.” *Id.* This collaboration has resulted in the development of the *FDASIA Report* (see *supra* note 5) and the Shared Nationwide Interoperability Roadmap, which promotes interoperable health IT (see The Office of the National Coordinator for Health Information Technology, *Connecting Health and Care for the Nation—A Shared Nationwide Interoperability Roadmap* (Feb. 2014) (*ONC Interoperability Roadmap*), available at <https://www.healthit.gov/sites/default/files/nationwide-interoperability-roadmap-draft-version-1.0.pdf>).

infrastructure and to understand the ongoing technology-based transformation in health care delivery.⁸ This will better assure that consumers—from major cities to rural and remote areas, Tribal lands, and underserved regions—can access potentially lifesaving health technologies and services, like telehealth and telemedicine.⁹ Leading this effort on behalf of the agency is its Connect2Health^{FCC} Task Force.¹⁰ Among other things, the Task Force is charged with charting the broadband future of “health *and* care” in order to ensure that the agency stays ahead of the health technology curve.¹¹ We use the phrase “health *and* care” deliberately in this Public Notice to reflect and include the broad range of participants in the emerging broadband health ecosystem, including providers (e.g., health systems, community health centers, clinicians, pharmacists, nutritionists, allied health professionals); public health and social service agencies and organizations; innovators and entrepreneurs; academic and research facilities; state and local policymakers; patients and their caregivers; as well as consumers who seek support to prevent disease and maintain optimum health.

This Public Notice seeks comment, data, and information on a broad range of regulatory, policy, technical, and infrastructure issues related to the emerging broadband-enabled health *and* care ecosystem. Commenters should address the agency’s authority on all issues raised in this Notice. The comment, data, and information requested are intended to provide the Commission with a broader understanding and perspective on the current state of broadband health technology and other related issues; and it will also inform the Task Force's work and recommendations.

THE BROADBAND HEALTH IMPERATIVE

Broadband holds promise for enabling health care solutions and advanced technologies that can

⁸ See, e.g., *Healthcare Connect Fund Order*, 27 FCC Rcd at 16832-46, Appendix B (FCC undertakes assessment of healthcare provider needs for broadband capability in light of the current and future state of telemedicine, telehealth, and health information technology before conducting reforms to its Rural Health Care Program).

⁹ For purposes of this Public Notice, “telemedicine” is defined as using telecommunications technologies to support the delivery of medical, diagnostic, and treatment-related services usually by doctors. See FCC.gov/health,, *Telehealth, Telemedicine and Telecare, What's What?*, <http://www.fcc.gov/page/telehealth-telemedicine-and-telecare-whats-what> (last visited March 13, 2017). For purposes of this Public Notice, “telehealth” is similar to telemedicine, but includes a wider variety of remote healthcare services beyond the doctor-patient relationship, often involving services provided by nurses, pharmacists, or social workers. See *id.*

¹⁰ The Connect2Health^{FCC} Task Force, a senior-level, multi-disciplinary team, brings together the expertise of the FCC on the intersection of broadband, advanced technology, and health. See “Chairman Pai Statement on Broadband Health and the Connect2Health^{FCC} Task Force” (rel. March 16, 2017), available at https://apps.fcc.gov/edocs_public/attachmatch/DOC-343926A1.pdf; see also, News Release, “FCC Chairman Announces New Connect2Health^{FCC} Task Force” (rel. March 4, 2014), available at <http://www.fcc.gov/document/fcc-chairman-announces-new-connect2health-task-force>. In this regard, we note that various bureaus and offices within the FCC work on proceedings and initiatives related to health care technology. For example, the Wireless Telecommunications Bureau and the Office of Engineering and Technology manage spectrum and work to create new opportunities for competitive technologies, including wireless medical devices; and the Wireline Competition Bureau oversees the Healthcare Connect Fund, a program intended to expand health care provider access to broadband, especially in rural areas, and to encourage the creation of state and regional broadband health care consortia or networks. Other bureaus and offices at the FCC, such as the Consumer and Governmental Affairs Bureau (including its Disability Rights Office and the Office of Native Affairs and Policy), play key roles as well.

¹¹ As the Office of the National Coordinator for Health Information Technology has urged, “the health IT community must expand its focus beyond institutional care delivery and health care providers, to a broad view of person-centered health.” *ONC Interoperability Roadmap*, *supra* note 7, at 8. See also Dr. Kristi Henderson, Chief Telehealth & Innovation Officer, University of Mississippi Medical Center, Human Capital Blog, *Better Health, Better Care, and Lower Costs Through Telehealth* (Jan. 24, 2014), http://www.rwjf.org/en/blogs/human-capital-blog/2014/01/better_health_bette.html (describing the health *and* care paradigm).

help to meet America's growing health care needs.¹² Health care accounts for a significant percentage of the U.S. gross domestic product and health care costs are projected to increase.¹³ Studies confirm that the United States has a serious health care supply problem. By some estimates, the country could face a shortage of up to 94,700 physicians by 2025, and the forecast is worse for rural communities.¹⁴ The healthcare provider shortfall is likely to disproportionately affect rural and remote areas which are already medically-underserved.¹⁵

At the same time, demand for health care services is increasing. Today, over 320 million people in the United States could, at any time, utilize health care services, with one person added every 12 seconds (net), yet we only have approximately 280,000 primary care physicians to meet the needs.¹⁶ By

¹² See, e.g., Steve Boccone, *Telemedicine Set to Bloom in 2015*, Bioscience Technology (Feb. 24, 2015), <http://www.biosciencetechnology.com/articles/2015/02/telemedicine-set-bloom-2015>. See generally Federal Communications Commission, Omnibus Broadband Initiative, *Connecting America: the National Broadband Plan*, Chapter 10, at 197-222 (rel. Mar. 16, 2010) (National Broadband Plan), available at http://hraunfoss.fcc.gov/edocs_public/attachmatch/DOC-296935A1.pdf at 199-217.

¹³ See Tom Howell, Jr., *Health care spending expected to pick up, grab bigger share of GDP*, The Washington Times (Sept. 3, 2014) ("Economists at the Centers for Medicare and Medicaid Services (CMS) said health spending should increase an average of 5.7 percent per year from 2013 to 2023, outpacing expected growth in the gross domestic product by slightly more than 1 percentage point."), <http://www.washingtontimes.com/news/2014/sep/3/health-care-spending-expected-spike-coming-years/>.

¹⁴ See Association of American Medical Colleges, *New Research Confirms Looming Physician Shortage* (April 5, 2016) ("[T]he United States will face a shortage of physicians over the next decade, according to a physician workforce report released by the AAMC The projections show a shortage ranging between 61,700 to 94,700, with a significant shortage showing among surgical specialties.") (citation omitted), https://www.aamc.org/newsroom/newsreleases/458074/2016_workforce_projections_04052016.html.

¹⁵ See Rural Health Information Hub, *Healthcare Access in Rural Communities*, <https://www.ruralhealthinfo.org/topics/healthcare-access> (last visited March 13, 2017); Telequality Communications, *The Big Five: Healthcare Workforce Deficits* (Oct. 5, 2016) ("The healthcare system is facing a serious workforce shortage. From physicians and nurses to health IT workers, these shortages are being felt deeply across the country every day. As with most challenges in the industry, the shortage is exacerbated in rural areas."), <https://telequalitycommunications.wordpress.com/2016/10/05/the-big-five-healthcare-workforce-deficits/>. See also Ayla Ellison, *The rural hospital closure crisis: 15 key findings and trends*, *Beckershospitalreview.com* (Feb. 16, 2016) (Since 2010, 80 rural hospitals closed, and those closures were spread across more than 20 states. Across the U.S., there currently are 673 rural hospitals that are forecasted to be vulnerable to closure), <http://www.beckershospitalreview.com/finance/the-rural-hospital-closure-crisis-15-key-findings-and-trends.html>; see also University of North Carolina, *The Cecil G. Sheps Center for Health Services Research at University of North Carolina, 80 Rural Hospital Closures: January 2010 – Present*, <http://www.shepscenter.unc.edu/programs-projects/rural-health/rural-hospital-closures/> (last visited March 14, 2017); Jayne O'Donnell and Laura Ungar, *Rural Hospitals in Critical Condition*, USA Today (Nov. 12, 2014), available at <http://www.usatoday.com/story/news/nation/2014/11/12/rural-hospital-closings-federal-reimbursement-medicadaca/18532471/>.

¹⁶ See United States Census Bureau, Population Division, *Monthly Population Estimates for the United States: April 1, 2010 to December 1, 2017* (American Fact Finder), December 2016, available at <https://factfinder.census.gov/faces/tableservices/jsf/pages/productview.xhtml?src=bkmk> (last visited March 16, 2017); Association of American Medical Colleges, Center for Workforce Studies, *2014 Physician Specialty Data Book* (Nov. 2014), available at <https://members.aamc.org/eweb/upload/Physician%20Specialty%20Databook%202014.pdf>. See also Karen S. Rheuban, MD and Director of the University of Virginia Center for Telehealth, *Testimony before the Committee on Small Business Subcommittee on Health and Technology*, United States House of Representatives, at 4-6 (July 31, 2014) (*Dr. Rheuban Testimony*) ("It is widely accepted that our nation faces a shortage of physicians and other health professionals, which is anticipated to worsen with our aging population, higher rates of chronic illness, and greater numbers of covered individuals seeking care following the implementation of the Affordable Care Act.") ("Attracting health professionals to rural communities remains a daunting task and retaining those health professionals to practice in

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the year 2060, the number of people living in the United States is projected to increase by 100 million (resulting in a total of 425+ million people), further exacerbating the projected physician shortage concern.¹⁷ To further complicate matters, over 100 million Americans are dealing with chronic diseases and conditions (e.g., heart disease, stroke, cancer, obesity, diabetes, and arthritis);¹⁸ and despite best efforts, health care disparities persist across various geographic regions and ethnic groups.¹⁹ While many individuals struggle with one chronic illness, older Americans often face from two to as many as five chronic diseases at the same time.²⁰ By 2030, one out of every five Americans (or 71 million) will be over the age of 65, and 20 million will be over the age of 80.²¹

While broadband is not a complete answer, there are a growing number of broadband-enabled solutions that can play an important role in improving population health; addressing health needs beyond

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rural communities is all the more difficult."), *available at* http://smallbusiness.house.gov/uploadedfiles/7-31-2014_rheuban_testimony_final.pdf.

