The New Spectrum

A Survey of Mobile Connectivity in the Federal Workforce

Underwritten by

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Overview

Purpose

The share of Americans in possession of smartphones reached 77% in 2018, more than doubling ownership levels seen seven years ago. This is having a transformative effect on the workforce, as employees are given more freedom and flexibility to accomplish their work objectives in spite of geographical boundaries and location barriers.

The federal government has sought to capitalize on this mobility. In 2016, the FCC ‘unlocked’ a portion of the 3.5 GHz spectrum that had previously been available to a select group of incumbent users. This Citizens Broadband Radio Service (CBRS), as it is known, may finally give federal operators the wireless stability and quality enjoyed by many in the private sector space.

But are agencies on board with these developments? And are federal users satisfied with their mobile situation or are they ready for a change? To answer these questions, Government Business Council (GBC) undertook an in-depth research study in October 2018.

Methodology

To assess the perceptions and attitudes that federal officials have regarding mobile connectivity and access at their organization, GBC deployed a survey to a random sample of government respondents in October 2018. 413 federal employees responded, representing at least 28 major government departments and agencies. 54% of respondents hold positions at the GS/GM-13 level or above (including Senior Executive Service). Respondents hold a variety of job functions, with highest input from program/project managers, administrative officers, and technical/scientific specialists.

Note: Halfway through the survey, respondents were asked to view a short video. For quality assurance, responses from those who did not watch the majority of the video were removed from this portion of the survey report.

Executive Summary

Mobile devices have moved from optional to essential

56% of respondents say their organization has issued them a mobile device for work purposes. Of this group, 72% agree that these devices are essential for carrying out their daily work duties. Among those not provided devices by their organization, nearly one-third say their employer allows them to use personal devices to complete work assignments. Moreover, at least half of all respondents believe their productivity depends to a considerable or extreme amount on the ready availability of wireless access.

Current wireless capabilities disappoint majority of federal workers

Even as respondents signal greater reliance on mobile devices, a majority feel let down by existing connectivity in government offices. For example, 47% say wireless connectivity in the office is worse or much worse than that available outside the office. Additionally, 53% disagree or strongly disagree with a statement suggesting their building provides seamless connectivity whenever and wherever it is needed. Finally, 50% admit to have used a cellular data connection on their device when office Wi-Fi has experienced disruption.

Many favor the FCC’s decision to unlock more spectrum

While a significant majority of respondents were unaware of the FCC’s 2016 ruling to unlock spectrum in the Citizens Broadband Radio Service, many expressed support for the benefits such bandwidth could bring to their organization. The ability to deploy private LTE wireless networks in population-dense venues received strongest support, followed by the capacity to extend greater coverage for underserved and disadvantaged communities. At the same time, respondents feel that security concerns and bureaucratic red tape may impede their organization’s ability to leverage this spectrum effectively.
Research Findings

A majority of respondents are issued mobile devices to fulfill their work duties

56% of respondents have been issued one or more devices to carry out their work duties.

“...We have a whole host of mobile devices. We have a pretty diverse mission set, and they all use mobile differently. They all want it out in the field, and they need to have that data right there with them.”

Brian Varine, Chief for Cyber Threat Intelligence at Department of Justice. August 14, 2017.

Close to 3 in 4 respondents consider their mobile device essential for their work

“My work-issued mobile device is an essential tool for carrying out my job duties.”

Of those respondents who are issued one or more mobile devices by their organization, a significant majority consider such devices essential for executing their work. Conversely, just 16% feel their work-issued devices aren’t necessary for performing their duties.

72% of respondents agree or strongly agree their mobile device is essential for the job.

Note: Percentages may not add up to 100% due to rounding.
**Research Findings**

**Respondents rely heavily on mobile devices and resort to using personal devices when permitted**

*To what extent does your work productivity depend on having readily available wireless access?*

- Not at all: 16%
- Slightly: 15%
- Moderately: 18%
- Considerably: 26%
- Extremely: 25%

**51%** of respondents say their ability to be productive depends **considerably** or **extremely** on whether they have wireless access.

18% are **moderately** dependent on a wireless connection.

31% say wireless access is either **slightly** or **not at all** important for producing results.

*Only respondents who indicated that their organization does not provide mobile devices were presented with this question.*

**Does your organization allow you to use your personal mobile device to carry out your job duties?**

- Yes: 30%
- No: 57%
- Don't know: 13%

**30%** of respondents are permitted to use their personal mobile device for work purposes.*

57% say personal devices are forbidden, while 13% are unclear what their organization’s policy is regarding use of personal devices.

