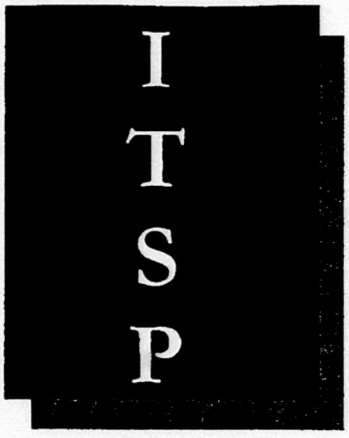


Information Technology Strategic Plan

City of Portland, Oregon
July, 1998

Executive Summary

The Digital Age – A Challenge For Government

Modern life is increasingly defined by the near-instantaneous capture, easy manipulation, and rapid distribution of information Information Technologies (all means of electronically transmitting or storing data, voice, and video) have become critical for everything from global commerce to person-to-person communication

A steadily growing portion of the general public has Internet access and regularly uses it for everything from e-mail to shopping to personal financial management Portable computing and global wireless communication are rapidly becoming commonplace

Public and private sector organizations are quickly expanding the amount of information and services available on-line World Wide Web addresses have moved from being obscure to nearly ubiquitous in less than three years School systems are graduating students for whom Internet access has become routine. Information Technologies' new capabilities are transforming the ways the world works

An increasing number of local governments across the country are making information and services, including electronic transactions, available via the Internet To continue our status as one of the best-managed cities in the nation, the City of Portland must strategically engage and effectively manage existing and evolving Information Technologies

Vision

The ITSP effort is a result of City Council's declared vision of November, 1996

The City of Portland is a global leader in effective and innovative government. We are known for our ability to work collaboratively with our citizens and other partners to ensure the provision of effective and affordable services for the present and future economic, social, and environmental needs of our community.

The ITSP effort will support City Council's vision by

1) Improving the quality of service and access to government for all by providing
   - ✓ electronic access to City information
   - ✓ greater opportunity for citizen input to government
   - ✓ electronic delivery of City services
2) Improving the quality and efficiency of internal operations
3) Facilitating access to Information Technologies for all citizens
4) Fostering regional receptivity to Information Technology industries

To successfully achieve these goals, the City's approach to the management of IT has evolved

Background

Historically, each bureau made IT investment decisions based on individual bureau missions and the availability of resources for hardware, software, and training This led to duplicative efforts and disparate choices in types and configurations of hardware and software Those disparate choices were generally effective for achieving individual bureau missions but did not reflect any system-wide perspectives Thus, the organization lacked system-wide strategies and policies for

- IT governance
- IT budgeting and financing
- Integration of networks
- Storage, transmission, and integration of data and documents
- Establishing IT proficiencies for users and support staff

Recent Progress

With City Council's establishment of the ITSP effort, bureaus collaborated to begin improving the system-wide coherence of the City's use of Information Technologies ITSP staff, committees, and task forces have produced

- an IT asset inventory
- standardization of e-mail /scheduling applications
- initial standards and guidelines for publishing on the World Wide Web
- an Internet Use policy
- the Information Technology Strategic Plan
- a review of IT positions, classification and compensation
- the first system-wide technical standards and policies for network management and interconnection
- the establishment of Portland's membership in Global Cities, a national database of local government policies and practices

Framework

Although new and better ways of doing business and providing electronically extended access for customers and partners remain the overall motivation, achieving this goal requires some critical intermediate steps which can be viewed as "getting the City of Portland's IT house in order"

IT progress can be illustrated as a pyramid (see Figure 1 below) [1] At Level 1, the base of the pyramid, organizations build an IT infrastructure (computers, networks, etc) and work to optimize it IT is used to improve efficiency and cut costs At the next level, organizations with a stable infrastructure build competence, initiate new processes, and work on business process re-engineering IT adds value and levers change At Level 3, the peak of the pyramid, IT is fully integrated into the organization's business processes IT makes business possible and is central to the progress of the organization itself