¹⁷ See United States Census Bureau, 2012 National Population Projections: Summary Table, NP2012-T1, <http://www.census.gov/population/projections/data/national/2012/summarytables.html> (last visited March 13, 2017). In addition, the U.S. is also experiencing a nursing shortage—the projected shortage is estimated to be as high as 400,000 to 808,000 registered nurses by 2020. See American Association of Colleges of Nursing, Nursing Shortage, <http://www.aacn.nche.edu/media-relations/fact-sheets/nursing-shortage> (last visited March 13, 2017).

¹⁸ According to the U.S. Centers for Disease Control and Prevention:

As of 2012, about half of all adults—117 million people—had one or more chronic health conditions. One of four adults had two or more chronic health conditions.

Seven of the top 10 causes of deaths in 2010 were chronic diseases. Two of these chronic diseases—heart disease and cancer—together accounted for nearly 48% of all deaths.

Obesity is a serious health concern. During 2009-2010, more than one-third of adults, or about 78 million people were obese. . . . Nearly one of five youths aged 2-19 years was obese

Arthritis is the most common cause of disability. Of the 53 million adults with a doctor diagnosis of arthritis, more than 22 million say they have trouble with their usual activities because of arthritis.

Diabetes is the leading cause of kidney failure, lower limb amputations other than those caused by injury, and new cases of blindness among adults.

See Centers for Disease Control and Prevention, Chronic Diseases and Health Promotion, <http://www.cdc.gov/chronicdisease/overview/> (internal citations omitted) (last visited March 13, 2017).

¹⁹ See [Healthypeople.gov](http://www.healthypeople.gov), Disparities, <http://www.healthypeople.gov/2020/about/foundation-health-measures/Disparities> (last visited March 13, 2017). See also Rural Assistance Center, Rural Health Disparities, <http://www.raconline.org/topics/rural-health-disparities> (last visited March 13, 2017) ("Rural Americans are a population group that experience significant health disparities. . . . Rural risk factors for health disparities include geographic isolation, lower socio-economic status, higher rates of health risk behaviors, and limited job opportunities. Higher rates of chronic illness and poor overall health are found in rural communities when compared to urban populations. . . . Several studies have shown that rural residents are older, poorer, and have fewer physicians to care for them."). See also Alicia Gallegos, *Medical Experts Say Physician Shortage Goes Beyond Primary Care*, Association of American Medical Colleges (Feb. 2014) ("Some areas of the country already are showing signs of an inadequate physician workforce, according to health experts. Certainly folks living in rural areas and many in urban, inner-city areas already are having difficulty with access.") (internal quotations omitted), <https://www.aamc.org/newsroom/reporter/february2014/370350/physician-shortage.html>.

²⁰ Studies indicate that Americans over the age of 65 tend to be much more intense utilizers of medical care than others. See Wolff JL, Starfield B, Anderson G., *Prevalence, expenditures, and complications of multiple chronic conditions in the elderly*, Arch Intern Med 2002;162(2):2269-76.

²¹ See [Agingstats.gov](http://www.agingstats.gov), http://www.agingstats.gov/Main_Site/Data/2012_Documents/Population.aspx (last visited March 13, 2017).

the hospital; expanding access to primary, acute, preventive and specialist care, especially for those Americans living in rural and underserved areas; providing more cost-effective solutions; improving the quality of care; and better engaging consumers in their health.²² Put simply, health care is being transformed by the availability and accessibility of broadband-enabled services and technologies and the development of life-saving wireless medical devices.

Indeed, we are already realizing some of the tremendous benefits that broadband-enabled health technologies and innovative wireless medical devices have to offer:

- Electronic Health Record (EHR) systems can track and transmit vast amounts of patient clinical data.
- X-rays, MRIs, and CAT scans can be transmitted seamlessly to specialists at a distant hospital.
- Telemedicine and telehealth programs and services provide opportunities to close access to care gaps and facilitate specialized training.²³
- Medical providers are able to prescribe medications electronically, saving time and money.²⁴
- Surgeons are able to perform operations miles away from patients via robotics.²⁵

²² See Melinda Beck, *How Telemedicine is Transforming Health Care*, Wall Street Journal (June 26, 2016) (“Driven by faster internet connections, ubiquitous smartphones and changing insurance standards, more health providers are turning to electronic communications to do their jobs—and it’s upending the delivery of health care. Doctors are linking up with patients by phone, email and webcam. They’re also consulting with each other electronically—sometimes to make split-second decisions on heart attacks and strokes. Patients, meanwhile, are using new devices to relay their blood pressure, heart rate and other vital signs to their doctors so they can manage chronic conditions at home. Telemedicine also allows for better care in places where medical expertise is hard to come by.”), available at <https://www.wsj.com/articles/how-telemedicine-is-transforming-health-care-1466993402>; JT Ripton & C. Stefan Winkler, *How Telemedicine is Transforming Treatment in Rural Communities*, Becker’s Health IT and CIO Review (April 8, 2016), <http://www.beckershospitalreview.com/healthcare-information-technology/how-telemedicine-is-transforming-treatment-in-rural-communities.html>; Rural Health Information Hub, *Telehealth Use in Rural Healthcare*, <https://www.ruralhealthinfo.org/topics/telehealth> (last visited March 13, 2017). See also *Healthcare Connect Fund Order*, 27 FCC Rcd at 16689-90 & Appendix B. See generally *Wireline Competition Bureau Interim Evaluation of Rural Health Care Pilot Program Staff Report*, WC Docket No. 02-60, Staff Report, 27 FCC Rcd 9387 (2012) (*Pilot Program Staff Report*).

²³ At least one industry expert estimates that the number of doctor-patient video consultations will nearly triple—i.e., from 5.7 million in 2014 to over 16 million in 2015, and will exceed 130 million in 2018. See Brian Dolan, *Doctor-patient video visits to triple to 16 million next year*, MobiHealth News (Aug. 28, 2014), <http://mobihealthnews.com/36156/doctor-patient-video-visits-to-triple-to-16-million-next-year/>. These services also provide promise even in remote areas with little to no connectivity or reception with use of a “telemedicine backpack.” See Jonah Comstock, *Telemedicine Backpack Helps Bring Doctor’s to Low Connectivity Areas*, MobiHealth News (Feb. 14, 2017) (“The lightweight backpack contains four high-gain antennae, two modems, a rugged tablet, a fifteen-hour battery, and various tools like stethoscopes and ultrasounds.”) (“In rural areas, . . . the cost savings are pretty apparent. If you save one helicopter flight, you’ve just paid for the whole system.”) (internal quotations omitted), <http://www.mobihealthnews.com/content/telemedicine-backpack-helps-bring-doctors-care-low-connectivity-areas>. See also *Healthcare Connect Fund Order*, 27 FCC Rcd at 16680-81.

²⁴ Cathy Schoen, et al., *Survey of Primary Care Physicians in Eleven Countries*, 28 Health Aff. w1171 (2009), available at <http://content.healthaffairs.org/cgi/reprint/28/6/w1171?ijkey=46Z9Be2ia7vm6&keytype=ref&siteid=healthaff>.

²⁵ See Crystal Ponti, *Doctors Can Use Robotic Telemedicine to Assess Coma Patients*, Smithsonian (Feb. 13, 2017) (“A new study shows that a remote specialist can be just as effective at reporting a comatose patient’s condition than a medical professional in the room.”), <http://www.smithsonianmag.com/innovation/doctors-can-use-robotic-telemedicine-to-assess-coma-patients-180962145/#Dw0iUOIOv292jIIt.99>; Rose Eveleth, *The Surgeon Who Operates from 400km Away*, bbc.com (May 16, 2014), <http://www.bbc.com/future/story/20140516-i-operate-on-people-400km-away> (last visited March 13, 2017). See also *Rural Health Care Support Mechanism*, WC Docket 02-60, Report and Order, Order on Reconsideration, Further Notice of Proposed Rulemaking, 18 FCC Rcd 24546,

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- Self-service health kiosks are becoming increasingly available at pharmacies and grocery chains, providing additional access points for primary care and disease screenings.²⁶
- Remote patient monitoring applications and services are reducing hospital readmissions as well as travel and associated expenses for patients.²⁷
- Mobile devices like smartphones and personal data assistants are transforming the way physicians manage patient care; they are also empowering and engaging consumers to take a more active role in managing their own health.²⁸
- Implant or body-worn monitoring, therapeutic, and treatment technologies include wireless blood glucose monitors and automated insulin pumps.²⁹
- "Ingestibles" and "smart pills" (broadband-enabled digital tools that are swallowed by the patient) use wireless technology to monitor internal reactions in real-time, dispense medication, and provide other granular health data.³⁰

Veterans, in particular, have seen tangible benefits from telemedicine. Most notably, critical mental health services are now accessible via telemedicine to those veterans living in rural areas or abroad.³¹ In

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24550 (2003) ("For example, a video teleconference link allowed a surgeon in Anchorage to provide real-time guidance to a doctor in an isolated village in Alaska while he performed life-saving emergency surgery to stem bleeding for a patient diagnosed with an ectopic pregnancy. The emergency surgery was necessary, because the patient could not be airlifted to Anchorage due to fog. In Virginia, telemedicine links, which transported high-quality ultrasound pictures, allowed a neonatal cardiologist to remotely diagnose an infant located in a rural hospital with a descending aorta. The doctor was able to prescribe medication, which provided additional time to transport the infant to a specialty hospital for open heart surgery.").

