The Evolution of Telecom and the Ohio Template for Reform: 2009

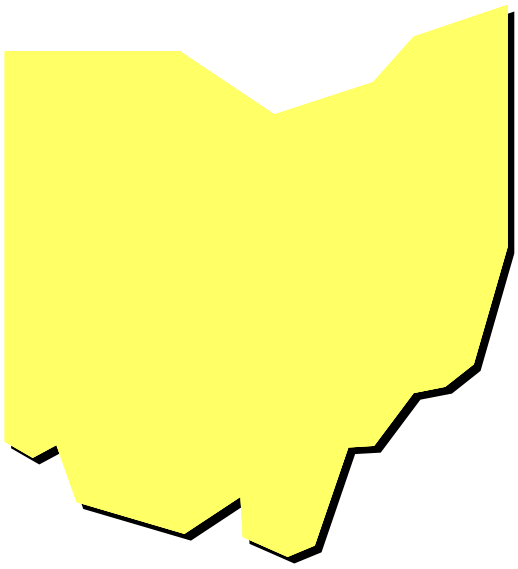

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TABLE OF CONTENTS

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Executive Summary

Absent meaningful reform legislation at the federal level, a number of Midwestern states have independently acted to remove outdated legacy regulations and correct imbalances caused by increased competition in the telecommunication industry since 1996. Ohio's neighboring state of Indiana passed the most comprehensive telecom reform bill in over two decades in 2006.

Drawing upon recent reform legislation in Iowa, Texas, Ohio and Michigan, Indiana's new legislation, including statewide video franchising, is recognized as the legislative template for other states to follow. Now, two years after deregulation in Indiana, competition in the market has held consumer prices in check, new capital investments have occurred, and consumer complaints are negligible.

Ohio's continued commitment to regulatory reform is best captured by the passage of Senate Bill 117 in 2007, establishing uniform franchising standards for Ohio. As with Indiana and a number of other Midwest states, Ohio's legislation passed with strong bi-partisan support and improved the competitive landscape for video and data services. Now it's time to address legacy regulations that sustain growing imbalances in the telephone market, which are anti-competitive, and inhibit outside capital investment and innovation for the Buckeye State.

In 1996 Congress passed the Telecommunications Act of 1996 and established the preconditions for efficient competition in the telecommunications marketplace. What Congress didn't do, as economist Alfred E. Kahn suggests in his 1998 book, is prescribe a regulatory off ramp as the deregulated marketplace rapidly changed the competitive landscape.[1] Later, in a 2007 speech before the Federal Trade Commission, Kahn stated that continued comprehensive regulation of the telephone industry is not only unnecessary, but will likely "harm ratepayers by inhibiting competition and diminishing investment." [2]

There are a number of legacy regulations in Title 49 of the Ohio Revised Code that should be eliminated, or revised to encourage competition, innovation and outside capital investment. The major reform findings and recommendations of this paper are as follows:

[1] Kahn, Alfred E. Letting Go: Deregulating the Process of Deregulation, or: Temptation of the Kleptrocrats and the Political Economy of Regulatory Disingenuousness (Institute of Public Utilities and Network Industries, Michigan State University, 1998).

[2] Remarks of Alfred E. Kahn before the Federal Trade Commission (Feb. 13, 2007). Available at http://www.ftc.gov/opp/workshops/broadband/presentations/kahn.pdf

- Eliminate archaic provisions and references to "telegraph company," and repeal duplicate references to telephone privacy and harassment already covered in other sections of the Ohio Code (Title 29).

- Adopt new definitions for technology and services which are consistent with current federal law, covered under the Telecommunications Act of 1996, and existing state law.

- Ohio should follow federal precedent and eliminate unwarranted tariff filing requirements. Acknowledge the competitive landscape for telephone service and extend pricing flexibility and repeal anti-competitive rules which inhibit incumbents from developing customized offerings and negotiating volume and term discounts.

- Consistent with the federal elimination of the bulk of state regulation of wireless, Ohio should now streamline wireless laws to focus on carrier registration, the collection, maintenance and reporting of pertinent information, and wireless 9-1-1 obligations.

- Rules which unfairly benefit some providers at the expense of others should be eliminated. Provider of last resort (POLR) requirements in competitive markets which allow exclusive access arrangement for services to multiple dwelling units (MDU) should be eliminated. As in Indiana, incumbents should be protected from having to provide POLR services where MDU owners permit a single provider to provide equipment, accept incentives in exchange for exclusive rights, or charge occupants for services.

- Ohio should eliminate confusion over consumer protection requirements and, for the sake of efficiency, consolidate jurisdiction under a single state agency already charged with resolving consumer complaints for other competitive industries.

The impact of these reform measures can be significant. Streamlining regulations in the information technology sector to encourage continued investment in broadband would improve Ohio's economy.

- By including both the physical investment benefits and the productivity-enhancing benefits of broadband, between 15,000 and 30,000 jobs per year are supported or created in Ohio due to broadband investments.

- Ohio businesses and consumers are moving toward broadband and away from traditional wireline technology. Achieving sufficient broadband infrastructure will allow for a critical mass of Ohio broadband users to develop and adopt productivity-enhancing practices.

- Encouraging a complete broadband infrastructure dovetails in with Ohio's Strategic Economic Development Plan. According to the state's plan, "Digital

connectivity is a major contribution that state government makes to the process of developing a state's economy."

- In the narrowest sense, an investment of $1 million in broadband results in the creation of between 18 and 50 jobs in Ohio. This measure of impact is due solely to the physical investments made in broadband technology and hardware.

- There is a productivity-enhancing or economy-transforming nature that accompanies broadband. The high speed and ease of information flow may result in reduced costs or more efficiencies of production. Broadband's deployment has widespread impacts on Ohio's economy since its speed and data transmittal capacity are desired by all types of Ohio businesses and consumers.

- The Ohio reform effort is timely given the finite investment dollars available by carriers during strained economic times. Only those states that support a level playing field can expect to attract new outside investment capital. Ohio should move with dispatch to create an environment that attracts these limited investment dollars.

1.0 Statewide Legislative Mandate

By Robert Yadon, Ph.D., Michael Hanley, M.A. and Barry Umansky, J.D.

1.1 Introduction

For nearly 100 years the Federal government has been involved in the regulation of telephone companies, using the statutory framework established earlier for railroad common carriers. The U.S. Congress began such regulation with the Mann-Elkins Act of 1910.[3] Title II of the Communications Act of 1934[4] continued and expanded this regulation and went on, over the course of many decades, to extend such regulation to other forms of telecommunications. Title II establishes the rights and responsibilities of common carriers – regulations that can affect carrier revenues and limit the discretion and flexibility normally accorded commercial operations and commercial transactions.

For much of the past two decades, however, federal regulators have been attempting to deregulate much of the telephone industry. Nonetheless, and on myriad occasions, these efforts have been thwarted in the courts as judicial bodies have rejected – as inconsistent with the FCC's statutory mandate – federal agency initiatives seeking to rely less on intrusive regulations and rely more on marketplace forces in a competitive environment. Among several such examples were efforts to reduce regulation of carrier-provided services and to eliminate the mandatory tariff filings for some carriers. Starting in 1979, the FCC attempted to "forbear" from many forms of regulation of non-dominant carriers. However, the courts consistently rejected[5] these and related deregulatory steps.

This series of judicial impediments led to increasing pressure on Capitol Hill to amend the governing federal statute to allow reduced regulation and greater reliance on the forces of the market. However, as discussed below, federal statutory changes over a dozen years ago have not worked to afford needed deregulatory relief for all carriers. Indeed, it has become evident that reforms at the state level now are needed to achieve that which the federal government has failed to provide – reduced regulatory authority and activity, resulting in an equitable and consumer-benefiting competitive landscape for all competing carriers. Thus, federal deregulatory steps now must be complemented by needed and "corrective" state regulatory reform.

The Telecommunications Act of 1996[6] was the first major overhaul of telecommunications law in almost 62 years. The goal of this new law was to remove the legacy control of the federal court from AT&T's divestiture, encourage new technology and competition in the marketplace, and thereby improve services. While a number of positive events occurred, an unintended outcome of this legislation was the creation of an imbalance in the landscape of the telecommunications industry. New entrants in the marketplace were not only encouraged, but allowed to grow at an unprecedented rate at the collective expense of regulated incumbent services providers and, ultimately, the consumer. That is, the benefits envisioned by the drafters of the 1996 Act have not been realized. Indeed, the competitive

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[3] P.L. No. 61-218, Section 7, 36 Stat. 539,544 (1910.
[4] Communications Act of 1934, P.L. No. 73-416, 48 Stat. 1064 (1934).
[5] *See, e.g.* MCI v. FCC, 765 F.2d 1186 (D.C. Cir. 1985), AT&T Co. v. FCC, 978 F.2d 727 (D.C. Cir. 1992).
[6] P.L. No. 104-104, 110 Stat. 56 (1996).

imbalance between incumbent and competitive carriers has been exacerbated in the years following federal regulatory reform.

According to Matthew Hisrich, a policy analyst with the Buckeye Institute:

> The current [regulatory] system has created an environment where rules and regulations that were originally intended to foster greater competition actually hinder it by favoring one company over another. Congress had no way of knowing that today's telecommunications market would be so vastly different. In today's market, consumers have a variety of new choices that were not available to them in the past. Local providers now compete with cable, satellite and wireless companies for consumers' communications needs.[7]

Here is a case in point. Cable prices have risen 77 percent since 1996, roughly double the rate of inflation, according to a recent Bureau of Labor Statistics report released in May 2008.[8] This isn't a surprise for most cable subscribers in the Midwest. It is a reflection of a failed national telecommunication policy that deregulated the cable industry in 1992[9], and consistently supported cable's monopolistic pricing, plus horizontal and vertical integration within the cable industry. Technological change and marketplace forces have changed the telecom landscape since 1996, but national policy has not kept pace and U.S. consumers are paying the price.

Drilling down, here are a few recent examples of cable rate increases in Ohio communities that have dwarfed inflation for a decade and more.[10]

- In Findlay, the cost of cable service soared 67 percent from 1999 to 2007.
- Dayton subscribers saw rates increase 47 percent between 2000 and 2006.
- In Canton, the cost of cable increased 41 percent between 1999 and 2007.
- Akron cable rates have risen nearly 40 percent since 2000.

Back in 2003, the U.S. General Accounting Office (GAO) issued a report that found that only through direct, head-to-head competition between cable firms and wireline competition would cable bills be lowered by 15 percent for basic and expanded basic services. Further, the report went on to find that competition from satellite alone would prove ineffective in impacting cable rates. For intermodal competition, the report concluded that head-to-head wireline competition would prove 40 times more effective than satellite alone when it comes to impact on cable price.[11]

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[7] Matthew Hisrich, "Ohio lawmakers should loosen telecom restrictions," Business Courier of Cincinnati. February 27, 2004.

[8] Matt Richtel, "Cable Prices Keep Rising; Customers Keep Paying," The NY Times, May 24, 2008. Available at http://www.nytimes.com/2008/05/24/technology/24cable.html?partner=rssnyt&emc=rss.

[9] Cable Television Consumer Protection and Competition Act of 1992, Public Law 102-385--Oct. 5, 1992

[10] http://www.freedomworks.org/publications/assessing-the-case-for-ohio-cable-franchise-reform.

[11] U.S. General Accounting Office (U.S. GAO), Issues Related to Competition and Subscriber Rates in the Cable Television Industry, October 2003; Telecommunications: Issues in Providing Cable and Satellite Television Service, October 15, 2003.

In spite of mounting evidence, Congress was reluctant to remedy these market imbalances. States like Indiana and Ohio could passively await national telecom reform at the federal level. History suggests, however, that any federal action on telecom deregulation would be subject to lengthy Congressional debate and lobbying pressure from all sides that, over time, have only delayed enactment of effective reform legislation. Therefore, absent any timely federal mandate for effective reform, change would have to begin at the state level. This has been the path taken in many states, and the results have been the effective and rapid creation of fair competition, increased services, reduced or stable prices and expanded benefits for consumers.

1.2 State Reform Movement Begins

In 2005, Texas became the first state to enact a statewide video franchising law. Senate Bill 5 was passed by the Texas Legislature and signed by the Texas Governor Rick Perry on September 7, 2005.[12]

In response, the Digital Policy Institute (DPI) at Ball State University issued a report entitled, *The Economic Impact of Telecom Reform in Indiana: 2006*.[13] This report substantiated earlier research, including independent studies by federal agencies, major universities and think tanks, all of which came to a similar conclusion. Only direct, head-to-head competition would lead to increased capital investment, increased broadband services, new jobs, and potential lower costs for Indiana consumers.

On March 14, 2006, Indiana became the second state to enact statewide franchising when Governor Mitch Daniels signed into law the state's most comprehensive telecom bill (HEA 1279) in more than two decades. With strong bipartisan support, Indiana's new reform legislation, including statewide video franchising, became a legislative template that over 20 other states would follow.

