The Economic Development Benefits Of Broadband

Broadband is the underpinning for some of today's most important transformations in business activity and government services.

By Steve Smith / *Ronin Technology Advisors*

Broadband in 2017 bears many similarities to the railroads as they opened in the United States in the late 1800s. In both cases, a significant investment of time and materials was necessary to develop new infrastructure, and in both cases, the ultimate value of that investment derives not from the infrastructure but from the economic ecosystem that grows and evolves around it. In the case of the railroads, that meant banking and financial services institutions, travel and hospitality providers, printing and communications companies, freight logistics and shipment handlers, and a host of other businesses.

The impact of the railroad became defined not by connecting distant points but by creating new businesses out of nothing, enabling existing businesses to grow and changing the way municipalities viewed themselves in the broader economic landscape.

That's true of broadband, too. High-speed connectivity offers more than just improvement in online work. It offers five broad economic benefits to communities – connections to the information economy, the internet of things (IoT), the engine of electronic commerce, the world of big data and the visual experience era.

THE INFORMATION ECONOMY

In much the same way that railroads opened commerce among towns and expanded the focus of municipal economies to the sale of products and services regionally and nationally, broadband enables municipalities to think bigger. Remote work is one of the most immediate and obvious benefits. Towns connected to fast, reliable broadband enable their citizens to take jobs with firms in distant cities, creating new opportunities beyond the reach of the local economic base.

The statistics point toward remote work becoming the norm: The number of work-at-home employees has grown by 103 percent since 2005. Though the total U.S. employee workforce grew by 1.9 percent from 2013 to 2014, the number of remote-work employees grew by 5.6 percent – nearly three times as fast. In a survey of business leaders at a recent Global Leadership Summit in London, 34 percent said more than half their company's full-time workers would work remotely by 2020.

Connecting to the information economy involves more than remote work. It also involves remotely acquiring the skill sets necessary to

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participate in that economy. Colleges and universities have steadily increased the amount of coursework students can remotely participate in. Beyond traditional higher education, massive open online courses offer many of the same benefits in a no-cost learning environment. Much of that coursework is best performed in a live, video-enabled setting that provides real-time interaction – and that is best served on a reliable, fast, digital backbone that can accommodate the streaming content needs of tens of thousands of students simultaneously.

THE INTERNET OF THINGS

Broadband offers the possibility to connect citizens to town services by leveraging the emerging IoT. For example, towns can notify citizens immediately when water quality changes, monitor park usage by offering free Wi-Fi and tracking logins, and enable train signals to communicate with traffic signals so cars can cross the tracks before a train blocks the intersection. These are just a handful of the thousands of new projects towns across the United States are undertaking based on the presence of reliable, fast broadband infrastructure.

The IoT promises better communities by enabling city infrastructure to do more – more self-reporting and status checking, more intelligent conversation with related services and more transparency. Citizens don't have to wonder any longer where the snowplows are; they can pull up live maps that show where the plows are working and when they'll be in a specific area. Traffic lights can dynamically accommodate changes in weather to minimize drive times and pollution. Rain sensors can push text messages recommending changes to lawn watering times.

To date, the IoT has been closely associated with smart-city initiatives in major metropolitan areas, but many of the same benefits that cities such as Stockholm, Songdo and Helsinki have realized can be put to work in municipalities a fraction of their size. In many cases, the cost-benefit ratio is actually higher for smaller cities. Though the IoT can be retrofitted to existing infrastructure, it's most efficiently deployed as part of a larger municipal infrastructure renovation project – which is why implementing IoT projects along with broadband construction has become increasingly popular.

THE ENGINE OF ELECTRONIC COMMERCE

The ability of light manufacturers and specialty retailers in smaller cities and towns to connect to the global engine of electronic commerce is vital to municipal health and growth. As small firms achieve growth-stage viability through microfunding and crowdsourced funding services, municipalities that were historically agricultural, bedroom or tourist communities can develop manufacturing and retail economies. Fast, reliable broadband is a significant enabler for small businesses in light manufacturing and retail that need to move significant volumes of data – engineering designs, change data capture patterns, high-resolution color product images, volume ordering data – on a regular basis.