²⁶ See, e.g., Heather Mack, *Sam's Club teams up with Higi to offer health screening kiosk, app to members*, MobiHealthNews (Feb. 13, 2017) ("Big box wholesaler Sam's Club is wading into digital health territory via a new partnership with digital health kiosk company Higi, offering free, self-service health screening to 622 Sam's Club locations with pharmacies around the country."), <http://www.mobihealthnews.com/content/sams-club-teams-higi-offer-health-screening-kiosk-app-members>; Phillip Tracy, *Verizon connects wellness kiosk, offers smart health care for free*, RCRWirelessNews (Sept. 8, 2016) (health and wellness retail kiosk offers consumers free interactive health care services at grocery stores; kiosk relies on wireless connectivity to enable interactive functionalities and make immediate upgrades).

²⁷ Studies show that the United States could cut \$197 billion from its health care bill over the next 25 years by more widespread use of remote monitoring to track the vital signs of patients with chronic diseases such as congestive heart failure and diabetes. See CMS Telehealth, *Remote Monitoring Technologies Could Shave Health Care Costs by \$197 Billion*, *supra* note 5.

²⁸ See, e.g., Daniela Hernandez, *Doctors monitor patients remotely via smartphones and fitness trackers*, Kaiser Health News (March 10, 2014), <http://www.pbs.org/newshour/updates/doctors-monitor-patients-vitals-via-smartphones-fitness-trackers>. See also *Implementation of Section 60002(B) of the Omnibus Budget Reconciliation Act of 1993*, WT Docket No. 10-133, Annual Report, etc., 26 FCC Rcd 9664, 9807 (2011). In addition, patients are able to use patient portals to engage with their health care providers and systems remotely (especially when distance is a factor). A patient portal is a secure online website that gives patients convenient 24-hour access to personal health information from anywhere with an Internet connection. See HealthIT.gov, *Frequently Asked Questions, "What is a patient portal?"*, <http://www.healthit.gov/providers-professionals/frequently-asked-questions/343#id11> (last visited March 13, 2017).

²⁹ Food and Drug Administration, *For Consumers, More Choices Available for Diabetes Management*, <http://www.fda.gov/ForConsumers/ConsumerUpdates/ucm424219.htm> (last visited March 13, 2017).

³⁰ See Nick Bilton, *Disruptions: Medicine that Monitors You*, N.Y. Times (June 23, 2013), http://bits.blogs.nytimes.com/2013/06/23/disruptions-medicine-that-monitors-you/?_r=0.

³¹ See, e.g., Adam Mazmanian, *How VA is driving telemedicine* (Feb. 13, 2014) ("The Department of Veterans Affairs uses videoconferencing to connect medical professionals across its network and enhance patient care.") ("Increasingly, veterans of the wars in Iraq and Afghanistan are accessing telemedicine for mental health services,

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fiscal year 2014, more than 690,000 military veterans accessed the U.S. Department of Veterans Administration's (VA) health care network using telemedicine programs, reflecting more than 1.7 million episodes of care.³² The Veterans Health Administration notes that “[telemedicine] technology is now considered ‘mission critical’ for effectively delivering quality healthcare to veterans, particularly for those in rural or underserved areas.”³³

These are just some of the opportunities that broadband-enabled services and health-related communications technologies and devices offer, especially for those living in rural and underserved areas, low density populations, and Tribal lands; for older Americans; persons with disabilities; military veterans; and the economically disadvantaged—all of whom have traditionally faced significant health *and* care challenges. We endeavor to foster the development and accessibility of these and other emerging communications-based technologies throughout the country. The work ahead, however, can only be successful if it combines the efforts of all levels of government, industry, innovators and entrepreneurs, academia, consumers, and the health care community. Accordingly, we seek broad public and private stakeholder input and collaboration on the issues discussed below.

REQUEST FOR COMMENT AND DATA

As part of its charge, the Connect2Health^{FCC} Task Force is focused on the following objectives:

- Promoting effective policy and regulatory solutions that encourage broadband adoption and promote health IT;
- Identifying regulatory barriers (and incentives) to the deployment of radio frequency (RF)-enabled advanced health care technologies and devices;
- Strengthening the nation's telehealth infrastructure through the FCC's Rural Health Care Program and other initiatives;
- Raising consumer awareness about the value proposition of broadband in the health care sector and its potential for addressing health care disparities;
- Enabling the development of broadband-enabled health technologies that are designed to be fully accessible to people with disabilities;
- Highlighting effective telehealth projects, broadband-enabled health technologies, and mHealth applications across the country and abroad—to identify lessons learned, best practices, and regulatory challenges; and
- Engaging a diverse array of traditional and non-traditional stakeholders to identify emerging issues and opportunities in the broadband health space.

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including treatment of post-traumatic stress disorder.”), *available at* <http://fcw.com/articles/2014/02/13/how-va-is-driving-telemedicine.aspx>.

³² See Katie Wike, *2 Million Telehealth Visits for Vets in 2014*, Health IT Outcomes (Oct. 20, 2014) (reporting that the number of veterans using telehealth services has increased over the last four years, and that 55 percent of the veterans using telehealth services lived in rural areas where access to VA facilities is difficult), <http://www.healthitoutcomes.com/doc/million-telehealth-visits-for-vets-in-0001>. See also Greg Slabodkin, *VA Expanding Telehealth to Meet Growing Needs of Veterans*, HealthData Management (Aug. 15, 2016) (In 2015, the VA reported that home telehealth reduced hospital bed days of care by 58 percent, hospital admissions by 32 percent, while telemental health reduced psych bed days of care by 35 percent.), <http://www.healthdatamanagement.com/news/va-expanding-telehealth-to-meet-growing-needs-of-veterans>.

³³ *Id.* (referencing statement from Kevin Galpin, MD, acting executive director for telehealth at the Veterans Health Administration). In fact, Dr. Galpin, testifying before the House Veterans’ Affairs Subcommittee on Health, “has found telemental healthcare to be equally effective, if not more so, than in-person appointments, bringing highly specialized care to patients who otherwise would have to travel long distances.” *Id.*

To continue evaluating these and other challenges, we request that stakeholders and other interested parties provide comment, information, and/or data on the issues and subject matter described below. This Notice seeks the most current information available that is specifically relevant to the intersection of broadband, advanced technology, and health care in view of the aforementioned Task Force objectives. For convenience, the issues for comment are enumerated; and we request that parties, in their submission, identify the enumerated issue to which their written response pertains. We also encourage parties to identify any other relevant issues not covered below.

OBJECTIVE I: Promote effective policy and regulatory solutions that encourage broadband adoption and promote health IT.

Broadband and advanced technologies appear increasingly critical to the effective transformation of our health care system. First, these technologies enable the efficient exchange of patient and treatment information by allowing providers to access patients' electronic health records from on-site or hosted locations.³⁴ Second, in many cases it can remove geography and time as barriers to care by enabling telehealth and telemedicine applications like video consultations and remote patient monitoring.³⁵ Third, broadband provides a foundation for the next generation of medical devices, as well as other health innovation and connected-care solutions.³⁶ Finally, broadband-enabled health IT offers real opportunities for consumers to take charge of their own health.³⁷

To ensure that these and other benefits continue to accrue and expand, it is critical that we identify and engage in appropriate efforts to address any current and emerging issues of concern. In this regard, we note that there are some broad policy measures that, if implemented, could accelerate broadband deployment generally, and thereby provide greater access to broadband-enabled health technologies, solutions and services, especially for those consumers living in rural and underserved areas of the country. A prime example is the possible establishment of "Gigabit Opportunity Zones." In September 2016, FCC Chairman Ajit Pai, as part of his Digital Empowerment Agenda for accelerating the deployment of high-speed Internet access, called on Congress to provide tax and other financial incentives for the private sector to deploy gigabit broadband services in low income neighborhoods, which he referred to as "Gigabit Opportunity Zones."³⁸ More recently, the Commission created the Broadband Deployment Advisory Committee (BDAC) to provide the Commission advice on, among other things, accelerating broadband deployment, identifying regulatory barriers to infrastructure

³⁴ See Office of the National Coordinator, <http://www.healthit.gov/> (last visited March 13, 2017).

³⁵ See *supra* notes 22-25. See also *Dr. Rheuban Testimony*, *supra* note 15.

³⁶ *National Broadband Plan*, *supra* note 12, at 201. See *In the Matter of Use of Spectrum Bands Above 24 GHz for Mobile Radio Services, First Order and Further Notice of Proposed Rulemaking*, 31 FCC Rcd 8014, 8020 ¶ 6, 7 (2016); *In the Matter of Use of Spectrum Bands Above 24 GHz for Mobile Radio Services*, Notice of Proposed Rulemaking, 30 FCC Rcd 11878, 11882, 11883 ¶¶ 6, 8 (2015).

³⁷ See, e.g., Scott M. Andes and Daniel Castro, *Opportunities and Innovations in the Mobile Broadband Economy*, The Information Technology and Innovation Foundation (Sept. 14, 2010), available at <http://www.itif.org/publications/opportunities-and-innovations-mobile-broadband-economy>.

