Center for Public Technology
Rural Internet Access Authority
North Carolina Association of County Commissioners
North Carolina League of Municipalities

July 2002

For additional information concerning information contained in this report, please contact Shannon Schelin at the School of Government.
Telephone: (919) 962-5438
E-mail: Schelin@iogmail.iog.unc.edu

This report is available on-line at:

The Center for Public Technology's Web site
www.cpt.unc.edu/publications.html

The Rural Internet Access Authority's Web site
www.e-nc.org

COPYRIGHT 2002
SCHOOL OF GOVERNMENT

School of Government
CB# 3330 Knapp Building,
The University of North Carolina at Chapel Hill,
Chapel Hill, NC 27599-3330

(This page is intentionally left blank.)

Table of Contents

I. Letter of Transmittal

II. Definitions

III. Statement of Research

IV. Key Findings

V. Recommendations

V. Appendix A—Maps of N.C. Technological Capacities

VI. Appendix B—Charts of N.C. Technological Capacities

VI. Appendix C—Survey Instrument

VIII. Appendix D— Best Practices (submitted by local governments in NC)

(This page is intentionally left blank.)

Letter of Transmittal

July 2002

Dear Reader,

The ability to effectively access computers and the Internet is becoming increasingly important for full participation in America's economic, social and political environment. In today's challenging economy, it is critical to apply the latest technological advances in order to effectively achieve the benefits of the Internet in areas such as business, agriculture, health, learning and government.

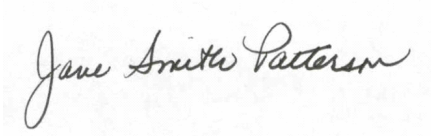
Basic services such as renewing a driver's license over the Internet and eliminating time spent waiting in line, sending electronic mail to a local elected official, or having access to the county's website to find a comprehensive source of information, are often beyond the reach of our citizens and businesses as many local governments are not equipped to handle such requests.

The Rural Internet Access Authority, as stated in Session Laws 2000-149, is charged with providing high speed Internet access to every North Carolinian at reasonable rates as well as ensuring that Internet access is made available throughout the state. In conjunction with the Center for Public Technology, the Rural Internet Access Authority initiated a local government survey. The survey gathered relevant information and developed a benchmark of existing technology within local governments, portraying what is currently being provided to citizens and businesses. The results of this current state assessment tell us that we have made progress, but not yet enough in enabling local governments to communicate and conduct/process transactions with our citizens and businesses. The survey gathered data on the infrastructure, equipment, personnel capacity and applications that currently exist to support e-government and the use of information technology in government, particularly web-based Internet applications.

As you read through the report, please notice the recommendations endorsed by the Rural Internet Access Authority, for providing effective tools and funding to local governments to advance e-government in North Carolina.

For specific information regarding the local government survey or to download a copy of the final report, please visit http://www.e-nc.org/surveys/gov_survey.shtml or call us at (919) 250-4314. To find out more about more about the missions and goals of the Rural Internet Access Authority, visit our website at http://www.e-nc.org.

Sincerely,



Jane Smith Patterson
Executive Director,
Rural Internet Access Authority

Definitions

Connectivity: the ability to link to the Internet.

Hardware: physical equipment (computers, monitors, keyboards, etc.) as opposed to programs, procedures, rules, and associated documentation.

High-Speed Internet Access: connection to the Internet at speeds of at least 128 kbps for residential customers and 256 kbps for business customers, as defined by the Rural Internet Access Authority.

Information Technology: the branch of technology devoted to the study and application of data and its processing.

Infrastructure: the physical components, such as physical and wireless transmission media and communication devices, used to connect computers and users.

Interoperability: the ability of software and hardware on different machines from different vendors to share data.

Local Area Network (LAN): a network that connects computers in a limited geographic area.

Metropolitan Area Network (MAN): a backbone network that connects local area networks in a metropolitan area and handles the bulk of communications activity across that region.

Software: a set of computer programs, procedures, and associated documentation concerned with the operation of a data processing system.

Wide Area Network (WAN): a network that covers a large geographical area using a communications channel that combines telephone lines, microwave, satellites, or other transmission media.

STATEMENT OF RESEARCH

Design

The research design selected for the Center for Public Technology/Rural Internet Access Authority E-Government Survey is exploratory in nature. Many of the survey components are based on surveys conducted by the U.S. General Accounting Office[1] and the International City/County Managers Association.[2] The survey results described in this report offer insight into the current status of information technology (IT) in North Carolina, including information on 173 variables for county and municipal levels of government, as well as North Carolina school systems, community colleges, and Councils of Government. They provide a benchmark for measuring future progress and offer a roadmap for information technology planning and investments in local governments. The survey results will help the Rural Internet Access Authority determine appropriate directions for funding in order to generate high-value returns for local governments and citizens. However, prior to understanding the current state of technological capacity in North Carolina local governments, it is essential to establish a vision for the future, a map to guide us down the virtual road less taken.

Population and Response Rate

The survey inquires about the number of personal computers in use; the types of Internet connections in use; the percentage of employees with personal computers and Internet and e-mail access; the types of electronic transactions, networks, and software in use; and related technology issues. Several local government officials and industry experts reviewed the survey to ensure the validity of the questions. The survey was mailed to all 100 North Carolina counties, 530 municipalities, 58 community colleges, 17 Councils of Government, and 122 school systems.[3] To encourage participation and to ensure the accuracy of the returned data, follow-up telephone calls were made to all the units. In addition, the Department of Public Instruction's Annual Media and Technology Report provided data on all of the school systems.

Response Rates:

- **94 percent of counties**
- **76.8 percent of municipalities**
- **100 percent of school systems**
- **79 percent of community colleges**
- **76.5 percent of councils of government**

Limitations

There are two main threats to internal validity. One threat involves the survey respondent misreporting the usage of e-government tools and techniques. This threat is difficult to control at the onset, but follow-up with other members of the governmental unit, as well as content analysis of the local government's Web site can provide insight into possible instances of misreporting. In addition, the premise of the survey conducted by the School of Government was to generate funding streams to areas of need, so the likelihood of misreporting in order to inflate the e-government rating is unlikely. It is important to note that the data provided by the survey respondents for their organizations may not be reflective of all departments and divisions. For example, county extension offices or local schools may have lower connectivity speeds or lack network infrastructure.

The second threat to internal validity is the mishandling of data by the survey team. The data could be entered into the statistical package incorrectly. The use of scatter plots and other tools to identify outliers alerts the researcher to potential data problems. In addition, all completed surveys are kept on file for data verification purposes. These techniques help to solve data entry problems.

The limitations of the findings from this study will come primarily from the lack of comparable data from other states in the United States. Because the data has only been collected for North Carolina, the findings merely reflect what is occurring in North Carolina. The findings cannot be generalized to the population of local governments outside of North Carolina. However, it is feasible that the research design may expand to include a sample of other local governments across the United States in order to determine if the findings in North Carolina are unique to the state or are similar to findings in other states.

---

[1] US General Accounting Office. *Federal Information System Controls Audit Manual*. GAO/AIMD-12.19.6, January 1999.
[2] Donald F. Norris et al., "Is Your Local Government Plugged In? Highlights of the 2000 Electronic Government Survey." (Baltimore, MD: International City/County Management Ass'n, Feb. 27, 2001).
[3] The survey was distributed based upon tier designations but the analysis completed for this report is based upon population divisions.

KEY FINDINGS

The survey data contain important insights on the IT readiness of local governments and educational units in North Carolina.

The contrasts among the units of government that emerge when the data are analyzed by the size, relative wealth, and type of organization are impressive. As expected, the picture that emerges can be summarized as follows:

- Larger units of government are making use of a much greater IT capacity and they are supporting it with dedicated staff. This is confirmation of the urban-rural split.
- Level of IT use is generally correlated to the ability of governments to invest in technology.
- Counties generally have a higher level of IT utilization as compared to municipalities. This is attributed to their operation of state and federally funded systems.
- The amount of technological capacity found in the school systems and community colleges is by no means sufficient for the significant demands these units face; however, it does offer a well-grounded starting point for collaborative work with local government units to increase the understanding and usage of e-government.

Recognizing that these general differences do help to explain for variation among the units of government and education, the following observations represent the key findings and implications of the survey data

Slow Internet Connections

One of the primary goals of the Rural Internet Access Authority is to provide high-speed Internet access at competitive prices to all North Carolinians within three years at prices in rural counties that are comparable to prices in urban North Carolina. The value of a high-speed connection versus a standard dial-up connection is the rate of information transfer. The response time is essential because the more quickly applications can be delivered and processed, the more they are used, and the more efficient they become. As more Web applications become available, the rate of data transfer will become increasingly important.

The survey results indicate a clear disparity between municipalities and counties in connectivity methods. Twenty-one percent of all responding municipalities have no Internet connection at all. In addition, among those municipalities with populations of 1000 or less, over 40 percent have no Internet connection. Among the municipalities with Internet connections, over 70 percent rely on modem connections.

In contrast, 85 percent of all responding counties connect to the Internet via both modem and high-speed methods or only high-speed methods. Even among the smallest counties, those with populations of 12,000 people or less, 73 percent have high-speed connections. For counties with populations of 28,000 or greater, all but one county use either high-speed and modem connections or only high-speed connections to the Internet. Additionally, the majority of school systems and community colleges use both modem and high-speed methods or only high-speed methods to connect to the Internet.

Lack of Web Sites in Municipalities

Current literature indicates that government Web sites are necessary to encourage civic participation and to allow citizens access to government service twenty-four hours a day, seven days a week. A recent national survey conducted by the International City/County Managers' Association (ICMA) found that more than 80 percent of local governments had Web sites. North Carolina's municipalities are well behind this national average. Only 37 percent of responding municipalities have Web sites. However, 80 percent of North Carolina counties have Web sites. Almost 90 percent of school systems and all reporting community colleges have Web sites.

Use of Web Sites

The use of the official Web site for transaction processing and other forms of citizen engagement is one of the central components of e-government. However, the majority of North Carolina local government units use their Web sites for information dissemination only. Less than six percent of the responding municipalities use their Web sites for both information dissemination and transaction processing. Even in the municipalities with populations over 100,000, only 21 percent use their Web sites for both information dissemination and transaction processing.

Furthermore, only 24 percent of North Carolina counties use their Web sites for both information dissemination and transaction processing. Again, even in the largest counties, with populations over 100,000, only 23 percent have transactional capabilities on their Web sites. Clearly, this is one of the largest, most pressing issues facing the successful implementation of e-government in North Carolina. The ability to conduct on-line transactions is one of the cornerstones of e-government and one of its biggest citizen services.

Biggest Hindrances to E-Government

All types and sizes of government units surveyed rank funding as the biggest hindrance to implementing e-government initiatives. For counties, the second and third biggest hindrances include staff concerns, security concerns, lack of technical infrastructure, implementation/maintenance issues, and training issues. As the counties' populations increase, they are more likely to be concerned with security and staff issues as the second and third hindrances to e-government.

Again, all sizes of municipalities rank funding as the biggest hindrance to e-government. The second and third biggest hindrances for municipalities include training issues, staff concerns, lack of technical infrastructure, implementation/maintenance issues, and keeping up with new technologies. As the municipalities' populations increase, they are more likely to be concerned with security issues and the lack of technical infrastructure.

Lack of Dedicated IT Support

The lack of information technology departments, or more accurately, a lack of IT staff, in local government units is another obstacle to development and implementation of e-government initiatives. Information technology departments provide the knowledge base and the technical support to implement and maintain technology systems on a daily basis. Without dedicated information technology departments, or at least trained information technology personnel, local governments will have difficulty moving forward into the era of e-government.

Over 90 percent of the responding municipalities do not have an IT department. Seventy-three percent of the counties have an IT department. Furthermore, 100 percent of the responding counties with populations over 52,000 have IT departments. Although not all organizations need a fully dedicated information technology department, all do need at least one person trained to handle the information technology issues that will inevitably arise.

Lack of Network Infrastructure

The value of interoperability and connectivity through networks is immeasurable. Networks enable the sharing of applications and data across departments, and they save money by streamlining applications and reducing data redundancy. Networks are instrumental in allowing the various departments to share applications and communicate with one another.

Among reporting municipalities, more than 65 percent do not have local area networks (LANs) and almost 90 percent do not have wide area networks (WANs). In contrast, 80 percent of the reporting counties have LANs, while 57 percent have WANs. For counties with populations greater than 52,000, all reporting counties have LANs.

Although almost 95 percent of the school systems have WANs, this does not mean that the individual schools within these districts are networked. It is critical that individual schools install networks in order to capitalize on the communication improvements and shared applications between departments, neighboring schools, local community colleges, and local governments.

Inefficient Use of Available IT Infrastructure

One of the biggest problems facing the local governments that currently have networks in place is the use of multiple fractional T-1 lines. The use of these types of lines, based on the specific needs of separate departments and divisions, is extremely costly and does not take advantage of the economies of scale that occur with demand aggregation. The best solution for local governments is to determine the total need of the organization and its agencies, departments, and divisions. This will encourage the government to lease a dedicated T-1 line, which will provide faster data transmission and be more cost-effective. Again, it is imperative that local governments, school systems, community colleges, and councils of government leverage their collective power to enhance their existing and future infrastructure.

Lack of Usage of State Contract

The lack of commitment to using the state contract for IT purchases among the local government units is concerning. Overall, 72 percent of the counties report using the state contract for IT purchases. Thirty-six percent of Tier 1 counties and 58 percent of Tier 2 counties use the state contract, compared to 73 percent of Tier 3, 90 percent of Tier 4, and 91 percent of Tier 5 counties. Only 24.2 percent of the municipalities in North Carolina use the state contract for IT purchases. Fifteen percent of Tier 1, 27 percent of Tier 2, 19 percent of Tier 3, 23 percent of Tier 4, and 37 percent of Tier 5 municipalities use the state contract. Clearly, this lack of usage by the municipalities means that they are not receiving the benefits of demand aggregation, including better pricing.

Lack of IT Strategic Plans

Another important consideration in planning and implementing information technology in local government is strategic planning. Approximately 10 percent of the municipalities have a strategic plan for information technology. Approximately 25 percent of the counties have an IT strategic plan. Clearly, the need for strategic planning and wise, guided investments in information technology is paramount to the role of e-government.

