The Implication of the World Wide Web for Providing Public Information from Local Government Agencies: Some Boston Metropolitan Examples

by

Jon D. Chandonnet

B.A. Political Science and French
University of Richmond, 1992

SUBMITTED TO THE DEPARTMENT OF URBAN STUDIES AND PLANNING IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE DEGREE OF

MASTER IN CITY PLANNING
AT THE
MASSACHUSETTS INSTITUTE OF TECHNOLOGY

September, 1997

©1997 Jon D. Chandonnet. All Rights Reserved

The author hereby grants to MIT permission to reproduce and to distribute publicly paper and electronic copies of this document in whole or in part.

Signature of Author: ____________________________________________
Department of Urban Studies and Planning
September, 1997

Certified by: ________________________________
Principal Research Scientist/Lecturer of Urban Studies and Planning
Thesis Supervisor

Accepted by: _________________________________________________
Associate Professor of Urban Studies and Planning
Chair, MCP Committee
The Implication of the World Wide Web for Providing Public Information from Local Government Agencies: Some Boston Metropolitan Examples

by

Jon D. Chandonnet

Submitted to the Department of Urban Studies and Planning in September, 1997 in Partial Fulfillment of the Requirements for the Degree of Master in City Planning

ABSTRACT

This study examines how community development and planning organizations communicate with the public in sixteen metropolitan Boston municipalities. The study categorizes the communication methods these organizations currently use to communicate with the public and examines how newly emerging computer communication technologies might be used by these organizations to communicate with the public in the future.

Thesis Supervisor: Michael J. Shiffer
Title: Principal Research Scientist/Lecturer of Urban Studies and Planning
Acknowledgements

A huge thanks Mike Shiffer for providing me with numerous opportunities to be exposed to the field of information technology throughout my academic life at MIT. I feel that your influence has helped me in to grow into my current career. Mike, I also appreciate your patience and support during the thesis process. There were some less than favorable circumstances, but its finished. Thanks for sticking with me.

To Lang Keyes, I appreciate the insight and the perspective that you provided to me during the research process. You always brought me back to the bigger picture. Thanks.

I also want to thank my family for supporting me during some trying times, and Liz thanks for being there during the final push. You got me through the door, and Terry thanks for carrying it the last few yards over the goal line to Sandy who spiked it home. Go team.
Table of Contents

INTRODUCTION 6
Research Objectives 10
Chapter Summaries 13
Definition of Terms 15

CHAPTER 1. COMPUTER COMMUNICATIONS BACKGROUND 18

CHAPTER 2. RESEARCH METHODS 25
2.1 Research Method 26
2.2 Study Area 26
2.3 Selected Interviewees 27
2.4 Interview Questions 28
2.4.1. Background Questions 28
2.4.2. Current Organizational Information Provision 30
2.4.3. Communication Mandates 31
2.4.4. Current Computer Communication Methods 31
2.4.5. Future Computer Communication Methods 31

CHAPTER 3. NON COMPUTER-BASED COMMUNICATION METHODS 33
3.1. The Information Flow Process 35
3.2. Agency Information Provision Requirements 37

CHAPTER 4. AGENCY INFORMATION PROVISION MODEL EXPLAINED 40
4.1. Mandatory Notification 42
4.1.1. Definition 42
4.1.2. Example 43
4.1.3. Category characteristics 44
4.2 Inquiry Response 46
4.2.1. Definition 46
4.2.2. Example 47
4.2.3. Category characteristics 48
4.3. Educating the Public 50
4.3.1. Definition 50
4.3.2. Example 51
4.3.3. Category characteristics 52
4.4. Informing the Public 54
4.4.1. Definition 54
4.4.2. Example 55
4.4.3. Category characteristics 55

CHAPTER 5. CURRENT COMPUTER-BASED PROVISION METHODS 58
5.1 Individual level 59
5.2 Agency level

CHAPTER 6. FUTURE MODEL OF AGENCY COMMUNICATION 75
6.1 User side 77
6.2 Agency or provider side 80

CHAPTER 7. FUTURE AGENCY COMPUTER-BASED INFORMATION PROVISION METHODS 84
7.1. Future World Wide Web Uses 86
7.2. Description of Future Uses 90
7.2.1 Mandatory Notification 90
7.2.2 Inquiry Response 92
7.2.3 Educating the Public 94
7.2.4 Informing the Public 95
7.3. Obstacles 97
7.3.1. General Obstacles 98
7.3.2. Category specific obstacles 101

CHAPTER 8. CONCLUSION 107
8.1. Study Summary 107
8.2. Cautions 108
8.2.1. Public service inequities 108
8.2.2. Public adaptation to computer-based methods 109
8.2.3. Implementation without reason 110
8.3. Avenues for Further Research 110
8.3.1. Public information needs 110
8.3.2. Agency resources requirements 111
8.3.3. Public accessibility 111

Appendix 113
Appendix A 113
Appendix B 116
Appendix C 118

Bibliography 120
Introduction

Development agencies can improve the effectiveness of their communication with the public in a number of ways. First, development agencies can communicate information with the goal of improving the public's understanding of agency roles and activities. As a result of the lack of a public that is not adequately knowledgeable of agency roles and activities, agency staff must spend notable periods of the day serving as an intermediary between the public and knowledge about how to access agency information and services. Second, lack of understanding of development agency roles and activities may cause the public to be skeptical of the value of development agencies during a time, due to considerable fiscal pressure, when development agencies want to be
perceived as a source of valuable public services. As the result of these two factors, development agencies need to create strategies to more effectively communicate with the public.

A third way that development agencies can improve communication with the public is to develop methods that allow members of the public to receive responses to questions when a development agency staff member is unavailable. This may include times of the day that are outside of regular agency hours of operation. Fourth, budgetary pressures often causes agency staff members to be continually asked to complete more tasks in less time. Incessant interruptions from the public, seeking responses to routine information requests frequently, cause agency staff members to be less productive than is possible. As a result, agency staff members seek strategies to more efficiently provide responses to routine public questions without having to commit staff time to actually intervene, on a case by case basis, in the public knowledge acquisition process.

Fifth, development agencies often want to provide targeted communication to members of the public; however, agencies generally do not know the specific information demands of the public and do not have methods available for delivering large amounts of targeted information to a broad cross section the public. Thus, development agencies regularly seek new methods for providing targeted communication to the public.
As the result of recent advancements in microcomputer and network communications technology, organizations can potentially employ new methods to improve communication with the public. As the result of these advancements, computers and communications are the two queen technologies of the Information Age. Combined into computer networks they offer the basis for today’s Web and for tomorrow’s information infrastructures (Dertourzos, 1997).

The reference to “today’s Web” in the above statement is a reference to the World Wide Web, invented by Tim Berners-Lee as a method for allowing researchers at CERN, the European particle-physics laboratory in Switzerland to interlink files located on different microcomputers. What Berners-Lee invented was an addressing protocol and a computer coding language that permits individuals to gain access to remote computer files located across town or across the world. This computer communication protocol permits tens of millions of computer users across the world to instantaneously access desired information located on a machine across town or across the world. The World Wide Web represents an innovation that creates a foundation for the initial stage of a world wide information infrastructure referenced in the above paragraph. Berners-Lee’s invention is one of the newly developed tools that has revolutionized the way people communicate.

---

1 The addressing protocol is known as hypertext transport protocol (http) and the coding language is known as hypertxt markup language (html).
Table 0.1. below, encapsulates a theory about the role of information technology for planning organizations. This theory states that in the 1960s information technology was principally used by planning organizations to facilitate efficient transaction processing within an organization; In the 1970s information technology was mainly used so that staff organizational staff members could integrate diverse data sets. In the 1980s information technology was primarily used to support semi-structured organizationally-based decision making. In the 1990s planning organizations will increasingly be used to promote intercommunication and dialogue (Klosterman, 1991).

Diagram 0.1 Information Technology in Planning Organizations Over Time

<table>
<thead>
<tr>
<th>Period</th>
<th>Primary Focus</th>
<th>Nature of Concern</th>
<th>Information Technology Role</th>
</tr>
</thead>
<tbody>
<tr>
<td>1960s</td>
<td>Data</td>
<td>Electronic Data Processing</td>
<td>Facilitate Efficient Transaction Processing</td>
</tr>
<tr>
<td>1970s</td>
<td>Information</td>
<td>Management Information Sys.</td>
<td>Integrate Diverse Data Sets</td>
</tr>
<tr>
<td>1980s</td>
<td>Knowledge</td>
<td>Decision Support Systems</td>
<td>Support Semi-structured Decision-making</td>
</tr>
<tr>
<td>1990s</td>
<td>Intelligence</td>
<td>Planning Support Systems</td>
<td>Promote Interaction, Communication Dialogue</td>
</tr>
</tbody>
</table>

The focus of this research paper is the period of the 1990s and the near future. A period when computers in combination with network communications technology permit intercommunication and dialogue not only within planning agencies but between development agencies and the public with the primary concern of creating not only more intelligent planning analysis but a more intelligent public.
Broadly stated, the goal of this research is to identify the communication responsibilities of development agencies as well as the current non-computer based methods these agencies use to communicate with the public, and ultimately to use this information to identify the computer communication methods that development agencies might use to improve communication with the public. The specific research objectives that guide this research study are stated in greater detail on page seven.

Research Objectives

In order to gain insight into how information technology can improve communication between the public and development agencies, an attempt is made to gather information on six principal research objectives.

The first research objective is to categorize the communication responsibilities that development agencies must fulfill in order to satisfy their public communication obligations. The purpose behind this objective is to gain a clearer understanding of the reasons that development agencies communicate with the public. Knowing why development agencies communicate with the public informs the methods that these agencies use to communicate with the public, the focus of research objective two.
With a clearer understanding of why development agencies communicate with the public through objective one, the second research objective is to identify how development agencies communicate with the public using non-computer communication. Knowing why and how development agencies communicate with the public may help inform how computer communication might be used by development agencies in the future to improve communication with the public.

With clearer knowledge of the non-computer techniques that development agencies use to communicate with the public, provided through objectives one and two, the purpose behind objective three is to identify how development agencies are currently using computer communication to communicate with the public. This knowledge might be useful to development agencies by allowing them to view where they stand relative to other agencies and possibly allowing these agencies to gain an understanding of the potential future uses of computer communication for improving communication with the public that other development agencies have successfully implemented.

The fourth research objective is to characterize the degree that the interviewees, and the agencies they work for, currently use computer communication to communicate with the public. An understanding of the extent that development agencies and employed staff use computer communication
may aid development agencies in identifying the skills and equipment their agency might need to bring their agency’s use of computer communication to a more technologically sophisticated level.

The fifth research objective is to suggest future ways that development agencies might use computer communication with the public. These suggestions may provide development agencies with an understanding of the possibilities that computer communication may allow their agency for improving communication with the public. Knowing the possibilities, may stimulate these agencies to consider further investigation of how their agency might be able to implement computer communication strategies. These suggestions may also provide agencies with a point of departure when investigating computer communication strategies.

The sixth research objective is to identify potential obstacles that might block development agencies from successfully implementing computer communication. Knowing these obstacles may allow development agencies to understand their agency’s current capacity to implement computer communication. In addition, knowledge of these obstacles might allow development agencies to determine strategies their agency could take to avoid these obstacles. In the following section, a brief overview of the topics covered in each of the eight chapters of this research study is provided.
Chapter Summaries

In chapter one, a general overview of how computer communication methods might be used by development agencies is provided along with an explanation of the advantages that development agencies might realize through the implementation of computer communication.

Chapter two explains the research methods used to examine the six research objectives and defines several terms used throughout this research study. In chapter three, a matrix developed to explain the communication responsibilities of development agencies is presented, and the non-computer communication methods these agencies employ to provide information are explained.

In the fourth chapter, ways that organizations might use computer communication to improve communication with the public are summarized. In the fifth chapter, ways that development agency staff members and the agencies that employ them currently use computer communication techniques to communicate with the public are categorized. The degree that the interviewees and the agencies they work for currently utilize computer communication when communicating with the public is also characterized in chapter five.
The sixth chapter provides a description of the various computer software and hardware tools that both users and providers of information might employ to deliver and receive information through computer communication. In the seventh chapter, ways that development agencies might use computer communication to facilitate interaction with the public are suggested, and obstacles that might block development agencies from successfully implementing and utilizing computer communication are identified.

Finally, in the eighth and final chapter, a research synopsis is provided, cautions that agencies might want to consider prior to implementing computer communication techniques are discussed, and potential avenues for further research are suggested.
Definition of Terms

There are several terms used throughout this paper that may be ambiguous to the reader. In an effort to reduce possible confusion associated with several commonly used terms, the following definitions are provided.

Public

The term public means, of or pertaining to, or affecting a population or a community as a whole (Random House Dictionary, 1993). In the context of a public who interacts with development agencies, the term characterizes a number of entities including: everyday citizens who live in a community, as well as housing developers, retailers, entrepreneurs and employers to name a few groups. All groups that interact with development agencies. In instances where only one of these groups is meant to be identified the more specific group name is used.

Computer Communication

Computer communication refers to a method of communication involving the use of networked personal or microcomputers as well as software tools that facilitate communication. Computer communication permits several variations of interaction between people and computers. The interaction may be person to person, person to computer, or computer to computer.
Development Agency

During the interview process, it became evident that the activities of community planning related to land use zoning, urban design, neighborhood planning, and parks/open space planning; the activities of economic development related to economic growth, business development, employment, regulations, small business assistance, new venture funding, and work force development; and the activities of community development related to affordable home ownership, housing stock maintenance/improvement, and affordable housing information each have distinct responsibilities within the municipal government structure.

Although they have separate responsibilities, the three local government departments of community planning, economic development, and community development are commonly grouped together in the same local government agency. Development agency is the term used in the study to refer to this multipurpose agency.

