Statewide Report on Ohio's Readiness for Global Electronic Commerce May 2000

technology policy group
an OSC Initiative

This is a summary report. For more detailed information please visit www.ecom-ohio.org.

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We wish to thank the members of the ECom-Ohio Steering Committee, whose untiring efforts have brought ECom-Ohio to fruition.

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Ready, Set, Go!

Action! must be our watchword as the information revolution powerfully transforms our economy and society. But is Ohio ready to compete in the new information economy? This report answers that question and more. It documents ECom-Ohio's landmark public-private leadership effort to measure Ohio's readiness for global electronic commerce. The project has collected data in 22 key indicators that measure our state's performance against a comprehensive set of national benchmarks (www.cspp.org).

The Internet and growth of e-commerce as a way of doing business has thrust Ohio's industrial base into a time of turbulent change. Network traffic doubles every six months and forecasts show that business-to-business e-commerce will be a major driver of our state's economy in the next decade, generating new entrepreneurial ventures, sources of wealth and jobs. As industry experts recently observed:

> *"Business-to-business trade isn't growing up in high-tech centers like Silicon Valley; it's developing in industrial hubs like Cleveland and Detroit. As B2B trade expands, there will be a flight of talent and venture capital money to support these efforts, leaving the coasts feeling a bit of a frost — while middle America experiences the Internet boom in 2001."*
>
> *- - Forrester Research, February, 2000*

We firmly believe that Ohio—a leader in the first industrial revolution—has the potential to be a leader in the ECom revolution in which we are participating today. Thriving in this time of change will challenge all of Ohio's firms and institutions. The report you hold identifies a course of action and the direction we must take to remain competitive. Turn the page to see how you can get involved within your home, firm, educational institution, or government unit to move our state forward in the new economy.

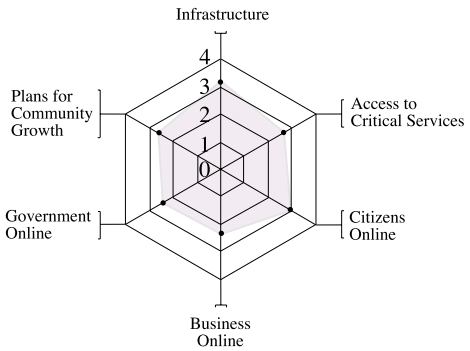
Roderick G. W. Chu
Chancellor, Ohio Board of Regents

Lars Nyberg
Chairman and CEO, NCR Corporation

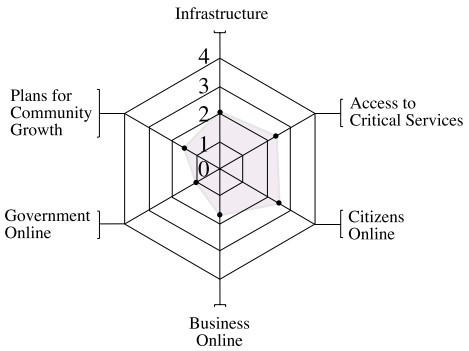
Ohio's Electronic Commerce Readiness

Ohio's rural and urban ratings are based on six summary aspects of the Computer Systems Policy Project (CSPP) grid. The CSPP grid provides national benchmarks on e-commerce readiness for communities and regions at www.cspp.org. ECom-Ohio collected and analyzed data to evaluate the state of Ohio's performance based on the CSPP benchmarks.

