



JUNE 11-12, 2019

# THE TRANSFORMATIONAL IMPACT OF 5G

NATIONAL ACADEMIES KECK CENTER | WASHINGTON, DC 20001

## Related Reading

*No Endorsement Intended or Implied*

### Related National Academies Publications

- [Critical Issues in Transportation 2019](#) (2018)
- [Telecommunications Research and Engineering at the Communications Technology Laboratory of the Department of Commerce](#) (2015)
- [Wireless Technology Prospects and Policy Options](#) (2011)
- [Spectrum Management for Science in the 21st Century](#) (2010)

### **5G and Global Competition and Security**

#### "Is Huawei a Security Threat? Seven Experts Weigh In"

Colin Lecher and Russell Brandon  
*The Verge*, May 20, 2019

#### Executive Order on Securing the Information and Communications Technology and Services Supply Chain

U.S. White House, May 15, 2019

#### 5G: National Security Concerns, Intellectual Property Issues, and the Impact on Competition and Innovation

Hearing of the Senate Judiciary Committee, May 2019

#### "Your 5G Phone Won't Hurt You. But Russia Wants You to Think Otherwise."

William Broad  
*New York Times*, May 12, 2019

#### The 5G Ecosystem: Risks and Opportunities for DoD

Milo Medin and Gilman Louie  
Defense Innovation Board, April 2019

#### "China Will Likely Corner the 5G Market - and the US Has No Plan"

Susan Crawford  
*Wired*, February 20, 2019

#### "Keeping Huawei Hardware Out of the U.S. Is Not Enough to Secure 5G"

Tom Wheeler and Robert Williams  
*Lawfare*, February 20, 2019

#### How 5G Will Shape Innovation and Security: A Primer

James Andrew Lewis  
Center for Strategic and International Studies,  
December 6, 2018

#### "America Will Win the Global Race to 5G"

Michael Kratsios  
White House Office of Science and Technology  
Policy, October 25, 2018

#### Deliver Uncompromised: A Strategy for Supply Chain Security and Resilience in Response to the Changing Character of War

Chris Nissen, John Gronager, Robert Metzger, and Harvey Rishikof  
MITRE Center for Technology and National Strategy,  
August 2018

#### The Race to 5G: Exploring Spectrum Needs to Maintain U.S. Global Leadership

Hearing of the U.S. Senate Committee on Commerce, Science, and Transportation, July 25, 2018

#### Global Race to 5G - Spectrum and Infrastructure Plans and Priorities

David Abecassis, Chris Nickerson, and Janette Stewart  
Analysys Mason, April 2018

#### China, the United States, and Next Generation Connectivity

Hearing of the U.S.-China Economic and Security Review Commission, March 8, 2018

#### Telecom Services: The Geopolitics of 5G and IoT

Jeffries, September 2017



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## [The 5G Economy: How 5G Technology Will Contribute to the Global Economy](#)

Karen Campbell, Jim Diffley, Bob Flanagan, Bill Morelli, Brendan O'Neil, and Francis Sideco  
IHS Economics and IHS Technology, January 2017

## [5G and Next Generation Wireless: Implications for Policy and Competition](#)

Doug Brake  
Information Technology and Innovation Foundation, June 30, 2016

## [Investigative Report on the U.S. National Security Issues Posed by Chinese Telecommunications Companies Huawei and ZTE](#)

Chairman Mike Rogers and Ranking Member C.A. Dutch Ruppersberger  
Permanent Select Committee on Intelligence of the U.S. House of Representatives, October 8, 2012

## **Future of 5G Devices and Networks**

### [Research and Development Priorities for American Leadership in Wireless Communications](#)

National Science and Technology Council's Wireless Spectrum R&D Interagency Working Group, May 2019

### ["Wireless Communications and Applications Above 100 GHz: Opportunities and Challenges for 6G and Beyond"](#)

Theodore Rappaport, Yunchou Ying, Ojas Kanhere, Shihao Ju, Arjuna Madanayake, Soumyajit Mandal, Ahmed Alkhateeb, and Georgios Trichopoulos  
*IEEE Invited Paper*, 2019