The specific title of the agency may vary from one municipality to another, but a common title that captures the essence of these three combined departments is development agency. Table 0.2 on the next page shows the specific names of the 16 organizations that are referred to as development agencies in the study.
Table 0.2 Planning and Community Development Agency Titles

<table>
<thead>
<tr>
<th>Municipality</th>
<th>Planning and Community Development Agency Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>Town of Arlington</td>
<td>Department of Planning and Community Development</td>
</tr>
<tr>
<td>Town of Belmont</td>
<td>Office of Community Development</td>
</tr>
<tr>
<td>City of Boston</td>
<td>Boston Redevelopment Authority</td>
</tr>
<tr>
<td>Town of Brookline</td>
<td>Planning Department</td>
</tr>
<tr>
<td>City of Cambridge</td>
<td>Community Development Department</td>
</tr>
<tr>
<td>City of Everett</td>
<td>Mayor's Office of Community and Economic Development</td>
</tr>
<tr>
<td>Town of Lexington</td>
<td>Planning Department</td>
</tr>
<tr>
<td>City of Lynn</td>
<td>Community Development Department</td>
</tr>
<tr>
<td>City of Malden</td>
<td>Planning Department</td>
</tr>
<tr>
<td>City of Medford</td>
<td>Office of Community Development</td>
</tr>
<tr>
<td>City of Newton</td>
<td>Dept. of Planning and Development</td>
</tr>
<tr>
<td>City of Quincy</td>
<td>Planning and Community Development Department</td>
</tr>
<tr>
<td>City of Revere</td>
<td>Office of Planning and Community Development</td>
</tr>
<tr>
<td>City of Somerville</td>
<td>Office of Housing and Community Development</td>
</tr>
<tr>
<td>Town of Watertown</td>
<td>Planning and Community Development Department</td>
</tr>
<tr>
<td>City of Waltham</td>
<td>Planning Dept.</td>
</tr>
</tbody>
</table>
Computer Communication

Background

The combination of hardware such as the microcomputer and various network communications devices along with various software tools and communications protocols serve as the infrastructure for a newly emerging method of communication that is refereed to as computer communication in this study. This chapter provides a general overview of how computer communication works.

---

1. See Definition of Terms on page 12 for the definition of computer communication used in this study.
communication methods might be used by development agencies and explains some advantages that development agencies might realize through the implementation of computer communication. This chapter does not cover the specific details of the software and hardware aspects of computer communication; those details are noted in Chapter Six.

Computer communication can take several forms. It can be communication between two individuals that happens either synchronously or asynchronously. For example, computer communication can mean two individuals communicating in synch through their computers where the two individuals can not only hear one another's spoken message, but they can also watch the person speak the words on a small window on the screen of their personal computer. In essence, this form of communication combines the ability to transfer the spoken word like the telephone while transmitting the moving image of the person speaking the words. In the future, members of a town planning department may use this form of person to person computer communication to respond to a citizen's question concerning one of the requirements he must be follow to successfully file a zoning variance request online.

The added benefit of full motion visual imagery accompanying the audible transmission of voice communication is the potential for this
communication method to deepen the quality of interaction between a citizen and her local government. The ability to match a person’s voice with her face may create a heightened degree of intimacy between the two communicating parties that is not possible through voice communication alone. This heightened intimacy may lead citizens to view local government officials as having a greater degree of value than they previously perceived. In addition, the presence of visual gestures that can not be conveyed through voice communication alone may provide greater meaning to the messages exchanged between communicating parties.

Computer communications also allows two individuals to communicate asynchronously as well. For example, a staff member of the city’s community development office may respond to an e-mail message from a citizen who is interested in knowing if she is eligible for additional housing subsidies as the result of the expected birth of a second child. Prior to the advent of computer communications methods, the person posing the question to the community development staff member has to either place a phone call or make a personal visit to the community development department staff member’s office.

Using computer methods rather than the phone or a personal visit might mean that the community development department staff member may have fewer interruptions during the course of his work day and potentially be more
productive. The staff member can set aside a specific part of his work day to respond to e-mail messages posed by citizens. The ability to simply pose a question through e-mail has advantages for the expectant mother as well. She can make more efficient use of her time. Instead of taking time out of her work day to travel down to the community development office to ask her question, she can simply go to her computer and take a few minutes to type and send her message.

E-mail not only has the potential to save the time it takes for the public to make an information request, e-mail’s can shorten the time it takes development agencies to deliver information to the public. For example, development agencies are usually required to deliver information to members of the public owning property within a certain distance of a property with a pending zoning variance request. Delivering notification using e-mail, instead of the United States Postal Service, can reduce the time it takes for the information to reach the public from a few days to a few hours, thus providing neighboring property owners additional time to consider their reaction to the pending variance request.

Computer communication can also take the form of communication between a person and a computer. For example, a person may access information on the town’s vital characteristics such as total population, average
resident income, and the locations of public parks and open space since all of this
information is stored on a computer in town hall that citizens can access through
their personal computers. Another example of computer communication
between an individual and a computer that may take place in the future might
occur when a retailer uses her computer to access a city’s database on available
retail properties for lease that are located in markets that are suitable for the sale
of her organization’s products.

There are several potential advantages to the “person-to-computer” form
of communication. First, the public can gain access to information that was
previously difficult to access such as the vital statistics of a community. The
information may have existed as a paper file in a filing cabinet or may have even
existed digitally stored on a personal computer on a staff member’s desk in the
city’s development agency but was inaccessible to the public.

Second, when a member of the public requests information that a member
of the community development agency must fill, the staff member does not
actually have to be a direct intermediary in the process since the person seeking
the information can go to her computer and search the community development
agency’s public files. The staff member who previously spent time filling
information requests can now spend her time identifying commonly requested
information and organizing the information in a format that is easy to understand and accessed.

Third, publicly accessible computer files can potentially allow development agencies to present information that they were previously unable to be presented. For example, a hypermedia presentation that uses text, graphics, motion video, three-dimensional modeling applications and virtual reality tools can be created to illustrate the impacts of a proposed development project and delivered through the World Wide Web. As a result the public can have access to the same information as planners. This has the potential to allow the public to gain a more informed understanding of planning board decisions, and it may even allow the public to become a more active participant in the planning process. The ability to deliver a hypermedia presentation through the World Wide Web has a second advantage. Such a presentation can allow the public to view the information at their own convenience rather than according to the meeting schedule controlled set by the municipality. This may result in a larger segment of the population gaining knowledge about development proposals and becoming involved in the project input process as a result.

Educating the public about development agency initiatives through computer communication has the potential of developing a public that has a greater appreciation of their municipal development agency. Having a greater
appreciation for the town's development agency, may lead the public to value the agency more highly and to be more supportive of future agency initiatives.

Fourth, through computer communication a computer automated feedback mechanism can be created. Such a feedback mechanism might reduce the friction associated with providing feedback into various development agency planning processes. Reducing friction, means reducing the effort than an individual must exert to provide input into the planning process, so instead of going to a zoning board meeting to register an opinion, a neighbor's viewpoint can be registered electronically.

In the chapters that follow the results of a research study are described that provide greater insight into how development agencies might be able to integrate computer communication into their current public communication strategy so that the advantages of computer communication noted in this chapter might become part of the public communication strategy of development agencies.
In this chapter, the research methods used to study development agencies and staff members are explained, the study area is defined, the reasoning that lead interviewees to be included in the study is explained, and finally the logic behind the discussion questions is described.
2.1 Research Method

In an effort to handle the research objectives listed on pages of the introduction, a qualitative research study of 16 planning and development agencies surrounding the city of Boston was conducted.

2.2 Study Area

The sixteen cities and towns involved in this study include the city of Boston and fifteen cities and towns immediately surrounding the city of Boston. Table 2.1 below lists these sixteen municipalities.

Table 2.1 Municipalities Included in the study.

<table>
<thead>
<tr>
<th>Municipality</th>
<th>Town of Arlington</th>
<th>City of Malden</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Town of Belmont</td>
<td>City of Medford</td>
</tr>
<tr>
<td></td>
<td>City of Boston</td>
<td>City of Newton</td>
</tr>
<tr>
<td></td>
<td>Town of Brookline</td>
<td>City of Quincy</td>
</tr>
<tr>
<td></td>
<td>City of Cambridge</td>
<td>City of Revere</td>
</tr>
<tr>
<td></td>
<td>City of Everett</td>
<td>City of Somerville</td>
</tr>
<tr>
<td></td>
<td>Town of Lexington</td>
<td>Town of Watertown</td>
</tr>
<tr>
<td></td>
<td>City of Lynn</td>
<td>City of Waltham</td>
</tr>
</tbody>
</table>

2.3 Selected Interviewees

The study involved one staff member from each of the 16 community development and planning agencies. Phone contact was made with the agencies in the study area and an initial contact was identified. The initial contact was

---

The city of Chelsea and the town of Winthrop were two additional municipalities targeted for inclusion in this study; however, they were ultimately not included as the result of difficulties contacting an individual to interview from the municipal planning and community development agency.
asked what position they hold within the organization and whether or not they could provide a broad description of the organization's activities. This was to assure that after all sixteen interviews were conducted that the interviewees represented a broad-cross section of job responsibilities held in community development and planning agencies. Table 2.2, titled Interviewee Background, on the following page shows the job titles and principal responsibilities of each interviewee. The four principal job responsibilities of each interviewee are marked by an X in one of the four right hand columns of table 2.2. The four principal job responsibility categories include economic development (Econ. Dev.), community planning (Comm. Planning), community development (Comm. Dev.), and generalist (General).

Table 2.2 Interviewee Background

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Belmont</td>
<td>Planning Coordinator</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Boston</td>
<td>Research Manager</td>
<td></td>
<td></td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Brookline</td>
<td>Senior Planner</td>
<td></td>
<td></td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Cambridge</td>
<td>Community Development Planner</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Everett</td>
<td>Community Development Dir.</td>
<td></td>
<td></td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Lexington</td>
<td>Assistant Planner</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lynn</td>
<td>Associate Director</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Malden</td>
<td>Principal Planner</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Medford</td>
<td>Econ. Dev. Planner</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Newton</td>
<td>Senior Planner</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Quincy</td>
<td>Principal Planner</td>
<td></td>
<td></td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Revere</td>
<td>Deputy Dir. of Planning &amp; Comm. Dev.</td>
<td></td>
<td></td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>Somerville</td>
<td>Admin. and Finance Director</td>
<td></td>
<td></td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Watertown</td>
<td>Senior Planner</td>
<td></td>
<td></td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>Waltham</td>
<td>Senior Planner</td>
<td></td>
<td></td>
<td></td>
<td>X</td>
</tr>
</tbody>
</table>
Once it was determined that the individual contacted was suitable for inclusion in the study, a meeting time was identified when each interviewee could spend approximately one hour responding to a series of discussion questions.

2.4 Interview Questions

Each of the sixteen interviewees was asked the same series of discussion questions. These questions are listed in Appendix A, Discussion Questions. The questions were broken down into five sections and include: Section I, Background Questions; Section II, Current Organizational Communication; Section III, Communication Mandates; Section IV, Current Computer Communication; Section V, Future Computer Communication. The discussion questions were developed and posed in order to gather information relative to the principal research objectives of this study listed in the introduction. In the paragraphs that follow, the discussion questions are matched with the research objectives they are meant to investigate.

2.4.1. Section I, Background Questions

The purpose of the questions in discussion section I, Background, was to collect general information on the interviewees, the organizations that employ them and the communities their agency's serve. The primary job responsibilities of each of the interviewed staff members are classified into one of the three sub-
departments of planning and community development departments, community planning, economic development and community development. Table 2.2 on page 18 lists the self-identified job responsibility of each interviewee.

Three of the interviewees identified themselves as economic development specialists, four of the interviewees identified themselves as community planning specialists, six of the interviewees identified themselves as community development specialists, and three of the interviewees identified themselves as generalists having to fulfill the job responsibilities of more than one sub-departmental category. This illustrates that the individuals interviewed represent a cross-section of the principal job responsibilities within planning and development agencies.

Questions I.3.a.-I.3.d. asked the interviewees to identify general demographic characteristics of the municipality that their agency serves. These characteristics include population, total number of households, income per capita, and median household income. Table 2.3 below lists these general municipality demographics.
Table 2.3 General Municipality Demographics

<table>
<thead>
<tr>
<th>Municipality</th>
<th>Population</th>
<th>Households</th>
<th>Inc. Per Capita</th>
<th>Med. hh inc.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Town of Arlington</td>
<td>44,630</td>
<td>18,819</td>
<td>$ 21,449</td>
<td>$ 43,309</td>
</tr>
<tr>
<td>Town of Belmont</td>
<td>24,720</td>
<td>9,664</td>
<td>$ 26,793</td>
<td>$ 53,488</td>
</tr>
<tr>
<td>City of Boston</td>
<td>574,283</td>
<td>228,464</td>
<td>$ 15,581</td>
<td>$ 29,180</td>
</tr>
<tr>
<td>Town of Brookline</td>
<td>54,718</td>
<td>19,080</td>
<td>$ 29,044</td>
<td>$ 45,598</td>
</tr>
<tr>
<td>City of Cambridge</td>
<td>95,802</td>
<td>39,405</td>
<td>$ 19,879</td>
<td>$ 33,140</td>
</tr>
<tr>
<td>City of Everett</td>
<td>35,701</td>
<td>14,139</td>
<td>$ 14,220</td>
<td>$ 30,786</td>
</tr>
<tr>
<td>Town of Lexington</td>
<td>28,974</td>
<td>10,515</td>
<td>$ 30,718</td>
<td>$ 67,389</td>
</tr>
<tr>
<td>City of Lynn</td>
<td>81,245</td>
<td>31,554</td>
<td>$ 13,026</td>
<td>$ 28,553</td>
</tr>
<tr>
<td>City of Malden</td>
<td>53,884</td>
<td>21,921</td>
<td>$ 15,820</td>
<td>$ 34,344</td>
</tr>
<tr>
<td>City of Medford</td>
<td>57,407</td>
<td>21,829</td>
<td>$ 16,941</td>
<td>$ 38,859</td>
</tr>
<tr>
<td>City of Newton</td>
<td>82,585</td>
<td>29,455</td>
<td>$ 28,840</td>
<td>$ 59,719</td>
</tr>
<tr>
<td>City of Quincy</td>
<td>84,985</td>
<td>35,678</td>
<td>$ 17,436</td>
<td>$ 35,858</td>
</tr>
<tr>
<td>City of Revere</td>
<td>42,786</td>
<td>17,438</td>
<td>$ 14,723</td>
<td>$ 30,659</td>
</tr>
<tr>
<td>City of Somerville</td>
<td>76,210</td>
<td>30,319</td>
<td>$ 15,179</td>
<td>$ 32,455</td>
</tr>
<tr>
<td>City of Waltham</td>
<td>57,878</td>
<td>20,728</td>
<td>$ 16,777</td>
<td>$ 38,514</td>
</tr>
<tr>
<td>Town of Watertown</td>
<td>33,284</td>
<td>14,190</td>
<td>$ 20,382</td>
<td>$ 43,490</td>
</tr>
</tbody>
</table>

2.4.2. Current Organizational Communication

The questions in discussion section II, Current organizational communication, focus on research objectives 1 and 2, a categorization of the communication responsibilities that development agencies must fulfill relative to the provision of information to the public, and the identification of current non-computer transferred communication methods that municipal planning and community development departments employ when providing information to the public. The specific interviewee responses to the questions in sections II are listed in Appendix A.
2.4.3. Communication Mandates

The discussion questions in discussion section III, Communication mandates, do not focus specifically on one of the six research objectives. The response to these questions are used in the four sections of chapter 3, titled motivations for the purpose of identifying the impetus that leads development agencies to communicate with the public.

