# FOSTERING 21ST CENTURY WIRELESS CONNECTIVITY

## Key Spectrum & Infrastructure Issues for Policymakers

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ctia Everything™ Wireless

# Overview

The United States is the world leader in wireless. Across America, nearly 380 million wireless connections join people and increasingly every part of our world together.[1] That's roughly 1.2 wireless connections for every man, woman, and child in the country. Those connections generate tremendous traffic over wireless networks: 9.65 million terabytes of mobile data in 2015 alone[2] – more than doubling the prior year's record levels.

These connections and the data that rides across them, as well as the significant industry investment that makes it all possible, drive significant economic growth and create jobs. The wireless industry generates over $400 billion in economic activity[3] and accounted for over 4.6 million American jobs in 2014.[4]

If our nation's spectrum and infrastructure policies keep pace, these trend lines will only accelerate as three related developments – the Internet of Things (IoT), Smart Communities, and 5G, the next-generation of wireless networks – transform our lives, our communities and our economy.

**4.6 MILLION** ... The number of American jobs that depend directly or indirectly on wireless.

## The 3 Pillars of the Next Generation of Wireless.

**5G**

**SMART COMMUNITIES**

**IoT**

## 5G.

5G will unlock new cycles of innovation and investment across the mobile ecosystem. Tomorrow's 5G networks will offer unparalleled speeds (10x as fast), support a massive increase of IoT devices (100x the number of devices), and enable real-time connections with minimal delays in response (5x as responsive), enabling entirely new services and applications.[5] Driving this wireless revolution is a projected $275 billion in industry investment, which stands to pump $500 billion into the U.S. economy and create 3 million jobs.[6]

**By 2020:**
IoT devices will be more than **twice the number** of people on earth.


## Smart Communities.

Using sensors and other wireless technologies to monitor critical infrastructure, improve energy efficiency, manage traffic patterns, and enhance public safety, cities and towns can deliver core government services more efficiently, improve residents' lives, and grow their economies. Indeed, these communities see an "annual GDP growth rate that is 0.7 percent higher and an unemployment rate that is a full percentage point lower" than others.[7] Wireless-powered smart city solutions could produce $160 billion in benefits and savings from lower energy use, reduced traffic congestion, and decreased fuel costs. [8]

## The Internet of Things.

The IoT, which is bringing broadband connectivity to everyday and industrial devices, sensors, and objects, will usher in positive changes, increased productivity and economic growth across nearly every economic sector, from transportation and health care to public safety and energy. The number of IoT devices worldwide will conservatively surpass 20 billion by the year 2020,[9] and this increase in connectivity stands to add roughly $2.7 trillion to U.S. GDP by 2030. [10]

# KEY POLICY PRESCRIPTIONS TO KEEP U.S. MOBILE LEAD

This is an exciting time for wireless consumers. Tomorrow's networks have the potential to revolutionize the way Americans live and work and unleash economic growth and ingenuity. The wireless industry stands ready to deploy innovative solutions to the challenges facing our country, from energy use and health care to transportation and education. The wireless industry invests over $30 billion a year in next-generation wireless networks and infrastructure,[11] and is ready to invest to support 5G, smart communities, and IoT innovations.

Ensuring that America continues to lead the world in wireless, however, is dependent upon government policies—from local city councils to Congress—to support future investment and innovation. Over the past decade, policymakers have taken steps to ensure America's continued wireless leadership. But much more needs to be done to support a national 5G rollout. Freeing up more licensed, exclusive use spectrum and streamlining the deployment of wireless infrastructure must be priorities.

Other countries have seen our success and the economic growth that wireless generates, and they want to seize our global lead. To ensure that the next-generation of wireless technologies – and all the investment, jobs, and benefits that flow from there – remains U.S.-led, policymakers need to redouble efforts to support wireless innovation.

**75%** of app providers are based in the U.S.

# A SPECTRUM STRATEGY FOR GROWTH AND INVESTMENT

In recent years, policymakers have made progress in freeing up spectrum for mobile broadband, but much work needs to be done to provide industry the spectrum resources needed to support Americans' mobile usage.