*Only respondents who indicated that their organization does not provide mobile devices were presented with this question.*
Almost half of respondents say office connectivity pales in comparison to what’s outside.

**How would you rate your organization’s wireless/Wi-Fi capabilities with regard to enabling mobility in your work environment?**

- Very poor: 16%
- Poor: 17%
- Neutral: 26%
- Good: 29%
- Very good: 13%

**“The wireless connectivity my organization provides at work is __________ than that available outside the office.”**

- Much worse: 18%
- Worse: 29%
- On par: 39%
- Better: 11%
- Much better: 3%

**Percentage of respondents, n=403**
Note: Percentages may not add up to 100% due to rounding

**Percentage of respondents, n=397**
Note: Percentages may not add up to 100% due to rounding

*42%* of respondents say their organization’s wireless capabilities are good or very good at enabling mobility, versus 33% who consider it poor or very poor.

*47%* of respondents feel that wireless connectivity in the office is worse or much worse than that available outside the office.
More than half of those surveyed say ubiquitous connectivity is out of the picture.

“*My place of work offers seamless connectivity throughout the building whenever I need it.*”

- Strongly disagree: 23%
- Disagree: 30%
- Neutral: 20%
- Agree: 21%
- Strongly agree: 6%

53% of respondents disagree or strongly disagree that their place of work provides seamless connectivity whenever they need it.

Note: Percentages may not add up to 100% due to rounding.
“A soldier that had a question about something actually picked up his laptop from where he was sitting and walked from one end of the TOC all the way to the other end. By virtue of the fact that he was able to operate wirelessly versus connected to a wire, the amount of time that was lost to provide mission support was reduced to a much more negligible amount. And that right there is truly disruptive and game-changing technology.”

Lt. Col. Mark Henderson, U.S. Army
1 in 2 respondents has had to use a cellular data connection as a result of Wi-Fi outage.

50% of respondents have resorted to using a cellular data connection at work stemming from unexpected Wi-Fi disruptions. The most common segment of this group have to resort to a cellular connection on a daily basis.

Meanwhile, 27% indicated that cellular data access is needed on a weekly to monthly basis.

1 in 4 respondents admits to using a cellular data connection in the office on a daily basis as a result of Wi-Fi failures.
Research Findings

Over a third say the process to access work information on mobile devices is inefficient

How efficient is the process you must go through to access work-related information on your mobile device?

<table>
<thead>
<tr>
<th>Efficiency Level</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Very inefficient</td>
<td>17%</td>
</tr>
<tr>
<td>Inefficient</td>
<td>22%</td>
</tr>
<tr>
<td>Neutral</td>
<td>37%</td>
</tr>
<tr>
<td>Efficient</td>
<td>20%</td>
</tr>
<tr>
<td>Very efficient</td>
<td>4%</td>
</tr>
</tbody>
</table>

Note: Percentages may not add up to 100% due to rounding

Less than a quarter of respondents (24%) believe that current processes to access work-related items on mobile devices is efficient or very efficient. Overall, respondents either feel neutral on the matter or disapprove of the current hoops they must pass through to access work data on their mobile devices.

39% feel that current processes to access work-related information on mobile devices is inefficient or very inefficient.
Nearly half of respondents do not feel their agency is a leading advocate for wireless access.

“*My organization is a leader when it comes to marshalling resources to improve wireless access in the workplace.*”

- Strongly disagree: 24%
- Disagree: 24%
- Neither agree nor disagree: 30%
- Agree: 12%
- Strongly agree: 3%
- Don’t know: 8%

48% of respondents disagree or strongly disagree that their organization is a leader when it comes to marshalling resources to improve wireless access in the workplace.
In 2016, the FCC finalized establishment of the Citizens Broadband Radio Service (CBRS), a 150 MHz slice of spectrum that can be used to extend wireless access for public consumption.

CBRS is innovative because of a concept known as shared spectrum. By deploying a three-tier model, it allows for spectrum sharing while protecting incumbent users in the band (e.g., satellites, military radar). If the higher tiers aren’t using all of the spectrum in a given time, general authorized access users are free to make use of the coverage.

This is particularly attractive for government, where conventional Wi-Fi channels are unable to resolve mobile data demands and spikes in wireless usage. With the spectrum created by CBRS, federal agencies will now have the capability to deploy private LTE to maintain connectivity in spite of Wi-Fi disruptions and traffic.