³⁸ Remarks of (then) FCC Commissioner Ajit Pai, *A Digital Empowerment Agenda*, The Brandery, Cincinnati, Ohio (Sept. 13, 2016), available at <https://www.fcc.gov/document/commissioner-pais-digital-empowerment-agenda>. Under the proposal, tax and other benefits would be made available to those entities who want to provide service in a geographic area of any size so long as the average household income for residents of the zone was at or below 75% of the national median. Further, to qualify as a Gigabit Opportunity Zone, state and local governments must adopt deployment-friendly policies. The proposal anticipates that all companies could receive tax incentives to spur private-sector gigabit broadband deployment in these areas and, at the same time, entrepreneurs could be incentivized to create jobs in these zones through a tax credit that offsets the employer's share of payroll taxes.

investment, and making recommendations for reducing and/or removing regulatory barriers.³⁹ We now seek additional and specific data regarding the pace of deployment and adoption of broadband for health and in health care. As detailed below, we also invite input on policies or initiatives that the FCC could implement to further spur deployment and adoption of broadband services, especially in critical need areas at the intersection of health and broadband (e.g., the counties identified in the Connect2Health^{FCC} Task Force's *Priority 100* and *Rural 100* lists).⁴⁰

1. We request suggestions regarding ways in which the FCC, based on its authority, can further accelerate broadband adoption in the health care context and promote broadband-enabled health IT solutions, either on its own or working in collaboration with other agencies, and, at the same time, ensure that such services and technologies are fully available and accessible to all Americans, including those living in rural and remote areas, low density populations, Tribal lands, and in underserved urban areas of our country.⁴¹ We also seek comment on what impediments to these efforts exist, and how the FCC can address them.
2. We request information and data on the types, impact, scale, and benefits of broadband-enabled services and technologies used for the delivery of health care. How is broadband *currently* being used to augment or transform existing health care delivery? What types of health care settings are using broadband-enabled services and technologies besides large medical hospitals? What variety of medical issues are they used for? Where are these health care settings located? What are some of the *future plans* for using broadband-enabled health services and technologies – not just by clinicians and hospitals but also by other participants in the broader health ecosystem?
3. We are also interested in learning how health technologies and services can take advantage of new technological applications and emerging communications networks. For example, what impact will the Internet of Things (IoT) have on broadband-enabled health technologies and services such as telehealth and telemedicine? To what extent will pervasive connectivity and a fully connected environment around individuals (e.g., IoT) shift the point of care delivery? How might the demands on broadband networks evolve in this new environment? What, if any, changes are anticipated in existing broadband-enabled health services and technologies—operating over current mobile networks—when 5G (Fifth Generation Mobile and Wireless Networks) becomes available?⁴² To what extent might telehealth and telemedicine be impacted by the availability of 5G networks? What medical device innovations are anticipated to be developed using 5G networks?

³⁹ See FCC News Release, *Chairman Pai Forms Broadband Deployment Advisory Committee* (rel. Jan. 31, 2017), available at <https://www.fcc.gov/document/chairman-pai-forms-broadband-deployment-advisory-committee>.

⁴⁰ See FCC, Connect2Health^{FCC} Task Force, *Mapping Broadband Health in America*, Priority 100 and Rural 100, <https://www.fcc.gov/health/maps/priority-and-rural-100> (last visited March 10, 2017). See also FCC, Connect2Health^{FCC}, *Critical Need Counties in Broadband and Health—Priority 100* (pdf copy of Priority 100 list), available at <https://www.fcc.gov/sites/default/files/Priority-100-Counties.pdf>; Connect2Health^{FCC}, *Critical Need Counties in Broadband and Health—Rural 100* (pdf copy of Rural 100 list), available at <https://www.fcc.gov/sites/default/files/Rural-100-Counties.pdf>.

⁴¹ Certain urban areas can also face the same basic challenges in access, quality, cost, and socioeconomic issues as in rural areas. See *Dr. Rheuban Testimony*, *supra* note 16, at 5.

⁴² See *Use of Spectrum Bands Above 24 GHz for Mobile Radio Services, etc.*, GN Docket No. 14-77, *et al.*, Notice of Proposed Rulemaking, FCC 15-138 (rel. Oct. 23, 2015) (proposing new rules for wireless broadband in wireless frequencies above 24 GHz and finding, in part, that new tech developments may allow use of these high frequencies for mobile applications—like 5G service—with significantly more capacity and faster speeds for next generation of mobile service.).

4. What technical issues concerning the variety of broadband-enabled health care solutions and technologies are appropriate and necessary for the FCC to consider with respect to efforts to accelerate broadband adoption and promote health IT solutions?⁴³ Are there issues of concern with respect to access, availability, interoperability, capacity, reliability, privacy, security, and speed? If so, please describe them. Does consideration of any of these issues vary depending on the technology platform—e.g., digital subscriber line (DSL), cable, fiber, wireless, or satellite?
5. We seek to better understand health care providers' connectivity requirements. What type of connectivity (e.g., wired or wireless; fixed or mobile) is necessary to support the deployment of health IT applications today and in the near future at the different types of health care delivery settings (e.g., tertiary care centers versus primary care physician practices, larger physician groups, clinics, hospitals, as well as "hospital in the home" settings).
 - a. What are the minimum bandwidth and speed requirements for the different types of health IT applications available today and in the near future for clinical and non-clinical settings?⁴⁴ We also seek comment on bandwidth constraints brought on by increased overall usage as well as the impact of data intensive medical applications. Are there future technologies or applications on the horizon that could be bandwidth intensive? If so, what are they, and to what extent could compression and other technologies provide a solution for such future technologies or applications?
 - b. Some evidence suggests that real-time image manipulation and video (e.g., telestroke and tele-emergency applications) will stimulate demand for more and better broadband and at lower prices.⁴⁵ Are there current issues concerning network speeds and delays for these types of services? Do mobile health applications present unique considerations in terms of coverage, reliability, and security? We seek suggestions on whether, and if so, how the Commission could address these issues.
 - c. To what extent do rural communities and Tribal lands have access to Internet connection speeds that are sufficient to support the effective and efficient transmission of data and video to provide telehealth, telemedicine, and other broadband health technology services?
 - d. What, if any, interoperability,⁴⁶ capacity, reliability, security, and speed issues currently exist for wireless (i.e., radiofrequency (RF)-based) medical devices used by patients in both clinical and non-clinical settings (e.g., at home); and for healthcare providers with respect to the provision of broadband-enabled health

⁴³ See *National Broadband Plan*, *supra* note 12, at 199 ("It is imperative to focus on adoption challenges, and specifically the government decisions that influence the system in which private actors operate, if America is to realize the enormous potential of broadband-enabled health IT.").

⁴⁴ This information will allow us to further evaluate healthcare provider needs for broadband capability in light of the changing state of telemedicine, telehealth, and health care information technology. *Accord Healthcare Connect Fund Order*, 27 FCC Rcd at 16832-46, Appendix B.

⁴⁵ See *generally id.* at 16689-90 & Appendix B ("Assessment of Broadband Needs of Health Care Providers").

⁴⁶ In the health IT context, interoperability generally can be defined as "the seamless sharing and use of electronic health information." *ONC Interoperability Roadmap*, *supra* note 7, at 4. ONC has been working closely with the FCC, FDA, and other federal agencies to develop national interoperability standards for health IT. See *generally Federal Health IT Strategic Plan*, *supra* note 4 (the plan details the policy, technology, and behavioral changes that public and private stakeholders must make to achieve nationwide interoperability).

- technologies, like telehealth and telemedicine services? Are there other technical issues appropriate for the Commission to consider?
- e. What impediments, if any, exist in trying to retrofit existing and future health care facilities (e.g., hospitals and clinics) for broadband-enabled services and technologies, given current connectivity needs and the existence of varied spectrum environments? Do current designs take into consideration any potential interference concerns with projected wireless networks and devices that will be used in these facilities? Are there (or should there be) industry standards or best practices for ensuring that new health care facilities consider broadband in their design and account for any necessary conduits, wiring, building configuration, and materials (e.g., there may be a need to consider certain materials for internal or external walls to better enable wireless broadband within a facility or to limit RF into a building) at the design and construction phase?
6. We seek to understand the full range of issues that might be affecting the development and adoption of broadband-enabled technology and services in health care. What non-technical impediments or issues currently exist in the provision of broadband-enabled health technology services? Are there any circumstances or practical considerations (e.g., cost, funding, and training) that may be creating disincentives for clinicians and health care settings to offer broadband-enabled health services and technologies, such as telehealth and telemedicine? If so, please describe what they are, including the extent and nature of the Commission's authority to address them.
7. What efforts are being made at the state and local levels to address broadband health technology accessibility issues in rural and remote areas, Tribal lands, and underserved urban areas? We seek specific information, particularly from states, localities, Tribal governments, and rural and urban medical centers, about any broadband-enabled health IT programs that have been developed and implemented (or will soon be implemented) to reach these areas.⁴⁷ How successful have those programs been? What are some of the lessons learned in developing those programs? What programs and other efforts are necessary to drive attention to those rural and underserved populations that need health technologies most? How can the Commission better facilitate the deployment of services and technologies as well as consumer adoption in those areas?
8. We seek suggestions on ways the Task Force can effectively and efficiently identify any gaps in the availability of broadband-enabled health technologies in the country. We request any information, data, or studies that can better inform the Task Force as to where broadband-enabled health services and technologies are critically needed in the country but are insufficient or unavailable. Why do these availability gaps exist? Maps and data—including those commissioned by or for states or localities—would be particularly helpful. In August of 2016, the Task Force launched one such broadband health analytics tool—the *Mapping Broadband Health in America* platform—to allow stakeholders to more easily analyze and

⁴⁷ As an example, as of December 2016, the University of Virginia Health System's Karen S. Rheuban Center for Telehealth, using broadband technology, has established a 152 site telehealth network in the Commonwealth of Virginia through which it has supported over 60,000 patient encounters in more than 60+ medical sub-specialties, saving patients over 16 million miles of travel. See University of Virginia Health System, Patient Services, <http://uvahealth.com/services/telemedicine-telehealth-services/about> (last visited March 14, 2017). Similarly, the University of Mississippi Medical Center has been engaged in ongoing efforts to expand the provision of telehealth services in the state of Mississippi and now offers more than 30 different medical specialties and extends to more than 100 clinical sites. Since it began in 2003, its tele-emergency services alone have helped more than 450,000 patients. See University of Mississippi Medical Center, Center for Telehealth, <https://www.ummchealth.com/telehealth/> (last visited March 14, 2017).

study the intersection between connectivity and health for every state and county in the United States.⁴⁸ While the response to the platform—from other federal agencies, as well as private organizations and industry—has been uniformly positive, with some already using the mapping platform to improve data-driven decision-making around broadband health-related policies and initiatives, we seek additional stakeholder input. How can we further improve the analytic platform to encourage investment in broadband health networks in areas with the greatest health and connectivity needs? If we wanted to refine the tool to identify potential partnerships among health care providers or between health care providers and broadband service providers, what is the best way to achieve that goal?

9. What are the impediments to making health IT and other broadband health technology services available and ubiquitous in rural and remote areas, low population density areas, Tribal lands, and underserved urban sectors? Are there any unique challenges that persist in these areas; if so, what are they? In particular, we seek comment on any deployment, infrastructure, geographic, expertise (e.g., the availability and adequacy of IT expertise), telecommunications carrier availability, cost, and any other challenges in these areas. We seek suggestions for how to address such challenges, including on any rule and/or policy changes that the Commission should consider.

