Albuquerque, New Mexico

University of New Mexico PIT (Basketball Arena)

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the university of new Mexico

www.unm.edu

City within a city

- **Overview of Campus** The University of New Mexico (UNM), New Mexico's flagship university, is the state's largest public, four-year degree-granting institution. Located in Albuquerque with branch campuses in Los Alamos, Gallup, Valencia and Taos, UNM's total enrollment is 36,722 students , 6,000 staff, 1,000 faculty, 20,000 employed staff state wide and 160,000 active alumni.
- Founded in 1889 (125 Year celebration) as New Mexico's flagship institution, The University of New Mexico now occupies nearly 800 acres near old Route 66 in the heart of Albuquerque, a metropolitan area of more than 500,000 people. From the magnificent mesas to the west, past the banks of the historic Rio Grande to the Sandia Mountains to the east, Albuquerque is a blend of culture and cuisine, styles and stories, people, pursuits and panoramas.

20,000 port telephone system – VoIP (6,000), digital 8,000), analog (6,000) 500 trunks

2nd largest central office in new Mexico

Unm, university hospital, health sciences, branch campuses and non university agencies

University Hospital #1 Wired Hospital for the past 6 years

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City within a city

- Responsibilities 400+ buildings (UNM, UH, HSC)
  - Life Safety (Internal campus police department)
    - Code blue (100+)
    - Fire alarm (400+)
    - Intrusion (100+) – panic, entry, ring down
    - Elevator
    - 911 (20,000 extensions – analog , digital and VoIP)
    - Applications (Rave-guardian)
  - Analog, digital, IP end points, unified communications – softphones
  - SIP, TDM trunking
  - Cellular footprints – coverage indoor, outdoor issues with providers
  - 400 work orders, 200 trouble tickets a month - staff of six
  - Large, medium, small projects – same staff
  - Cost center 10M budget
  - IT 400+ employees
  - **WWW.unm.edu**

UNIVERSITY LIFE-SAFETY LANDSCAPE

- Campus 911 system (20,000 ports) – Analog, digital, VoIP
- Cellular 911 calls made from the University to Albuquerque PSAP transferred to UNM police
- Code blue emergency devices
- Fire alarm systems (400 panels)
- Intrusion systems
- Elevator systems
- Ring down systems
- Access control

Unm network Snap SHOT - enterprise

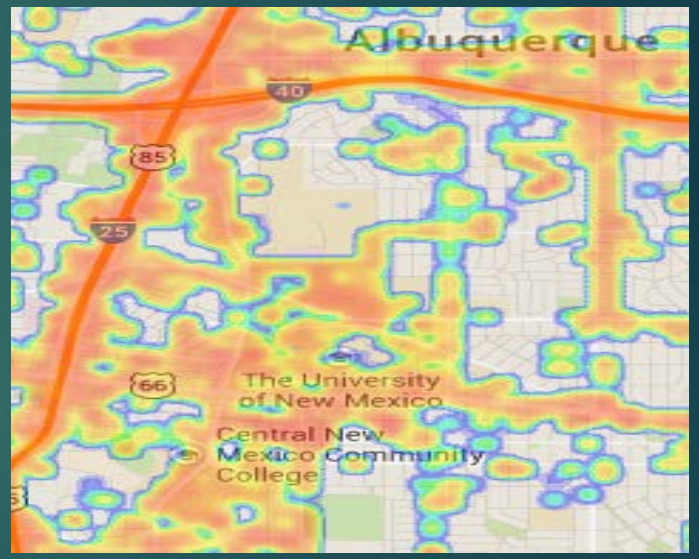
- Network infrastructure ensures that the UNM community can easily connect systems to the campus network and gain access to network-based voice and data services and the Internet. UNM relies on these services for:
  - Over 1,000,000 Voice calls per month, including 911 traffic, operator calls, acd- automatic call distribution AND auto attendant
  - Over 1,000 miles of network fiber – aging needs to be replaced
  - Over 10,000 miles of telephone cable – copper plant
  - Over 55,000 wired connections per day - IP
  - Over 18,000 wireless connections per day – IP
  - Cellular handsets 1000+ 50,000 at any given time on campus