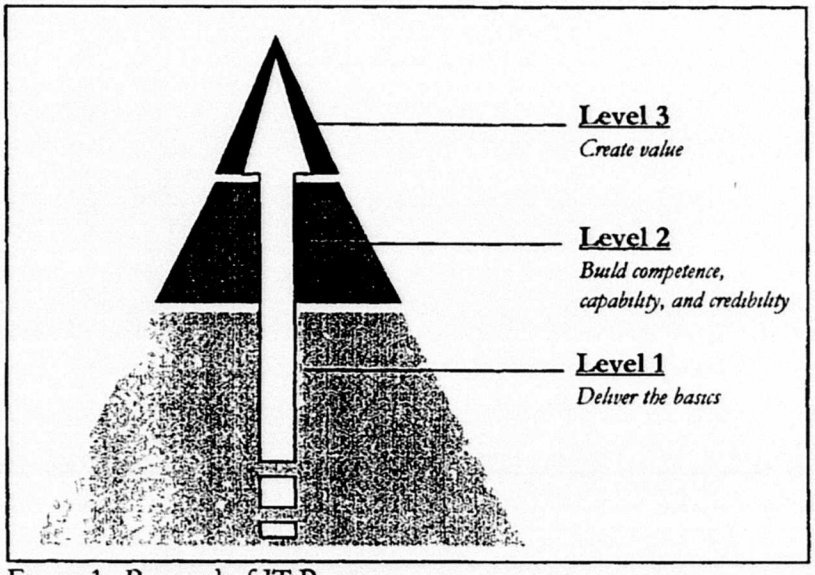


Figure 1 Pyramid of IT Progress

Most of the bureaus in the City of Portland have achieved significant progress on all three levels City-wide, however, significant gaps exist on Levels 1 and 2 Real progress on Level 3 will occur only when gaps have been plugged on the foundation layers of the pyramid Thus, the following strategic objectives focus on establishing a solid, interoperable infrastructure (Level 1) and applications base (Level 2)

1 Carol Hildebrand, "The Nature of Excellence," *CIO*, August, 1997

Strategic Objectives

The ITSP Executive and Management Committees have identified eight critical Strategic Objectives which must be addressed before consideration of more sophisticated uses of IT is possible Most of the IT Strategic Objectives are crucial to the implementation of GIS, Blueprint 2000, system-wide Internet-based technologies, improvement of public access to information, decision-making, and services, and efficient information-sharing throughout the organization Six of the objectives relate to the use or deployment of IT, they are summarized in the table below The other two relate to the roles and responsibilities for IT management, and financing the City's IT infrastructure They are summarized in the following pages

OBJECTIVE	DESCRIPTION	DEADLINE	LEAD AGENCY
Backbone	Develop and implement a high capacity Network Backbone	June 30, 2000	BIT, BGS
Network Design	Design and implement an Enterprise Network	December 31, 1999	BGS, BIT
Internet, Intranet, Extranets	Develop and implement Internet, Intranet, Extranet strategies	June 30, 2000	ITSP
Information Management	Develop and implement Information Management Policies	January 1, 2001	ITSP, GIS
Standards	Develop and implementDesktop IT Standards	January 31, 2000	ITSP
IT Proficiency	Establish User and IT staff support proficiencies	June 30, 2000	ITSP, HR

Strategic Objective #7: Organization

The Strategic Plan reconfirms the governance structure for system-wide IT created by Resolution 35560 ("Establishing the ITSP Executive Committee") which is currently in place The following table summarizes this structure and the primary roles and responsibilities for each entity involved in IT management

ENTITY	ROLES AND RESPONSIBILITIES
IT Executive Committee	Sets system-wide IT policy and arbitrates issues Oversees ITSP and GIS Programs Manages system-wide ITSP allocations
ITSP and GIS Management Committee	Researches and recommends IT / GIS policy as directed by the Executive Committee or as raised by Management Committee members Creates task forces to research and recommend IT policies Provides forum for sharing information on IT projects and issues
Bureau of Information Technology (BIT)	Manages core system functions Acts as IT service provider to other bureaus by agreement
Bureau of General Services - Telecomm	Holds primary responsibility for system-wide WANs
Corporate Geographic Information Systems	Develop and implement integrated geo-referenced information systems Managed by the IT Executive Committee
Individual Bureaus	Abide by system-wide policies Manage their own IT operations

Strategic Objective #8: Financing IT

The City of Portland recognizes IT as essential to system operations and will make accountability for IT investment a standard element of the City's budget process at both the bureau level and system-wide

For the short term, the IT Strategic Plan recommends that.