OBJECTIVE II: Identify regulatory barriers (and incentives) to the deployment of RF-enabled advanced health care technologies and devices.

The Commission has a long history of addressing spectrum needs for the development of next-generation health technologies and medical devices, and of exercising flexibility, as necessary and appropriate, in revising its rules and policies to speed up their deployment.⁴⁹ However, in recent months, stakeholders in the health sector and commercial wireless industry have raised concerns about the likely surge in demand for spectrum for wireless medical devices and broadband-enabled services—noting trends toward fully connected hospitals, widespread remote patient monitoring, and leveraging connectivity to improve health facilities' workflow and back-office functions—and have sought appropriate regulatory relief.⁵⁰ Most recently, in August 2016, TerreStar Corporation filed a request for

⁴⁸ See News Release, "FCC Connect2Health Task Force Unveils Broadband Health Mapping Tool," August 2, 2016, available at https://apps.fcc.gov/edocs_public/attachmatch/DOC-340575A1.pdf. The mapping platform is open source, open data, and allows for open integration of a users' proprietary data.

⁴⁹ See, e.g., *Amendment of Parts 2 and 95 of the Commission's Rules to Establish a Medical Implant Communications Service in the 402-405 MHz Band*, WT Docket No. 99-66, Report and Order, 14 FCC Rcd 21040 (1999) (Commission responded to advances in medical implant technology by establishing Medical Implant Communication Service (MICS) within Part 95 of its Rules); *Amendment of Parts 2 and 95 of the Commission's Rules to Provide Additional Spectrum for the Medical Device Radiocommunication Service in the 413-457 MHz Band*, ET Docket No. 09-36, Report and Order, 26 FCC Rcd 16605 (2011) (The FCC adopted rules to enable a new generation of wireless medical devices (i.e., Medical Micropower Networks (MMNs) that can be used to restore functions to paralyzed limbs.); *MBAN First Report and Order*, 27 FCC Rcd 6422, *supra* note 7 (The FCC released an Order to allocate spectrum for Medical Body Area Networks (MBANs), making the U.S. the first country in the world to make spectrum available for this specific usage. MBANs are networks of wireless sensors, often no bigger than a Band-Aid, which can transmit data on a patient's vital health indicators to their doctor or hospital.); *Promoting Expanded Opportunities for Radio Experimentation and Market Trials Under Part 5 of the Commission's Rules and Streamlining Other Related Rules*, etc., ET Docket Nos. 10-236, 06-155, Report and Order (2013) (The FCC issued a Report and Order, revising and streamlining its rules to modernize the Experimental Radio Service (ERS) by establishing a more flexible framework to keep pace with the speed of modern technological changes while continuing to provide an environment where creativity can thrive.).

⁵⁰ For example, CTIA, an international organization representing the commercial wireless communications industry, has called on the FCC to allocate more spectrum for health-related services, in anticipation of increased demand and the ongoing innovation in wireless health applications. See Meredith Attwell Baker, President and CEO, CTIA-The

(continued....)

waiver of its substantial service requirements to enable use of its wireless licenses in the 1.4 GHz band to provide wireless medical telemetry service (WMTS) operations, citing increasing demand.⁵¹ Several wireless medical device manufacturers supported the waiver request and argued that there was a spectrum shortage facing WMTS licensees.⁵²

Below, we seek information and data on (i) the types of broadband-enabled health technologies and medical devices currently in the market and those that may be launched in the near future; (ii) the future spectrum and wireless infrastructure needs in the health care sector; and (iii) any concerns about the increased use and proliferation of wireless medical devices in health care settings and public spaces. Also, we welcome comment on what, if any, regulatory barriers exist (as well as incentives that could be implemented) concerning the deployment of advanced broadband-enabled health care technologies and medical devices. For purposes of this Public Notice, we are only seeking information on "medical devices" that use RF wireless technology or communications functions for diagnosis, treatment, or patient monitoring.

10. We seek information on the types of broadband-enabled health technologies and medical devices that are *currently* in the market. In addition, what emerging types of broadband-enabled health technologies and medical devices are likely to be available to consumers *soon*? What are the *future* trends in this market area?
11. What, if any, technical issues or concerns exist for patients and other users of medical devices when such devices are used in hospital settings? Do these concerns vary depending on the type and size of the hospital setting? Are these concerns exacerbated when medical devices are operating in large or busy hospital environments (which may include a wide variety of wireless technologies, some of which may be unrelated to clinical care); if so, what are those concerns, how can they be addressed?

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Wireless Association, Keynote Address at Broadband Health Summit in Florida (Oct. 1, 2015), *available at* https://www.fcc.gov/sites/default/files/BTB-Jacksonville_MayoClinic_Transcript.pdf (event transcript). *See also* Jay White, *The Connected Hospital: Wireless Technology Shapes the Future of Healthcare*, Becker's Hospital Review (Aug. 9, 2016), *available at* <http://www.beckershospitalreview.com/healthcare-information-technology/the-connected-hospital-wireless-technology-shapes-the-future-of-healthcare.html>; IT Business Edge, *Six Ways Wireless Technology is Transforming Health Care*, *available at* <http://www.itbusinessedge.com/slideshows/six-ways-wireless-technology-is-transforming-health-care-06.html> (last visited March 13, 2017) (Wireless technologies are transforming patient care by: managing staff work flow; tracking medical equipment; automating environmental monitoring; increasing security; monitoring hand hygiene compliance; and analyzing operational data.); HIPAA Journal, *How to Improve Hospital WorkFlows*, www.hipaajournal.com/improve-hospital-workflows/ (last visited March 10, 2017). *See also* Qualcomm Press Release, *Philips and Qualcomm Announce Strategic Collaboration To Advance Personalized Healthcare* (Aug. 31, 2016), <https://www.qualcomm.com/news/releases/2016/08/31/philips-and-qualcomm-announce-strategic-collaboration-advance-personalized>.

⁵¹ Specifically, TerreStar requested that the Commission temporarily waive those requirements for its commercial wireless licenses in the 1.4 GHz band until April 23, 2020, so that it may implement wireless medical telemetry service (WMTS) operations on this spectrum through leasing arrangements between TerreStar and a mix of health care providers, health care facilities, and wireless medical telemetry equipment manufacturers. *See* FCC Public Notice, *Wireless Telecommunications Bureau Seeks Comment Regarding TerreStar's Corporation's Request for Relief of Certain 1.4 GHz Construction Requirements*, WT Docket No. 16-290, DA 16-1029, 31 FCC Rcd 9798 (rel. Sept. 14, 2016).

⁵² In response to the FCC Wireless Telecommunications Bureau's Public Notice (*see supra* note 51), which sought comment on TerreStar's request, a number of commenters, including manufacturers of WMTS services, supported TerreStar's waiver based on predicted shortages of spectrum for WMTS services. *See, e.g.,* American Society for Healthcare Engineering of the American Hospital Association (ASHE) Comments in WT Docket No. 16-290, at 2-3 ("ASHE appreciates TerreStar's recognition of the likely spectrum shortage facing WMTS licensees, and of the substantial benefit that can be realized by making the 1390-1395 MHz and 1432-1435 MHz bands available for use in WMTS systems."); Philips HealthCare Reply Comments in WT Docket No. 16-290, at 2.

12. Similarly, what, if any issues or concerns exist for patients and other users of medical devices when such devices are used primarily in potentially uncontrolled, non-hospital settings (e.g., in homes, aircraft, cruise ships, or other close quarter, multi-unit dwellings, etc.), where non-health related wireless technologies that also emit radio frequencies (e.g., baby monitors, wireless home security systems, Wi-Fi routers, etc.) may proliferate? And to what extent might similar issues or concerns exist for emerging and future technological innovations (e.g., electric automobiles, smart cars, smart homes, etc.)?
13. We seek comment, data, and any studies on the possible complexities of the future RF environment in homes, hospitals, and other public spaces related to the increasing number of medical applications and devices.
14. How are medical devices currently being tested and evaluated to ensure that consumers and patients can safely use them in both clinical and non-clinical settings, given their operation in varied spectrum environments? Are there currently any FCC rules or policies that serve as barriers to testing and deployment of advanced health care technologies and medical devices? If any, please identify which specific rules and/or policies, and explain how they have served to impede the testing and deployment of health care technologies and medical devices. How might the Commission address such concerns?
15. We also request recommendations on how the Commission could make an assessment of the spectrum and wireless infrastructure needs for the future of health care in the United States. We seek input from all relevant stakeholders, including members of the health care, wireless, and software industries who are developing wireless healthcare applications for the present and future; physicians, consumer advocates, and academicians; and relevant federal, state, and local government agencies. While we envision building upon the spectrum management and wireless infrastructure deployment policies that the FCC has successfully employed in the past to promote innovation in wireless health services, we ask commenters to identify any novel framework, including those that might include smart city initiatives⁵³ or public/private partnerships, that could be useful in planning for the wireless future of our nation's health care system.
 - a. One of the compelling drivers of mobile technology in healthcare is the increasing availability of health apps for smartphones and tablets. There is now an app for almost every conceivable healthcare need, ranging from drug dose calculators to fully functioning electronic medical records. We are also seeing the development of smart homes and automobiles that would enable even more sophisticated remote health monitoring. How soon will we see widespread adoption of these technologies and what implications will they have on the spectrum needs of the health care industry?
 - b. In developing a national spectrum plan for the health care industry, are there particular spectrum bands that the FCC should consider?
 - c. When it comes to increased need for spectrum-based health technologies, what challenges do small, rural, and critical access hospitals have that are different from what large hospitals face?
 - d. Do health care facilities, because of their different physical characteristics, require

⁵³ See U.S. Department of Commerce, National Telecommunications and Information Administration, *Bringing Spectrum Sharing to a "Model City"* (April 7, 2015), <https://www.ntia.doc.gov/blog/2015/bringing-spectrum-sharing-model-city>; CTIA Wireless Foundation, Events, *CTIA Wireless Foundation Smart Cities Expo at the FCC* (Nov. 2, 2016), <https://www.wirelessfoundation.org/events/details/2016/11/02/default-calendar/ctia-wireless-foundation-smart-cities-expo-at-the-fcc>; FCC Public Notice, *The Federal Communications Commission and the National Telecommunications and Information Administration: Model City for Demonstrating and Evaluating Advanced Sharing Technologies*, ET Docket No. 14-99, 29 FCC Rcd 8242 (2014).

