# Introducing . . . GIGABIT 1

Large portions of both developed and especially developing economies remain underserved in an ongoing pandemic that makes real broadband more essential than ever. Copper-based fixed access networks are increasingly exhausted. Efforts to improve supply with fiber have been throttled by prohibitively high costs and installation complications. Wireless alternatives continue to fail in the face of the significant technical challenges in fiber-class fixed access, including pervasive obstructions, spectrum scarcity, interference, changing conditions, and unworkable deployment models.

Tarana innovation has solved all these problems. Our Gigabit 1 platform (G1) is powered by the results of more than ten years of focused R&D, and crafted from its custom silicon up to its cloud-based service automation with a completely fresh approach to fixed wireless. Extensively validated by tier-1 operators and well proven in mass-scale networks, our fundamental advances in multi-radio performance completely transform the economics of delivering gigabit-class access.

**Fast broadband is more essential than ever.**
**Getting it to the home is hard.**
**We've made it easy.**

> **Fiber quality**

> **In free, unlicensed spectrum**

> **At massive scale**

## TARANA
BROADBAND REINVENTED
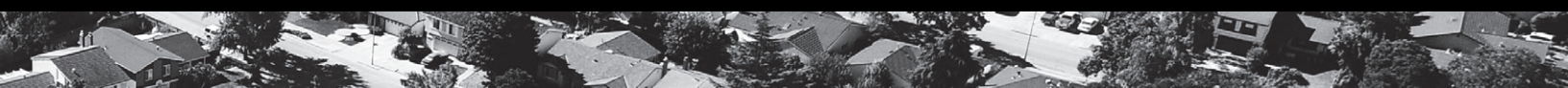
## Residential Coverage

Sacramento, California Metro Area Example

**G1 Range
3 GHz**

**Households
Passed**

61,100

21,700

10,100

**G1 Range
5 GHz**

22,800

8,100

3,700

5G mm-wave
28 GHz
(for reference)

68

**Cell-Edge Mbps**

━━━ 800

━━ 500

━ 200

25m tower, 1,000 HH/km²
Erceg B propagation
Sacramento, CA example

1km



# G1 Highlights

> Up to 800 Mbps aggregate throughput per link

> Up to 9.6 Gbps capacity / site / 80 MHz channel (using free, unlicensed spectrum)

> 1024 users / site (256 / sector)

> Industry-first cancellation of unlicensed-band interference

> 3 or 5 GHz

> Simple cellular deployment model

> ~2x cellular range in NLoS or LoS conditions

> Compact, integrated base node and low-cost remote node

> Enhanced TR101 Broadband Forum network architecture (no complex packet core required)

> Comprehensive cloud suite for planning, zero-touch config, monitoring, SDN management, and support automation

> Software-defined radios, enabling automated, cloud-managed performance upgrades

**Degree of Link Obstruction**

─ 35 dB EPL

NLoS

nLoS

─ 0 dB

Notes:
Metrics sourced from RNs via the Tarana Cloud Suite.
Excess pathloss = measured minus free-space.

# A simple IP-based network architecture, supported by the Tarana Cloud Suite, enables multiple subscriber access models for highly cost-efficient residential and enterprise service.
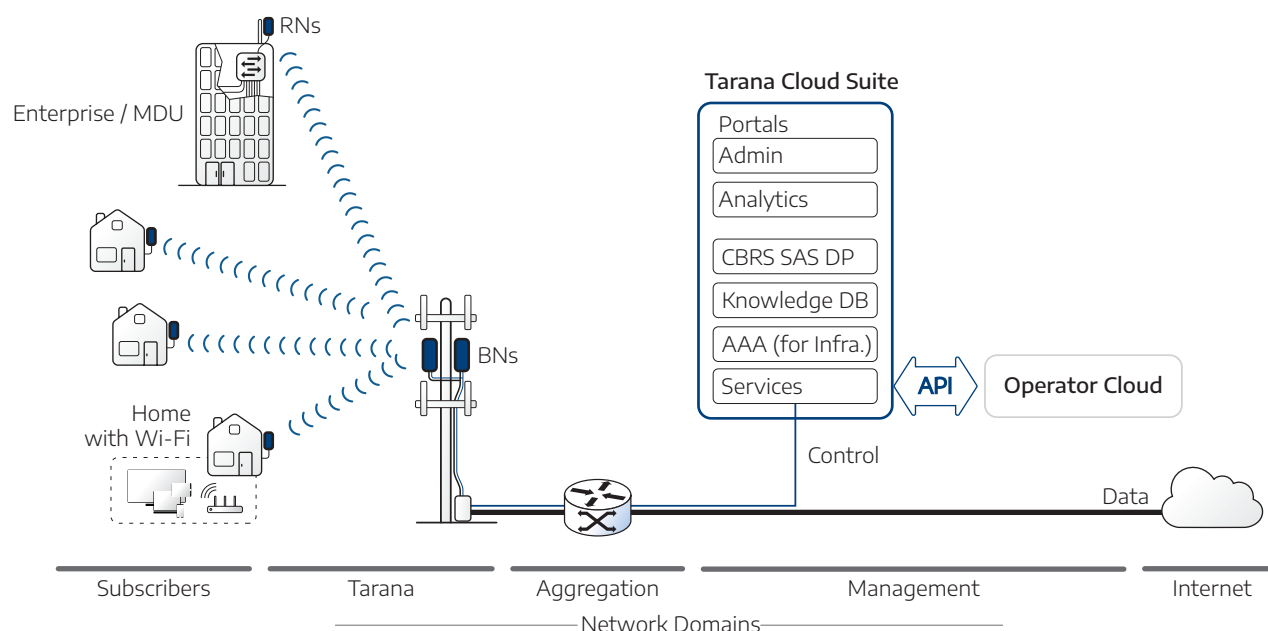


