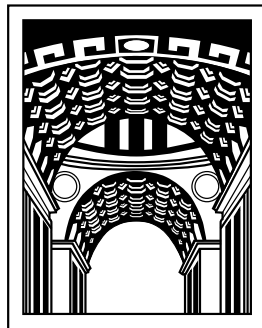


# **RURAL VERSUS URBAN TELECOMMUNICATIONS IN THE US: CHANGES IN MARKETS AND TECHNOLOGIES**

**2009-2014**

DECEMBER 2009



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## CHAPTER I

# EXECUTIVE SUMMARY

### 1.1 Urban vs. Rural: Digital Divide

Access to the Internet—or the lack thereof—has been a topic of debate since the early 1990s, when dial-up access was the norm. Since the Millennium, the question has turned to broadband availability for all US households, or the lack thereof. As the economic recession gripping the US has deepened, the question of broadband deployment and availability has morphed yet again, and concerns are now being raised regarding whether the current situation warrants government intervention or involvement.

In this study we attempt to assess the current state of urban versus rural access to advanced telecommunications services. We look at the disparities as they exist today between urban and rural populations, and the various service modalities present in US communities that can provide high-speed access to the Internet. We conclude our examination with an assessment of the likely impacts of government stimulus spending on fostering broadband availability.

The premise that a “digital divide” exists between rural and urban markets has been advanced for many years (another way to pose the question of a “digital divide” is to consider the imbalance between economic *haves* versus *have-not* communities in the US.) Further complicating the picture, the digital divide has been used to define many facets of telecommunications technology, including telephones, computers, Internet access—and most recently “broadband” access versus dial-up capability. Another premise, that markets are “underserved” if only one provider is present in the market, has more recently been put forward as an impediment to broadband adoption and a contributor to the digital divide.

In this study, INSIGHT elected to examine the household demographics of the US population in order to determine the current state and potential future adoption potential for residential broadband services. What are the reasons for the perceived “digital divide” in the adoption rate of broadband? Can the lack of household broadband access be attributed to the failure of the telecommunications industry to extend that capability to un-served rural markets and under-served segments? Will the subscription rate to broadband service increase significantly if

the capability is available everywhere or is the lack household broadband subscription due to other factors?

## 1.2 How Bad Off Are We?

The debate on the condition of US broadband deployment has usually been focused on national deployment statistics—and then on a comparison of broadband deployment in other countries. The validity of comparisons with other countries should be seriously debated.

For example, The Organization for Economic Co-Operation and Development (OECD) provides sets of comparative broadband statistics. These comparisons are often made at the “population” percentage level and not at the household level. Furthermore, under the OECD definition of “broadband” in one country may not be classified as “broadband” in another. According to the OECD, there is no standard definition of the threshold speed for broadband among the member countries.

Initial OECD data collected on xDSL (digital subscriber line) and cable modem access subscriptions resulted in a de-facto definition for broadband service. Broadband service came to be defined as service with greater than 256 Kbit/s for downstream connectivity. In addition, basic ISDN (integrated services digital network), 128 Kbit/s service was excluded from a broadband classification.

The Telecommunication Standardization Sector (ITU-T) coordinates standards for telecommunications on behalf of the International Telecommunication Union (ITU) and defines broadband as a transmission capacity that is equal to or greater than 256 Kbit/s in one or both directions but that is not provided through ISDN.

What has made the whole question of assessing a “digital divide” so fraught with difficulty has been the collection of base data. In the United States, the Federal Communications Commission (FCC) had originally established the speed for broadband access at 200 Kbit/s in one or both directions for reporting on the deployment of high-speed or broadband services. This 200 Kbit/s threshold has been used for years and has provided the only reliable measures to understand “broadband” deployment in the US. Furthermore, the FCC has used the ZIP code boundaries as a method to define geographic areas for the collection of broadband deployment data. The FCC reporting system has counted the availability of broadband service providers at the ZIP code level. If a single subscriber to high-

speed service was identified within the area, the FCC counted that specific ZIP as being serviced by a broadband provider. If more than one service provider reported that they had customers within the ZIP, then the FCC also counted the number of service providers for that specific code. *The presence of a single customer could result in the entire ZIP code being counted as being covered by high-speed service, while only a minor portion of the ZIP code actually had service.*

Since the Broadband Data Improvement Act (BDIA) was signed into law in 2008, the FCC has acted on improving the precision and quality of its broadband data collection by revising the methodology for reporting service coverage in a geographic area. Broadband service providers must now report the number of broadband connections in service by Census Tract. The Census Tract is a relatively small subdivision of a county. The Census Tract area usually encompasses between 2,500 and 8,000 persons and is designed to be a homogeneous geographical area with similar population characteristics, economic status, and living conditions. The alignment of broadband data collection to Census tracts should result in much better analysis on the deployment of the broadband service.

