INFORMATION TECHNOLOGY INDICATORS FOR A HEALTHY COMMUNITY

A Project of the City of Seattle Department of Information Technology and the Citizens Telecommunications and Technology Advisory Board

CREDITS

CITY OF SEATTLE DEPARTMENT OF INFORMATION TECHNOLOGY

MARTY CHAKOIAN	CHIEF TECHNOLOGY OFFICER
RONA ZEVIN	DIRECTOR OF INTERACTIVE MEDIA
MATT LAMPE	DIRECTOR OF STRATEGIC PLANNING AND POLICY
DAVID KEYES	COMMUNITY TECHNOLOGY PLANNER – INDICATORS PROJECT MANAGER
JOAN E. O'BRIEN	MANAGEMENT SYSTEMS ANALYST
WILLIAM A. SMITH	COMMUNITY TECHNOLOGY RESOURCE COORDINATOR, VISTA VOLUNTEER

PROJECT CONSULTANTS

EMILY BANCROFT	
LEE HATCHER	SUSTAINABLE SEATTLE

CTTAB INDICATORS COMMITTEE (FORMER AND CURRENT MEMBERS)

DOUG SCHULER
AKI NAMIOKA
TERRYL ROSS
MIKE DONLIN

COVER GRAPHIC

WILLIAM A. SMITH

SPECIAL THANKS TO THE PUBLIC FORUM PARTICIPANTS AND THE TECHNICAL ADVISORY GROUP (LISTING IN APPENDIX).

FOR MORE INFORMATION ABOUT THIS PROJECT, CONTACT:

HTTP://WWW.CITYOFSEATTLE.NET/TECH/INDICATORS

DAVID KEYES
CITY OF SEATTLE
DEPARTMENT OF INFORMATION TECHNOLOGY
710 SECOND AVE, SUITE 450
SEATTLE, WA 98104
(206) 684-0600
DAVID.KEYES@CI.SEATTLE.WA.US

EMILY BANCROFT
CITY OF SEATTLE
DEPARTMENT OF INFORMATION TECHNOLOGY
710 SECOND AVE, SUITE 450
SEATTLE, WA 98104
(206) 684-0600
EMILY.BANCROFT@CI.SEATTLE.WA.US

CITY OF SEATTLE
DEPARTMENT OF INFORMATION TECHNOLOGY
710 SECOND AVENUE, SUITE 450 SEATTLE WA 98104
(206) 684-0600 FAX (206) 684-0911

TABLE OF CONTENTS

Technology in the modern age tends to become enmeshed in ever larger complex systems that have major implications for society. There is a need to understand the influence and directions of technology and technological systems, both positive and negative.

- Doug Schuler, author, teacher and former member of the City of Seattle CTTAB.

INTRODUCTION

The Information Technology Indicator Project is a two phase project to measure the impact of information technology[1] on the health and vitality of our city. This paper presents the results of the first development phase, a community constructed set of indicators. Measurements for these will be gathered and presented in the second phase. The City of Seattle Department of Information Technology and the City's Citizens Telecommunication and Technology Advisory Board (CTTAB) guided the development of these indicators with significant participation from a wide range of interested residents, including technology, education and community leaders.

WHY TECHNOLOGY INDICATORS?

That information technology impacts our community is clear. Technologies are evolving rapidly. Computers and the Internet are changing the way we live, work, learn, participate and play. Studies show people are getting computers and hooking up to the Internet, but not all sectors of our community have had sufficient access, knowledge or the resources to fully participate in the information age. The gap between information rich and poor has been termed the digital divide and some studies have shown this gap to be growing. How the digital divide gets defined is critical to how the gap is measured. These indicators grew out of an intent to ensure our residents have adequate opportunities to participate fully in the information age.

Quality civic participation requires residents to have electronic access and be sufficiently technology fluent. In Seattle, we have linked our work on the digital divide with the broader, more positive concept of developing a technology healthy community.
The City and people of Seattle want to build a technology healthy community where:

- information technology is enhancing our local economy
- access to technological tools are equitable and affordable
- information technology needs are being met and applied to solving social issues,
- technology is promoting relationship building and community development, and
- the use of technology supports the sustainability of our quality of life.