2.4.4. Current Computer Communication Methods

Discussion questions in Section IV, Current computer communication methods, focus on research objective 3, the examination and the categorization of ways that municipal planning and community development departments currently use computer transferred communication methods to interact with the public. The specific questions posed in discussion section IV are listed in Appendix A.

2.4.5. Future Computer Communication Methods

Discussion questions in Section V, Future computer communication, focus on research objectives 4, 5, and 6; suggested future ways that metropolitan planning and community development departments might use computer transferred communication methods to facilitate interaction between their organizations and the public; a description of the degree that the interviewees and the organizations they work for currently utilize computer transferred
communication methods when interacting with the public; and, an assessment of the likelihood that municipal planning and community development organizations might employ computer transferred communication methods to interact with the public. The specific interviewee responses to the questions in discussion section V are found in Appendix A.
Research Objectives 1 and 2 serve as the focus of chapter three. The goal of the first research objective is to categorize the communication responsibilities that development agencies must fulfill in order to satisfy their public communication obligations. The purpose behind this objective is to gain a clearer understanding of the reasons that development agencies communicate with the public. Knowing why development agencies communicate with the...
public informs the methods that these agencies use to communicate with the public, the focus of research objective two.

With a clearer understanding of why development agencies communicate with the public through objective one, the goal of the second research objective is to identify how development agencies communicate with the public using non-computer communication methods. Knowing why and how development agencies communicate with the public may help inform whether computer communication might be used to improve communication with the public by development agencies in the future.

This chapter is organized in 2 parts. Part 1, 3.1. The Information Flow Process, provides a discussion of the organizational information flow process and also provides a context for understanding how communicating with the public fits in with the basic flow of information through planning agencies. Part 2, 3.2. Agency Communication Requirements, explains the categories used to characterize the communication requirements of development agencies and provides a listing of the communication methods.
3.1. The Information Flow Process

The Information flow process characterizes the basic flow of information through metropolitan planning organizations (Baxmann, Chandonnet, and Shiffer, 1996). The information flow model was created for a study completed by the M.I.T. Department of Urban Studies and Planning for the Federal Highway Administration (FHWA) and the National Association for Regional Councils (NARC). There are three concepts captured in the information flow process. These concepts include Data Acquisition, Data Analysis and management and, Information distribution. Diagram 2.1 below, shows the concepts of the information flow model.

Diagram 3.1

The information flow process refers to the way that information is acquired, analyzed, and distributed by Metropolitan Planning Organizations. For the purpose of the National Association of Regional Council study, the three stages of the process include Data Acquisition, Data Analysis and Management, and Information Distribution. In the following paragraph, greater detail is
provided on each of the three stages of the organizational information flow process.

As a first step, data has to be gathered. Data acquisition activities refer to the various strategies that development agencies use to gather data. The intermediate information flow category is concerned with data management and analysis. The focus of activities in this category is on "making sense" of the acquired data to support planning and decision-making processes. Finally, the information distribution category encompasses activities that agencies perform to make information available to parties within and outside of MPO organizations (Baxmann, Chandonnet, and Shiffer, 1996).

This study focuses on the last stage of the information flow process, information distribution. For the purpose of this study, the term information distribution is referred to as communication. Although different terminology is used, the two terms have essentially the same meaning. One difference between the two terms is that information distribution encompasses the provision of information to parties within as well as outside of the organization while communication refers solely to information that the organization provides to parties outside of the organization.
3.2. Agency Communication Model

The process used to develop the model that characterizes agency communication requirements was an iterative one. The explanation of this iterative process is divided into two parts each consisting of several steps.

The first step of part one of model development process was to identify principal agency functions. As a result of discussions with the individuals listed in Appendix A, three principal development agency functions have been identified. These principal agency functions include: community planning, economic development, and community development. Having identified the principal agency functions, the next stage in the model development process was to identify the organization’s responsibilities within each of these three principal agency functions were listed. The next stage in the model development process was to identify the communication requirements that accompany the various organizational responsibilities along with the current communication methods and prospective computer methods. Appendix B shows a table listing the principal responsibilities, communication requirements, current methods, and prospective future computer methods categorized according to the three principal agency functions.

Part two of the process used to develop a model of agency communication was accomplished in two steps. Step one involved basing the model on
organizational communication requirements rather than organizational responsibilities. Four categories for characterizing agency communication were created. These four categories created to characterize agency communication requirements include: mandatory notification, inquiry response, educating the public and informing the public. Appendix C shows the new model of agency communication with the agency responsibilities listed under each principal agency communication category.

In order to simplify the model, the agency responsibilities listed under the four categories of agency communication were omitted. Table 3.1 below shows the Agency Communication Model. The model lists four principal agency communication responsibilities along with the non-computer methods that development agencies use to communicate with the public.

<table>
<thead>
<tr>
<th>Agency Responsibility</th>
<th>Method</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mandatory notification</td>
<td>direct mailing</td>
</tr>
<tr>
<td>Inquiry Response</td>
<td>phone, direct person to person contact</td>
</tr>
<tr>
<td>Educating the Public</td>
<td>newspaper, cable access, report mailing</td>
</tr>
<tr>
<td>Informing the Public</td>
<td>cable access, newspapers, flyers</td>
</tr>
</tbody>
</table>

The development of the agency communication model accomplishes the first two research objectives by categorizing the communication responsibilities of municipal planning that development agencies must fulfill relative to the provision of information to the public and by identifying the current non-
computer communication methods that development agencies employ when providing information to the public. Knowing these agency responsibilities and current communication methods might better inform how agencies can improve future communication with the public using computer communication methods.

The following chapter provides a more detailed explanation of the four categories of the agency communication model. The explanation is divided into sections, a general explanation of the category, an example of the an organizational communication responsibility and how that responsibilities is currently accomplished, the category characteristics, and the non-computer methods used to provide information to the public.
Chapter 4 provides an explanation of each of the four categories of the agency communication model; Mandatory Notification, Inquiry Response, Educating the Public, and Informing the Public. Each category is explained in three sections; category definition, category example, and category characteristics. The focus of the category definition section is to explain the basic meaning of each category. The focus of the category example section is to illustrate how one example agency communication responsibility is
operationalized. The focus of the category characteristics section is to describe
the essential qualities of each category. The category characteristics section is
further divided into four sub-sections. These four sections are explained in
greater detail below.

"Motivation" is the first sub-section. The provision motivation is
the impetus behind the delivery of information to the public. In the case
of inquiry response, the impetus that leads to the provision of information
to the public is a request for information from the public.

"Method", the second sub-section, describes the communication
means through which the information is delivered to the public. There are
a variety of methods utilized by agencies. These methods include: the
telephone, in person contact, The United States Postal Service, cable
television, newspapers, newsletters, and community meetings. The
method used depends on the size of the recipient audience and the level of
intimacy required. The matrix below categories the methods according to
the size of the recipient audience and the level of intimacy required.

"Volume", the third sub-section, has two meanings. It refers to the
amount of information provided on a transaction basis as well as the total
number of transactions delivered on a cumulative basis.
"Category specific characteristics", the fourth sub-section, focuses on significant category characteristics that are consequential only to the category in question and irrelevant to the other three categories.

In the remainder of this chapter each of the four categories of the agency communication model are described in greater detail according to the format outlined above.

3.1. Mandatory Notification

3.1.1. Definition

The communication category "mandatory notification" refers to information that development agencies are required to communicate to the public by law. The principal mandate requiring agencies to communicate with the public relates to the municipality’s zoning bylaw. As a result of mandatory provision laws often contained within the municipality’s zoning bylaw, any variance request filed with the municipality’s zoning board initiates the communication process.

“Mandatory notification” covers a number of agency communication responsibilities referenced in Appendix C. These responsibilities include: notifying citizens of proposed zoning variance requests as well as notifying
citizens of proposed design review decisions. In the following example, the zoning variance communication process is summarized to illustrate one example of the “mandatory notification” communication process.

4.1.2 Example

The zoning variance process typically begins when a property owner files a request with his local municipal planning board to alter his property in a manner that is not listed as a proper use in the municipality’s zoning bylaws. In the example case, the property owner wants to modify his existing residence from a single family to a multifamily residence. The zoning bylaw governing the property in question states that the property is to be zoned for single family residences only.

The first step a property owner needs to take when seeking a variance request is to file a variance with the municipal planning board in his town. After the property owner files a zoning variance request, the municipality must provide notice to property owners within a given distance of the property in question that a property owner at a nearby address has filed a zoning variance request with the town’s planning board. The notification, send in the form of a letter through the mail and generally referred to as an abutter’s notice, commonly states that the zoning board will hear the variance request case on a
specific date and that citizens are invited to attend the zoning board meeting to state supporting or opposing views.

4.1.3. Category specific characteristics

Motivation

In the case of “mandatory notification”, a law initiates the public communication process.

Method

The common method for delivering information found in the “mandatory notification” category is the United States Postal Service (USPS). One reason that the USPS is the most common method for delivering mandatory information is that the USPS takes upon itself the responsibility of delivering mail to every property in a municipality. Another reason that the USPS is the commonly preferred means of delivering this information is that it is an efficient means for delivering a large number of messages in a relatively short period of time.

Volume

Typically, the volume of information delivered per mandatory notification case is not very great. In the case of an abutters notice or a design review notice generally the volume of information needed to convey the required information does not cover more than a page of text. The cumulative volume of transactions
varies according to the required coverage area stipulated in the municipality’s statutes governing notification, but an approximate range of households notified by an abutter’s notice can range between a few dozen to a few hundred households.

Category specific characteristics

reliability
The communication method used to notify citizens must be as close to 100% stable as possible. This means that the method must deliver the information to the intended property owner without error.

accessibility
Complete recipient accessibility represents another category specific characteristic of mandatory notification. Complete recipient accessibility means that all property owners who are targeted to receive abutters notices must have the capacity to receive those notices. In other words, the recipient citizen must have a personal mail box.

time sensitivity
Information classified under mandatory notification of concerned parties is typically time sensitive, so it must reach the intended recipient within a specified time period.
4.2 Inquiry Response

4.2.1. Definition

The communication category of "inquiry response" refers to information that development agencies provide to the public as the result of a public request. Development agencies respond to inquiries for information from the public for several reasons such as the Freedom of Information Act, as well as commonly held beliefs of effective planning practice.

"Inquiry response" covers a number of agency communication responsibilities referenced in Appendix C. These responsibilities include: providing citizens demographic information such as the total population of residents living in town; providing retailers with market condition information, such as average income levels of various age classifications of city residents; providing low income residents who are searching for housing with information on available rental or purchase options; and providing developers with information on available lease and purchase sites for new businesses. In the following paragraphs, instances when a development agency responds to inquiries for information are explained in order to provide greater detail on the "inquiry response" category of development agency communication.

---

4 A number of interviewees stated that this was an important motivating factor behind their communication efforts.
4.2.2. Example

There are several instances when a development agency responds to information requests. One example from each of the three departments of a typical planning and development agency, community planning, economic development, and community development is provided.

In the case of community planning, an individual in the process of deciding whether to relocate to a new town may visit the town’s community planning department to gather statistics on the town’s school system, or to confirm that a property of interest is in accordance with the zoning bylaw governing the property.

In the case of economic development, the economic development department responds to an inquiry for information from a developer of a retail clothing store who is deciding whether to purchase a specific property and wants to gather demographic information on the city to confirm whether or not the local market is suitable for her products.

In the case of community development, a newly pregnant low income mother contacts the community development department to inquire about possible changes in her monthly housing subsidy as the result of the impending birth of her second child.
4.2.3. Characteristics

Motivation

In the case of inquiry response, the impetus that leads to the provision of information to the public is a request for information from the public as opposed to being provided through the impetus of the agency.

Methods

Information requests classified within the inquiry response category are responded to on an individual case by case basis. As a result of the individualized nature of an inquiry or a request, the two principal methods agencies use to deliver information are the telephone or direct in-person contact. In-person contact means that the individual making the request has paid a visit to the planning and community development department to speak with an agency staff member face to face. In some cases the inquiry may be placed by an individual, but the information provided as the result of the request requires delivery through another method such as the US Postal Service as in the case of the development report referenced in the preceding paragraph. In other cases, the information is provided during question and answer sessions of neighborhood meetings.
Volume

The quantity of information provided as the result of an inquiry ranges from a single word response, as in the case of an inquiry related to the total number of residents living in a city, to a multipage report that describes the benefits of a proposed community development project. In the case of a request for a multipage development report, the report is mailed to the inquirer since the telephone is an unreasonable method for delivering such large volumes of information.

