CONTACT: Stuart Volkow | 310-752-3674 | svolkow@gmail.com  FRN **0013245733**

# *World Mobile Network Antenna Research and Development at UC San Diego*

## *Seeking FCC Experimental Special Temporary Authority*
### *for Rooftop Antenna Testing for Band 71*

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## Stuart W. Volkow
Project Manager
2057 Village Park Way, #204
Encinitas CA 92024 | 310-752-3674
FRN:  **0013245733**

**Office of Engineering and Technology, FCC**
Application File#: 2489-EX-ST-2023  |  Confirmation#: EL146896

**Antenna Site:**

  9500 Gilman Drive
  UC San Diego, Atkinson Hall, Room 2318
  La Jolla CA 92093
  **Rooftop antenna Garden, Atkinson Hall, UC San Diego**:
  Height Above Ground Approximatey 360 ft.      32'52"59 N 117'14"05 W

## Synopsis

World Mobile Networks LLC, has a research and development lab at UC San Diego at the Qualcomm Institute ( qi.ucs.edu ). The Qualcomm Institute is housed in Atkinson Hall, and includes a rooftop antenna garden with connectivity into the circuits Lab below. It is designed to accommodate RF development and testing. QI affords access to expert collaborators, testing equipment, and prototyping resources including electronic and machine shops.

**Reason for Experimental STA**

We are designing, fabricating and testing unique antenna elements and arrays for improving range and capacity in band 71 for mobile cellular broadband communications. The mission is to make these antennas efficient and light-weight so that they can be deployed on traditional structures as well as tethered aerostats to reach underserved areas. Since we are not licensed commercial 4G LTE operators, we need the STA to test.

**What We Seek To Accomplish**

Off the shelf radios from Abside and/or Erickson wll be used.

Production units can be omni-directional. Test antennas will be directional with approximately 45 to 90 degree beam angles. We will be testing for range and signal-to-noise ratios.

## Budget and Schedule

This is a 12 month project privately funded by World Mobile Networks LLC, the U.S. subsidiary of World Mobile Group ( https://worldmobile.io/en ). We have spent the past 4 months on prototypes and bench tests and are ready to field test from the roof.

## People

- Stuart W. Volkow, Project Manager, http://www.linkedin.com/in/svolkow
- James Tag, Architect and RF Engineer, https://www.linkedin.com/in/jamestagg/
- Professor John Stanford, Antenna Engineer/Designer, https://jacobsschool.ucsd.edu/people/profile/john-sanford , https://www.linkedin.com/in/john-sanford-06b4b94/
- Matthew Bracamontes, Staff Engineer, https://profiles.ucsd.edu/matthew.bracamontes
- Paid Student Interns from Mechanical and Electrical Engineering
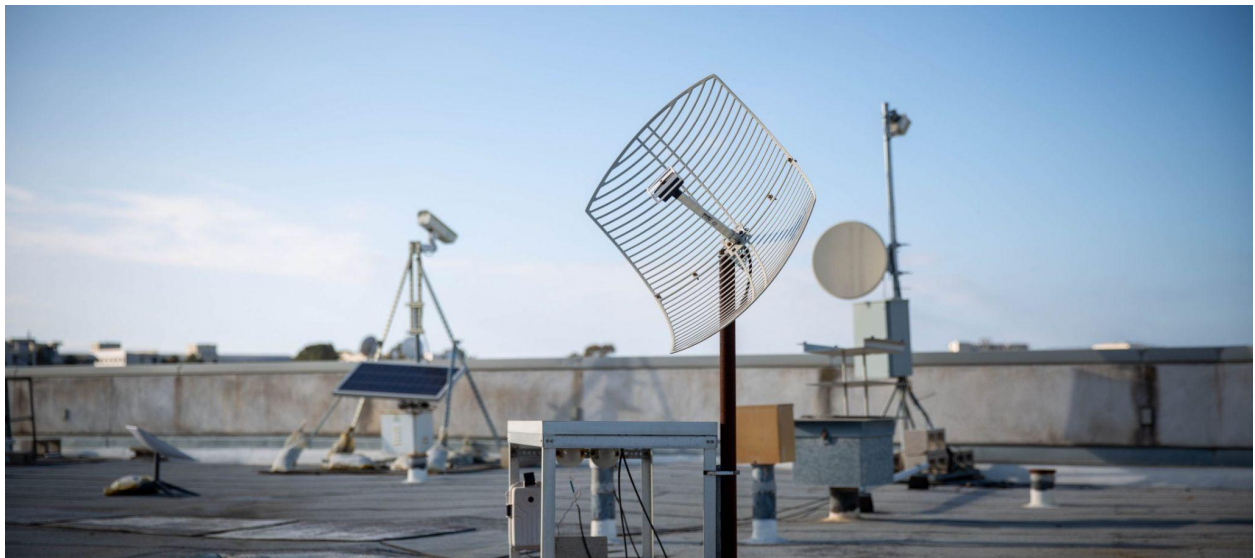
**Prototypes:**



**Rough Design for Final Product:**
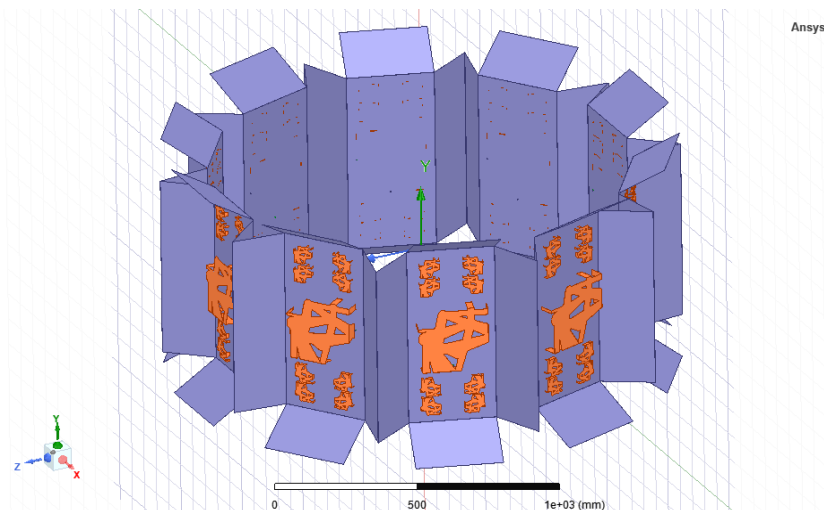
## Site of Antenna Project

Atkinson Hall, UC San Diego rooftop antenna garden connected to 5th floor circuits lab.

## The Problem We Are Solving For

Full participation in the global 24/7 connected economy requires robust, reliable mobile service. Increasingly this also means broadband data. In the developed world the hunger for mobile broadband will require a 40% increase in capacity within the decade. In urban areas buildings serve as mobile phone repeater towers, and capacity can be increased by upgrading existing equipment and infilling by mounting new equipment on more buildings. Satellite systems from companies such as Starlink and ViaSat provide additional global broadband coverage but remain expensive for most people.

Despite excellent worldwide mobile cellular coverage, large geographic areas exist around the world with no coverage or poor broadband coverage. Many of these areas are less developed and rural, far from urban centers, with few or no tall buildings that can accommodate mobile cellular repeater equipment. Constructing towers is expense, and the number of towers needed for adequate coverage in many parts of the world is impractical.

References:
*International Mobile 3G, 4G, 5G coverage:*
*https://public.tableau.com/app/profile/ituint/viz/ITUFactsandFigures2021/MobCoverage03*