

Asset Mapping Catalyzes Broadband Development

Communities can jump start broadband investment with a sophisticated understanding of the assets they can offer to Internet service providers.

By Brian Mefford / *Connected Nation Exchange*

Private investment in broadband networks is at an all-time high. In addition, the federal Connect America Fund has allocated \$4.5 billion annually, through 2018, to the promotion of broadband access, and Congress has created a nationwide first responder network, FirstNet, built on broadband. Finally, smartphone and tablet penetration are rapidly increasing the demand for broadband for personal use, business, education, health care and more.

Communities that act proactively will attract investment from Internet service providers. Those that do not will quickly be left behind. One necessary step for communities to position themselves for this shift is technological asset mapping.

Asset mapping is the process of identifying, measuring and evaluating a community's resources. Before community leaders can plan, they must fully comprehend their current situation. Used properly, asset maps can encourage investment, facilitate partnerships and help recruit companies.

Sophisticated asset maps take into consideration the most recent advances in technology – and invariably identify resources that communities have not considered, in large part because technological innovation can transform resources and leverage new market conditions. Yesterday's unused resources are today's untapped assets.

KANSAS AND KENTUCKY BENEFIT FROM ASSET MAPPING

When AT&T sought to expand its 4G LTE wireless service in Palo Alto in 2011, it ran into considerable investment hurdles. Fighting to maintain the aesthetic integrity of their town, community members first staunchly opposed towers, then resisted a distributed antenna system. For more than two years, AT&T was forced to repeatedly reassess and redesign its expansion strategy. At last, after agreeing to a multitude of conditions and receiving endorsements from the city's utilities department, an arborist and a third-party consultant, AT&T was able to move forward on a plan that used dozens of less-intrusive small-cell wireless Internet cells.

The delay and repeated disruption of the approval process represents a significant – and often prohibitive – barrier to investment. Internet service providers can often be dissuaded by these hurdles and decide not to invest in a community. However, communities have another option: altering this cost-benefit equation by mapping their assets and eliminating investment hurdles.

This was effectively demonstrated recently in both Kansas and Kentucky. When Google announced it would launch a mega-speed Internet project, many cities applied. Kansas City won because it not only presented a sophisticated understanding of its assets but also

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was able to use that understanding to coalesce a united front. Now the city enjoys the highest Internet capacity in the nation. Its economy – and the start-up ecosystem in particular – has experienced a vibrant renaissance.

Asset maps draw investment and attract high-speed Internet access to new places. Until recently, citizens in Warren County, Ky., were handicapped by a lack of access to high-speed Internet. Though technically “served” according to the state’s broadband map, students often had to visit one another’s homes in the hope of finding Internet service fast enough to finish their homework. Their education was stifled, and teachers had difficulty teaching students the skills needed in today’s economy.

Warren County decided to act. It first hired a technology consulting firm, Connected Nation Exchange (CNX), to perform a holistic study of the community’s infrastructure and

capabilities. CNX analyzed reports, measured throughput and interviewed stakeholders. It created a GIS map that integrated the county’s infrastructure with census data and household coverage. It then compiled this technical data alongside market data, ultimately creating an asset map that Warren County used to recruit investment.

The initiative was a success. Within a few months, a locally owned wireless broadband company, FastNet, had negotiated countywide leases with public agencies for access to such things as water towers, roof access and dark fiber. As a result, the company is now able to offer high-capacity broadband services to homes and businesses throughout the entire county and even surrounding counties. This distinction separates Warren County from competing communities in recruiting businesses and meeting the needs of the education community. In addition, the Warren County asset maps supported the public

safety community in its upgrade of its own communications network, pointing to existing tower assets that could be used instead of newly built towers as originally proposed.

As these cases demonstrate, communities that enlist proactive strategies are better able to draw investment. Kansas City and Warren County demonstrate that asset maps play a central role by simultaneously cutting costs, demonstrating benefits and expediting access to Internet service providers.

WHAT IS ASSET MAPPING?

Communities have long recognized the benefits of mapping their resources, often using maps to revamp their economic development strategies. Asset mapping can require taking full stock of all asset types. These include human capital, research and development institutions, financial capital, the industrial base, connective organizations, the legal and regulatory environment, physical infrastructure and quality of life. Once a community obtains a clear picture of its current situation, it can use its asset map as a catalyst for public-private partnerships, plans, benchmarking and performance measurement.

Creating an accurate, useful asset map is no easy task. Researchers, analysts and professionals typically survey economic reports and profiles, scan available information from the Internet and other sources and extensively interview local leaders and pertinent experts. A community’s assets must be understood within the context of its region, including the larger networks that connect the community to regional, national and global economies. Only by examining a community’s assets within a larger context of opportunity can mappers ascertain the value of assets.

Technological assets are some of the most complex to map. Experts must model broadband availability and usage, which requires identifying physical infrastructure such as towers, antennas and fiber cables and surveying residential, commercial and public users



Exhibit 1: Asset Map Example
Source: Connected Nation Exchange

to measure demand and throughput. The topological and physical attributes of a community must be mapped in great detail, as actual throughput varies depending on a number of potential barriers. Compiling all this information in a user-friendly format yields an integrated assessment of a community's broadband usage, resources and needs.