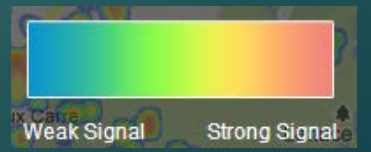
UNM LANDSCAPE CELLULAR – MACRO-SMALL CELL

- Crown castle
  - PIT, football stadium – Verizon, t-Mobile, AT&T
  - $2 million to build
- T-mobile
  - Chemistry
  - Cow on parking structure
  - Cow physics and astronomy
- AT&T
  - New macro on parking structure lomas
- Sprint
  - UH – generator plant
- Verizon
  - Small cell popejoy – parking , sub requirements
  - Macro parking structure - lomas
  - New – dane smith , south campus parking structure

Cellular lay of the land outdoor coverage

- Verizon (macro plus small cell)
  - New macro forthcoming two locations – main campus and south
  - Code blue and light design for small cell (5g) in progress
- T-mobile
  - Two macros – cow and permanent
- At&T
  - Macro
  - New small cell design for lighting – 5g in progress
- Sprint
  - Hospital only macro
  - New small cell design for lighting – 5g in progress
- Crown castle
  - Basketball and football arena Idas (Verizon, T-Mobile, AT&T)





How does cellular add value or just complicate the issue?

- Cellular communication has been one of the most disruptive technologies of the last twenty years
- Cellular service and infrastructure in buildings and venues is a very dynamic space
- Having a quality cellular connection has gone from a technical “nice to have” to a personal and professional must have
- 70% of all calls and 80% of all cellular data sessions originate inside a building
- Early days of cellular networks, the primary problem was getting coverage not capacity
- At the end of the day the goal is greater capacity to serve more cellular users who are accessing more data-intensive applications - Coverage is usually not the issue – capacity issues are

