Coordinating Broadband Beyond BIAS

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Missed Connections

How Federal, State, and Local Governments Can Combine IIJA Funding Streams for Smarter, Interoperable Infrastructure Investment

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Introduction: An Overlooked Opportunity

When the Infrastructure Investment and Jobs Act (IIJA) was passed in 2021, it marked a generational opportunity for government leaders to modernize critical infrastructure across the United States. With over $1.2 trillion in funding available across broadband, electric utilities, water systems, natural and LP gas distribution, and transportation networks, the Act enabled agencies at every level of government to shape resilient, future-ready communities. Now, in 2025, we find ourselves in a vastly different landscape—where disruptive technologies like artificial intelligence (AI), real-time analytics, and next-generation connectivity allow us to reimagine what public infrastructure can achieve.

Today, integrated infrastructure is more than just a goal—it's a practical and necessary strategy. Effective, real-time operation of community systems—during both routine service and emergencies—requires high-capacity broadband connectivity. No communications medium is better suited to this task than fiber-based broadband.

Broadband is not just another utility—it is becoming the digital *central nervous system* of community governance. It supports both independent operation and interoperability among critical public, cooperative, and private systems, including power, water, natural and LP gas, public safety, emergency services, and transportation. Many communities today have the opportunity to design and deploy this *systems* approach using fiber-based broadband networks funded by the NTIA's Broadband Equity, Access, and Deployment (BEAD) program under Division F of the IIJA as the catalyst, then leveraging other provisions of the IIJA that call for infrastructure modernization.

In an Open Access Network (OAN) model, a municipality may act as Infrastructure Owner, while commercial Network Operators and Service Providers deliver competitive consumer services through open-access agreements with the municipal government. This governance model enables public authorities to future-proof their infrastructure and ensure long-term value for constituents.

Historically, federal broadband programs have focused primarily on expanding residential Internet access. However, broadband must also be understood as essential operational infrastructure for local governments. Without recognizing its strategic role in managing core public systems, communities risk limiting future scalability and cutting themselves off from intergovernmental coordination—especially with state and federal systems that are becoming increasingly integrated and dependent on high-speed data exchange.

Unfortunately, the IIJA itself perpetuates this fragmented deployment approach. Funding is often siloed by infrastructure type, which discourages local agencies from planning shared deployments or leveraging one project to support another. As a result (and at a minimum), construction and trenching efforts may be duplicated, disrupting communities and driving up costs.

Worse, this fragmentation overlooks the growing interdependence between sectors. Electric grids rely on fiber-based broadband to enable smart grid technologies and advanced metering infrastructure. Transportation networks need fiber-based broadband for adaptive signal control, transit coordination, and vehicle-to-infrastructure (V2I) communications. Water, LP, and natural gas utilities require secure data links for pressure monitoring, leak detection, remote control, and regulatory compliance.

The rapid emergence of AI in infrastructure management has fundamentally changed the playing field. AI systems now help cities and counties manage infrastructure through synchronized, real-time data from across public services—balancing energy loads, rerouting traffic, anticipating maintenance, and responding to disruptions. These capabilities raise the bar for what our infrastructure must support—and fiber-based broadband is the connective tissue that makes it possible.

Emergency Coordination and Public Safety

Government agencies also depend on broadband to maintain operational readiness and protect public safety. Whether managing severe weather, wildfires, cyberattacks, or power outages, real-

time, multi-agency coordination is essential. Broadband enables emergency managers, utility operators, and first responders to collaborate through secure data exchange, geospatial analytics, and shared situational awareness in real-time.

Only a unified fiber-based broadband network can ensure the required robustness, security, and high-availability communication across all critical infrastructure. During disasters, this enables municipalities to guide public response with dynamic alerts, evacuation routes, recovery updates, and robust, backbone support for wireless communication systems—reaching citizens through apps, broadcasts, signage, and direct messaging in real-time.

Fiber as the Universal Utility Backbone

Fiber-based broadband underpins the integrated future of public infrastructure. It provides the performance, security, and reliability needed to support independent operation across electric, water, gas, transportation, and emergency systems—while enabling their coordinated control.

Municipalities investing today in fiber-based broadband for Broadband Internet Access Service (BIAS) can future-proof their communities by laying additional strands for other public functions. When deployed with microduct arrays, fiber infrastructure becomes modular and scalable—allowing secure, isolated channels for each department while reducing long-term trenching and construction costs.

This approach also facilitates state and federal interoperability. Shared fiber-based broadband platforms enable alignment with regional and national systems for traffic management, disaster coordination, energy grid response, and environmental monitoring. In this way, local infrastructure becomes part of a broader public data ecosystem.