SMALL-CELL TECHNOLOGY

Small-cell wireless technology illustrates how asset mapping can attract investment and help monetize previously unused resources. The speed and capacity of broadband directly depend on access to the nationwide broadband network, which is transmitted along two major pathways: fiber cable and wireless broadcasting. Cable provides a physical connection to the network, and wireless connects via broadcasting hubs, called cells. Traditionally, these cells have been located on high-rise towers, which are scattered throughout a region. A community's broadband capacity, therefore, has depended on the number and quality of cables and towers a community can access.

As demand for broadband services has increased, so has the demand for broadband infrastructure. The need for towers, in particular, has gone up dramatically. This phenomenon, known as "densification," requires more and more towers to be built in the same area.

Increasing the number of large, unsightly, obstructive towers in populated areas is often an unwanted development. Technology companies have adapted by inventing smaller and smaller cells. Today, these cells do not require large, obstructive towers; they can be placed on rooftops, steeples and other smaller-profile towers. Some microcells can even be installed within an office and serve an entire floor.

This represents a dramatic shift for broadband development in both cost and availability. As densification pressures mount, the frequency of small cells will need to increase exponentially in concentrated areas of broadband usage to meet the demand for speed and service.

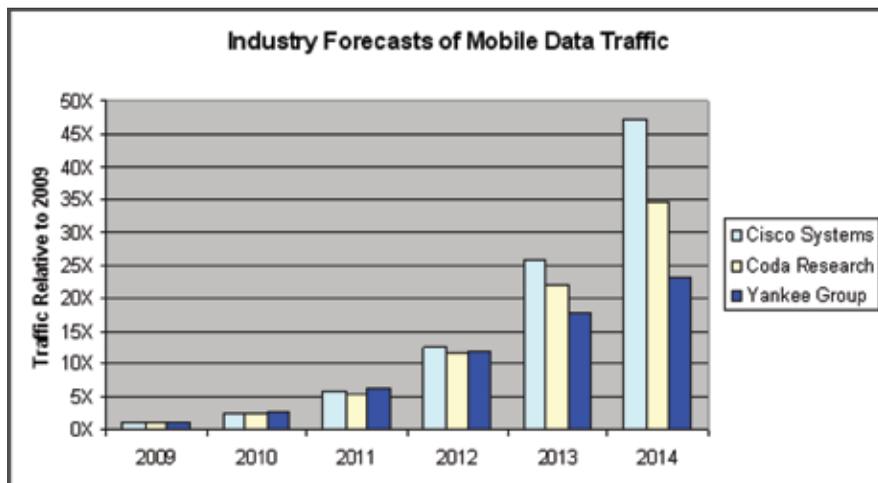


Exhibit 2: Industry Forecasts of Mobile Data Traffic
Source: National Broadband Plan, www.broadband.gov

A second driver in the demand for small cells relates to fiber cable. Though Internet service providers have invested significantly in fiber cables, the cost of last-mile fiber is often prohibitive. Installing underground cables is very expensive, especially in the final leg to the end user. At that point, the number of users does not always justify the capital expenditure. Small-cell wireless has created a new option by providing an affordable link between fiber cables and end users.

Because of densification and lower costs, the usage of small cells is growing rapidly. From 2010 to 2011, small-cell usage increased by 23 percent. From 2012 to 2016, revenue from small cells is expected to climb from \$100 million to \$1 billion.

Small-cell usage has the potential to catch up to and keep pace with the steep climb in broadband demand. This bodes well for both large and small communities seeking to upgrade their broadband infrastructure. Densely populated metro centers can meet the rising demand of broadband with affordable, nonintrusive cells. Small communities can extend broadband to their populations by linking inexpensive mobile platforms to the national grid. However, the degree to which a community can harness this trend depends on how well it can prepare for this technology.

ASSET MAPPING DRIVES NEW VALUATION

Communities should immediately consider mapping their assets in light of new technology. Doing so will surely increase their ability to attract the widespread investment occurring in broadband. However, simply creating a list of assets is not enough. Assets must be evaluated within the context of market demand and supply.

Asset value depends on a host of factors. The first is an asset's ability to access the larger broadband network. Cell sites, for example, must be installed in areas with the necessary backhaul to support data throughput. This backhaul includes fiber line capacity and density of existing cell towers.

Perhaps the most important factor in valuing an asset is its proximity to end users – the demand side of the equation. Business, health care, education and residential clusters represent significant but varying levels of demand for broadband usage. This demand, in turn, determines the volume and data rates required to support the area. In the case of small-cell technology, a public library or church steeple adjacent to a commercial district may generate greater investment interest than a rural water tower. Calculating these dynamics in conjunction with specific locations on an asset map can powerfully

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demonstrate the economic viability of particular broadband areas.

Other relevant assets extend beyond technology. Rights of way and zoning permits, for example, are substantial assets. The more a community can eliminate hurdles, the more robust its technological assets become. Moreover, expediting procedures powerfully demonstrates a community's willingness to engage in broadband investment. Failing to do so demonstrates the opposite and therefore leads to underserved communities. A slow-moving approval process can significantly escalate costs, discouraging broadband providers from doing business in the community.