- different types of small cells and wireless infrastructure than other commercial enterprises? What are the most challenging impediments to the deployment of wireless infrastructure in hospitals and health care systems? What policies should the FCC consider in order to help streamline infrastructure siting that is necessary for the deployment of wireless networks in hospitals and health care systems? What state or local government regulatory policies have helped to facilitate streamlined deployment of wireless infrastructure for health care?
- e. How can new advanced spectrum sharing techniques (e.g., dynamic spectrum sharing through database controlled coordination, software designed radios, or efficient spectrum use through network virtualization techniques) or secondary market mechanism (e.g., spectrum leasing arrangements) be leveraged to meet the spectrum demands of cutting-edge mobile broadband-enabled health technologies and medical devices that may be operating in varied spectrum environments? Are there any issues with harmonization of spectrum for medical uses across international borders to ensure that consumers can effectively and safely use medical and other devices across borders?
 - f. What are some of the recent and emerging trends in health care delivery (in rural and urban areas) that are implicating spectrum use and needs? Are these trends creating a greater need for spectrum wireless services, particularly in rural areas? Are these trends resulting in increased use of remote patient monitoring solutions?⁵⁴
16. Do any regulatory barriers exist concerning the deployment of advanced broadband-enabled health care technologies and medical devices? We also welcome suggestions on any regulatory incentives (that are within the FCC's authority) that could serve to foster continued investment in and further deployment of next-generation broadband-enabled health technologies and medical devices?

OBJECTIVE III: Strengthen the nation's telehealth infrastructure through the FCC's Rural Health Care Program and other initiatives.

Broadband deployment is one of the FCC's top priorities, particularly in rural America. Based on current evidence, broadband can be a game-changer particularly in rural areas—where consumers often have to drive long distances to access critical or specialty care; and where isolated clinics and health centers can save lives and promote community health by using advanced communications technologies to connect with medical expertise not otherwise available, as well as monitor patients who live many miles away from a health care facility.

The FCC's Rural Health Care (RHC) Program has helped expand broadband services for eligible health care providers (HCPs) in rural areas.⁵⁵ Currently, the RHC Program is comprised of three programs: the Healthcare Connect Fund (HCF), the Telecommunications Program,⁵⁶ and the Pilot

⁵⁴ In this regard, we are also interested in receiving information about the extent to which remote patient monitoring solutions are being used by patients living in rural areas; whether use of this remote solution is increasing in rural areas; and if there any legal and technical issues that may be inhibiting their availability and use?

⁵⁵ See generally *Healthcare Connect Fund Order*, 27 FCC Rcd 16678, *supra* note 7. Increasing access to broadband for eligible health care providers, particularly those serving rural areas, is consistent with Congress's directive in Section 254(h) of the Act that the Commission "enhance . . . access to advanced telecommunications and information services" for eligible health care providers and that telecommunications carriers provide telecommunications services necessary for the provision of health care in rural areas at rates reasonably comparable to similar services in urban areas. 47 U.S.C. §§ 254(h)(1), (h)(2)(A). See *Healthcare Connect Fund Order*, 27 FCC Rcd at 16696.

⁵⁶ See *infra* note 62 (describing the Telecommunications Program).

Program. With respect to the Pilot Program, while no new funding is available, some projects continue to accept new HCP sites.⁵⁷ As funding for the Pilot Program projects ends, Pilot Program projects are expected to apply for additional support, if needed, under the Healthcare Connect Fund.⁵⁸ The FCC established the Healthcare Connect Fund to expand health care provider access to broadband, especially in rural areas, and encourage the creation of state and regional broadband health care networks.⁵⁹ Under the Healthcare Connect Fund, eligible rural HCPs, and those non-rural HCPs that are members of a consortium that has a majority of rural HCP sites, can receive a 65 percent discount from the fund on all eligible expenses. HCPs are required to contribute the remaining 35 percent to participate in the program. HCPs can use the Healthcare Connect Fund to purchase eligible services and equipment, as well as construct their own broadband infrastructure where it is shown to be the most cost effective option.⁶⁰ The cap on total funding for the RHC Program altogether, which includes the Telecommunications Program and the Healthcare Connect Fund, is \$400 million annually.⁶¹

The Commission's RHC Program has made the benefits of broadband-enabled health services, such as telehealth and telemedicine, more available to consumers living in rural and remote areas.⁶² Such broadband-enabled services have provided patients in rural areas with access to critically needed medical specialists in a variety of practice areas.⁶³ The availability of telehealth and telemedicine programs also has been found to mitigate significant challenges associated with disparities in access to care and healthcare workforce shortages.⁶⁴ The RHC Program also has been found to save health care providers money as well.⁶⁵ The Commission continues to evaluate the Healthcare Connect Fund (HCF) in terms of

⁵⁷ See *Healthcare Connect Fund Order*, 27 FCC Rcd at 16820.

⁵⁸ See *id.* at 16821.

⁵⁹ See *id.* at 16678.

⁶⁰ See *id.* at 16880-83.

⁶¹ See generally FCC, Rural Health Care Program, <http://www.fcc.gov/encyclopedia/rural-health-care> (last visited March 13, 2017).

⁶² See *Healthcare Connect Fund Order*, 27 FCC Rcd at 16686-94; *Pilot Program Staff Report*, 27 FCC Rcd at 9425-34. It was in 1997 when the FCC established the Rural Health Care Telecommunications Program to ensure that rural health care providers paid no more than their urban counterparts for their telecommunications needs. See *Federal-State Joint Board on Universal Service*, CC Docket No. 96-45, Report and order, 12 FCC Rcd 8776, 9093-9161 (1997). The Telecommunications Program continues to operate alongside the Healthcare Connect Fund. However, it is expected that many health care providers currently receiving support under the Telecommunications Program may migrate to the new Healthcare Connect Fund. See *Healthcare Connect Fund Order*, 27 FCC Rcd at 16710.

⁶³ Examples of such practices include cardiology, gynecology, mental health services, and pediatrics; and, in some instances, doing so without requiring patients (many of whom are older Americans, have limited mobility, or have transportation challenges) to leave their homes or communities. See *Pilot Program Staff Report*, 27 FCC Rcd at 9432-34. The networks deliver services efficiently, reduce costs, and travel time for consumers, decrease medical errors, and enable health care providers to share critical information; they also allow for a more expedited coordinated response to potential public health emergencies, such as a bioterrorism attack, pandemic, or a disease-related outbreak. See generally *Dr. Rheuban Testimony*, *supra* note 16.

⁶⁴ See *supra* notes 22-25.

⁶⁵ See *Healthcare Connect Fund Order*, 27 FCC Rcd at 16680-81. For example, a South Carolina HCP consortium funded by the Commission's Rural Health Care Pilot Program saved \$18 million in Medicaid costs through telepsychiatry provided at hospital emergency rooms. See *id.* Another pilot project in the Midwest saved \$1.2 million in patient transport costs after establishing an e-ICU program. See *id.* (citations omitted). For rural health care clinics, the availability of telehealth and telemedicine services has not only saved their patients' lives, but it has also been demonstrated to help their viability, which is critical, given the lack of—or limited availability of—health care providers in rural and remote areas. Most rural HCPs operate on a very thin margin, and many operate at a loss. For rural HCPs, broadband connections mean they can use telehealth and telemedicine to retain patients and consult

(continued....)

the programmatic goals of (1) increasing access to broadband for HCPs, particularly those serving rural areas; (2) fostering the development and deployment of broadband health care networks; and (3) maximizing the cost-effectiveness of the program.⁶⁶

17. We seek comment and suggestions on how the FCC can further promote and help enable the adoption and accessibility of broadband-enabled health technologies, like telehealth and telemedicine, in rural and other underserved areas. Are there other initiatives or actions beyond the RHC Program that the agency, or the Task Force on behalf of the agency, could pursue in order to promote and help enable the adoption and availability of broadband-enabled health technologies in rural and underserved areas of the country?
18. Is the regulatory framework for the Rural Health Care program keeping pace with how broadband-enabled health care is being delivered in rural and underserved areas? If not, please explain in detail, describing any emerging challenges, gaps or opportunities for using broadband to better meet the health and health care needs of rural consumers.
19. We seek current information and data, if any, that can be used to measure the impact that the various RHC programs have had on certain populations and sectors—i.e., those living in rural and underserved areas, low density populations, and Tribal lands; older Americans; persons with disabilities; military veterans; and the economically disadvantaged in rural and urban communities—all of which have traditionally faced significant health and health care challenges.
20. We also are interested in hearing recent success stories about innovative health care services that were created or that became available as a result of the RHC Program, and how such services have helped consumers in rural and remote areas. We are particularly interested in receiving data and information about health outcomes, return on investment, and the ability to reach such underserved population groups. First-person accounts are welcomed.
21. We seek information, data, and studies that identify specific rural areas and underserved regions of the country that need funding assistance for the purchase of high-capacity broadband connectivity, connections, and any other services or equipment authorized under the RHC Program rules. We seek detailed information and data as to whether eligible health care providers in these areas and regions that require funding assistance have participated in the RHC Program, and if not, why not. We also seek suggestions on how the Commission can encourage or facilitate their participation. Are there specific challenges of which the Commission should be aware?
22. The Task Force is interested in identifying all currently available public (federal, state, or local) and private (e.g., non-profit or philanthropic organizations) funding sources for the provision of broadband-enabled health technologies and services (e.g., telehealth and telemedicine) in rural regions, Tribal lands, and in other underserved areas (including underserved urban areas), as well as for vulnerable populations. Please provide information

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with specialists remotely; reduce their overall operating costs by lowering the cost of delivering health care; minimizing human resource expenses; and reducing administrative costs.