These indicators will serve as signposts to measure our progress. It is our hope and intent that these indicators will inform, spark public dialogue, educate strategic planning, focus programs and encourage effective resource allocation.

[1]For the purpose of these indicators and this report, information technology is defined as information and communication tools, including personal computers, computer applications software, Internet and web-based communications, and devices for the storage and retrieval of information.

HOW WILL THE INDICATORS BE USED?

Having good local data about the impact that technology is having on our community is the first step in identifying priorities and securing resources. We intend that these indicators become a working tool for those who plan, fund and implement programs intended to increase equitable and healthy technology usage in the community. These indicators will help to focus those efforts and encourage partnerships between groups working towards similar goals.

Some of the groups that we see using the indicators are:

- **Business** as they target economic and workforce training development.
- **Community Organizations**, including non-profits and funders, as they plan and implement programs and seek and provide resources to create technology opportunities and increase community capacity.
- **Schools and the Education Community** as it works to ensure the education system provides adequate resources and enables information technology fluency and opportunities for youth and those seeking technology training.
- **Government** as it develops e-government services, monitors and encourages appropriate development, and sets priorities for resource allocation.
- **Residents**, including information technology professionals, who need technology opportunity programs and/or are active in their community and may volunteer to mentor, create or assist programs such as those provided at Community Technology Centers.

BREAKING NEW GROUND

There are a number of sets of indicators (e.g. economic, social and environmental). These indicators are used to measure and inform the public as to the state of a particular system or issue. There have been studies focused on particular aspects of information technology (i.e. employment in the high tech industry). However, there is not a comprehensive set of information technology impact indicators such as the one presented here. With this project we are creating a new model for evaluating the impact, both positive and negative, that technology is having on our region. The development and selection of the categories represented by the indicators were based on public participation. The linkage of categories is unique, but intentional. The focus on a whole system of technology impact indicators is critical to framing analysis in terms of a technology healthy community. This also takes the analysis of the digital divide a step further towards encompassing gaps in the economic and social fabric of our community. In addition to these particular indicators we recognize that there are other aspects of information technology to measure and a need to integrate technology indicators into economic and social welfare indicators. It is also our hope that these indicators and the process to create them will inform the development of national, international and other local technology impact indicators.

ENGAGING THE PUBLIC AND SELECTING INDICATORS

The idea for creating a set of indicators to measure the impact of technology on the Seattle area was presented by members of the City of Seattle's Citizens Telecommunications and Technology Advisory Board (CTTAB) to the City in 1998. It was presented in response to our need to track and evaluate the Citizens Technology Literacy and Access Fund projects and as a positive step to assess the state and influence of technology on our community. The indicators and public process developed by Sustainable Seattle were cited as a model.

To develop the indicators, we first turned to the community to construct a set of values and concerns for a technology healthy community. A public forum, entitled *Technology and the Community: What Should a Healthy Future Look Like*, was held on a Saturday morning in February, 2000. A concerted effort was made to involve a diverse group of individuals that would reflect the demographics of our community. Invitations were sent to neighborhood groups, social service providers, parks and recreation facilities, local politicians, members of the business community, educational representatives, and community activists. Over 130 people attended the forum to talk about the role that technology could, and should, play in a healthy community. We did not limit discussion to computers and the Internet. During the forum we asked forum participants to constantly keep in mind five overarching themes that we felt should play a large role in defining a technology healthy community: **Access, Literacy, Diversity, Content, and Infrastructure**. The public concerns and values developed at the forum became the backbone of the indicators presented here.