In turn, on June 25, 2007, Ohio Governor Ted Strickland signed into law Senate Bill 117 establishing a similar statewide uniform video franchising standard for the Buckeye State. Again, the new law passed by large bipartisan majorities in both the Ohio Senate and Ohio House, and became effective on September 24, 2007. Not only was the competitive landscape improved in Ohio for video services and data, for the first time small municipalities and townships were allowed to collect franchise fees.[14]

Today, over 50 percent of the U.S. population is now covered by new statewide video franchise legislation, encouraging competition for consumers and new investment in infrastructure. In competitive markets, cable prices are being either reduced or held in check as new bundled service offerings provide economic efficiency for consumers across all services.

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[12] The other early states to enact reform laws were: Arizona, California, Indiana, Kansas, New Jersey, North Carolina, South Carolina, Virginia, and Ohio.

[13] Available at DPI's website, www.bsu.edu/digitalpolicy.

[14] The prohibition against franchising for small jurisdictions, fewer than 500 potential customers, was repealed under SB 117.

1.3 Early Deregulation Results

While the impact of Indiana's telecom reform legislation continues to be evaluated over time, the effects of reform were documented in a second report by DPI entitled, *An Interim Report on the Economic Impact of Telecommunications Reform in Indiana*, released on February 15, 2008.[15] In the nearly two years since passage of HEA 1279, the report uncovered a number of positive post-HEA 1279 events that, collectively, help to gauge the impact of deregulation for Indiana citizens and the Indiana economy.

These early findings included the accelerated deployments of digital subscriber line (DSL) services in more than 100 new rural Indiana communities, collective capital expenditures of more than $516 million in new infrastructure, new competition for video in multiple markets in Indiana, more than 2,200 new jobs created for Hoosiers, and, finally, a positive impact on price in the marketplace.

For Ohio, the early results from video reform (SB 117) alone are equally impressive (see Video Services pages 18-19). Thirty five companies have been granted video-service authorizations by Ohio's Department of Commerce since September 2007. Of the state's 42 incumbent service carriers, AT&T alone has a commitment to invest $500 million in new infrastructure, including new fiber deployment, expanded broadband services and network upgrades. As in Indiana, AT&T is completing work to modernize its remaining 22 central offices, primarily in rural areas, with broadband DSL technology. Over 470 jobs have been created by AT&T to upgrade the network and introduce video competition to Ohio. As of September 2008, AT&T's U-verse is available to 600,000 living units in Ohio, and the firm is offering competitive video and broadband data service in parts of nearly 200 Ohio communities.[16]

1.4 Beyond Video Franchise Reform

The issue of telecommunication reform is not limited to video services and statewide franchising. There are a number of legacy regulatory issues that now deserve attention in Ohio's competitive marketplace. In Indiana, for example, the comprehensive deregulation of HEA 1279 had its origins in recent legislation in Iowa (telephone rate deregulation) and Texas (statewide video franchising) and followed actions taken in Ohio and Michigan.[17] By mixing and matching the best from surrounding states, Indiana was able to craft meaningful reform legislation that went beyond statewide video franchising and deregulated telephone rates.

In Table 1 below, the key differences between current Indiana legislation and Ohio law are highlighted by reform issue. Data presented suggest areas where Ohio can streamline legacy regulations that are no longer necessary, remedy imbalances in the competitive landscape, and provide an improved regulatory framework that encourages outside capital investment in broadband infrastructure and services.

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[15] Available at DPI's website, www.bsu.edu/digitalpolicy.
[16] http://www.att.com/gen/press-room?pid=4800&cdvn=news&newsarticleid=26115.
[17] http://www.csgmidwest.org/memberservices/Publications/SLMW/2006/0606/page1.pdf.

1.4 Table 1
Telecom Reform Issues Cross Comparison
Indiana vs. Ohio[18]

Reform Issue	Indiana	Ohio
Eliminate Tariffs	No action needed.	Basic local exchange services to businesses with less than 4 lines and to residential consumers require detariffing
Extend Pricing Flexibility	No action needed.	Primary basic residential service requires pricing flexibility.
Protect Against VoIP Regulation	No action needed.	No action needed.
Protect Against Wireless Regulation	No action needed.	Commission jurisdiction to impose utility regulation on wireless services should be eliminated.
Reform Provider of Last Resort Standard Obligation	Eliminate POLR requirement in competitive markets other than multitenant nonresidential settings. Allow option for provider to become POLR in high cost markets and receive support from explicit funding mechanism, if necessary.	Eliminate POLR requirement in competitive markets. Allow providers of last resort flexibility to utilize most efficient technology. Allow option for provider to become POLR in high cost markets and receive support from explicit funding mechanism, if necessary.
Broadband Deployment	No action needed.	No action needed.
Provide for Uniform Consumer Protection	No action needed.	Streamline existing regulations and assign sole jurisdiction for consumer protection to agency with responsibility for consumer protection in competitive industries.

[18] Table adapted from Hance Haney and George Gilder, "More Broadband, Increased Choice and Lower Prices Begin With Regulatory Reform," Discovery Institute, August 2008, p. 34. Available at: http://www.discovery.org/scripts/viewDB/filesDB-download.php?command=download&id=3321.

1.5 Issues on the Table

Beginning on a positive note, Ohio seems to be mindful of the need for reform and to remove legacy regulations that, over time, become anti-competitive and negatively impact economic growth and development in the information age.

> *Ohio has an unfortunate reputation for red tape and bureaucracy that needs to be addressed to ensure we are competitive with other states and countries that are competing for the same jobs and economic investment*.[19]

1.5.1 Eliminate Tariffs

As discussed earlier, the theory of tariff regulation dates back to the Interstate Commerce days and was eventually incorporated in the Communications Act of 1934 under Section 203. Tariffs are nothing more than the published and approved list of rates, charges and services that telephone carriers promise to deliver. Considered necessary under the early, pre-divestiture monopoly structure of the telephone industry, tariffs were useful to ensure that subscribers were aware of the scope, nature and price of services in an open, nondiscriminatory manner. Once approved, customers were required to pay the tariff rate as a matter of law.[20]

The FCC had indicated its interest in eliminating tariffs – and other regulatory structures deemed unnecessary by the agency – since the time of divestiture; but, as noted above, the agency was rebuffed by a series of court cases. As a result, the legacy statutory provisions of Section 203 of the Communications Act of 1934 remained in effect. For the past 20 years, however, there was a growing belief that tariffs were anti-competitive. The opportunity for regulatory relief finally came with the passage of the Telecommunications Act of 1996 which required the FCC to examine tariff rules and forebear enforcement if it found that the rules were not necessary to (1) ensure that carrier rates remain just and reasonable; (2) not necessary for consumer protection; and (3) the public interest would be served by eliminating the tariffing provisions.

In its 1996 Detariffing Order, the FCC finally concluded that it was no longer necessary to allow long-distance carriers to file tariffs because it would decrease incentives for innovation, make it harder to offer discounts and customized service arrangements, and increase the potential for coordination in price setting.[21] On April 28, 2000, the U.S. Court of Appeals (D.C. Circuit) upheld the Commission's orders requiring detariffing of interstate, domestic, interexchange services, and the FCC's detariffing rules went into effect.[22]

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[19] Regulatory Reform Task Force Report (The General Assembly of the State of Ohio), approved December 17, 2008. Available at: http://www.gongwer-oh.com/127/regdraft.pdf.

[20] AT&T vs. Central Office Telephone Inc., 524 U.S. 214 (1998).

[21] Policy and Rules Concerning the Interstate, Interexchange Marketplace Implementation of Section 254(g) of the Communications Act of 1934, as amended, 11 FCC Rcd 20730, 20779 (1996).

[22] MCI WorldCom, Inc. et al. v. FCC, 2000 WL 390520, No. 96-1459 (D.C. Cir. 2000).

Since then, individual states have begun a process of systematically eliminating tariffs. The necessity for reform should be obvious. By maintaining tariff requirements, incumbent local exchange carriers (ILECs) are forced to provide advance notice to competitors of impending changes in price or service levels. In turn, rivals can preemptively react to circumvent and thereby negate the announced offering. This anti-competitive requirement instills an artificial imbalance in the marketplace and reduces the incentives both for the incumbent and the rival to innovate.

In the Midwest, for example, Indiana has eliminated tariffs for all services, and Michigan has detariffed everything except primary basic residential service. Ohio has begun the reform process and lifted tariff requirements for advanced and toll services, as well as basic local exchange services provided to business customers who have four or more access lines, but it needs to de-tariff basic local exchange services to business customers with less than four access lines as well.

1.5.2 Extend Pricing Flexibility

In a competitive marketplace, the artificial requirement to offer similar terms to all customers, a vestige of common carrier regulation, prevents incumbents from developing customized offerings and negotiating volume and term discounts. While there is full pricing flexibility in Indiana, Ohio has only passed pricing flexibility for all but primary basic residential service, dealing with the latter on a case-by-case basis.

In May 2008, for example, the Public Utilities Commission of Ohio (PUCO) approved the request of AT&T Ohio for pricing flexibility of basic local telephone service and caller ID in four telephone exchanges, but denied a request in seven other exchanges. In December 2008, the PUCO approved Embarq's request for pricing flexibility in 25 telephone exchanges, and also approved Cincinnati Bell's request in four exchanges.

In a competitive landscape, where wireline incumbents are continuing to lose telephone market share to other providers (cellular, cable, CLEC, and VoIP services of non-facilities based competitors), new marketplace conditions suggest that absent barriers to entry for competitors, primary basic residential services require full pricing flexibility.

1.5.3 Protect Against Wireless Regulation

For the most part, in 1993 Congress eliminated state regulation of wireless systems.[23] While most states in the Midwest have eliminated state oversight of wireless services, including Indiana, Illinois, Wisconsin and Michigan, Ohio retains authority to regulated wireless service to the extent allowed by federal law. The mobility of wireless communication transcends state boundaries and questions the efficiency of utility-style state regulation of a highly competitive wireless marketplace. For example, there is ample evidence of a sharp decline in mobile telephone prices in the period since the launch of PCS service. Pricing decreased slightly in

[23] 47 U.S.C. §332(c)(3).

2007, which likely reflects continued price competition in the market.[24] Ohio's legacy wireless regulatory loophole should be eliminated.

1.5.4 Reform Provider of Last Resort (POLR) Regulations

Provider of last resort (POLR) is a regulatory theory established in states in the mid-1990s, when competition was introduced into the local telephone market and the original ILECs exclusive franchises were taken away. It is a provider that: (1) holds a certificate of territorial authority issued by the state utility commission; and (2) is required to offer local exchange service throughout a defined geographic area.

In a 2008 report, Haney and Gilder suggest a problem arises when regulations impose costs on some providers but not others. The requirement to act as a provider of last resort where the market is competitive and consumers can choose between multiple providers is anticompetitive.[25] For example, if a CLEC is allowed to cherry pick exclusive service in a housing development or office park, two problems come to mind. First, the ILEC who is under POLR obligations may be forced to maintain costly facilities to service only one or two subscribers in these areas or developments. Second, the CLEC may later go bankrupt or decide to no longer provide service. An ILEC who is still under POLR obligations would therefore be required to provide costly service in that area, one in which it was initially denied access to place facilities.

Indiana addresses most of these concerns under HEA 1279. Indiana Code now protects incumbents from having to provide communications service to occupants of multitenant, nonresidential real estate if the owner, operator, or developer of the property does any of the following to benefit another provider:

(1) permits only one provider to install communications facilities or equipment on the premises;
(2) accepts incentives from a provider in exchange for allowing the provider the exclusive right to provide service to the premises;
(3) collects charges from occupants for communications service; or
(4) enters into a prohibited agreement with a provider.

In high-cost areas where a provider of last resort is necessary to deliver basic service, the provider should be allowed to choose the most efficient technology in delivering this service, such as VoIP or a wireless technology.[26]

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[24] Consumer wireless rates have declined 35.6% since 1997. See the FCC's Annual Report and Analysis of Competitive Market Conditions With Respect to Commercial Mobile Services (released January 16, 2009) at http://hraunfoss.fcc.gov/edocs_public/attachmatch/DA-09-54A1.pdf
[25] Hance Haney and George Gilder, "More Broadband, Increased Choice and Lower Prices Begin With Regulatory Reform," Discovery Institute, August 2008, p. 26.
[26] Indiana Code IC 8-1-32.4

The answer for Ohio is to eliminate POLR requirement in competitive markets. Like Indiana, Ohio should allow flexibility to utilize most efficient technology and, if necessary, also allow funding support in high-cost areas if a provider elects to become a provider of last resort.

1.5.5 Provide for Uniform Consumer Protection

While state public utility commissions have a long history of dealing with quality of service issues, in a deregulated, competitive environment they are not the normal avenue for addressing complaints. In fact, empirical studies do not find a relationship between incentive regulation and service quality. The conclusion is there is no significant impact of any regulatory policy on telephone service quality.[27] The marketplace provides adequate incentives for providers to: (1) maintain quality of service levels; and (2) capitalize investment in network expansion and new services. Ohio already has adequate consumer protection laws governing other competitive industries.[28] Consumer protection laws for telecommunication service providers should be handled in a uniform manner by a single state agency, like the Attorney General's Office, that is already charged to resolve consumer complaints and enforce consumer protection laws.