Prevalence of a "Go It Alone" Approach

One of the final concerns about the state of e-government in North Carolina is the lack of partnerships and cooperative agreements between organizations. There are selected opportunities in local school systems and community colleges, which can be used to improve the affordability and accessibility for local governments. Recently, the community college system approved plans for instructional programs in e-commerce, which will add to their technology offerings. In addition, demand aggregation principles should be used for counties and municipalities to band together to create a greater demand for access and cost savings.

Demand aggregation has emerged as an essential tool for enhancing buyer purchasing power. The objective is to provide individual government units with the best possible price by allowing them to combine their purchasing interests with those of other buyers. Buyers and sellers will thus be positioned to increase profitability through low-cost purchasing opportunities. This group buying system will ensure that buyers get a competitive price since the buyers will be treated as one single entity, thus assuring government units of all sizes a level playing field. The ability to create high demand and lower costs is established through partnerships and coalitions to capitalize on demand aggregation. These types of partnerships will lead to advanced stages of e-government and other e-sectors and ultimately improve the state of North Carolina.

Comments from Local Governments

The survey also asked for open-ended comments with regard to two questions. The responses to these questions provide valuable insight into the daily concerns and issues facing our local governments. The following table contains the most common responses to the questions.

What programs or policies could help your organization achieve its IT goals?

- Funding for IT
- Development of replacement plan
- Use incentives to promote sharing systems and applications
- Multiyear, strategic planning for IT
- Disaster recovery planning
- Development of technology standards (infrastructure, equipment, applications)
- Standardize and centralize purchasing
- Education and certification process
- Develop model for Web-based access
- Free consulting; IT inspections
- Use digital signatures, security certificates
- On-line training
- Train elected officials to understand the importance of IT
- Counties should help their municipalities with IT
- Assistance with Web design/maintenance
- COG-based IT training
- Master list of software used in other towns and counties

What does state government need to understand about IT in North Carolina?

- Small counties/municipalities need funding for IT
- Need to educate the population about IT
- Broadband is cost-prohibitive
- Need to involve rural N.C. in IT planning
- Lack of access to high-speed Internet
- FCC should release restrictions and open up area to competition
- Reduce unfounded mandates
- Administration and commissioners need to understand IT

RECOMMENDATIONS

Drawing upon the analysis of the survey data, the Rural Internet Access Authority recognizes that progress is contingent upon efforts to build upon the existing capacity of local governments and educational units. Taking into account the strengths and limitations of the units of government, **four** interrelated strategies emerge.

1. **Vision:** The lack of strategic IT plans by local governments represents a gap in the ability of local units to connect their daily business and citizen relations with Information Technology. Public leaders and managers require sound business reasons to support technology investments. They need to demonstrate that the benefits and costs associated with these investments will result in positive outcomes for the unit of government. Rolling strategic planning efforts offer an opportunity to demonstrate the ways that IT investment over time will support the achievement of a unit's vision.

   The Rural Internet Access Authority recommends that a framework for local government strategic IT planning be developed and transferred to interested units of government.

2. **Expertise:** The operation of Internet-based, networked applications requires competent ongoing technical and management support. The survey highlights the lack of dedicated IT staff in the majority of local governments, particularly municipalities. In many instances, the technology in place is supported on a part-time and decentralized basis. Efforts to build upon this personnel capacity and assist in the establishment of centralized IT support are critical factors in the deployment and operation of new technologies. Furthermore, the comments of the local governments indicate a need to educate and inform elected and appointed officials, as well as the citizenry, about the value-add of IT.

   The Rural Internet Access Authority recommends that a curriculum and structure for training local staff be developed and implemented.

3. **Resources:** Survey data illustrate that small, rural governments, with low financial capacity lack the IT infrastructure (enterprise networks, high-speed connections, and Web-based applications) currently and in the near term. Provided that there is sufficient organizational justification for this infrastructure, there remains a critical issue of the availability of financial resources to support its acquisition and proper use. If the public policy interest of connecting rural North Carolina to affordable high-speed Internet is to be met, it is essential that the financial barriers to entry be overcome.

   The Rural Internet Access Authority supports local governments and encourages them to seek grants, subsidies, appropriations, and state and federal funds to help reduce the costs associated with the investment in core IT infrastructure and Web-based applications.

4. **Working together:** Decisions about whether or not to invest in IT are generally made individually by the units of government. There are multiple reasons for this: the "stovepipe" orientation and funding of programs, separateness of governance structures, and history. Cost-effective IT is sensitive to economies of scale. Smaller units of government do not enjoy the level of economic return because of their size. The advances in IT allow for the streamlined coordination of resources across multiple units of government and/or communities. There are examples of several local governments banding together to increase their purchasing power and support of IT. New governance protocols and business cases that aggregate the resources and demand for modern IT across multiple units of government need to be developed.

   The Rural Internet Access Authority recommends that survey data be used to identify potential areas and applications suitable for aggregation, incorporating local governments, school systems, and community colleges. Further, the RIAA recommends that best practices be highlighted and pilot programs that help specify these opportunities be implemented.

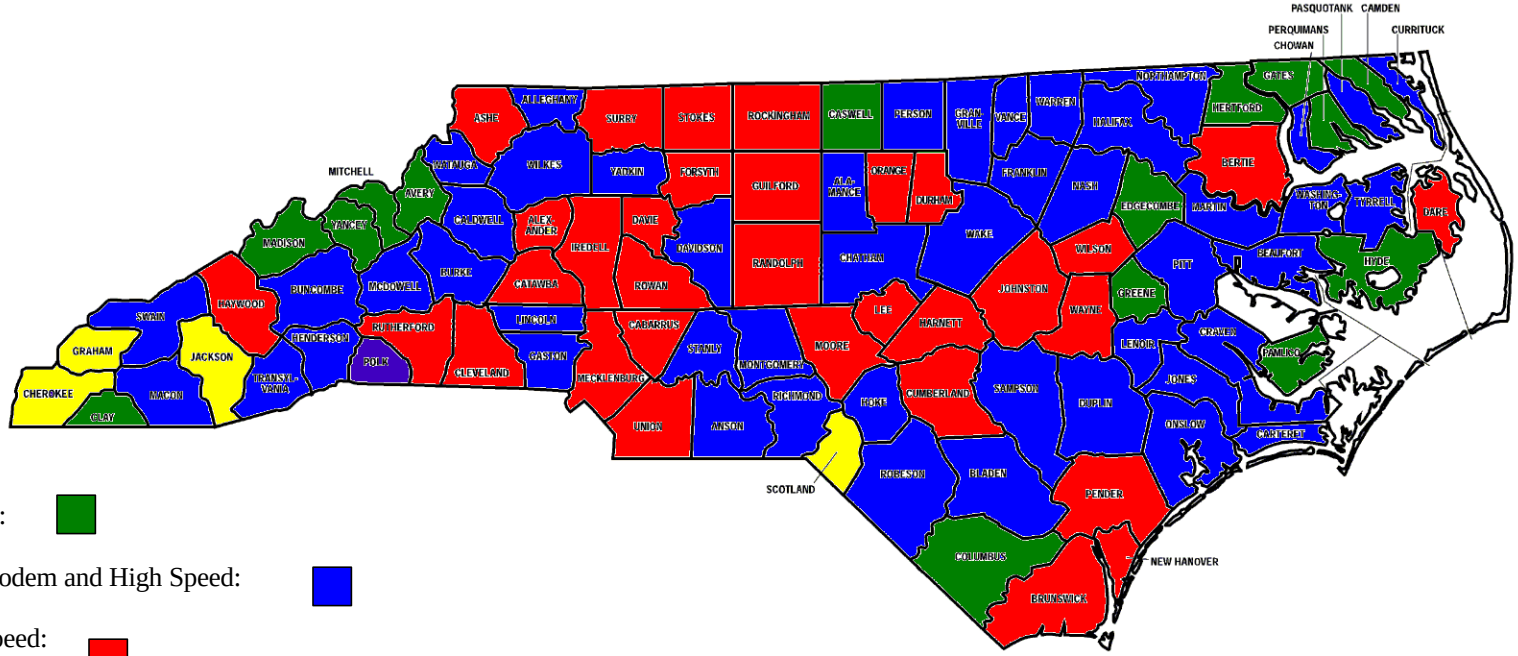
(This page is intentionally left blank.)

APPENDIX A

Maps of North Carolina's Technology Capacities

(This page is intentionally left blank.)

Map of North Carolina Counties and Their Internet Connections



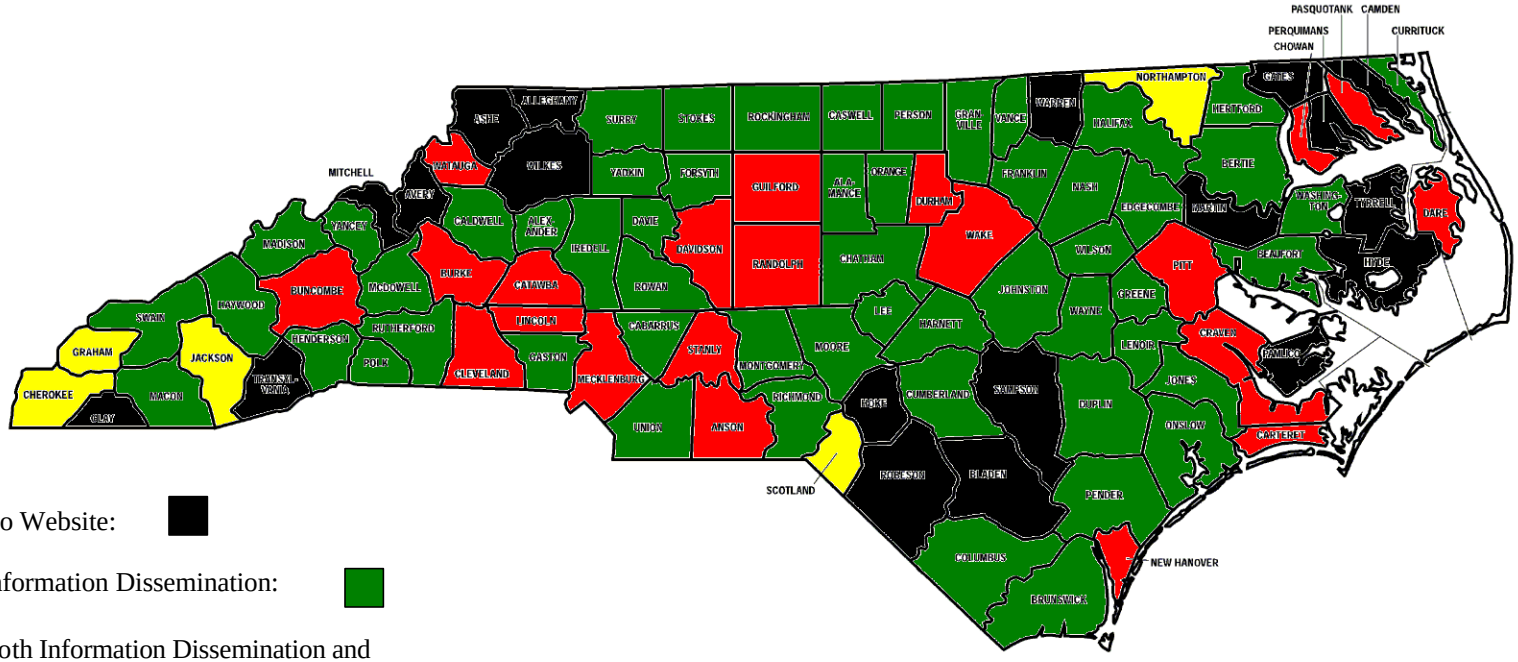
Modem:

Both Modem and High Speed:

High Speed:

Non-respondents:

Map of NC Counties and Their Web Site Capabilities



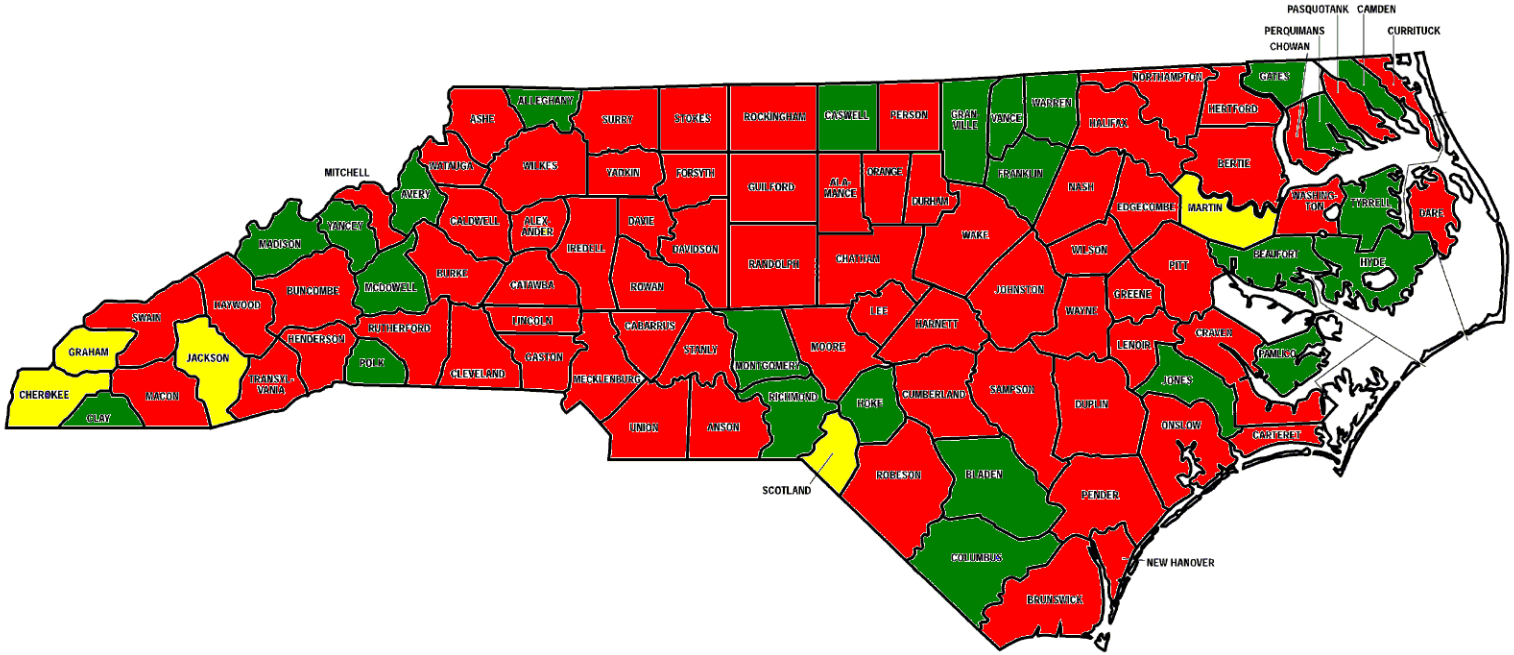
No Website:

Information Dissemination:

Both Information Dissemination and Transaction Processing:

Non-respondents:

Map of Counties with IT Departments



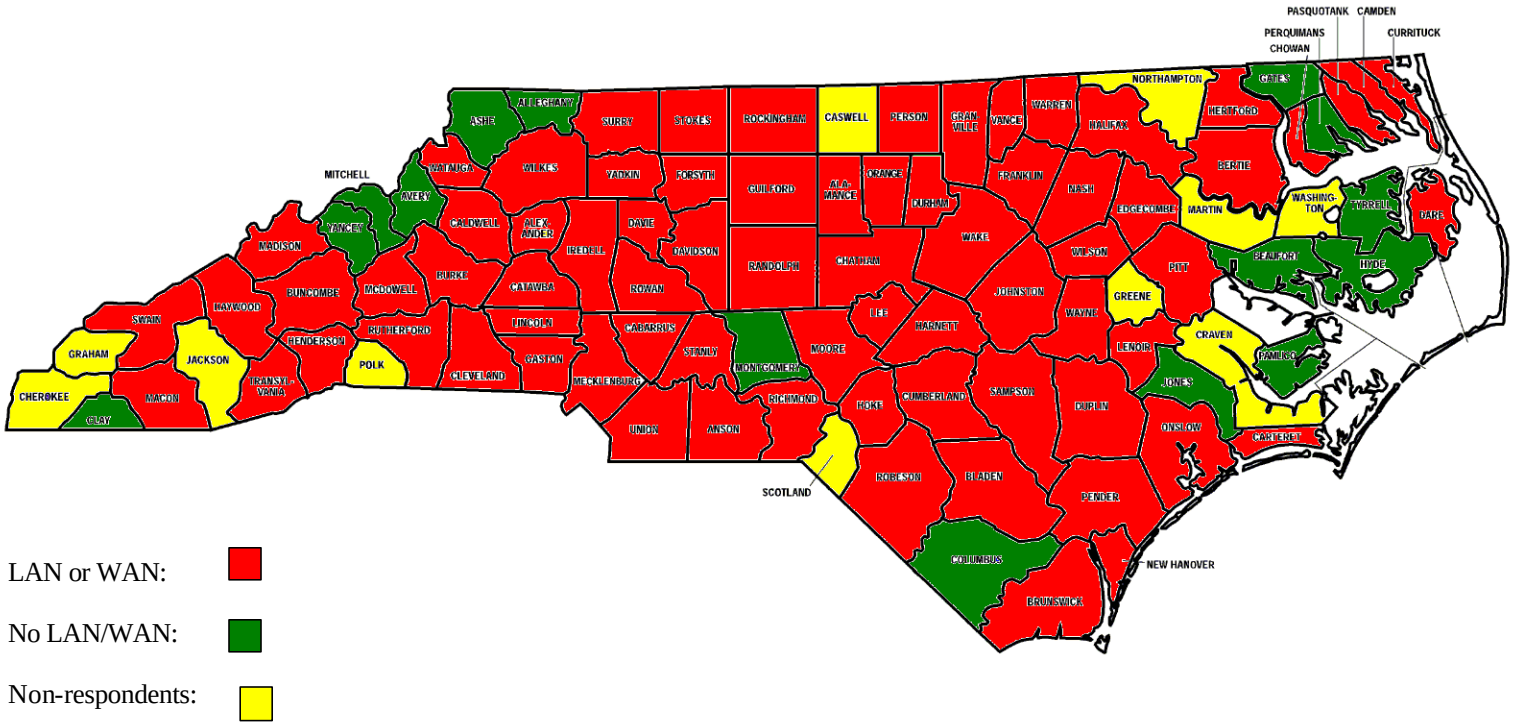
Map Key:

IT Department:

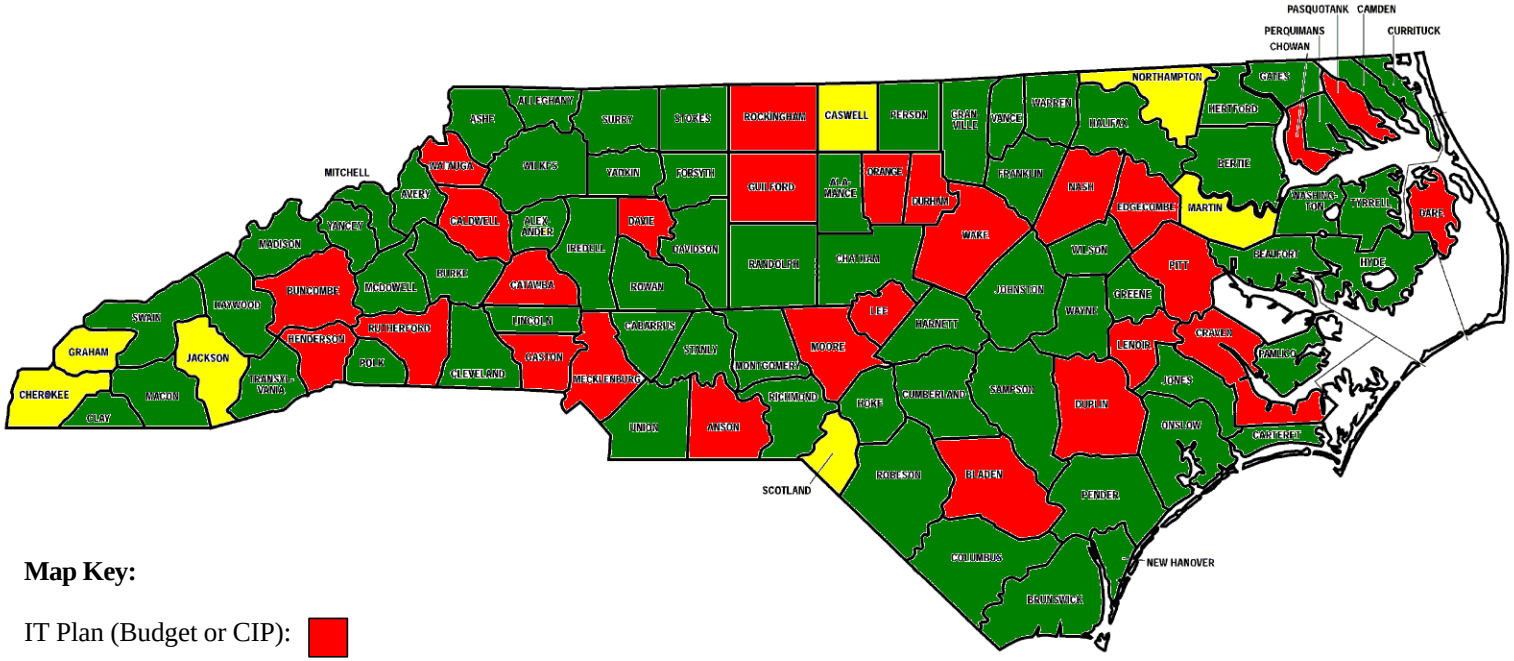
No IT Department:

Non-respondents:

Map of Counties with LANs and WANs



Map of Counties with Strategic IT Plans



Map Key:

IT Plan (Budget or CIP):

No IT Plan:

Non-respondents:

APPENDIX B

Charts of North Carolina's Technology Capacities

Chart of Internet Connection for Municipalities and Counties in NC

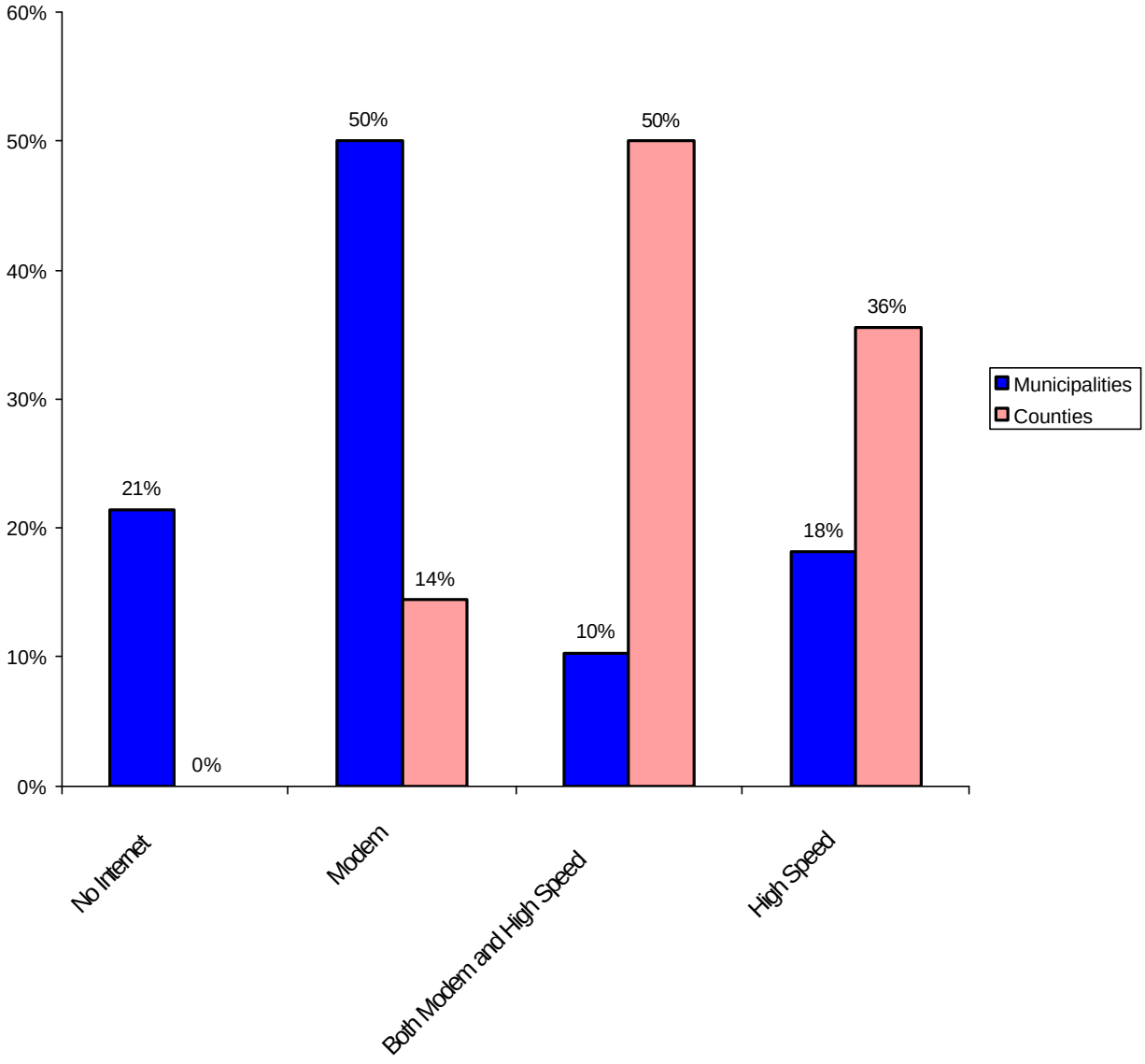


Chart of Internet Connection in North Carolina Counties by Population

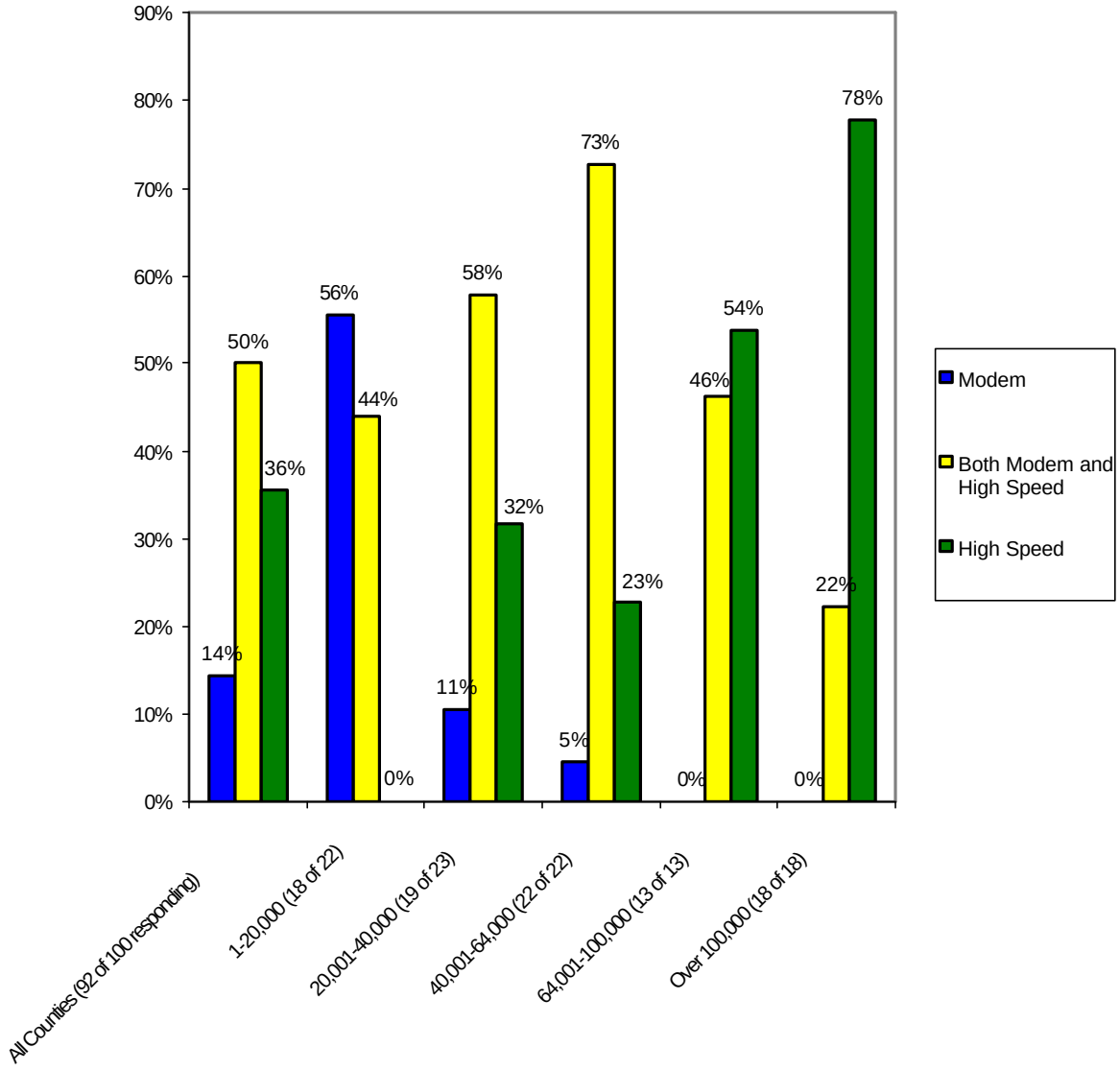


Chart of Internet Connection in North Carolina Municipalities by Population

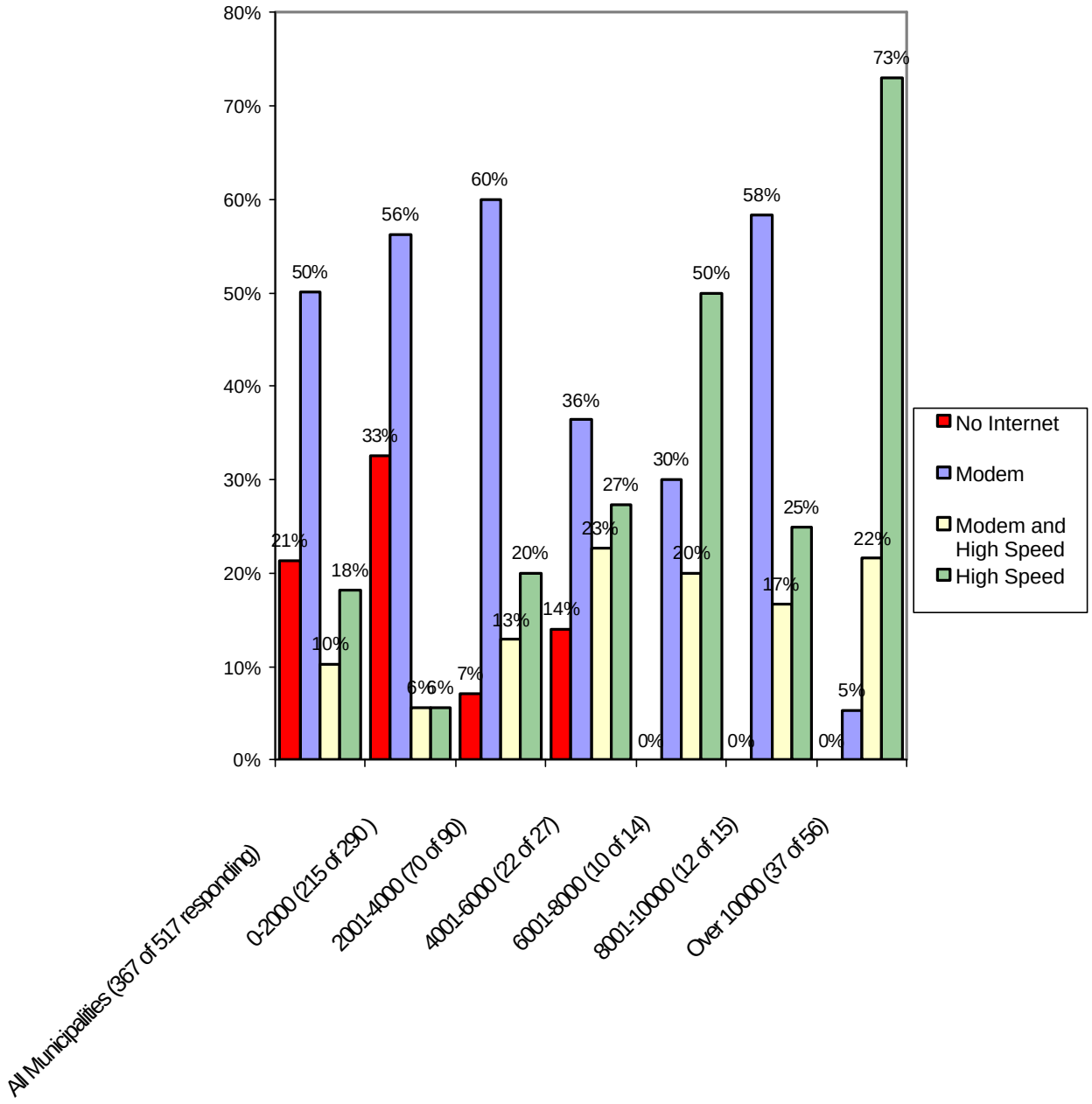


Chart of Websites in North Carolina Counties by Population

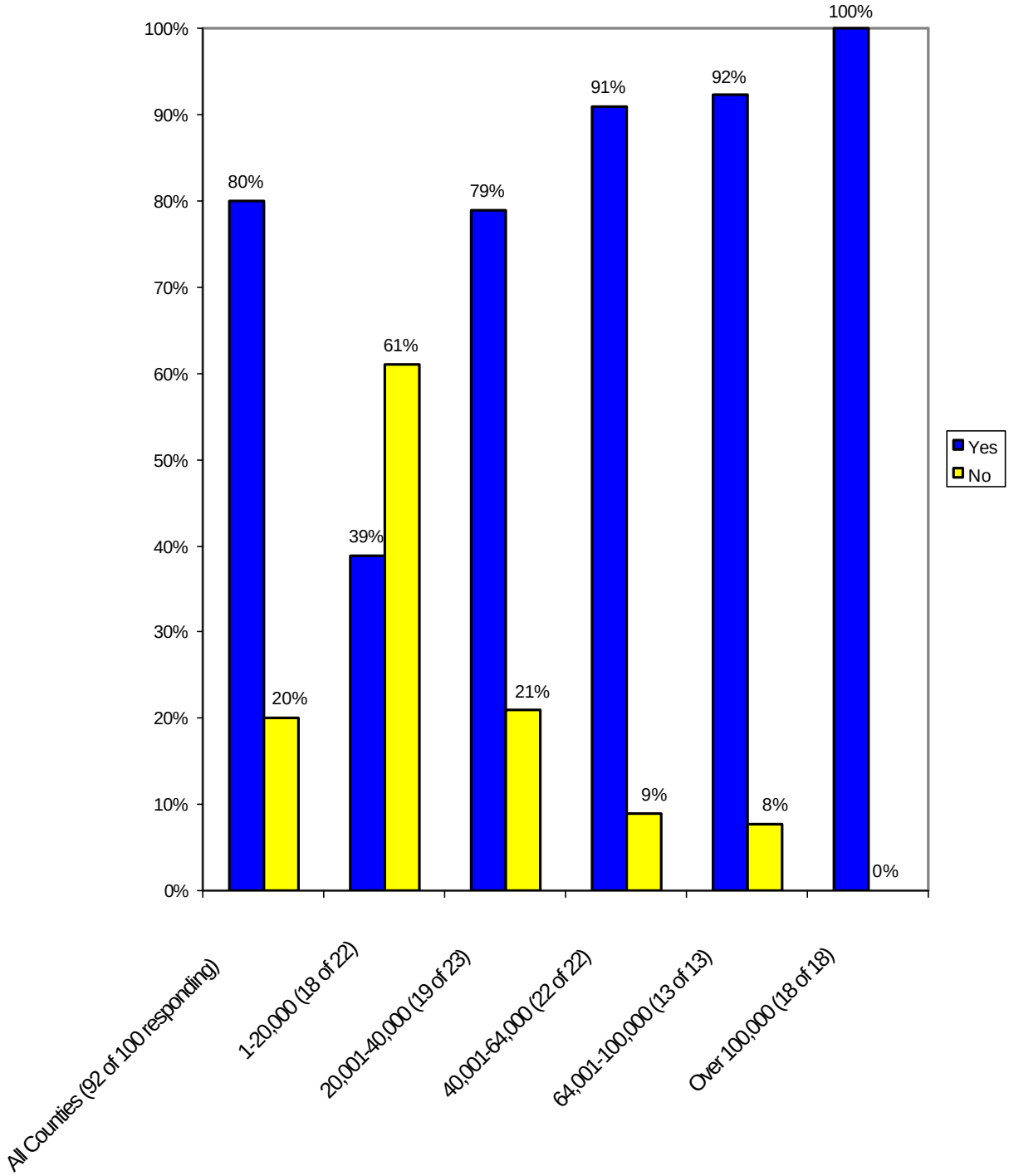


Chart of Websites in North Carolina Municipalities by Population

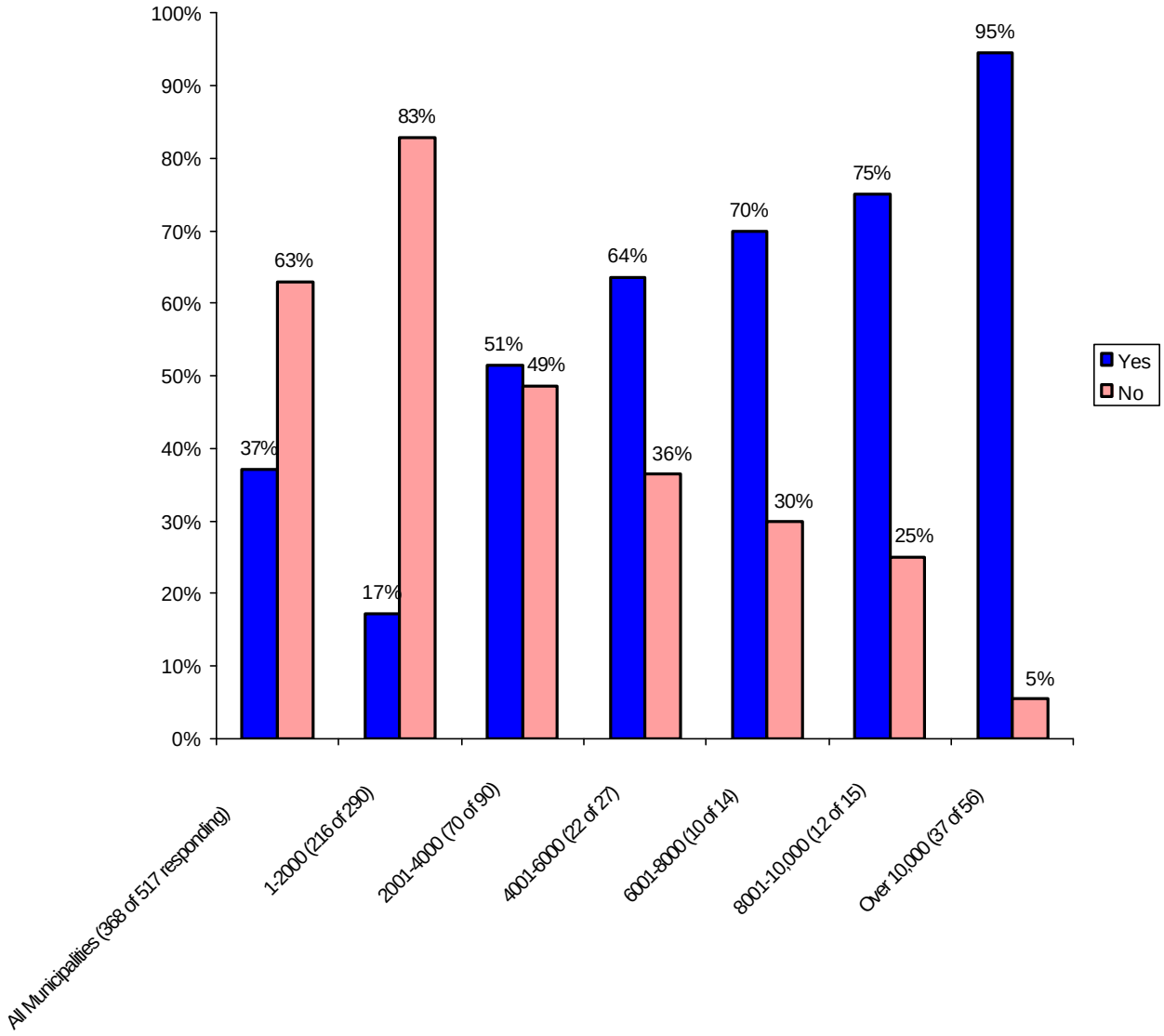


Chart of County Website Capabilities by Population

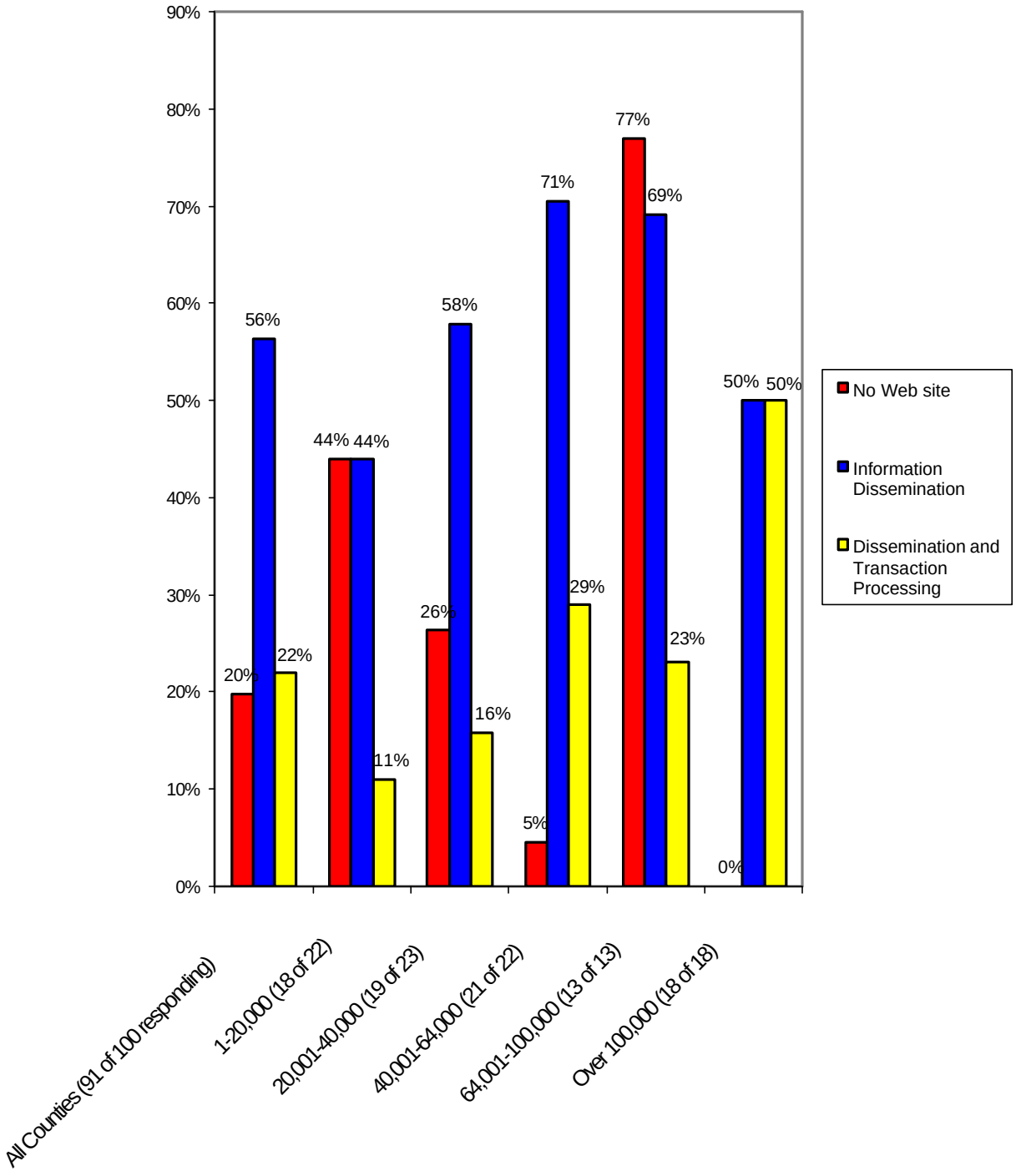


Chart of Municipal Website Capabilities by Population

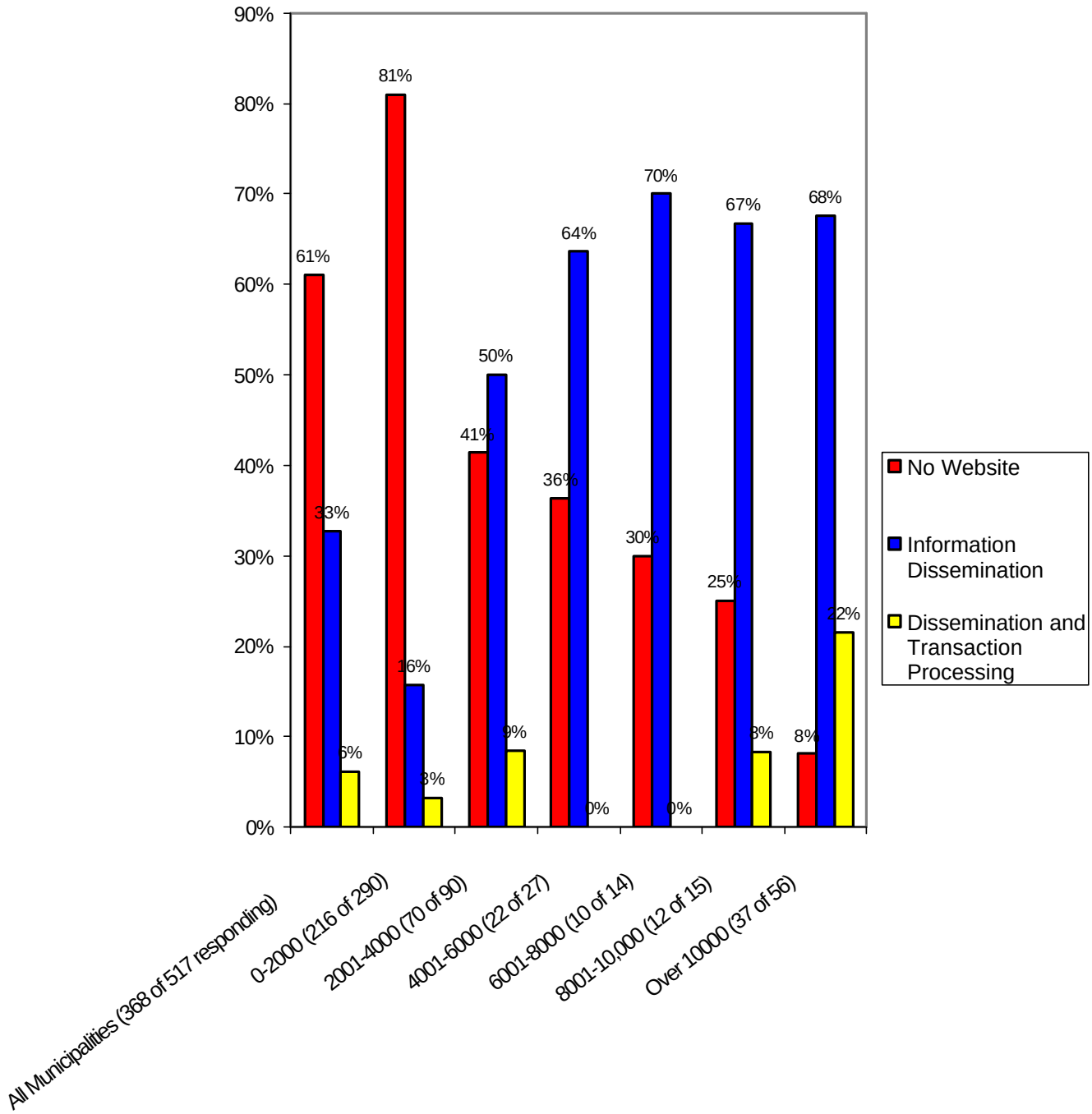


Chart of County IT Departments by Population

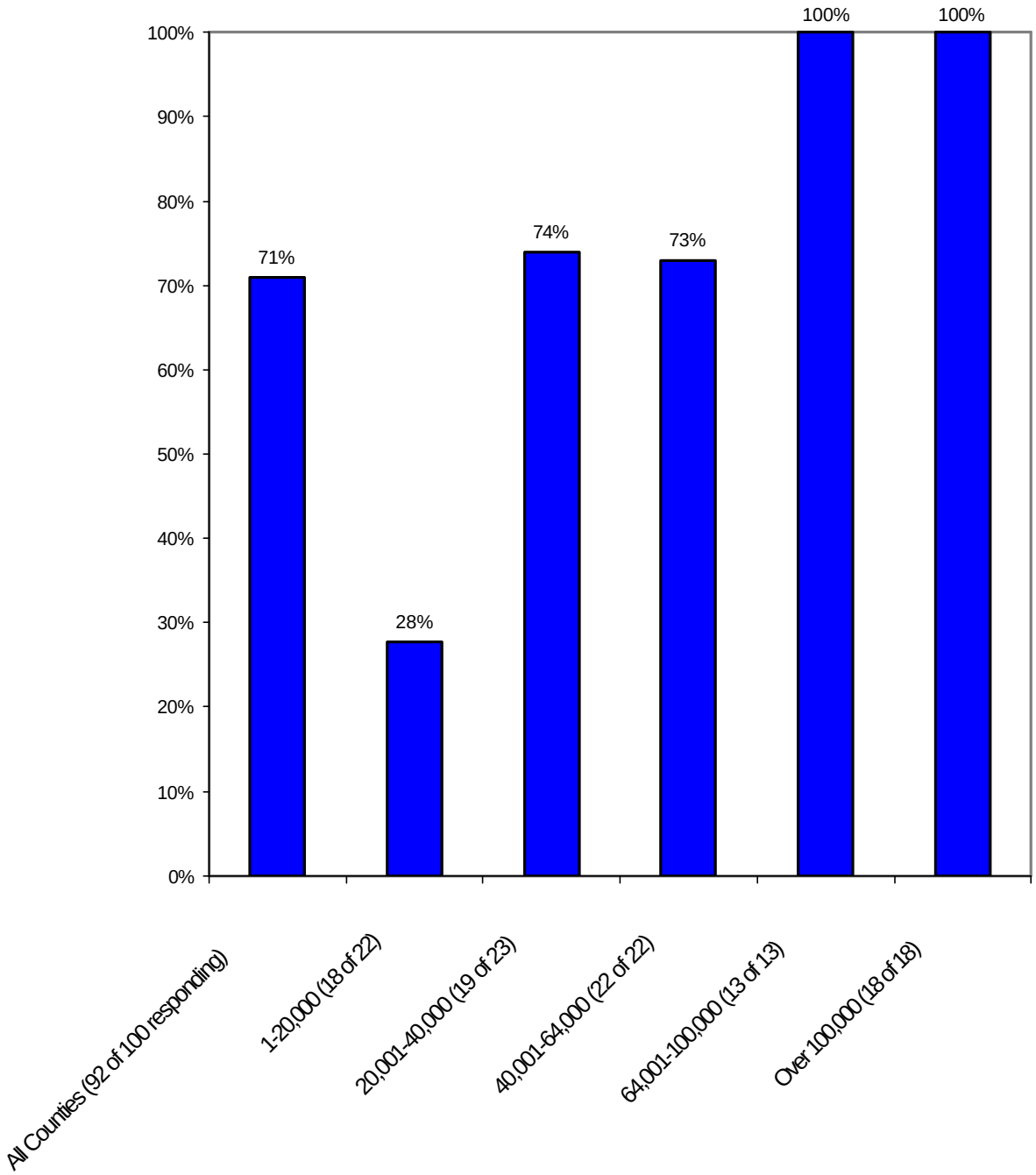


Chart of Municipal IT Departments by Population

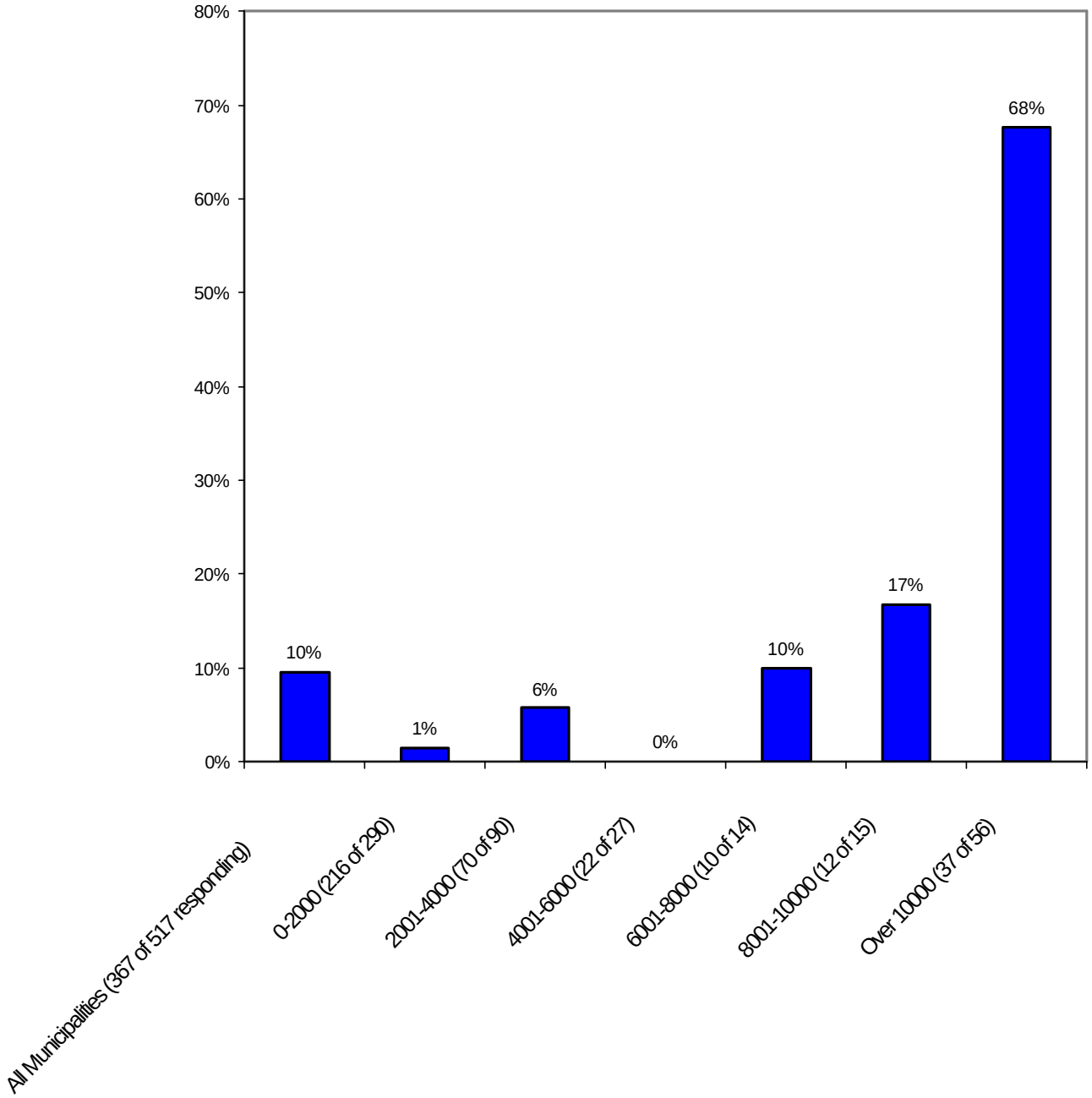


Chart of County Network Capabilities by Population

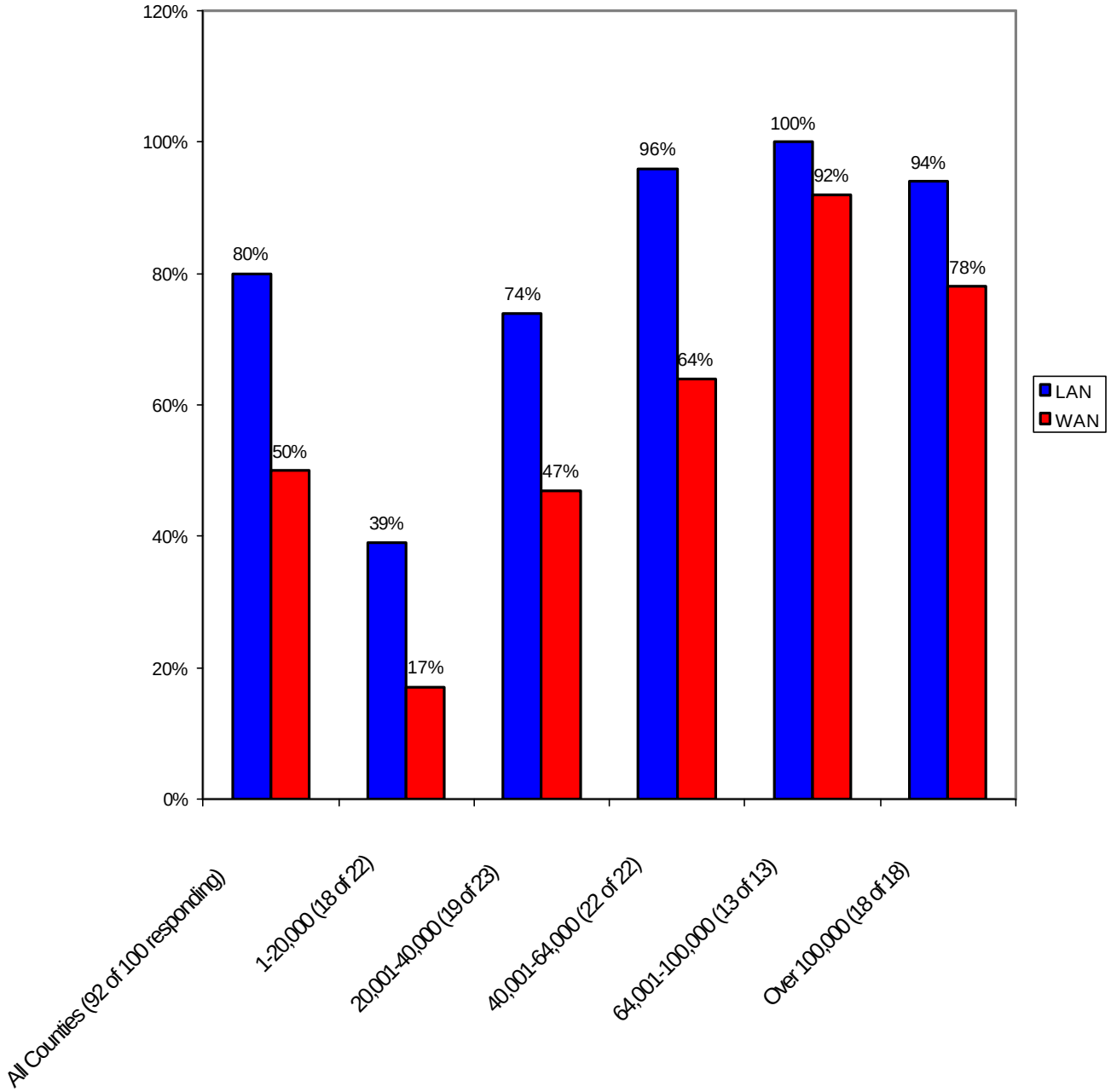


Chart of Municipal Network Capabilities by Population

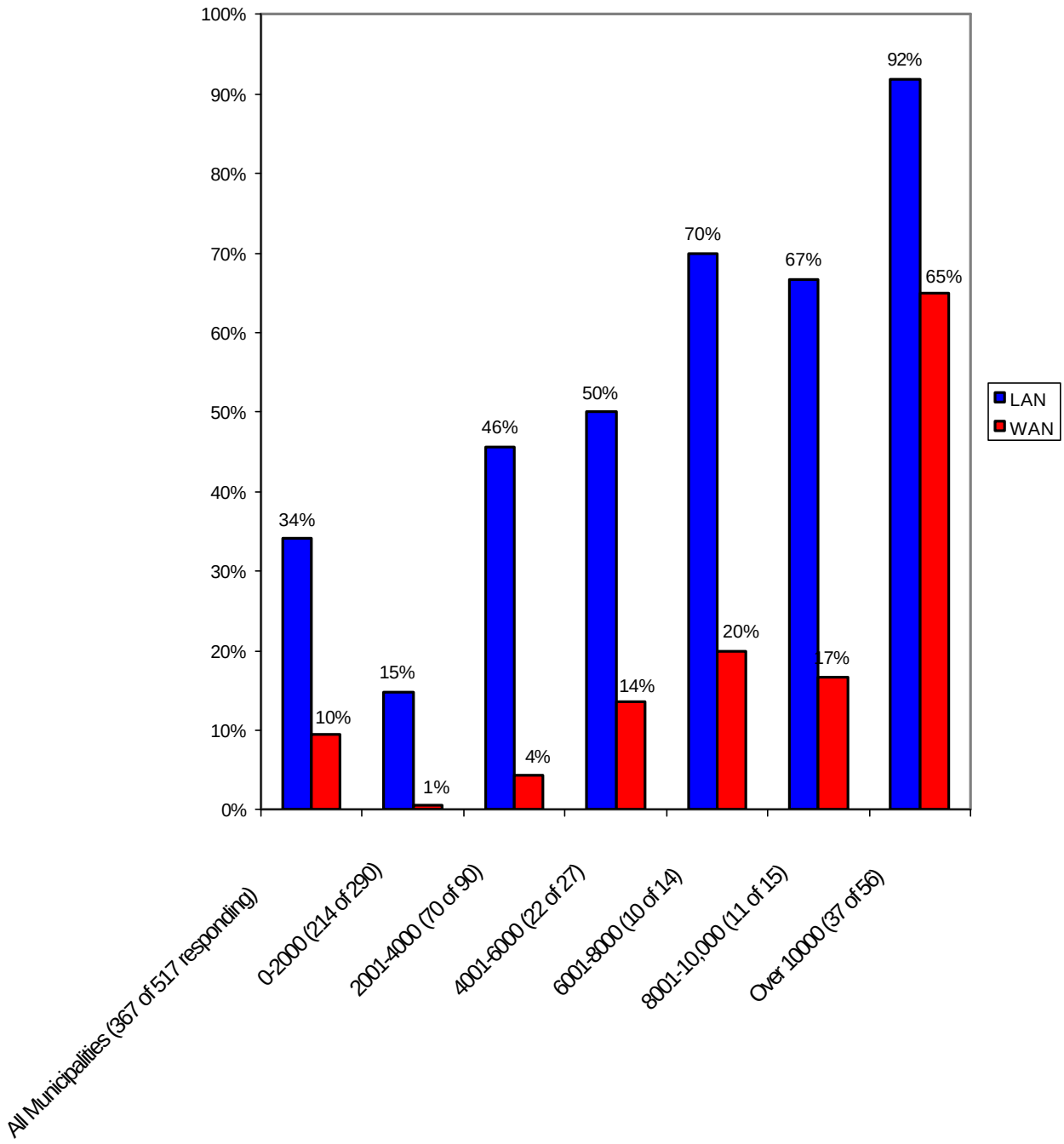


Chart of State Contract Use in Counties by Population

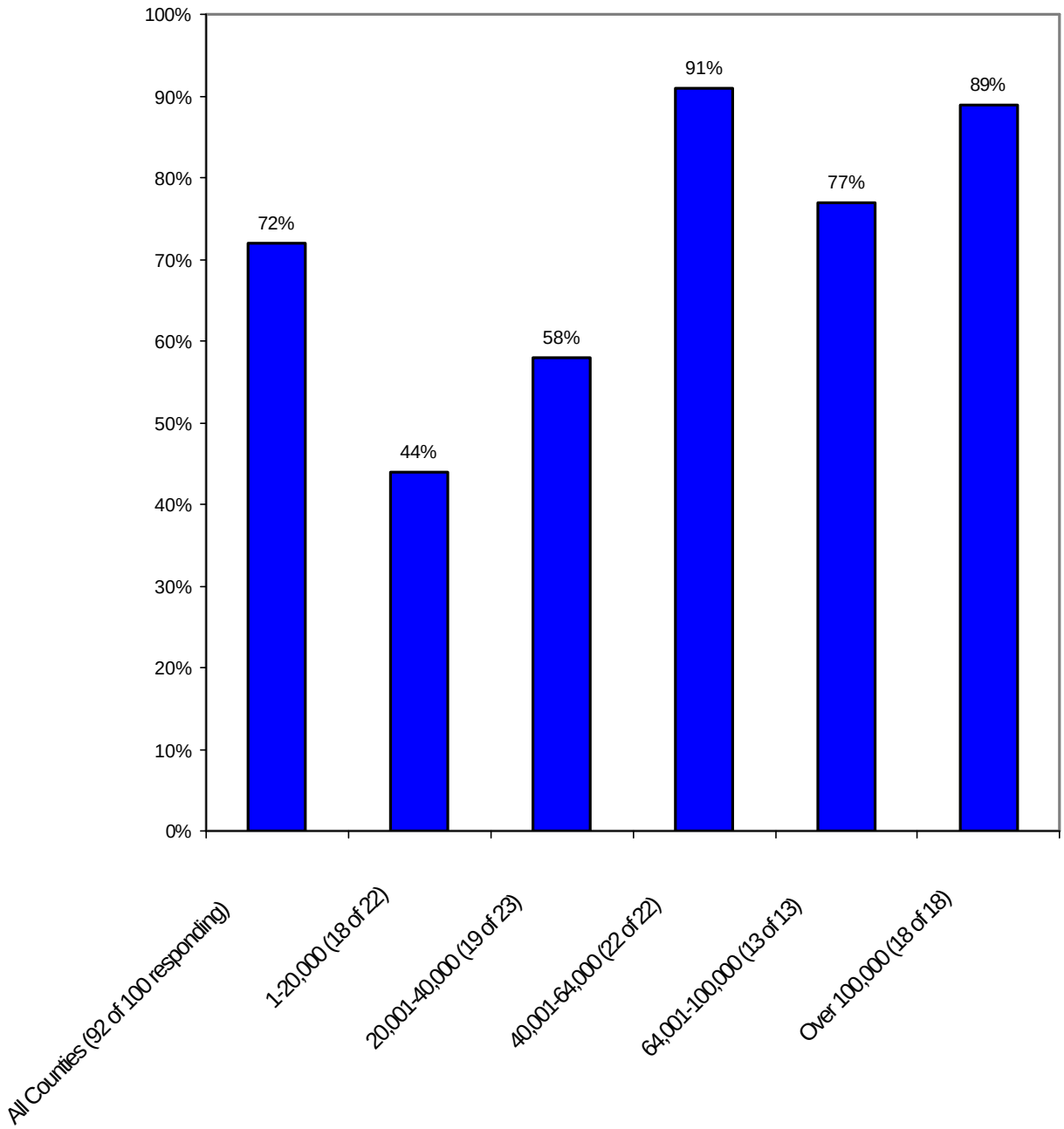


Chart of State Contract Use in Municipalities by Population

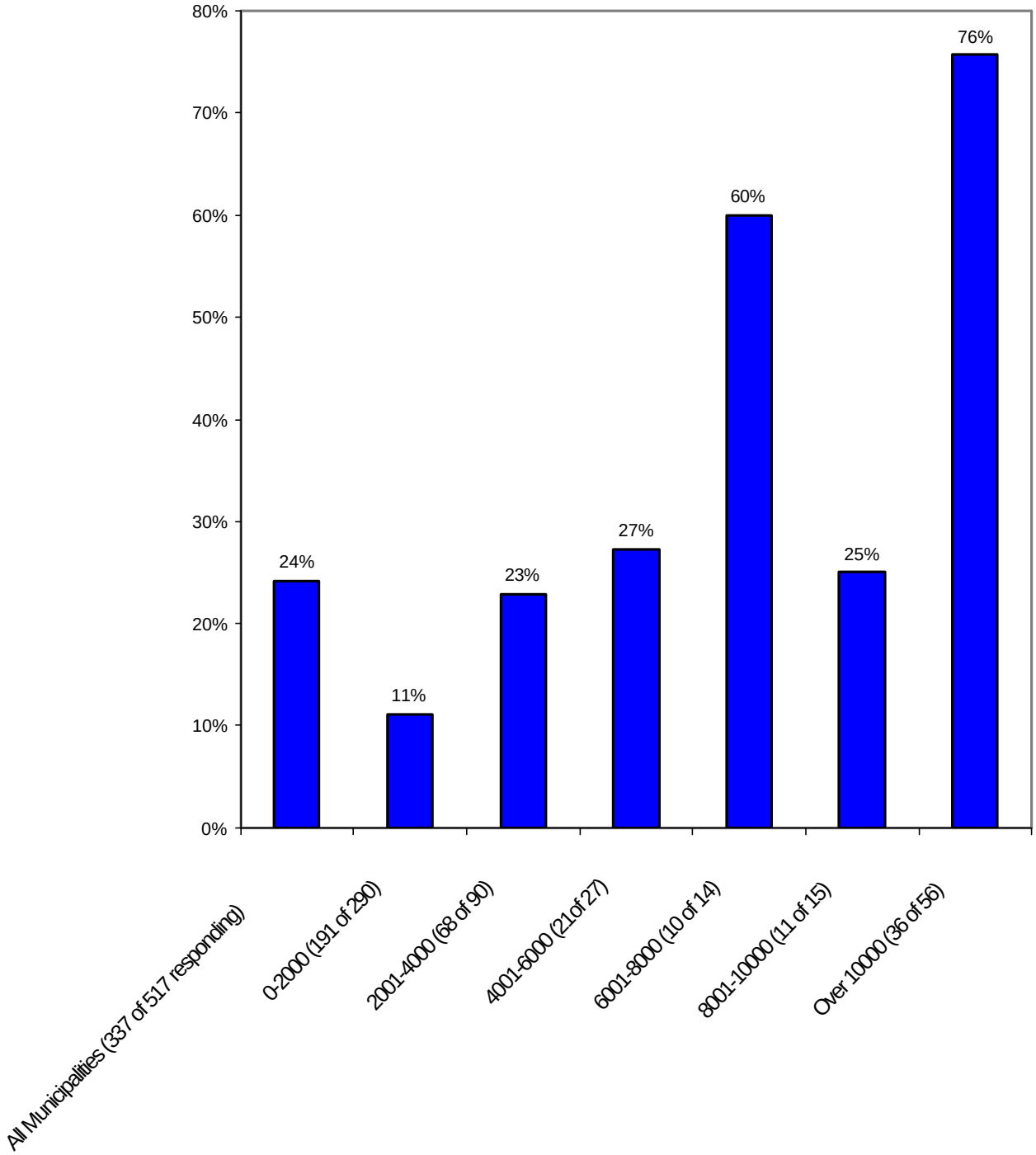


Chart of Strategic IT Plans in Counties by Population

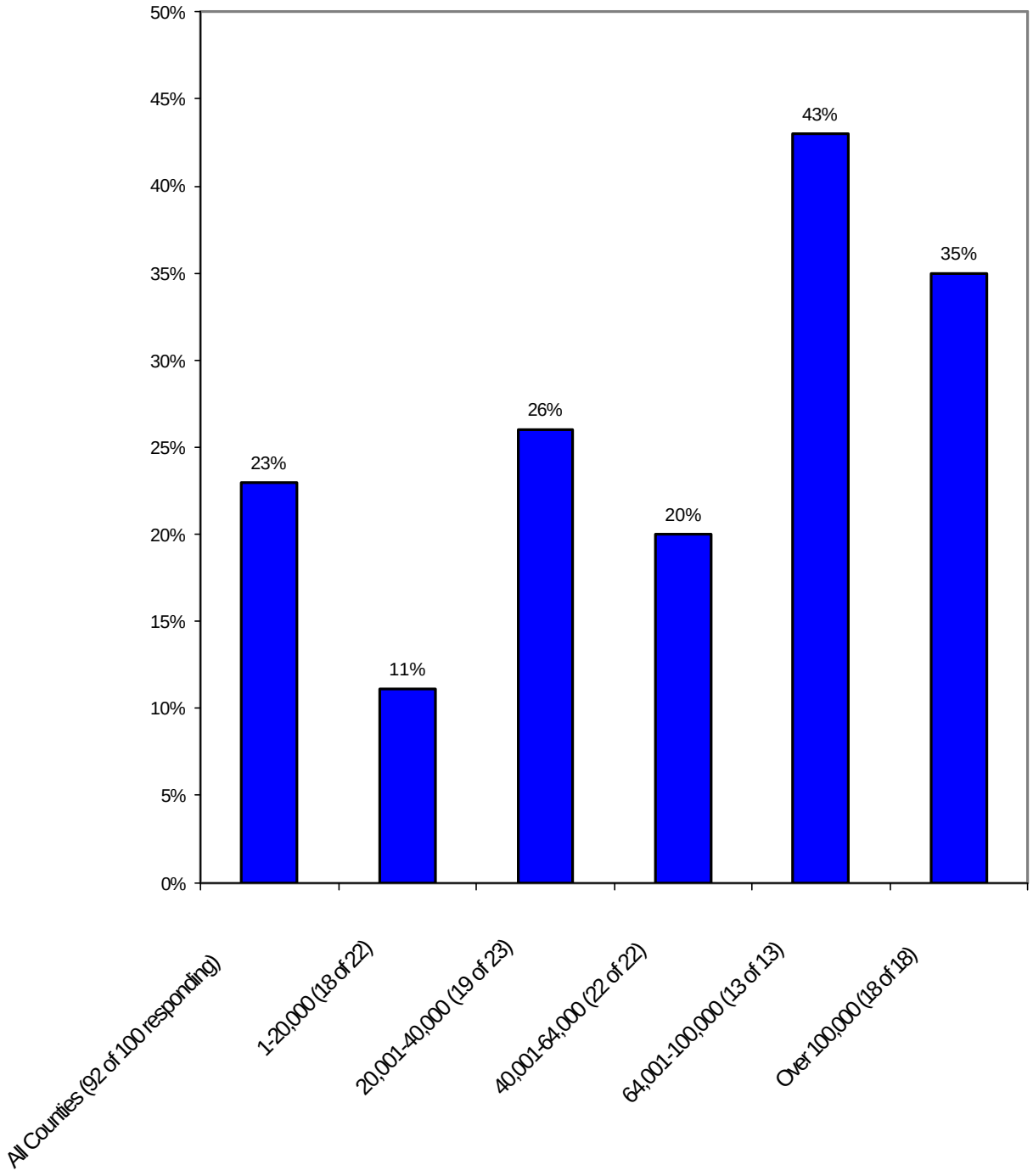
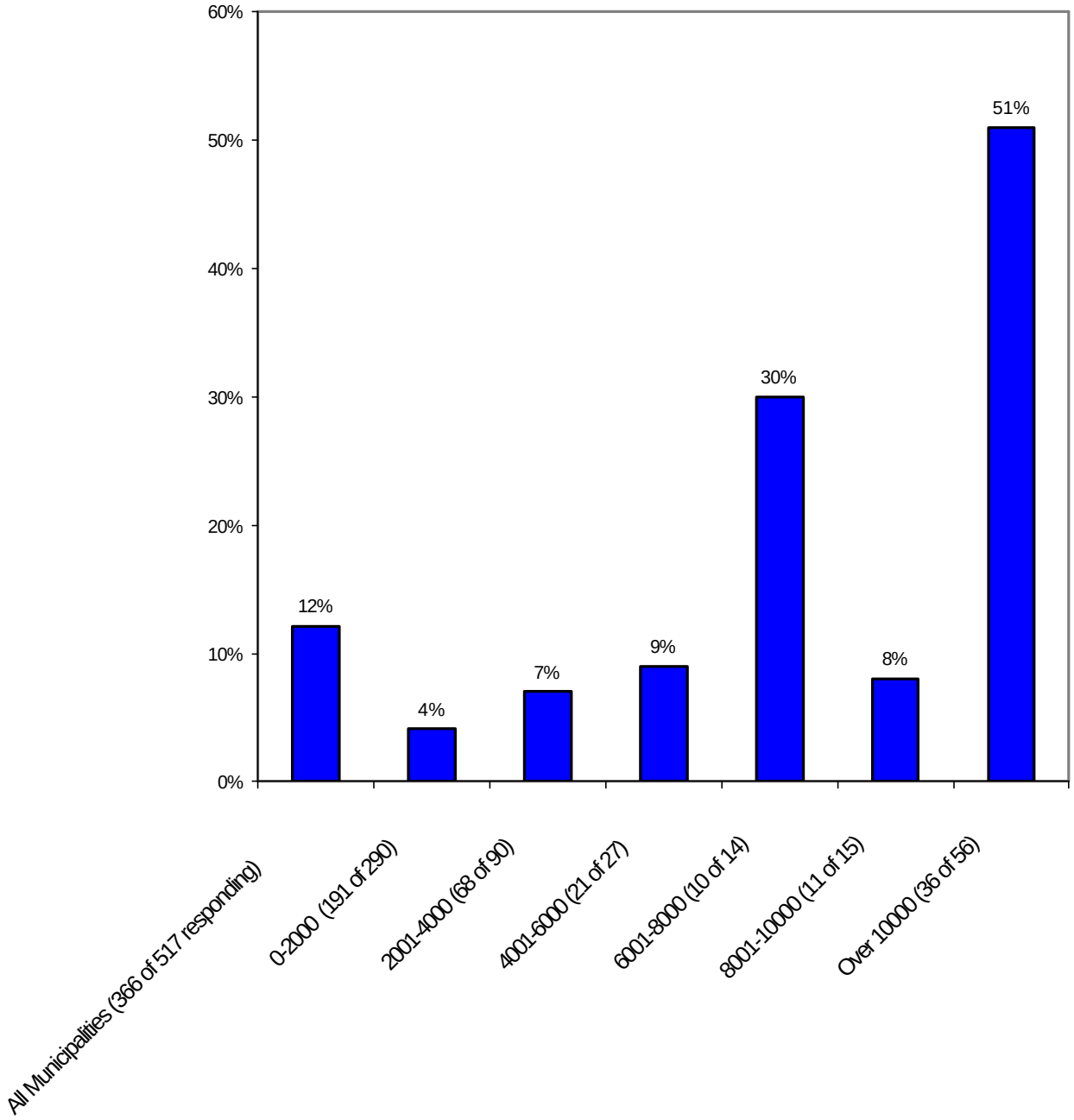


Chart of Strategic IT Plans in Municipalities by Population



Appendix C

Survey Instrument

Center for Public Technology--Rural Internet Access Authority

eGovernment Survey

General Information:	
Name	
Title	
Government Unit	
Address	
City	
State	
Zip Code	
Telephone	
Fax	
Email	

****Throughout the survey, you may use approximate numbers if you do not know the exact number.***

SECTION A: Internal Structure

