

SMART CITIES AND SERVICE IMPROVEMENTS COMMITTEE

(d)3. SMALL CELL AND 5G UPDATE



Presented by:

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Joint Venture Silicon Valley

Agenda

1. Permitting & Deployment Update
2. Current State of 5G – Joint Venture Silicon Valley
3. Questions and Feedback

A grayscale photograph of a city skyline. In the background, a prominent church spire rises above other buildings. The city is filled with various architectural styles, including modern glass-fronted buildings and older, more traditional structures. A wide street with traffic is visible in the foreground. The overall scene is a dense urban environment.

Permitting & Deployment Update

CITYWIDE 5G APPROACH

Public-Private Partnerships

Small Cell

Sep 2018

AT&T and Verizon

Fiber Optic Lines

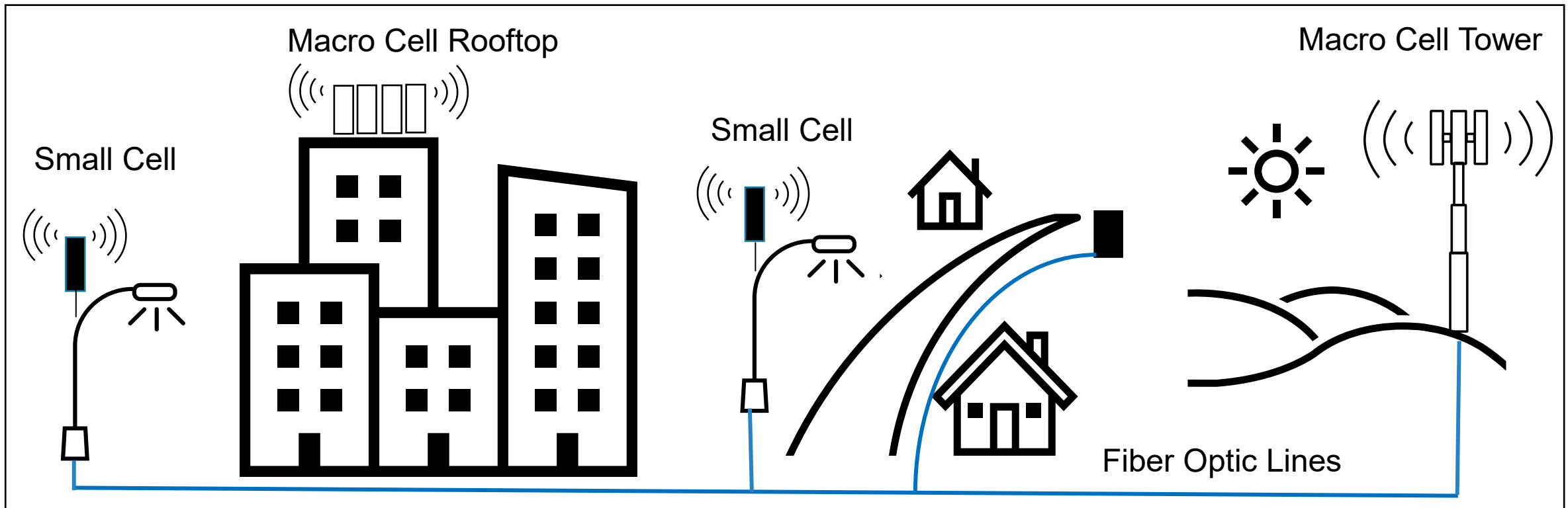
Sep 2018 and Oct 2019

AT&T, Verizon, and Comcast

Macro Cell

Dec 2020

T-Mobile



Partnership Benefits



Digital Inclusion

\$1.5M

4000+ broadband adoptions

Access to devices

Affordability of services

Adoption through digital literacy training



Smart Cities

\$4M

In-kind Internet of Things
Solutions

Smart traffic data and intersection safety

Smart streetlighting

Community center WiFi

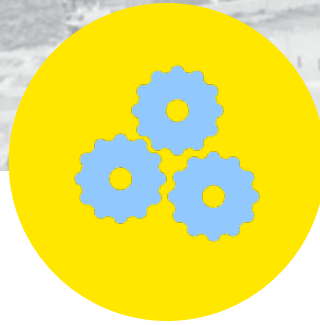
City fleet connectivity services

Best in Class Permitting Process



Multi-department coordination

Public Works
Planning, Building, Code Enforcement
Fire Department / HazMat
Office of Economic Development /
City Real Estate