A Technical Advisory Group was formed, made up of community technology planners, evaluation experts, business leaders, economic development experts, technology developers and social service providers, who worked with us to take the public concerns and values from the forum and develop working indicators. Again considering the five overarching themes of access, literacy, diversity, content and infrastructure, the Technical Advisory Group met to discuss how to begin creating indicators from the forum materials. The quality of concern and range of topics from the forum created a challenge for us and for the Technical Advisory Group. Not all of the impacts are easily measurable. While we were not able to create measurable indicators for all of the public concerns and values, they have not been forgotten. Some concepts, such as tracking cyber greenspace and evaluating how well technology is applied to solving social problems, were important but beyond what we were able to incorporate fully into an indicator. A portion of our final indicator report will be focused on those ideas and how important they are to keep in the forefront of discussion.

Our final step was to take the list of over sixty indicators from the Technical Advisory Group and City staff and narrow it down to a manageable set. The indicators were evaluated according to a set of criteria including measurability, reliability, validity, and relevance to the identified public values. This set was returned to the Technical Advisory Group and to the public forum participants for review and comments. Our hope is that although this list of indicators does not include all of the topics discussed at the forum, it remains true to the vision presented by the community that day.

PHASE 2: DATA COLLECTION

The next step for this project is to collect a first set of data for these indicators. Data will be collected and assembled from existing sources, surveying, and focus groups as appropriate. While our goal is to use all the indicators as listed here, these indicators may need to be modified based on the cost and availability of data. After the first set of data is complete, we will have a clearer picture of the areas in which we are meeting our goals of building a technology healthy community, as well as the areas where we might be falling short. These indicators are intended to be measured over time and will be most effective if done so. We have a goal of collecting and publishing the data every two years. Some indicators may also need to be revised in response to changes in technologies and their uses.

INDICATORS

The indicators presented in the following pages are arranged into six major categories. Each category has a set of subtopics with a description and one or more measurements. These measurements are intended to cumulatively provide an indicator of the topic presented. The indicator categories are:

Category A –Access

Category B – Literacy

Category C – Business and Economic Development

Category D – Community Building

Category E – Civic Participation

Category F - Human Relationships to Technology

Category G - Partnerships and Resource Mobilization

CATEGORY A –ACCESS

Information Technology (IT) is rapidly becoming an ever-present tool in every sector of our society, so it is important to gauge the accessibility of information technology tools to the public and the tools being used for access. Access may be at home or via work, school, or public access sites at a library, community center or Internet café. The level of access is a function of availability, cost, understanding, skill level, perception and needed application. This category looks at ownership and home use, public access and level of use.

A. OWNERSHIP OF INFORMATION TECHNOLOGY

a) Information Technology in the Household

What basic information technology systems do residents have access to at home?

These indicators will measure the percentage of residents who have home access to specific information technologies. National studies illustrate that people are more likely to have meaningful access to computers and the Internet when the technology is available in their homes. We recognize that many people are able to experience meaningful access at public sites, work, and school, and the next section contains indicators focused on access outside of the home. Demographic information will be collected for this survey, allowing us to look at home access by neighborhood, ethnicity, age of respondents, and income level.

INDICATOR

This indicator will be an aggregation or an index of the results of a survey question asking about Information Technology in the household. Data for the following will be presented on a graph: Telephone; Cell phone; Pager; Television; Computer; and Internet. Data for computers in the household will be broken down by computers that have been purchased or updated in the last 3 years and those that have not. Data for Internet connection will be broken down by speed/type of connection (14.4, 28.8, 56K, cable, DSL, other).

b) Barriers to Access

What are the barriers to ownership of computers and the Internet for residents?

INDICATORS

- Graph of the most significant barriers to ownership as determined by a survey of those who do not have computers and the Internet in their home.
- Tracking the annual cost for functional access (Price out a functional package of computer, software & Internet)

B. PUBLIC ACCESS TO INFORMATION TECHNOLOGY

By measuring the accessibility of IT to those citizens that are most likely to have difficulty affording computer systems and internet services, these indicators will tell us how IT is being made accessible by alternatives to personal ownership.

a) Use of Public Access

Where, outside the home, are people gaining access to computers?

INDICATOR

Graph showing percentage of respondents who use computers at the following locations: Work; School; Library; Community Center; Internet Café; Other.

b) Public Access Points

How available are public access technology centers to those that need them most?

