

## Telecommunications Deregulation in Texas: An Analysis of the 2005 Competition Act

by

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### Executive Summary

With the recent passage of an Act Relating to Furthering Competition in the Communications Industry, the Texas legislature has made great strides in telecommunications deregulation. For many years, regulations have limited competition and innovation in Texas telecommunications markets. The 2005 Competition Act will promote competition by eliminating entry barriers in two markets and deregulating pricing in a third market. Taken together, the three major reform measures of the 2005 Competition Act will hasten the movement toward an innovative, efficient telecommunications marketplace in which multiple service providers compete to offer consumers a package of voice, broadband Internet access, and video programming services. This paper describes in detail the three major reform measures of the 2005 Competition Act, their synergistic relationship, and the ways in which they will enhance the Texas telecommunications marketplace.

The first major reform measure, Chapter 43, eliminates entry barriers in the broadband Internet access market by allowing, for the first time, incumbent electric utilities to offer broadband Internet access over their network facilities. This emerging technology shows great potential for growth: since the requisite network infrastructure is already built, the investment that utilities will be required to

make to convert the network grid for Internet traffic is reasonable, and consumers will be required to use only a simple modem device to connect to the service. This new technology promises to intensify competition in the broadband Internet access market.

The second reform measure, Chapter 65, deregulates pricing in certain local-exchange telephone markets. Local-exchange service providers will now be free to set rates for residential telephone service according to market conditions—not according to regulatory mandates.

The third provision, Chapter 66, minimizes service providers' entry costs in the video programming market. It eliminates the requirement that service providers must negotiate and obtain a franchise in each local area they wish to serve. This important change essentially eliminates a major entry barrier that exists in many video programming markets. Chapter 66 also eliminates build-out requirements, thereby encouraging entry into the video programming market and giving entrants an opportunity to start on a small scale in a large market.

This paper also examines the magnitude of the digital divide and discusses the potential effect of the 2005 Competition Act on that divide. Although a digital divide still exists with regard to income, population

density, and education, it has narrowed considerably in recent years, and high-speed Internet services are now available in almost every zip code. To the extent that the digital divide still exists, it appears to be a demand-side rather than a supply-side problem, and regulatory policies aimed at eliminating it via supply-side measures are not likely to be effective. The competitive provisions of the 2005 Competition Act, however, should lead to lower Internet service prices, facilitating access for low-income households.

While the 2005 Competition Act has been in effect for only two months, economic theory, combined with similar deregulation experiences in other markets, suggests that it will increase competition in local video programming markets throughout Texas. This increased competition should allow new technologies to emerge, offering consumers lower prices, increased quality and quantity of telecommunication services, and expanded product choices. The 2005 Competition Act also provides a model for policymakers in other states who want to transform their regulated telecommunications markets into competitive, innovative, thriving marketplaces that will better meet the economic challenges of the 21st century.

## I. Introduction

On September 7, 2005, Texas Governor Rick Perry signed into law Senate Bill No. 5, an “Act Relating to Furthering Competition in the Communications Industry” (hereinafter “2005 Competition Act”), which many believe will significantly reform telecommunications regulations that have limited competition and diminished innovation in Texas telecommunications markets for many years.<sup>1</sup> This Act also serves as a model for legislators in other states who are seeking to reshape their telecommunications markets to meet the economic challenges of the 21<sup>st</sup> century. The primary objective of the 2005 Competition Act is to promote competition by eliminating entry barriers in two markets and by deregulating pricing in a third market. This should allow new technologies to emerge so that consumers would enjoy lower prices, increased quality and quantity of telecommunication

services, and expanded product choices among the various service providers in the marketplace.

The bill contains three important reform measures that are directly aimed at improving competitive conditions in three Texas telecommunications markets. Chapter 43 (*Use of Electrical Delivery Systems for Access to Broadband and Other Enhanced Services, Including Communications*) eliminates entry barriers in the broadband Internet access market by allowing incumbent electric utilities to offer broadband Internet access over their network facilities. The future growth of this emerging technology (called broadband over power lines (BPL)) is very promising. Since the requisite network infrastructure is already built, the investment that utilities would be required to make to convert the network grid for Internet traffic is reasonable and easily implemented, and consumers would be required to use only a simple modem device that is plugged into an electrical outlet to connect to the service.<sup>2</sup> Moreover, virtually all households and businesses in Texas are connected to the network since they have electricity in their residences or places of business and, thus, access is no longer an issue. The entry of an additional service provider in the broadband Internet access market will certainly intensify competition with the incumbent cable service provider using cable modem technology and with the incumbent local-exchange telephone service provider using digital subscriber line (DSL) technology.

Chapter 65 (*Deregulation of Certain Incumbent Local Exchange Company Markets*) deregulates pricing in certain local-exchange telephone markets on January 1, 2006, and in other markets on January 1, 2007. Local-exchange service providers will then be free to set rates for residential telephone service according to market conditions and not according to regulatory mandates. Texas regulators will declare a market deregulated if there are three or more service providers present, e.g. the incumbent local-exchange telephone service provider, a facilities-based competitor, and a wireless service provider. This condition will likely be satisfied in many local-exchange markets because wireless

1 “Act Relating to Furthering Competition in the Communications Industry,” S.B. 5, 79<sup>th</sup> Legislature, 2d Session, Texas 2005. See also “Texas Takes the Lead on Reforming Outdated Telecom Laws,” *FreedomWorks*, September 7, 2005.