Operational effectiveness

Construction drawing checklists
Templatized plan sets
Small cell deployment map
Electronic plan reviews
Weekly coordination meetings



Fast and predictable permit process

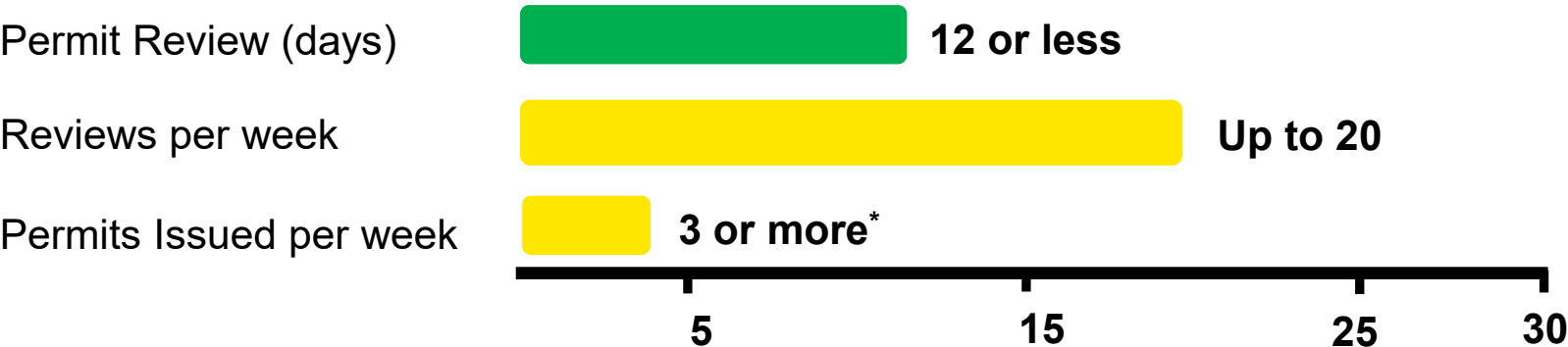
Reviews within in days not
months
20+ permit reviews per week

SMALL CELL DEPLOYMENT

Goal: 3,100 Permits by 2028¹



Progress: 1,928 Permits Issued – 62%

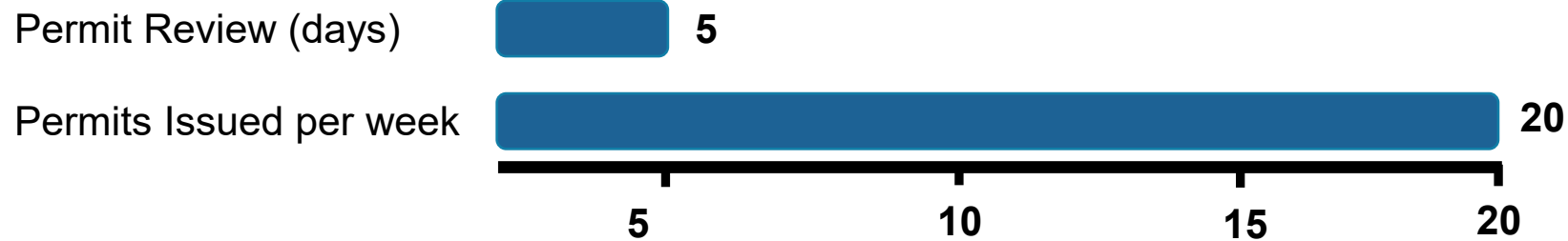


¹ Decreased from 4,000 due to newly available frequencies in the 5G "mid-band" spectrum called C-Band that use macro antenna instead of small cells.