Information classified within the inquiry response category is individual in nature, so that the audience at the receiving end of information provided through inquiry response is generally one person. However, it is important to note that there may a dozen or so requests for the same individual piece of information, such as the demographic characteristics of a specific town or available rental or purchase housing options for low income residents during the course of a week. So although the response is individual in nature, there may be a large volume of individual inquiries that the city must answer.

Category specific characteristics

Information provided as the result of a request takes two forms. It is either general, the information is commonly requested by other members of the public like community demographics, or the information request is very specific.
such as in the case of the example above where a prospective homeowner wants to verify whether a property of interest is in accordance with the town’s zoning bylaw governing the property.

4.3. Educating the Public

4.3.1. Definition

The educating portion of the concept educating citizens means to develop the facilities and powers of (a person) by teaching, instruction, or schooling (Random House Dictionary, 1993). The communication category, educating citizens, refers to information that development agencies provide to the public with the goal of increasing individual knowledge relative to a specific topic. There are no laws or mandates motivating agencies to provide this information; however, there are motivating factors causing agencies to provide information that educates citizens.

One of these motivating factors includes commonly held beliefs of effective planning practice such as the belief that a more educated citizenry has the capacity to participate in development agency related activities in a more meaningful way. Another motivating factor behind the agency’s efforts to provide educational information to the public is more selfish in nature. Agencies
often want to educate citizens so that the public has a better appreciation of agency activities.

"Educating the public" covers a number of agency responsibilities referenced in Appendix C. These responsibilities include: educating citizens about the zoning variance process; educating citizens about current land use regulations; educating citizens about urban design guidelines; educating entrepreneurs about available funding sources that support new venture creation; Providing entrepreneurs with business plan creation assistance; Educating executives about local regulations impacting their area of business; Educating first time homebuyers about the home ownership process. In the following example, the zoning variance process is summarized in order to illustrate how development agencies might practice one aspect of the "educating the public" communication process.

4.3.2. Example

The zoning variance process is typically not a simple process for citizens to understand and successfully engage. As a result, a member of the city’s planning agency staff often must spend time educating first time variance filers about the steps in the process. For example, a citizen wants to file a variance before transforming his residence from a single family residence to a multifamily residence. Upon receiving an understanding of the variance process, citizens are
expected to follow the steps outlined in the process. The planning department staff member must make it clear that until the variance is granted, and the proper building permits are issued, the individual can not begin making the desired modifications on his property.

4.3.3. Category specific characteristics

Motivation

The motivation for information classified in the educating the public category is an inquiry on the behalf of a member of the public.

Methods

Since information classified under educating the public is generally delivered on a case by case basis. The methods employed to deliver educational information need to effectively support one on one interpersonal interaction. This means that the individual receiving the information must have the capacity to ask questions of the individual delivering the information. There are a number of methods agencies can employ to deliver educational information.

In the case of information that can be delivered, agencies may provide the information over the telephone or direct person to person contact. More commonly the information is targeted for a larger audience from special interest groups to the entire community. In these cases the preferred delivery methods
include group mailings of newsletters and reports to the local community newspaper.

Volume

Information that is delivered by the agency to educate an individual, as in the above zoning variance example, is quite individualized, so the audience is usually one person. The volume of information delivered during the course of this transaction that must be digested by the recipient so that the recipient can properly act on the received information may be quite large.

Category specific characteristics

Upon receiving the information, the individual is often required to follow a process that the information lays out, so the format that the information is delivered through must allow for interaction between the deliverer and the recipient. This allows the recipient to ask questions as she is receiving the information. This format insures that the information is clearly understood and can be properly acted upon. This means that personal attention usually accompanies the delivery of the information. As a result of the personal attention provided by the agency, a direct relationship may develop between the agency staff member and the individual receiving the educational information.
4.4. Informing the Public

4.4.1. Definition

Informing means, to give or impart knowledge of a fact or circumstance (Random House Dictionary, 1993) The communication category, “informing the public”, thus refers to information in the form of knowledge or facts that development agencies provide to the public. The knowledge can take the form of a development study that analyses the options for the reuse of a track of land that the municipality has recently acquired. Facts can take the form of meeting times, locations, and dates.

The informing citizens classification of communication covers a number of agency responsibilities referenced in Appendix C. These responsibilities include: informing developers of land use studies; informing interested citizens of zoning board decisions; informing citizens of the results of neighborhood planning studies; informing citizens of proposed park/open space projects; informing unemployed citizens of potential employment opportunities; providing under skilled citizens with information on job training opportunities; informing citizens of programs that provide housing rehabilitation and maintenance assistance. In the following example, the process for informing citizens of the results of the neighborhood planning studies is summarized to illustrate how the informing citizens classification of agency communication is operationalized.
4.4.2. Example

Development agencies make an effort to inform the public about the status of development projects. This is commonly true for projects that are perceived to be important in the eyes of the public. One of the interviewees commented on a development project that the members of the community followed carefully. The town was in the process of redeveloping a piece of land that had previously served as a land fill, and many members of the community were interested in the plans being developed for the future use of the site.

In an effort to keep the citizens informed, a member of the town planning agency used two strategies to inform the public about future site development plans. The planner developed a monthly newsletter that was distributed to a list of approximately two hundred town citizens interested in following the development plans, and the planner sent information to a journalist from the town’s community newspaper who authored a series of articles on the progress of the project.

4.4.3. Category characteristics

Motivation

Information classified within the "informing the public" category is generally communicated to the public as the result of an internal agency motivation. The agency might be motivated to communicate with the public in
order to publicize an agency event with the purpose of increasing public participation, or the agency might want the public to be more knowledgeable about agency activities so that they can be more informed participants in the project development process.

Methods

The information found within the informing the public category is often meant to be widely distributed to as many members of the public as possible. As a result of the agency's desire to reach a mass audience, mass media types of delivery methods such as newspapers, public access cable television, and community meetings are often appropriate means for delivering information. In some cases the information is to be sent to a smaller group, such as in the case of a newsletter. In this case, the information is more targeted in nature and can be delivered to the intended audience through a more direct channel such as the mail.

Volume

The information provided varies in volume, it can range from a one line listing of a planning board meeting to the broadcast of an actual planning board meeting on public access cable television. Generally, the information is not tailored to appeal to a specific audience; rather, agencies want to expose the information to a mass audience.
In the following chapter, the current computer communication methods that organizations are using to communicate with the public.
Current Computer Communication Methods

Research Objectives 3 and 4 serve as the focus of this chapter. The goal of research objective three is to identify how development agencies currently use computer communication methods to communicate with the public. This knowledge might be useful to development agencies by allowing to view where they stand relative to other agencies and possibly allow these agencies to gain an understanding of the potential future uses of computer communication successfully implemented by other development agencies.
The goal of the fourth research objective is to characterize the degree that the interviewees and the agencies they work for currently use computer communication to communicate with the public. An understanding of the extent that development agencies and employed staff use computer communication methods may aid development agencies in identifying the skills and equipment their agency might need to bring their agency’s use of computer communication to a more technologically sophisticated level.

Current computer communication methods are examined at two levels, the individual level and the agency level. These two levels are handled separately in this chapter, so the chapter is divided into two parts. Part 1 deals with how individuals, those interviewed, use current computer communication tools. Part 2 deals with how the agencies of the individuals interviewed currently use computer communication methods to communicate with the public.

5.1. Individual Level

There were a series of questions posed during the interview phase of this study to examine and categorize the computer communication methods used by select municipal planning and community development agency staff members. Discussion question IV.2. in Appendix C posed during the interview process, asked whether the interviewee has used the World Wide Web in the past, and if
the interviewee has used the World Wide Web where is their access. The purpose of this question was to examine whether the interviewees have access to computer communication tools such as e-mail and the World Wide Web and whether their agency serves as this access point.

Table 5.1, on the following page, lists the results of interview question IV.

2. As the table shows, eight of the sixteen individuals interviewed have never used computer communication methods or used these tools only one time in their lives. Eight of those individuals interviewed have access to computer communication tools at work. None of those individuals interviewed have access at their homes, and none of those individuals interviewed have used a computer communication tool through a public access point such as their local public library or a commercial access point such as a cyber cafe. These results show that the individuals either have access to computer communication tools at work or they do not have access at all.
Table. 5.1 Access Point for Computer Communication Methods

<table>
<thead>
<tr>
<th>Municipality</th>
<th>Interviewee</th>
<th>Computer Use/Access point</th>
</tr>
</thead>
<tbody>
<tr>
<td>Town of Arlington</td>
<td>Assist. Dir. Planning and Comm. Dev.</td>
<td>used once at daughter’s school</td>
</tr>
<tr>
<td>Town of Belmont</td>
<td>Planning Coordinator</td>
<td>never used</td>
</tr>
<tr>
<td>City of Boston</td>
<td>Research Manager</td>
<td>access at work</td>
</tr>
<tr>
<td>Town of Brookline</td>
<td>Senior Planner</td>
<td>never used the web</td>
</tr>
<tr>
<td>City of Cambridge</td>
<td>Community Development Planner</td>
<td>access at work</td>
</tr>
<tr>
<td>City of Everett</td>
<td>Community Development Dir.</td>
<td>never used the web</td>
</tr>
<tr>
<td>Town of Lexington</td>
<td>Assistant Planner</td>
<td>access at work</td>
</tr>
<tr>
<td>City of Lynn</td>
<td>Associate Director</td>
<td>access at work</td>
</tr>
<tr>
<td>City of Malden</td>
<td>Principal Planner</td>
<td>never used</td>
</tr>
<tr>
<td>City of Medford</td>
<td>Econ. Dev. Planner</td>
<td>never used</td>
</tr>
<tr>
<td>City of Newton</td>
<td>Senior Planner</td>
<td>access at work</td>
</tr>
<tr>
<td>City of Quincy</td>
<td>Principal Planner</td>
<td>access at work</td>
</tr>
<tr>
<td>City of Revere</td>
<td>Deputy Dir. of Planning &amp; Comm. Dev.</td>
<td>access at work</td>
</tr>
<tr>
<td>City of Somerville</td>
<td>Admin. and Finance Director</td>
<td>never used</td>
</tr>
<tr>
<td>City of Quincy</td>
<td>Senior Planner</td>
<td>access at work</td>
</tr>
<tr>
<td>Town of Watertown</td>
<td>Senior Planner</td>
<td>never used</td>
</tr>
</tbody>
</table>

A second question posed to interviewees relates to the how computer communications tools are used by interviewed individuals, the specific question is IV. 4. of Appendix A. The responses of the eight individuals who use computer communication methods are listed in table 5.2 on the following page. The table shows that e-mail and the World Wide Web are the only computer tools that interviewed individuals use to send and receive information. None of the interviewed individuals use more sophisticated computer communication tools such as desktop video conferencing.

E-mail is used by all eight of the interviewees who use computer communication tools. These individuals use the e-mail tool for one of three reasons; first, to communicate internally with other members of their agency;
second, to communicate with professional associates outside of their agency; and, third, to respond to information requests from members of the public.

Thus, only one of the principal reasons that the interviewed individuals use the e-mail tool is to communicate with the public.

Table 5.2 Uses for Computer Communication Methods

<table>
<thead>
<tr>
<th>Municipality</th>
<th>Interviewee</th>
<th>e-mail</th>
<th>World Wide Web</th>
</tr>
</thead>
<tbody>
<tr>
<td>City of Boston</td>
<td>Research Manager</td>
<td>internal e-mail, receive/respond to info. requests</td>
<td>research</td>
</tr>
<tr>
<td>City of Cambridge</td>
<td>Comm. Dev. Planner</td>
<td>internal e-mail</td>
<td>access HUD</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>regulations</td>
</tr>
<tr>
<td>Town of Lexington</td>
<td>Assistant Planner</td>
<td>commun. with professional associates</td>
<td>data collection</td>
</tr>
<tr>
<td>City of Lynn</td>
<td>Associate Director</td>
<td>very infrequent use</td>
<td>access HUD</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>regulations</td>
</tr>
<tr>
<td>City of Newton</td>
<td>Senior Planner</td>
<td>commun. with professional associates</td>
<td>access HUD</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>regulations</td>
</tr>
<tr>
<td>City of Quincy</td>
<td>Principal Planner</td>
<td>occasionally responds to info. requests</td>
<td>access HUD</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>regulations</td>
</tr>
<tr>
<td>City of Quincy</td>
<td>Senior Planner</td>
<td>coord. Comm. Mtgs., commun. w/ profess. assoc.</td>
<td>access HUD</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>regulations</td>
</tr>
</tbody>
</table>

A third question posed to gain insight into how individuals use computer communication tools was question IV. 3. The question asks how frequently computer communication tools are used by the individuals interviewed. The responses of the sixteen are listed in table 5.3 on the following page.

These interview results show that interviewees make very limited use of computer-based communication methods. When used these methods are employed mainly to gather information to fulfill personal agency responsibilities rather than to communicate with the public. A small number of those interviewed do use e-mail to respond to information requests; however, the
interviewees mainly provide information to other agency professionals rather than to the public. None of the interviewees have ever posted information on the World Wide Web and none of the interviewees have the skills required to post information on the World Wide Web. These results show that computer communication methods play a very limited role in the way that interviewees communicate with the public.

There are several reasons that interviewees said that they are not using computer communication methods. First, several of those interviewed simply do not have access to the tools required to use computer communication methods at their offices. Although interviewees have never used these tools, they are anxious to begin using these tools and they feel the need to begin using these tools as soon as possible. Several of the interviewees, such as those from the towns of Watertown, Belmont, Lexington and Quincy, Arlington, and Cambridge expressed the need to get "wired" as soon as possible. In fact, during the interview I sensed that interviewees were defensive about their lack of computer communication capacity. The interviewees feel pressure to be "wired" from high level elected city officials such as the mayor and council members to be able to begin providing access to municipal service information on the World Wide Web in order to be as responsive as possible to the needs of constituents. Municipal residents themselves are also exerting pressure on
development agency officials to provide electronic access to municipal agency
information.