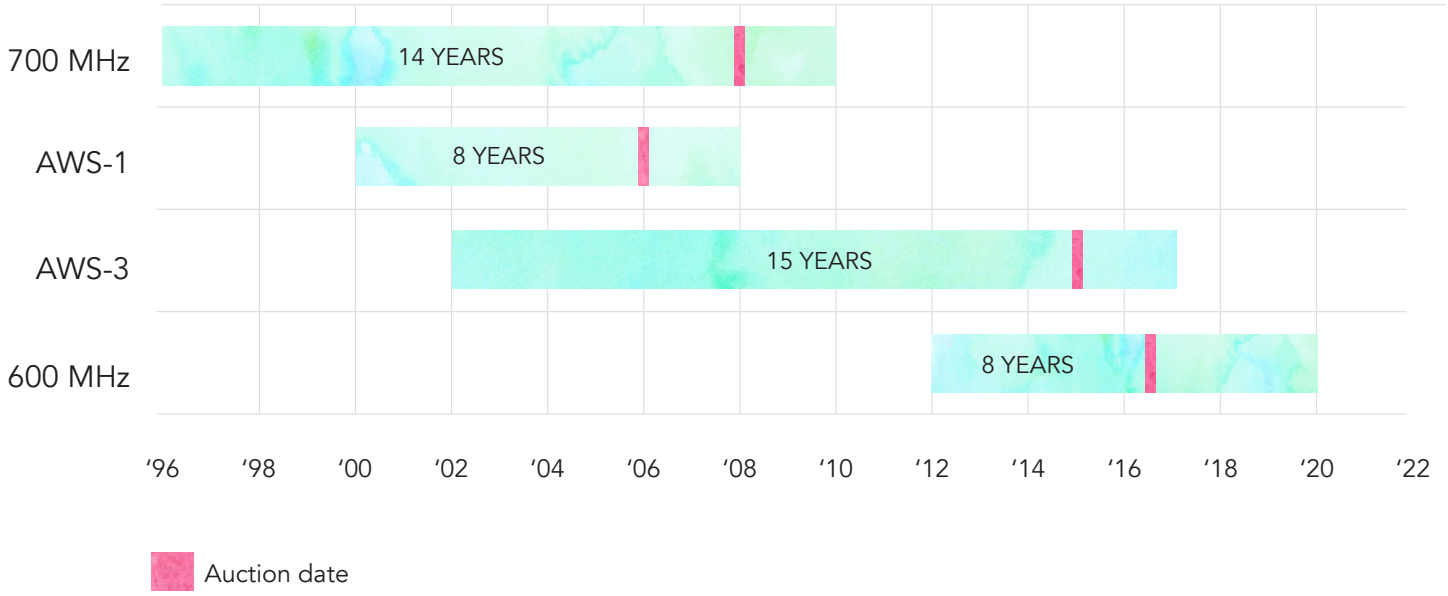
A successful approach should focus on a mix of low, mid, and high-band spectrum to support both 5G coverage and capacity needs.

Similarly, the U.S. should prioritize licensed exclusive use spectrum that has proven to be the core of our nation's successful spectrum policy.

In doing so, the wireless industry also needs access to additional unlicensed spectrum—open to all innovators—and careful execution of potential future spectrum sharing opportunities.

## Bringing more spectrum to market takes an average of 13 years.[12]

That's why policymakers must expedite spectrum-related work now to support tomorrow's mobile demand. Indeed, the now-in-progress Incentive Auction was first proposed conceptually in 2002,[13] then included in the 2010 National Broadband Plan,[14] subsequently authorized by Congress in 2012,[15] and the auction commenced in August 2016.