Overall, respondents show little to no familiarity with Citizens Broadband Radio Service

**How familiar are you with the Citizens Broadband Radio Service (CBRS)?**

- Not at all familiar: 78%
- Slightly familiar: 15%
- Moderately familiar: 5%
- Very familiar: 2%
- Extremely familiar: 1%

After respondents were asked about their familiarity with CBRS, they were invited to view a short video explainer summarizing CBRS and its potential application to their workspace. For quality assurance, respondents were required to watch the majority of the video in order for their responses to be documented in the final portion of the report.

“As wireless usage and mobile data demands skyrocket, today’s networks can’t keep up with users’ coverage and capacity demands. Especially indoors, where 80% of mobile data usage occurs.

Recently, the FCC opened up a 3.5 gigahertz spectrum in the US and named it Citizens Broadband Radio Service.

The key to CBRS is a powerful concept known as shared spectrum. By deploying a three-tier model, it allows for spectrum sharing while protecting incumbent users in the band. In a nutshell, if the higher tiers aren’t using all of the spectrum in a given time, general authorized users are free to jump in so anyone can deploy certified LTE based solutions.

Another potential application for CBRS is the concept of neutral host in which a shared LTE deployment can serve subscribers from multiple operators, offering greater indoor coverage and data capacity. This provides a cost-effective solution for stadiums, airports, convention centers, and hotels where a single operator solution won’t satisfy all of their customers.

By enabling anyone to deploy their own LTE based network, the sky’s the limit… literally.”
More spectrum is a plus, but opinions vary on the extent of its benefits for the workforce

A significant majority of respondents (86%) believe the spectrum created by CBRS will produce benefits of some kind. However, opinions differ on the extent of these benefits: 39% anticipate the gains will be considerable or extreme, versus 48% who anticipate slight to moderate improvements.

Just 14% of respondents are of the opinion that CBRS will not yield any benefits to their organization.

39% of respondents believe the spectrum created by CBRS can offer considerable to extreme benefits to their organization.
Respondents desire greater wireless coverage than current Wi-Fi provides them

Which of the following benefits of CBRS could provide value to your organization?

- Private LTE wireless networks that offer greater coverage than Wi-Fi: 36%
- Improved information access for underserved/disadvantaged communities: 31%
- Wide-area surveillance to protect government facilities/military bases: 28%
- More secure monitoring/visibility of network traffic: 26%
- Greater bandwidth for industrial IoT facilities (e.g., power plants, mines): 20%
- Other: 2%
- None of the above: 8%
- Don't know: 29%

Percentage of respondents, n=223
Respondents were asked to select all that apply
To move to private LTE coverage, agencies will need to address security concerns and red tape.

Which of the following factors might stand in the way of your organization using the new spectrum range established by CBRS?

- Security concerns: 64%
- Bureaucratic red tape: 53%
- Insufficient funding: 49%
- Lack of implementation strategy: 31%
- Fear of change/disruption: 27%
- Satisfaction with status quo: 19%
- Other: 4%
- None of the above: 1%
- Don't know: 14%

Percentage of respondents, n=223
Respondents were asked to select all that apply.
Private LTE can boost coverage in federal venues with heavy communications traffic

Private LTE is ideal for providing high-speed, uninterrupted coverage for densely-populated venues. Does your agency own, host, or collaborate with any of the following entities?

1st Military bases / stations (30%)

2nd Schools / universities (22%)

3rd Hospitals (18%)

4th Banks (6%)

5th Stadiums / arenas (6%)

Another potential application for CBRS is the concept of neutral host in which a shared LTE deployment can serve subscribers from multiple operators, offering greater indoor data coverage and data capacity.

This would be particularly cost-effective for federal agencies that own, host, or partner with population-dense institutions or venues where spectrum is in high demand, including military bases, hospitals, and places of learning.

Percentage of respondents, n=129
Respondents were asked to select all that apply
Note: Not shown are 29% of respondents selecting "None of the above"
When asked for their opinions on how to improve connectivity, respondents most frequently indicate the need for establishing a baseline inventory of spectrum needs and requirements.

One-third of those surveyed also say that consulting with experts and creating a spectrum strategy plan will enable greater progress toward these objectives.

1 in 3 respondents believe that developing a spectrum strategy plan can help improve connectivity at their agency.
Final Considerations

When considering how to improve mobile connectivity and coverage:

Develop baseline inventory of spectrum needs

Respondents have signaled their appetite for improving mobile connectivity by leveraging spectrum of CBRS. To pursue this goal, agencies need to take stock of their spectrum requirements and needs, a proposal favored by 35% of those surveyed. At the same time, agencies don’t need to go it alone. As over a third of respondents suggest, unlocking this bandwidth in a way that serves organizations effectively will likely depend on leveraging outside expertise in government and the private sector. By taking inventory of mobile demands and consulting with experts to understand the infrastructure required to support this transition, agencies can begin connecting their workforce in a way that promotes mission results, first and foremost.