Furthermore, the FCC has implemented a range of data rate tiers for the reporting of broadband services by service provider. The tiers are described in Table I-1.

Table I-1 FCC Broadband Tiers and Speeds

Broadband Tiers	Speed Range
Basic Tier 1	768 Kbit/s to 1.5.Mbit/s
Broadband Tier 2	1.5.Mbit/s to 3 Mbit/s
Broadband Tier 3	3 Mbit/s to 6 Mbit/s
Broadband Tier 4	6 Mbit/s to 10 Mbit/s
Broadband Tier 5	10 Mbit/s to 25 Mbit/s
Broadband Tier 6	25 Mbit/s to 100 Mbit/s
Broadband Tier 7	Greater than 100 Mbit/s

Source: FCC

Using the most recently available FCC data we have attempted to measure broadband availability versus demand at the household level. There are very different household segments that must be considered when gauging the prospective uptake of broadband services in both urban and rural areas that may be un-served or underserved. The demographics of these differing household segments are often ignored, yet it is the likely proclivity of the household to adopt that is at the heart of the issue in the current debate on broadband deployment and whether the adoption of broadband will increase significantly—even with investment in government stimulus funds.

In our analysis we considered differing household segments for the potential broadband uptake:

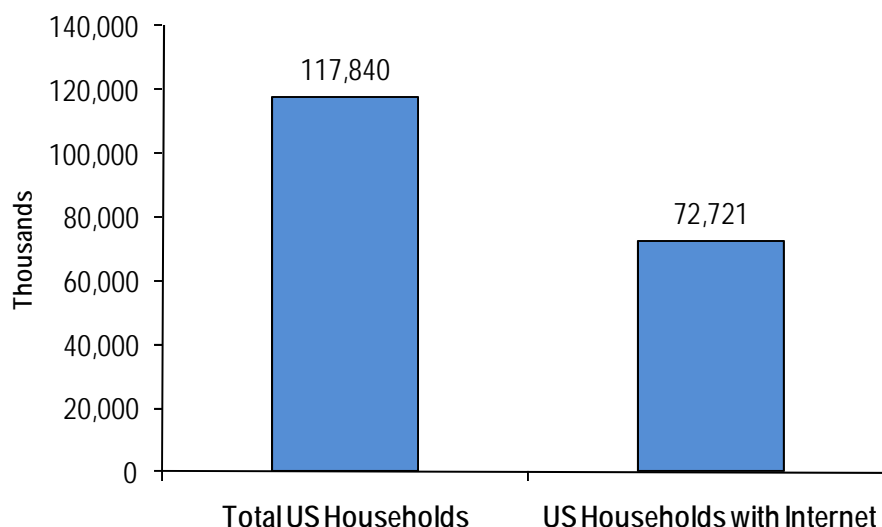
- Households with no Internet service.
- Households with dial-up service.
- Households without computers.
- Households with computers but without Internet service.

The analysis of these household segments must also be viewed in the context of the urban versus rural geographic distribution of the households in order to address the potential uptake of broadband by these respective markets.

### 1.3 What Needs Changing: Availability or Demand?

When INSIGHT looked at the current data, we found that on a national basis nearly 62 percent of households have access to the Internet, as depicted in Figure I-1.