# 600 MHz Broadcast Incentive Auction.

The FCC's first-of-its-kind incentive auction will repurpose 84 MHz of low-band spectrum currently licensed to television broadcasters. Raising $19.6 billion, the Incentive Auction - the second largest ever - will benefit "consumers by easing congestion on wireless networks, laying the groundwork for [5G] wireless services and applications, and spurring job creation and economic growth."[16] The new Administration should work with all stakeholders to expedite the process to relocate broadcasters and provide timely access to spectrum for wireless providers that have committed billions to access this spectrum in order to better serve mobile consumers.

# Federal Spectrum.

The FCC auctioned 65 MHz of federal spectrum for future mobile broadband use in 2015, and Congress established improvements to the Spectrum Relocation Fund to facilitate future spectrum re-allocations from the federal government. While the 2015 federal budget requires the FCC to auction 30 MHz and the FCC and NTIA develop plans to free up another 100 MHz by 2024,[17] the new Administration needs to move forward aggressively to identify win-win opportunities to shift a significant amount of additional federal spectrum for mobile broadband use. The Commerce Department's recent evaluation of federal spectrum usage provides a good framework to identify potential future bands,[18] and efforts on the Hill are already underway to make available hundreds of MHz of additional licensed and unlicensed spectrum for mobile broadband use.[19]

The New Administration should also work to timely re-auction AWS-3 spectrum relinquished by bidders,[20] and prepare for the 2019 World Radiocommunication Conference. This international conference represents a key opportunity for countries to harmonize regulations across different frequencies, including high-band spectrum.[21]

# High-Band Spectrum.

Earlier this year, the U.S. became the first country to make spectrum above 24 GHz available for 5G when the FCC approved its Spectrum Frontiers Order.[22] These rules opened up nearly 11 GHz of high-frequency spectrum for mobile broadband services, creating "a runway for U.S. companies to launch the technologies that will harness 5G's fiber-fast capabilities."[23] The New Administration should establish an auction date and move forward with planning the new auction. In addition, the agency should press forward with identifying additional high band frequencies and ensuring that exclusive licensed spectrum opportunities are prioritized for all high-band spectrum.[24] The FCC's approach should encourage prompt investment in 5G and promote licensee flexibility.

# Spectrum Sharing.

The FCC created a three-tiered experimental framework to accommodate the operation of small cells and other wireless broadband technology on a shared basis with incumbent users in the 3.5 GHz band.[25] The wireless industry supports this experiment and encourages the Administration to ensure the rules promote investment in all three tiers and can attract bidders to a future auction. While the 3.5 GHz band approach has promise, this is an experiment and the framework should be limited to the 3.5 GHz band until proven successful for government and commercial users.

# Unlicensed Spectrum.

Unlicensed spectrum is a sandbox for wireless experimentation and the U.S. needs to ensure sufficient unlicensed spectrum is available to support future mobile use. In doing so, all innovators should have equal access to these bands. LTE in Unlicensed is a technology that uses unlicensed spectrum together with an enhanced version of 4G LTE so consumers experience improved coverage, speed, mobility and security. The FCC must act promptly to begin authorizing the operation of LTE in Unlicensed devices to expand options for mobile consumers.[26]

> ...the new Administration needs to move forward **aggressively** to identify win-win opportunities to shift a significant amount of additional federal spectrum for mobile broadband use.