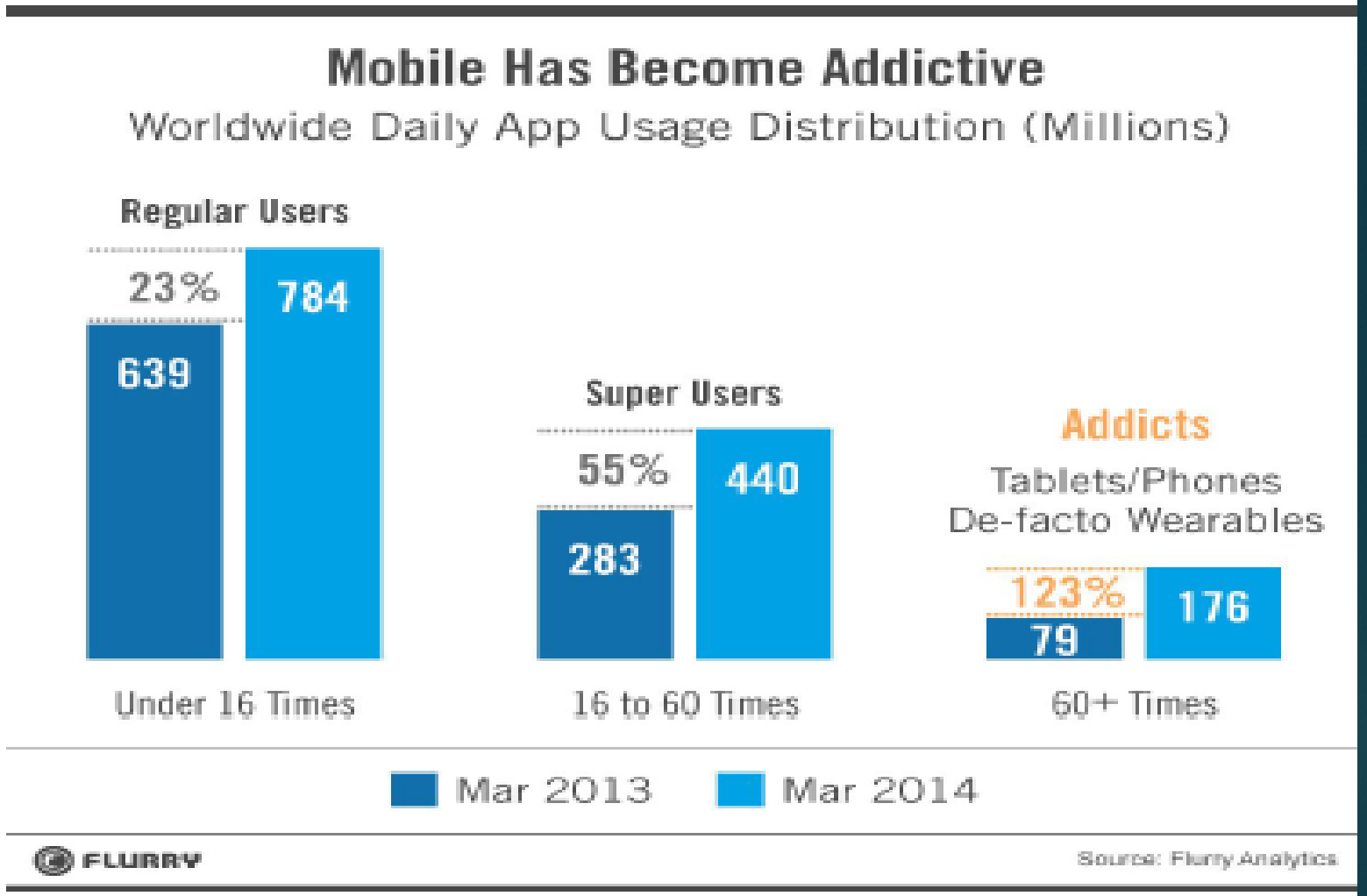
Many Reasons Why Cellular Matters…

- Access to Mobile Tools
- Student-Educator Interaction
- Student Social Network
- Campus 911 Security