### ["The Terrifying Potential of the 5G Network"](#)

Sue Halpern  
*The New Yorker*, April 26, 2019

### ["Global 5G Wireless Networks Threaten Weather Forecasts"](#)

Alexandra Witze  
*Nature*, April 26, 2019

## ["Exploiting High Millimeter Wave Bands for Military Communications, Applications, and Designs"](#)

James Harvey, Michael Steer, and Theodore Rappaport  
*IEEE Access*, April 2019

## [Fifth-Generation \(5G\) Telecommunications Technologies: Issues for Congress](#)

Jill Gallager and Michael DeVine  
Congressional Research Service, January 30, 2019

## ["Telecom Companies Are Seriously Overhyping 5G Networks"](#)

Amir Nasr  
*Slate*, January 30, 2019

## [How 5G Will Change the World](#)

Don Rosenberg  
World Economic Forum, January 18, 2019

## [The 5G Era in the US](#)

Pablo Iacopino, Dennisa Nichiforov-Chuang, James Robinson, David George, Tim Hatt  
GMSA Intelligence, 2018

## [5G: Fifth Generation Wireless Communications Colloquia](#)

Intelligence Community Studies Board  
National Academies of Sciences, Engineering, and Medicine, November 13, 2018

## [Setting the Scene for 5G: Opportunities and Challenges](#)

International Telecommunications Union, 2018

## ["Millimeter Wave Mobile Communications for 5G Cellular: It Will Work!"](#)

Theodore Rappaport, Shu Sun, Rimma Mayzus, Hang Zhao, Yaniv Azar, Kevin Wang, George Wong, Jocelyn Schulz, Mathew Samimi, and Felix Gutierrez  
*IEEE Access*, May 2013

## **5G Applications and Deployment**

### [Emerging Technologies and Their Impact on Non-Federal Spectrum Demand](#)

White House Office of Science and Technology Policy, May 2019



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## [FCC's 5G Fast Plan](#)

### ["Trump Administration Will Let the Private Sector Lead in Developing 5G"](#)

Ajit Pai

*The Kansas City Star*, April 30, 2019

### ["Inside Nokia's Factory of the Future: Robots, Data, Automation, 5G, and Even Some Humans"](#)

Chris O'Brien

*Venture Beat*, April 10, 2019

## [Software Defined Networks - Softwarization](#)

IEEE, March 2019

## [Here's What 5G Will Bring in 2019](#)

Ken Hu

*World Economic Forum*, February 26, 2019

## [Driving 5G NR technology evolution forward to unlock the full potential of 5G](#)

John Smee

Qualcomm, February 19, 2019

## [Hewlett Packard Enterprise Launches Platform to Unleash Real-time Processing at the Telecommunications Edge](#)

HPE, February 19, 2019

## ["Building Inclusion into 5G Wireless Networks"](#)

Jack Karsten

*Brookings*, February 5, 2019

## ["With 5G Networks, Your Campus Meetings Might Become Virtual"](#)

Erika Gimbel

*EdTech*, January 21, 2019

## [Enabling Opportunities: 5G, the Internet of Things, and Communities of Color](#)

Nicol Turner Lee

*Brookings*, January 9, 2019

## [Presidential Memorandum on Developing a Sustainable Spectrum Strategy for America's Future](#)

U.S. White House, October 25, 2018

## ["FCC's 5G Ruling Could Hurt City Tech Initiatives, Opponents Warn"](#)

Chris Teale

*SmartCities Dive*, September 27, 2018

## [5G Mobile: Impact on the Health Care Sector](#)

David Teece

UC Berkeley and Qualcomm Technologies, Inc.,  
October 2017

## [5G, Smart Cities, and Communities of Color](#)

Yosef Getachew, Alejandra Montaya-Boyer, and  
Spencer Overton

Joint Center for Political and Economic Studies, June  
2017