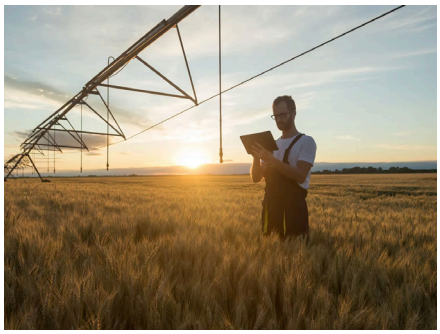
Case Study

Smart Cities

Deploying Smart City Assets Driven by Edge AI Optimization

Asset Integrated Infrastructure: Featuring Concepts of Edge AI Architectures, Web 2.5, and Social Impact

Tradewinds Networks Delivers Scalable Private Network Technologies Powered by Intel® Xeon® 6 SoC CPUs for Connectivity and Powerful Edge AI Secured by GuardTower™ Proactive Cybersecurity



In an era where connectivity is a fundamental human right, the collapse of the Affordable Connectivity Program (ACP) and the slow realization of BEAD (Broadband Equity, Access, and Deployment) funding have left millions of Americans in a "connectivity vacuum." Tradewinds Networks Inc. (TNI) introduces a disruptive model: **Asset Integrated Infrastructure (AII)**. This approach transforms broadband from a traditional utility expense into a profitable, community-focused data enterprise. Featuring **Intel-powered Edge AI technology**, TNI helps municipalities reclaim local value and deliver high-performance, secure data paths to urban, suburban, and rural communities.

Tradewinds Networks is not a broadband company. TNI delivers an integrated infrastructure – a unified, revenue-generating digital backbone that merges **connectivity**, **edge computing**, **edge AI**, **embedded cybersecurity**, **and community-focused business models** into a single deployable asset class. Where legacy telecom delivers connectivity, Tradewinds unifies technology stacks (data, cybersecurity, energy storage, and AI-driven systems) with a social impact methodology that drives adoption, sustainability, and performance computing at the very edge of the network. TNI deploys ecosystems that are sovereign, high-performance, and monetizable.

Bellflower, **California**, like many small US communities, faces a specific set of hurdles as a "built-out" city trying to modernize its digital infrastructure. While it sits in the heart of Los Angeles County, it often deals with the "middle-child" syndrome—lacking the massive fiber investments of downtown hubs while being too dense for easy, low-cost upgrades. The result is a 'Quality Divide,' which is made worse by the **lack of last-mile solutions** to address the social impact needs of the city.

> **"The market does not need more point solutions or siloed business models that extract developmental dollars from local communities. It needs integrated, resilient, and scalable core-to-edge infrastructure."**
>
> - Industry Editor

In the City of Bellflower project, Tradewinds' AII solution focuses on **Edge infrastructure**, **AI-driven applications**, **and Smart City architecture**, **providing connectivity**, **off-grid power**, **and network capabilities** to enable a communication railroad carrying any new digital content and innovation required by the city today and in the future. The platforms accelerate progress, serving as examples of intelligent, secure, and scalable digital ecosystems.

The Current Paradigm

Here are the top 5 issues Bellflower faces regarding broadband quality and its impact on city growth:

The "Fiber Gap" and Aging Copper Infrastructure

Much of Bellflower still relies on legacy coaxial cable or aging DSL lines. Because the city is densely populated and established, laying new fiber-optic cables requires significant "dig-once" coordination or expensive micro-trenching estimated at over $20M. The high cost of infrastructure creates a quality ceiling; while the speeds provided by cable and DSL technology might be "adequate" for basic browsing, they often **lack the symmetrical upload speeds necessary for modern remote work** – high-capacity data transfers, scalable IoT deployments, Vision AI for public safety, autonomous vehicles, and newer technologies.

Stifled Small Business and "Micro-Business" Growth

Bellflower's economy is heavily driven by small businesses and "mom-and-pop" shops. Without high-quality, affordable fiber, these **businesses struggle to adopt AI retail analytics, agricultural technology, cloud-based inventory systems, or global e-commerce platforms**. Cities with superior broadband have seen a surge in "micro-businesses" (under 10 employees) that stayed resilient during economic shifts. Bellflower risks losing these entrepreneurs to neighboring cities with more robust "digital infrastructure."