- Campus Safety Channels
- Student Location Tracking
- Transparent Mobility
- Parent-Student Communication

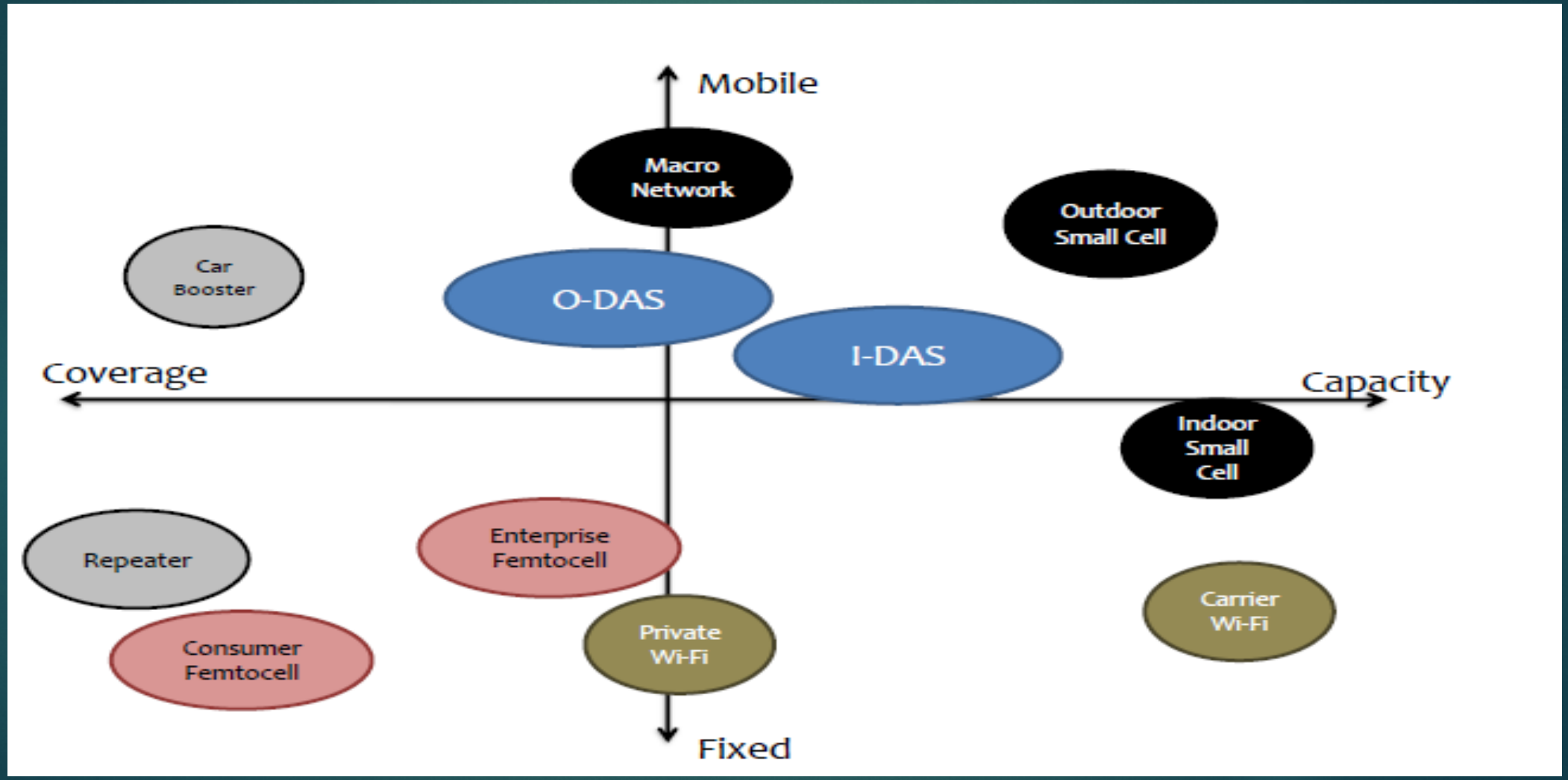
(It is the parent-to-student lifeline)