Securing the Smart Grid with Fiber-Based Infrastructure

The IIJA allocates $11 billion under Division D to modernize the electric grid. These investments support real-time load balancing, demand response, and integration of distributed energy resources—all of which rely on fiber-based broadband connectivity.

Fiber-based broadband is the only transmission medium that meets the latency, security, and bandwidth demands of the modern grid. It enables deterministic control, physical data isolation, and redundant path routing for mission-critical communications. Through microduct-based deployment, grid operators can scale capacity and protect infrastructure integrity over time.

Supporting Water, Natural Gas, and LP Gas Systems with Fiber

Division E of the IIJA dedicates $55 billion to upgrading drinking water and wastewater systems. Key priorities include lead pipe replacement, water quality assurance, and regional watershed protection. Each initiative requires continuous data collection, monitoring, and remote control—functions best supported by fiber-based broadband.

Natural gas and LP gas utilities face similar needs. Pipeline safety, pressure regulation, leak detection, and infrastructure monitoring demand secure, high-speed connectivity to meet regulatory and safety standards. Fiber-based broadband delivers this performance with physical

separation via strand-level isolation, enabling gas utilities to operate securely alongside water and electric systems.

By leveraging multi-strand fiber in shared conduits, municipalities can enable water, gas, and energy utilities to operate independently but cost-effectively. Fiber infrastructure becomes a shared asset, delivering cross-sector value while minimizing future deployment costs.

What Government Agencies Can Do

Federal, state, and local leaders can take active steps to align the infrastructure projects envisioned in the IIJA:

1. **Coordinate Infrastructure Planning:** Require agencies managing broadband, water, transportation, energy, and gas systems to collaborate during permitting and design. Align schedules and right-of-way usage.
2. **Create Joint Infrastructure Authorities:** Form regional consortia to represent shared interests, negotiate contracts, and pool resources for fiber-based broadband-enabled modernization.
3. **Update Grant and RFP Requirements:** Mandate cross-sector coordination in publicly funded infrastructure proposals. Encourage multi-use fiber-based broadband justification in grant applications.
4. **Maximize Use of Rights-of-Way:** Design microduct-based fiber infrastructure that allows departments and utilities to share conduit paths without duplicating trenching.
5. **Plan for 50 Years, Not 5:** Overbuild fiber capacity during current deployment to meet future needs. Labor costs dominate installation budgets—extra strands today save millions tomorrow.

Cybersecurity and Broadband Integration

The IIJA also acknowledges the growing importance of cybersecurity, particularly through provisions in Division G, Title VI. As infrastructure systems become more digitally interconnected and reliant on real-time data, ensuring their security is paramount. Broadband infrastructure—especially fiber-based broadband—must be deployed with integrated cybersecurity frameworks that protect both data and control systems.

Integrating the cybersecurity planning outlined in Division G with the broadband deployment strategies of Division F is not just recommended—it is essential. Cybersecurity cannot be treated as an afterthought or siloed responsibility. Instead, it must be embedded in the infrastructure itself, enabling real-time monitoring, anomaly detection, and secure command-and-control channels.

This integration must be applied uniformly across all infrastructure sectors. From electric and water utilities to natural gas systems, transportation networks, and public safety platforms, consistent cybersecurity protections—facilitated by a common fiber-based broadband backbone—are critical to resilience and national security.

A Smarter Path Forward

Communities today stand at a pivotal moment. The tools introduced by the IIJA are powerful—but when paired with 2025 technologies like AI, smart sensors, and advanced analytics, their impact can be transformational. Integrating fiber-based broadband into every public works and utility project is not just a policy recommendation—it's a blueprint for better governance.

By aligning IIJA funding streams and planning infrastructure collaboratively, public officials can unlock operational savings, increase resilience, and position their communities for long-term success. Fiber-based broadband is the key to unlocking smarter, more responsive governance.

How Big Bang Broadband LLC Can Help

Big Bang Broadband LLC (BBB) is a consulting firm specializing in broadband infrastructure strategy, planning, and deployment. While BBB does not advise on operational matters for transportation systems, or electric, water, or gas utilities, it helps public agencies understand how fiber-based broadband can support all of these systems.

BBB provides:

- Strategic guidance on integrating fiber-based broadband with critical infrastructure
- Planning and design services for microduct and open-access fiber-based broadband network deployments
- Cost-sharing strategies to coordinate trenching and right-of-way use
- Compliance support for IIJA and, specifically, NTIA funding programs

BBB empowers public officials to deploy smarter infrastructure by making fiber-based broadband the foundation of future-ready communities.

About the Author

David J. Malfara, Sr. is CEO of Big Bang Broadband LLC and a broadband infrastructure strategist with over 40 years of experience. He has advised municipalities, cooperatives, and private-sector partners on building resilient, scalable fiber networks to support 21st-century public services.

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