Vulnerability to Systemic Disruptions

Recent years have highlighted that Bellflower's network stability is vulnerable to failure. For instance, in August 2025, a cybersecurity incident at Bellflower schools disrupted both phone and internet services, exposing how fragile the local infrastructure can be. A lack of redundant, high-quality broadband paths and integrated **AI-enabled cybersecurity tools like GuardTower™** means that a single technical or security glitch can paralyze the city's educational and administrative functions.

The Digital Divide in Education

As seen during the transition to distance learning, Bellflower has faced significant challenges in ensuring all students have equal access. **The lack of high-quality, low-cost broadband disproportionately affects low-income families and non-English speaking households**. This "homework gap" impacts K-12, preventing the city from cultivating a future-ready workforce, which is essential for attracting high-tech industries and long-term city growth.

Dependency on Statewide "Middle-Mile" Progress

Bellflower is currently in a "waiting game" for the California Middle-Mile Broadband Initiative (MMBI). MMBI's goal is to create an open-access middle-mile fiber network that brings high-speed, reliable broadband to all Californians - especially the underserved. While the state is installing "telecom huts" and fiber nodes across Los Angeles County (with significant milestones in early 2026), Bellflower remains dependent on these external projects to **lower the cost for "last-mile" providers** to enter the city. Until these state-level connections are energized, the city remains at the mercy of a few dominant providers, limiting competition and keeping prices high.

A New Paradigm: Architecture

Scalability in Breadth and Depth Driven by AI Optimization

Bellflower, CA, demonstrates the viability of Asset Integrated Infrastructures. **TNI enables Bellflower** to, over time, layer on new smart city features. This means extending connections to a series of CCTV security cameras, which lead to Vision AI systems, traffic pattern analysis, and other management features.

Tradewinds Asset Integrated Infrastructure (AII) is built on **Intel® Xeon® 6 SoC processors**, with up to 32 cores, acting as the control plane for edge intelligence within Tradewinds deployments. The Xeon SoC architecture incorporates accelerators and networking to **reduce cost, power consumption, and space**. In addition, these processors simultaneously support:

- Multi-tenant edge computing
- AI inferencing workloads
- Embedded cybersecurity services

This Intel-based foundation allows municipalities and local businesses to run **real-time AI workloads at the network edge**, close to where data is generated, while maintaining sovereignty, resilience, and predictable performance.

The AI-optimized **Dell PowerEdge XR8000** platform completes the picture with modularity that allows connectivity and edge AI to run in the same chassis. It also offers demand-based scaling with the ability to add additional compute nodes to the same XR8000 and has redundant, high-availability power that is shared across all nodes.

For cities like Bellflower, this means one Intel-powered edge node can **support traffic analytics, public safety video, smart infrastructure monitoring, and secure municipal IT**—without deploying separate hardware stacks.

Intel® Xeon® 6 SoC transforms edge sites—intersections, rooftops, utility locations—into high-performance AI hubs that serve both city operations and local economic activity.