1. How many employees does your organization have?

_____

2. How many distinct locations does your organization have (i.e. separate facilities for DSS, police)?

_____

3. How many PCs does your organization have?

_____

4. How many full-time dedicated PC users does your organization have?

_____

5. How many limited PC users does your organization have?

_____

Do your employees have access to: ***Mark appropriate boxes***

	100%	**75%**	**50%**	**25%**	**0%**
6. PCs	☐	☐	☐	☐	☐
7. Email	☐	☐	☐	☐	☐
8. Internet	☐	☐	☐	☐	☐

9. For those with Internet, how do your employees connect to the Internet?

Answer Choices	***Mark appropriate box***
Modem	☐
High speed (broadband, ISDN, T-1, DSL, wireless, etc.)	☐
Both modem and high speed	☐
No Internet access	☐

10. Does your organization have an official county/city website?

Answer Choices	***Mark appropriate box***	***Provide URL***
Yes (please provide URL)	☐	_____
No, but implementing in next six months	☐	
No, but in planning stages	☐	
No, no plans at this time	☐	

11. Does your organization operate and host your own Web site?
Yes ☐
No ☐

12. Who is your ISP provider?
_____

13. Who is your Web site developer?
_____

14. In what capacity do you use your official website?

Answer Choices	***Check all that apply.***
Disseminate information	☐
Transaction processing	☐
Both information dissemination and transaction processing	☐
Other (please describe)	☐

_____

Which of the following electronic transactions are/will your organization be using?

	Have in-house	***Have outsourced***	***Planned***	***Not Planned***
15. Pay property tax	☐	☐	☐	☐
16. Pay utility bills	☐	☐	☐	☐
17. Pay tickets	☐	☐	☐	☐
18. Renew professional licenses	☐	☐	☐	☐
19. Pay for building permits	☐	☐	☐	☐
20. Renew parking tags	☐	☐	☐	☐
21. Register to vote	☐	☐	☐	☐
22. Vote online	☐	☐	☐	☐
23. Register vehicles	☐	☐	☐	☐
24. Order vital records	☐	☐	☐	☐