General Fund Bureaus with need should be provided one-time assistance in achieving minimum standards and overall General Fund base budgets should be adjusted to account for system-wide costs of IT.

While there will be a need for additional resources, the larger part of the cost will be in the redirection of existing resources within bureaus The major ongoing costs are training, IT support, and replacement/upgrades Research indicates that a successful investment in training, combined with a significant degree of standardization, is the best formula for improving productivity and limiting IT costs

The IT Executive Committee will ask for a thorough examination of current IT cost allocation methodologies and explore new approaches for long-term IT funding strategies

Additional Issues

Year 2000 - Work is underway to ensure year 2000 compliance for all City applications As of February, 1998, all City systems in need of upgrades or modifications have been identified All modifications required for compliance are scheduled to be completed and tested by no later than June, 1999 The most critical application identified thus far is the customer billing system for the Water and Environmental Services Bureaus The new system is scheduled to be tested and on-line by October, 1998

City-wide financial management system - There is a high level of interest in making the IBIS (City's financial system) significantly more user-friendly integratable with other applications and adept at functions beyond basic accounting The City currently lacks an automated way to make more extensive use of the data in IBIS A sophisticated IBIS would make current data more accessible to management and compatible with other financial management tools

Moving Onward

1) Adoption of the IT Strategic Plan by City Council
2) Development and implementation of the work plans for the ITSP Strategic Objectives
3) Bureau development of IT components for their individual strategic plans
4) Research and identification of electronic extended-access pilot projects

REQUESTED BUDGET			
STRATEGIC OBJECTIVE	**LEAD**	**DEADLINE**	**REQUESTED BUDGET FY 98-00***
1 Network Backbone	**ITSP, BIT, Bureaus****	**1998-2000**	**$ 268,000**
Develop standards for connections, media, and equipment	Network Task Force(TF), ITSP Mgmt Committee (MC) and Executive Committee (EC)	June 30, 1998	
Upgrade central equipment	BIT	June 30, 1999	
Integrate separate segments	BIT	December 31, 1999	
Implementation 100Mbps/1 Gbps connection	Each bureau	June 30, 2000	
2 Enterprise Network	**ITSP, BGS, BIT**	**1998-1999**	**$ 20,000**
Develop standards for connections, media, and equipment	Network TF, ITSP MC and EC	June 30, 1998	
Design high capacity network	BGS, BIT, Network TF	December 31, 1998	
Combine redundant WAN connections	BGS, Bureaus	December 31, 1998	
Implement Network Management system	BIT	December 31, 1999	
3 Internet/Intranet Strategies	**ITSP MC TF**	**1998 -2000**	**$ 125,000**
Coordinate Internet connections	ITSP TF	December 31, 1998	
Coordinate City's Internet presence	ITSP TF	December 31,1998	
Implement Electronic Commerce pilot project	ITSP TF, BIT, Bureaus	June 30, 1999	
Create City Intranet	ITSP TF	December 31, 1999	
Create Extranet with strategic partner	ITSP TF	June 30, 2000	
4. Information Management	**ITSP, GIS**	**1998 -2001**	**$ 1,000**
Create non-spatial data catalog	ITSP GIS TF	October 31, 1998	
Make coordination recommendations	ITSP GIS TF	December 31, 1998	
Determine storage and exchange guidelines	ITSP GIS TF, ITEC	June 30, 1999	
Ensure that stewardship agreements are in place	ITSP GIS TF, ITEC	December 31, 1999	
Put GIS "Hub" in place, fully operational	GIS	January 1, 2001	
5. Desktop Standards	**ITSP, Bureaus**	**1998 -2001**	**$1,643,000**
Develop process for hardware/software standards	ITEC	Established	
Make standards recommendations	ITSP MC	July 31, 1998	
Get standards approval	ITEC	August 31, 1998	
Develop standards implementation process	ITSP MC, Bureaus	September 30, 1998	
Complete implementation	Bureaus	January 31, 2000	
Modify Standards	ITSP MC and ITEC	As needed	
6 Staff/User Proficiency	**ITSP, HR**	**1998-2000**	**$ 1,509,000**
Define and adopt proficiencies	ITSP TF and HR	June 30, 1998	
Adopt proficiencies required for hiring	HR and Bureaus	July 1, 1998	
Ascertain skill deficiencies	Human Resources	September 30, 1998	
Increase training capacity	BIT and HR	September 30,1998	
Develop core IT staff competencies	ITSP and HR	September 30, 1998	
Achieve optimum training level	HR and BIT	June 30, 2000	
7. IT Roles/Responsibilities	**ITSP**	**Established**	
8. IT Financing	**ITSP, BFP**	**1998-2000**	
Identify system-wide IT financing issues	ITSP Finance TF	December 1, 1997	
Institutionalize IT Maintenance, Planning and Budget scheduling	BFP and ITSP	January 1, 1999	
Review system-wide IT finance and cost allocation	ITSP Finance TF	September 1, 1998	
TOTAL			**$3,566,000**