Urban Ohio



Rural Ohio



Infrastructure Capabilities

Components of E-Commerce

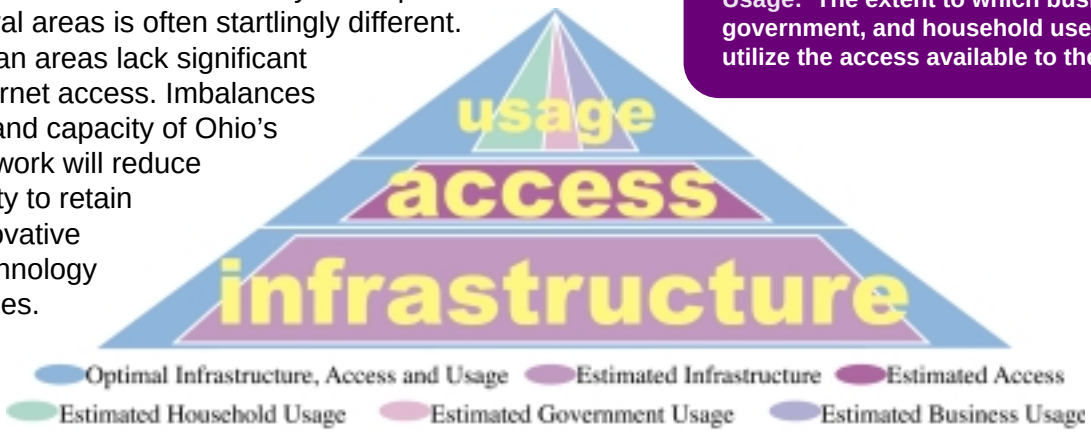
Ohio's metropolitan areas are wired and getting ready for e-business. In cities as diverse as Cincinnati, Columbus, Cleveland, Dayton and Toledo, e-businesses have become strong performers in the local economy. The picture in surrounding rural areas is often startlingly different. Ohio's non-urban areas lack significant broadband Internet access. Imbalances in the breadth and capacity of Ohio's public data network will reduce the state's ability to retain and attract innovative information technology driven companies.

Components of E-Commerce Defined

Infrastructure: The communication networks that connect users to the Internet.

Access: The choices available by which users can connect to the public data network at the level they demand or need.

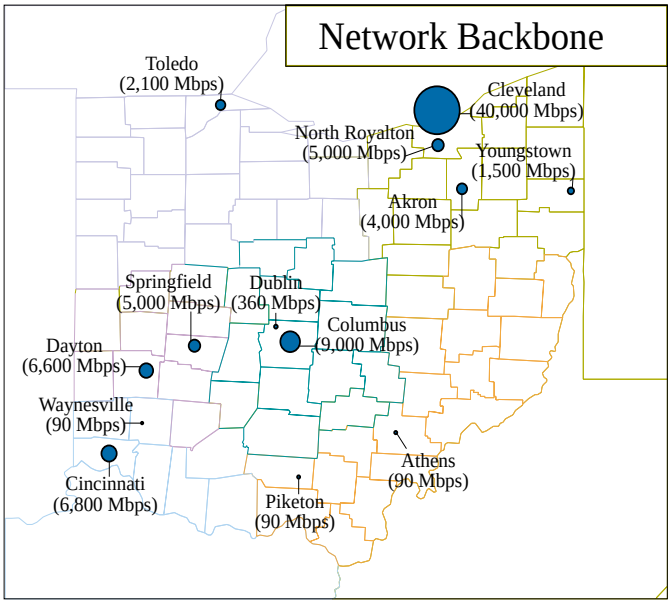
Usage: The extent to which business, government, and household users utilize the access available to them.



Available Local Backbone

Ohio's extensive connectivity infrastructure makes it one of the best connected states in the nation. Major network links run from Cleveland south to Columbus, Springfield, Dayton and Cincinnati, with multiple redundant DS3, OC12 or OC48 links to the Internet. Competition among network providers will be the main driver of network deployment among all regions, especially as more carriers enter the market and new technologies become more available and less expensive.

The state is home to an aggressive cable industry and penetration rates for cable modem technology in the Ohio market are twice the national average. The industry has significant plans for future investments statewide to carry high speed data. Digital Subscriber Line (DSL) service is being aggressively marketed by both incumbent telcos and national providers.



Ability to Meet Demand

Urban areas within Ohio have multiple, redundant points of presence and providers with multiple peering relationships. However, 60% of citizens report interruptions in service at least once a month. Although 90% of all connection attempts are successful, dialup connections are not robust enough to support high bandwidth applications.