A second reason that interviewees have not used computer
communication methods to communicate with the public is due to their lack of
computer skills. Several of the interviewees do have access to computer
communication methods with in their agencies but are not using these tools
because they say that they lack the required skills. This may be a legitimate
explanation for the true feelings of interviewees. This response might also e
interpreted as an excuse used by interviewees to mask their feelings of
intimidation related to computer technology.

A third reason that interviewees stated that they are not using computer
communication methods is due to the time required to develop the skills. The
interviewees said that they are already stretched to accomplish the their current
required tasks and that setting aside time to develop computer communication
skills is not a reasonable expectation. Those interviewees who currently use
computer communication tools have acquired these skills on their own personal
time away from work as the result of personal interest and curiosity. This points
out that if the individuals who currently lack the skills are to acquire them, they
will either have to gain them on their own time or development agencies will
need to provide time during regular hours of operation for staff members to
acquire these skills. An additional point to consider is that the individuals who have the skills may have a self-guided learning style while those who lack the skills may need to be guided through the learning process so the agency may need to provide individuals who lack the skills with formal training.

Although these results show that considerable progress needs to be made before interviewees begin using computer communication when communicating with the public, these results do necessarily show mean that those interviewed or the individuals who occupy the same development agency positions will not use computer methods in the future. Getting behind the issue of whether lack of use is due to a lack of time that might be remedied by permitting interviewees to develop the skills during regular agency hours of operation, is due to feeling of technical intimidation, or is due to learning style issues is an issue that was not specifically focused on in this study and may merit further examination in the future.
Table 5.3. Computer Communication Method Frequency of Use

<table>
<thead>
<tr>
<th>Municipality</th>
<th>Interviewee</th>
<th>Never</th>
<th>Daily</th>
<th>Weekly</th>
<th>Monthly</th>
</tr>
</thead>
<tbody>
<tr>
<td>Town of Belmont</td>
<td>Planning Coordinator</td>
<td></td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>City of Boston</td>
<td>Research Manager</td>
<td></td>
<td></td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Town of Brookline</td>
<td>Senior Planner</td>
<td></td>
<td></td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>City of Cambridge</td>
<td>Community Development Planner</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>City of Everett</td>
<td>Community Development Dir.</td>
<td></td>
<td></td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>Town of Lexington</td>
<td>Assistant Planner</td>
<td></td>
<td></td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>City of Lynn</td>
<td>Associate Director</td>
<td></td>
<td></td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>City of Malden</td>
<td>Principal Planner</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>City of Medford</td>
<td>Econ. Dev. Planner</td>
<td></td>
<td></td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>City of Newton</td>
<td>Senior Planner</td>
<td></td>
<td></td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>City of Quincy</td>
<td>Principal Planner</td>
<td></td>
<td></td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>City of Revere</td>
<td>Deputy Dir. of Planning &amp; Comm. Dev.</td>
<td></td>
<td></td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>City of Somerville</td>
<td>Admin. and Finance Director</td>
<td></td>
<td></td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>City of Waltham</td>
<td>Senior Planner</td>
<td></td>
<td></td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>Town of Watertown</td>
<td>Senior Planner</td>
<td></td>
<td></td>
<td></td>
<td>X</td>
</tr>
</tbody>
</table>

The table shows that eight of the interviewees never use computer communication tools and that eight of the interviewees use computer communication tools at varying degrees of frequency. Of the eight who use computer communication tools, one of the eight uses computer communications tools about once a month; Four of the eight use computer communication tools on a weekly basis; and two of the eight use computer communication tools on a daily basis.

5.2. Agency Level

The sixteen individuals interviewed for the study were asked to respond to questions that focus on the nature of information that their agency's provide to the public when using computer communication methods. There were two
questions posed to interviewees related to the agency level of computer communication methods. These questions focus on the World Wide Web and do not include e-mail, since e-mail is used to provide information at the individual level. The first question, question IV.1, simply asks the interviewee to provide the URL address for their agency’s Web site. As it turns out, none of the development agencies have their own web site.

The second question posed to interviewees related to current computer communication methods used at the agency level was question IV. 5 listed in Appendix A. The question asked interviewees to comment on the types of information that are posted on their agency’s Web site. As established through the previous question, none of the agency’s have their own web site; however, a number of the agencies post information on the municipality’s general Web site. This is a Web site that is often maintained by the mayor or town commissioner’s office and provides information on all municipal department’s and services.

Table 5.4, on the following page, shows the planning and community development related information posted on general municipal Web sites.
### Table 5.4 Agency Information on Municipal Web site

<table>
<thead>
<tr>
<th>Municipality</th>
<th>General Municipal Site</th>
<th>Planning and Comm. Dev. Related Info.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Arlington</td>
<td><a href="http://world.std.com/arling.html">http://world.std.com/arling.html</a></td>
<td>N/A -- currently developing info.</td>
</tr>
<tr>
<td>Boston</td>
<td><a href="http://Web.ci.boston.ma.us">http://Web.ci.boston.ma.us</a></td>
<td>N/A -- currently developing info.</td>
</tr>
<tr>
<td>Brookline</td>
<td><a href="http://Web.brookline.mec.edu">http://Web.brookline.mec.edu</a></td>
<td>Planning Board and Conservation Comm. listed</td>
</tr>
<tr>
<td>Everett</td>
<td>N/A</td>
<td>no site</td>
</tr>
<tr>
<td>Lexington</td>
<td><a href="http://lin.ci.lexington.ma.us">http://lin.ci.lexington.ma.us</a></td>
<td>Complete Zoning bylaw listed, Complete Public mtg. calendar</td>
</tr>
<tr>
<td>Lynn</td>
<td>N/A</td>
<td>no site</td>
</tr>
<tr>
<td>Malden</td>
<td><a href="http://Web.ci.malden.ma.us">http://Web.ci.malden.ma.us</a></td>
<td>Community demographics</td>
</tr>
<tr>
<td>Medford</td>
<td><a href="http://Web.Medford.org">http://Web.Medford.org</a></td>
<td>N/A -- no plans to develop info.</td>
</tr>
<tr>
<td>Newton</td>
<td><a href="http://Web.ci.newton.ma.us">http://Web.ci.newton.ma.us</a></td>
<td>clickable map of proposed dev. projects, staff and functions</td>
</tr>
<tr>
<td>Quincy</td>
<td><a href="http://ci.quincy.ma.us">http://ci.quincy.ma.us</a></td>
<td>N/A -- currently developing info.</td>
</tr>
<tr>
<td>Revere</td>
<td>N/A</td>
<td>no site</td>
</tr>
<tr>
<td>Somerville</td>
<td>N/A</td>
<td>no site</td>
</tr>
<tr>
<td>Waltham</td>
<td><a href="http://Web.city.waltham.ma.us">http://Web.city.waltham.ma.us</a></td>
<td>staff contact info., demographic info., housing loan/rehab. info</td>
</tr>
<tr>
<td>Watertown</td>
<td>N/A</td>
<td>no site</td>
</tr>
</tbody>
</table>

Table 5.4 above shows five of the sixteen municipalities, those with the N/A notation in the far right table column, do not have a Web site. One of the sixteen municipalities has a general Web site without a link to development agency information. Three of the sixteen municipalities have a general Web site and are in the process of developing plans for a link to development agency related information. The remaining seven municipalities have a link to development agency related information from their general municipal Web site. The nature of development agency related information provided on general municipal Websites varies from one municipality to another. Table 5.5 lists the nature and frequency of uses for development agency related information that is included on links off general municipal websites.
These interview results show that a majority of the development agencies interviewed do provide information to the public using the World Wide Web. However, it is important to note that the five agencies that do not have development agency World Wide Web access are from municipalities that have population that are less affluent than those that currently provide information through the World Wide Web. It will be important to follow the adoption of computer communication capacities in the future to analyze whether less affluent communities still have not adopted these capabilities. If this is the case than it may be necessary for the initiation of intervention by a governmental body to assure that all citizens have equal access to public services provided through computer communication. Equal access to computer communication is an issue that deserves more in-depth treatment, but is an issue that is not going to be dealt with in this study beyond the mention of its importance.

Table 5.5 Nature and Frequency of Use

<table>
<thead>
<tr>
<th>Nature of Use</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>Agency mission &amp; responsibilities</td>
<td>2</td>
</tr>
<tr>
<td>Agency staff contact information</td>
<td>2</td>
</tr>
<tr>
<td>Clickable map of proposed community development sites in locations around the municipality</td>
<td>1</td>
</tr>
<tr>
<td>Community demographics</td>
<td>2</td>
</tr>
<tr>
<td>Complete listing of Municipal boards and commissions</td>
<td>1</td>
</tr>
<tr>
<td>Complete Zoning bylaws</td>
<td>1</td>
</tr>
<tr>
<td>First time home buyer loan information and housing rehabilitation information</td>
<td>1</td>
</tr>
<tr>
<td>Neighborhood background information</td>
<td>1</td>
</tr>
<tr>
<td>Public meeting calendar; times, dates, and locations</td>
<td>2</td>
</tr>
</tbody>
</table>
Table 5.5 shows that interviewed development agencies use the World Wide Web to inform the public about their agency’s purpose and to provide information about who the public can contact with questions regarding various agency functions. Agencies also currently use the World Wide Web to inform the public about the dates of certain agency events. Development agencies also use the WWW to educate the public about issues such as the municipality’s zoning bylaws, neighborhood background information, community demographics, and first time homebuyer information.

This table also shows that development agencies are beginning to make a commitment to using computer methods to communicate with the public. Although current development agency use of these methods currently is limited in both breadth and depth. The important point to make related to current development agency use of computer communication methods is that these agencies are beginning to take steps toward providing development agency information through computer methods. This will allow agencies to begin gaining knowledge about how these methods can be effectively used to communicate with the public and to inform agencies about computer communication uses that are and are not appropriate. As pioneering development agencies take these first steps and document the reasons for their successes and failures, other agencies will be able to learn from the experiences of these pioneering agencies.
While speaking with the Assistant Director of Planning and Community Development from the Town of Arlington, the first of sixteen agencies interviewed, it became evident that there is a progression of steps along a continuum of technology implementation that characterizes the extent of agency communication use. As a result of this early insight, the remaining interviewees were asked questions meant to assess where their agency is positioned along the continuum of computer tool implementation.

There are two stages along the continuum between no agency capacity to deliver information through computer communication methods and full agency capacity to deliver information through computer communication methods. The first stage of the continuum, hardware infrastructure, includes two principal components, a personal computer and networking components. A personal computer is a familiar component, but the networking aspects of the hardware infrastructure are less familiar, so an explanation of these components is included in the following paragraph.

The first networking hardware component is the wiring used to link computers together into an internal network. Wiring also serves as the link through which data in the form of packets of digital signals passes into and out of the organization to other locations around town or across the country. The
connection between organizations across town or across the country is commonly referred to as the Internet. The second networking hardware component is the network switches and routers used to route computer communication messages within the agency’s internal network as well as to pass and receive messages from outside the agency.

The full implementation of hardware infrastructure permits agency staff to focus on the second state of the continuum, software tools, as agencies work towards full computer communication capacity. The software tools are application programs installed on personal computers that facilitate computer communication. There are two software based computer communication methods that interviewees stated that their organizations use. These two methods are electronic mail and the World Wide Web. The software tools that interviewees need to send and receive e-mail are known as e-mail clients. The software tools that interviewees use to assess information on the World Wide Web (Web) are known as Web browsers. Table 5.6 on the following page characterizes agency computer communication capacity.
Table 5.6 Agency Computer Communication Capacity

<table>
<thead>
<tr>
<th>Municipality</th>
<th>Agency</th>
<th>Hardware</th>
<th>Software</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>PC</td>
<td>Network</td>
</tr>
<tr>
<td>Town of Arlington</td>
<td>Dept. of Planning and Comm. Dev.</td>
<td>X</td>
<td>O</td>
</tr>
<tr>
<td>Town of Belmont</td>
<td>Office of Community Development</td>
<td>X</td>
<td>I</td>
</tr>
<tr>
<td>City of Boston</td>
<td>Boston Redevelopment Dept.</td>
<td>X</td>
<td>E</td>
</tr>
<tr>
<td>Town of Brookline</td>
<td>Planning Department</td>
<td>X</td>
<td>O</td>
</tr>
<tr>
<td>City of Cambridge</td>
<td>Community Development Department</td>
<td>X</td>
<td>E</td>
</tr>
<tr>
<td>City of Everett</td>
<td>Mayor's Office of Comm. &amp; Econ. Dev.</td>
<td>O</td>
<td>O</td>
</tr>
<tr>
<td>Town of Lexington</td>
<td>Planning Dept.</td>
<td>X</td>
<td>I</td>
</tr>
<tr>
<td>City of Lynn</td>
<td>Community Development Dept.</td>
<td>X</td>
<td>E</td>
</tr>
<tr>
<td>City of Malden</td>
<td>Planning Department</td>
<td>O</td>
<td>O</td>
</tr>
<tr>
<td>City of Medford</td>
<td>Office of Community Development</td>
<td>X</td>
<td>I</td>
</tr>
<tr>
<td>City of Newton</td>
<td>Dept. of Planning and Development</td>
<td>X</td>
<td>E</td>
</tr>
<tr>
<td>City of Quincy</td>
<td>Planning and Community Dev. Dept.</td>
<td>X</td>
<td>E</td>
</tr>
<tr>
<td>City of Revere</td>
<td>Office of Planning and Comm. Dev.</td>
<td>X</td>
<td>E</td>
</tr>
<tr>
<td>City of Somerville</td>
<td>Office of Housing and Comm. Dev.</td>
<td>X</td>
<td>O</td>
</tr>
<tr>
<td>City of Waltham</td>
<td>Planning and Community Dev. Dept.</td>
<td>X</td>
<td>E</td>
</tr>
<tr>
<td>Town of Watertown</td>
<td>Planning Dept.</td>
<td>X</td>
<td>O</td>
</tr>
</tbody>
</table>

Table 5.6 shows that computers are common tools found on staff member desks in fourteen of the sixteen agencies, represented by the X in Table 5.6, interviewed. Thus two of the sixteen agencies, represented by the O in table 5.6, do not have the foundation component required for computer communication. The X and O notation is consistent throughout the graph, so agencies with an X in the one of the four hardware or software columns have the capacity to use that component.