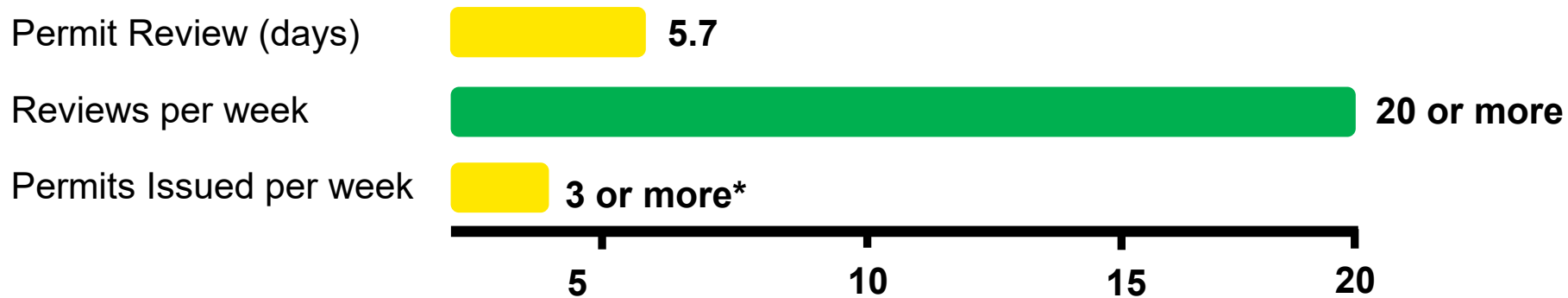
* Average number of permit requests is approximately 6 per week and an average of 2-3 review cycles before the permit is issued.

MACRO CELL DEPLOYMENT

Goal: 240 Permits by June 2022



Progress: 148 Permits Issued – 62%



*Average number of permit requests is approximately 3 per week and an average of 2.4 review cycles before the permit is issued.