Ohio Dial-up Connection Speeds (kilobytes/second)

	24	26	28	31	33	37	38	42	44	45	46	48	49	50
NW - Toledo (419)	-	1%	6%	1%	-	14%	-	22%	11%	43%	2%	-	-	-
NE - Cleveland (440)	-	13%	-	13%	13%	19%	-	-	-	-	-	-	-	42%
NE - Cleveland (216)	-	13%	-	14%	13%	34%	-	-	-	-	-	-	-	27%
W - Dayton (937)	1%	56%	26%	8%	8%	-	-	-	-	-	-	-	-	-
C - Columbus (614)	8%	53%	7%	12%	17%	3%	-	-	1%	-	-	-	-	-
C - Delaware (740)	-	-	1%	2%	7%	42%	-	-	-	-	2%	4%	2%	41%
SW - Cincinnati (513)	-	17%	-	9%	9%	2%	-	-	37%	27%	-	-	-	-
SE - Cambridge (740)	-	34%	34%	16%	16%	-	-	-	-	-	-	-	-	-
SE - Waverly (740)	-	50%	2%	-	-	7%	-	-	-	-	-	41%	-	-
SE - Marietta (740)	-	-	1%	2%	7%	42%	-	-	-	-	2%	4%	2%	41%

* Numbers in red indicate highest frequency connection speeds at each location

Key Findings

As the information economy continues to transform Ohio's industry base, the public data network will become as important to growing companies as sewer lines or road improvements. In some areas of the state, sufficient bandwidth is not available to support future emerging high bandwidth applications. Ohio's policies should boost competition among network providers and develop market-led solutions to imbalances in network access and capacity.

Action Agenda

- To provide high bandwidth services in the low density areas of the state, develop market-led incentives, such as implementing an advanced universal service fund, aggregating demand by joining education and government communications requirements, or developing private sector buying cooperatives for network services.
- Implement policy principles that effectively balance the private and public role in broadband development in all regions of the state.

Access to Critical Services

Range of Services

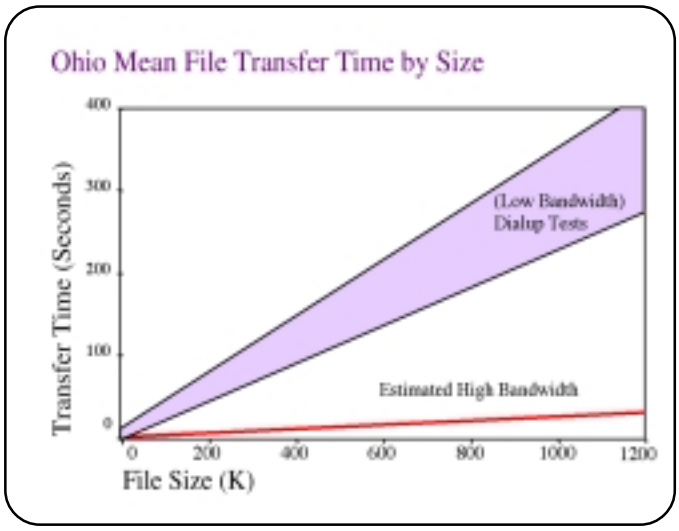
Dialup access at 56K is available throughout Ohio for residents and small businesses. Integrated Services Digital Network (ISDN) and cable modem services are available in urban and suburban areas but only 7% of all Ohio households and businesses are currently connected at these speeds. ISDN, T-1s, DSL and cable technologies are not widely available throughout the state. Some businesses in rural areas have been required to invest and build their own high bandwidth network connections. In urban areas, a wide range of payment and service options are available.

Affordability

For residents and small businesses, flat dialup service options are available throughout the state. In some rural areas, dialup connections to the Internet may only be available through a few ISPs. T-1 and ISDN service is available at flat rates based upon connection speeds, not actual usage. About 80% of the businesses are aware of various service and usage options for network connectivity. Large businesses have access to numerous competitive pricing options for high bandwidth service, although these are not yet based upon usage.

Quality of Service

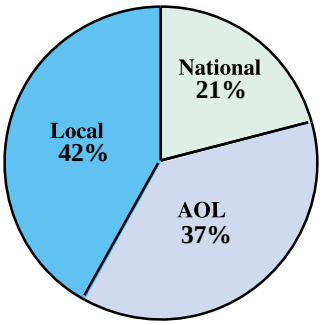
Dialup and higher bandwidth service setup times are nominal; almost all households and businesses are connected within a week. Where T-1s and ISDN lines are available, waiting times for installation range from 7-10 days. Most users in business and at home consider transmission speeds adequate for current levels of usage. However, about 50% of residents and businesses report disruptions in service at least once a month. Even so, over 85% of Ohio's business and household consumers rate their Internet Service Provider (ISP) service response as satisfactory.



