



# UNDERSTANDING THE SOCIETAL BENEFIT OF THE 12 GHZ BAND

## THE 12 GHZ SPECTRUM BAND HAS THE POTENTIAL TO CREATE OVER \$1 TRILLION IN TOTAL SOCIETAL BENEFITS. HERE'S HOW.

Spectrum is a crucial, but finite, resource. As the Federal Communications Commission (FCC) works to free up more spectrum resources to accelerate 5G deployment and help connect all Americans, it must seize the opportunity that the 12 GHz spectrum band offers for providing next generation connectivity and for closing the digital divide. The 12 GHz band – the “goldilocks” of spectrum due to its ideal coupling of mid-band positioning with coverage and capacity characteristics – is a contiguous 500 MHz spectrum block with zero federal encumbrances that can be put to use immediately, without auction, at no cost to consumers, jump-starting a variety of network deployments across both rural and urban America.

As a comprehensive economic analysis developed by the Brattle Group – a highly respected global economics firm – clearly demonstrates, the 12 GHz band is the answer to meeting burgeoning U.S. 5G spectrum needs and has the potential to generate \$50 billion in value created by mobile services and over \$1 trillion in total societal benefit. With its unique propagation characteristics, as outlined by several robust engineering analyses, the 12 GHz band is especially valuable for adding mobile 5G capacity, deploying fixed wireless access (FWA) networks in a variety of community settings, facilitating opportunistic indoor factory and enterprise use, adding backhaul capacity, and fostering a variety of other technical applications. The more than 30 members of the diverse 5Gfor12GHz Coalition – which range from academic organizations to public interest groups, to providers and equipment manufacturers – are working to prepare equipment and deploy 12 GHz supported networks for a variety of customers and communities. Learn more below about some of the ways these networks have the potential to provide real-world impact to consumers across the country.

### CASE STUDY: COACHELLA VALLEY UNIFIED SCHOOL DISTRICT

#### How GeoLinks Can Use 12 GHz to Power Networks that Connect Underserved California School Districts

One of the most pressing issues facing rural communities because of the growing digital divide in the U.S. is lack of access to educational tools. The reality of this scenario has been highlighted repeatedly throughout the COVID-19 pandemic, particularly as it relates to distance learning programs. In several school districts across California, concentrated groups of students have remained completely cut off from online learning environments, with many unable to log on to virtual classes and resources in any capacity.

A leading telecommunications company and wireless Internet service provider (WISP) based in Southern California, GeoLinks, is working with these districts to bring students online and close the homework gap using 12 GHz powered fixed wireless access (FWA) networks. One leading example of this is GeoLinks' proposal with the Coachella Valley Unified School District in Riverside County.

Coachella Valley Unified School District enrolls over

In several school districts across California, concentrated groups of students have remained completely cut off from online learning environments, with many unable to log on to virtual classes and resources in any capacity.

over 17,000 students each year, 100 percent of whom are Black and Hispanic. Over 11,000 students in this district qualify for free or reduced-cost meals, over 9,400 qualify as "English Learners" (meaning English is a second language), and the graduation rate is hovers around 75 percent – a number catalyzed by the disparities in virtual learning that stemmed from the pandemic. To combat the emerging homework gap in this school district, Geolinks has discussed deploying two network options for students and their families. The first is a gigabit symmetrical service, which requires a technician to install a receiver at the residence. The second, which will offer 100-500Mbps down and 20-100Mbps up, requires no installation, as it uses wireless mesh technologies. This approach is ideal for those families living in older, multi-tenant housing lacking a contemporary twisted pair ethernet cable or fiber to each residence, or where an installation in every unit is disruptive, cost-prohibitive, or blocked by property owners.

This is often the situation for the most underserved of families in the Coachella Valley Unified School District, so GeoLinks would put extra attention to ensure that wireless options are reliable and able to power next generation network. One spectrum tool they are hoping to utilize in order to do so is the 12 GHz band – 500 MHz of unencumbered spectrum that can be put to use immediately by WISPs to help close the digital divide.

By deploying 12 GHz for the Coachella Valley Unified school district, GeoLinks will help school board and county officials provide fast and reliable connections for more than 17,000 families. This connection will aid teachers in providing better educational experiences

**By deploying 12 GHz for the Coachella Valley Unified school district, GeoLinks will help school board and county officials provide fast and reliable connections for more than 17,000 families. This connection will aid teachers in providing better educational experiences. for students, ensure students can complete and submit**

for students, ensure students can complete and submit assignments in a timely manner, and provide students access to innovative digital education tools (especially pertinent to workforce certificate programs) as they become available.

While GeoLinks hopes to connect the Coachella Valley Unified school district with 12 GHz, current FCC rules prohibit GeoLinks, and other similar WISPs, from using the band to its full potential. As it stands, FCC rules governing the 12 GHz band require any broadcast over the spectrum (how networks send signals to users) in an only one-way capacity. So, radios would currently be forced to broadcast 12 GHz from the tower to the customer and another frequency (potentially 5 GHz) to broadcast from the customer back to the tower. The FCC rules also stipulate that radios must broadcast 12

**While GeoLinks hopes to connect the Coachella Valley Unified school district with 12 GHz, current FCC rules prohibit GeoLinks, and other similar WISPs, from using the band to its full potential... This severe restriction limits not only the distance 12 GHz can be broadcast but also the capacity at which it can broadcast over distance – leading to less reliable and slower connections for Coachella Valley students and their families.**

GHz at a fraction of the power other bands currently enjoy. Allowed power levels in immediately adjacent bands are 66 dB higher (4 million times higher). This severe restriction limits not only the distance 12 GHz can be broadcast but also the capacity at which it can broadcast over distance – leading to less reliable and slower connections for Coachella Valley students and their families.

With new rules governing the 12 GHz band, GeoLinks will be more equipped to achieve its goal of closing the homework gap in Riverside County and then bringing those solutions to rest of California and, eventually, beyond.