After passage of HEA 1279, the Indiana Utility Regulatory Commission (IURC) has no jurisdiction over quality of service issues. Likewise, Ohio should avoid the confusion of duplicate jurisdictions and assign sole responsibility for consumer protection to the agency with jurisdiction for consumer protection in other competitive industries.

1.6 Competition

State regulators know that competition and regulation exist at opposite ends of a continuum. In the purest sense, competition and regulation are incompatible. Knowing the moment when economic conditions warrant corrective action is the key.

With the Telecommunications Act of 1996[29] the federal government began the formal process of deregulating the telecommunication industry and encouraging competition across services. As early as 1998, former regulator and noted economist Alfred E. Kahn wrote a book on the deregulation process and noted that regulation is frequently anticompetitive and discourages heavy investment in network facilities.[30]

Kahn suggests that genuine deregulation will produce real competition and big consumer benefits, but much of it will take time. He wrote that the best thing regulators can do, after establishing the preconditions for efficient competition, is "get out of the way. They have got to

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[27] David Sappington, "The Effects of Incentive Regulation on Retail Telephone Service Quality in the United States," Review of Network Economics, Vol. 2, Issue 4 –December 2003.
[28] Ohio Consumer Sales Practices Act.
[29] P.L. No. 104-104, 110 Stat. 56 (1996).
[30] *See*, Kahn, Alfred E. Letting Go: Deregulating the Process of Deregulation, or: Temptation of the Kleptrocrats and the Political Economy of Regulatory Disingenuousness (Institute of Public Utilities and Network Industries, Michigan State University, 1998).

resist their inbred tendency to micromanage everything and to proclaim great consumer benefits, publicly, while doing everything they can to conceal the costs."[31]

Robert W. Crandall, noted economist of the Brookings Institution, advised policymakers to deregulate completely in his 2005 book, Competition and Chaos.

> The economic lesson from the history of regulation is that regulation and competition are a bad emulsion. Once the conditions for competition exist, it is best for regulators to abandon the field altogether. This is particularly true in a sector that is undergoing rapid technological change and therefore requires new entry and new capital. The politics of regulation favor maintaining the status quo, not triggering creative destruction.[32]

Later, in a 2007 speech before the Federal Trade Commission, Kahn confirmed that the transition [in the telecom industry] is complete and that comprehensive regulation of landline phone services is both unnecessary and will likely harm consumers by inhibiting competition and diminishing investment.[33]

The next section will present the competitive landscape for telecommunication in Ohio and help determine if, as the economists suggest, now is the time to complete the reform agenda and open Ohio markets to expanded services and new capital investment.

1.7 Ohio Telecommunication Trends

This section reviews the status of broadband service availability and investments in seven areas: high-speed lines by state, cable modems, DSL, fixed wireless, fiber deployments, video services and investments in broadband technologies. (See Table 3, page 18 for data table.)

1.7.1 High-Speed Lines by State

Ohio is the 7th largest state by population[34] and ranks 8th in the US for the number of high-speed (broadband) lines as of December 31, 2007, according to FCC data.[35] High-speed lines are connections to end-user locations that deliver services at speeds exceeding 200 kbps in at least one direction.

From December 1999 to December 2007 (the most recent FCC reporting period), Ohio added 4.6 million high-speed lines, with an annual average growth rate of 27 percent (see Table 2). In comparison, Indiana, which ranks 19th for the number of high-speed lines by state with 2.75 million, had an annual growth rate during the same period of 38 percent.[36] Interesting, Indiana's growth rate for high-speed lines was 90 percent since the implementation of telecom

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[31] http://www.news.cornell.edu/releases/Aug98/kahn.book.ssl.html.
[32] *See*, Crandall, Robert W. Competition and Chaos (Brookings Inst. 2005) at 166.
[33] Remarks of Alfred E. Kahn before the Federal Trade Commission (Feb. 13, 2007). Available at http://www.ftc.gov/opp/workshops/broadband/presentations/kahn.pdf.
[34] U.S. Census Bureau State & County QuickFacts
[35] FCC Form 477 – Table 10, December 31, 2007. Available at www.fcc.gov.
[36] Ibid.

reform in June 2006 through December 2007. Ohio's high-speed lines grew by 87 percent during the same period.

1.7.2 Cable – Modem

While many states are experiencing a slowdown in the growth of broadband via cable modems, Ohio's high-speed cable modem lines grew by 26.5 percent from June 2006 through December 2007. Ohio's growth rate was slightly higher than the national growth rate of 25 percent. Indiana's cable modem lines declined by 10 percent during the same period, in part reflecting the growth of non-cable broadband services since deregulation in 2006.[37]

Cable modems represented 32.5 percent of all of high-speed technology line categories in Ohio at the end of 2007. That compared to 30 percent nationally.

There were 19 providers of high-speed cable modem service in Ohio during 2007, the same as during 2006. That placed Ohio 14th nationally (tied with Kentucky and Pennsylvania) for the number of cable modem providers per state.[38]

High-speed cable modem service was available to 98 percent of Ohio residential end-user premises where cable systems can provide cable TV service, as of December 31, 2007. [39]

1.7.3 DSL

High-speed lines connecting homes and businesses via digital subscriber lines (DSL) to the Internet and other telecommunication services increased 19 percent in Ohio during 2007, growing from 863,961 to 1,028,827. ADSL (Asymmetric DSL) lines, which are used primarily for residential service, accounted for all the growth. SDSL services, which are used primarily by businesses for services such as video conferencing, declined 13.6 percent from 5115 to 4415.[40]

According to FCC data, 84 percent of residential end-user premises with access to high-speed services in Ohio had DSL available as of December 31, 2007, a six percent increase over the end of 2006. Ohio ranked 8th for the number of ADSL lines of the 45 states reporting at the end of 2007, the same as 2006.[41]

The number of residential DSL service providers in Ohio grew to 44 at the end of 2007, up from 37 at the end of 2006. DSL accounted for 50 percent of residential broadband high-speed lines in Ohio in 2007, an increase of nearly five percent since 2006. SDSL providers declined from 20 in 2006 to 18 in 2007.

In comparison, Indiana's growth of DSL lines from the start of telecom deregulation in June 2006 to December 2007 was 43 percent, versus 36 percent for Ohio during the same period.

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[37] FCC Form 477 – Table 12, December 31, 2007. Available at www.fcc.gov.
[38] Ibid.
[39] Ibid.
[40] FCC Form 477 – Table 11, December 31, 2007. Available at www.fcc.gov.
[41] FCC Form 477 – Table 14, December 31, 2007. Available at www.fcc.gov.

The gap between the penetration of new DSL versus cable modem broadband lines in Ohio continued to narrow in 2007. There were 165,566 DSL lines added between 2006 and 2007, a growth rate of 19 percent, compared to 194,847 cable modem lines, an increase of 15 percent. DSL and cable, for the first time, both accounted for 32 percent of residential high-speed lines.[42]

1.7.4 Fixed Wireless

The number of high-speed fixed wireless lines and wireless Internet service providers (WISPs) in Ohio has grown significantly since 2006. According to FCC data, there were 19,417 high-speed fixed wireless lines as December 31, 2007, an increase of 6,680, or 52 percent, over 2006.[43]

Nationwide, Ohio ranked 11th for the number of fixed wireless lines at the end of 2007, of the 41 states reporting. As of December 31, 2006, Ohio ranked 14th nationally for the number of fixed wireless lines, of the 42 reporting states.[44]

The total number of WISPs in Ohio, according to the FCC, has not grown since 2006. There were 16 WISPs serving Ohio residential and business customers at the end of 2006, the same as 2007. In June 2005, there were 17 WISPs serving Ohio. According to the Web site WISP Directory.com, there are 57 WISPs listed as serving Ohio residents and businesses.[45]

Conversely, Indiana, since the inception of telecom deregulation in June 2006, has seen a surge of WISPs. According to an analysis of the Indiana Office of Utility Consumer Counselor (OUCC) Broadband Service Provider Search Web site, in 2008 there were 68 WISPs serving Indiana residential and business customers, a 187.5 percent increase since implementation of HEA 1279 in June 2006.[46]

1.7.5 Fiber Deployments

When it comes to Ohio's future business expansion and economic development, a necessary ingredient to be competitive in the information economy is a robust, statewide network of high-speed fiber infrastructure. Fortunately, Ohio can boast of having one of the most robust statewide educational, governmental and commercial fiber optic networks in the country. Some examples include:

In Northwest Ohio, the Independents Fiber Network and thirteen community-based networks formed the BNG Optical Transport Network. BNG network members operate a 400-

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[42] FCC Form 477 – Table 11, December 31, 2007. Available at www.fcc.gov.
[43] FCC Form 477 – Table 9, December 31, 2007. Available at www.fcc.gov.
[44] FCC Form 477 – Table 8, December 31, 2007. Available at www.fcc.gov.
[45] www.wispdirectory.com
[46] OUCC Broadband Service Provider Search Web site. http://www.in.gov/oucc/utilsearch/. The information on the site is current as of November 8, 2006 and includes active service providers that are known to the OUCC. Information on the site states that the OUCC does not endorse or sponsor particular providers and cannot guarantee that information on providers' Web sites is correct, complete or up to date.

mile fiber network delivering voice, video and data services. In December 2008, Corning and Horizon Chillicothe Telephone signed a Corning Connected Community Program agreement to support the deployment of optical fiber in Darbyville. The network will bring broadband Internet access to the village of less than 300 residents.[47]

In Central Ohio, the City of Dublin created DubLink, a fiber network for public groups and private businesses, as an economic development tool. In part because of DubLink, Ohio State University established medical research facilities and Qwest, Nationwide, Verizon Wireless, OhioHealth, and Battelle have located and expanded their presence in Dublin.[48]

In Northeast Ohio:

- American Fiber Systems provides commercial fiber optic services in the Greater Cleveland area.[49]
- First Telecom Services provides telecommunications infrastructure development and management services to businesses in Akron, downtown Cleveland and the Greater Cleveland area, Toledo and Youngstown.[50]
- The Medina County Port Authority is building an 88-mile fiber optic ring that will provide a wholesale platform for retail broadband services to a wide variety of users.[51]
- OneCommunity fiber network serves the Greater Cleveland area and connects more than 1500 sites in 22 counties. OneCommunity, a nonprofit organization, serves educational, governmental, research, arts and cultural, health care, civic and other nonprofit organizations.[52]

To help spur economic development in Southwest Ohio, Butler County built a 120-mile fiber optic backbone network throughout the county. The Butler County Fiber Network, built in 2002, connects the cities of Oxford, Hamilton, Middletown and Evendale to a high-speed broadband network. Neighboring counties have followed suit and the network is now available throughout the Cincinnati-Dayton region.[53]

The backbone of Ohio's educational and research fiber networks is OSCnet, a dedicated high-speed fiber optic network that serves K-12, colleges and universities, hospitals and public broadcasting. With more than 1,850 miles of fiber, it is the most advanced statewide research and education network in the nation. It is managed by OARnet, the networking division of the Ohio Supercomputer Center, which provides videoconferencing, Internet2 connectivity, engineering consulting and satellite trailer networking systems for remote Internet connectivity. OSCnet was

[47] Press release: Corning and Horizon Chillicothe Telephone Bring Broadband to Darbyville, Ohio. http://www.corning.com/news_center/news_releases/2008/2008121102.aspx
[48] City of Dublin, Ohio Web site. http://www.dublin.oh.us/econdev/dublink.php
[49] American Fiber Systems Web site. http://www.americanfibersystems.com/
[50] First Telcom Services Web site. http://www.firsttelecomservices.com/Who_We_Are/index.html
[51] Cleveland.com. http://blog.cleveland.com/metro/2008/08/medina_county_port_authority_t.html
[52] OneCommunity Web site. http://www.onecommunity.org/
[53] Butler County Alliance. http://www.butlercounty.biz/Fiber.htm

merged in 2007 with a new state and local government networking initiative to create the Broadband Ohio Network.[54]

Rural Ohio's access to fiber optic cable via OSCnet got a boost in 2007 with the awarding of more than $35.4 million in grants to four regional telehealth networks, representing the largest state share of funding among the 42 states and three U.S. territories receiving awards through the FCC's Rural Health Care Pilot Program.[55]

The four telehealth projects are:

- The Southern Ohio Healthcare Network - $13.9 million to provide connectivity to about 60 facilities by building or purchasing fiber optic rings, as well as to provide connectivity to facilities outside the reach of the rings. The network will impact 15 counties: Adams, Athens, Fayette, Gallia, Highland, Hocking, Jackson, Meigs, Morgan, Perry, Pike, Ross, Scioto, Vinton and Washington.
- The Northeast Ohio Regional Health Information Organization - $11.3 million to expand and upgrade an existing network to connect 19 medical facilities. The network will impact 22 counties: Ashland, Ashtabula, Carrolton, Columbiana, Coshocton, Cuyahoga, Erie, Geauga, Holmes, Huron, Lake, Lorain, Mahoning, Medina, Portage, Sandusky, Seneca, Stark, Summit, Trumbull, Tuscarawas and Wayne.
- A consortium of eight healthcare facilities in southeastern Ohio, Holzer Consolidated Health Systems, which began receiving $1.8 million to upgrade its existing network to a broadband fiber-optic network. In August 2008, the Holzer project merged with the Southern Ohio Healthcare Network project. The regional SOHCN network will initially impact Gallia and Jackson counties.
- The statewide West Virginia Telehealth Alliance, which will receive $8.4 million to connect approximately 450 West Virginia healthcare facilities, reaching Internet2 through OSCnet connections to Marshall University in Huntington, W.Va.