Insights from Ruckus

Ruckus is pioneering mobility for the federal workforce

Agencies face a range of challenges in fulfilling their mission, but mobility and wireless access should not be among them. With a twenty-year history of Federal IT network modernization, Ruckus knows how to help federal agencies update their access infrastructure in a scalable and secure fashion.

From software-upgradeable switches to Wi-Fi that works in the toughest environments, to secure access for every device and user, Ruckus is committed to ensuring that agencies can operate securely, reliably, and adaptively wherever mission leads them.
A majority of respondents are senior decision-makers in the federal government.

1 in 4 respondents are civilians working in the Department of Defense or registered as Active Duty Military.

54% of respondents identify as GS-13 or above, including members of the Senior Executive Service, General/Admiralty, and Major/Commander.
Most widely represented are program managers, administrative officers, and technical specialists.

**Job function**

<table>
<thead>
<tr>
<th>Job Function</th>
<th>Percentage</th>
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<tbody>
<tr>
<td>Program/project management</td>
<td>15%</td>
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<tr>
<td>Administrative/office services</td>
<td>12%</td>
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<tr>
<td>Technical/scientific</td>
<td>9%</td>
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<tr>
<td>Human resources</td>
<td>8%</td>
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<tr>
<td>Agency leadership</td>
<td>6%</td>
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<tr>
<td>Finance</td>
<td>6%</td>
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<tr>
<td>Healthcare professions</td>
<td>6%</td>
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<tr>
<td>Law enforcement/public safety</td>
<td>5%</td>
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<tr>
<td>Information technology</td>
<td>5%</td>
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<tr>
<td>Acquisition/procurement</td>
<td>5%</td>
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<tr>
<td>Audit/inspectors general</td>
<td>4%</td>
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<tr>
<td>Legal</td>
<td>4%</td>
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<tr>
<td>Customer service</td>
<td>3%</td>
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<tr>
<td>Facilities, fleet, and real estate</td>
<td>2%</td>
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<tr>
<td>Communications/PR</td>
<td>1%</td>
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<tr>
<td>Policy research/analysis</td>
<td>1%</td>
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<tr>
<td>Other</td>
<td>9%</td>
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Note: Percentages may not add up to 100% due to rounding.

Respondents were asked to choose which single response best describes their primary job function.

**Departments and agencies represented**

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<thead>
<tr>
<th>Department/Agency</th>
<th>Percentage</th>
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<tbody>
<tr>
<td>Veterans Affairs</td>
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<tr>
<td>Agriculture</td>
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<td>Army</td>
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<td>Homeland Security</td>
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<td>Air Force</td>
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<td>Navy</td>
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<td>Interior</td>
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<td>Treasury</td>
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<td>Transportation</td>
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<td>Health &amp; Human Services</td>
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<td>Commerce</td>
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<td>NASA</td>
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<td>Environmental Protection Agency</td>
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<td>Office of the Sec. of Defense</td>
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<td>Energy</td>
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<td>Justice</td>
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<td>Housing &amp; Urban Development</td>
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<td>General Services Administration</td>
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<td>Social Security Administration</td>
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<td>Small Business Administration</td>
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<td>Office of Personnel Management</td>
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<td>Congress/Legislative Branch</td>
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<td>Education</td>
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<td>Labor</td>
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<td>State</td>
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<td>National Science Foundation</td>
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<td>Marine Corps</td>
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<td>Executive Office of the President</td>
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<tr>
<td>Other Independent Agency</td>
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</table>

Departments and agencies are listed in order of frequency.
About

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**Government Business Council**

As Government Executive Media Group’s research division, Government Business Council (GBC) is dedicated to advancing the business of government through analysis, insight, and analytical independence. An extension of Government Executive’s 40 years of exemplary editorial standards and commitment to the highest ethical values, GBC studies influential decision makers from across government to produce intelligence-based research and analysis.

**Report Author:** Daniel Thomas

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**About Ruckus**

Ruckus Networks, an ARRIS company, is redefining connectivity around the globe. Ruckus’ high-performance network infrastructure provides secure, reliable access to data, applications and services no matter how tough the environment. Ruckus innovates across wired and wireless technology to modernize federal networks and deliver mission success. When connectivity really matters, the federal government turns to Ruckus.

Learn more at [https://www.ruckuswireless.com/](https://www.ruckuswireless.com/).

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