# The Tarana Cloud Suite powers efficient network planning, zero-touch provisioning, SDN management, and support automation — featuring...

| | |
|---|---|
| **Subscriber Service Activation** | API support for zero-touch deployment configuration, with minimal to no changes on directly connected infrastructure<br>Infrastructure authentication<br>QoS management<br>Speed test tools |
| **Management and Maintenance** | 24 x 7 x 365 KPI monitoring and management, including long-term historic data<br>Fault logging, correction, and reporting<br>Firmware and configuration management automation with pre-provisioning support<br>End-user login and management with role-based access |
| **Radio and Network Planning Integration** (US only, requires HH data) | Spectrum management — CBRS SAS domain proxy<br>Coverage footprint prediction (heatmap in Google Earth) and capacity of each cell or sector<br>Cell densification analysis<br>Household-level service-level estimation to help sales and business teams identify and target customers |
| **Fault Management and Network Analytics** | Alarms and historic events with e-mail alerts<br>User-defined threshold-based alerts<br>Alarm correlation, capacity expansion, anomaly detection |
| **REST API for Carrier System Integration** | Device inventory, and network topology<br>Subscriber provisioning and billing integration<br>Geo-mapping information |

# Tarana G1 System Specifications

| | | |
|---|---|---|
| Radio Network Elements | | BN: Base Node |
| | | RN: Residential Node |
| Topology | | Scheduled, concentrated multi-point |
| Maximum # of Users | Per BN | 256 |
| | Per Site | 1024 (4BNs) |
| Channel Bandwidth | BN | 80 MHz (2 x 40MHz) |
| | RN | 80 MHz (2 x 40MHz) |
| Aggregate Throughput (UL + DL) | Per Link | 800 Mbps |
| | Per BN | 2.4 Gbps |
| | Per Site | 9.6 Gbps (4 BNs) |
| Duplexing | | TDD |
| Downlink/ Uplink Ratio | | Configurable 2:1 or 4.5:1 (network-wide) |
| Modulation | | QPSK 1/2 to 256 QAM 7.35/8 UL/DL |
| MIMO Streams Per Link | | 1x1, 2x2 |
| MU-MIMO Streams at Aggregation Point | | 6 MU-MIMO streams per BN |
| | | 24 MU-MIMO streams per site |
| Spectral Efficiency | | 30 bps/Hz per BN75 - 90 bps/Hz per band, configuration dependent |
| Range (full rate, frequency dependent) | NLoS | up to 3 km (Note. This depends on vertical asset height, frequency band, morphology, and target cell-edge data rate.) |
| | LoS | up to 15 km (likewise) |
| Recommended Frequency Reuse Factor | | Universal frequency reuse (k = 1) |
| | | Enabled by advanced self-interference cancellation |
| Form Factor | BN | Outdoor micro enclosure (fully-integrated antenna, RF, and baseband) |
| | | 4 BNs for 360° coverage |
| | RN | Outdoor, single enclosure (fully-integrated antenna, RF, and baseband) |
| Beamforming | | Auto-convergent, retro-directive |
| Interference Management | | Self-interference cancellation, |
| | | Advanced Burst Interference Cancellation (ABIC) |
| Scheduler | | Advanced 4D frame-based scheduling |
| Frequency Support | | 3.550-3.700 GHz (US CBRS) |
| | | 5.150-5.250 GHz (FCC/ISED) |
| | | 5.725-5.850 GHz (FCC/ISED) |
| Latency (1-way avg) | | < 5 msec |
| Model Numbers | BN 5GHz | G1-BN5ASI002 |
| | BN CBRS (Cat B) | G1-BN3ASI001 |
| | RN 5GHz | G1-RN5ASI002, G1-RN5ASI012, G1RN5ASI012 |
| | RN CBRS (Cat B) | G1-RN3ASI001, G1-RN3ASI011 |
| Compliance | | RSS-247, FCC 15E, FCC Part 96, WINFF-TS-0122 |
| Safety | | IEC 62368-1, IEC 60529, IEC 60950-1, IEC 60950-22 |
| Tarana Cloud Suite | | Scalable Microservices based multi-tenant network management |
| | | Zero-touch provisioning and control of radios with streaming telemetry |
| | | Firmware and configuration management |
| | | 24x7x365 KPI monitoring and management |
| | | Fault management and historical events |
| | | Network Analytics |
| | | SAS-Domain Proxy |
| | | Northbound Rest-API for Customer and operator portal (B/OSS) |
| Interfaces | BN | Dual 10-Gbps SFP+ and one 1-Gbps data interfaces |
| | | Additional 1 Gbps mgmt Ethernet interface. |
| | | -48V DC Power |
| | RN | 1 Gbps Ethernet interface, with PoE support |
| HxWxD (inches) | BN | 16.4 x 21.2 x 4.6 in. |
| | RN | 11 x 12.5 x 3 in. |
| Weight (lb.) | BN | 42 lbs. |
| | RN | 7 lbs. |
| Power Consumption (Typical) | BN | 275W |
| | RN | 35W |
| Mounting | BN | Saddle clamp, band clamps for pole mount (2-3/8" - 5" OD) |
| | RN | Band clamp for pole mount (1.5" - 2.5" OD) |

Specifications subject to change without notice.