Eleven of the sixteen organizations have some form of network capacity. These are agencies signified by either an I or E in the table above. The I symbolizes agencies with only internal network capacity. The E symbolizes
organizations with both internal and external network capacity. The seven agencies with both internal and external network have the capacity to use electronic mail and the World Wide Web to communicate with the public.

The table show that development agencies vary considerably with regard to their readiness to implement computer communication methods. Some organizations have the capacity today while other organizations have none of the components required to implement computer communication methods. In the chapters that follow, an explanation of the obstacles that organizations must overcome prior to developing the capability to use computer communications are outlined. These obstacles help to shed insight into the reasons that there is such a wide variation in current development agency computer communication capability.
Future Model of Agency Communication

This chapter describes the computer hardware and software that might be used by development agencies to facilitate computer communication with the public. Diagram 6.1 on the following page, shows how the various hardware and software aspects of the development agency computer communication model might fit together. Following the diagram is a description of the various computer software and hardware tools that both users and providers of information can employ to deliver and receive information through computer communication is provided. The explanation is divided in two parts, the user side and the agency side.
Diagram 6.1 System Architecture to Support Computer Communication

- Development Agency
  - Standard Database Files
    - job listings files
    - available housing files
    - available commercial property files
    - property owner address files
  - Spatial Database Files
    - map files
    - motion video files
    - VR files
    - GIS coverage layer files
  - Hypertext Files
    - community history files
    - planning study files
    - social service program files
    - zoning bylaws
    - current project status
    - organization information files
  - Middleware Programs
    - prioritize information requests
    - database search rules
    - provide GIS functionality

- Public
  - Computer Communication Users
    - find a job
    - listing of property owner files
    - find a place to live
    - learn the municipal zoning bylaws
    - learn how to file a zoning request
    - submit an online zoning variance request
    - receive an abutter's noticeably e-mail
    - identify a location for a new retail outlet
    - browse the community history

Development Agency Staff Person

Computer Communication Users
6.1 User Side

On the far right hand side of the diagram is a rectangular box that represents the public. The long square box on the far right hand corner of the diagram includes a listing the potential ways that the public might use computer communication to interact with development agencies. These uses might include applying for subsidized housing program funds by completing an online application, learning about a municipality's bylaws, accessing a database on available jobs according to an applicant's current skills, learning about the history of a the community by accessing the municipality's community history WWW site, receiving an e-mail message about a proposed development project that is planned for a curious citizen's neighborhood, and researching the feasibility of placing a retail outlet in a specific community.

A member of the public must obtain various hardware and software tools in order to have the capability to employ the previously mentioned uses. A personal computer is the principal hardware tool that permits an individual to use computer communications. In order to have access to computer communications, a member of the public not only needs a computer with a display device, (i.e. a monitor), an input device (i.e. a keyboard and a mouse), and a central processing unit, the user also needs a modem to send and receive information from development agencies.
Information delivered between the public and development agency staff members must travel through wire networks. These wire networks are represented by dashed lines on diagram 6.1. The user must establish and maintain a connection with a local network service provider, sometimes referred to as Internet service provider (ISP), in order to send and receive information through the network. The sender, in this case, the development agency must also maintain a network connection in order to deliver information to users. The network referred to in this paragraph is commonly known as the Internet.

Various tools permit access to information through the Internet. The first tool is the World Wide Web. The World Wide Web is a set of communication standards and protocols such as hypertext transport protocol (HTTP) and a computer coding language known as hypertext markup language (HTML) that permit individuals to gain access to remote computer files located across town or across the world. Sometimes a number of files will be combined to create what is commonly referred to as a Website where a number of files are joined together through associative links, known hyperlinks. These files can be on the same computer or stored in computers on separate sides of the world, so that an individual who is browsing through information on the City of Cambridge's municipal homepage looking for information on the city's development agency can link to information about Tsukuba, Japan one of Cambridge's sister cities. Websites can be composed entirely of text as in the case of a planning report, or
the Websites can be a combination of text, three dimensional schematics, and motion video files that are combined into a hypermedia presentation.

User’s need to run a software program on their computers commonly referred to as Web browser that permits a user to type the address of the desired file or website into the proper location in his Web browser to gain access to the information listed at the desired address. The address, referred to as the Uniform Resource Locator (URL), is unique to that computer file. No other computer file can have that same address. There are several popular commercial Web browsers on the market. Netscape’s Navigator and Microsoft’s Internet Explorer are two of the most popular browsers currently in use.

E-mail is a second tool used to transfer information through the Internet. Usually an e-mail message is sent to an individual at a specific e-mail address. The e-mail file has a header file that identifies the location of the intended recipient. After the message is delivered, it sits in the recipient’s e-mail folder until the recipient opens the massage on their personal computer using a software application known as an e-mail client.

Desktop video conferencing is a third tool used to transfer information through the Internet. Desktop video conferencing permits two people to communicate sending a combined audio and video signal. Both users need a
video camera to broadcast their combined audio and video signal as well as a desktop video conferencing client application to receive the video signal. CUSEEME is a popular desktop video client application.

A tool used for sending and receiving information through the Internet is File Transfer Protocol (FTP). FTP is not an application that people commonly use to transfer messages, but rather it is an application that permits users to send and receive whole files. One way FTP can be used is to transfer a report, saved as a file, to a colleague in another city. Fetch is commonly used FTP client application.

6.2 Agency or Provider Side

There are a variety of elements on the development agency side of computer communication equation. Diagram 6.1 assumes a three tier system architecture. According to this system design. Data files are shown on the far left of the computer communication system architecture diagram. Database files are used to store raw data. These database files are often organized according to the information that they store such as standard database files that contain job listing files, available housing files, available commercial property files and property owner address files are stored in one database; spatial database files such as map files, motion video files, VR files, and GIS coverage layers are stored in another database; and hypertext files such as community history files,
planning study files, social service program files, zoning bylaw files, current project status files, and organizational information files are stored in a final database. These database files serve as the first tier of the three tier system architecture and can be thought of as the raw material that is processed through various middleware programs.

Middleware programs, shown in the middle of the system architecture diagram, are used to turn the raw data found in database files into valued information for users. Middleware programs can be used as analysis tools to set the rules for data searches that yield desired search answers. Diagram 6.1 shows middleware programs in the middle of the schematic. Middleware program can be used to search databases according to a set of search rules that the user can manipulate. Middleware programs can be used as tools to prioritize information requests. Finally middleware programs could be developed to emulate the functionality of a Geographic Information System (GIS). A GIS is usually a stand alone application that allows users to view data from a spatial perspective. This mean that a member of the public, through a GIS, could view the demographic characteristics of her town in such a way that the population densities in her town are shown according to various shaded regions on a town map. Such an implementation allows members of the public to understand the nature of their community in often never seen before ways.
Diagram 6.1 on page 72, provides details on the agency or provider side of computer communications. There are several hardware requirements that an agency that uses computer communications to provide information to the public will need. First the agency will need a computer, commonly referred to as a server, that stores the files that the agency makes available to the public through computer communications. The server must run software, commonly referred to as server software, that allows public access to agency files. In order to serve files, an agency must register a domain name with interNIC, an international body responsible for registering domain servers. The domain name is a unique address to that is specific to one and only one computer and the files stored on it. It is like the street address of your home. Your home is the only place in the world with its specific address. Having a specific street address means that people who are looking for you know where to find you. The same is true of agency information. If a person has the Web address for an agency’s publicly accessible information, than after typing that address, the only Website that should appear in their browser is the desired Website.

Diagram 6.1 shows a listing of information that might be available to the public through a development agency’s server including: a listing of available jobs, a listing of available rental housing, a listing of property owner files. These files might be communicated to the public in a variety of different ways. First, the agency could use a middleware application such as a geographic information
system (GIS) to analyze all of the property owners living within a given distance of a property that has filed a zoning variance. Once the development agency has identified the property owners living within the given distance, the staff member could generate and send an e-mail message, abutter's notice, to all identified property owners about the pending variance request to be heard by the planning board. The e-mail message could include the Web address of a site that allows interested property owners to see the exact location of the property. The agency could go even further and require the variance filer to provide a before and after images of the property for neighbors to evaluate the possible impacts of proposed changes.

The development agency may create a file of the process that first time homebuyer must follow when buying a new home. The agency could generate a middleware application that takes the homebuyer through a step by step educational description of the process.

In the following chapter, suggested future uses of the World Wide Web as a means of communicating between development agencies and the public are identified by interviewees. In addition, obstacles that might block agencies from using computer communication methods to communicate with the public are identified.
Future Computer

Communication Methods

Research Objectives 5 and 6 serve as the focus of chapter seven. The goal of the fifth research objective is to suggest ways that development agencies might use computer methods to communicate with the public. These suggestions may provide development agencies with an understanding of the computer communication methods they might use to improve communication with the public. Knowing the possibilities, such as those listed in this chapter, may stimulate development agencies to consider further investigation of the ways that they might implement computer communication strategies.
The goal of the sixth research objective is to identify potential obstacles that might block development agencies from successfully implementing computer communication methods. Knowing these obstacles may allow development agencies to understand their capacity to implement computer communication methods. In addition, knowledge of these obstacles might allow development agencies to determine strategies they could take to avoid these obstacles.

This chapter is divided into three sections. In the first section, possible future uses of the World Wide Web as a means of communicating with the public are identified by interviewees. In the second section, one suggested future use of computer communication from each of the four categories of the agency communication model is described in greater depth. In the third section, obstacles are identified that might block development agencies from successfully implementing computer communication methods.
7.1 Possible Future World Wide Web Uses

Interviewees were asked to suggest how the Web might potentially be used to communicate with the public in the future. The sixteen agencies researched during the source of this study are all at different stages of the technology implementation process. This section attempts to show how development agencies, at varying levels of current technology implementation, can evaluate their current technology implementation and to see how they could continue their evolution towards a more sophisticated level of computer communication implementation. The are divided into the four categories of development agency information provision, mandatory provision, inquiry response, educating the public, and informing the developed in the early stages of this research study along with the interactive application processing category of agency information provision identified after the interview stage of the research process.

The three categories of technology implementation include, low level technology implementation, medium level technology implementation and high level technology implementation. Low level technology implementation refers to a technology implementation that can be implemented with a minimum of technological sophistication on the part of the development agency. This means

---

5 Question V.2 of Appendix A, Discussion Questions, lists the specific question posed to agency staff members during the interview process.
that the agency could use shrink wrap software programs, developed for a mass audience of users and with a wealth of technical support available. An additional characteristic of low level technology implementation is that there is a minimum of specialized computer educated support staff required to maintain public computer communication. A medium level implementation of computer communication means a greater level of technology implementation than a low level implementation and a less sophisticated level of technology implementation than a high level technology implementation. For example, a medium level of technology implementation might mean than an organization provides web access to version of their agency’s database of available commercial properties that are for rent. A high level of implementation of computer communications refers to the highest level of technology implementation. For example, this level of technology implementation refers to an implementation where an organization not only makes a version of their commercial property available for rent through the WWW, but the agency also provides the functionality such that members of the public can perform individualized rule based queries of the database. The obstacles or drawbacks to these implementations are detailed in the obstacles section of this chapter.

Inquiry Response

Low Level

- Use e-mail to communicate with grantee organizations. In one municipality, fifteen community agencies are funded by the development agency, and they call the agency to learn about their annual grant awards.
Medium Level
- Provide public Web access to demographic data on the municipality population.
- Provide public Web access to information on residential properties that the municipality has taken ownership of due to foreclosures that are available for acquisition.

High Level
- Provide public Web access to a listing of properties that are available for commercial development. Members of the public can enter the attributes of an ideal commercial property into a search engine and receive a listing of the properties that satisfy their search requirements.

Educating the Public

Low Level
- Post the zoning bylaws on the Web in the form of an HTML document.
- Provide a listing of who to go to in the town for the response to a specific question on the Web.
- Provide public access to a community profile on the Web.
- Provide public Web access to a listing of changes in development regulations.
- Provide public Web access to municipal foundation documents such as the town bylaw and zoning bylaw.

Medium Level
- E-mail interested individuals a message about changes in development regulations.

High Level
- Develop a specialized search program that allows members of the public to identify the information from a foundation document by entering into a search program that returns the result of their search into a search results box on their screen. This saves the user time from having to scroll through an entire document trying to find the information of interest.

Informing the Public

Low Level
- Provide 24 hour Web access to general agency information so that people can get the information when they need it and are not restricted by the agency’s hours of operation.
- Provide public Web access to Economic Development reports and statistics.
• Provide public Web access to a listing of employment opportunities
• Provide public Web access to all municipal government generated and commissioned reports or summaries.
• Provide Web access to executive summaries of agency sponsored reports that people can download.
• Provide Web access to a listing of development agency meeting schedules.

Medium Level
• Provide public Web access to information on the progress of large scale redevelopment projects including drawings of the proposed project.
• Provide the public with access to a database of available jobs.

High Level
• Send e-mail messages to people who qualify for programs that exist to aid them according to previously provided personal attributes.
• Provide Web access to information on first time home buyer programs, and send e-mail messages to individuals who might qualify for an agency sponsored program. The application and information should not be provided directly on the web since classes and the application process are used to test participant resolve.
• Allow the public to search a database of available jobs according to a set of personally identified search attributes.

Interactive Application Processing

High Level
• Provide public Web access to application forms such as special permits and zoning variance requests.
• Allow the public to apply for and be issued building permits through the Web.
• Allow the public to apply for licenses over the Web.
• Allow social service clients to fill out forms over the Web.

