



Bridging the Rural Broadband Gap

Ryan E. Guerra, Ph.D.

Founder & CEO

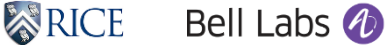
Introduction



Ryan E. Guerra, Ph.D.

Founder & CEO

- Rice Ph.D. electrical engineering
- Built world's first residential Television White Space link
- Principle Investigator for Skylark's research grants



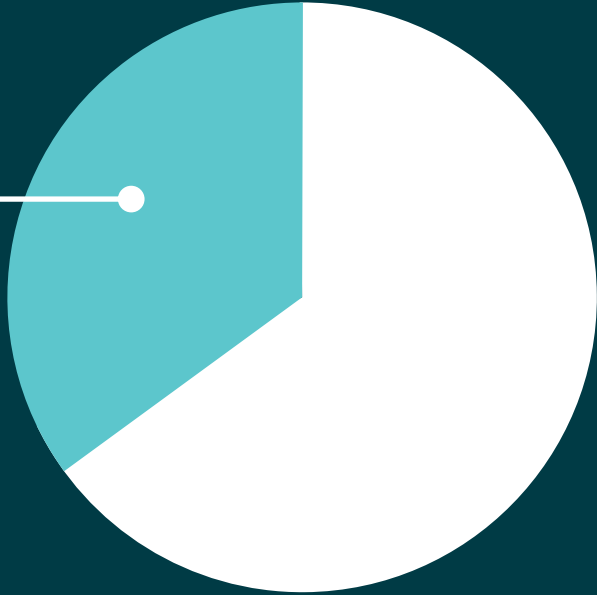
Clayton Shepard, Ph.D.

Founder & CTO

- Rice Ph.D. electrical engineering
- Built world's first Massive MIMO system in 2011
- Faculty lecturer at Rice University



Argos v2



- 39% of Americans in rural areas lack broadband access.

16.8 million households at \$55/mo is a **\$10.8 Billion** new US market for ISPs.



Today's network infrastructure is too expensive for rural markets.

Revenue: ↓ 10x

CapEx: ↑ 2x

OpEx: ↑ 3x

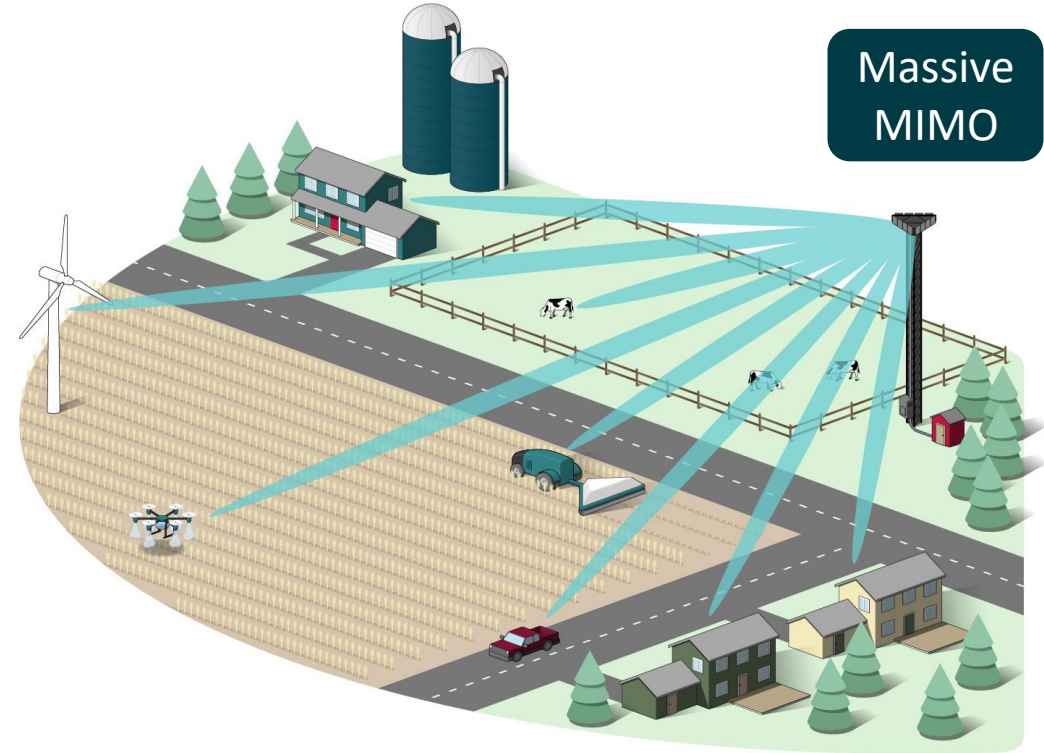
(Compared with urban areas.)