* Estimated new resources only. See Appendix B for details

** All bureaus participate in ITSP. For certain Strategic Objectives, a particular bureau may act as project leader

APPROVED BUDGET			
STRATEGIC OBJECTIVE	**LEAD**	**DEADLINE**	**APPROVED BUDGET FY 98-00**
1 Network Backbone	**ITSP, BIT, Bureaus****	**1998-2000**	**$ 110,000**
Develop standards for connections, media, and equipment	Network Task Force(TF), ITSP Mgmt Committee (MC) Executive Committee (EC)	June 30, 1998	
Upgrade central equipment	BIT	June 30, 1999	
Integrate separate segments	BIT	December 31, 1999	
Implementation 100Mbps/1 Gbps connection	Each bureau	June 30, 2000	
2 Enterprise Network	**ITSP, BGS, BIT**	**1998-1999**	**$ 0**
Develop standards for connections, media, and equipment	Network TF, ITSP MC and EC	June 30, 1998	
Design high capacity network	BGS, BIT, Network TF	December 31, 1998	
Combine redundant WAN connections	BGS, Bureaus	December 31, 1998	
Implement Network Management system	BIT	December 31, 1999	
3 Internet/Intranet Strategies	**ITSP MC TF**	**1998 -2000**	**$ 125,000**
Coordinate Internet connections	ITSP TF	March 30, 1998	
Coordinate City's Internet presence	ITSP TF	December 31,1998	
Implement Electronic Commerce pilot project	ITSP TF, BIT, Bureaus	June 30, 1999	
Create City Intranet	ITSP TF	December 31, 1999	
Create Extranet with strategic partner	ITSP TF	June 30, 2000	
4 Information Management	**ITSP, GIS**	**1998 -2001**	**$ 0**
Create non-spatial data catalog	ITSP GIS TF	June 30, 1998	
Make coordination recommendations	ITSP GIS TF	December 31, 1998	
Determine storage and exchange guidelines	ITSP GIS TF, ITEC	June 30, 1999	
Ensure that stewardship agreements are in place	ITSP GIS TF, ITEC	December 31, 1999	
Put GIS "Hub" in place, fully operational	GIS	January 1, 2001	
5 Desktop Standards	**ITSP, Bureaus**	**1998 -2001**	**$1,180,000**
Develop process for hardware/software standards	ITEC	Established	
Make standards recommendations	ITSP MC	June 30, 1998	
Get standards approval	ITEC	August 31, 1998	
Develop standards implementation process	ITSP MC, Bureaus	September 30, 1998	
Complete implementation	Bureaus	January 31, 2000	
Modify Standards	ITSP MC and ITEC	As needed	
6 Staff/User Proficiency	**ITSP, HR**	**1998-2000**	**440,500**
Define and adopt proficiencies	ITSP TF and HR	June 30, 1998	
Adopt proficiencies required for hiring	HR and Bureaus	July 1, 1998	
Ascertain skill deficiencies	Human Resources	September 30, 1998	
Increase training capacity	BIT and HR	September 30,1998	
Develop core IT staff competencies	ITSP and HR	September 30, 1998	
Achieve optimum training level	HR and BIT	June 30, 2000	
7 IT Roles/Responsibilities	**ITSP**	**Established**	

**** All bureaus participate in ITSP For certain Strategic Objectives, a particular bureau may act as project leader**

APPROVED BUDGET			
8 IT Financing	**ITSP, BFP**	**1998-2000**	
Identify system-wide IT financing issues	ITSP Finance TF	October 1, 1998	
Institutionalize IT Maintenance, Planning, Budget Scheduling	BFP, ITSP, Bureaus	January 1, 1998	
Review system-wide IT finance and cost allocation models	ITSP Finance TF	September 1, 1998	
TOTAL			**$1,855,500**