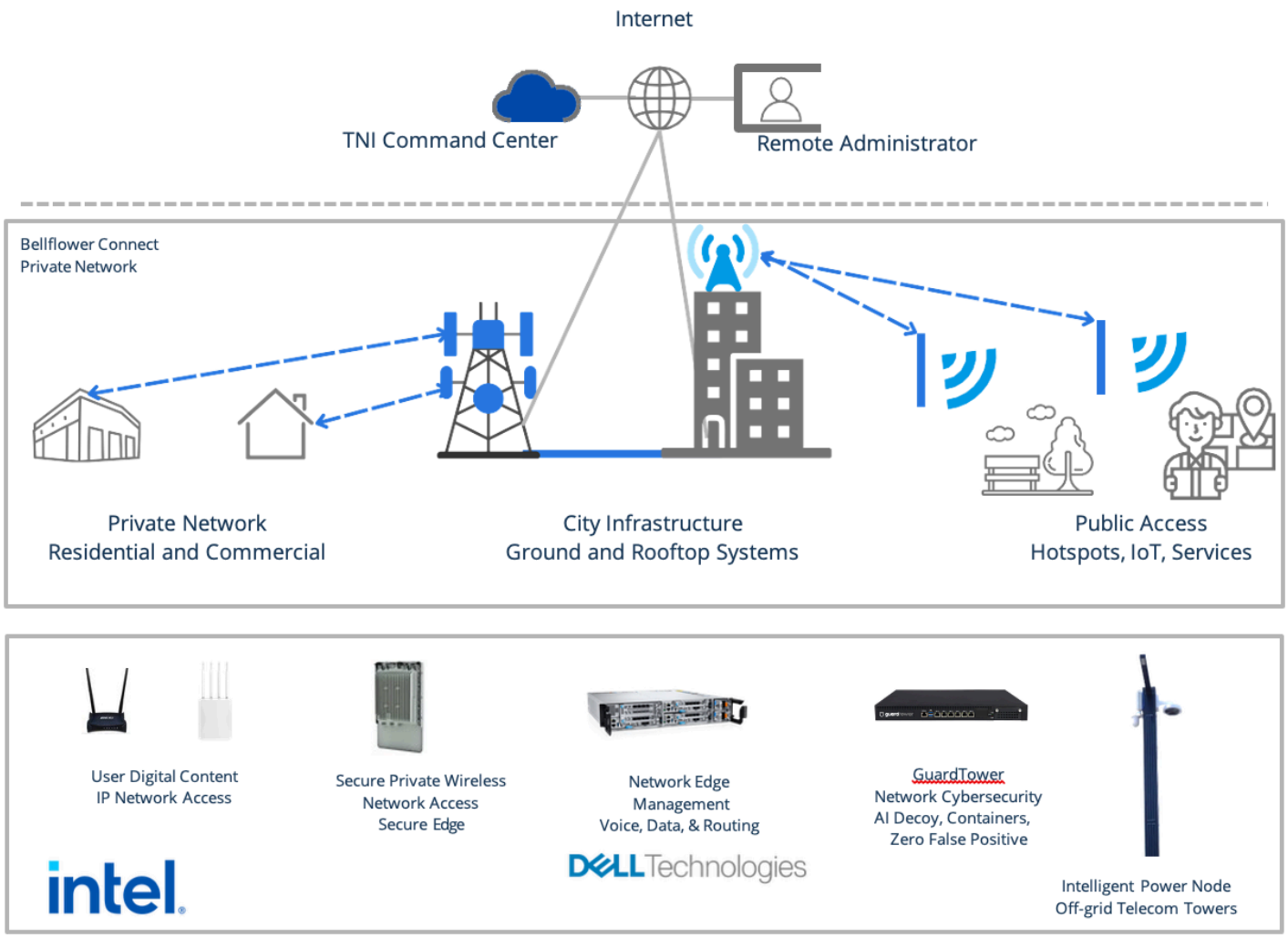
Intel® Advanced Matrix Extensions (AMX), built into Xeon® 6 SoC processors, are a key enabler for scaling AI inference at the edge without GPUs. AMX accelerates matrix math used in:

- Computer vision
- Pattern recognition
- Anomaly detection
- Behavioral modeling

Intel® OpenVINO™ provides the software layer that unifies AI across the Tradewinds ecosystem and allows these workloads to run efficiently on Intel CPUs using AMX acceleration. It enables AI models to be deployed once and reused across multiple municipal and commercial use cases.

AMX and OpenVINO™ make **edge AI** viable for small cities and local businesses, not just hyperscalers.

Intel® OpenVINO™ allows a city to become an AI platform—where innovation at City Hall, a school, or a corner store runs on the same trusted Intel software foundation.



BELLFLOWER CONNECT

Self-sustaining Private Community Network Pillars:

- Secure last-mile wireless infrastructure
- Data security (GuardTower)
- Digital navigators, outreach & education
- Workforce development & digital inclusion

Scalable Public Network Pillars:

- Public Wireless-Network-as-a-Service
- Recurring revenue stream for ownership
- Scalable service offerings with IoT
- Edge computing, IoT, and Applications

The TNI network is also built to be off-grid during times of cyber threats

GuardTower's on-premises design runs without access to cloud resources. This means that city resources can be shielded from external attack vectors while still ensuring proactive cyber defenses within the system. The Intel-driven performance platforms deliver edge computing performance, keeping city data secure.