INDICATOR

Proximity to Public Access

- Using low income census blocks as a proxy for low access, use GIS/database analysis to plot and calculate average distance to the nearest public access center (community center, school open to public, library) from the center point of the census block.
- Calculate number of public computers per household mile (i.e. 4 PC's (personal computers) within ¼ mile for 100 households = .16)

c) Capacity of Public Access Points

Are public access points being utilized?

INDICATOR

Capacity Index showing number served versus capacity of center: Calculate available hours or user sessions vs. time used. Could use sample of centers. Alternatively calculate with number of users.

d) IT As A Tool For Breaking Down Barriers

How available is technology to underserved communities and groups?

INDICATORS

These indicators are an opportunity for case studies looking at some of the barriers to technology access for underserved populations such as people with disabilities, people who are homebound (including seniors), and those who do not speak English. For these groups, technology could be a great benefit, allowing them to communicate, retrieve information, and participate in employment opportunities that otherwise may not have been available. However, these groups also seem to experience the most barriers to access.

People with Disabilities

Cost comparison of access with adaptive equipment for someone with disabilities versus standard package for meaningful access

Sample of civic information web sites using content standards for those with disabilities.

Homeless Population

Percent of homeless population with voicemail and/or email accounts as determined by a survey

Homebound Population

Pie chart of percent of population who are homebound and the percent of homebound who have computers and the Internet

C. INFORMATION TECHNOLOGY USAGE

Along with access to information technology, it is important to consider how technology is being utilized. Information technology tools will change over time, so it is important to get an idea of how these tools are being used and what value they hold for individuals' personal needs.

a) Patterns of Use

How regularly are those that have access using computers and the Internet?

INDICATOR

Graph indicating the percent of respondents who answered yes to the following three survey questions.

- Do you regularly use a computer?
- Do you regularly use Internet access?
- Do you regularly use your personal email?

Will also include the percent of respondents who feel that the access that they have to Information Technology is sufficient for their personal needs.

b) Types of Use

What are the most important uses of computers and the Internet for residents?

INDICATOR

Graph indicating the percent of respondents who feel that Information Technology is very important for the following functions:

- Shopping
- Health Information
- Finances
- News
- Personal communication
- Organizational work
- Employment/Professional needs
- Cultural Needs
- Games
- Political Involvement
- Publishing
- Recreational
- Other

CATEGORY B – LITERACY

Just as the ability to read is integral to basic survival and achievement, the ability to work with computers and the Internet is becoming fundamental to participating and working in society. Basic technology literacy is a first goal for survival in the information age; technology fluency is essential for full participation. "Fluency" with information technology in this context refers to a definition developed by the National Academy of Science's Committee on Information Technology Literacy in their report entitled Being Fluent with Information Technology (National Academy Press, 1999). Fluency refers to a person's ability to apply his or her knowledge to adapt to changes, synthesize new information, and effectively apply information technology to work and personal needs. These indicators measure technology literacy in our community and the capacity of the education system to produce technology fluent students.

A. INFORMATION TECHNOLOGY LITERACY

The overall indicator will be an index assembled from the responses to the following questions. The index will provide a measure of basic literacy, basic skills, and fluency for the adult population. This basic literacy will also be measured for school-age children (K-12) in the Education section.

a) Use of Basic Applications

What percentage of residents know how to use basic computer applications?

INDICATOR

This indicator will be a graph indicating the percent of respondents in a survey asking for comfort level of the following basic and more advanced applications:

- Navigating a Computer (turning computer on and off, using a mouse, opening programs, finding files)
- Word Processing (creating a document, saving a document and printing a document)
- Publishing (creating a flyer with colors and simple graphics)
- Spreadsheet (creating a simple spreadsheet or database)
- Managing Peripherals (adding or changing a printer, scanner, external drive or some other computer peripheral)
- Installing Software

b) Basic Internet Communication Skills

Do residents know how to use the Internet to find information and communicate with others?