Competition

For data services, a wide range of technologies and providers are available in urban and suburban areas; there is less choice in rural areas. Over 3% of Ohio's citizens log onto the Internet using cable modems, well above national averages. Many regions have a highly competitive ISP market, although providers generally have only one level of service. In Ohio, there are over 173 ISPs and discriminating buyers can find alternative service packages.

Ohio Customer Usage by Type of ISP



Key Findings

The urban and suburban Ohio market is highly diverse and boasts a variety of options for broadband service. In some small cities and rural areas, incentives may be required to bring broadband service options to residents and businesses.

Action Agenda

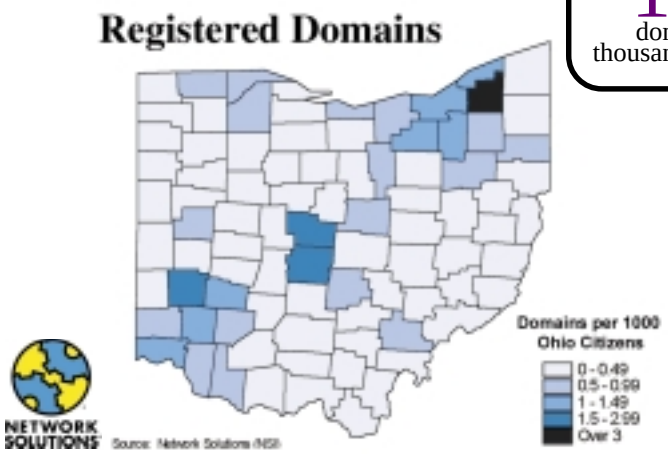
- Broaden general public access to computing technologies through better support of community computing centers, after-hours school access, and libraries.
- Ensure that state's economic development tools are defined broadly enough to support the information infrastructure needs of Ohio's growing companies.
- Provide targeted incentives to boost connectivity in the state's underserved areas.

Business Online

Domains

1.00
domains per
thousand population

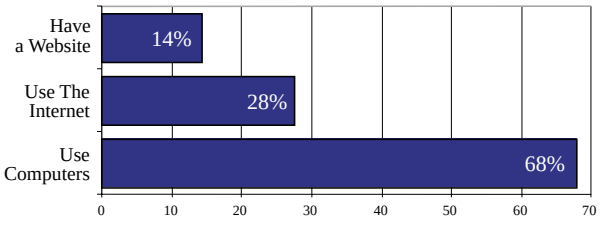
Ohio has registered domains in every county. The state's domain growth rate significantly increased during the last six months of 1999. The total number of Ohio domains grew at more than 150% (4,510 in December 1998 to 11,250 in December 1999). Areas with the most domain density are clustered around major urban technology areas, such as Cleveland, Columbus, Cincinnati, Dayton, and Toledo.



Websites

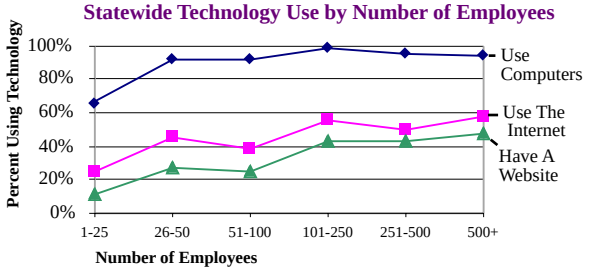
About 28% of Ohio's businesses are connected to the Internet and 14% have websites. Among Ohio's businesses with more than 100 employees, website usage is significantly higher at about 40%. Transportation, retail and financial service industries are more aggressive at using somewhat interactive content to attract new customers. Currently, very few businesses use tracking or push technology to retain customers. While there are companies with websites that demonstrate latest best practices in web usage, these are not widely used. However, industry forecasts indicate that the Midwest will experience a strong upsurge in use of web-enabled business-to-business commerce during the next 2-5 years.

Business use of technology . . .



Percent of Businesses

. . . varies with the number of employees



Market Development & Business-to-Business Transactions

About 80% of those Ohio businesses with websites cite competitive pressure and attracting new customers as primary reasons for creating a web presence. About 7.5% of those surveyed indicated that they used Electronic Data Interchange (EDI) with suppliers or customers. Significant business-to-business electronic transactions are forecast to spur transformations in key Ohio industry sectors, such as logistics and automotive.