Information Technology Strategic Plan Credits

IT Executive Committee Members

Tim Grewe, Co-Chair
David Kish, BGS
David Knowles, BOP
Margaret Mahoney, BOB
Glenn Meyer, BIT
Dennis Nelson, Licenses
David Olson, Cable
Vic Rhodes, PDOT
Mike Rosenberger, Co-Chair
Felicia Trader, PDC
Chief Robert Wall, Fire Bureau
Sherrill Whittemore, BOEC

Dave Gooley for Dean Marriott, BES
Richard Karman for Chief Moose, Police Bureau
Gordon Wilson for Charles Jordan, Parks Bureau

ITSP Management Committee & Task Force Members*

ITSP Staff*

* See page 69 for a complete list of member names

Table of Contents

Introduction

Information technology (IT), formerly characterized as a means of cutting clerical costs, has emerged as a front-line strategic tool for managing and enhancing organizations IT is a key component in the development and execution of strategic initiatives, reorganizing institutional structure, and enhancing the interaction of an organization with its environment and customers

Leading-edge, high-performance organizations recognize that IT is now one of several factors – along with human resources, finances, and operations – that helps enable or even defines an organization's strategic goals As such, IT requires executive attention and must itself be managed strategically to ensure its alignment with an organization's business goals

Information is only as valuable as its accuracy Complete, reliable information is an essential part of government's primary function -- decision-making Therefore, the importance of strategic investment in and management of IT cannot be underestimated In the course of identifying Portland as one of the top 5 "best managed" cities in the nation, *Financial World* noted that one of the City of Portland's few shortcomings was the absence of a strategic approach to the management of information or Information Technology

In 1995, City Council recognized the need for a coordinated, comprehensive approach to IT deployment with the passage of Resolution 35413 This resolution resulted in a study by Executive Solutions, Inc , which recommended that a consensus-driven approach be taken to resolving key internal IT issues and then applied to IT in order to improve public services Council approved the creation of the IT Strategic Planning (ITSP) project, placing its development in the Office of Finance and Administration (OFA) in FY 1996-97 In November, 1996, Council created a governing structure for ITSP led by an Executive Committee of Bureau Managers empowered to develop City-wide IT strategies and make City-wide IT policy This document – the City of Portland's IT Strategic Plan – is the result of that process

The ITSP's underlying goals are twofold to enable smarter, more efficient internal operations and to widely extend citizens' electronic access to government services This IT Strategic Plan represents the beginning of the City's long-term efforts in this direction In order to achieve these goals, there must be a coherent, functional organization-wide IT infrastructure along with an organization-wide evolution into a new mode of inter-bureau collaboration on IT

This document identifies key strategic objectives for the application of IT in the City Recommendations for changes in the City's deployment, management, and financing of IT are included, as well as suggestions for its use by City staff The ITSP targets crucial technology areas, including data management, data communications, and Internet technologies, addressing the City's need to better enable its staff to gain access to information City staff must be able to analyze and share this information, as well as provide better citizen access to government information and decision-making processes

It should be noted that this is a *strategic* plan, not a detailed list of applications that need to be developed As the initiatives in this plan are implemented, new challenges will emerge, as will new technology options to address them This Plan will be updated regularly Detailed implementation plans will be required in some areas to flesh out high-level strategies and to adjust the Plan to reflect changes in circumstance However, it is anticipated that the strategic framework outlined here will provide abundant policy guidance for the follow-up work required to enable a consistent approach and a smooth implementation path for the foreseeable future

1 MISSION, VISION, GOALS, AND VALUES

Before addressing specific objectives for the Information Technology Strategic Plan, it is necessary to clearly establish its purpose and scope The Plan applies to the City of Portland as a whole, and must therefore be aligned with the City's vision and values Chapter 1 sets out the key goals of the ITSP as well as the expected outcomes of the Plan for the City of Portland