INDICATOR

This indicator will be a graph indicating the percent of respondents who are comfortable completing the following Internet and communication tasks:

- Connecting to the Internet
- Using e-mail (creating and sending a message, replying to a message, using an address book, and sending and receiving attachments)
- E-mail lists (signing up and removing oneself from a e-mail list)
- Searching for information
- Downloading files from the Internet
- Creating a web site
- Setting up a listserve

B. FLUENCY

Beyond basic literacy, it is important to measure what percentage of residents are fluent in information technology. As stated above, fluency connotes a higher level of competency than basic computer literacy, and refers to a person's ability to apply his or her knowledge to adapt to changes, synthesize new information, and effectively apply information technology to work and personal needs.

a) Fluency of Residents

Are residents able to apply information technology in a new situation or to acquire a new technological skill?

INDICATOR

This indicator will be an index showing the range of fluency of residents based on survey questions asking the following:

- How many new programs have you learned to use, if any, in the past year?
- How many new ways of using information technology have you adopted, if any, in the past year?
- How many times have you helped someone else to get started using IT or to learn a new application in the past year?

Fluency index: none, 1-2, 3-5, more than five

C. EDUCATION

This section will measure the preparation in computer and Internet skills we are providing to future generations through looking at technology usage in K-12 schools.

a) Information Technology in K-12 Education

How well is K-12 education integrating technology into the classroom?

INDICATORS

- A graph showing a percentage of teachers who have integrated technology into their classroom and the barriers for those who have not based on a survey of local teachers.

- A graph showing the current extent of information technology access in schools containing the following pieces of data:
  - % of K-12 classrooms that have Internet access
  - % of computers that are connected to the Internet
  - Number of students per computer
  - Number of students per computer with Internet access
  - % of students that have achieved technology competency standard

CATEGORY C – BUSINESS AND ECONOMIC DEVELOPMENT

Information Technology and the information technology industry has a far reaching impact on local employment, the local economy and our quality of life. The high tech sector, including information technology, accounts for a very significant portion of our local economy. A healthy community requires a healthy industry with sufficient jobs and a workforce to meet industry needs. Technology literacy, fluency and specialty skills training is becoming a requirement for more employment opportunities, even in entry-level positions. In addition, small business increasingly needs sufficient information technology capacity to survive and flourish. This section tracks the workforce and industry needs and impacts to our local community.

A. WORKFORCE NEEDS

Businesses and citizens need computer skills in order to maintain a healthy economy. These indicators examine the demand and distribution of employment in the context of IT requirements and skills.

a) Basic Technology Literacy and Employment

How important is basic technology literacy to finding employment?

INDICATORS

- Bar graph: Total jobs in the area, % that require basic technology skills, % of information technology professionals[2]
- Percentage of jobs (based on a sample) listed in the Seattle Time Employment Classifieds that list computer skills as a pre-requisite for employment.

b) Local Workforce

Are local students moving into IT fields? Are we meeting our IT workforce needs with local people?

INDICATORS

- Demographic breakdown of local graduating high-school students who plan to pursue an IT degree after graduation.
- Demographics of local graduates from four year IT programs based on current educational data.
- Percent of local hires and local contracts given to IT professionals based on a survey of employers.
- Number of annual foreign visas applied for by local companies for foreign IT professionals.

[2] Information Technology professionals are defined as those people whose jobs fit into the Northwest Center for Emerging Technologies' eight IT professional career clusters: Database Development/Administration; Digital Media; Enterprise Systems Analysis/Integration; Network Design/Administration; Programming/Software Engineering; Technical Support; Technical Writing; and Web Development/Administration.

B. SUSTAINING A HEALTHY INDUSTRY

A healthy industry is creative and profitable, supported by and responsible to local communities, and economically beneficial. The following indicators look at IT infrastructure for businesses, IT economic impacts on the local economy, IT application, and citizen involvement in new IT development.

a) Development of New IT Business

Are we creating an environment that is conducive to the development of new IT business?