# FACILITATE NEW NETWORK INVESTMENT

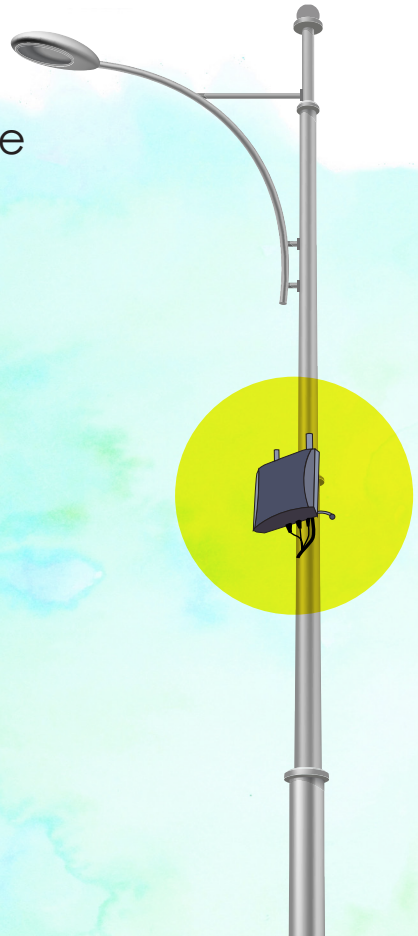
Wireless operators increasingly require new approaches to infrastructure development. Carriers are deploying smaller antennas – DAS and small cells – to densify their networks and boost capacity. These new deployments typically have a much smaller footprint—the size of a pizza box—and also require far more installments to serve a community compared to traditional wireless deployments reliant on a single large cell tower. Too often today, efforts to invest in local communities is frustrated by the inability of operators to gain access to rights of way and infrastructure needed to deploy networks, high (and often discriminatory) fees that greatly exceed the costs of cities and towns to provide access, and processing time that takes months, if not years.

Policymakers at every level of government must reduce barriers to new wireless deployment to support 4G and 5G services with three overarching goals:

1. Improve access to government-owned infrastructure and rights of way for new wireless deployments

2. Ensure reasonable and non-discriminatory fees that reflect 5G economics and architecture

3. Simplify zoning processes with set timetables and more uniform procedures



## Municipal and State Level.

Local cities and towns should embrace the potential for smart communities and take a fresh look at their local zoning ordinances to facilitate new investment. Similarly, states should take efforts to streamline deployment efforts in their states, eliminate roadblocks to deployment, and promote wireless investment.

## At the FCC.

The FCC has taken steps to promote wireless deployment in the past few years. Two years ago, the FCC took steps to speed the deployment of wireless infrastructure on existing towers and wireless sites, implementing shot clocks and "deemed granted" provisions, and streamlined the process for temporary facilities.[27] Last year, the agency exempted small cell deployments from review under the National Historic Preservation Act.[28] From that foundation, the FCC should act decisively to promote additional wireless deployment to establish guard-rails on local zoning and tribal review of new wireless infrastructure.

First, the FCC should seek to promote deployment with affirmative outreach to state and local governments to educate policymakers on applicable federal obligations and the economic and societal impact that deployment-friendly policies can have in communities. The FCC should also act under its clear authority to bar state or local efforts that have the effect of prohibiting new wireless service.[29] Specifically, the FCC should prohibit moratoriums on new wireless deployments or any other local practice that prevent wireless technology upgrades. Similarly, the agency should proactively address excessive and discriminatory right-of-way fees.

## In Congress.

Congress should also move forward to promote deployment and infrastructure reform. Targeted efforts could help unlock tens of billions in new investment across the country in 4G and 5G deployments. Lawmakers should ensure the wireless operators have clear rights to access all necessary rights-of-way and municipal infrastructure under set time frames with "deemed granted" rights wherever appropriate if localities do not timely act on requests. Congress should also move forward with existing proposals to promote "dig once" policies, and streamline broadband placement on federal lands like those included in the MOBILE NOW Act.

# CONCLUSION

Policymakers should focus on opportunities in Congress, the Administration, and at the FCC to encourage the reallocation of spectrum for commercial wireless use and to adopt infrastructure policies that improve access to government-owned facilities and rights of way, ensure more reasonable rates and costs, and simplify zoning processes. If we get it right, we will remain the global leader in wireless and continue to reap the social and economic benefits of that position.

# ENDNOTES

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[21] ITU, **World Radiocommunication Conferences (WRC),** http://www.itu.int/en/ITU-R/conferences/wrc/Pages/default.aspx. Spectrum under consideration includes 27.5-29.5 GHz, 37-40.5 GHz, 47.2-50.2 GHz, 50.4-52.6 GHz, and 59.3-71 GHz.