2 See, for example, “The Web’s New Outlet,” *Wall Street Journal*, March 2, 2004.

service is basically ubiquitous and because the emergence of Voice over Internet Protocol (VOIP) telephone is widely available to consumers with broadband Internet access.

Chapter 66 (*State-Issued Cable and Video Franchise*) minimizes the entry cost incurred by service providers seeking to enter the video programming market.<sup>3</sup> Specifically, the 2005 Competition Act eliminates the requirement that service providers must negotiate and obtain a franchise from the local franchising authority in each local area they wish to serve. Instead, service providers are now only required to obtain a single state-issued cable and video franchise that allows them to offer service in any local market in Texas. This single franchise requirement lowers in a very significant way the entry cost that potential service providers incur because they will now avoid the costs associated with obtaining a franchise in each local market. While the 2005 Competition Act has only been in effect for a few months, economic theory, combined with similar deregulation experiences in other markets, suggests that there will be an increase in competition in local video programming markets throughout Texas because of this important reduction in entry costs.

In this policy report, I will describe in detail how the regulatory changes in Chapter 66 will increase competition in the video programming market in Texas. In addition, I will evaluate several issues related to the changes made in Chapter 66, such as the entrant's incentive to "build out" to underserved or less profitable areas, market discrimination, and the holy grail of all telecommunications reform debate—the digital divide among Texas citizens. I will argue, for example, that new entrants are likely to enter densely populated markets first, but will likely extend their service to less populated areas once they have established a presence in the market.

In the final section of this report, I will describe how the three major reform measures of the 2005 Competition Act are interrelated and how each measure will likely have a competitive impact in the other telecommunications markets. Furthermore, I will argue that the three reform measures taken together will increase the move-

ment toward a single telecommunications marketplace in which multiple service providers compete to offer consumers a package of voice, broadband Internet access, and video programming services.

## II. Franchise Fees

### *The 2005 Competition Act will lower regulatory entry barriers*

One of the major reform measures in the 2005 Competition Act is the creation of a state-issued cable and video franchise. While this specific change does not eliminate the state's control over entry into the video programming market, it does lower the entry costs that potential entrants incur when seeking permission to enter a local market. Consequently, economic theory predicts that new entry will likely increase, which will mean lower prices and an increase in the quality and quantity of service provided in the market.

Before the 2005 Competition Act was passed, cable firms, who were the primary service providers in the video programming market, were required to negotiate and obtain a franchise agreement for each local market they served. While there is no available data describing the details of the franchise process in Texas, economist Thomas Hazlett reports that "cities typically devote between two and ten years to the process of deciding upon a franchise."<sup>4</sup> Assuming that this is representative of the franchise process in Texas, one can only imagine how staggering the time and resource cost was for a prospective service provider seeking to enter several local video programming markets in Texas before September 2005.

What are the important changes in Chapter 66 that will make entry into the video programming market easier and less costly? The first important change, mentioned above, is that new entrants are no longer required to obtain a franchise agreement for each local market they wish to serve; now they are only required to obtain one state-issued franchise agreement that covers all markets they intend to serve.

The second important change is that the Texas Regulatory Commission must notify a

<sup>3</sup> This is sometimes called the cable television market.

<sup>4</sup> See Thomas W. Hazlett, "Private Monopoly and the Public Interest: An Economic Analysis of the Cable Television Franchise," *University of Pennsylvania Law Review* 134 (July 1986): 1335-1409.

prospective entrant within 15 days upon receiving its franchise application whether the application is complete. If so, then the Commission must issue a certificate of franchise within 17 days of receipt of the completed application. Thus, the entire process is limited to 32 days. The obvious and

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predicted effect of these changes is a reduction of the legal costs associated with seeking an agreement from each local franchise authority and the time cost associated with obtaining permission to enter a new market. This will undoubtedly make new entry more likely in Texas video programming markets. In fact, according to the National Telecommunications and Information Administration:

The franchising process eliminates or seriously impedes entry by competitors, imposes substantial costs and delays on franchisees, cable subscribers and the public, which are not offset by countervailing benefits. The public would be better served by municipal efforts to provide a choice of cable service providers rather than extracting costly concessions from a sole cable franchisee. We therefore recommend that municipalities no longer grant exclusive franchises. Instead, municipalities should

permit, even encourage, entry by competitive service providers.<sup>5</sup>

Chapter 66 also requires each holder of a state-issued franchise to pay a 5 percent franchise fee, based on its gross revenues, to each local municipality in which service is provided. Since profit potential is the major factor driving the entry decision, this change will also have a positive impact on the likelihood of new entry to the extent the new franchise fee is less than the average of the separate fees paid before the 2005 Competition Act was passed. Hence, the combined effect of these important changes contained in Chapter 66 will lower entry barriers and increase competition in video programming markets across Texas.<sup>6</sup>

*The 2005 Competition Act will limit the exercise of market power*

How will the 2005 Competition Act affect monopolies and consumer choices in the video programming market? Economic theory predicts that a monopolist produces less output than the competitive quantity and charges a price that is higher than the competitive price. Consequently, the monopoly output results in a loss in consumer surplus.<sup>7</sup> In other words, consumers forego benefits that they would otherwise enjoy under competitive conditions because fewer goods and services are sold in the marketplace.<sup>8</sup>

Chapter 66 promises to replace an old regulatory regime, in which the incumbent service provider was able to exercise considerable market power because the market franchise was typically limited to one service provider, with a competitive market in which there are multiple service

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5 Thomas W. Hazlett and Matthew L. Spitzer, *Public Policy Toward Cable Television: The Economics of Rate Controls* (The MIT Press, 1997, p. 39).