INDICATORS

- IT business license data on the percentage of current local businesses that are IT businesses and the % of new businesses (within one year) that fall into the IT sector.
- Number of initial public offerings for companies in the Puget Sound Region per year.
- Percentage of city where infrastructure exists for large businesses to locate (fiber infrastructure) and for small businesses to locate (DSL Infrastructure).

b) Impact on Local Economy

What is the impact of the IT industry on our local economy?

INDICATORS

- A graph indicating the amount of our workforce that the IT industry accounts for. This graph will include the number of IT employees as a percentage of local employment and the number of employees in the IT industry and percentage of total workforce that this number represents.
- A graph showing the local wages in the IT industry based on the median and average wage of IT workers and the median and average wage of workers in the IT industry. This graph will also show the total income of IT employees and IT industry employees compared to area total, median, and other industries.
- The degree to which IT has increased the ability and likelihood of people to run extra businesses out of their homes.

c) Technology Usage in Small Business

How are small businesses using technology? What are the barriers to effective usage?

INDICATORS

- A graph, based on survey, showing the percentage of small businesses that are using information technology for the following types of functions:
  - Personnel
  - Finance
  - Inventory
  - Customer Information
  - Communication
  - Work Management
- A graph, based on survey, showing the percentage of small businesses with a web site that is being used for the following functions:
  - Product Marketing
  - Sales
  - Customer Communications
  - Procurement
- A graph showing the barriers to technology and web site usage based on a survey of small businesses.

CATEGORY D – COMMUNITY BUILDING

One of our local goals and priorities is the strengthening of neighborhoods and community organizations. There is potential for IT to both benefit and harm efforts to build community. The Internet and computers are changing the flow of community communications. The non-profit sector increasingly needs sufficient information technology capacity to deliver services. This category measures the extent to which IT is being used in community building activities.

a) Electronic Participation in Local Communities

Are local community groups incorporating electronic participation into their activities?

INDICATOR

Graph showing the percentage and types of local community groups that have incorporated electronic participation based on a household residential survey.

b) Neighborhood Internet Presence

Are local communities providing information online and are people aware of the resource?

INDICATORS

- Percentage of neighborhoods online based on data from the Department of Neighborhoods and/or Seattle Community Network and the percentage of these sites that include important local content on services, local activities, local businesses, schools, social service, and neighborhood discussion or email lists.

- Percentage of residents who are aware that their neighborhood has a website based on a survey.

c) Technology Usage By Community Institutions (NPO's)

Are non-profits making effective use of technology?

INDICATORS

- A graph showing the percentage of local non-profit organizations using technology for the following functions and the level of importance technology holds for these functions:
  - Communication with organizational contacts
  - Communication with clients
  - Publishing organizational documents
  - Financial Management
  - Information and Referral
  - Purchasing
  - Fund-Raising
  - Publicity
  - Volunteer and/or Membership Recruitment

- Graph showing the percent of employees in non-profit organizations who could use a computer for their work and have one and the percent of those computers that are updated.

CATEGORY E – CIVIC PARTICIPATION

Publication and delivery of government services and communications are increasingly delivered via the Internet. It is important to consider how this influences citizens access to public officials and civic participation.

a) Information Technology as a Means for Civic Participation

How is IT affecting residents' ability to influence government decisions?

INDICATOR

- A graph showing the ways that residents last contacted an elected official (data from the Citywide Residential Survey)
- A graph showing the results of a survey of residents and elected officials asking how effective the Internet is as a means of engaging in civic dialogue about issues.

b) Information Technology as a Means of Accessing Government Services

Are residents currently using IT as a way to access government services? Would they use IT to access other government services that are not yet available?

INDICATOR

- A graph showing the percentage of people who have accessed government information or used a government service online, as well as the percentage of people who would if available.
- The number of people who have paid a city parking ticket online.

CATEGORY F - HUMAN RELATIONSHIPS TO INFORMATION TECHNOLOGY

IT is perceived to have risks and opportunities in the nature of human interaction with it. These indicators are provided to assess the positive and negative impacts of IT on people and their perception of those impacts. These concerns are critical reflections of our quality of life.

a) Privacy, Security, and Safety Concerns

What is the impact of the Internet on residents' sense of privacy, security and safety?