Ohio Business Best Practice Sites

American Greetings:
www.americangreetings.com
Cooper Tire & Rubber Company:
www.coopertires.com
Frognet:
www.frognet.net
Gold Star Chili:
www.goldstarchili.com
Reynolds & Reynolds:
www.reyrey.com
Victoria Travel & Tours:
www.victoria-travel.com

Networking

Local Area Networks (LANs) are used in 37% of Ohio's businesses and Wide Area Networks (WANs) are used in 17%. Even though many businesses are networked, only 9% of these businesses rely on e-mail as their primary form of communication with suppliers or customers. Only 32.5% of the businesses in Ohio have more than half of their employees using computers.

37% businesses have a LAN

17% businesses have a WAN

Key Findings

Businesses in Ohio do not use their websites aggressively for marketing or selling. However, recent growth rates show that businesses in Ohio are rapidly changing. As business-to-business e-commerce becomes pronounced among key vendors and customers, Ohio businesses will need to adapt new technologies quickly to remain competitive.

Action Agenda

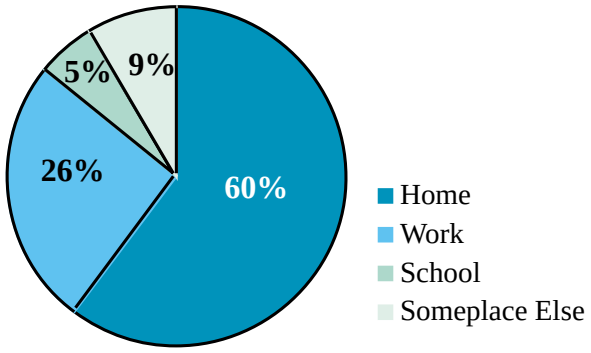
- Share results of ECom-Ohio assessment with Ohio's business, legislative and education leadership.
- Educate general public and media on Ohio's strong information technology assets.
- Provide resources and a "toolkit" to small businesses to help them get online.
- Boost training and educational programs at all levels to attract new workers and assure adequately trained workforce entrants who meet Ohio companies' needs.
- Address tax policy and privacy issues which are the most significant barriers to widespread business and household Internet usage.

Citizens Online

Internet Access at Home and at Work

Ohio matches the national average in terms of computer ownership and Internet usage. About 45% of Ohio's households own a computer and 41% are online and log on at least once a month. Thirty-seven percent of Ohio's households cite lack of access as a barrier to getting on the Internet. Ohio exhibits a "digital divide" in which ownership and usage rates decrease significantly as household incomes decline. About 45% of Ohioans are reluctant to engage in interactive online activities because of concerns over privacy and security. Widespread consumer education, industry security and privacy initiatives and appropriate regulation can help to offset these concerns.

Ohio Internet Usage by Location



Schools

Over 90% of Ohio's schools have been wired through the SchoolNet program but some areas lack adequate updated hardware or computing facilities for effective educational use. In Ohio, 7 out of 10 schools have every classroom connected to the Internet. About 86% of these schools offer staff and teachers Internet training either on or off site but there is a perceived lack of computer skills mastery and full integration into curriculum offerings.

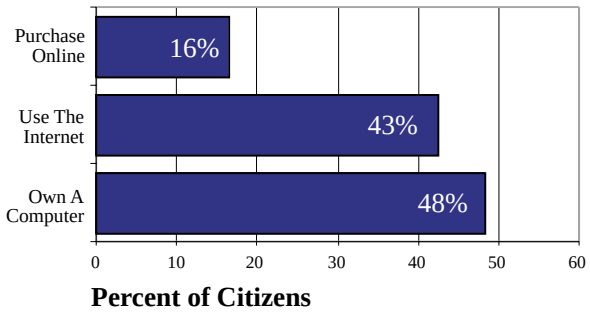
Libraries

Libraries in Ohio boast an outstanding array of network services and public access to electronic cataloguing, information, databases, and resources. The Ohio Public Library Information Network (OPLIN) provides 693 libraries with connectivity to the Internet in all 88 counties — totaling 4,134 points of public access throughout Ohio. High quality access is available at 650 locations, and more limited services are available elsewhere. Ohio's public library system is using technology and the Internet to implement resource sharing and make tools available to all users.