New deployment of fiber optic technology to nonprofit organizations, governmental units and municipalities, rural communities and businesses allows for high-speed digital Internet services, and offers new opportunity for fiber backhaul necessary for deployment of new wireless technology. Ohio's fiber diet is a testimony to its forward-thinking development efforts and recognition as a good place to do business in the information age.

[54] OSCnet Program Review. Available at: http://www.osc.edu/oscnet/project_overview/index.shtml
[55] Four telehealth networks will leverage OSCnet to aid Ohio communities. Available at: http://www.osc.edu/press/releases/2007/telehealth.shtml

1.7 Table 2
Ohio High-Speed Lines by Technology
June 2000 – December 2007
(Over 200 kbps in at least one direction)

Ohio	ADSL	SDSL	Traditional Wireline	Cable Modem	Fiber	Fixed Wireless	Power Line & Other[2]	Total
12/31/2007	1,024,412	4,415	14,368	1,498,317	7,349	19,417	*	4,612,073
6/30/2007	945,096	4,722	18,124	1,405,899	15,876	13,573	*	3,956,535
12/31/2006	858,846	5,115	19,625	1,303,470	19,235	12,737	*	3,186,537
6/30/2006	752,633	5,392	18,693	1,184,924	19,046	11,669	*	2,392,030
12/31/2005	663,011	5,316	22,082	1,064,948	18,655	8,997	*	1,889,878
6/30/2005	555,749	6,097	21,850	961,119	24,130	12,722	*	1,505,272
12/31/2004[1]	455,336	*	*	804,712	*	*	86,992	1,347,040
6/30/2004	369,386	*	*	709,145	*	*	79,256	1,157,787
12/31/2003	303,969	*	*	597,442	*	*	76,475	977,886
6/30/2003	243,689	*	*	508,458	*	*	69,788	821,935
12/31/2002	205,140	*	*	435,404	*	*	69,811	710,355
6/30/2002	151,612	*	*	363,675	*	*	64,791	580,078
12/31/2001	112,527	*	*	264,031	*	*	60,208	436,766
6/30/2001	87,567	*	*	213,606	*	*	57,792	358,965
12/31/2000	55,046	*	*	127,692	*	*	47,603	223,845
6/30/2000	33,603	*	*	*	*	*	*	156,888

Source: FCC Local Telephone Competition and Broadband Deployment Statistical Reports.
http://www.fcc.gov/wcb/iatd/comp.html
[1]FFC data reporting methods changed beginning 2005
[2] Other includes wireline technologies other than ADSL, optical fiber-to-the subscriber's premises, and terrestrial wireless systems.
*Data withheld to maintain firm confidentiality

1.7.6 Video Services

With the passage of Senate Bill 117 in September 2007, Ohio created a video-service authorization process. The Ohio Department of Commerce was given jurisdiction to grant state-issued video-service authorizations to replace local cable franchise agreements. Satellite television providers are not included in the new authorization process.

Since the video-service authorization process began, 36 companies have applied for, and 35 have been granted, video-service authorizations that cover 87 of Ohio's 88 counties.[56] Of the 35 companies granted video service, 14 are ILEC telephone companies, 3 are cable companies and ILEC telephone companies, and 18 are cable companies (see Table 3).

Within three months after passage of the video-service legislation, 26 companies had filed for authorizations. The first company to receive a video-service area authorization was AT&T on November 7, 2007.

The companies receiving video-service authorizations for the most counties include Time Warner cable (84 counties), and AT&T (20 counties). More than one-half of the companies (19) received video-service authorizations for two or fewer counties. Only one county – Adams County – has no current authorized video-service provider.

1.7.7 Investments in Broadband Technologies

During the past few years carriers have increased investment in their respective broadband networks. AT&T, for example, is investing $500 million in Ohio as a result of video service area reforms. Over the next several years, the company says it will continue to invest in fiber network upgrades, further broadband deployment and Internet-based technologies to bring new services to Ohio consumers.

AT&T also reports that new jobs have resulted from the video service reform efforts and the expansion of its U-verse broadband video service. Several hundred jobs throughout the state - at least 470 from AT&T alone - have been created to upgrade the network.[57]

Nationally, AT&T has announced plans to spend $17 billion to $18 billion in 2009 on network improvements. Approximately two-thirds of the investment will extend and enhance the company's wireless and wired broadband networks to provide more coverage, speed and capacity. To support increased customer demand in mobility, broadband and video, the company plans to add nearly 3,000 jobs in 2009.[58]

Verizon, operating under an alternative regulatory plan approved by the Public Utilities Commission of Ohio, has invested more than $13.5 million since 2006 to bring broadband access to more than 37,000 additional phone lines across the state. In 2008, Verizon installed high-speed Internet equipment, based on digital subscriber line (DSL) technology, at 48 company communications facilities across the state.[59]

Verizon Wireless continues to invest in its Ohio wireless broadband network. In October 2008, the company expanded the rollout of its 3G high-speed wireless network to portions of

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[56] Ohio Department of Commerce Video Service Regulation. http://www.com.ohio.gov/admn/vsa/

[57] AT&T Ohio Marks One-Year Anniversary of Statewide Video Reform Legislation; Rapid Deployment of AT&T U-Verse Benefits Ohio Consumers. Available at: http://www.att.com/gen/press-room?pid=4800&cdvn=news&newsarticleid=26115.

[58] AT&T to Invest More Than $17 Billion in 2009 to Drive Economic Growth. http://www.att.com/gen/press-room?pid=4800&cdvn=news&newsarticleid=26597

[59] Verizon press releases. Available at: http://newscenter.verizon.com.

Athens, Vinton, Jackson and Meigs counties. The addition of the broadband wireless network to 23 cell sites follows a nearly $17 million network investment Verizon Wireless made in this area earlier in the year. In June 2008, the company announced it had activated 46 new cell sites throughout these markets. The wireless broadband network will enable Verizon Wireless customers to access the wireless Internet, email, mobile music, and videos from laptops and mobile phones.[60]

Since 2000, Verizon Wireless has invested more than $1.4 billion on improvements to its network in Ohio, including investing more than $258 million in 2008 and making the following upgrades:

- 126 new cell sites were activated statewide to improve network coverage and capacity.
- Equipment on 211 existing cell sites throughout the state was upgraded, which further improved network capacity.
- The company's high-speed wireless broadband network was expanded to 329 cell sites across Ohio.

Embarq and CenturyTel, with the recently announced approval of their merger by the Ohio Public Utilities Commission, plan to invest missions in service upgrades in Ohio. Embarq's net capex is expected to be less than $300 million company wide for the first six months of 2009 (guidance was given only for six months pending completion of the merger with CenturyTel). CenturyTel expects its system-wide capital expenditures in 2009, excluding any Embarq-related acquisition, integration or post-closing capital expenditures, to be between $280 and $300 million, in line with 2008 capital expenditures of $287 million.

Cincinnati Bell reported $51 million in capex expenditures in 2008 in its Wireless sector, which were essentially flat for the year. The company reported year-over-year growth of 1 percent in its postpaid wireless subscriber base, to 551,000 customers at the end of the fourth quarter. Year-over-year DSL subscriber growth equaled five percent. At the end of the fourth quarter 2008, Cincinnati Bell had 233,000 DSL subscribers. [61]

Clearwire Corporation brought its residential and business wireless broadband Internet service to Ohio in August 2007. Clearwire's service area includes Dayton, Beavercreek, Bellbrook, Centerville, Englewood, Fairborn, Franklin, Huber Heights, Ketterling, Miamisburg, Middletown, Oakwood, Springboro, Springfield, Tipp City, Trotwood, Troy, Vandalia, West Carrollton, Wilmington and Xenia.

The company is building the first, nationwide 4G mobile Internet wireless network. Plans call for expanding its high-speed mobile WiMAX network across 80 US markets in 2010, and launching a dual mode 3G/4G modem this summer giving subscribers access to a nationwide 3G mobile data network.

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[60] Verizon Wireless. http://news.vzw.com/news/2009/01/pr2009-01-28f.html
[61] Cincinnati Bell. http://www.cincinnatibell.com/aboutus/news/articles/news.asp?page=20090205.asp

1.7.6 Table 3
Ohio Video-Service Authorizations by County, 2007-2009

Type	Company	Counties
Cable	Armstrong Cables Services	Ashland, Lorain, Mahoning, Medina, Richland, Wayne
ILEC	Arthur Mutual Telephone Company	Definance, Paulding,
ILEC	AT&T Ohio	Clark, Cuyahoga, Delaware, Fairfield, Franklin, Geauga, Greene, Hancock, Lake, Licking, Lucas, Medina, Miami, Montgomery, Pickaway, Portage, Stark, Summit, Union, Wood
ILEC	Ayersville Telephone Company	Defiance
ILEC	Bascom Communications, Inc.	Seneca
Cable	Block Communications Inc.	Erie, Huron, Lucas, Ottawa, Sandusky, Wood
ILEC	Buckland Telephone Company	Allen, Auglaize
ILEC	Cincinnati Bell	Butler, Clermont, Hamilton, Warren,
Cable	Comcast	Paulding
Cable	Comcast of Illinois/Indiana/Ohio, LLC	Mercer
Cable	Comcast of Illinois/Ohio/Oregon, LLC	Belmont, Columbiana, Harrison, Jefferson, Mahoning
Cable	Comcast of Ohio	Belmont, Columbiana, Harrison, Jefferson, Mahoning
ILEC	Conneaut Telephone Company, Inc.	Ashtabula, Lake
Cable	Cox Communications	Cuyahoga
Cable	East Cleveland Cable TV and Communications, LLC	Cuyahoga
ILEC	FJ Communications, Inc.	Putnam
ILEC	Glandorf Telephone Company	Putnam
Both	Horizon View	Jackson, Pickaway, Pike, Ross, Scioto
Cable	Insight	Delaware, Fairfield, Franklin, Licking, Pickaway
Cable	Massillon Cable TV, Inc.	Stark, Summit, Wayne
ILEC	McClure Telephone Company	Henry, Lucas, Wood
ILEC	Middle Point Home Telephone Company	Van Wert
Cable	New Athens TV Cable Company; Morristown TV Cable Company; and Richards TV Cable Company	Belmont, Harrison, Monroe
Both	Orwell Communications	Allen, Ashtabula, Hancock, Henry, Paulding, Trumbull
Cable	Powhatan Point	Belmont
Cable	Quality One Technologies, Inc.	Allen, Putnam,
Cable	Rapid Communications	Astabula, Gallia, Geauga, Noble, Perry, Washington
Both	Shertel Cable, Inc. and SMTA	Definance, Paulding
Cable	Suddenlink Communications	Guernsey, Monroe
Cable	Suddenlink Communications	Geauga, Jefferson, Portage, Trumball
Cable	Time Warner Cable, LLC.	Allen, Ashland, Ashtabula, Athens, Auglaize, Brown, Butler, Carroll, Champaign, Clark, Clermont, Clinton, Columbiana, Coshocton, Crawford, Cuyahoga, Darke, Defiance, Delaware, Erie, Fairfield, Fayette, Franklin, Fulton, Gallia, Geauga, Greene, Guernsey, Hamilton, Hancock, Hardin, Harrison, Henry, Highland, Hocking, Holmes, Huron, Jackson, Knox, Lake, Lawrence, Licking, Logan, Lorain, Lucas, Madison, Mahoning, Marion, Medina, Meigs, Mercer, Miami, Monroe, Montgomery, Morgan, Morrow, Muskingum, Noble, Ottawa, Perry, Pickaway, Pike, Portage, Preble, Putnam, Richland, Ross, Sandusky, Scioto, Seneca, Shelby, Stark, Summit, Trumball, Tuscarawas, Union, Van Wert, Vinton, Warren, Washington, Wayne, Williams, Wood, Wyandot
ILEC	TSC Communications, Inc.	Allen, Auglaize
ILEC	Wabash Mutual Telephone Company	Mercer
Cable	WideOpenWest Cleveland, LLC	Cuyahoga
Cable	WideOpenWest Ohio, LLC	Delaware, Fairfield, Franklin, Licking, Union

2.0 The Road Ahead: Potential Economic Impact

By Jack Kleinhenz, Ph.D. and Russ Smith, Ph.D.