Small Cell and Macro Cell Teams



Liz Koki, Small Cell Team

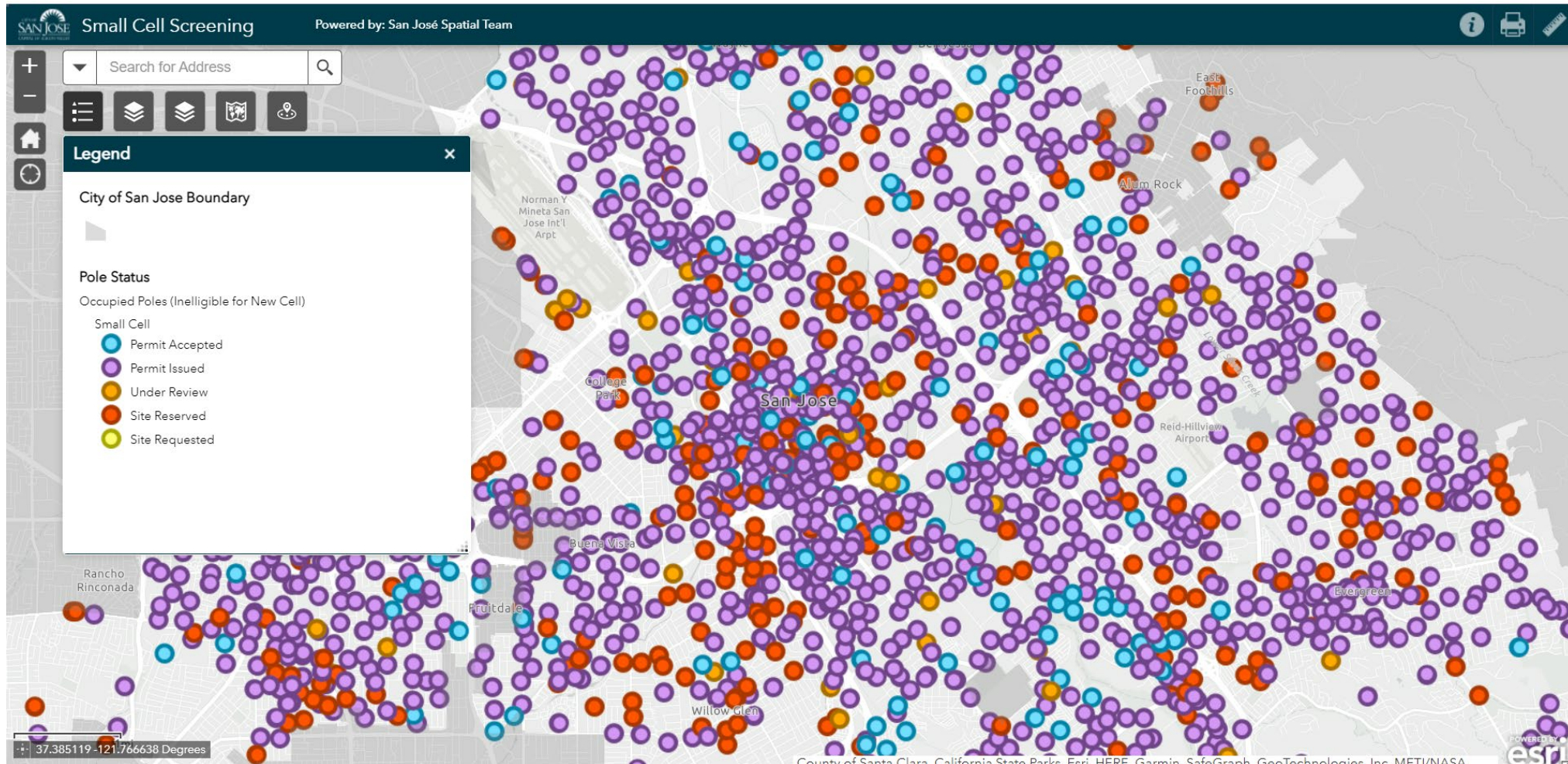


Stefanie Farmer, Macro Cell Team



Leslie Domondon, Macro Cell Team

Platform to share and track information



SMALL CELL PUBLIC OUTREACH

- Frequently Asked Questions
- 20-Day Notice Requirement
- Design Guidelines
- Information on health and safety studies and FCC pre-emption

» Civic Innovation

+ Smart City Advisory Board

Innovation and Technology
Advisory Board

+ Projects

Digital Privacy

Digital Inclusion and Broadband
Strategy

Broadband Strategy and Small
Cell Deployment

+ User Experience (UX) Guide

Your Government » Departments & Offices » Office of the City Manager » Civic Innovation »

BROADBAND STRATEGY AND SMALL CELL DEPLOYMENT

To successfully implement the City's Digital Inclusion and Broadband Strategy, a robust citywide public and private sector digital infrastructure is required. The City currently partners with telecommunication companies that maintain antennas across the City, many of which are installed on City property, such as streetlights, traffic lights, and rooftops. These antennas are known as "small cells". The City seeks to leverage small cell technology, which will offer enhanced voice and data capacity citywide, improve emergency communication capability, and pave the way for the equitable deployment of 5G broadband technology. As of September 2018, the City has agreements with AT&T, Mobilitie, and Verizon.

Frequently Asked Questions (FAQ)

Q: What are small cells?

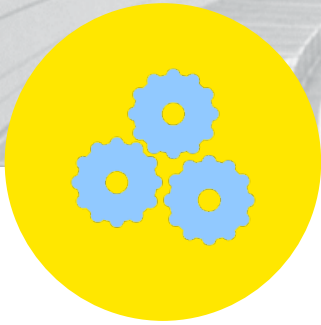
A: Small cells are small radio antenna equipment installed on streetlights, rooftops, and other locations as a primary way to deliver 5G (Fifth Generation) mobile technology. The City of San José Small Cell Deployment relies upon installing small cell equipment on city-owned streetlights to meet the network design needs of this latest version of mobile technology.



Q: What are the benefits of small cell technology?

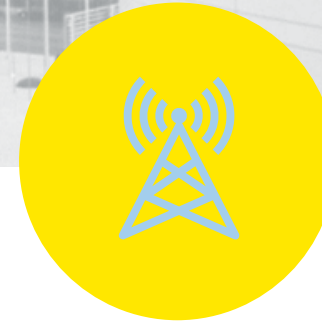
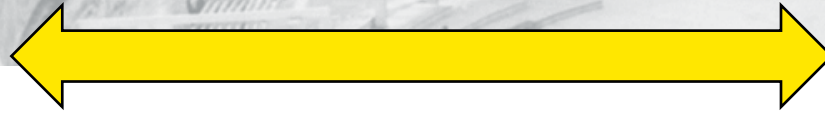
A: Small cell technology offers enhanced voice and data capacity citywide, improves emergency communication capability, and paves the way for the equitable deployment of 5G broadband technology. Additionally, allowing small cells generates revenue for the San José Digital Inclusion Partnership to support efforts to close the digital divide for the residents of San José, with a focus on low-income youth as well as other vulnerable populations, such as the elderly and disabled, providing affordable broadband service, devices, and digital literacy to underserved communities. All income received from small cell usage fee revenue is to be allocated to the Digital Inclusion Program Fund.

