

Use Case 2: Urban Connectivity

Multi-gigabit last mile connectivity in dense communities, backup to fiber

Challenge

Urban networks must deliver massive throughput for modern applications while maintaining reliable service into dense neighborhoods located off the established fiber routes. Traditional approaches fall short:

- **Capacity gap:** Bandwidth-intensive applications — such as video streaming, autonomous devices, AI-driven systems, and edge computing — exceed the capacity of current backhaul networks, creating data bottlenecks.
- **Coverage gap:** Low-income multi-dwelling units often reside off the fiber grid, forcing residents onto expensive or unreliable alternatives.
- **Permitting delays:** Trenching and pole attachment approvals can take months, delaying network upgrades.
- **Infrastructure constraints:** Saturated bandwidth conduits and limited right-of-way stall new fiber builds.
- **Spectrum constraints:** Microwave and millimeter wave (mmWave) links in urban areas experience significant congestion and interference.

Solution

Taara Lightbridge delivers high-capacity connectivity at the speed of light. With mean latency under 5 ms, Taara Lightbridge delivers data faster than fiber optic cables! Operating in the optical frequency enables providers to build high-capacity urban mesh networks with multiple wireless optical links, scaling to 100 Gbps and beyond.

- Lightweight terminals can be mounted on poles, transit stations, rooftops, or sides of buildings, and providers can activate service within hours.
- Hybrid architecture allows automatic failover of priority traffic to fiber or radio, ensuring uninterrupted connectivity in dense urban areas.

BENEFIT	OPERATOR IMPACT
Rapid deployment	Operational in hours, instead of months or years
Cost efficiency	Fraction of the CAPEX of new fiber builds
Pair with high-speed last mile	Unlocks fiber-to-the-home and ngFWA growth, enabling new service tiers
Ultra-low latency	< 5 ms latency, faster than fiber
Scalability	Multiple links scale to 100 Gbps+ accommodates growing data demand
Unlicensed spectrum	Optical spectrum is uncongested and unlicensed

In a recent four-week proof-of-concept in San Francisco, GFiber deployed a 4.5-mile Taara Lightbridge link between two buildings. The trial delivered a rock-solid 20 Gbps connection on clear days with zero packet loss, sub-millisecond latency, and seamless performance outperforming traditional mmWave and microwave radios.

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Our pilot program provided valuable insights into how this cutting-edge technology performs in an urban environment. As Taara continues refining its approach, we’re excited to see how innovations like this could shape the future of connectivity.

James Alexander, Network Engineer, GFiber