2.0.1 Background and Justification

Outdated Ohio regulatory-induced behavior may be driving greatly needed capital investment in the wrong direction. In markets that have very little or no competition, the government typically imposes regulations as a surrogate for competition. Despite significant increases in competition in recent years, Ohio telecoms – and in particular incumbent local exchange carriers – are still encumbered with outdated regulations generated by the Public Utilities Commission of Ohio. Such regulations may be inappropriate; they are effectively a tax that precludes a more prudent use of scarce resources for appropriate investment.

We believe that market-driven investments in broadband would be in the public interest and benefit Ohio. Other research explores the taxing effect and investment-distorting effects of some telecommunications regulations.[62] This report has a limited scope. We review research conducted on the economic impact potential of broadband, a key component to Ohio's information infrastructure. Benefits of market-driven capital investments in Ohio are deduced and provide policy makers with better decision-making information.

2.0.2 Method

Kleinhenz and Associates was engaged by the Digital Policy Institute to explain how updating the regulatory requirements will benefit the Ohio public. This will be accomplished by employing economic theory and information obtained from published literature as well as the Ohio industry itself. Kleinhenz and Associates describes the current market conditions and provides implied benefits of updated regulations based upon previously published reports and data provided by the Ohio telecoms.

The report is organized into four parts. The first section offers a description of the Ohio telephone market. Market structure (intramodal and intermodal competitors, i.e., wireline, wireless, and VoIP), investment, and pricing are explored. The second part reviews research conducted regarding the benefits of telephone industry investments. No such study has been done in Ohio but other findings, both nationally and at the state level, are offered. The third part of the study offers a description of the types and magnitudes of benefits one might expect to come about due to an increase in broadband investment in Ohio. Finally, conclusions are offered as to the state of industry competition and benefits of technological reinvestments.

[62] Cited in Hazlett et al, 2004.

2.1 Ohio Telecom Industry Structure

2.1.1 Demand for Services: Direction Consumers Are Going.

With the growth in suppliers and technologies, consumers have many choices. Based upon Ohio data, they are choosing to pay more and to "go wireless". From the peak of 7 million residential phone lines in 2001, Ohio Telecoms reports that 18% of those customers are now wireless only. Furthermore, 76% of all Ohio residents have a wireless phone and are willing to spend, on average, $69 per month for the service. This compares to the $39 per month consumers pay for regulated, local phone service. Lastly, there are 3.7 million more wireless subscribers than landline subscribers.[63] Wireless subscribers have increased at a rate of 11% per year since 2000.

2.1.2 A Dynamic Consumer Flight from Wireline to Wireless

Supporting National Evidence: Nielsen, 2008, reports that 17 percent of all U.S. households, some 20 million, are wireless "substitutors," homes without landlines that rely solely on wireless for telecommunications. "Cord cutters" are found to have lower incomes, smaller households with just one or two residents, make the cut during a move or a job change and save between $33 and $26 per month for a household of one or two.

Morgan Stanley predicts that 32% of households will be wireless by 2012, four years from now. The firm also notes a leap in wireless data usage[64]

In 2005, Ohio's most recent data, revenues from mobile wireless services were 46 percent greater than revenues collected for incumbent's providing local exchange service.

2.1.2 Table 4
Ohio Telecommunications Revenues by Type of Service, 2005[65]

Service	Revenues ($ Millions)
Mobile Wireless	$3,928
ILEC[1]	$2,679
Ratio	1.47

[1] Excludes line charges

[63] Ohio Telecom Association, 2008, p 8. 8.7 million wireless users in Ohio vs. approximately 5 million traditional wireline users.
[64] Morgan Stanley Research, October 1, 2008.
[65] FCC August 2008.

USB Investment Research points to annual loss of primary residential lines of 11.5% per year by 2009. Bernstein Research[66] confirmed that in this high fixed cost industry, loss of landlines compresses margins. Regarding the U.S. market as a whole, "as access line losses have mounted, variable costs are shed and fixed costs remain. The remaining fixed costs are being spread across a smaller and smaller base of fixed lines. Average cost per access line has therefore soared."

2.1.3 Internet Access Demand: Residential and Business

Aside from cell phones, customers want Internet access. The Federal Communications Commission reports that in Ohio there are 2.4 million residences with broadband of some fashion. Businesses in Ohio account for another 1.6 million customers of broadband. Residential consumers are willing to spend, on average, $38 per month on broadband while businesses spend, on average, $75 per month. Broadband had 770,000 new subscribers in 2007 and has averaged a blistering annual growth rate of 43% per year since 2003.[67]

Wide access to the Internet and broadband in particular is believed to proved social and economic benefits. The form and amounts of growth are subjects of research and are discussed below. There is the belief that productivity increases along with job growth and other public benefits result from information exchange.[68] To that end, broadband equipment is often placed following existing rights of way and public services such as Wi-Fi are popular in some places.

2.1.4 Demand for Services – How Do Ohio Residents Use Broadband?

ConnectOhio[69], a public-private partnership conducted a survey of Ohioans in March of 2008. They found that 76 percent of Ohio residents have a computer. More than 90 percent of Ohioan residents have access to high-speed broadband service, but only 55 percent subscribe to it. Furthermore, 14 percent subscribe to mobile broadband services. About 350,000 Ohio households do not have access to broadband service. Like Internet usage, broadband is fairly distributed among age groups with the exception of those in the "over 65" category (see Table 5).

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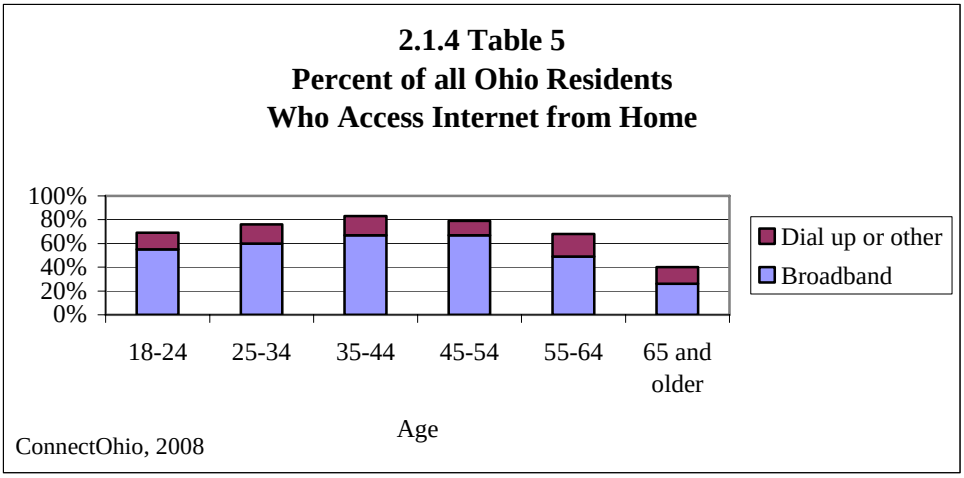
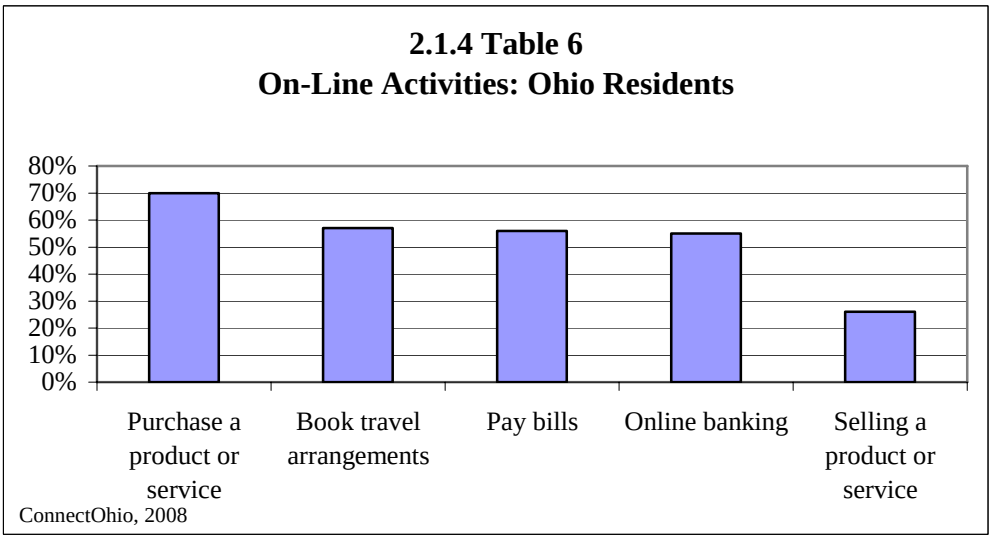
[66] Bernstein Research, 2008.
[67] Ohio Telecom Association, 2008.
[68] Substantial research exists regarding benefits of information communication technology and is discussed in the latter part of this paper.
[69] http://connectohio.org/_documents/OHExecutiveSummary09182008_FINAL.pdf. The survey was carried out on 1200 residents via random digit dialing and claims a +/-3% accuracy at the 95% confidence level.



While on-line activities are quite varied, this report focuses on transactional activities such as purchases, banking and paying bills. Between 55 and 70 percent of Internet users at home conduct these activities.



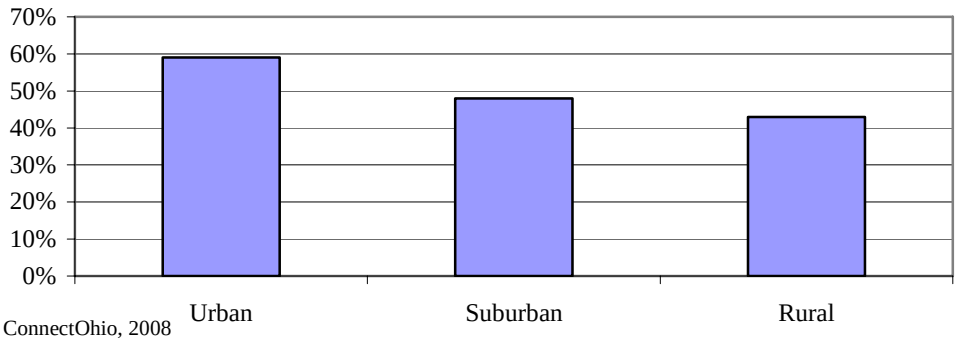
There is a strong work-to-home linkage. More than four of 10 residents use the Internet to work from home, either during regular business hours or in the evening. 19% of residents subscribe to broadband because they "need to conduct business on line." Among Ohio residents employed full or part-time, ConnectOhio found:

- 8% operate a business at home with an Internet connection,
- 12% work at home, via the Internet instead of commuting and
- 22% work at home outside of normal business hours, often using the Internet.

There is a gap between availability of broadband in urban areas (96 percent) compared to rural areas (79 percent). Yet, even where available, not all Ohio residents subscribe to broadband. In the urban areas currently only 60% of residents subscribe (Table 7).

Approximately 45% of rural residents subscribe to broadband. There is also evidence of an income barrier as about one out of three low-income families (making less than $25,000 annually) do not have a computer at home.

2.1.4 Table 7
Ohio Residents Who Have Broadband at Home



ConnectOhio, 2008

2.1.5 Demand for Services - Ohio Business Usage of Broadband

Ohio businesses view the Internet as a necessity for growth. A goal stated by the Ohio Department of Development in its Strategic Plan is to increase connectivity.[70]

> *"Connectivity* rests on Internet connections that are fast and reliable. This is an essential part of business infrastructure and a highly desirable, if not critical, requisite for Ohioans at home and at work. Digital connectivity is a major contribution that state government makes to the process of developing a state's economy. Ensuring Ohio competes in the new economy means ensuring Ohio's cities and communities have access to the digital information, tools, and technical assistance they need to be competitive in terms of both opportunities afforded and amenities provided for those living or seeking to do business in Ohio."

In March 2008, ConnectOhio conducted a survey of 807 firms in Ohio to ascertain their degree of computer, Internet and broadband usage.[71] The survey uncovered that 82% of businesses use a computer and 59% of businesses have a broadband service. Remarkably, 18% of businesses reported not having a computer.

Broadband, including DSL is used by the majority of firms across all industries. Broadband is most intensely used in the professional/finance industry in which 71 percent of firms report subscribing. Interesting for Ohioans might be the fact that manufacturing firms appear to be high users of computers and broadband.

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[70] Ohio, Home of Innovation and Opportunity. A Strategic Plan for the Ohio Department of Development. p.83 (Goal 4 Invest in Regional Assets)

[71] The error interval is +/-3.4% at 95% confidence level.

It appears there is room for broadband to expand. Indeed, 11 percent of all firms indicated they needed more broadband width. The adoption curve also depends, in part, on the number of firms using the Internet. In fact, 41 percent of firms using the Internet reported only using it within the last 5 years. This coincides with increasing investments made in broadband over the same time period.

Of note is the healthcare industry. A gap exists between healthcare firms that use computers and those that use broadband. Only 58% of healthcare firms reported using broadband compared to 80% of the firms that use computers. The current draft of the federal stimulus package identifies development of electronic medical records within the next 5 years as a goal. Broadband adoption will be critical for this industry.