Next Steps



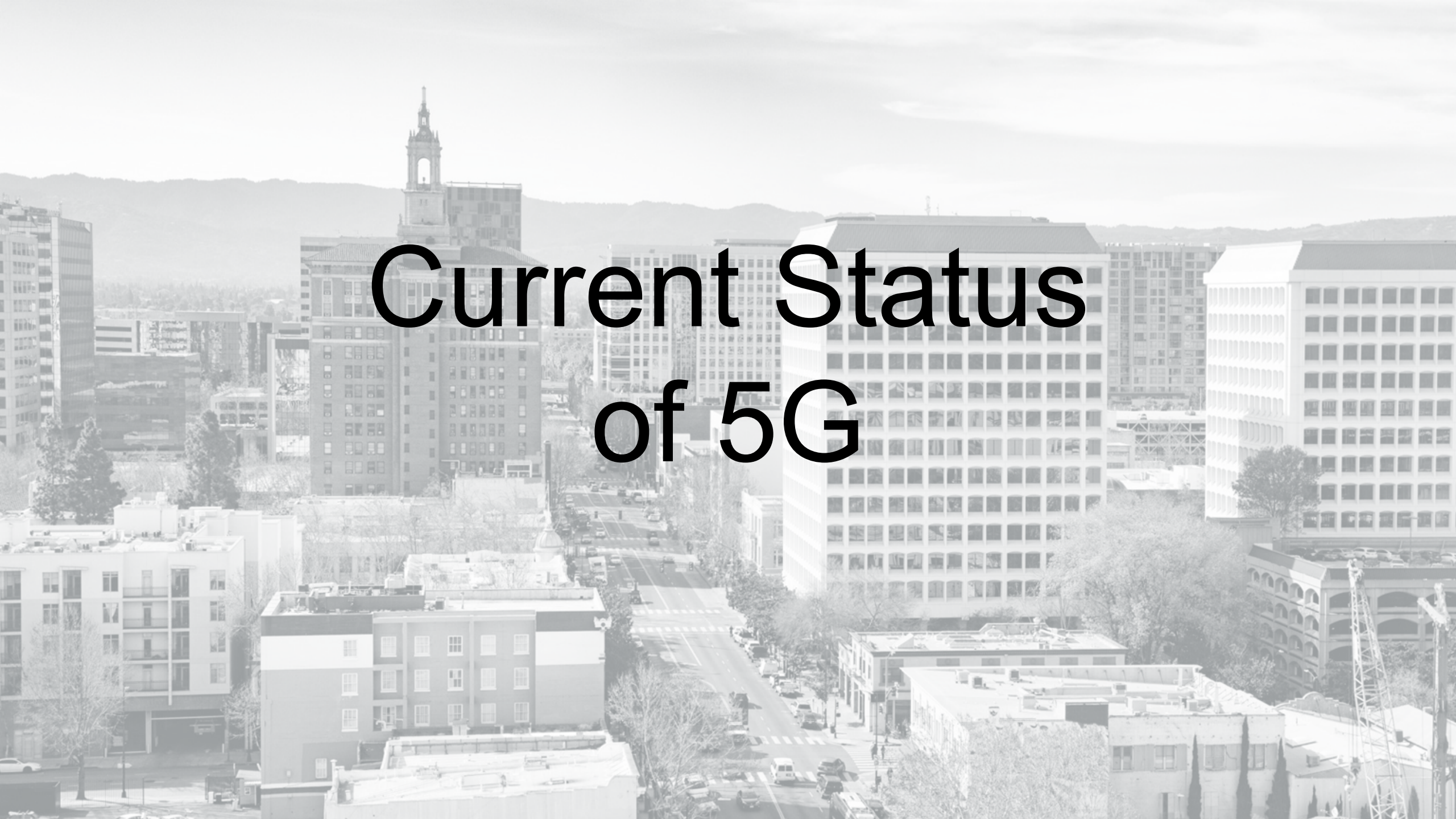
Broadband Permitting

- Maintain capacity and swift permitting for small cells and macro sites
- Streamline and accelerate permitting for cell site back-up power and generators



Digital Inclusion & Broadband Strategy

- Conduct program assessment
 - Adapt to current needs, technology, and small cell revenue decline
 - Update the City's Digital Inclusion and Broadband Strategy

A grayscale photograph of a city skyline. In the background, a prominent church spire rises above the rooftops. The city is filled with various buildings, including modern high-rises and older, more traditional structures. A wide street with traffic is visible in the foreground. The sky is overcast with soft clouds.

Current Status of 5G

Why 5G? And Why Now?