Solution: Faros[®] Massive MIMO Beamforming



100 Mbps per 20 MHz channel
5 bps/Hz



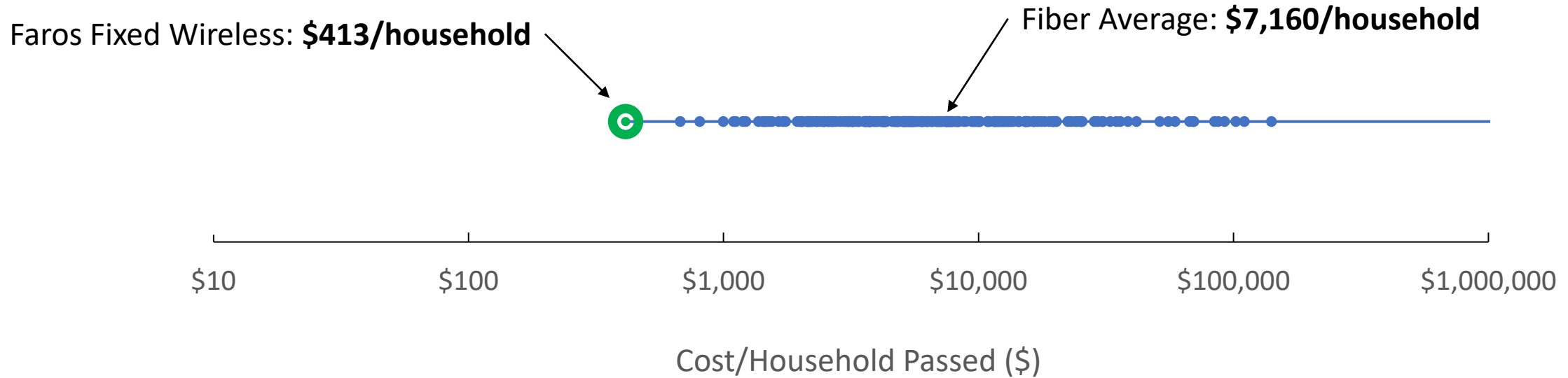
$100 \times 8 = \underline{800}$ Mbps per 20 MHz channel
40 bps/Hz

Skylark's Massive MIMO beamforming serves up to **32x more** users at **longer** range.