6 Chapter 66 does not, however, eliminate any of the other concessions that a local franchising authority may demand from the new entrant. For example, franchise authorities in Tampa, Florida requested from Verizon Communications Inc. \$13 million worth of goods such as an emergency communications network, digital editing equipment, and video cameras. See "Spotty Reception: As Verizon Enters Cable Business, It Faces Local Static," *Wall Street Journal*, October 28, 2005, p. A1.

7 Consumer surplus is the benefit that consumers enjoy, but would be willing to pay for, which is in excess of the price they actually pay for consuming those units of video programming.

8 Economists are less concerned, however, with the price increase because it simply transfers income from consumers to the service providers. Although policymakers often claim that they are concerned with income redistribution issues, it is the local franchise authorities who are directly responsible for creating a monopoly outcome when they issue an exclusive franchise in their local market. Some policymakers will argue, however, that it is efficient to have only one service provider in the market. Economists call this situation a natural monopoly. For an overview of this debate, see Hazlett (1986). Recent evidence suggests that, at least in Canadian markets, video programming is not a natural monopoly. See Stephen M. Law and James F. Nolan, "Measuring the Impact of Regulation: A Study of Canadian Basic Cable Television," *Review of Industrial Organization* 21 (November 2002): 231-249.

providers.<sup>9</sup> Critics would claim, however, that monopoly service providers were unable to exercise undue market power because competitive alternatives were available to consumers.

This argument rests on two assumptions. First, over-the-air broadcast television is an imperfect but inexpensive substitute for video programming service and, therefore, minimizes the market power that cable service providers are able to exercise in their local markets. The primary reason is that demand elasticity (i.e., consumers' responsiveness to price changes) is the main determinant of market power. So, if consumers are not very responsive to price increases for video programming, meaning that demand is relatively inelastic, then the cable service provider is able to exercise market power. However, if consumers are responsive, the cable service provider is unable to exercise market power because consumers will substitute an alternative service. While demand elasticity estimates for video programming are relatively scarce, economists Thomas Hazlett and Matthew Spitzer report own-price estimates around -2.0.<sup>10</sup> Economists Robert Crandall and Harold Furchgott-Roth report evidence that the "demand for cable services is sensitive to the number of broadcast channels available to households without cable service."<sup>11</sup> These findings show that the incumbent monopoly service provider's ability to exercise market power was somewhat constrained by the presence of over-the-air broadcast television.

The second premise of the critics' argument is that the availability of direct broadcast satellite video programming (DBS) may also limit the monopoly service provider's exercise of market power. In 2005, this service is widely available on competitive terms to almost all Texans and is very comparable to the service packages provided by incumbent cable service providers in terms of price, the number of basic channels, the breadth of premium channels, availability of digital

technology features, and availability of local channels in many of the larger markets. The major advantage satellite service providers have over cable service providers is that satellite providers are not required to obtain franchise agreements to provide service in a particular market. This naturally raises the question: why are cable service providers and others still required to obtain franchise agreements under the 2005 Competition Act?

What is the competitive impact of DBS service on cable competition and cable prices? Economists Andrew Wise and Kiran Duwadi find that quality-adjusted cable prices have no statistical impact on DBS penetration rates, which, on the surface, can be interpreted to mean that consumers do not treat cable and DBS video programming as close substitutes.<sup>12</sup> Moreover, Wise and Duwadi note that several Federal Communications Commission (FCC) and General Accountability Office (GAO) studies find that cable prices are lower when there is an overbuilder (a second wireline company in the same market) present, but those prices appear to

*Table 1*

*Broadband and Video Programming Service Providers in Texas*

Service	Number of Service Providers	Number of Communities or Towns Served
Cable video programming	87 <sup>a</sup>	1,129 <sup>a</sup>
Number of zip codes reporting 2 or more cable service providers present.	0	0
DBS	2	1129
DSL broadband	31 <sup>b</sup>	575 <sup>c</sup>
Cable broadband	12 <sup>b</sup>	575 <sup>d</sup>

<sup>a</sup> <http://www.fcc.gov/mb/engineering/liststate.html>

<sup>b</sup> FCC, *High-Speed Services for Internet Access: Status as of December 31, 2004*, July 2005, Table 6

<sup>c</sup> <http://www.dlsbroker.com/states/texas/dsl-texas-cities.html>

<sup>d</sup> <http://www.buytelco.net/buytelcodsl.asp?gtse=goog&kw=Texas+Cable>

Note: Author's calculations. I assume that *DirecTV* and *EchoStar* are both available in Texas. In addition, I counted 575 cities or towns listed for DSL and cable broadband service.