The obstacles or drawbacks to these implementations are detailed in the obstacles section of this chapter.

---

* There is only a high level implementation classification for the interactive application classification since this is a very sophisticated implementation from the outset.
7.2. Detailed Description of Future Uses

The examples used to provide greater insight into the four communication model categories explained in chapter four are carried through in this section and serve as the basis for suggested future uses of computer communication methods by metropolitan planning and development agencies.

7.2.1. Mandatory notification

Computer communication methods have the potential for use under the mandatory notification category of communication. The example of the zoning variance process from chapter four is carried through in this example. In this example, electronic mail and the word wide web are two computer communication tools that are used to support the mandatory notification category of communication.

In the future, community planning departments may choose to distribute abutter’s notices using electronic mail instead of the United States Postal Service. Using computer communications methods to provide this information allows agencies to include the URL address for a map of the city that shows the exact location of the property for which the zoning variance is being requested. Upon receiving the URL for the proposed variance, an individual can enter the URL in their Web browser and jump to the planning department’s map site that shows proposed zoning variances. Once at the map sight, an individual will be able to
click on various map locations that represent proposed zoning variances, or enter the address for the proposed variance that they have in their electronic mail file in order to locate properties whose owners have filed variance requests.

Upon identifying the address of a proposed zoning variance, the architectural drawings showing the proposed property modifications will appear on the curious neighbor’s computer screen. The drawings will provide the neighbor with insight into the changes that will be made as a result of the variance request. In addition to an architect’s representation of the proposed plans, the neighbor will have the ability to view a photograph of the property prior to the implementation of the proposed changes in order to have a before and after perspective.

Once the neighbor views the before and after representations of the property, she will have the ability to provide her reactions through a feedback form. The planning department will be able to collect and organize all of the comments from neighbors and provide these comments to the zoning board to aid them during the decision making process. This example shows that mandatory notification might encompass more than simply the notification of an address for which zoning variance property modifications have been filed. The obstacles or drawbacks to this implementation are detailed in the obstacles section of this chapter.
7.2.2. Inquiry response

Computer communication methods have the potential for use within the inquiry response category of communication. One example from each of the three departments of a typical planning and community development agency, 1.) community planning, 2.) economic development, and 3.) community development is provided in this section. These examples are continued from chapter four.

In the case of community planning, an individual in the process of deciding whether to relocate to a new town may visit the town’s community planning department Web site to analyze the statistics on the town’s demographics to decide whether or not these characteristics fit with the person’s requirements. While browsing through information on the town’s demographics, the person may choose a link characteristics on the town’s public school system. The town may also provide access to its database of properties that violate the town’s zoning bylaw, so the prospective property owner can confirm whether or not a property of interest is in compliance with the town’s zoning bylaw.

In the case of economic development, the developer of a retail clothing store is deciding whether to purchase a specific property and wants to gather
information on available lease sites to locate a new shop. The woman goes to the city’s economic development Web site and enters the attributes of her ideal retail location such as the density of people with certain education and income levels living within a certain distance of a lease property with a specific number of square feet and with a certain mix of stores in the shopping complex under consideration. After entering the ideal attributes of a store site, the woman's screen returns a group of properties that meet her requirements. The leasing agent handling the property is listed along with the property. Additionally, the potential retailer can view the contact information of potential store sites transferred into her to do file to be followed up on later in the day.

In the case of community development, a newly pregnant low income mother logs onto a computer at her neighborhood library to access her case file maintained by the community development department. She enters her password in the database. Upon gaining access to her account, she runs an analysis of the impact of the impending birth of her second child on her monthly public housing subsidy. The results of her analysis show that she is entitled to a 30% increase in her monthly subsidy.

As the result of the birth of her second child, the woman needs to increase the size of her living space. The woman goes to the section of the community development site that lists available properties. The woman enters several
search attributes into a database search engine. She identifies the part of town
she would like to live in, her need to be located more than 1/2 mile from a stop
along a particular public transit line, and her desire to live in a particular section
of her chosen neighborhood so that her child can attend a specific elementary
school. After entering the attributes of her ideal housing unit, a list of three units
that satisfy her search attributes is returned to her screen along with the contact
information for the leasing agent who needs to be contacted so that the woman
can gain access to the available housing units for a closer look. The woman
registers her housing needs and the attributes of her ideal unit with the
community development department housing database so that e-mail notices of
available properties can be e-mailed to her over the next four weeks, a time
period that the searcher determines. The obstacles or drawbacks to these
implementations are detailed in sections of this chapter that follow.

7.2.3. Educating the public

Computer communication methods have the potential for use under the
educating the public category of communication. The example used to illustrate
potential future uses of computer communication tools to educate the public is
the same example used to explain the category in chapter four.

The zoning variance process is not a simple process for citizens to
understand and successfully engage who have not previously been involved in
the process. Using computer communication in the future, variance filers might go to the town's community planning department Web site and select an icon for the zoning variance process. After selecting the icon for the zoning variance process, the filer comes to a page that asks him to enter the address for the variance is being filed, his personal contact information, and the nature of his variance request. This process registers the variance request with the town's planning board. This information is run through a program and the steps that the individual must follow to move through the variance process are listed. The filer has the variance process information forwarded to his personal to do list. As he takes a look through the steps in the process, he has one question about the second stage of the process. An input box on the variance process page allows the filer to e-mail questions to a member of the zoning variance staff. The filer is guaranteed a response to his question with in two working days of posing the question. The obstacles or drawbacks to this implementation are detailed in the obstacles section of this chapter.

7.2.4. Informing the public

Computer communication methods have the potential for use under the "informing the public" category of communication. The example used to illustrate potential future uses of computer communication tools to inform the public is the same example used to explain the category in chapter four.
Development agencies make an effort to inform the public about the status of development projects. This is especially true of projects that a significant portion of the public have a keen interest in following. Computer communication methods could be used by development agencies when "informing the public". In the example below, the computer communication methods replace the more traditional communication method, the newsletter, that was previously published to inform citizens of the progress of a project.

The example outlines how computer communication methods could be used throughout the plan development and implementation process. During the earliest stage of the process, the agency could send out an e-mail message to all citizens in the town notifying them of the need for public input for a proposed development project. The e-mail message could include the URL address of a town planning site that outlines the advantages and drawbacks of redeveloping of an old town landfill. At this early stage of project development, the WWW site may provide a place for public recommendations for future site uses.

If the process happens to have progressed through the recommendation stage and to the plan design stage, the Web site may provide an architect's plan for the future site that illustrates how the recommended improvements might look once the site has been redeveloped. Again, there would be a place on the site for the public to comment on the proposed plans.
If the project was even further along through the development process, and the plans were finalized and implemented, the agency web site could show images of the "built out" project. The site could also include images of the site before the improvements so that the public could contrast the images of the site before and after completion of the site improvements. In addition to before and after images, there could be an explanation of the steps that were followed to complete the project such as the recommendations from members of the public that were included in the final design plan and eventually implemented at the site. There could also be a description of the funding sources that had to be gathered in order for the project to become a reality.

7.3. Obstacles

In this section obstacles that might block metropolitan planning and development agencies from successfully implementing and utilizing computer communication method are identified. This section is organized in two parts. In Part 1 describes general obstacles that are consistent across the four communication categories are discussed. These general obstacles include: public computer literacy, public infrastructure requirements, agency staff skill requirements, agency content maintenance requirements, agency infrastructure requirements, and agency system maintenance requirements. In Part 2 category
specific obstacles that are of special concern to one of the four specific categories are discussed.
7.3.1. General obstacles

A number of obstacles face agencies as they consider implementing computer communication methods. A number of these obstacles are agency specific. Agencies must acquire the equipment and personnel to deliver and develop the information or content to the public. A number of these obstacles are public specific. The public requires a certain knowledge base or the possession of various hardware and software tools to be able to receive agency information.

Public computer literacy

The public must have the technological literacy to configure their computer systems to send and receive computer communication information. The computer hardware and software developers and network access providers are making their products and services increasingly more “user friendly” to use; however these products and services remain complex components to set up.

Public infrastructure requirements

The public must have the infrastructure required to receive the messages. The computer components the public needs to receive information through computer methods include a computer, a network connection and software tools, such as e-mail client and a Web browser. These computer components have an initial start-up cost to acquire. A computer with the proper network access tool such as a modem costs at least $1,000.00 to acquire, and the monthly connection
fees to gain access to a network in order to receive e-mail and browse Web information typically cost at least $9.95 a month.

Agency staff skill requirements

Knowledge and skill are required to develop the WWW based such as searchable databases of available employment opportunities, residential housing options, retail store locations, or corporate office space as well as html documents such as town zoning bylaws. Knowledge and skill are also required to develop an interactive application processes such as one that allows contractors and property owners to apply for special permits and request zoning variances online. These database and WWW development skills are not skills that the typical development agency staff members possess. None of the sixteen development agency staff members possess these skills, so in order for these computer communication uses to be realized, development agencies either need to hire staff with these skills or contract for these service to be provided.

Agency content maintenance requirements

Once created, the content that agencies develop and serve to the public must be maintained. For example, new employment opportunities constantly become available and need to be included in agencies’ Web accessible databases. In addition, amendments are occasionally made to a city’s zoning bylaw that need to be included in the WWW accessible version of the city’s zoning bylaw.
These changes constantly must be updated in a non-computer communication environment and are smoothly absorbed in this non-networked world; however, systems need to be established that allow this information to be smoothly absorbed into a networked world as well. If agencies are not able to provide the most up to date information on-line than agencies run the chance of frustrating the public and cause them to disengage from using computer communication methods.

Agency infrastructure requirements

In order to successfully implement computer based communication strategies, the development agency must acquire the system hardware and software required to serve content to the public. Hardware components include: computer servers that store the information that the public accesses, the internal network components such as routers and hubs that allow information to be transferred between agency staff members, wiring that links computers connected to an agency’s internal network as well as link the internal development agency network to the networked world outside of the agency. Software requirements include the server software that the agency needs to run on its computer server that organizes the information files stored on the machine and that provides permission for members of the public to access files classified as publicly accessible. It is advisable for server software to include a security
program that keeps uninvited guests from accessing files that are not meant for their access.

Agency system maintenance requirements

The planning department will most likely have to commit permanent staff resources to keeping its computer communication system functioning smoothly. Often organizations that provide such computer communication access have a staff person, commonly referred to as a network administrator on staff to maintain the organization’s computer systems. Depending on the extensiveness of the organization’s internal network, the network administrator might have the capacity to maintain the agency’s internal as well as external computer communication requirements. Generally, planning and development agencies exercise considerable fiscal flexibility to maintain current staff members much less hire an additional staff member with network administration skills.

7.3.2. Category specific obstacles

Mandatory notification

One characteristic of mandatory notification that presents an obstacle to computer implementation is the requirement for 100% accessibility that is the benchmark established by the United States Postal Service. This means that 100% of the property owners need to be able to be reached through e-mail.
Currently, only about 35% of the households in the United States have computer communication capability.

Inquiry response

One characteristic of “inquiry response” that presents an obstacle to computer implementation is the broad range of questions posed to agencies. Agencies will need to create responses to this broad range of questions and have the responses available in a publicly accessible database. The public will most likely not have the patience to search a large index for their response. Instead, they will want to quickly enter the nature of their question, and have an answer provided promptly. At the very least, the public might be willing to search an index location that lists the response to their question rather than simply having the exact question appear on their screen in a response.

For example, a person might inquire about the total population of individuals over the age of 65. The most convenient response from the perspective of the person posing the question would be to have the exact number, say 7,531 people, appear in a response box on the screen; however, this is actually a complex software engineering task that is in all likelihood beyond the financial resources of an agency to develop. A coalition of agencies from across the state or even the country might be able to commission the development of such a project, but coordinating the interests of these agencies so
that they agree to design specifications presents additional hurdles to the implementation process.

Another strategy that agencies might use to allow the public to pose questions through a computer method is to enter the nature of the question in an inquiry box and have an index location appear in an inquiry response location on the screen that the user can click to read information on the question posed. This method essentially employs search engine technology that is currently widely used, so it does not pose the same degree of technical obstacles as the method outlined in the above paragraph.

Another obstacle to the implementation of a computer method for inquiry response is that the organization will need to make a considerable initial investment to identify the range of questions that the public might pose and then generate the content that provides the responses to these questions.

Educating the public

One characteristic of the "educating the public" category that presents an obstacle to computer implementation is the development of a process and software tools that allow the public to go through an iterative educational process. The development of such a process will involve a considerable resource commitment on the part of agencies not only to collect the information to be
included in the educational process, but more importantly to develop the software tools that permit this learning process. A collective approach on the part of many agencies, such as a statewide or national effort, might bring greater resources to the table, but the coordination efforts of bringing so many groups to the table has important organizational considerations that present implementation obstacles.

Informing the public

One characteristic of the “informing the public” category that presents an obstacle to computer communication implementation is anticipating the information that the public might want to assess and developing a method that allows the public to be informed of this desired information. Simply sending out mass e-mail messages that inform the public about upcoming meetings or the availability of agency sponsored reports might cause members of the public to become overwhelmed with information and cause the public to disregard development agency e-mail messages. In an attempt to keep the public from suffering information overload, agencies need to make this process meaningful for the public and effective for the agency.

Perhaps the agency can send a brief questionnaire to the public inquiring about the issues that they identify as important. The agency can then tag e-mail messages with importance ratings that the public can use to judge the urgency of
incoming messages. This might mean that the public reads a couple of the messages they have identified as important rather than disregard all e-mail messages originating from development agencies. This method would require a significant initial commitment on the part of the agency and the public as well as an ongoing investment on the part of the agency. These issues present obstacles to implementation.

The next chapter provides a conclusion for this research study and is organized in four parts. Part 1 is a general study synopsis. Part 2 lists possible advantages to computer communication methods. Part 3 describes cautions that agencies may want to heed as they move forward in their computer communications strategies. Part 4 lists possible avenues for future research related to the provision of information to the public through computer communication methods.
Conclusion

This chapter provides a conclusion for this research study and is organized in three parts. Part 1 is a general study summary. Part 2 describes cautions that agencies may consider as they move forward in their attempts to develop computer communications. Part 3 lists possible avenues for future research related to communicating with the public through computer communication methods.