⁶⁶ See *id.* at 16682 ("These goals inform all the choices we make in this Order. As we implement today's Order, we will collect information to evaluate the success of our program against each of these goals."). See also *Wireline Competition Bureau Seeks Comment on Healthcare Connect Fund Annual Reports*, Public Notice, WC Docket No. 02-60, DA 14-853 (rel. June 19, 2014); *In the Matter of Rural Health Care Support Mechanism*, Order, WC Docket No. 02-60, DA 14-854 (rel. June 19, 2014) (waiving for one year the requirement that consortium led entities in both the Healthcare Connect Fund and the Rural Health Care Pilot Program file annual reports for the preceding funding year under). The HCF Annual Reports collect from consortia, among other things, data regarding the types of telehealth applications utilized by participants and reach of supported healthcare networks.

about those funding sources, as well as their website address, if any.

23. We seek any other comment, information, and data concerning the RHC Program as well as the general needs of rural consumers for broadband-enabled health solutions that would be helpful to the Task Force, given its charge and objectives.

OBJECTIVE IV: Raise consumer awareness about the value proposition of broadband in the health care sector and its potential for addressing health care disparities.

It is critically important that consumers fully understand the practical and personal benefits of broadband in health care and in facilitating greater care coordination, proactive engagement in disease prevention, and self-management. Placing more care decisions in the hands of consumers and personalizing that experience appears to be a major theme in health applications and product development today.⁶⁷ We also recognize that as consumers fully realize the practical health benefits of broadband, consumer demand for broadband-enabled health services and technologies will serve to further accelerate broadband deployment and adoption altogether—a national priority.

24. We seek suggestions on how the Commission can effectively increase consumer awareness about the value proposition of broadband in the health care sector? Are there any practical efforts that the Commission can undertake to accelerate consumer adoption of broadband, and in particular broadband-enabled health services and technologies, especially among underserved populations? How might the Commission ensure that certain groups—e.g., rural consumers, those living on Tribal lands, older Americans, people with disabilities, military veterans, non-English speakers, and the economically disadvantaged—are fully aware of the availability and benefits of broadband-enabled health services and technologies? Are there any states, cities, and organizations engaged in similar efforts that could lead to potential partnerships?
25. We also seek comment on any concerns that may discourage consumers, health care providers, and others from adopting broadband-enabled health services and other advanced health technologies, including telehealth and telemedicine services and emerging medical devices. To what extent do safety, security, reliability, and privacy concerns influence adoption of broadband-enabled health services and other advanced technologies? To what extent do costs, socioeconomic status, and digital literacy issues impact adoption?
26. We request information on any studies, pilots, research, or other data that quantifies the benefits of broadband-enabled health technologies in improving patient outcomes and in reducing costs. What kind of return on investment have pilot and demonstration projects experienced?
27. We are interested in learning how broadband can enable healthcare-related support systems to connect patients to the people, services and information they need to get well and stay healthy. In this regard, physicians inform us that there is growing recognition that the need for social services and supports (e.g., nutritionists, dieticians, pharmacists, family caregivers, fitness centers, and other health care supports or supporters outside the traditional hospital setting) significantly impact the ability of some consumers to become healthy and stay well, and that the availability of broadband is increasingly essential to bridging the various services and supports. We seek comment and suggestions on how the Commission can support the development and availability of these new broadband-enabled services and supports (outside

⁶⁷ Rebecca Vesely, *Health 2.0: The Customer Is King*, iHealthBeat (Sept. 29, 2014), <http://www.ihealthbeat.org/insight/2014/health-20-the-customer-is-king?view=print>.

- the RHC Program) especially on Tribal lands and in rural, remote, and other underserved areas?
28. We seek information and any studies about how broadband-enabled services and technologies have been, and could be used, to address health and health care disparity issues, and the impact (and successes) such services and technologies have had in addressing such issues.⁶⁸
29. Are there any practical issues (e.g., the lack of a home computer) that may be impeding consumer awareness and adoption of broadband-enabled health technologies? What efforts can be undertaken to help alleviate some of these issues?

OBJECTIVE V: Enable the development of broadband-enabled health technologies that are designed to be fully accessible to people with disabilities.

The availability and accessibility of broadband-enabled health technologies designed to serve the needs of Americans with disabilities is critically important. One recent study estimates that, in 2013, the overall percentage of people with a disability in the U.S., among the civilian noninstitutionalized population, was 12.1 percent or approximately 37 million people.⁶⁹ Other studies suggest that the number is higher than 50 million,⁷⁰ and that it is predicted to continue to increase.⁷¹ Given these statistics, it is imperative that we do what we can, within our statutory authority, to promote the goal of making broadband-enabled health technologies and cutting-edge health and medical devices and applications available, accessible, and usable by people with disabilities.

Technology has historically played an important role in the disability community. Many people with disabilities use communications technology, devices, or services in their daily lives, and broadband is becoming an essential data transmission platform that enables a wide range of services and tools. Ensuring that people with disabilities are able to access electronic health records, engage in video consultation with their physicians, fully utilize the latest health apps, and benefit from advances in wearable health technology, for example, are essential to the ongoing health care transformation. Consistent with its charge, the Task Force will consider the extent to which broadband-enabled services and technologies used for the provision of health *and* care are available, accessible, and usable by all Americans, including those with disabilities. We therefore seek any data, information, and comment that will assist the Commission in better understanding how it may assist in achieving these important goals.

30. How are broadband-enabled health technologies and medical devices currently being used by people with disabilities? To what extent can these technologies and devices address the

⁶⁸ Some medical research and scientific data document the existence of healthcare disparities. See Larry Gramm, Graciela Castillo, and Stephanie Pittman, *Access to Quality Health Services in Rural Areas—Primary Care: A Literature Review*, Rural Health People (2010), available at <http://sph.tamhsc.edu/centers/rhp2010/03Volume2accessprimarycare.pdf>. See also NORC at the University of Chicago, Briefing Paper Presented to the U.S. Dept. of Health and Human Services, *Understanding the Impact of Health IT in Underserved Communities and Those With Health Disparities* (Oct. 29, 2010), available at <http://www.healthit.gov/sites/default/files/pdf/hit-underserved-communities-health-disparities.pdf>.

⁶⁹ U.S. Census Bureau (Disability Characteristics 2009-2013, American Community Survey 5-year Estimates), http://factfinder.census.gov/faces/tableservices/jsf/pages/productview.xhtml?pid=ACS_13_5YR_S1810&prodType=table (last visited March 13, 2017).

⁷⁰ See Matthew W. Brault, *Americans with Disabilities: 2010*, Current Population Reports (July 2012) (estimating that, in 2010, 18.7 percent or 56.7 million of the civilian noninstitutionalized U.S. population had a disability, and 12.6 percent or 38.3 million had a severe disability), available at <http://www.census.gov/prod/2012pubs/p70-131.pdf>.

⁷¹ See Erickson, W., Lee, C., & von Schrader, S., Cornell University, *2012 Disability Status Report: United States* (2014), available at http://www.disabilitystatistics.org/StatusReports/2012-PDF/2012-StatusReport_US.pdf?CFID.

health care needs of people with disabilities in the future? Provide specific examples of the existing barriers, if any, that these technologies and devices pose for people with disabilities.

31. We seek comment on whether the design and development of broadband-enabled health services and technologies, as well as cutting-edge health and medical devices and applications, are accessible to, and usable by, people with disabilities.⁷² Are there practical concerns or other issues that are inhibiting or limiting the use and availability of broadband-enabled health services and technologies for people with disabilities? How are hospitals and clinicians currently addressing, if at all, any of these issues? An increasing number of health care services provide patient portals for patients to access medical records and communicate with physicians and specialists. What measures are taken to ensure that these mechanisms are fully accessible to users with disabilities (e.g., accessible via screen readers used by individuals who are blind)?
32. To what extent are clinicians aware of video relay service (VRS) and using it when remotely consulting with American Sign Language (ASL) users on a telephone call? Is there a need for VRS providers to have ASL interpreters with a knowledge of (and ability to translate) specialized health or medical vocabulary? Should a VRS call that involves consultations between a deaf or hard of hearing person and a doctor be given priority over other calls waiting in a queue, especially when there is a possible medical emergency?⁷³ We also seek comment as to whether our telecommunications relay service (TRS) rules are currently optimized to encourage medical consults via telemedicine?
33. We seek suggestions as to how the Commission can effectively raise awareness among people with disabilities about the value proposition of broadband in health? How can the Commission help to enable the adoption and accessibility of such services and technologies among people with disabilities, especially given our authority?

OBJECTIVE VI: Highlight effective telehealth projects, broadband-enabled health technologies, and mHealth applications across the country and abroad—to identify lessons learned, best practices, and regulatory challenges.

Related to the objective of increasing consumer awareness about the practical health-related benefits of broadband is the need to inform the public—especially those in rural and underserved regions—about the availability and successes of the many broadband-enabled telehealth and telemedicine centers and projects across the country and abroad, as well as existing and emerging mHealth applications, and to identify lessons learned and best practices.

34. We seek current information and data on the effectiveness of broadband-enabled telehealth and telemedicine services, including any recent research on these services. How are patients responding to these services? We are particularly interested in receiving comments directly

⁷² We note that the Commission has a statutory obligation under Section 706 of the Telecommunications Act of 1996 to encourage the deployment on a reasonable and timely basis of advanced telecommunications capability to all Americans, and to implement provisions of the Communications Act requiring providers and manufacturers to ensure that telecommunications and advanced communications services and equipment are accessible to individuals with disabilities. *See* 47 U.S.C. §§ 1302(a), 255, 617.

⁷³ The Commission recently adopted an order permitting skills-based routing service on a trial basis in response to a proposal from VRS providers; this will allow VRS callers to receive VRS communications assistance with particular skill sets (e.g., knowledge of medicine). *See Structure and Practices of the Video Relay Service; Telecommunications Relay Services and Speech-to-Speech Services for Individuals with Hearing and Speech Disabilities*. CG Docket Nos. 10-51 and 03-123, Report and Order, etc., FCC 17-26 (rel. March 23, 2017).