9 Market power refers to a firm's ability to raise price profitably above marginal cost. See Jeffrey Church and Roger Ware, *Industrial Organization: A Strategic Approach* (Irwin McGraw-Hill, 2000, p. 29). See Hazlett (1986) for a discussion of the monopoly franchise problem.

10 See Hazlett and Spitzer (1997, p. 8 & p. 34). Economic theory shows that a monopolist will always operate in the elastic part of the market demand curve it faces.

11 Robert W. Crandall and Harold Furchgott-Roth, *Cable TV: Regulation or Competition?* (The Brookings Institution, 1996, p. 145).

12 Andrew Stewart Wise and Kiran Duwadi, "Competition between Cable Television and Direct Broadcast Satellite—It's More Complicated than You Think," *FCC Media Bureau Staff Research Paper* No. 2005-1, January 2005.

be unaffected by the presence of DBS competition.<sup>13</sup> For example, one FCC report shows that the average price per channel for the noncompetitive market is \$0.67 per channel compared to \$0.65 per channel in those markets with DBS competition and \$0.52 per channel in those markets with an overbuilder.<sup>14</sup> Interestingly, the FCC reports that DBS service providers now serve close to 25 percent of the video programming subscribers nationwide, and are the second and fourth largest service providers in the marketplace.<sup>15</sup>

One plausible explanation for the apparent inconsistency between the growth in DBS competition reported by the FCC and the findings that DBS has no apparent impact on cable prices is that DBS is simply capturing a larger share of subscribers in a growing market. In other words, DBS firms are attracting a larger percentage of new subscribers in growing markets relative to the incumbent cable service provider, but they are having less success in convincing existing cable subscribers to switch to DBS.<sup>16</sup> Thus, I will assume cable service providers have a monopoly position in those markets in which they are sole service providers, but their ability to exercise market power is limited (not eliminated) to the extent that over-the-air broadcast television and DBS are substitute services.

What is the video programming market structure like in Texas? The FCC reports that only three percent of the cable communities nationwide were competitive in January 2004.<sup>17</sup> This means that cable firms have in effect a monopoly

position in roughly 97 percent of local markets nationwide. Thus, Texas should be representative of the United States. The data in Table 1 indicate there are 87 service providers serving 1,129 local communities.<sup>18</sup> However, I estimate there are currently no communities in which there is an overbuilder present—that is, no communities that the FCC would likely classify as competitive. Consequently, the main impact that Chapter 66 is likely to have in Texas video programming markets is to encourage new entry, which will increase economic efficiency and decrease service prices.

To what extent will Chapter 66 increase economic efficiency? To answer this question I will assume a demand elasticity for video programming services equal to  $-2.0$ ; a subscriber base of 1,320,225; an average monthly cable bill for the monopoly service provider (i.e., when there is no other wireline service provider present) equal to \$45.56; and an average monthly cable bill for a competitive service provider (i.e., when there is a wireline overbuilder present) equal to \$39.37.<sup>19</sup> Given these assumptions, the estimated gain in economic efficiency is equal to a conservative \$15,396,424 per year for Texas video programming consumers.<sup>20</sup> Moreover, the estimated gain in consumer surplus for current video programming subscribers is \$98,066,313 annually, or \$74.28 per subscriber.

### III. Build-Out

One important provision of the state-issued

13 Wise and Duwadi (2005, pp. 5-6).

14 See *Report on Cable Industry Prices*, MM Docket No. 92-266, 4 February 2005, Attachment 6.

15 See FCC, In the Matter of *Annual—Assessment of the Status of Competition in the Market for the Delivery of Video Programming*, Eleventh Annual Report, MB Docket No. 04-227, February 4, 2005, p. 4.

16 Wise and Duwadi (2005) argue that switching costs limit the substitution between cable and DBS video programming. They do report evidence that DBS competition does increase the quality of the cable service (e.g., number of channels) in a local market.

17 See *Report on Cable Industry Prices*, MM Docket No. 92-266, February 4, 2005, footnote 4, for more details.

18 These data are found at <http://www.fcc.gov/mb/engineering/liststate.html>. All cable communities must register with the FCC and a cable service provider must file Form 322, “Cable Community Registration,” for each community served in accordance with 47 C.F.R. § 76.1801.

19 The elasticity estimate is in the range of estimates reported by Hazlett and Spitzer (1997, p.8). The number of subscribers is actually the number of coaxial cable high-speed lines in Texas as of December 2004. This is a conservative estimate of the number of cable subscribers in Texas since not every cable subscriber will purchase high-speed service with video programming service. It is likely though that a high-speed service subscriber will also subscribe to video programming. The data are found in FCC, *High-Speed Services for Internet Access: Status as of December 31, 2004*, July 2005, Table 10. The monthly cable bill data are found in *Report on Cable Industry Prices*, MM Docket No. 92-266, February 4, 2005, Attachment 6.