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[25] **See Amendment of the Commission's Rules with Regard to Commercial Operations in the 3550-3650 MHz Band,** Order on Reconsideration and Second Report and Order, 31 FCC Rcd. 5011 (2016), https://apps.fcc.gov/edocs_public/attachmatch/FCC-16-55A1_Rcd.pdf.

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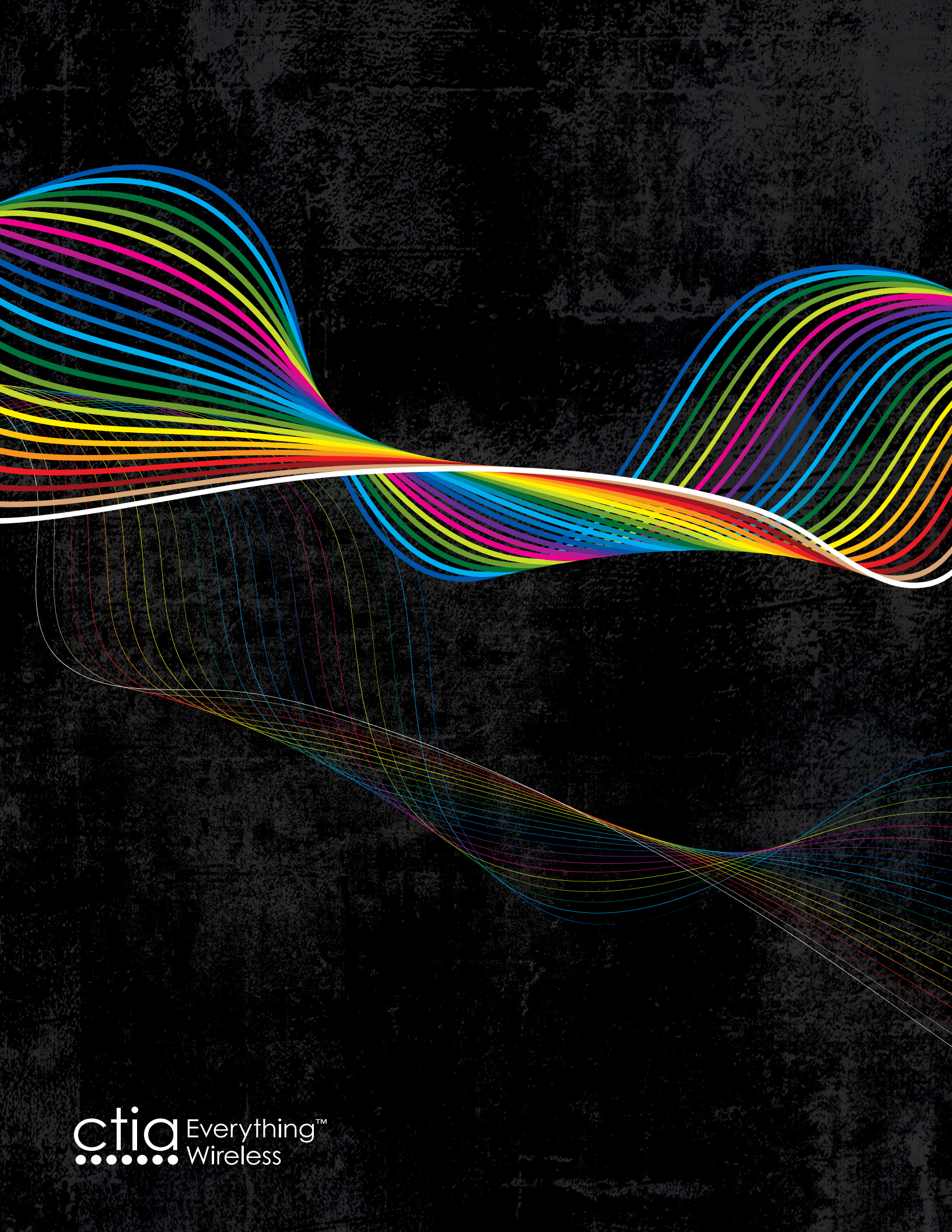
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