Mobile Broadband Trends

- Average consumer launches mobile app 10x per day
- 'Mobile addict' launches app more than 60x per day
- College students (18-24) over-index by 49% in mobile addict category



COVERAGE SPECTRUM – COVERAGE VS CAPACITY – MOBILE VERSUS FIXED – MANY OPTIONS



E-femto, s-femto repeaters ($500 Range) – requires exposure to gps-cell site for 911

Verizon IP Extender

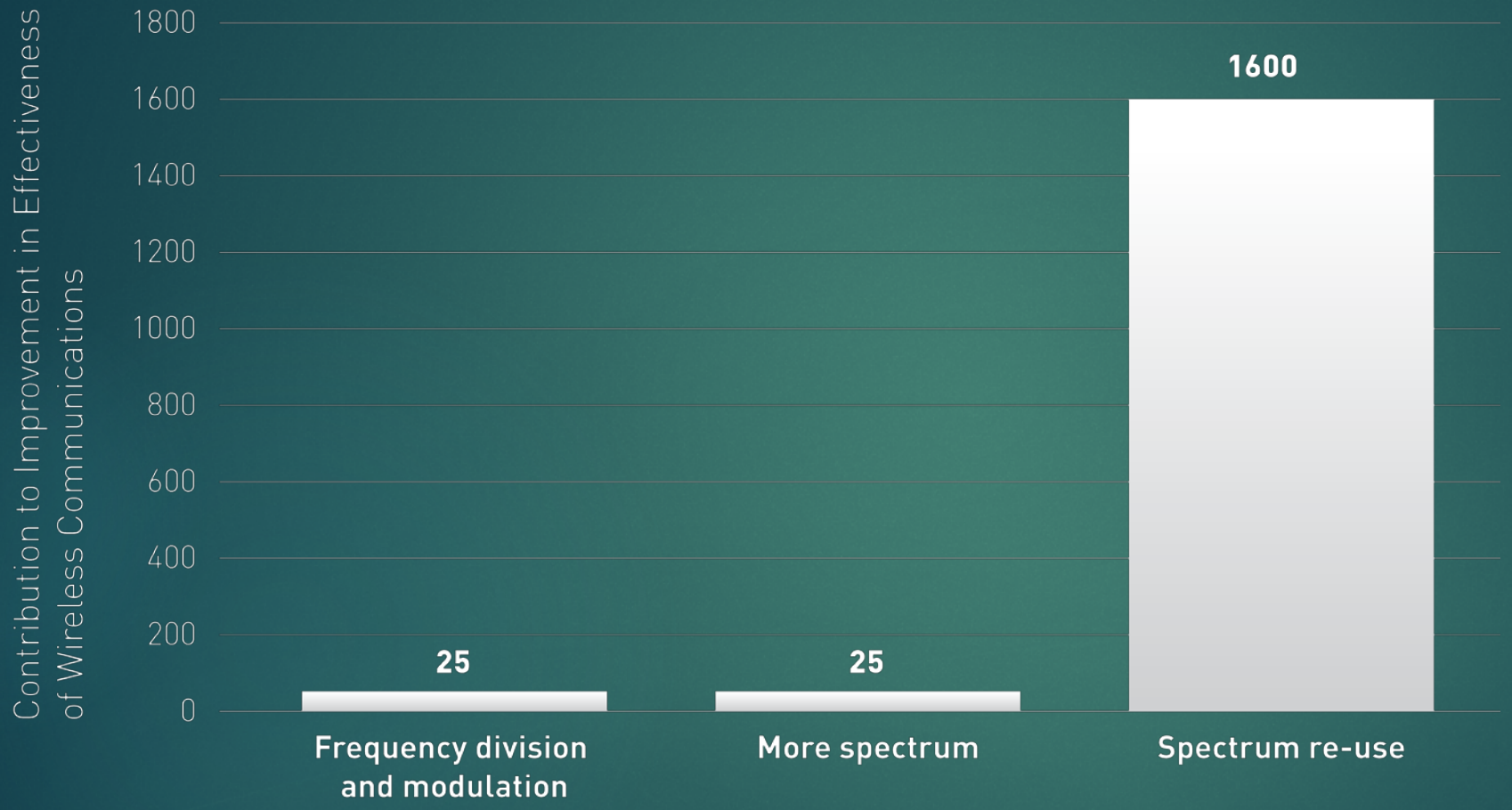
Cellular repeaters to WiFi or Wired IP

T-Mobile Extender

7 common mistakes universities make with cellular

1. Architech assume university has rf and support models in place for iDAS
2. New buildings low-e glass – no rf penetration – assuming desk phones can be disabled with 100% coverage
3. Idas is expensive to install, maintain and suport
4. Funding models are required
5. Cellular companies not interested in installing idas in buildings – no roi
6. If entertained the operators planning horizon is 12 to 18 months in advance and compete against new handsets or massive amount of data (superbowl)
7. Lack of dedicated resources to manage cellular – complex, challenging technology that requires consistent attention
8. First responders – firstnet, bda (building distribution amplifier) - states will mandate this at some point – finding the funding models and support