Cost of Rural Broadband: USDA ReConnect



CapEx: 243 projects across rural US, 2019-2020



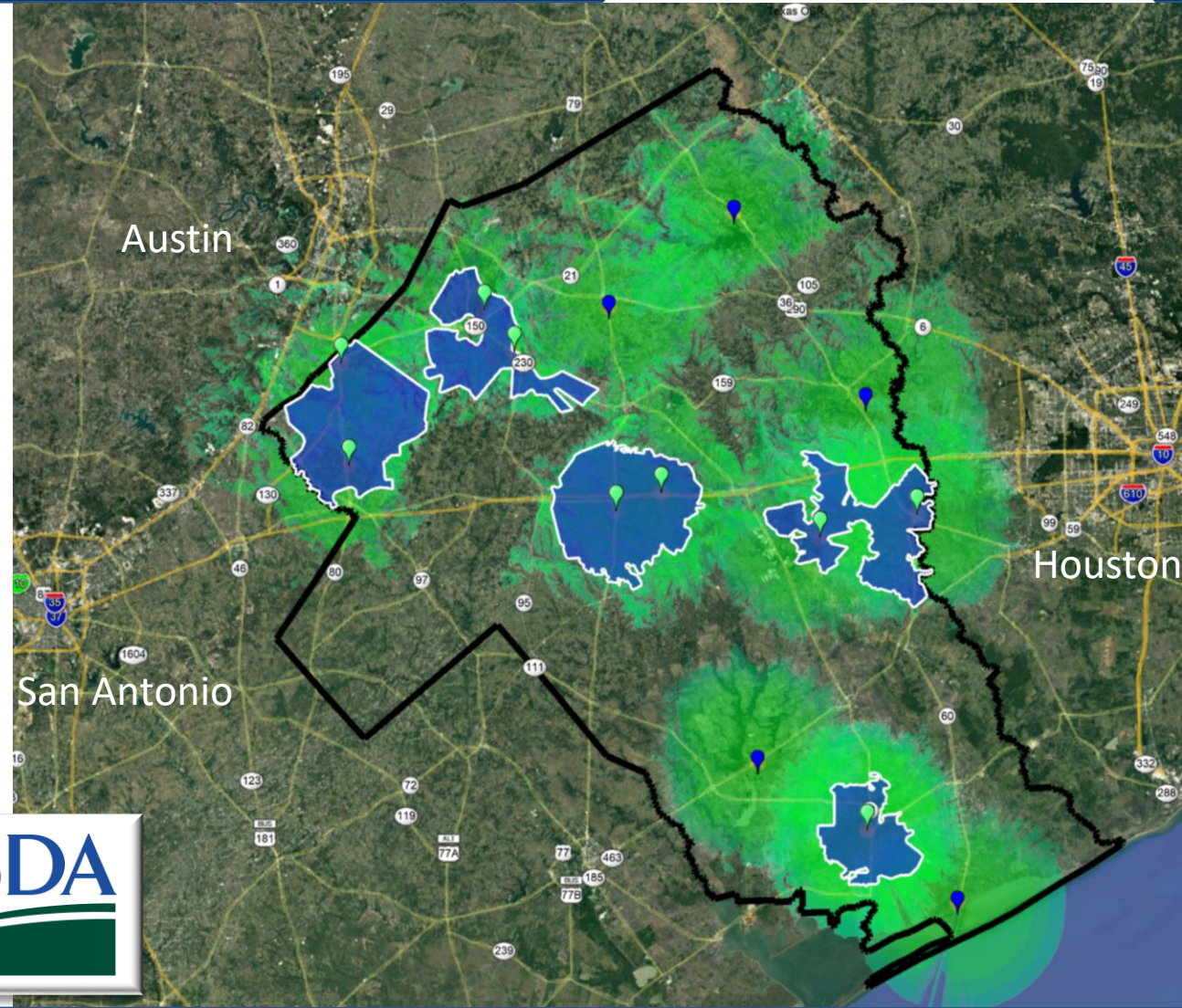
Source: public ReConnect program data

Skylark's Texas ReConnect Project



- \$10M budget (100% loan)
- 22,684 households *passed*
- 6,773 households served
- Status: *pending review*

Let the USDA know you want broadband in your county!