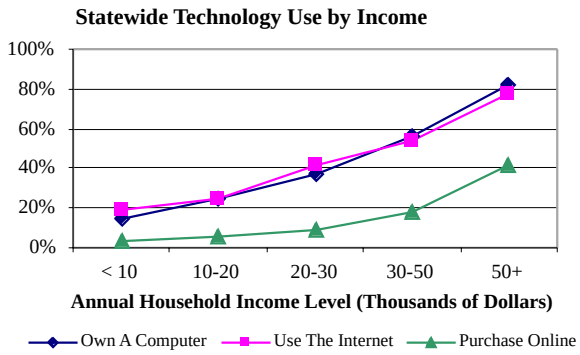
OPLIN

Ohio Citizens Online

Household Internet use . . .



. . . varies by income



Key Findings

To remain competitive in the New Economy, Ohioans need to be fluent in a range of online technologies. Ohioans are accessing the internet in growing numbers, and the public library system's investments in internet connectivity and workstations provides a strong basis for convenient public access. By aggressively expanding this access as well as providing a broad range of opportunities, tools and training, we can assure that Ohio's workforce is ready for the demands of the New Economy.

Action Agenda

- Raise awareness of public benefits of online opportunities, such as distance education, government services, healthcare, and consumer information.
- Encourage and publicize business-led efforts to provide home computers and Internet access to employees.
- Provide additional opportunities for teacher training in web technologies through company externships and staff development.
- Eliminate barriers to Ohio's household use of Internet technologies such as privacy concerns, affordability, education, and access.

Community Planning

New Communities Created

Communities with aggressive economic development efforts typically have a strong web presence. Good examples of this are the Greater Columbus Supersite and the City of Cincinnati website. Statewide, several freenets exist, as well as county-run ISPs in rural areas. Numerous special interest groups have a web presence and most major hospitals and healthcare providers are offering education and outreach services over the network.

Ohio Websites of Interest

Greater Columbus Supersite:
www.columbus.org
City of Sylvania:
www.cityofsylvania.com
City of Cincinnati:
www.rcc.com
Cleveland Live:
www.cleveland.com
City of Kettering:
www.ketteringoh.org
ACEnet:
www.acenetworks.org

Employment Opportunities and Skills

There are two statewide employment sites and several local one-stop sites. Most sites provide job searches. Only a few one-stops use online applications, perhaps because their services are being supplanted by OhioWORKS (www.ohioworks.com), an award-winning system which provides online application capabilities for job opportunities throughout the state.

Information Technology for Ohio's New Economy
itWORKS.OHIO
www.itworks-ohio.org

The Ohio Department of Education and the Ohio Board of Regents are implementing the itWORKS.OHIO initiative to develop state-of-the-art training in secondary schools, colleges, and universities. Through this effort, new partnerships are being created between businesses and schools that prepare students for successful information technology careers. Workforce skills and the availability of adequately trained candidates are still a growth constraint for many Ohio firms.

Planning

The State of Ohio is supporting regional efforts to prepare for the impact of e-commerce on local firms and economic competitiveness through a new Edison network program, Ohio's IT Alliance. This statewide program provides support to regional information technology groups, such as the Northeast Ohio Software Association, Dayton's IT Alliance, the Southwest Ohio Regional Software Association, the Information Technology Alliance of Northwest Ohio, and the Central Ohio IT Alliance.

OHIO'S
IT ALLIANCE
An Edison Network Supporting Information Technology Growth

The Public Utilities Commission of Ohio has been actively considering the level of competition that exists in the Ohio telecommunications market as well as possible incentives to boost broadband access availability in the state's rural areas.

Government Websites

All State of Ohio agencies have a web presence. Although many agencies post calendars, meeting minutes, and newsletters online, these resources are often outdated. A few state agencies, such as the Tuition Trust Authority and the Architects Examining Board, have multiple interactive features. Many other state agency websites have at least one interactive feature. The state has a procurement system, ebuy!, for office supplies and is moving toward online procurement or online downloadable forms for other aspects of citizen service. Most state employees are online, have individual e-mail accounts, and use e-mail to communicate and solve problems for the public.

Ohio Government Websites of Interest

State of Ohio Home Page:
www.state.oh.us
Ohio Tuition Trust Authority:
www.otta.state.oh.us
Architects Examining Board:
www.state.oh.us/arc

Few local government units outside of metropolitan areas are online. Of those cities online, there are limited government resources, downloadable forms, or other self-service options for citizens. No local government unit provides procurement online. The City of Cincinnati, however, has advanced interactive features on its website, allowing citizens to pay parking fines online.