Improving Mobile Networks

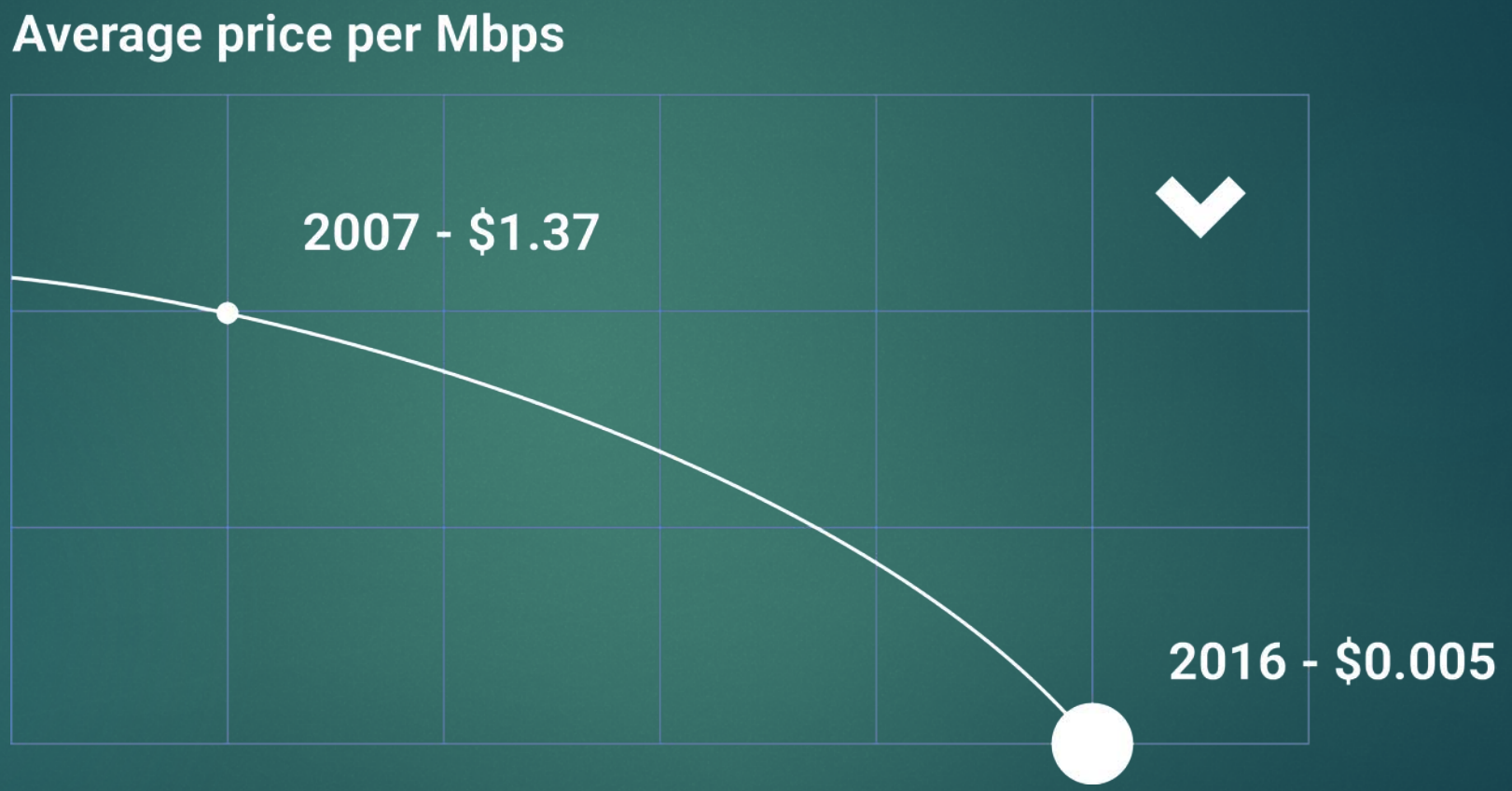


25x25x1600 = 1,000,000

Fold improvement over 45 years

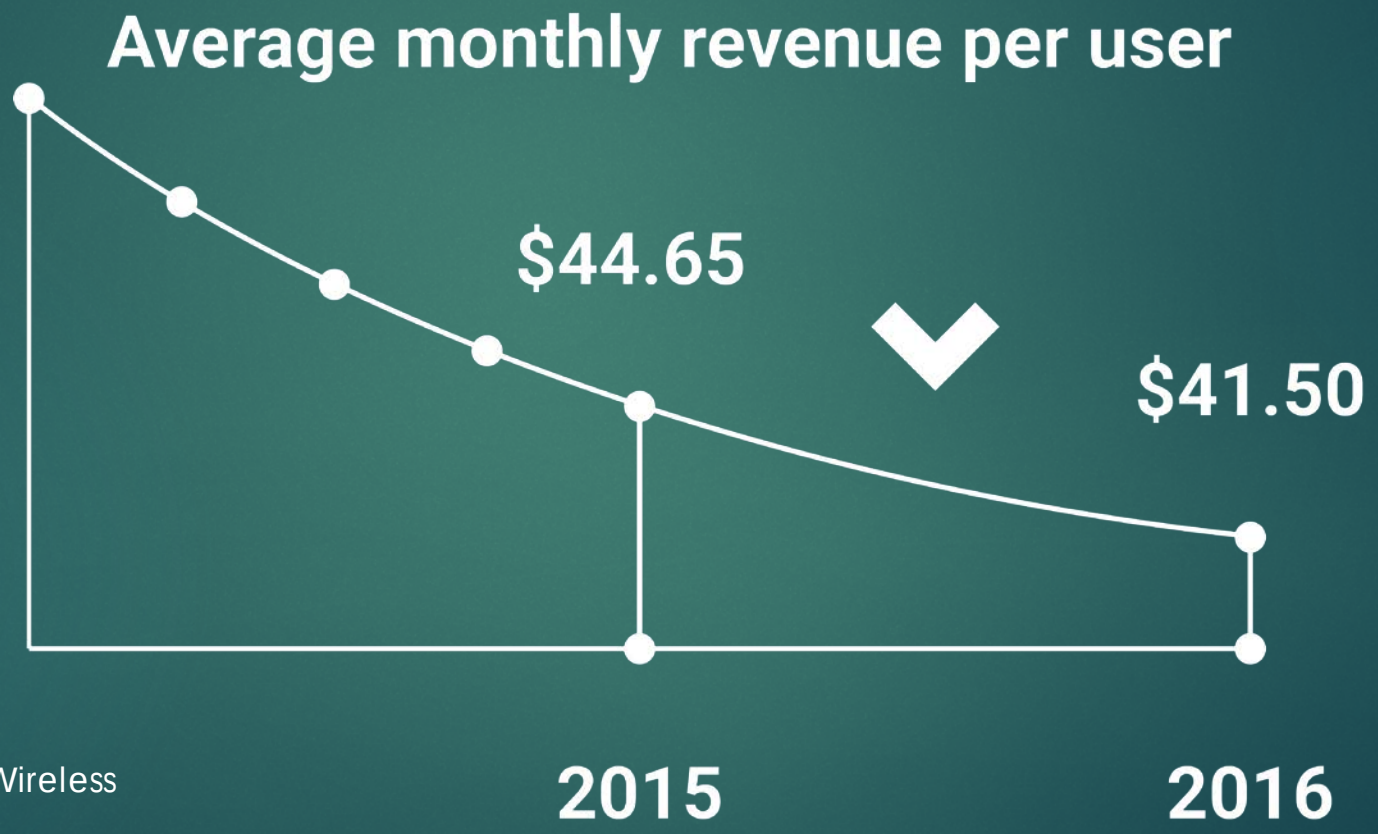
Source: MoffettNathanson

How Low Can It Go?