20 This is an estimate of the deadweight loss of monopoly that is avoided when a second wireline competitor is present in the marketplace.

franchise that will certainly draw much attention is that the holder of a state-issued franchise is not required to “comply with mandatory build-out provisions.”<sup>21</sup> Build-out requirements in general are likely to place an undue burden on service providers and should be eliminated altogether. They are likely to decrease the chance that new service providers will enter a particular market, for several reasons. First, a potential entrant is less likely to enter a new market if it must first commit to building out the market. New entrants are likely to enter markets on a small scale and where there is a profit opportunity before they commit scarce investment resources to serving larger and perhaps less profitable markets. A mandatory build-out requirement creates a risk—a potential sunk cost—for any service provider that enters. The investment resources necessary to build out a market are sunk once the entry decision is made and the service provider commences operation.<sup>22</sup> Consequently, the potential entrant, who perceives additional risk associated with entering a new market that may turn out to be less profitable than expected and where the costs of entering are not fully recoverable, may decide not to enter.

The second reason is more practical. New firms may choose to enter on a small scale to establish a market presence before expanding their operations to consumers in other areas of the market in competition against the incumbent service provider, who has already established a market presence. Again, eliminating the build-out requirement for state-issued franchise holders is likely to encourage more entry since it provides an entrant with an opportunity to get started on a small scale in a large market.

## IV. Discrimination

A second important provision of the state-issued franchise is that the holder shall “not deny access to service to any group of potential residential subscribers because of the income of the residents in the local area in which such group resides.”<sup>23</sup> While the probable intent of

this condition is to ensure that service providers do not discriminate against potential subscribers who may be unable to afford the video service, as well as to minimize the chances that service providers practice some form of video redlining, the impact of this provision on the

*Table 2*

*Deployment of Residential and Small Business High-Speed Lines 1999 to 2004*

Technology	1999 Lines	2004 Lines	Annual Growth: 1999-2004 (percent)
DSL Broadband	338,613	13,538,541	73.8
Cable Broadband	1,402,394	21,270,158	54.4
Satellite or Wireless Broadband	50,189	422,623	42.6
Fiber-to-the-Home or Powerline	1,023	34,959	70.6
Texas High-Speed Lines	152,518	2,597,539	56.7

Source: FCC, *High-Speed Services for Internet Access: Status as of December 31, 2004*, July 2005, Tables 3 & 8, and author's calculations.

likelihood of entry is unclear.

One possible effect is that this provision will reduce entry into those areas in which there is a mix of high- and low-income individuals because the service provider would be unable to deny access to low-income individuals who may be unable to afford the service. Rather than risk the potential legal problems with discrimination, the service provider may choose not to enter the market at all. This effect seems unlikely, however, since low- and high-income individuals are not likely to live in the same areas.

The more likely effect is that this provision will increase entry. New entrants may perceive that the regulatory playing field is level to the

*Table 3*

*Deployment of Residential and Small Business Advanced-Services Lines 1999 to 2004*

Technology	1999 Lines	2004 Lines	Annual Growth 1999-2004 (percent)
DSL Broadband	163,850	5,445,582	70.1
Cable Broadband	872,024	20,811,704	63.4
Satellite or Wireless Broadband	7,682	84,465	47.9
Fiber-to-the-Home or Powerline	138	33,189	109.7

Source: FCC, *High-Speed Services for Internet Access: Status as of December 31, 2004*, July 2005, Table 4, and author's calculations.

21 2005 Competition Act, Sec. 66.007

22 See Jeffrey Church and Roger Ware, *Industrial Organization: A Strategic Approach*, Chapter 14 for more details.

23 2005 Competition Act, Sec. 66.014 (b).

extent that the incumbent and the new entrant are both prohibited from discriminating on the basis of income and, therefore, will decide that it is profitable to enter the market. Nonetheless, the effect of this condition on discrimination is likely to be minimal since competitive pricing within the market will naturally discriminate against buyers who are unwilling or unable to pay the market price, and willingness and ability are most likely correlated with income.

## V. Digital Divide

What impact will the 2005 Competition Act have on broadband deployment? Broadband deployment is probably one of the most critical policy issues facing regulators and policymakers today at both the state and federal levels, and it is the center of the debate over whether there is a digital divide in telecommunications markets. Indeed, Section 706 of the Telecommunications Act of

1996 states that “[t]he Commission and each State commission with regulatory jurisdiction over telecommunication services shall encourage the deployment on a reasonable and timely basis of advanced telecommunication capability to all Americans...”<sup>24</sup> Thus, the pertinent question is: how will the key provisions of the 2005 Competition Act likely impact broadband deployment in Texas?

To provide some background and a perspective from which to answer this question, I first examined the overall broadband deployment situation for the United States. The empirical evidence for the United States as a whole presents a very positive picture. For instance, the number of high-speed lines has increased from 2,754,286 in December 1999 to 37,890,646 in December 2004—almost a 14-fold increase.<sup>25</sup> Similarly, the number of advanced-services lines increased from 1,988,455 in December 1999 to 28,857,608 in

### High-Speed Subscribership Ranked by Population Density

Table 4

*Percent of Zip Codes with at Least One High-Speed Subscriber, Ranked by Population Density 2000 and 2004\**

Persons per Square Mile	Percent of Zip Codes with at Least One Subscriber*	
	December 2000	December 2004
> 3,147	98.2	99.1
947 - 3,147	97.1	98.7
268 - 947	95.7	99.1
118 - 268	91.5	98.2
67 - 118	85.9	98.0
41 - 67	76.1	97.5
25 - 41	65.0	95.5
15 - 25	50.1	91.4
6 - 15	38.5	86.2
< 6	27.5	74.8

\* These data relate to percent of zip codes that have a particular population density. For example, in the second column, 98.2 percent means that 98.2 percent of zip codes with a population density greater than 3,147 persons per square mile have at least one high-speed subscriber

Source: FCC, High-Speed Services for Internet Access: Status as of December 31, 2004, July 2005, Table 14.