Figure I-1 All US Households and Households with Internet Access, 2009 (Thousands)

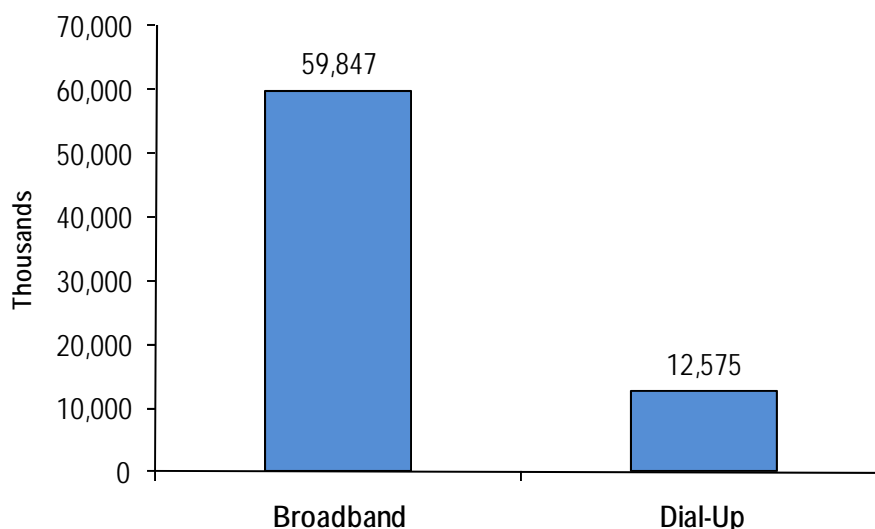


Source: Census

When we compare urban versus rural Internet access rates, we found only a five percent difference between the Internet access rate of rural households versus the Internet access rate of the urban households.

Of the 73 million households that subscribe to Internet services, 83 percent gain their Internet access by means of broadband services. Figure I-2 shows that more than 58 million households have broadband access.

Figure I-2 US Household Internet Access By Access Type



Source: Census

Our data showed a much greater disparity in the broadband subscription rates between rural and urban household Internet access (66 versus 86 percent respectively), than the five percent difference that exists in the respective rural and urban household Internet access subscription, (58 versus 63 percent respectively). The 20 percent difference may be significant *if* it can be attributed to the lack of broadband availability in the rural markets instead of other demographic characteristics such as household income or the lack of any desire to switch from dial-up to broadband.

Our analysis suggests that 45 million of the more than 117 million US households have no Internet service. This represents 38 percent of the US households.

When we add the “no Internet” category of households to the dial-up category of households in order to determine the total number of households that could potentially be candidates for broadband service in the US, we estimate that the non-broadband households approaches 58 million households. *These 58 million non-broadband households represent 49 percent of the households in the US.* But are they all potential candidates?

INSIGHT developed a metric to account for the uptake of broadband from dial up customers, should pricing or availability concerns be addressed over our forecast

period. By applying our uptake rate metric to the universe of US dial-up households, we found that less than 4.8 million dial-up households could potentially switch to broadband if the pricing and availability concerns were addressed, a rather paltry number.

#### 1.4 The Stimulus Plan and Broadband Availability

The American Recovery and Reinvestment Act of 2009, aka The Stimulus Package, involves the government directly in investment for broadband deployment through grants and loans. The Commerce Department's Broadband Technology Opportunity Program, BTOP, has been funded at \$4.7 billion and is intended to provide grants to support the deployment of broadband infrastructure and services in un-served and underserved areas. The United States Department of Agriculture's Rural Utilities Service has been funded at \$2.5 billion to support the deployment of high-speed Internet service to rural communities. The net investment from these programs is limited to \$6.4 billion since portions of these programs will fund other subprograms such as mapping, broadband adoption and public computer centers.

INSIGHT projects that non-governmental funding will provide the majority of the growth in broadband penetration for the next five years. This private sector activity will still result in a broadband gap for an estimated 40 million households that would need to be addressed by the stimulus funding. With an estimated 40 million households still lacking broadband access by year-end 2014, the \$6.4 billion in government funding would allow for an investment of \$164 per household to provide broadband access to these non-broadband households. The availability of such a small investment amount per household casts serious doubt that any significant expansion of broadband access will result from this government action. This position is further bolstered by the argument that, at the current estimate of \$1,500 per household, at least \$60 billion would be needed to deploy universal broadband access across the United States.

While the exact number of households that do not have access to broadband service is unknown, even to the government, INSIGHT estimates that at least 12 million rural and non-urban market households do not have access to any broadband service due to the lack of supporting terrestrial infrastructure. Given a minimum cost of \$1,500 per household, it is easy to see that the price tag for expanding broadband access to 12 million new households could exceed \$18 billion.

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