2.1.5 Table 8
Computer Usage by Industry Sector, Ohio 2008
(% of firms)

	Computer	**Broadband**
High Tech	86%	69%
Ag/Mining/Construction/Utility	86%	47%
Manufacturing	87%	68%
Wholesale Trade/Transport/Warehousing	84%	59%
Retail Recreation/Food/Lodging	79%	54%
Professional/Finance	86%	71%
Healthcare	80%	58%
Other Services	78%	58%
State Average	**82%**	**59%**

Source: ConnectOhio, 2008

2.1.5 Table 9
How long has the business used the Internet?
(% of firms)

<1 year	2%
1 to 2 years	8%
3 to 5 years	31%
6+ years	59%

Source: ConnectOhio, 2008

Ohio businesses use the Internet for a variety of transactions. Seventy-seven percent of firms reported making online purchases. Training, bidding on contracts, customer support and online tracking and control were mentioned by many firms. Telecommuting is also a factor for broadband consideration. In Ohio, 26 percent of firms report that they have employees that telecommute on a regular basis. Niched within those firms are broadband users among whom,

3 percent reported having employees who telecommute. This implies that 9 percent of firms in Ohio use broadband with employees who telecommute.

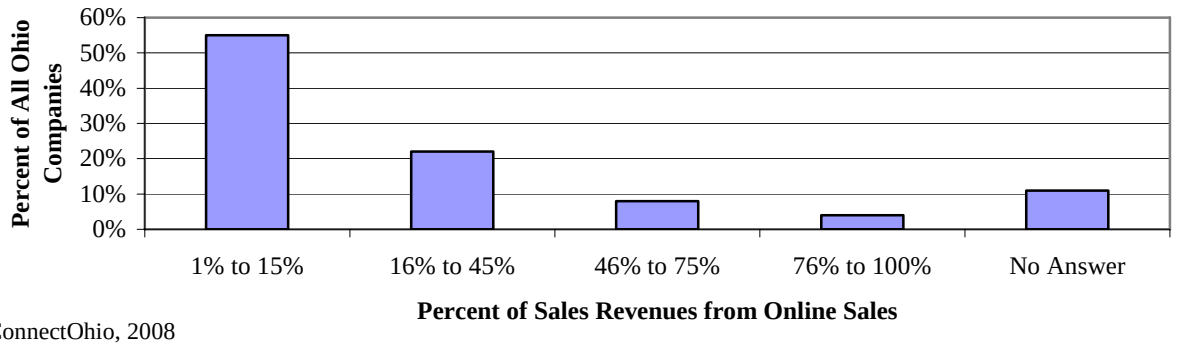
2.1.5 Table 10
Broadband Adopter Internet Applications

Online purchasing	77%
Researching or booking business travel	71%
Online banking	63%
Online shipment tracking and control	62%
Online marketing and advertising	57%
Online selling or accepting orders	43%
Online billing or bill payment	45%
Online healthcare or insurance admin	39%
Online customer support	38%
Online training	31%
Online employee benefits information	28%
Bidding on contracts online	26%
Accepting real-time credit or debit card pmts	24%
Online accounting and internal auditing	21%
Online inventory tracking and control	15%
Video conferencing	14%
Blogging	11%
Online manufacturing process control	4%

Source: ConnectOhio, 2008

Broadband-users have average annual revenues double those of non-broadband users. Of all Ohio companies, 55 percent report receiving between 1 and 15 percent of their revenues from

2.1.5 Table 11
Firms Reporting Online Sales Revenues, Ohio 2008



ConnectOhio, 2008

online sales (see Table 11). At the other extreme 4 percent of firms report they receive between 75 percent and 100 percent of their revenues from online sales.[72]

2.2 Market Conduct: Competition and Investment

2.2.1 Many Broadband Competitors

To meet the changing demand and technologies, the telecommunications industry is changing rapidly and competition is fierce. Voice telephone technology is now digitized like any other video or data stream. The ones and zeros of the digital age can be carried in a variety of ways: traditional landlines, DSL, fiber cable, coaxial cable, wireless systems, and blended systems. Each of the technologies may be optimal for a segment of the market, if not the whole market.

Large Incumbent Local Exchange Carriers account for most of Ohio's regulated lines. There are 35 small Incumbent Local Exchange Carriers that serve approximately 5% of the regulated lines. These smaller incumbents range in size from 500 to 30,000 access lines.

2.2.1 Table 12
Large Incumbent Local Exchange Carriers

AT&T Ohio
Cincinnati Bell
Century Tel
Embarq
Verizon
Windstream

Source: Ohio Telecom Association, 2008

The Ohio Telecom Association[73] reports there is healthy competition in all facets of telephone service. The association records 86 competitors for the consumer broadband subscriptions and 66 competitors for traditional wireline service. Not all suppliers compete in all markets. Furthermore, there exist overlapping carriers providing more than one service.

[72] Only 205 firms responded to this question.
[73] Ohio Telecom Association, 2008

2.2.1 Table 13
Types of Telephone Service Competition, Ohio 2008

Technology	# Customers	# Competitors
Broadband	3.9 million	86
Cell Phone	8.7 million	12
Traditional Wireline Phone[74]	6.0 million	66

Source: Ohio Telecom Association, 2008

2.2.1 Table 14
Types of Carrier Competition, Ohio 2008

Type of Carrier	Competitors
Incumbent Local Exchange Carriers	42
Competitive Local Exchange Carriers	24
Long Distance Providers	243
Cellular Providers	12
Cable Television providers	21
Broadband Providers	86
End-user VoIP Service Providers	246

Source: Ohio Telecom Association, 2008

2.2.2 Degree of Competition

Loomis and Swann (2005) find there is substantial competition between ILECs and CLECS. In their study, they found that regulatory constraints may place the ILEC in a weak position. They believe that regulatory policies ought to account for the competitive effects of the communications market.

2.2.3 Evidence of Ohio Competition-Spurred Investment

Proof of competition and findings discussed earlier regarding the consumers' flight to wireless exist In Ohio. Ohio Incumbent Local Exchange Carriers have lost 23 percent of their lines to Competitive Local exchange Carriers.[75]

Data for high speed lines in service as of 2007 show there is a high degree of competition at the zip code level. All zip code areas in Ohio have at least three competitors with high speed lines in service.[76]

[74] OTA, Number of ILECs=42, Number of CLECs=24, total end-user lines=6 million in 2007, p7.
[75] Ohio Telecom Association, 2008
[76] http://www.fcc.gov/Bureaus/Common_Carrier/Reports/FCC-State_Link/IAD/hspd1207_tables.xls

2.2.3 Table 15
Ohio High-Speed Line Geographic Competition

	High-Speed Lines	
Number of Providers	**Number of Zip Codes**	**Percent of Zip Codes**
1	**1**	**0**
2	**7**	**0**
3	**13**	**1**
4	**29**	**2**
5	**121**	**8**
6	**237**	**16**
7	**243**	**17**
8	**235**	**16**
9	**174**	**12**
10+	**410**	**28**
Totals	**1470**	**100%**

Source: FCC, 2009

Further evidence of the highly competitive field in Ohio is offered by the 2009 FCC Common Carrier report. For every one high-speed service provider in the US, there is 1.6 in Ohio. Ohio consumers, perhaps due to population density, benefits from a greater number of high speed lines per capita as well.

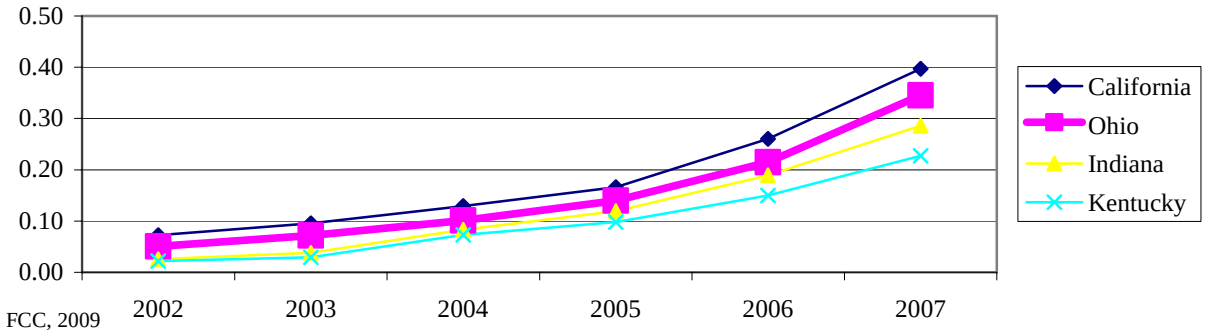
2.2.3 Table 16
Ohio High-Speed Lines Per Capita

2007	**Ohio**	**US**
High-speed lines per capita	0.345	0.338
Providers of high speed lines per capita	0.0000075	0.0000046

Source: FCC, 2009

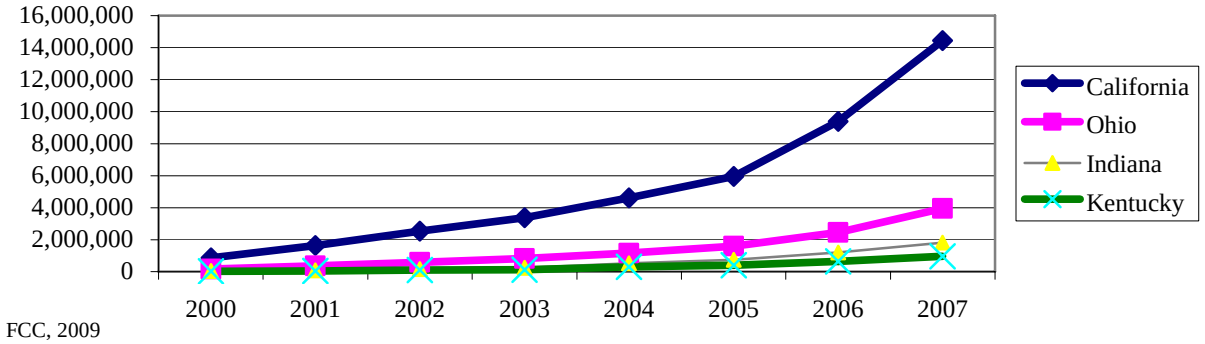
Capital investment by Ohio telecoms into high-speed lines has kept abreast of California and the US investment rate in general.

2.2.3 Table 17
High-Speed Penetration: Lines Per Capita



FCC, 2009

2.2.3 Table 18
High-Speed Lines by State



FCC, 2009

2.2.3 Table 19
High-Speed Lines by Type and End User[77]

	Residential	%	Business	%	Total	%
Ohio	2,634,429	57%	1,977,644	43%	4,612,073	100%
Nationwide	73,976,483	61%	47,188,828	39%	121,165,311	100%

[77] FCC Form 477 – Table 13, December 31, 2007. Available at www.fcc.gov.

2.2.4 Why the Big Investment Push?

Under current FCC regulations telephone, wireless, television, and Internet providers are able to compete in any market against any other. Broadband providers are not required to give competitors wholesale access to their infrastructure so that competitors can resell services to consumers, as is done under the regulated wireline model. Consequently each broadband competitor wishing to stay in the market has to invest in its own infrastructure. Even with large growth rates, broadband is only in 54% of Ohio homes, implying there is much room for further industry investment.[78]

DSL and cable are the two primary broadband technologies. Both rely on existing infrastructure to provide Internet services. DSL has 968,000 residential subscribers in Ohio amounting to 40% of the broadband residential market.[79] DSL shares the copper wiring of telephone service and cable shares a blend of fiber and coaxial cable (for TV service).

The existing copper line and cable line system must be upgraded by private industry if it wishes to offer broadband.[80] For DSL, the provider must install aggregation equipment (DSLAM) that can send Internet data from the serviced area and forward it to the larger highways of the Internet. By installing a fiber connected street cabinet, the DSL provider can extend its service well beyond a three-mile range from the central telephone company office. Faster downloading times are available the closer the user is to the central office and the sooner the user is hooked into a fiber line. The DSL provider clearly has incentive to provide early service to areas where there exist high concentrations of lines. Targeting these areas will spread the fixed cost among many users.

For cable, the provider, often an existing cable television firm, must upgrade its networks by adding nodes and moving them closer to residences, replacing coaxial cable the closer they get to the residence, with fiber optic cable. These providers must also install routing, switching, and amplifier equipment to improve data transmission. Just as with DSL, fixed costs and market competition force broadband providers to take advantage of economies of density.

2.2.5 The Magnitude of Capital Expenditure

The telecom industry is capital intensive. Capital expenditures reportedly made in the US by the industry exceeded $60 billion in 2006.[81] Ohio telecoms have made and plan to continue making investments in Ohio's infrastructure in order to improve service. For an overview of investments made, see Section 1.7.7 of this report.

The FCC, in its August 2008 report on 'Trends in Telephone Service"[82] finds that in 2005 wireless carriers invested 27 cents for each dollar of revenue collected from end users for

[78] Ohio Telecom Association, 2008, p 13.
[79] Ohio Telecom Association, 2008.
[80] Kolco, 2007.
[81] FCC, 2008
[82] FCC Trends in Telephone Service, 2008, p17-3.

structures and equipment. Wireline, resellers, satellite and other carriers invested 20 cents on the dollar. Overall capital expenditures were 25 cents for each dollar of end-user revenues.