A New Paradigm: Scalable Edge Infrastructure

Initially a city with limited assets

The "quality divide" in Bellflower, characterized by an average internet speed of 35 Mbps (falling short of the FCC's 100/20 Mbps standard) and probable smartphone dependency among vulnerable populations, impacts the city's economic vitality through several key channels:

- Limited Innovation and Entrepreneurship
- Hindered Education Attainment and Human Capital Development
- Reduced Access to Essential Digital Services
- Lower Consumer Spending and Digital Economy Participation
- >2,000 school children with little to no access to the internet

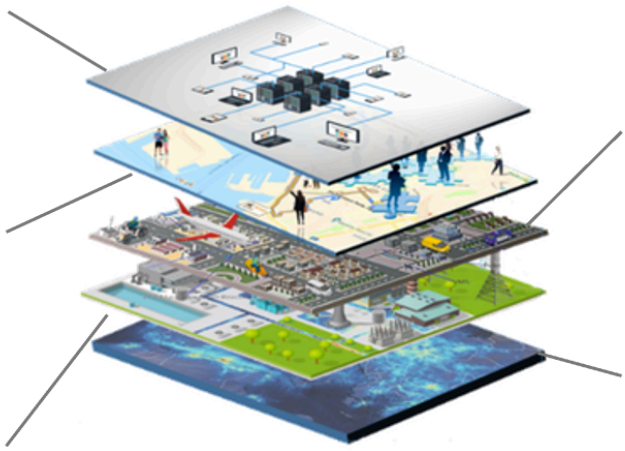
TNI Asset Integrated Infrastructure

Modular, scalable platforms deliver performance at the edge and are optimized for AI/ML application delivery.

GuardTower - Cybersecurity
End-to-End Network Security
AI-driven application & analysis
Proactive alerts

Public Safety
Vision AI-driven Systems
Public IoT Systems
Resilient Emergency Communication

Private In-Building Network
Enhanced Cellular Coverage
Leverage Off-Load Capabilities
Data Tracking



Native Edge
Deliver Applications at the Edge
Urban Mobility
Pedestrian Safety

Green & Sustainable
OLOVO Generational BESS
Carbon Credit Savings
Battery Energy Storage

General Quantifiable Insights from Broader Studies:

While Bellflower-specific figures are unavailable, broader economic research on California cities' broadband impact provides context:

- Broadband Penetration and GDP - increasing broadband penetration by 10% can lead to a 1.5% increase in GDP growth.
- Broadband Speed and GDP - Doubling the broadband speed for an economy increases GDP by 0.3%.
- Economic Benefits of Addressing Affordability - CPUC study estimated that offering a 100/20 Mbps service for $15/month to the lowest income subscribers could result in $100 million per year in savings to low-income state residents.
- Multiplier Effects - Investment in broadband infrastructure - for every $1 invested in broadband can return $4 to the local economy.

A New Paradigm: Human Ingenuity - AI Optimization

TNI smart city solutions move away from centralized, monolithic ISP structures toward distributed, resilient, and secure infrastructures. The technical stack is miniaturized and placed at the utmost edge of the deployed network. Combined with independent routing, power, and security, these private networks stack like modular building blocks managed by Edge AI compute capabilities.