25. Access to county/city records	☐	☐	☐	☐
26. Obtain court records	☐	☐	☐	☐
27. GIS/Mapping	☐	☐	☐	☐
28. Citizen surveys and polls	☐	☐	☐	☐
29. Bid and proposals	☐	☐	☐	☐
30. Procurement	☐	☐	☐	☐

31. Other (please describe) _____

What are the three biggest obstacles you face in moving government services to the Internet? (Please rank answers with 1, 2, or 3. 1=biggest obstacle and 3=third largest obstacle. Choose only your top three concerns.)

Answer Choices	***Place ranking on line***
32. Staff concerns	___
33. Funding issues	___
34. Training issues	___
35. Security concerns	___
36. Fear	___
37. Keeping up with new technologies	___
38. Lack of technological infrastructure	___
39. Privacy concerns	___
40. Implementation/maintenance issues	___
41. Lack of state model	___
42. Political Support	___

43. Other (please describe) _____

SECTION B: Personnel

1. Does your organization have a dedicated Information Technology (IT) department?
Yes ☐
No ☐

2. How many employees are employed full-time in your IT department?

_____

Which of the following positions does your IT department have? *Check all that apply.*

3. General Management ☐
4. Security ☐
5. System/Executive Software Support ☐
6. Telecom./Network Maintenance & Control ☐
7. Data Administration ☐
8. Database Administration ☐
9. Quality Assurance ☐
10. Application Development and Maintenance ☐
11. System Planning/Resource Management ☐
12. Computer Operations ☐
13. Librarian ☐
14. Production Control ☐
15. PC Administration ☐
16. LAN/WAN Administration ☐
17. Data Entry ☐
18. GIS Specialist ☐
19. Other (specify) _____

20. Please list direct contacts for the following areas, including name and telephone number.
Hardware:_____
Software:_____
Networking:_____
GIS:_____
Other:_____

SECTION C: Equipment

Which of the following items does your organization have? ***Mark appropriate boxes.***

	Currently Have	*Don't Have but Plan to Buy*	*No Plans to Buy*