Prepared for Smart Cities and Service Improvement Committee, May 2022

David Witkowski, Executive Director, Civic Technologies Program

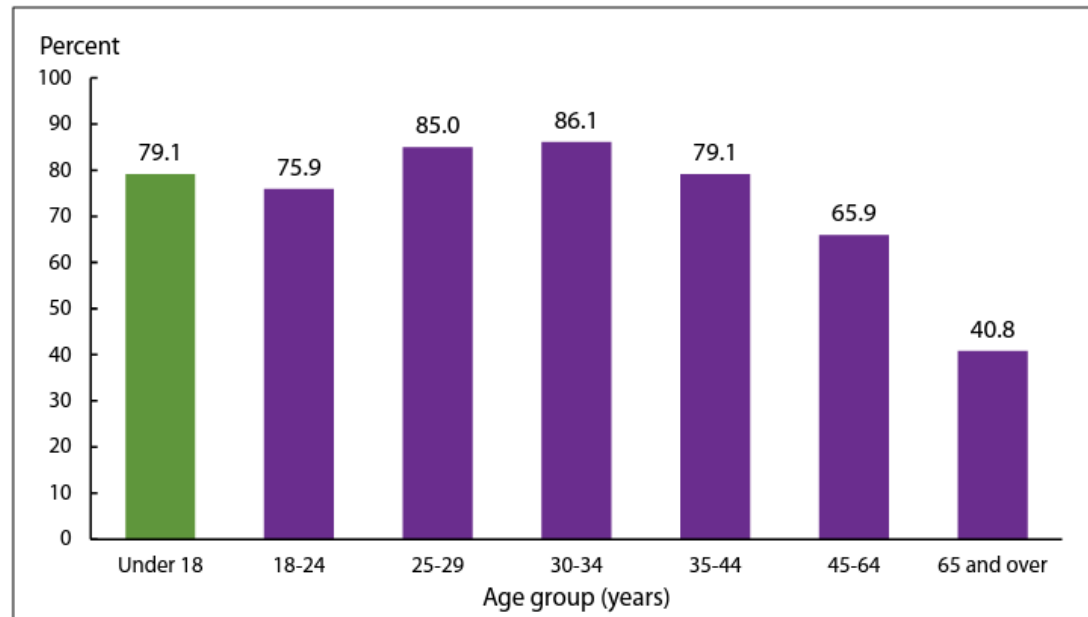
www.jointventure.org/wireless

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Wireless-Only

Figure. Percentages of wireless-only adults and of children living in households with only wireless telephone service, by age group: United States, January–June 2021



NOTES: Wireless-only adults are adults who live in households with only wireless telephone service and have their own wireless telephone. In 2021, data collection procedures for the National Health Interview Survey were modified because of the COVID-19 pandemic. Estimates from 2021 may have been impacted by these changes. See text in this report for more details.

SOURCE: National Center for Health Statistics, National Health Interview Survey.

- CDC Wireless Substitution (Bi-annual, June 2021)
- Wireless-only (U.S. wide)
 - 57 million children (79.1%) live in wireless-only households.
 - Renters: 81.9%
 - Poverty: 68.3%
 - Hispanic: 77.4%
 - Ages 25-29: 85.0%
 - Ages 30-34: 86.1%
 - Ages >44: 65.9%
- **Key Point: >80% of calls to 9-1-1 come from wireless phones**

4G Limitations



- Designed for personal devices (phones, tablets, hotspots).
- Not optimized for the Internet of Things.
- Not optimized for fixed broadband.
- ***LTE is capacity limited (~200 per radio-sector)***
- Industry saw pandemic overload in many areas...
 - Of the 16,000 distance learning connections created by SCCOE, 14,200 were done with 4G LTE hotspots.

