

Digital Telecommunications Technologies in the Rural South: An Analysis of Tennessee

Summary

To really ride on the Information Superhighway, rural communities need digital capability in the central office switches that serve them (and preferably broadband capacity in the lines that connect them). Unfortunately, digital switches are not universally available, especially in rural areas where the costs can be prohibitive.

In a recent study for the TVA Rural Studies Program, researchers Edward Malecki and Carlton Boush take a closer look at the presence and capacity of central office switches serving rural areas in Tennessee. In so doing, they provide new insight on local variations in the availability of digital technology.

Digital switching permits clear transmission of data at high rates—a must in today’s world. Furthermore, it allows for local phone companies to offer value-added services such as custom-calling to their customers. Accordingly, the quality of local service and the ability of rural citizens, businesses, and institutions to compete depend greatly on the capability of the central office switch and on the distance to it. (Beyond 18,000 feet the signal deteriorates. Consequently, boosters are needed and the boosters can garble data.) To get a better idea of the capability of rural systems, Malecki and Boush examined all of the central office switches in Tennessee.

By assigning switches to a 6-level hierarchy based on switch capability, the researchers reveal a distinct pattern in favor of urban areas. In general, the higher the level the switch, the more advanced are the services that are available.

Highest Switch Level Available	Available in a County	
	Metro	Nonmetro
Level 1 (International Direct Long Distance)	0	6 (11.3%)
Level 2 Signal System 7 (The software that enables all advanced digital services)	1 (2.4%)	24 (45.3%)
Level 3 Switched 56 Kbps (A high rate of speed)	5 (11.9%)	4 (7.5%)
Level 4 Primary-interface and basic-rate ISDN (Allows constant connection to customer)	33 (78.6%)	18 (34%)
Level 5 Multi-rate ISDN (Permits customer to control amount of bandwidth as needed)	3 (7.1%)	1 (1.9%)

From the chart, the pattern is clear--the highest capability switches are concentrated disproportionately in metro areas. In fact, 56 percent of rural counties have no switch higher than level 2. Other findings indicate that rural areas are more likely to have fewer switches in addition to having switches with lower levels of digital capability. The rural disadvantage in switches is primarily caused, the researchers find, by low population density in rural areas (which means the costs of switches must be spread over fewer customers). Larger total population and more employment in business services also work in favor of urban areas and against rural.

The implications of these findings are troublesome. Digital communications is a must for rural businesses and communities and the current availability of advanced switches suggests that many are doing without. Worse, upgrading the switches can be prohibitively expensive and may take a long time in the newly deregulated telecommunications environment. Nevertheless, something must be done if rural areas are to succeed in the information age. As Malecki and Boush put it, "The quality of rural jobs depends to a great extent on rural America having access to the same communications technology as the rest of the nation."

Malecki and Boush's paper can be found at:

<http://www.rural.org/publications/malecki99-7.pdf> or you can contact the TVA Rural Studies program at 606-257-1872 or by e-mail tvars@rural.org.