Table 5

*Percent of Population Residing in Zip Codes with High-Speed Service, by Population Density 2000 and 2004\**

Persons per Square Mile	Percent of Population that Resides in Zip Codes with High-Speed Service*	
	December 2000	December 2004
> 3,147	99.9	100.0
947 - 3,147	99.8	99.9
268 - 947	99.3	100.0
118 - 268	98.1	99.8
67 - 118	95.0	99.7
41 - 67	87.9	99.3
25 - 41	80.0	98.5
15 - 25	69.4	96.8
6 - 15	61.9	95.0
< 6	49.9	91.8

\* These data relate to percent of the population living in zip codes that have a particular population density. For example, in the second column, 99.9 percent means that high-speed Internet service is available to 99.9 percent of the population living in those zip codes with a population density greater than 3,147 persons per square mile.

Source: FCC, High-Speed Services for Internet Access: Status as of December 31, 2004, July 2005, Table 14.

24 § 706 (a) Public Law 104-104, Title VII, February 8, 1996, 110 Stat. 153.

25 See FCC, High-Speed Services for Internet Access: Status as of December 31, 2004, July 2005, Table 1. The FCC defines high-speed lines as “those that provide services at speeds exceeding 200 kilobits per second (kbps) in at least one direction.”

26 See FCC, High-Speed Services for Internet Access: Status as of December 31, 2004, July 2005, Table 2. The FCC defines advanced services lines as “those that provide services at speeds exceeding 200 kbps in both directions.” Advanced services lines are a subset of high-speed lines.

December 2004—almost a 15-fold increase.<sup>26</sup> Furthermore, broadband is now the most popular choice of technology for approximately 53 percent of all residential Internet users in the United States.<sup>27</sup>

Across the United States, residential and small-business users accounted for much of the growth in both the number of high-speed and advanced-services lines between 1999 and 2004. For example, they accounted for approximately 65 percent of the high-speed lines and 52 percent of the advanced-services lines in 1999, and 93 percent of the high-speed lines and 91 percent of the advanced-services lines in 2004. This tremendous growth in the number of broadband lines accounted for by residential and small-business users is nothing short of exceptional.

The data in Table 2 show the number of high-speed lines deployed by the major service providers: DSL broadband, cable broadband, satellite or wireless broadband, and FTTH or

Powerline.<sup>28</sup> The FCC data for “ADSL” (asymmetric digital subscriber lines) and “Other Wireline” are combined and presented as DSL broadband in this table. Similar data for advanced services lines are presented in Table 3. It is clear from Table 2 that DSL broadband has grown at a much faster pace (73.8 percent) than cable broadband (54.4 percent), which is not too surprising since cable broadband started with a much larger base in 1999.

The broadband deployment data for urban and rural areas and for various income classes also present a positive picture for the United States. Tables 4 and 5 show data classified by population density, and similar data are presented in Tables 6 and 7 for household income classes. In Tables 4 and 5, several important trends emerge. First, since December 2000, the number of zip codes with at least one subscriber has been steadily increasing. By December 2004, 75 percent of even the most sparsely populated zip codes (fewer than six persons per square mile) had at least one high-

## High-Speed Subscribership Ranked by Household Income

Table 6

*Percent of Zip Codes with at Least One High-Speed Subscriber, by Median Household Income 2000 and 2004\**

Median Household Income	Percent of Zip Codes with at Least One Subscriber	
	December 2000	December 2004
\$53,494 - \$291,938	96.1	98.8
\$43,617 - \$53,478	88.9	97.6
\$38,396 - \$43,614	79.5	96.7
\$34,744 - \$38,395	74.5	95.0
\$32,122 - \$34,743	71.2	94.3
\$29,893 - \$32,121	67.4	93.8
\$27,542 - \$29,892	66.9	93.6
\$24,855 - \$27,541	65.1	92.6
\$21,645 - \$24,855	61.2	92.9
\$0 - \$21,644	54.9	83.3

\* These data relate to percent of zip codes that have a particular median household income. In the second column, 96.1 percent means that 96.1 percent of all zip codes with a median household income in the range from \$53,494 to \$291,938 have at least one high-speed subscriber.

Source: FCC, High-Speed Services for Internet Access: Status as of December 31, 2004, *July 2005, Table 15*.