OPPORTUNITY FOR INVESTMENT

The value of new assets ultimately depends on how likely these assets are to be integrated into the nationwide network and how well they can be integrated into that network. Fortunately, there is tremendous momentum for both communities and companies to invest in broadband technologies. The benefits are increasingly clear, and the federal government is currently investing substantial resources to ensure that the quality of the nation's technology infrastructure is second to none.

The marketplace has organic momentum as well. As of 2012, smartphone usage reached 80 million customers and is growing at 25 percent per year. As video streaming and interactive content have become commonplace, the demand for more data transmitted at faster speeds has grown rapidly. Indeed, the demand for broadband is expected to rise to as much as 25 to 35 times its current usage by 2016. This unprecedented expected

increase in demand signals an ever-pressing need to invest in the necessary infrastructure. Although there are more than 250,000 cell towers in the United States today, the current rate of infrastructure expansion is expected to cover only a portion of the demand. Small cells will ultimately be the ideal method to meet this unmet demand.

Internet service providers have grown eager to harness this shift. AT&T, for example, is investing heavily in small-cell infrastructure as part of its Project VIP. The company has laid out an aggressive investment plan that includes an expanding reliance on small-cell sites and in-building distributed systems. Indeed, AT&T plans to build 40,000 new small-cell sites versus 10,000 new towers over the next two years.

Other companies have sprung up to harness new opportunities. Republic Wireless, a young but growing company, utilizes Wi-Fi networks to provide mobile telephone service at much cheaper rates. There is momentum in all levels of the broadband economy.

RETURN ON INVESTMENT

By using asset maps, communities and broadband providers can pinpoint opportunity, facilitate partnerships, anticipate hurdles and streamline processes. Such an initiative would be tremendously attractive for Internet service providers, who often need to be convinced of the value of investing in a particular community. A community that has measured, analyzed and assessed potential assets and also garnered support for the development will undoubtedly stand out among possible development locations for national carriers.

Communities that successfully

position themselves for broadband investment see extraordinary results. Put simply, high-speed broadband has become an integral and necessary condition for any community in the 21st century. This includes enhanced quality of life and improved health care, education and public safety.

Most clearly, broadband access creates jobs. This can be seen on both extremes of the broadband-capacity spectrum. As discussed above, Kansas City is rapidly becoming a hub for business growth and innovation because of the Google Fiber program. On the opposite end of the spectrum, communities without broadband are simply passed by in an increasingly competitive, mobile and transitory economy. Companies without broadband access cannot compete with those that have it; thus, communities without broadband are unable to recruit or keep quality companies.

When a community receives broadband, it is quite literally placed on the map. Communities that were once quickly overlooked are now viable candidates for possible locations of new enterprise. As a small example, many companies have started "reshoring" their operations to the United States. Previously outsourced operations, such as call centers, are now being placed in rural communities that have gained access to broadband. Within this fast-paced, interconnected economy, only communities with broadband capacity could even be considered.

Though broadband infrastructure as a whole certainly benefits communities, monetizing previously unused assets has the most immediate effect on a community's bottom line. A municipal building can lease cell-site locations for \$18,000 to \$24,000 a year. If this estimate held true in the Palo Alto example of 40 AT&T sites, that community might have generated revenues of \$720,000 to \$960,000 a year. Given the recent budget constraints afflicting communities across the nation, such an annual inflow of cash could represent a tremendous immediate benefit.

CONCLUSION

Across the country, communities are looking to attract substantial investment in high-speed Internet infrastructure. Communities that leverage their assets and find ways to encourage broadband growth will have better functioning education, health care and public safety systems and will be able to attract and retain quality businesses.

Asset mapping can be used to identify the most efficient method of developing and encouraging Internet service provider investment in a community. Providers will then lease the most efficient locations to install their broadcasting technology, and the owner (public or private) will receive a negotiated rent. Existing assets with potential that was previously overlooked can now bring in thousands of dollars annually while providing valuable services to the community.

Because the planning and installation of these broadband

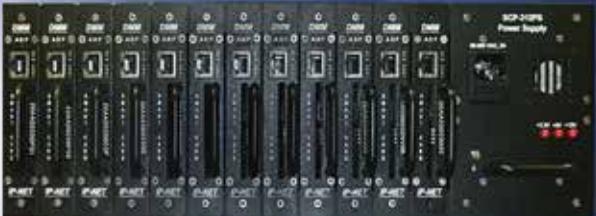
Existing assets with overlooked potential can bring in thousands of dollars annually while providing valuable services.

networks will require a significant investment by Internet service providers (and these resources are limited), communities will compete to receive this investment. Those communities that take the proper measures to proactively assess their existing assets and needs will be in the best position to attract this investment.

By identifying locations, evaluating demand and expediting regulatory procedures through the use of asset mapping, economic development leaders can maximize their chances of improving broadband internet

access in their community. Doing so is a necessary step to positioning their communities for economic prosperity. ❖

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