Key Findings

The State of Ohio is actively beginning to coordinate individual community technology planning efforts to maximize their impact. There must be an aggressive effort to put local government units online.

Action Agenda

- Implement Governor's Council on Electronic Commerce plan to put state services online by 2003, targeting key online service opportunities providing the greatest benefits for fast-track implementation.
- Use government as a leader in e-procurement and e-business transactions when interacting with Ohio businesses.
- Encourage local government units to boost their web presence with numerous online citizen service offerings.

Glossary of Terms

Access—The technology choices available by which users can connect to the public data network at the level they demand or need (dialup, cable, DSL, ISDN, wireless, etc.)

Bandwidth—The capacity of a transmission channel to move data among locations.

Cable modem—A device that enables a personal computer to be connected to a local cable TV line and receive and send data.

Dialup access—Refers to connecting to the Internet via a modem and standard telephone line.

Domain name—The unique name that identifies an Internet site and its address.

DS3 (Digital Signal 3)—A standard digital transmission rate of approximately 45 Mbps.

DSL (Digital Subscriber Line)—A technology which enables the ordinary copper component of telephone lines to carry data at rates much higher than ISDN.

E–commerce (Electronic commerce)— Commercial and non-commercial transactions facilitated through the use of networked technologies.

Gbps (Gigabits per second)—A measurement of the rate of speed at which data is transferred (e.g., 1 Gbps equals 1 billion bits per second).

Infrastructure—The communication networks that connect users to the Internet.

Internet—The collection of interconnected networks that use the IP protocols.

ISDN (Integrated Services Digital Network)—A service that allows for higher data transmission speeds and is capable of handling at least two services over one line simultaneously (i.e., voice and fax or voice and data).

ISP (Internet Service Provider)—A company or organization that provides users with connectivity to the Internet.

Kbps (Kilobits per second)—The rate of speed at which data is transferred (e.g., 1 Kbps equals 1,000 bits per second).

LAN (Local Area Network)—A network of interconnected workstations that share the resources of a single processor or server within a relatively small geographic area, such as an office.

Mbps (Megabits per second)—A measurement of the rate of speed at which data is transferred (e.g. 1 Mbps equals 1 million bits per second).

OC3 (Optical Carrier level-3)—An optical fiber line that supports digital signal transmissions at 3 times the base rate of 51.84 Mbps or approximately 155 Mbps.

OC12 (Optical Carrier level-12)—An optical fiber line that supports digital signal transmissions at 12 times the base rate of 51.84 Mbps or approximately 560 Mbps.

OC48 (Optical Carrier level-48)—An optical fiber line that supports digital signal transmissions at 48 times the base rate of 51.84 Mbps or approximately 2.5 Gbps.

OC192 (Optical Carrier level-192)—An optical fiber line that supports digital signal transmissions at 192 times the base rate of 51.84 Mbps or approximately 9.7 Gbps.

T1—A commonly used line for Internet connectivity that supports digital transmissions at 1.5 Mbps.

Usage—The extent to which business, government and household users utilize the Internet access and infrastructure available to them.

WAN (Wide Area Network)—A geographically dispersed telecommunications network.

Wireless access—A communications system in which radio-frequency or infrared waves carry a signal through the air, rather than along a wire.

xDSL (Digital Subscriber Lines)—One of many variations of DSL, the most common of which is ADSL, asymmetric digital subscriber line service.

Workteam Members

OSC - Ohio Supercomputer Center
University of Akron - Institute for Policy Studies
Cleveland State University - The Maxine Goodman Levin College of Urban Affairs
PricewaterhouseCoopers

Regional Convenors

Central

Greater Columbus Chamber of Commerce

Northeast

NorTech - Northeast Ohio Technology Coalition

Northwest

EISC, Inc.

Southeast

OVRDC - Ohio Valley Regional Development District
OMEGA - Ohio Mid-Eastern Governments Association
BHHVRDD - Buckeye Hills-Hocking Valley Regional Development District

Southwest

IAMS - Institute of Advanced Manufacturing Sciences

West

Greater Dayton IT Alliance