Table 7

*Percent of Population Residing in Zip Codes with High-Speed Service, by Median Household Income 2000 and 2004\**

Median Household Income	Percent of Population that Resides in Zip Codes with High-Speed Service	
	December 2000	December 2004
\$53,494 - \$291,938	99.8	99.8
\$43,617 - \$53,478	99.0	99.9
\$38,396 - \$43,614	97.8	99.8
\$34,744 - \$38,395	96.6	99.7
\$32,122 - \$34,743	95.9	99.6
\$29,893 - \$32,121	94.5	99.4
\$27,542 - \$29,892	93.8	99.4
\$24,855 - \$27,541	93.1	99.2
\$21,645 - \$24,855	91.1	99.3
\$0 - \$21,644	91.5	99.0

\* These data relate to percent of zip codes that have a particular median household income. In the second column, 99.8 percent means that high-speed Internet service is available to 99.8 percent of the population living in those zip codes with a median household income in the range from \$53,494 to \$291,938.

Source: FCC, High-Speed Services for Internet Access: Status as of December 31, 2004, *July 2005, Table 15*.

27 “Feeding the Internet Habit: Broadband Growth Is Changing Lifestyles Online and Off,” *Kalamazoo Gazette*, December 31, 2004.

28 The FCC lists four technologies: asymmetric digital subscriber line (ASDL); other wireline technologies which includes symmetric DSL services; coaxial cable which includes hybrid fiber-coax; optical fiber to the home; and satellite and terrestrial wireless systems.

speed subscriber, and 86 percent of zip codes with only six to 15 persons per square mile had at least one subscriber (see Table 4). Second, and more importantly, the largest increases have been in the less densely populated areas. This suggests that broadband deployment is spreading to those rural areas that policymakers believed were being underserved. Moreover, in December 2004, 92 percent of the population of the most sparsely populated zip codes (fewer than six persons per square mile) lived in areas with at least one high-

speed Internet service provider, and 100 percent of the residents of more densely populated areas lived in zip codes with high-speed access (see Table 5). This is significant because it shows that high-speed services are available in almost every zip code even though there are fewer zip codes with at least one subscriber. More importantly, this suggests that broadband deployment is a demand-side and not a supply-side problem, and that current regulatory policies aimed at eliminating the digital divide may be largely ineffective.

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*The competitive provisions of the 2005 Competition Act should lead to even more availability... and broadband access should become even more affordable for low-income individuals when competitive pressures lower service prices below current levels.*

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The data presented in Tables 6 and 7 show high-speed subscribership ranked according to household income. According to a Pew Internet and American Life report, *How the Internet Has Woven Itself into American Life*, income and education are two important determinants of broadband use.<sup>29</sup> Income is important because broadband Internet access is likely to be a normal good and, therefore, its use will increase as income rises. Education is important since it is correlated with income, and highly educated individuals are accustomed to using the Internet at work or

school. Therefore, I assume that broadband use is more prevalent among high-income households. The data in Tables 6 and 7 confirm the relationship between broadband use and income discussed above. Table 6 shows that in December 2004, as median household income increased, the percentage of zip codes with at least one high-speed subscriber increased as well. Furthermore, Table 7 shows that in December 2004, regardless of income, at least 99 percent of the population lived in an area with high-speed Internet service. Indeed, according to this data, almost 100 percent of zip codes had at least one service provider, while approximately 40 percent had five or more service providers.<sup>30</sup>

A Pew Internet and American Life report, *Internet Use by Region in the United States*, presents a number of findings that are also worth mentioning.<sup>31</sup> First, there are regional differences in Internet usage among adults 18 years and older. For example, the highest percentage of Internet users is found in the Atlantic seaboard region (68 percent), whose population has high income and high education levels. By contrast, the lowest percentage (48 percent) is found in the South, which has the lowest income and education levels. Clearly, Internet usage is related to education and income. Again, this finding suggests that broadband usage is probably a demand-side problem, largely influenced by education and income, and not a supply-side problem related to deployment and availability. Thus, even if service providers roll out the service in areas with low income and, perhaps more importantly, low education levels, the service may not be used to the extent that policymakers anticipate. The idea that if you build it, they will come may hold true only for areas with relatively high income and high education levels.

How does Texas compare to the rest of the United States in terms of broadband deployment? To answer this question, I have updated the data in a 2005 Report to the 79<sup>th</sup> Texas Legislature titled the *Scope of Competition in Telecommunica-*

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29 See *How the Internet Has Woven Itself into American Life*, Chapter 4, *Internet: The Mainstreaming of Online Life*, Pew Internet and American Life report, 2005, <http://www.pewinternet.org/>.

30 See FCC, *High-Speed Services for Internet Access: Status as of December 31, 2004*, July 2005, Table 12.

31 See *Internet Use by Region in the United States*, Pew Internet and American Life report, 2003, <http://www.pewinternet.org/>.