2.2.5 Table 20
US Capital Expenditures for Structures and Equipment, 2006[83]
($ Millions)

Telecom Carrier	Structures	Equipment	Total
Wireline	$10,160	$21,981	$32,141
Wireless	$12,648	$15,321	$27,969
Total	**$22,808**	**$37,302**	**$60,110**

2.3 Economic Benefits: The Evidence and Implications for Ohio

2.3.1 Findings of Other Economic Studies

A study by Gaasbeck et al.[84] (Sacramento State University) found that historically, a 1 percentage point increase in the share of the adult population using broadband increased the employment growth rate by as much as 0.075 percentage points and the payroll growth rate by up to 0.088 percentage points. The intermigration from dial-up to broadband was found to have a similar but smaller effect.

The authors found that in 2005, increased broadband use contributed about 52,000 of the 281,000 net new jobs created in California. Migration from dial-up added another 53,000. Combined, there was net new payroll of $5.9 billion.[85] The report further assumes "a strong increase in the proportion of the adult population using broadband (3.8 percentage points per year)". This assumption for California results in generation of 1.8 million jobs and $132 billion of payroll in California over the next 10 years. They offer a "dramatic broadband growth scenario of 7.6 percentage points per year and a scenario showing "moderate increase of 0.2 percentage points."

A paper commissioned by the Economic Development Administration[86] found "support for the conclusion that broadband positively affects economic activity in ways that are consistent with the qualitative stories told by broadband advocates." They looked at communities that had mass-market broadband by 1999 and found that by 2002, these communities had outgrown a control group of like communities. Growth occurred in employment (adding 1.5% to growth rate[87]), the number of businesses (+0.5%[88]) , and business growth in the IT-intensive sectors

[83] FCC, August 2008.

[84] Gaasbeck et al., 2007.p.1
[85] Ibid., p.7.
[86] Gillet et al., 2006.
[87] Ibid. p.22.
[88] Ibid, p.23.

(0.5%). Model results were most strong at the zip-code level analysis rather than at the state-level.

Crandall et al, 2007 (Brookings Institution) used state-level FCC broadband penetration data for 2003 to 2005 to estimate the effects of broadband deployment on output and employment on the U.S. The authors found that for every one percentage point increase in broadband penetration, employment is projected to increase by 0.2 to 0.3 percent per year. Specifically, they found an average broadband line per capital of 0.12 in 2004 (12 lines per every 100 people). An increase of 0.01 lines per capita (to 0.12+0.01=0.13) was found to increase growth in employment by 0.00223 or 0.2 percentage points. When looking over the two-year period from 2003 to 2005, authors found similar annualized results. In both employment models, there was statistical significance. For the entire U.S. economy, this suggested an increase of about 300,000 jobs over a one year period. Models estimated GDP impacts were consistent with employment findings yet were less precise and not statistically significant.

Crandall makes an elegant case for allowing unhindered investment by the telecoms. He writes "results suggest that all levels of government should follow policies that encourage broadband competition, which will lead to lower prices and hence greater use." Furthermore, "increased use will require an expansion of supply, specifically greater investment by service providers in broadband infrastructure… It is critical that new regulatory policies not reduce investment incentives for these carriers."

Hazlett, et al, 2004, (U.S. Chamber of Commerce) cites a traditional capital expenditure-to-revenue ratio of 21%[89] for Regional Bell Operating Companies (RBOCs). The same report also cites Bureaus of Economic Analysis multipliers that suggest that for each addition $1 of telecom capital spending there is $2.86 of extra output and every $1 million rise in telecom capital spending leads to 18.2 new jobs.[90]

Hazlett also explains the spin-off benefits of high-speed communications. He writes, "High-speed communications systems have helped corporations pursue the restructuring activities known variously as reengineering, demand-flow manufacturing, lean manufacturing, speed-to-market, or cycle-time reduction. These strategies show up as reduced inventories, lower working capital, improved product quality, and increased output per hour of work - the key drivers of long-run increases in living standards."[91]

Barkey et al. 2006 (Ball State University) predicted total Indiana consumer surplus benefits of between $136 million and $300 million depending upon assumptions of 15% and 30% declines in cable rates. The decline in rates is predicted to come about due to Indiana's proposed 2006 telecom/broadband reform under H.B.1279.[92] The expected investment in cable broadband would cause an increase in supply, shifting the supply curve outward to the right and reducing the equilibrium price for cable broadband. This would result in reduced prices for consumers and more consumer discretionary income.

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[89] Hazlett et al., 2004, p 92.
[90] Hazlett et al., 2004, p xviii.
[91] Hazlett et al., 2004, p xix.
[92] Barkey et al., 2006, p.20.

The Digital Policy Institute White Paper (Ball State University) reports on the outcome of passage of Indiana's H.B.1279 and finds that 2,200 new jobs (as of February 2008) had been announced by telecommunications firms as a direct result of Indian's reform legislation. Authors report that Indiana telephone companies made investments of $516 million in the prior 18 months.

2.3.2 Implied Ohio Benefits Due to Broadband Growth

A good historical review of research is found in Crandall, 2007. He notes that broadband is a mere subset of a much larger set of technologies called Information Communication Technology (ICT). He states that ICT technology has been flourishing yet, even given its magnitude, measuring its economic benefits has proven difficult until recently. ICT had to reach a critical mass of usership and technology had to continue to improve. By the early 1990's the Internet had developed due to this critical mass and an evolution away from dial-up access. Crandall reports several studies that find benefits from ICT at the micro, or firm, level.

Following a series of earlier studies, a capstone study, Jorgenson, 2007, found that ICT "contributed 59 percent of the growth in labor productivity from 1995 to 2000 and 33 percent from 2000 to 2005." Crandall asks "Will the growth rate continue?" He points out that another researcher, Stiroh, 2006, believes there will be a shift away from ICT capital to complementary capital that will use ICT.

Just as was the case for ICT benefits, Crandall argues that it will take time for broadband benefits to be accurately measured. Broadband currently faces some of the same critical mass and investment barriers faced by ICT.

Studies reviewed by Crandall for his report are the first attempts at measuring these early stages of broadband. Clearly there are two levels of impact. The first is that of the direct capital investment required as mentioned above in terms of billions of dollars and millions of lines or wireless nodes. By themselves, these investments will spur the economy and generate classic multiplier effects of jobs, income and GDP growth.

However, there is predicted to be more. As with computers and the Internet, Crandall and others argue that broadband technologies are expected to ultimately alter productivity and change the way business works. Crandall and the authors reviewed by Kleinhenz and Associates attempt to measure this second productivity-shifting, impact of broadband.

2.3.3 Range of Ohio Benefits of Broadband Deployment

An effort was made to correlate the findings from reviewed studies to the situation in Ohio. When applying the results of the analyses to Ohio, an acceptable range of 15,000 to 30,000 jobs per year are due to broadband investments. Investments of $1 million in broadband result in between 18 and 50 jobs. The estimates take into account broadband's productivity-enhancing attributes and are not limited to benefits of hardware installment. Timeframes vary and data are not necessarily corresponding. Ohio has suffered population losses that make it

difficult to apply studies that stake a claim to broadband's contribution to employment growth. Although one could reasonably argue that broadband in Ohio has curtailed job loss. Results should be seen as approximations and furthermore all occur during today's high-growth period for broadband. Applications are described below.

2.3.3 Table 21
Summary of Employment Impact Studies

Study	Benefits as Applied to Ohio
Gaasbeck, 2007	15,000 jobs/yr between 2001 and 2005
EDA (communities w/ broadband vs. none)	30,000 jobs/yr between 1999 and 2002
Crandall, 2007 (based on lines per capita)	290 to 440 jobs per year
Atkinson, 2009 (Type II plus network effect)	19,920 jobs for a $400 million investment
Hazlett (US multiplier impact $500 million)	Between 309 and 9,100 jobs

A study by Gaasbeck et al.[93] (Sacramento State University) found that for the four-year period between 2001 and 2005, there occurred a rise in broadband usage from 15% to 54% by California adults. Using Bureau of Labor Statistics population data and assuming the same growth occurred among non-adults, this implies that by 2005 there were 19.4 million broadband users in California. These people now access the Internet via broadband. Modeling showed there was a resulting increase of 198,000 jobs in California. This implies that for every 100 new users of broadband there is a corresponding increase of 1.4 jobs in California (see Table 22).

2.3.3 Table 22
Job Creation in California from Broadband Adoption[94]

	a	b	c = axb	d = annual diff	e	f = dxe
	CA Population	**BB* Usage**	**BB Users**	**Additional CA BB User**	**Change in Employment**	**Calculated Change in Employment Per Additional BB User**
2001	34,507,030	15%	5,176,055			
2005	35,885,915	54%	19,378,394			
				14,202,340	**198,000**	0.014
* Broadband						

[93] Gaasbeck et al., 2007.p.1
[94] US Census and FCC data. http://www.fcc.gov/Bureaus/Common_Carrier/Reports/FCC-State_Link/IAD/hspd0607_tables.xls

In 2008, 55 percent of Ohioans subscribed to broadband to access the Internet. Since this is similar to what is reported in California (54%), we take the same growth rate of usage for Ohio as was reported in California. Over the 2001 to 2005 time period Ohio's population fell but the growth in broadband usage increased by 4.4 million people. Applying the 1.4 jobs per factor, we arrive at an estimate of 62,000 jobs created by broadband adoption in Ohio over the four-year period (see Table 23). The number seems plausible since California reported 198,000 jobs and has approximately three times the population of Ohio.

2.3.3 Table 23
Job Creation in Ohio from Broadband Adoption[95]

	OH Population	**BB* Usage**	**BB Users**	**Change in BB Users**	**CA Rate of Empl Change Per BB User**	**Estimated Change in Ohio Employment**
2001	11,450,954	15%	1,717,643			
2005	11,391,298	54%	6,151,301	4,433,658	0.014	**62,071**
* Broadband						

The paper commissioned by the Economic Development Administration[96] found that communities that had mass market broadband by 1999, had outgrown a control group of like communities by 2002. Growth occurred in employment (adding 1.5% to growth rate[97]). Unfortunately, Ohio lost close to 120,000 jobs from 1999 to 2002. The traumatic job losses may have overshadowed any job growth generated from broadband. One could assume that broadband availability shaved 1.5% off of the job loss figure. In other words, the 120,000 jobs lost represent of job loss rate of 2% over the three year period. At this level, 1.5% would equal 90,000 jobs (120,000*1.5%/2%) over the three year period or 30,000 jobs per year.

Crandall et al, 2007 found that for every one percentage point increase in broadband penetration, employment is projected to increase by 0.2 to 0.3 percent per year. His analysis covered the years 2003 to 2005. Ohio employment increased by 29,000 jobs over that period. For Ohio at an annualized job growth of 14,500 jobs, this translates to between 29 and 44 additional jobs per year per percentage point increase in broadband.

Ohio increased from 0.09 lines per capita in 2003 to 0.17 lines per capita in 2005, realizing an 8 percentage point increase in broadband penetration over the two-year period. Multiplying 8 percentage points times 29 to 44 jobs per percentage point yields between 232 and 352 jobs due to broadband access over the two-year period.

[95] US Census and FCC data. http://www.fcc.gov/Bureaus/Common_Carrier/Reports/FCC-State_Link/IAD/hspd0607_tables.xls
[96] Gillet et al., 2006.
[97] Ibid. p.22.

Extrapolating the analysis even further to the year 2007, reveals that the broadband penetration increased from 0.17 in 2005 to 0.4 lines per capita in 2007, approximately an annual 10 percentage point increase in broadband penetration. Multiplying 10 percentage points times 29 to 44 jobs per percentage point, yields 290 to 440 jobs per year due to broadband in Ohio. Unfortunately, 2,000 jobs were lost in Ohio between the years 2005 and 2007. Assuming Crandall et al to be correct, the growth of broadband in the state, shielded the state from even further loss.

Hazlett, et al, 2004, cites Bureaus of Economic Analysis multipliers that suggest that for each addition $1 of telecom capital spending there is $2.86 of extra output and every $1 million rise in telecom capital spending leads to 18.2 new jobs.[98] In his paper, a $500 million investment in broadband in the U.S. would result in creation of 9,100 jobs ($500 million x 18.2 jobs per million) nationwide. In addition, U.S. GDP will be positively impacted by $1.4 billion. Using AT&T's announced $500 million investment in Ohio video (broadband) deployment, there would be a gain of 9,100 jobs within the U.S. Many of these jobs, undoubtedly, would be realized in Ohio. At a very minimum, partitioning by Ohio's 3.8 percent of U.S. population, one could estimate that Ohio would, at the least, benefit from 309 jobs and $54 million in GDP.