Broadband is a key economic development driver for attracting new entrepreneurs to electronic commerce zones within a municipality. Across the United States, many towns have defined enterprise zones with a focus on electronic commerce development, using tax incentives to attract new businesses that rely on distant trade over a robust fiber backbone. Zones of this type generally provide qualifying businesses with credits against their state income tax, corporate excise tax or both, typically equaling 25 percent of the capital cost for electronic commerce investments.

THE WORLD OF BIG DATA

Big data – data sets too large to analyze with conventional analytical tools – is a trending technology. The IoT promises more than connecting infrastructural components in real time; it also promises the ability to populate and examine an ever-expanding body of collected data and look for emerging

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trends in municipal operations and citizen services.

Big data offers valuable use cases for municipalities of all kinds. In agricultural communities, sharing crop health and pricing data can help every contributor see emerging trends before they become problems. Similarly, comparing annual yields over time with commodity pricing can help predict future economic performance of the sector.

Capturing and examining big data horizontally (at a single moment in time across a wide geographic area) or longitudinally (over a long period of time in a defined area) – can apply to other municipal endeavors, too. From studying town and regional weather patterns to better predict weather and inform citizens to analyzing utility usage over time to plan a more efficient power and water system, big data holds immense promise for the improvement of citizens' lives – and the efficient use of their tax dollars.

Access to big data's long-term benefits requires resilient, fast broadband infrastructure that makes the daily transfer of gigabytes of data a straightforward, unremarkable task. For this reason, more and more municipal governments look to combine urban and exurban big data initiatives with the installation of new fiber optic broadband infrastructure. The benefits of community and regional big data visibility substantially outweigh the cost of installation and operation.

THE VISUAL EXPERIENCE ERA

Ubiquitous telepresence, or the always-on visual experience, places the heaviest demands on broadband infrastructure. HD-quality video can break down perceived barriers of distance between an employee and an employer, a patient and a physician, an air quality sensor and a central utility operations room or a distant field irrigation meter and a city water planner. Bringing distant entities together with video makes the real distance between them less relevant.

Municipal planners should consider how to bring the citizenry closer to outside opportunities and how to bring outside services closer to the population. Opportunities include remote work, cultural and artistic events in distant cities, and regional political events.

Bringing outside services closer to the population makes a small town feel bigger. The promise of telemedicine delivered in full HD means a small town can have access to specialists in other cities. Working in conjunction with local health care staff, distant physicians can instruct on-site teams what to look for, gauge patient reaction and response and act appropriately.

GETTING STARTED

Facing the immense opportunities that broadband offers, communities generally have one immediate question: How do we get started?

At Ronin, we use a five-step process to build a holistic service and infrastructure plan.

- **Start with the end in mind.** We recommend working backward from the desired community outcomes through the broadband service layer and ultimately to the design of the network and the associated service ecosystem. Beginning with the end in mind makes it easy to draw functional throughlines to the architecture and partner group. That process, in turn, starts with identifying the key performance indicators (KPIs) that citizens want to see changed as a result of implementing municipal broadband.

- **Centralize and productize community KPIs.** When a single concern, such as communication, emerges across multiple areas of service, establishing a center of excellence and pulling multiple services into a centralized environment becomes a cost- and time-efficient idea. These centers of excellence become delivery, innovation and planning hubs that reduce overall cost to serve and work together to deliver quality service to citizens.

- **See the full landscape.** Since 2010, an increasingly complex ecosystem of smart-city service providers has sprung up, offering technologies and professional services in areas that range from city parking and waste management to city data traffic, transport, connectivity and more. Choosing the right technology partners and building out the right smart-city "stack" is a unique endeavor for each municipality.

- **Define value delivered to citizens.** To citizens, broadband can seem to be a "shovels" project when, in fact, it is much more. Understanding how each use case in a deployed broadband ring provides tangible benefits can provide insight into the value of the investment and the fiscal and experiential returns taxpayers can expect for their money.

- **Build the delivery ecosystem.** The resulting plan should consider everything from broadband service billing and customer care through service quality feedback and ongoing ecosystem evolution roadmapping. It's important to have a partner that can assist in every step of this process. ❖

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