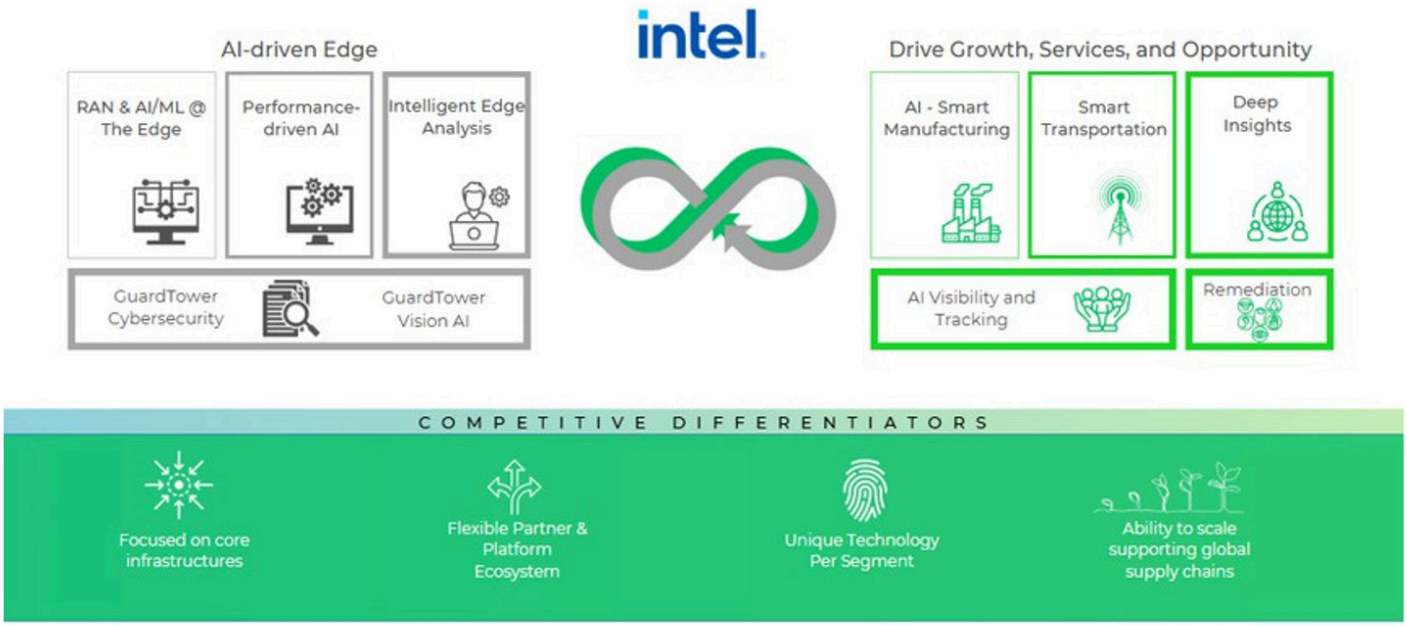
TNI delivers an **Enterprise Hybrid** model, categorized as "Web 2.5." This paradigm bridges the gap between pure decentralized networks, while it aggregates visibility over TNI's Agentic AI for visibility and optimization.

1. Edge AI-Driven Intelligence

Unlike traditional networks that merely pass traffic, TNI networks process data at the edge. This facilitates real-time edge AI-driven applications such as **smart street lighting, air quality, traffic sensors, and water utility leak detection**, creating a "living lab" environment.

2. Proactive Cybersecurity with GuardTower™

Security is not an afterthought. Every Tradewinds AII deployment integrates GuardTower™ cybersecurity, based on a hardened proactive deception/detection framework, keeping the connectivity infrastructure safe using **CPU-native AI inference** at the network edge. This ensures a preemptive defense grid, providing high-fidelity threat intelligence and zero-dwell-time protection for sensitive community data. The security use case is an ideal example for smaller cities.



Learn More

Intel® Xeon® 6 Processors

Intel® Advanced Matrix Extensions (AMX)

Intel® Distribution of OpenVINO™ Toolkit

Intel® Enterprise AI

Tradewinds Networks

About Tradewinds Networks Inc.

Tradewinds Networks, Inc. (TNI) is a next-generation technology vendor and integrator that develops and deploys secure, community-focused broadband, proactive cybersecurity, and smart city ecosystems. Through its EdgeAI Ecosystem, Asset Integrated Infrastructure business models, and GuardTower cybersecurity platform, TNI delivers resilient, real-time infrastructure that enables digital transformation, equitable access, and long-term value creation across critical industries and under-connected communities.

About Intel

(NASDAQ: INTC) is an industry leader that focuses on developing technologies that change the world, drive global progress, and enrich human lives. Driven by Moore's Law, Intel is dedicated to the continuous innovation of semiconductor design and manufacturing to provide customers with solutions to major challenges. By integrating intelligence with the cloud, network, edge, and various computing devices, Intel unlocks the potential of data and helps improve both business and society.

TRADEWINDS

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