1. PCs/Desktops	☐	☐	☐
2. Workstations	☐	☐	☐
3. Minicomputers	☐	☐	☐
4. Laptops/Notebooks	☐	☐	☐
5. Sub-notebooks	☐	☐	☐
6. Mainframes	☐	☐	☐
7. Personal Digital Assistants (PDAS)	☐	☐	☐
8. Printers	☐	☐	☐
9. Monitors	☐	☐	☐
10. Video Data Projection Devices	☐	☐	☐
11. Optical Scanners	☐	☐	☐
12. Optical Readers	☐	☐	☐
13. Digital Cameras	☐	☐	☐
14. Removable/Archival Storage	☐	☐	☐
15. Uninterruptible Power Supplies	☐	☐	☐

16. Other_____

SECTION D: Networks

1. Does your organization have a network that connects local departments together?
Yes ☐ If yes, please continue Section D.
No ☐ If no, please go to Section E.

2. Please list each of your departments that connect to the state and the type of connection they have (i.e. the police department has a T-1 connection to DCI).

Department	**Type of Connection**

Does your organization have:

Network Infrastructure	***Check boxes.***
3. Local Area Network (LAN)	☐
4. Wide Area Network (WAN)	☐
5. Metropolitan Area Network (MAN)	☐

Networking Servers	***Check boxes.***
6. Web Server	☐
7. Notes Server	☐
8. Comm./Remote Access Server	☐
9. Database Server	☐
10. Email Server	☐
11. Fax Server	☐
12. File Server	☐
13. Media Server	☐
14. Print Server	☐

SECTION E: Software

Check all appropriate boxes.		***Please specify type and release.***
1. Microsoft Office Suite	☐	_____
2. Other Word Processing	☐	_____
3. Other Spreadsheet	☐	_____
4. Other Database	☐	_____
5. Other Presentation Graphics	☐	_____
6. Other Software Suite	☐	_____
7. Personal Info Manager	☐	_____
8. Accounting	☐	_____
9. Project Management	☐	_____
10. Statistical Packages	☐	_____
11. Computer Aided Design	☐	_____
12. Desktop Publishing	☐	_____
13. Paint/Image Editor	☐	_____
14. Video and Audio Editing	☐	_____
15. Multimedia Authoring	☐	_____
16. Web Page Authoring	☐	_____
17. Groupware	☐	_____
18. Electronic Mail	☐	_____
19. Web Browser	☐	_____

What software are you using for the following categories?