Rural Massive MIMO Base Station

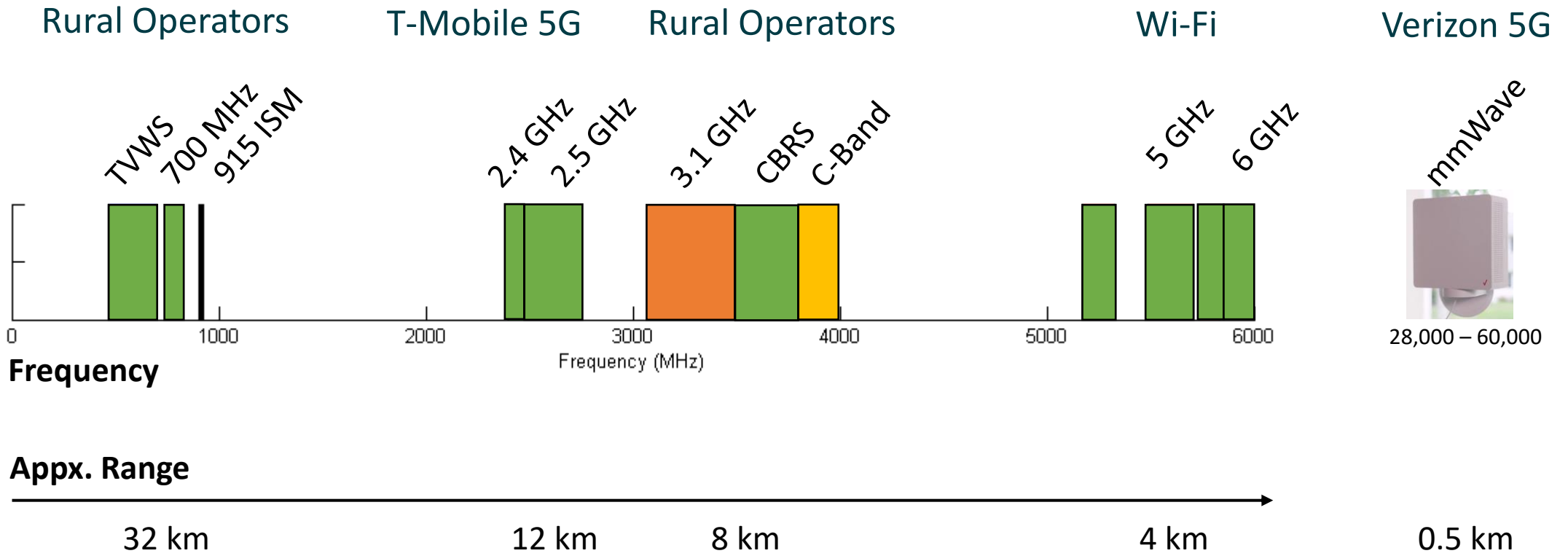


Faros 64T x 64R

Subscriber Installations



Mid-Band & Low-Band Spectrum for Rural

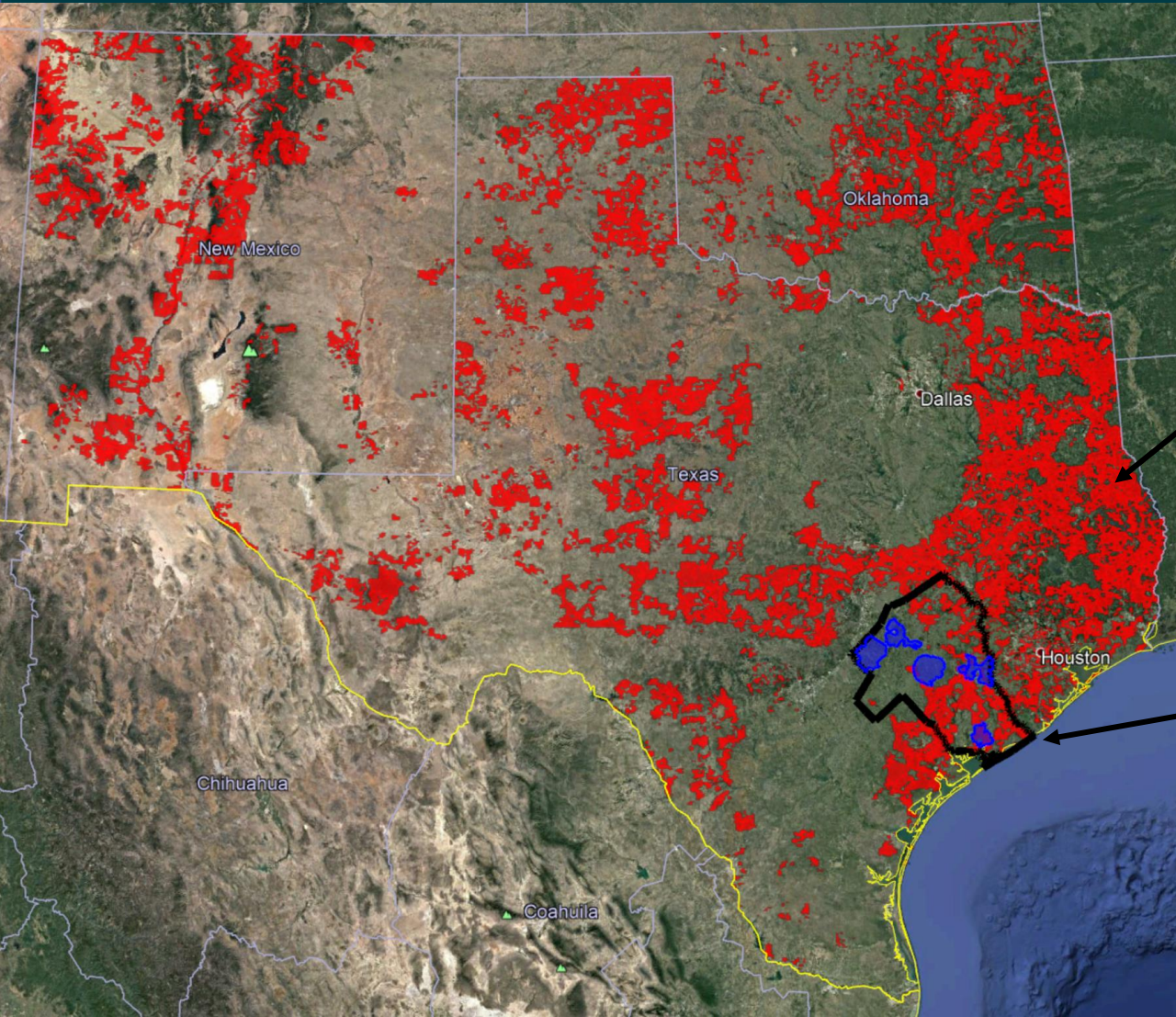


Spectrum Status

- available
- 2020 auction
- pending

- FCC Auction 904: \$20.4Bn in subsidy to connect rural areas
 - Phase I: \$16 Bn (Oct 2020)
 - Phase II: \$4.4 Bn + Phase 1 leftovers (TBD)
- Nationwide reverse auction for 10-year subsidy contracts
- Expectations:
 - Offer voice and broadband service commercially
 - 40% of locations served by year 3, additional 20% by end of years 4 and 5
 - Likely 50/5 Mbps or 100/20 Mbps service