- from consumers about their experience with these and other broadband-enabled services and technologies.
35. We also seek comment on specific challenges faced by states, localities, and Tribal governments, as well as communities abroad, in deploying effective broadband-enabled telehealth and telemedicine projects.
 36. We seek comment on how the public can be better informed about the availability of broadband-enabled health services and technologies and mHealth applications. What have states, localities, other federal agencies, Tribal governments, and hospitals and clinics done to inform the public about the availability of these options? How effective have these projects been in promoting greater broadband utilization?
 37. We seek submissions of any case studies, research and video/audio summaries concerning recently launched applications/programs that are on the cutting edge of telehealth, telemedicine, mHealth, and other broadband-enabled health technologies and services.
 38. We seek comment on the extent to which the United States is not taking full advantage of the opportunities that broadband-enabled health technology provides. For countries that have been the most successful in making broadband-enabled health services and technology more widely available, especially in rural and underserved areas, we seek information on the approaches that such countries took (including lessons learned) in achieving success in broadband health adoption.

OBJECTIVE VII: Engage a diverse array of traditional and non-traditional stakeholders to identify emerging issues and opportunities in the broadband health space.

Published reports indicate that the “the health IT industry is gaining a reputation as an emerging sweet spot for technology investors.”⁷⁴ We want to be sure that Commission policies do not present obstacles to continued innovation and investment in broadband-enabled health technologies, including medical devices that rely on communications technology. We observe that there is a growing desire for such technologies—including those that are wearable or otherwise track and monitor personal health—and that this emerging health market is estimated to be worth billions.⁷⁵ There are also countless smartphone apps that track health-related issues. By some estimates, there are over 100,000 digital health apps offered in the three major app stores.⁷⁶ In addition, recent advances in broadband-enabled sensor technology offer the potential for the emergence of more convenient and ultimately less costly and less invasive health care solutions. For example, we may soon see the widespread use of smart clothing (or smart “tattoo” applications) that use skin-based sensors to measure things like heart rate, respiration, and blood pressure.⁷⁷ Robotics, virtual reality, and other consumer facing health technologies also offer the potential to help older Americans live more independently. Some technology companies are even

⁷⁴ Dan Bowman, *Health IT a new sweet spot for investors*, FierceHealthIT (Sept. 4, 2014), <http://www.fiercehealthit.com/node/30306/print>.

⁷⁵ See Alexander Pelletier, *Google and Apple enter digital health. Will they rocket-launch health care to new future?* (Feb. 4, 2014), <http://vectorblog.org/2014/02/google-and-apple-enter-digital-health-will-they-rocket-launch-health-care-to-new-future/>. See also Paul Giorgio, *Will wearable technology change health care?* (Sept. 17, 2014), <http://www.click2houston.com/news/will-wearable-technology-change-health-care/28112830>.

⁷⁶ See generally Healthcare Information and Management Systems Society, *Mobile Health Apps: A Practical Guide for Healthcare Stakeholders* (Dec. 2013), available at <http://www.himss.org/files/mHIMSS%20Roadmap%20Mobile%20Health%20Apps%20A%20Practical%20Guide%20for%20HC%20Stakeholders.pdf>.

⁷⁷ See C.C. Weiss, *Next-generation clothing monitors your heart, tracks your posture and gives you a hug*, GizMag (March 13, 2013), <http://www.gizmag.com/wearable-technologies-round-up/26599/>.

experimenting with combining web search with online health consultations for a one-stop offering.⁷⁸ To help inform the Commission in its related and other efforts in this area, we seek comment and information on these and other emerging health technologies, applications, services, and connected medical devices.

39. We seek comment on any emerging issues of concern (that have not been identified in this Public Notice) that potentially impact efforts to accelerate the availability of broadband-enabled health technologies and services, as well as medical devices that rely on communications technology.
40. While the United States has made great strides in recent years, many advances in digital health technologies are still not broadly available, widely utilized, or well-tailored to meet the needs of all Americans.⁷⁹ We seek comment on these concerns.
41. What are the emerging opportunities for investors, innovators, and entrepreneurs in the broadband health space and in the development of the next generation of connected health technologies and converged medical devices? We seek suggestions on any efforts that the Commission might undertake to support innovation and entrepreneurship in these areas. Are there emerging or non-traditional stakeholders that should be part of the Commission's efforts? If so, please identify them and their respective roles in or contributions to the broadband health space.
42. We seek comment on how to promote small and diverse investors, innovators, and entrepreneurs in the broadband health sector in order to better ensure that the benefits of broadband-health technologies and services are available to all Americans.
43. We seek to engage all potential stakeholders in this national broadband health effort. Commenters should identify any additional stakeholders that are not specifically referenced in this Public Notice. We also encourage parties to identify any other relevant issues (not covered in this Notice) for the Task Force, given its charge and objectives.

Filing Instructions and Procedural Matters

Interested parties may file comments on or before May 24, 2017, and reply comments on or before June 8, 2017. Because this Public Notice does not itself initiate a "proceeding," responses to the Public Notice are not "presentations" subject to the prohibitions in restricted proceedings and the disclosure requirements in permit-but-disclose proceedings.⁸⁰ Nonetheless, parties discussing or providing information to the Task Force or any other members of the Commission regarding the issues raised in this Public Notice are strongly encouraged to file a memorandum in the docket, summarizing their discussion and/or information.⁸¹ All filings concerning this Public Notice must reference **GN Docket No. 16-46**. Comments may be filed using the Commission's Electronic Comment Filing System

⁷⁸ See, e.g., Hayley Tsukayama, *Google is testing live-video medical advice*, The Washington Post, (Oct. 13, 2014), <http://www.washingtonpost.com/blogs/the-switch/wp/2014/10/13/google-is-testing-live-video-medical-advice/?hpid=z14>.

⁷⁹ For example, a study by IMS Health found that use of these and other tools lags because too few health apps are designed to address demographics with the greatest needs— e.g., patients over the age of 65 are among the top users of healthcare resources, yet app downloads are the lowest among this group; further, while 87% of African American mothers showed a strong interest in receiving health information via mobile phones, the study found that only about 18% of them used text messages to share health information. See IMS Health, *IMS Health Identifies Opportunities for Mobile Healthcare Apps to Drive Patient Engagement, Enhance Delivery of Care* (2013), available at <http://www.imshealth.com/portal/site/imshealth/menuitem.c76283e8bf81e98f53c753c71ad8c22a/?vgnnextoid=0b96ccb4c3402410VgnVCM10000076192ca2RCRD>.

⁸⁰ See 47 C.F.R. §§ 1.1202(a), 1.1206, 1.1208.

⁸¹ To the extent that the discussion or provision of information bears on open proceedings, parties also will need to comply with the applicable rules pertaining to those presentations. See 47 C.F.R. §§ 1.1204-1.1208.

(ECFS).⁸² Comments sent via e-mail to the Commission that do not use the ECFS form described below will be considered informal and will not be associated with the filings in the docket identified above.

- **Electronic Filers:** Comments may be filed electronically using the Internet by accessing the ECFS: <http://apps.fcc.gov/ecfs/> (click the “submit a filing” tab). Filers should follow the instructions provided on the website for submitting comments. For ECFS filers, in completing the transmittal screen, filers should include their full name, U.S. Postal service mailing address, and the applicable docket number: **GN Docket No. 16-46**.
- **Paper Filers:** Parties who choose to file by paper must file an original and one copy of each filing. Filings can be sent by hand or messenger delivery, 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, Marlene H. Dortch, Office of the Secretary, Federal Communications Commission.
 - All hand-delivered or messenger-delivered paper filings for the Commission’s Secretary must be delivered to FCC Headquarters at 445 12th St., SW, Room TW-A325, Washington, DC 20554. All hand deliveries must be held together with rubber bands or fasteners. Any envelopes must be disposed of before entering the building. The filing hours are 8:00 a.m. to 7:00 p.m.
 - 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 must be addressed to 445 12th Street, S.W., Washington, D.C. 20554.
- **Additional Filing Instruction:** To the extent feasible, parties should e-mail a copy of their comments to the Task Force’s e-mail box, at connect2health@fcc.gov. In the e-mail, please insert "Comments in GN Docket No. 16-46" in the subject line.

Copies of all filings will be available in GN Docket No. 16-46 through ECFS and are also available for public inspection and copying during regular business hours at the FCC Reference Information Center, Portals II, 445 12th St., S.W., Room CY-A257, Washington, D.C. 20554, telephone (202) 418-0270. These documents will also be available via ECFS. Documents will be available electronically in ASCII, Microsoft Word, and/or Adobe Acrobat.

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 and Governmental Affairs Bureau at 202-418-0530 (voice) or 202-418-0432 (TTY). Contact the FCC to request reasonable accommodations for filing comments (accessible format documents, sign language interpreters, CART, etc.) by e-mail at: fcc504@fcc.gov; phone: 202-418-0530 or TTY: 202-418-0432.

For further information about this Public Notice, please contact Ben Bartolome, Special Counsel, Connect2Health^{FCC} Task Force, at (770) 935-3383, or via e-mail at connect2health@fcc.gov (inserting "Question re GN Docket No 16-46" in the subject line). Requests for a meeting with the Task Force should be sent to engageC2H@fcc.gov. In the e-mail, please insert "Meeting Request re GN Docket No. 16-46" in the subject line, and identify and describe your organization (if affiliated with one), provide your contact information, and state the purpose of the meeting request. Press inquiries should be directed to Katie Gorscak, Communications Director, Connect2Health^{FCC} Task Force, at (202) 418-2156, or via e-mail at Katie.Gorscak@fcc.gov. For additional information about the Connect2Health^{FCC} Task Force, please visit the FCC’s broadband health hub at <http://www.fcc.gov/health>.

⁸² See *Electronic Filing of Documents in Rulemaking Proceedings*, GC Docket No. 97-113, Report and Order, 13 FCC Red 11322, 11326, para. 8 (1998).

Action taken on April 21, 2017: By Chairman Ajit Pai and Commissioners Mignon L. Clyburn and Michael O’Rielly.

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