INDICATOR

A graph showing the percentage of residents who feel that companies respect their privacy, that online transactions are secure, and that there are adequate safety precautions for children to access the web safely.

b) Web Content

How satisfied are residents with content on the web?

INDICATOR

The correlation of age and ethnicity on satisfaction of web content based on a survey.

c) Impact of Information Technology on Personal Time

How has electronic communication influenced personal time?

INDICATORS

Measurement of the impact that computers and the Internet have had on residents' personal time based on a survey.

d) Quality of Life

How is Information Technology impacting our overall quality of life?

INDICATORS

Measurement of the perceived impact that information technology is having on residents' personal quality of life and the quality of life of the city based on a survey.

CATEGORY G - PARTNERSHIPS AND RESOURCE MOBILIZATION

It is important to consider where the sources of support in order to coordinate resource placement and develop sustainable services. Many of the initiatives to foster technology literacy and access rely on contributions of money, time and materials from private and public sources. There is tremendous value in the contributions made by the Information Technology industry and volunteers working in the industry.

a) Investment

Who is investing in community technology centers?

INDICATOR

Revenue generated by community technology centers (CTC's) through private donations, corporate donations, government funding, and earned income as determined by survey of CTC's.

b) Sharing Expertise and Resources

How much are those with technology skills giving back to the community?

INDICATORS

A graph showing the percentage of IT businesses that offer incentives for employees to volunteer in the community, the percentage of IT volunteers giving time to technology centers, and the percentage of IT volunteers volunteering at sites other than technology centers.

NEXT STEPS AND CHALLENGES

The Information Technology Indicators presented here are the first step in providing a tracking of technology impacts in the Seattle area. The next step is to collect measurements on the indicators presented here. Some of this data already exists as a result of other studies, while some of it will be collected specifically for this project. As appropriate, surveying and focus groups will be conducted to collect the new data. This new data, combined with what is already existing, will make up the first set of measurements for these indicators.

After the data has been collected, it will be published and distributed broadly to the community. Along with this data will be a set of recommendations and action steps for groups to use to target the areas identified by these indicators.

In creating these indicators, we discovered that there is still much work to be done to measure the impact of technology on our community that cannot be covered in this effort. One of the most clearly defined needs was for a comprehensive evaluation of the community technology centers (CTC's) in the city. There is a need for data about usage, awareness of resources, curriculum, availability, barriers to usage, effectiveness of training and population served that could not be covered with this set of indicators. A need for a separately funded and developed evaluation needs to be on the agenda. If these public access centers are to be a resource for our residents, we need to know what quality of access and training is available.

As described in the introductory section, there are also areas where defining the indicator is extremely difficult or where there are significant barriers to collecting the data in a reliable and valid means. However there are important stories to tell and public discussion to have about the impact of information technology on our personal lives and the life of our community.

CONTACT INFORMATION

Many of the documents produced during this project, including the initial results from the public forum are available at http://cityofseattle.net/tech/indicators.htm. If you would like more information about the Information Technology Impact Indicators Project, go to our web site or contact David Keyes (david.keyes@ci.seattle.wa.us, 206-386-9759) or Emily Bancroft (emily.bancroft@ci.seattle.wa.us, 206-234-5378).

CREDITS

This project is part of the City of Seattle Citizens Technology Literacy and Access initiative, developed with the guidance of the volunteer Citizens Telecommunications and Technology Advisory Board (CTTAB). Additional assistance was provided by Sustainable Seattle, as well as Seattle Community Network and DebateAmerica/Seattle, a project of the Northwest Forum at the UW Daniel J. Evans School of Public Affairs. Special thanks to those in the Technical Advisory Group, public participants and City staff who contributed to the development of these indicators.

APPENDIX A – TECHNICAL ADVISORY GROUP

The following is a list of the Technical Advisory Group members and their organizational or company affiliations.