32 This section is based on the *Report to the 79<sup>th</sup> Texas Legislature: Scope of Competition in Telecommunication Markets of Texas*, Public Utility Commission of Texas, January 2005, and Federal Communications Commission, *High-Speed Services for Internet Access: Status as of December 31, 2004*, July 2005.

tions *Markets of Texas*.<sup>32</sup> In December 2004, Texas ranked fourth among all states in terms of the number of high-speed lines. While the national growth rate between December 1999 and December 2004 was 52 percent per year, the growth rate in Texas over that same period was an impressive 57 percent per year.<sup>33</sup> Of course, this growth in high-speed lines was accompanied by an equally impressive increase in the growth of broadband subscribership over the period from December 1999 to December 2004. Cable subscribership exceeded DSL subscribership for much of that period until the first quarter of 2004, similar to the trends emerging at the national level.<sup>34</sup>

In terms of broadband availability, the 2005 report paints a positive picture for Texas as well.<sup>35</sup> Eighty-five counties reported no broadband service providers in 2002, but by 2004, the number of counties with no providers had dropped to 16. Interestingly, 93 counties reported one service provider in 2002 and 2004, but the number of counties that reported between two and six service providers increased from 66 in 2002 to 117 in 2004. Moreover, the number of counties in the 16-24 range increased from zero to six in just two years. Finally, the data in Table 1 show the widespread availability in broadband access across Texas, and confirm the aforementioned argument that if a digital divide does exist, then it appears to be a demand-side problem and not a supply-side problem. More importantly, the competitive provisions of the 2005 Competition Act should lead to even more availability, especially when electric utilities begin to roll out BPL, and broadband access should become even more affordable for low-income individuals when competitive pressures lower service prices below current levels.

## VI. An Overview of the Competitive Impact of the 2005 Competition Act

The three major features of the 2005 Competition Act will enhance competition in the Texas

telecommunications markets discussed above: broadband Internet access, local-exchange telephony, and video programming.

Chapter 43 is aimed at lowering entry barriers in the broadband Internet access market by making it easier for electric utilities to offer BPL to their customers. This has potential spillover effects in other Texas telecommunications markets. For example, it will increase competition in the broadband Internet access market, but it will also increase competition in the local-exchange telephone market if customers use VOIP technology over the broadband power lines for their telephone service.<sup>36</sup> It is quite reasonable to imagine the incumbent local-exchange telephone companies competing against the local electric utility in the local-exchange telephone market. Moreover, it is reasonable to imagine the electric utility one day using its broadband power lines to offer video programming, which would increase competition in the video programming market. Thus, the promotion of BPL Internet access may spill over into other telecommunications markets and, as a result, increase competition in those markets as well. Furthermore, the promotion of BPL Internet access may also have a positive impact on the digital divide since electric utilities could potentially provide broadband Internet access to all Texans. While a broadband service provider or DSL broadband service provider may be slow to extend service to a rural area, broadband availability and access may no longer be important policy issues, given the potential for electric utilities to serve what were once under-served areas in the broadband Internet access market.

Chapter 65 is aimed at deregulating local-exchange telephone markets in either January 2006, if the population of the market exceeds 100,000, or January 2007 if the population is less than 100,000. The critical factor in the Commission's decision will be, however, whether there are three service providers in the market: the incumbent, a facilities-based competitor, and a wireless service provider. An incumbent and a wireless service provider are most likely present in every market throughout Texas, whereas a

33 *Report to the 79<sup>th</sup> Texas Legislature*, p. 17.

34 *Report to the 79<sup>th</sup> Texas Legislature*, p. 18.

35 *Report to the 79<sup>th</sup> Texas Legislature*, p. 19.

36 See, for example, *Report to the 79<sup>th</sup> Texas Legislature: Scope of Competition in Telecommunication Markets of Texas*, Public Utility Commission of Texas, January 2005, p. 71.

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facilities-based competitor is not. This should not present a major problem, however, if consumers are able to use VOIP technology over BPL or over cable or DSL broadband lines.

Chapter 66 is aimed at replacing multiple franchises with a single state-issued franchise to lower entry costs into the video programming market. This will likely increase competition in the other markets since new entrants will likely offer both video programming and broadband Internet access. Moreover, consumers subscribing to both will have the opportunity to use VOIP technology for their local-exchange telephone service, which should increase the likelihood that the Commission will find sufficient competition in the local-exchange market to deregulate pricing in that market. Taken all together, the changes described above will increase competition in Texas telecommunications markets and may indeed increase the speed with which we move toward digital convergence in a marketplace where telecommunication service providers of all types compete by offering consumers a package of voice, video, and broadband services.

## VII. Summary and Conclusions

The 2005 Competition Act passed in September 2005 seeks to reform telecommunications policy in Texas by eliminating regulatory

restrictions that have limited entry into several key telecommunications markets. For the first time, electric utilities are permitted to offer broadband Internet access service (BPS) using their network infrastructure, and this new technology promises to intensify competition in the broadband Internet access market. Moreover, the 2005 Competition Act makes it easier for new competitors to enter the video programming market since new entrants are only obligated to obtain a single franchise from the state, instead of a franchise for each local market they wish to serve. This important change essentially eliminates the exclusive (i.e., monopoly) franchise that exists in many video programming markets and promises to intensify competition in those markets. Taken together, these two reform measures will benefit Texas citizens as greater competition lowers service prices, increases the quality of services provided, and spurs service providers to seek new innovations that will lead to new and better services in the future.

The Texas legislature has taken bold steps on the path toward reforming telecommunications regulatory policy so that competitive markets will better serve the citizens of this state. This sweeping legislation also provides a model for those policymakers in other states who are seriously interested in transforming their regulated telecommunications markets into competitive marketplaces that will better serve their states' citizens.



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