8.1. Study Summary

The goal of this study was to examine six research objectives: 1.) The communication responsibilities that development agencies must fulfill relative to the provision of information to the public; 2.) Current non-computer communication methods that municipal planning and community development
departments employ when providing information to the public; 3.) The ways that municipal planning and community development departments are currently using computer communication methods to communicate with the public; 4.) The degree that the interviewees and the organizations they work for currently utilize computer communication methods to communicate with the public; 5.) Future ways that metropolitan planning and development agencies might use computer communication methods to communicate with the public and; 6.) Obstacles that might block metropolitan planning and development agencies from successfully implementing and utilizing computer communication methods.

Development agencies have important responsibilities related to the provision to the public. As the result of emerging information technologies, these agencies have the opportunity to explore new methods for providing this information to the public and improve their ability to meet these communication responsibilities.

8.2. Cautions

8.2.1. Public service inequities

Although only a few municipalities are included in this study, the study describes how emerging information technologies can be used to provide new services to the public. The study shows that municipalities with greater financial
resources at both the agency and the individual levels are ahead of those municipalities with fewer resources in the implementation of computer information methods.

This study brings to light an important public policy question, will those municipalities with greater resources continue to develop their computer methods for communication and be able to provide greater services to the public while those communities with less resources are unable to provide comparable services. Will this mean that the municipality where an individual decides to locate her residence determines the level of public services she receives?

8.2.2. Public Adaptation to computer communication methods

This study is written from the perspective that assumes the general public will positively respond to the ability to use computer technology methods to gather information from development agencies. The public is not accustomed to using computer communications methods and ultimately may react negatively to this means of communication. Personal reactions to these new computer communication methods will need to be examined and assessed prior to agency implementation.
8.2.3. Implementation without reason

Having ability to provide services through computer methods exists does not mean that using this option is the best strategy for providing information to the public. It is advisable that a few agencies study current public communication techniques and then implement computer strategies and compare the advantages of traditional public communication methods and compare these with computer communication based methods. This will provide the development agency with a clearer understanding of the advantages and obstacles that computer communication methods might provide their agency. Other development agencies can use this information as a benchmark when deciding to implement computer provision strategies of their own.

8.3. Avenues for further research

8.3.1. Public information needs

This research is organizationally based and focuses on the information that agencies might provide to the public. An important question to examine prior to the development of a public communication system is to examine the information that members of the public might want to receive from planning and development agencies.
8.3.2. agency resource requirements

While the study identifies the resources that agencies might need to employ to deliver the information through computer communication methods, accurate figures of the amount of financial resources that an organization might require to implement computer methods have not been identified. For organizations to take the steps along the development process towards the implementation of computer communication strategies, these organizations may need to have a clearer understanding of the financial amounts they need to commit to the implementation of such a system.

Will municipalities have to support the implementation of computer information methods themselves or will they be able to turn to the government to balance the resources available for the development of such communication techniques, so that resource abundant and resource barren municipalities alike will be able to provide the same level of services to the public? This is an important issue that needs to be watched as development agencies begin implementing computer communication methods.

8.3.3. Public accessibility

Will the percentage of homes capable of receiving computer communication information from development agencies remain at their current penetration levels or will they reach the near ubiquitous penetration rates
associated with other communication mediums such as the television and telephone which both have 98% penetration rates in American homes? This is an important consideration that agencies will want to have a firm grasp on prior to developing computer methods, since it is unlikely that these organizations will want to support two separate systems for communicating with the public, one similar to current non-computer methods and one that incorporates computer provision techniques.

This leads to the related question of the threshold that agencies will use to determine when to implement computer-base communication methods. Is the threshold 75% of households with computer-communication accessibility or is the threshold at least 90%? Only time will tell the levels of computer communication household penetration.

Will these penetration levels be attained through market forces that cause the price of the required components to drop and the necessity of having computer methods to increase, or will a government program need to be developed such as the provision of tax incentives that households use to acquire the required components that individuals such as present speaker of the House of Representatives, Newt Gingrich, has suggested.
Appendix

Appendix A: Discussion Questions

I. Background questions

1. Interviewee background
   a. organization that the interviewee works for
   b. interviewee’s job title
   c. job responsibilities

2. Organizational background
   a. organization’s principal responsibilities
   b. how large is the organization’s staff
   c. does the organization perceive itself as having a role of providing
      information the public
   d. time/resources committed to public communication

3. Community characteristics
   a. density (persons per sq. mi.)
   b. land area (sq. miles)
   c. Population
   d. households
   e. per capita income
   f. median household income

II. Current organizational communication

1. Kinds of information these organizations provide to the public.

2. How information is provided to and gathered from the public

   community meetings
   reports
   community access television
   phone conversations
   mailings
   World Wide Web
   newspapers

3. How many people does the information currently reach?

4. Does the organization respond to information requests from the public?

5. How are information requests made?
6. Frequency of information requests.

7. Do information requests of the same general type or are they highly specific?

8. Is there information that you want to provide but are unable to provide?

III. Communication mandates
   1. Is the organization mandated to provided/gather information to/from the public
   2. How sets the mandates?
   3. Do mandates describe the format for providing/collecting information. If so, describe the format.

IV. Current computer communication methods
   1. Organization’s web address
   2. Has the interviewee used the World Wide Web in the past. If yes, where is the access point? work, home, library, other
   3. How often is the Web used? daily, weekly, monthly
   4. How do you use the World Wide Web/Internet: (electronic communications mediums)
   5. Is the Web used to post information about organization’s activities.

      reference the research into the city web sites, at this point only Newton has planning related information posted on the site

      describe which planning departments are referenced off of the city’s official home page

      Other than Newton’s description of proposed development activities the Web is used only to post meeting information

V. Future computer communication
   1. Is the organization making plans to use the World Wide Web to provide information the public.

      everyone commented on how important the Web for future communication, but only
the BRA provided a strategy for use.

2. How might the World Wide Web be used in the future.
## Appendix B

<table>
<thead>
<tr>
<th>Responsibility</th>
<th>Info Provision Requirements</th>
<th>Current Methods</th>
<th>Computer Methods</th>
</tr>
</thead>
<tbody>
<tr>
<td>I. Community Planning</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Land use zoning</td>
<td>notify citizens of proposed zoning variance requests</td>
<td>flyers, mailings, newspaper</td>
<td>e-mail, Web</td>
</tr>
<tr>
<td></td>
<td>educate citizens of the zoning variance process.</td>
<td>phone conversations, drop-in visits</td>
<td>e-mail, Web</td>
</tr>
<tr>
<td></td>
<td>educate citizens of current land use regulations</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>inform citizens of land use studies</td>
<td>newspapers, direct mail</td>
<td></td>
</tr>
<tr>
<td></td>
<td>inform citizens of zoning board decisions</td>
<td>newspapers, cable T.V.</td>
<td></td>
</tr>
<tr>
<td>Urban Design</td>
<td>notify citizens of proposed design review decisions</td>
<td>flyers, mail, newspapers</td>
<td>e-mail, Web</td>
</tr>
<tr>
<td></td>
<td>educate citizens about urban design guidelines</td>
<td>phone conversations, drop-in visits, public lib.</td>
<td>e-mail, Web</td>
</tr>
<tr>
<td>neighborhood planning</td>
<td>inform citizens of the results of neighborhood planning studies</td>
<td>comm. meetings, newspapers</td>
<td>e-mail, Web</td>
</tr>
<tr>
<td></td>
<td>provide info. on funded dev. comm. projects</td>
<td>meeting, newspapers</td>
<td>e-mail, Web</td>
</tr>
<tr>
<td>parks/open space planning</td>
<td>inform citizens about proposed park/open space projects</td>
<td>newsletters, newspapers, comm. meetings</td>
<td>e-mail, Web</td>
</tr>
<tr>
<td>Gen Citizen comm. knowledge</td>
<td>distribute demographic info.</td>
<td>telephone, direct mailing</td>
<td>e-mail, Web</td>
</tr>
<tr>
<td>Responsibility</td>
<td>Info Provision Requirements</td>
<td>Current Methods</td>
<td>Future Computer Methods</td>
</tr>
<tr>
<td>-------------------------------------</td>
<td>---------------------------------------------</td>
<td>-------------------------------------------</td>
<td>-------------------------</td>
</tr>
<tr>
<td>II. Economic Development</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>econ. growth</td>
<td>distribute market information</td>
<td>reports, phone conversations, e-mail, Web</td>
<td></td>
</tr>
<tr>
<td>Business Development</td>
<td>distribute info. on available lease/dev. sites</td>
<td>drop-in, phone</td>
<td>e-mail, Web</td>
</tr>
<tr>
<td>Employment</td>
<td>inform citizens of employment opportunities</td>
<td>drop-in, phone conversation, direct mailing</td>
<td>e-mail, Web</td>
</tr>
<tr>
<td>Regulations</td>
<td>educate about business regulations</td>
<td>phone conversation, drop-in e-mail, Web</td>
<td></td>
</tr>
<tr>
<td>Small business Assist.</td>
<td>provide business plan assistance</td>
<td>one-on-one consultation e-mail, Web</td>
<td></td>
</tr>
<tr>
<td>New Venture Funding</td>
<td>provide info. on available funding</td>
<td>one-on-one consultation, phone conversation</td>
<td>e-mail, Web</td>
</tr>
<tr>
<td>Workforce Development</td>
<td>provide Job training information</td>
<td>workshops e-mail, Web</td>
<td></td>
</tr>
<tr>
<td>III. Community Development</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Affordable Home ownership</td>
<td>homebuyer training the process</td>
<td>workshops, one-on-one consultation e-mail, Web</td>
<td></td>
</tr>
<tr>
<td>Housing Stock maintenance/improvement</td>
<td>inform citizens of programs to assist in housing rehab /maintenance</td>
<td>workshops, one-on-one consultation e-mail, Web</td>
<td></td>
</tr>
<tr>
<td>Affordable Housing information</td>
<td>distribute info on available lease/purchase options</td>
<td>one-on-one consultation e-mail, Web</td>
<td></td>
</tr>
<tr>
<td>Interaction with social service providers</td>
<td>distribute information to non-profit organ. re: grant apps</td>
<td>mailings, phone e-mail, Web</td>
<td></td>
</tr>
</tbody>
</table>
## Appendix C

### Agency Responsibilities

<table>
<thead>
<tr>
<th>Mandatory Notification</th>
<th>current methods</th>
<th>Computer method</th>
</tr>
</thead>
<tbody>
<tr>
<td>notify citizens of proposed zoning variance requests</td>
<td>mailings</td>
<td>e-mail</td>
</tr>
<tr>
<td>notify citizens of proposed design review decisions</td>
<td>mailings</td>
<td>e-mail Web</td>
</tr>
</tbody>
</table>

### Inquiry Response

| providing demographic info.                                 | telephone, direct mailing | e-mail, Web   |
| providing market condition info.                            | telephone, direct mailing | e-mail, Web   |
| providing info. on available lease/dev. sites (business)    | telephone, drop-in visits | e-mail, Web   |
| providing info. on available lease/purchase options (housing) | telephone, drop-by in visits | e-mail, Web |
| providing info. on the criteria that allow individuals to qualify for social service program funding | telephone, neighborhood mtg. | e-mail, Web |

### Educating the Public

<p>| educate citizens about the zoning variance process          | phone conversations, drop-in visits | Web |
| educate citizens of current land use regulations            | phone conversations, drop-in visits | Web |
| educate citizens about urban design guidelines              | phone conversations, drop-in visits | Web |
| educate citizens about available funding sources to support new venture creation | drop-in visits, phone conversations | Web |
| provide business plan assistance                            | one-on-one consultation | Web |
| educate about business regulations                            | phone conversation, drop-in visits | e-mail, Web |
| homebuyer training                                           | workshops, drop-in visits | Web |
| provide Job training information                             | workshops | Web |</p>
<table>
<thead>
<tr>
<th><strong>Agency Responsibilities</strong></th>
<th><strong>current method</strong></th>
<th><strong>computer method</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Informing the Public</td>
<td></td>
<td></td>
</tr>
<tr>
<td>inform developers of land</td>
<td>newspapers, direct mail</td>
<td>e-mail, Web</td>
</tr>
<tr>
<td>use studies</td>
<td>comm. meeting, newspapers</td>
<td>Web</td>
</tr>
<tr>
<td>inform citizens about the</td>
<td>newsletters</td>
<td></td>
</tr>
<tr>
<td>status of development projects</td>
<td></td>
<td></td>
</tr>
<tr>
<td>inform citizens of zoning</td>
<td>newspapers, cable T.V.</td>
<td>e-mail, Web</td>
</tr>
<tr>
<td>board decisions</td>
<td>comm. meetings, newspapers</td>
<td>e-mail, Web</td>
</tr>
<tr>
<td>inform citizens of the results of neighborhood planning studies</td>
<td>newsletters, newspapers, comm. meetings</td>
<td>Web</td>
</tr>
<tr>
<td>inform citizens of proposed</td>
<td>drop-in, phone conversation, direct mailing</td>
<td>e-mail, Web</td>
</tr>
<tr>
<td>park/open space projects</td>
<td>workshops</td>
<td></td>
</tr>
<tr>
<td>inform citizens of employment.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>opp (database)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>inform citizens of programs</td>
<td></td>
<td></td>
</tr>
<tr>
<td>to assist in housing rehab./</td>
<td></td>
<td></td>
</tr>
<tr>
<td>maintenance</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Bibliography


Batty, M. 1995. The Computable City. A paper delivered at the m-squared conference November 29-30 at the BBC Wales Studios in Cardiff, United Kingdom.


M.I.T. Department of Urban Studies and Planning for the Federal Highway Administration (FHWA) and the National Association for Regional Councils (NARC).