Source: FCC's "Twentieth Wireless Competition Report"

More Data for Less Cash

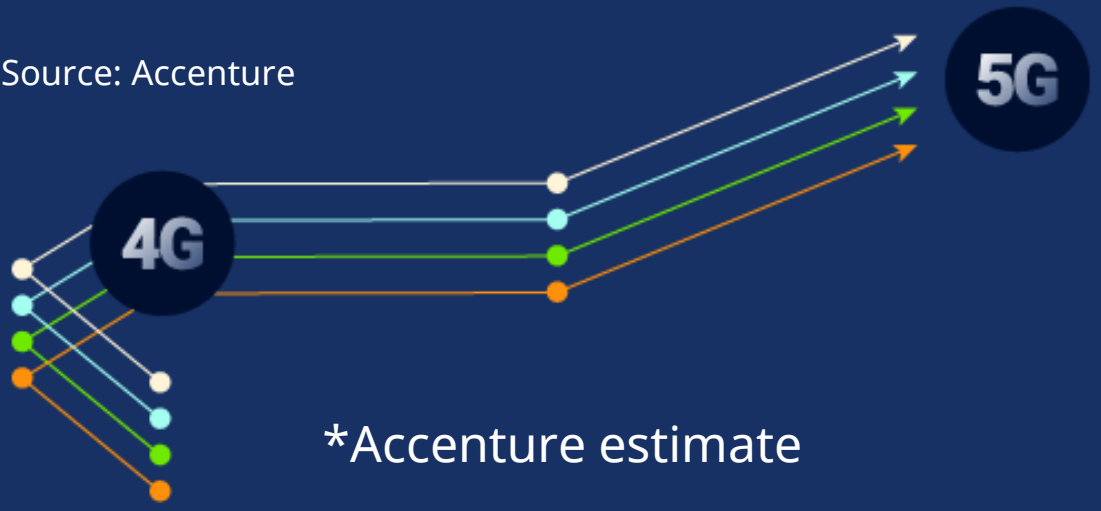


Source: FCC's "Twentieth Wireless Competition Report"

5G Momentum

- **$275 billion** opportunity
- **3 million** new jobs
- **$500 billion** boost to GDP
- **100 x more** antenna locations