Atkinson, et al, 2009, (The Information, Technology and Innovation Foundation) found that a $10 billion investment in broadband across the U.S. would generate 498,000 jobs. Of those, 268,000 jobs will be created due to the "network effect." Authors found that broadband itself increases business productivity, spurs upstream investment and contributes to the creation of new industries. They claim a network effect multiplier of 1.17 will more than double the number of traditionally calculated direct and indirect jobs. Knowing that Ohio has approximately 4% of high speed lines, one would expect Ohio to garnish 4% of the U.S. investment and 4% of the job benefits. This translates into a $400 million investment and 19,920 jobs for Ohio.

2.3.4 Implications

This report documents that Ohio businesses and consumers are moving toward broadband and away from traditional wireline technology. Furthermore, this report notes that massive investments are being made and will likely continue to be made within the context of Ohio's very competitive information technology market. The benefits of broadband to Ohio are positive and large, fostering perhaps tens of thousands of jobs per year in Ohio. Achieving sufficient broadband infrastructure will allow for a critical mass of Ohio broadband users to develop and adopt productivity-enhancing practices. The authors believe it is not in the public's best interest to have regulations that might distort or hamper any investment in this very beneficial technology.

[98] Hazlett et al., 2004, p xviii.

3.0 Conclusions and Recommendations

By all relevant measures, the passage of Ohio's new reform legislation will result in benefits similar to those clearly predicted for Indiana in 2006.[99] But, even beyond these expected results, Ohio's proposed legislation has created other beneficial externalities that even further bolster the view that the legislation is needed and justified.

While capital investment by Ohio telecoms has kept abreast of the US investment rate in the past, strained economic times will limit investment dollars in the foreseeable future. All providers have any number of choices on where to invest, and in this environment capex dollars will only flow to states that are set up to attract new investment.

We can conclude that if Ohio will adopt the ideal reform approach to fostering competition and bringing service and economic advances to its citizens and its businesses, this can advance the economic environment in the state for future business investment and job creation. Ohio should learn from the legislative failures and shortfalls in other jurisdictions and continue legislative reform that truly will become the model for other states to adopt and emulate. The state must not wait for a federal solution; instead, it should take forceful action now and begin reaping significant benefits for Buckeyes.

The drafters of Senate Bill 117 carefully observed regulatory, legislative and judicial trends in developing a structure that minimizes regulatory delay and the substantial costs of compliance with superfluous laws and regulations, and assures full consumer protection. The growth in vibrant competition in Ohio is now readily apparent.

A wide range of communications policy experts have lauded Indiana's similar experience and have developed data underscoring the benefits of "Indiana-like" deregulation. Many states have followed Indiana's lead in creating a legislative and regulatory environment that spurs competition and assigns great value to consumer choice. One salient example is that of Connecticut, which adopted a statewide video franchising law to end what was ongoing, protracted litigation that simply was impeding firms' entry into video competition.

In fact, as discussed in this report, the recent behavior of past Senate Bill 117 opponents paints a less compelling, negative picture that further substantiates the notion that Ohio's video reform legislation was the right step. For one, virtually all cable operators now also have filed for statewide franchises in order to terminate, upon grant of their statewide franchises, their existing franchises with local communities. Telephone entry into video is having a significant competitive effect on incumbent cable operators.

If the experiences in Indiana hold true, the key elements of the proposed legislation will become the catalyst for rapid deployment of additional broadband service in general, across copper, fiber and wireless. Providers are finding easier entry into the video arena using their new infrastructure to provide the entire panoply of electronic communications offerings in their

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[99] *The Economic Impact of Telecom Reform in Indiana: 2006,*Digital Policy Institute , Ball State University, February 14, 2006. Available at: www.bsu.edu/digitalpolicy.

service areas. It is to be hoped that expedited entry, created by reduced regulatory and legislative barriers, can help advance this nation's lackluster broadband penetration status.

In conclusion, this is the beginning of the parade, not the end. Observed gains in infrastructure investment, employment, and competition for digital broadband services will continue in a deregulated environment that encourages not only growth for existing technologies but welcomes deployment of new, broadband wireless solutions as well. The purpose of this report was to document Ohio's progress under a deregulated landscape and recommend areas for continued improvements. As Congress considers new national policy down the road, Ohio must continue to be diligent in protecting these statewide gains against future, poorly-crafted national policy.

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Appendix 1

Reference Tables

Table 24
High Speed Lines per Capita[100]

	2002	2003	2004	2005	2006	2007
California	0.08	0.12	0.15	0.20	0.33	0.47
Ohio	0.06	0.09	0.12	0.17	0.28	0.40
Indiana	0.03	0.07	0.10	0.15	0.23	0.36
Kentucky	0.02	0.06	0.09	0.12	0.18	0.27
United States	0.07	0.10	0.13	0.17	0.28	0.40

Table 25
High Speed Lines by State[101]

	2002	2003	2004	2005	2006	2007
California	2,960,664	4,084,382	5,294,566	7,337,217	11,894,864	17,158,292
Ohio	705,739	972,686	1,340,976	1,932,269	3,200,543	4,612,073
Indiana	202,760	415,603	637,696	922,569	1,417,112	2,267,037
Kentucky	99,265	243,005	360,903	508,198	774,736	1,161,667
U.S.	19,441,619	27,744,342	37,352,520	51,217,519	82,809,845	121,165,311

[100] http://www.fcc.gov/Bureaus/Common_Carrier/Reports/FCC-State_Link/IAD/hspd1207_tables.xls
[101] Ibid.

Table 26
Ohio Employment

Year	Annual/ average	Job Growth	Percent Growth
1991	4,819	-63	-1%
1992	4,845	26	1%
1993	4,919	73	2%
1994	5,076	157	3%
1995	5,221	145	3%
1996	5,296	76	1%
1997	5,392	96	2%
1998	5,482	90	2%
1999	5,564	82	1%
2000	5,625	61	1%
2001	5,543	-82	-1%
2002	5,445	-98	-2%
2003	5,398	-47	-1%
2004	5,409	11	0.2%
2005	5,427	18	0.3%
2006	5,436	9	0.2%
2007	5,425	-12	-0.2%
2008	5,411	-13	-0.2%

Appendix 2

About the Authors

Robert Yadon, Ph.D.

Dr. Yadon holds a Ph.D. in Mass Media from Michigan State University, and a M.S. degree in Mass Communications from Oklahoma State University. He is a professor of Information and Communication Sciences and a member of the graduate faculty at Ball State University. Dr. Yadon teaches courses in technology, business aspects, and regulatory policy issues, and he serves as the director of the Applied Research Institute. Since his arrival at Ball State, Dr. Yadon has been involved with the early development of the Center, including primary responsibility for funding of the Applied Research Institute and development of the Digital Policy Institute (DPI).

Prior to Ball State University, Dr. Yadon served as the Vice President of Television Operations at the National Association of Broadcasters (NAB) in Washington, D.C. He also has served as a member of the faculty at Michigan State University and the University of Oklahoma, and has extensive leadership experience in applied research projects including NSF-funded and FEMA-funded research. He is a senior research fellow in the Digital Policy Institute at Ball State, a member of the Institute of Electrical and Electronic Engineers (IEEE), and a member of the Computer Security Institute (CSI).

Michael Hanley, M.A.

Michael Hanley holds a M.A. in Journalism from Ball State University, and a B.A. in Visual Design from Purdue University. He is an assistant professor of Journalism and a member of the graduate faculty at Ball State University. Mr. Hanley teaches courses in advertising research, advertising media planning and buying, brand development and interactive media, and serves as the director of the Institute for Mobile Media Research. Since his arrival at Ball State, Mr. Hanley has been involved with research in the area of mobile advertising and marketing, and mobile policy implications.

Prior to Ball State University, Mr. Hanley spent 20 years as an executive in brand management, advertising and marketing experience with two Fortune 500 financial services companies (Lincoln Financial Group and Conseco), a Fortune 500 energy company (Vectren), a national accounting and consulting firm (Crowe Horwath), and a geothermal energy systems distributor (WaterFurnace of Indiana). He is a research fellow in the Digital Policy Institute at Ball State, a member of the Mobile Marketing Association, co-chair of the MMA's Academic Outreach Committee, co-editor of the *International Journal of Mobile Marketing*, and a member of the American Academy of Advertising.

Barry Umansky, J.D.

Barry D. Umansky is a professor in the Telecommunications Department at Ball State University, following a term as the Edmund F. and Virginia B. Ball Chair in Telecommunications at Ball State. He is a communications lawyer who has represented broadcasters and other electronic media and has had an extensive communications career in government and industry. After work in college and law school at radio and TV stations in the Midwest, he served for seven years as an attorney doing communications policy work at the Federal Communications Commission (FCC) in Washington, D.C. Mr. Umansky then began a twenty-year career as Deputy General Counsel with the National Association of Broadcasters ("NAB") in Washington. He was in the private practice of communications law in Washington prior to coming to Ball State in 2003.

He has been an active member of the Federal Communications Bar Association and currently is on the Board of Trustees of the Kansas Association of Broadcasters Foundation and the Board of Directors of the Broadcast Education Association. In addition to teaching responsibilities and heavy involvement in university governance, Mr. Umansky is faculty advisor to three Ball State student organizations: "Station WCRD," the "Pre-Law Interest Group" and "Media Matters." He also is a senior research fellow at the Digital Policy Institute at Ball State.

Jack Kleinhenz, Ph.D.

Jack Kleinhenz. Ph.D. is CEO of Kleinhenz & Associates and Regional Economist and Lecturer at Weatherhead School of Management. Kleinhenz & Associates is a business and economic consulting and an investment advisory firm based in Cleveland, Ohio. The firm specializes in industry studies, forecasts, regional economic and labor market issues, strategic planning and business plan development.

Jack has over 25 years of broad-based experience working with Fortune 500 companies, financial service companies, regulators, planners, universities, airports, manufacturers, chambers of commerce, trade associations, non-profit organizations and state and local government agencies. He is known for translating economics and information into clear explanations and action. Jack speaks on business and regional economic issues and is regularly called upon for his expertise by the local and national media. Formerly with the Federal Reserve Bank of Cleveland, Jack recently served as chief economist and consultant to the Greater Cleveland Growth Association, the nation's largest chamber of commerce. He teaches economics as a faculty member of Case Western Reserve University's Weatherhead School of Management.

A graduate of John Carroll University, Jack earned his M.A. and Ph.D. in Economics from the University of Notre Dame. In 1995, Jack was named one of John Carroll University's Top 50 School of Business Graduates. Previous faculty appointments include the University of Notre Dame and John Carroll University. He was awarded the title of National Association for

Business Economist (NABE) Fellow in October 2008. Jack is a member of the Governor of Ohio's Council of Economic Advisors and the Northeast Ohio Council of Economic Policy Advisors, trustee of Notre Dame College, and a corporate director for Beverage Distributors, Inc, Cleveland, Ohio. A former NABE board member he is chairman of the NABE Education Foundation and a member of NABE's statistics committee that meets regularly with policymakers and administrators of United States statistical agencies.

Jack is also a contributing economic forecaster to the Federal Reserve Bank of Chicago, the Federal Reserve Bank of Philadelphia and a NABE Outlook panelist. Jack has been recognized by the Chicago Fed for forecasting excellence in 2000-2003, 2004-2007 and in June 2008. His 2003 US economic forecast received the most awards and his June 2008 forecast received the award for best GDP forecast which he also received in 2005. Contact Jack at 216 321-9522 or www.kleinhenzassociates.com.

Russ Smith, Ph.D.

As a research consultant and associate with Kleinhenz & Associates, Inc. Russ is involved with economic development and market studies. For the better part of three years performed cost/benefit analysis of research tasks funded by the Gas Research Institute. In this capacity he assessed benefits of safety standards as well as benefits of software and hardware development. The results of his work are used by the Gas Research Institute to measure organizational productivity (Corporate Performance) and file annual reports with the Federal Energy Regulatory Commission. He has also been a Principal Investigator of a research project for the Illinois Natural Gas Vehicle Coalition assessing the economic impact on the state of Illinois of upcoming federally mandated clean fueled vehicle purchases. He was Principal Investigator of a cooperative bio-fuels project with the Chicago Transit Authority, the Chicago Police Marine Unit, and the Chicago Dept. of Environment.

At Chicago State University, Russ taught in the Department of Political Science and Economics and served as an Extension Research specialist in Ohio and an Economist at the University of Illinois at Chicago. Russ earned a Ph.D. in Agricultural Economics from Ohio State University and a Masters in Agri-Business also from the Ohio State University. He holds an undergraduate degree from the American University.

Appendix 3

About the Digital Policy Institute

The Digital Policy Institute (DPI) serves the 21st century as an independent, interdisciplinary association of faculty who have a collective interest in digital media. These interests include the structure of, and competition within, electronic communication industries and further include the public policy issues of digital creation, storage, transmission, reception, consumption, and legal intellectual property protection of digital information.

The DPI is a vehicle for faculty research that coalesces around the arenas of law, regulation, economics, intellectual property, and technology as these relate to public policy issues of local, state and national interests.

For more information, please visit the DPI website at: www.bsu.edu/digitalpolicy.