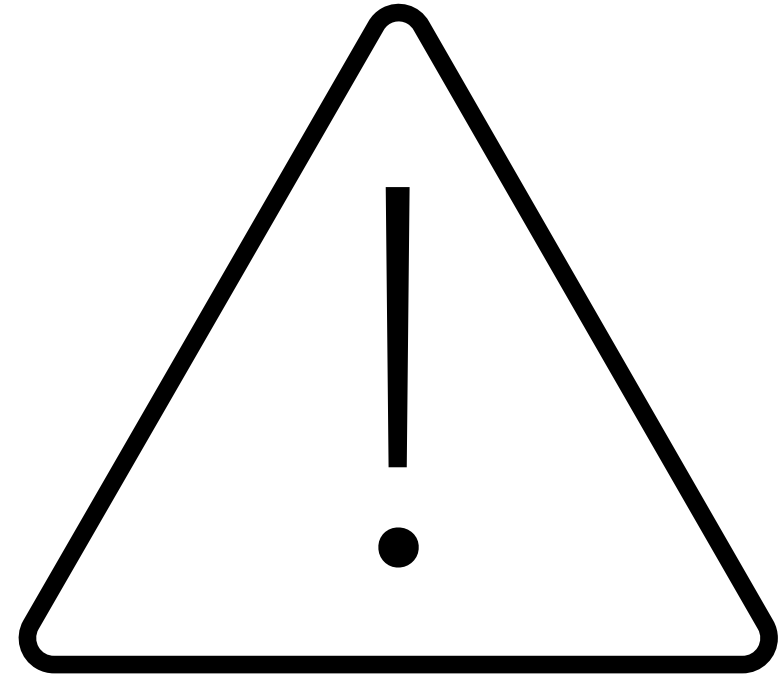
5G Evolution



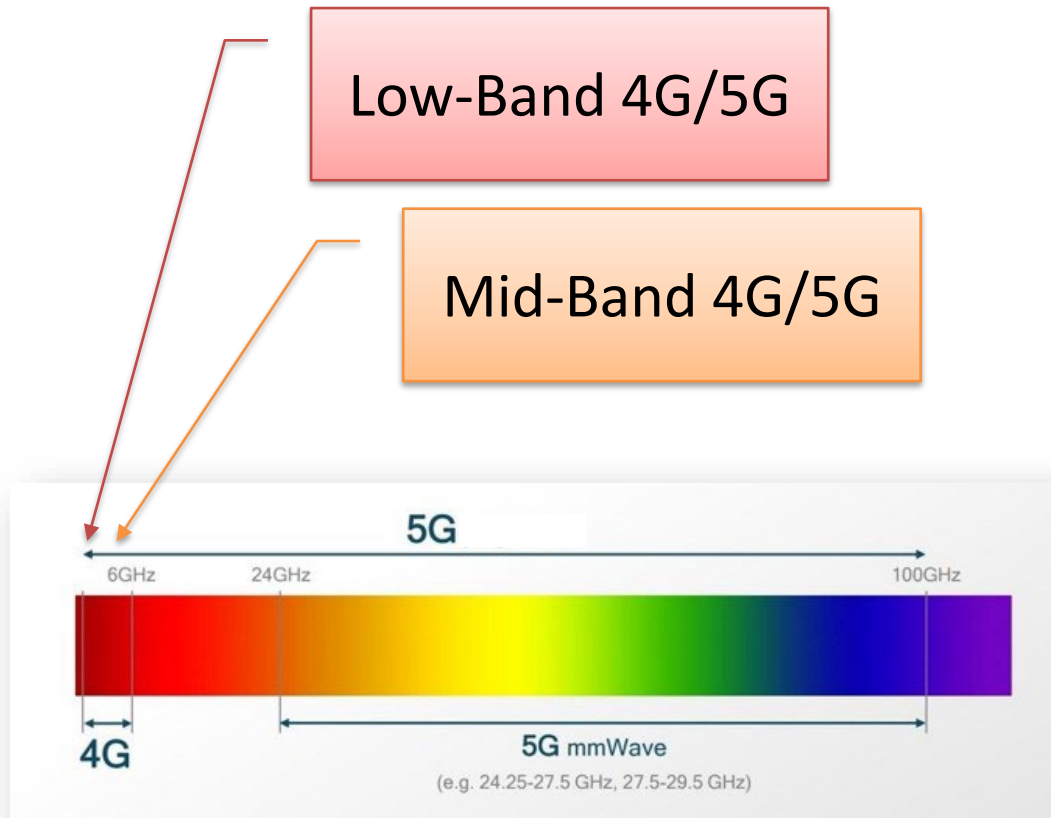
- Designed for more than just devices.
- Optimized for the IoT and other use cases.
- Supports fixed broadband (i.e. it's an ISP option/alternative).
- Capacity: Millions of devices per radio-sector.
- ***Key point: 5G is data-focused, so it must be located near users in order to be useful.***