Categories	***Name of Software and Release***
20. Finance and Administration	
21. Accounting	
22. Payroll	
23. Human Resources and Employee Benefits	
24. Inventory	
25. Purchasing and Procurement	
26. Property Taxes and others	
27. Records Management	
28. Licensing	
29. Motor Vehicle Registration	
30. Elections and Voting	
31. Investment Management	
32. Fleet Management	
33. Social Services Case Management	
34. Health Services Case Management	
35. Information and Referral	
36. Library	
37. Courts	
38. Fines, Fees and Forfeits	
39. Case Management	
40. Warranting	
41. Child Support Enforcement	
42. E911	
43. Dispatch	
44. Accident Records Management	
45. Inmate Management	
46. Traffic Controls	
47. Mapping	
48. GIS	
49. Other	

SECTION F: Procurement

1. Do you use state contract for your IT purchases?
Yes ☐
No ☐

2. Do you competitively bid your contracts?
Yes ☐
No ☐

3. Do you have any significant outsourcing contracts or are you considering any?
Have ☐
Considering ☐
Don't have ☐

4. Do you have a replacement policy for hardware, software, or infrastructure?
Yes ☐
No ☐

5. Do you have an IT plan that is tied to your budget?
Yes ☐ If yes, go to Question 6.
No ☐

6. Do you have a capital investment plan that reflects your technology plan?
Yes ☐
No ☐

7. Do you use a cost-benefit analysis or total cost of ownership model to guide your IT investments?
Yes ☐
No ☐

SECTION G: eHealth

1. Does your health department communicate online with physicians' offices in your county?
Yes ☐
No ☐

2. Does your health department have a direct connection to the schools in your county?
Yes ☐
No ☐

3. Does your health department have a direct connection to the local hospital?
Yes ☐
No ☐

4. Is your health department directly connected to the NC Department of Health and Human Services in Raleigh?
Yes ☐
No ☐

5. What type of connection does your health department have to the Internet?
_____

6. Does your health department have an information systems analyst?
Yes ☐
No ☐

7. Does your health department have a local area network administrator?
Yes ☐
No ☐

8. What type of software program does your health department use for email and general office activities?
_____

9. Does your health department have a separate budget for information technology and the Internet?
Yes ☐
No ☐

10. If yes, what is the amount?
_____

SECTION H: Open-Ended Questions

1. What programs or policies could help your organization achieve its IT goals?
_____
_____
_____
_____
_____

2. What does state government need to understand about using information technology in rural North Carolina?
_____
_____
_____
_____
_____

3. Please include any additional comments or concerns.
_____
_____
_____
_____
_____

Appendix D

Best Practices

(The information contained within this section is not considered a part of the official report. It is merely a brief description of some local government best practices from North Carolina. These descriptions were written and submitted by local governments and the Rural Internet Access Authority does not endorse these practices.)

Best Practices

It is useful to set a framework to highlight the most creative governmental uses of technology. The Rural Internet Access Authority solicited input from various local governments about their current best practices with regard to strategic use of information technology. As such, it should be noted that this section is not an endorsement of specific best practices; it is merely a snap shot of some innovative measures that local governments are undertaking in order to incorporate information technology into their organizations. The information provided by the local governments has not been guaranteed or endorsed by the Rural Internet Access Authority.

ANSON COUNTY
(submitted by Anson County)

Demand aggregation has emerged as an essential tool for enhancing buyer purchasing power. The objective is to provide individual government units with the best possible price by allowing them to combine their purchasing interests with those of other buyers. Buyers and sellers will thus be positioned to increase profitability through low-cost purchasing opportunities. This group buying system will ensure that buyers get a competitive price since the buyers will be treated as one single entity thus assuring government units of all sizes a level playing field. Anson County offers several best practices, including demand aggregation and resource sharing. The county has taken over several local municipalities' technology functions for purposes such as tax collection and billing. By providing these municipalities with technology services, Anson County not only most effectively maximizes their in-house hardware and software investments, the smaller governmental units are able to take advantage of these improved economies of scale.

PORTAL IN A BOX
(submitted by Dr. Lee Mandell, North Carolina League of Municipalities)

There is a recent proliferation of ready-to-use county and municipal Websites that are easily developed and supported and are hosted remotely at a reasonable fee. All a government needs is a PC with a connection to the Internet and they can have a presence on the Internet. The "Totally Web Government" program is a collaboration of National League of Cities, IBM Corporation and state municipal leagues. The "GovOffice WebCreator" is a collaboration of the International City/County Management Association, the League of Minnesota Cities, as well as other state municipal leagues, and private sector partners, Avenet, AT&T and Microsoft Corporation. Both programs provide cities and towns with a "one-stop" evolving menu of e-government services and applications ranging from a user-friendly program to create a basic home page to a variety of interactive applications that will provide the capacity to respond electronically to citizen and business requests for information and services.

Totally Web Government and GovOffice WebCreator both provide styles, page templates, images, and text to get cities and towns started with building professional-looking Websites with a minimum of training and effort. They each combine a low cost, easy to create and maintain Web site development capability with reliable and economical contract Web hosting.

The North Carolina League of Municipalities is sponsoring both programs to assist their members (especially smaller towns and cities) to make the best and most cost-effective use of powerful e-government technologies.

SMOKY MOUNTAIN KNOWLEDGE NETWORK AND APPALACHIAN ACCESS
(submitted by Dr. Cecil Groves, President of Southwestern Community College)

The 23-county western North Carolina region is an area of profound beauty and sublimity—with the terrain ranging from some of the highest mountains east of the Mississippi to deep, shaded gorges where trout-filled streams turn into rushing whitewater rivers. One of the most geographically isolated, and economically deprived areas in southern Appalachia, this area is surrounded on all sides by the 5,000-foot peaks of the Blue Ridge and Smoky Mountains. However, while this region boasts some of the most breathtaking beauty to be found in the country, it paradoxically presents some of the most perplexing and challenging problems to the people who live here.

In our region, a sharp decline in manufacturing, serious challenges to burley tobacco production, turbulent markets based on seasonal tourism, high illiteracy rates, below-average wages and above-average housing costs, the out-migration of talent, and a fragile physical environment threaten the vitality—if not survival—of the region. Economic diversification and market expansion are the keys to the long-term survival of our communities.

Coupled with these challenges is the simultaneous emergence of a new economy that is powered by 21st Century technologies and knowledge resources. This new economic order presents a wealth of opportunity for those who have access to these resources—increased economic opportunities, higher living standards, better schools, stronger communities, and more meaningful participation in government and public life—and a widening gap for those who do not. At the center of the New Economy is a powerful "engine" which prefers the high-octane gas of e-business. The great thing about e-business is that it knows no boundaries—it is not geographically confined—it literally erases the distance that rural areas have from markets and centers of economic activity. Those communities that have the infrastructure and the workforce poised to take advantage of this high-powered engine will win the race.

By all accounts, to create a new economic reality for itself, rural western North Carolina's existing and prospective businesses, emergent IT professionals, artisans and farmers, health care providers, government and public agencies, educational institutions, marginalized groups, and non-profit organizations—respectively—must have:

Essential Elements:

Poised Infrastructure ➔

1. High-performance broadband telecommunications infrastructure with connectivity at affordable prices and broad-based public and private sector access to technology resources;

Poised Workforce ➔

2. Community-based digital literacy campaigns as well as seamless, comprehensive training and re-training opportunities;

3. A process for identifying, engaging, readying, and supporting the local workforce and businesses to transition to—as well as perform and compete in—a global marketplace; and

Poised Market ➚ ➘

4. Innovative approaches to business market expansion to a more diversified and robust national and global platform.

A Bold Plan for the Future

A Direct Response to:

- NC Rural Prosperity Task Force
- Vision 2030
- NC Progress Board
- Advantage West's Blue Ribbon Commission
- US Department of Commerce's *"Falling Through the Net"*

Armed with the collective thoughts of some of the best thinkers in the state and nation, these four critical ingredients are being addressed holistically through an innovative grassroots partnership called the Western North Carolina Knowledge Coalition (WNCKC). In 1998, the 100+ leaders who comprised the WNCKC in the 23 western-most counties recognized that preparing the region to participate in the 21st Century economy would become the principal foundation for renewing our economic vitality and began to take action.

Key Players and Funders

- Appalachian Regional Commission
- WNC Knowledge Coalition
- Education and Research Consortium
- Southwestern Community College
- The Institute at Biltmore
- Advantage West
- NC Rural Center
- US Department of Commerce
- Library of Congress
- US Department of Education
- City of Asheville
- County of Buncombe
- University of North Carolina—Asheville

In 1999, Southwestern Community College, a member of the WNCKC, formed an affiliated collaborative called the Smoky Mountain Knowledge Network (SMKN). This broad-based coalition (encompassing Jackson, Macon and Swain Counties and the Eastern Band of the Cherokee Indians) is focused on developing and moving forward with an integrated community development strategy that incorporates all of the essential elements enumerated above. The end goal is to create a sustainable "engine" capable of harnessing many of the same cultural and economic benefits enjoyed by our urban sister communities without sacrificing our quality of life.

In developing the conceptual framework for SMKN, the College and its partners realized that all individuals and organizations seeking to participate in this new economy must be connected—essential element #1. Unfortunately, extremely high connectivity costs and limited service availability were putting western North Carolina's rural areas at a tremendous disadvantage. We discovered that the fundamental issue for service providers is aggregate demand. It is simply more profitable to target high-end customers in the most densely populated areas where demand is the greatest and the infrastructure requirements are most concentrated. In urban areas, the presence of major research universities, world-class medical centers, and high-tech industries has attracted remarkable economic activity and growth. We determined that our rural region would not be able to compete for connectivity unless we find ways to leverage our buying power and create that demand. We have formally organized our efforts at leveraging this buying power under an initiative we call Appalachian Access.

The purpose of this initiative is to lower the cost of access to and increase availability of high-speed telecommunications services in rural western North Carolina. To accomplish this, we are closely identifying all of the properties of telecommunications demand for public and private users (Internet, wireless, long distance, local service, etc) to build an attractive business case to catalyze this to happen. Users will then have the opportunity to take advantage of the lower costs via a regional non-profit membership cooperative or volume-purchasing consortium. As more and more users are added, the price for services will be driven down—as much as 40 percent or more.

College partners and community leaders also knew that for our region to do well, connectivity is not the only issue. People, companies and communities also need support and value-added services, application opportunities to leverage the connectivity—education and training, market and business development, etc.—thereby addressing essential elements # 2, #3, and #4. We believe that this is the beauty of the Smoky Mountain Knowledge Network effort: it intertwines the issues of connectivity (access to bandwidth) with issues of applications (what to do with the connectivity once you get it). The SMKN initiative will utilize Appalachian Access's telecommunications connectivity to provide a mechanism to eliminate the high costs of individual organizations each buying technology applications (like Internet service, e-commerce applications, Web development, etc.) and each initiating their own stand-alone training and reform initiatives. SMKN will essentially function as an Applications Service Provider that bundles a variety of specialty applications on behalf of a group of users. Using 21st century technologies to deliver an integrated menu of voice, data, video services, SMKN partners will browse the connectivity and applications menu, making independent decisions about the degree to which they will plug-in to the open architecture of the network and draw down services. Network partners will share technical support which none could justify nor afford on their own and they can export courseware and other application deliverables worldwide.

A region must do all of this simultaneously—abandoning the "cart-before-the-horse" mentality—resulting in a unified poised infrastructure, workforce and market.

TELECOMMUNICATIONS BEST PRACTICES
USE OF TOWER ASSETS
(submitted by Mr. Wally Bowen, Mountain Area Information Network)

The Town of Tryon in Polk County owns a telecommunications tower on Tryon Peak, a nearby mountaintop. The Polk County Library and the Polk campus of Isothermal Community College were starved for affordable bandwidth. The college and the library, in conjunction with the nonprofit Mountain Area Information Network (MAIN), approached the Town of Tryon about placing a small wireless antenna on the town tower.

Using the antenna on Tryon Peak, the college and MAIN were able to lease an expensive T-1 circuit to the Internet and to bounce a portion of that bandwidth off the antenna and down to the library for its public-access computers and staff LAN (local area network). The college, the library and MAIN split the cost of the T-1 circuit three ways, thereby making the high-speed bandwidth affordable for all parties. In return for use of its tower, the Town of Tryon gets a free high-speed wireless link to the Internet. The wireless operation is managed by NewEra.Com, an Asheville-based wireless firm, which is now offering broadband commercial services in Polk County.

Link:
http://www.shorecliffcommunications.com/magazine/volume.asp?Vol=21&story=197

Use of Cable Franchise Assets

The cable franchise grants a cable company the use of public right of ways. This franchise is an effective monopoly and yields a very high return on investment for the cable company. (The monopoly is effective because only in large metropolitan areas will cable companies compete with each other.)

Federal law allows the franchise to be used to leverage the value of public right of ways to bring free cable-modem Internet access to local schools, libraries and community centers. These agencies can save thousands of dollars in Internet-access fees.

Similarly, federal law allows local governments to use the cable franchise to negotiate the installation of an Institutional Network (I-NET) by the cable company. This network, which can connect government buildings, libraries, schools, community centers, etc, can also be used to save thousands of dollars annually in telecommunications fees.

Another cable franchise strategy among rural communities is the creation of a regional partnership to negotiate cable franchise renewals and to coordinate telecommunications services. One of the most developed of these collaborative efforts is in the Beaverton, Oregon area, where the Metropolitan Area Communications Commission has been able to improve the region's telecommunications services while saving thousands of dollars in local government telecom costs.

Links:
http://www.maccor.org
http://www.natoa.org
http://www.mwg.org/epub/cyber/strat.htm

Each of these best practices offers a unique opportunity for local governments and education units to partner with other community members to further explore the opportunities and advantages offered by information technologies.