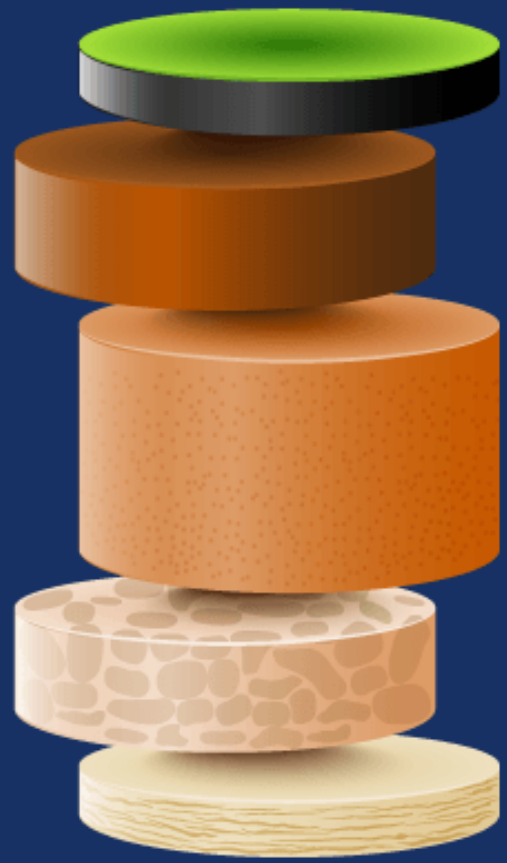
Source: Accenture



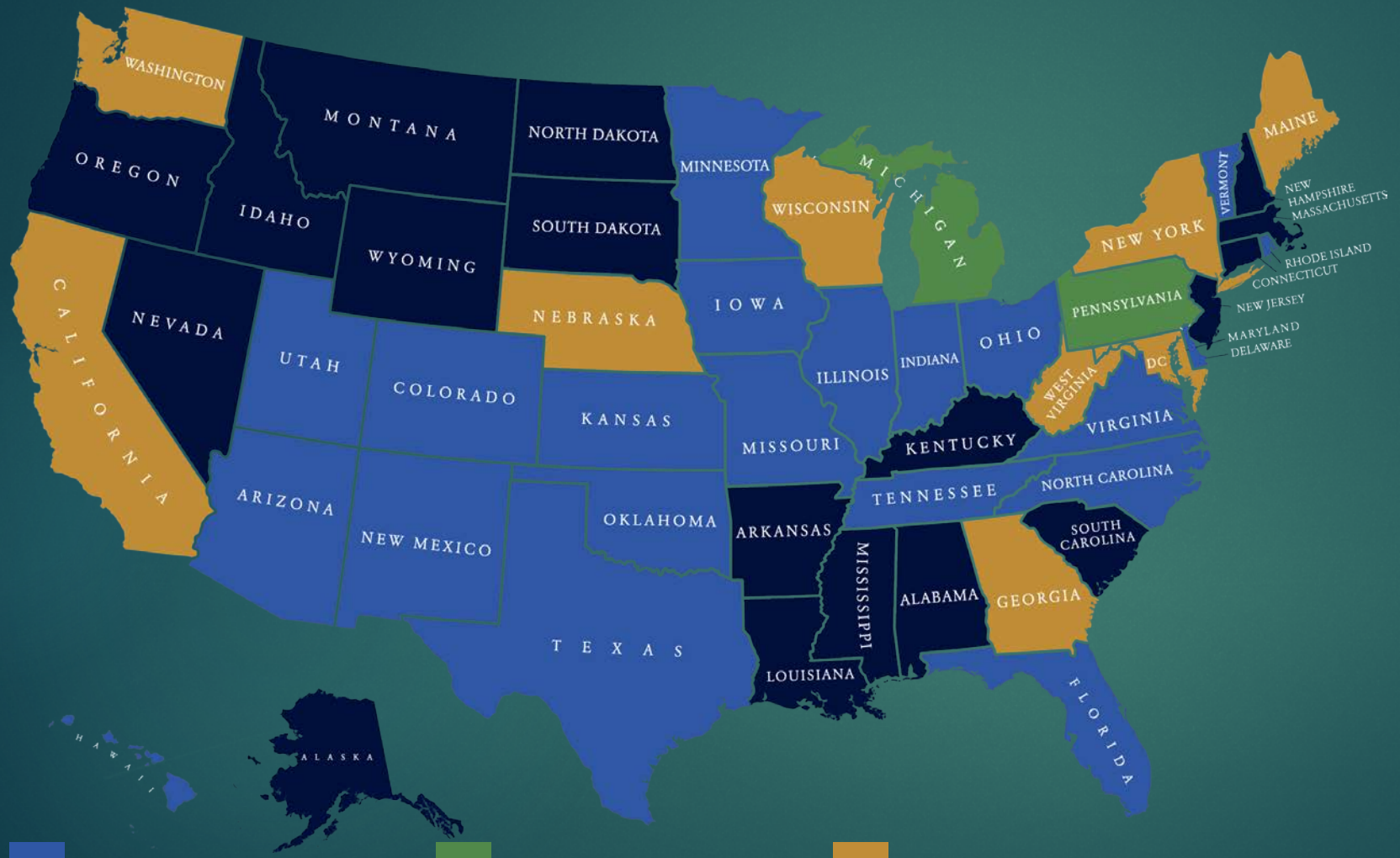
*Accenture estimate

A Shifting Landscape

- **M&A Activity**
  - AT&T/Time Warner
  - Sprint/T-Mobile
- **New Entrants**
  - Comcast
  - Google
  - Dish



Working in States



- 21 State Bills
- Michigan and Pennsylvania active
- States where bills failed continue to have local discussions in anticipation of the next legislative session
- Notables:
  - California
  - Georgia
  - New York
  - Washington

Small Cell Bills Enacted

Current Active States

2018 Bill Failed: on-going discussions to prepare for 2019 session

Thank you
Questions ?

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