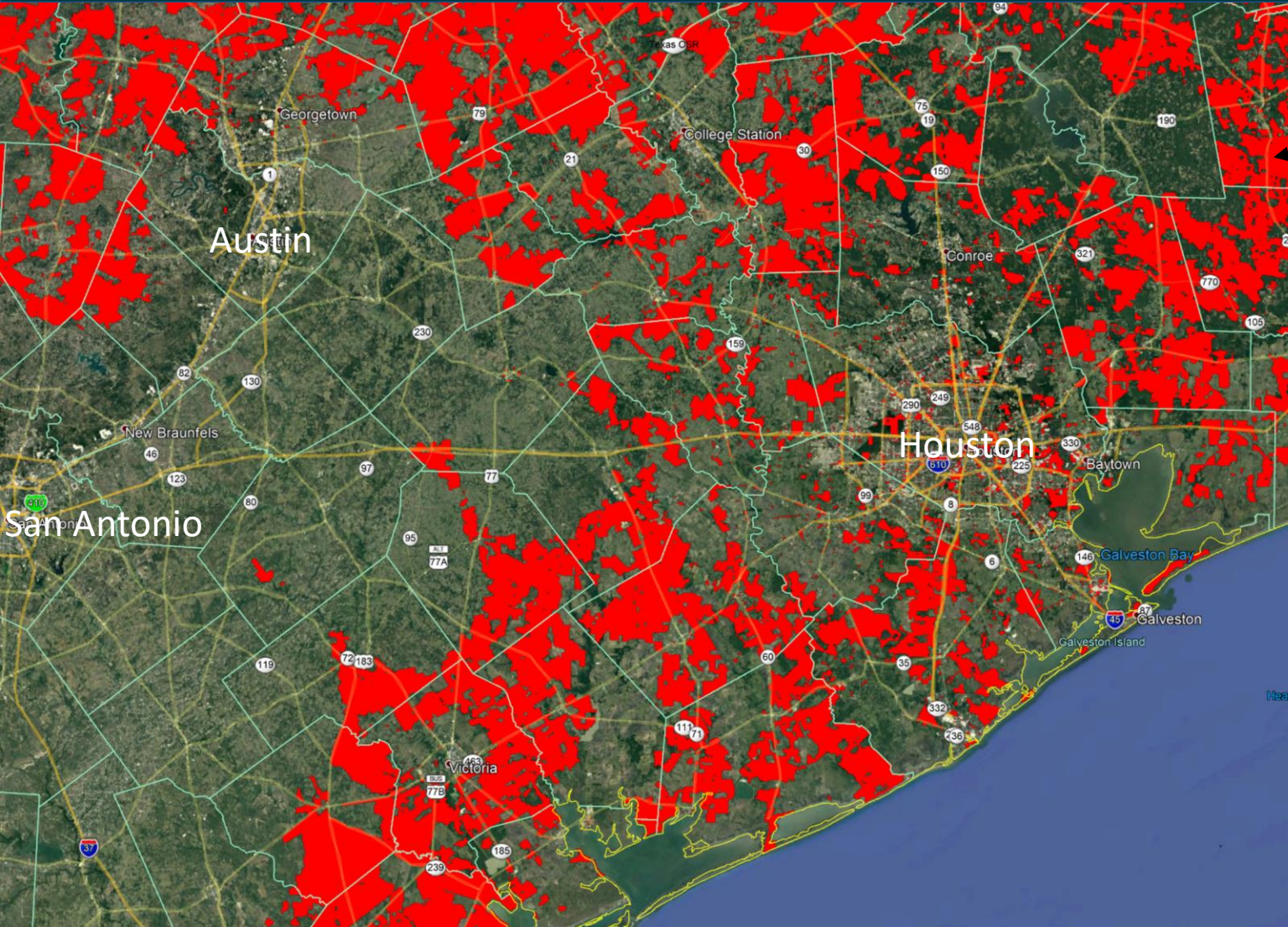
Texas RDOF Subsidy Regions



RDOF Subsidy Areas (red)

Skylark's USDA ReConnect Project Area

H-GAC RDOF Subsidy Regions



RDOF Subsidy Areas (red)

We're looking for service providers or partners interested in owning/operating high-speed broadband networks in 2021.

Please reach out through our website or via email!

<https://skylarkwireless.com>

info@skylarkwireless.com

Houston Chronicle Profile



<https://www.houstonchronicle.com/business/texas-inc/article/houston-startup-rural-internet-access-tv-channels-15476539.php>