Andrew Gordon	*Daniel J. Evans School of Public Affairs*
Mike Donlin	*Seattle Public Schools*
Craig Kyte	*Seattle Public Library*
Doug Schuler	*Evergreen State College*
Parker Lindner	*Washington State Higher Education Board*
Steve Guest	*Seattle Community Network Association*
Melissa Guest	*Seattle Community Network Association*
Susannah Malarkey	*Washington Technology Alliance*
Dave Sieminski	*United Way of King County*
Brian Benzel	*Seattle Public Schools*
David Thurman	*Battelle and Washington Software Association*
Lawrence Snyder	*University of Washington – Computer Science*
Sarah Meyer	*Microsoft Corporation*
Darryl Hunt	*Central Area Youth Association*
Sharon Henderson	*El Centro de la Raza*
Dave Bockmann	*City of Seattle Department of Neighborhoods*
David Messerschmidt	*Northwest Forum*
Ben Wolters	*City of Seattle Office of Economic Development*
Jaime Greene	*NPower*
Agarva Hirst	*Archdiocesan Housing Authority-Computer Learning Center*
Ann Suter	*SCAN Board of Directors*
Bill Wright	*Midtown Commons*
Rona Zevin	*City of Seattle Department of Information Technology*
Trish Dziko	*Technology Access Foundation*
Richard Civille	*Center for Civic Networking*

Alan Ward	*Seattle Community College District*
Robert Mahan	*Battelle and Washington Software Association*
Ti Locke	*KCTS*
Jon Stahl	*ONE/Northwest*
Karen Manuel	*Central Area Youth Association*
Robin Oppenheimer	*Seattle Art Museum*
Keneta Anderson	*Washington Software Foundation*
Aki Namioka	*Active Voice Corporation*
John Young	*Private Industry Council*
Ann Hemholz	*Washington Literacy*
James Kelly	*Urban League of Metropolitan Seattle*
Louis Watanabe	*University of Washington – Office of Business and Economic Development*
Matt Lampe	*City of Seattle Department of Information Technology*
Maria Langlais	*City of Seattle Department of Human Services*

APPENDIX B – CTTAB MEMBERS

The following is a list of the current members of the Citizens Telecommunications and Technology Advisory Board (CTTAB). More information about CTTAB and its projects can be found at http://www.cityofseattle.net/cttab

Gary Low

John Schlick

Kim Munro

Anthony Williams

Frances Malone

Betty Richardson

Terryl Ross

Jerry Whiting

Mike Weisman

Bill Covington

Bob Valiant

Mike Donlin

Former CTTAB Members who were involved in this project:

Aki Namioka

Doug Schuler

Andy Gordon

APPENDIX C – PARTIAL LIST OF SOURCES CONSULTED

The following is a partial list of the sources that were consulted during the first phase of the Information Technology Indicators Project. A full list of sources will be included in the final report.

1999 Central Puget Sound Regional Economic Report: Employment Patterns and Trends, 1995-1998 - The Puget Sound Regional Council

Being Fluent with Information Technology – Committee on Information Technology Literacy and The National Research Council

Building a Foundation for Tomorrow: Information Technology Skill Standards (Version2.0, The Millennium Edition) - Northwest Center for Emerging Technologies

Directions and Implications for Advanced Computer Symposium Proceedings, March 1997 – Computer Professionals for Social Responsibility

Falling Through the Net: Defining the Digital Divide, July 1999 – The United States Department of Commerce

Index of Innovation and Technology, Washington State 2000 – The Washington Technology Center

Indicators of a Sustainable Community, 1998 – Sustainable Seattle

Losing Ground Bit by Bit: Low-Income Communities in the Information Age – The Benton Foundation

National Educational Technology Standards for Students: Connecting Curriculum and Technology – International Society for Technology in Education

Online Content for Low-Income and Underserved Americans: The Digital Divide's New Frontier, A Strategic Audit of Activities and Opportunities – The Children's Partnership

Signposts: Social and Health Indicators for King County – United Way of King County