Top 3 Concerns About 5G

- EMF Health Effects
- Property Valuation Effects
- Aesthetics

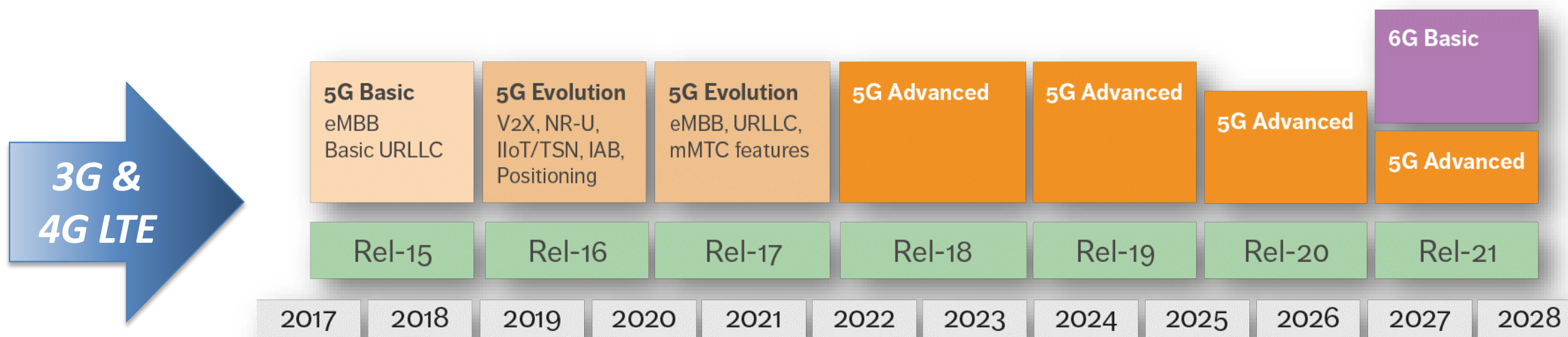


5G Evolution



- 5G is the system, 5G-NR (like 4G-LTE) is the information (modulation).
- Most 5G uses frequencies (low-band and mid-band) that have been in use (and studied) for decades.
- ***Key Point: 5G and millimeter wave are not interchangeable terms.***

The Road to 5G and Beyond



Is ~~5G~~ Electromagnetic Energy Safe?



EMF Health Effect Science

- Quantity of research done on low-band and mid-band EMF: 10,000+ studies
 - International Committee on EM Safety (www.ices-emfsafety.org) links over 4,000 quality peer-reviewed studies
 - EMF Standards: ANSI (1974), NCRP (1980's), IEEE C95.1 (1992 – 2019)
- Quantity of research done on millimeter-wave EMF: More than 100 studies
 - Millimeter wave is new to *cellular*, and is less studied, but the current body of evidence points to safety.
 - My position is that more studies are needed, to reassure the public, but there is no cause for concern right now.



Anti-EMF “Science”

- BioInitiative Report (BIR) is widely cited by opposition groups, but was widely debunked in peer reviews. Notable reviews that found major issues with BIR:
 - COMAR 2009 review (<http://bit.ly/3c923xV>)
 - Verschaeve 2012 (<https://bit.ly/3cVx9bC>)
 - Verschaeve's work is especially notable because he looks not only at the BIR, but at 33 different reports on EMF health effects.
 - Verschaeve reviewed several of the major no-harm reports and scored ICNIRP, IARC, and SCENIHR at 10/10, and scored the pro-harm BIR at only 3/10.



(Illustration by iStock/axel2001)

Property Valuation Studies

- 2005 survey by a realtor in NZ
 - Claimed a 20% reduction in valuations – but this was a *survey*.
- Scientific studies have not found this effect using objective data
 - JVSV 2012 (Macros – Data from MLS) : <http://bit.ly/cellsiteMLSstudy>
 - JVSV 2021 (Small Cells – Data from BKFS) <https://bit.ly/SCREstudy>
 - Valbridge 2018 (Boston, Dallas, Phoenix*, and Raleigh-Durham) : <https://www.valbridge.com/market-studies>
 - Maennig (Hamburg DE) and others...



* Valbridge - Phoenix found one location with a nominal 1% reduction, but also found *increases* in valuation for nearby properties

Property Valuation Economics

- Shifting demographics and economics will favor homes with good coverage
 - ***Key Point: Home buyers (esp. Millennials and Gen Z first-time home buyers) want better connectivity.***



Resources



- www.jointventure.org/wireless
- bit.ly/jvsv-telecom-hbook-v2
- bit.ly/EMFMediaCoverage
- bit.ly/cellsiteMLSstudy
- bit.ly/SCREstudy
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FEEDBACK AND QUESTIONS

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