1.1 Purpose and Scope

a Purpose of the IT Strategic Plan

- To define an integrated strategy for applying Information Technology in the City of Portland
- To define a collaborative City-wide organizational structure for IT policies and standards
- To identify a mechanism for financing IT capital investments and operating expenses

b Purpose of IT in the City of Portland

The City of Portland provides technology and services to its staff to ensure efficient delivery of appropriate services and access to government for Portland-area residents

c Scope

This plan will address strategic IT issues of City-wide significance

Strategic vs operational goals

- are fundamental to core business processes rather than focused on one particular application
- are defined in terms of outcomes rather than particular products or services
- significantly alter the roles, responsibilities, and relationships of vital portions of the organization
- provide a framework for further decision-making

City-wide vs individual bureaus

- directly address those goals publicly embraced by City Council in ordinances, publications, and resolutions
- improve the City's overall capacity to make decisions, deliver services, and receive and supply accurate information to the public and other institutions
- improve communication, cooperation, and coordination among bureaus and between the City and the public
- support the missions of multiple bureaus rather than one particular bureau

1.2 Relationship to Overall City Goals and Objectives

a Motivation

The City's IT Strategic Plan is driven by the vision and goals established by the City Council and implemented by City staff These determine the criteria by which decisions about technology investments will be made This is true both at the strategic level, as embodied in this document, and at the operational level, as bureaus define, select, and implement specific technology solutions to address business needs

b The City's Vision

In a November 17, 1996 work session, City Council defined its vision for the City

The City of Portland is a global leader in effective and innovative government. We are known for our ability to work collaboratively with our citizens and other partners to ensure the provision of effective and affordable services for the present and future economic, social, and environmental needs of our community.

c. The City's Goals

City Council defined its goals for the City in the November 17, 1996 work session

Livable Future

- Build a livable city through good planning and well-managed growth
- Ensure decent, affordable housing
- Promote healthy families and children
- Support quality education to produce well-educated citizens

Confidence in Government

- Build a sense of community by promoting citizen participation, connectedness, and partnerships
- Continuously improve the delivery of quality public services
- Maintain a financially stable City

Quality Jobs and Public Safety

- Promote economic vitality and access to quality jobs for all citizens
- Ensure a safe, peaceful community

1.3 Vision of IT in the City of Portland

The City of Portland will use Information Technology in a coordinated, strategic way to

- support its key business objectives
- improve the delivery of services
- make better decisions
- share information
- improve citizen access to government
- attract and retain technology-related business investment

> *"The next driving force is the push for direct interface with the citizen using information technology. By delivering information directly to the citizen, labor costs decline. And the interfaces - like ATM machines - operate day and night"*
>
> -George Lindamood, former Director of the Washington State Dept of Information

1.4 Key Goals of the IT Strategic Plan

With the IT Strategic Plan, the City of Portland will

- develop a strategy to enable easy electronic access to City information by staff and the public
- develop a strategy to create and integrate a City IT infrastructure (networks, e-mail, electronic scheduling, databases) that enables the City to accomplish its organizational goals and objectives
- define the requirements for management and support of IT, including the roles of centralized and decentralized support units which
  - ✓ provide ongoing guidance on IT strategies and policies
  - ✓ anticipate and resolve technology-related policy issues
  - ✓ enable broad participation from within City government
- develop an investment strategy and financing mechanisms for City IT
- develop a strategy to facilitate electronic access to City decision-makers and public input to City processes

1.5 Expected Outcomes

Once the ITSP is put in place, the City of Portland will be on the road to

- a successful GIS (Geographical Information Systems) program
- reduced duplication of effort
- improved efficiency and effectiveness of City staff and work processes through easy system-wide access to data and documents
- integrated City-wide Information Technologies
- cohesive, sensible, forward-looking, system-wide, and bureau-level IT investment strategies and policies which improve City services
- user-friendly access to public information by citizens and City staff
- well-trained staff made more productive and effective by prudent application of IT
- cooperative, collaborative IT governance based on complete and accurate information
- an affordable IT investment strategy which provides the appropriate levels and types of IT investment -- hardware, software, networks, databases, and training -- where they are needed, based on an understanding of the services required by Portland residents and businesses

1.6 Values of the City of Portland

In order to succeed, the IT Strategic Plan must embrace the corporate values held by the City of Portland These values must be reflected ultimately in the policies, technology choices, strategic investments, and organizational changes recommended in this plan

The Executive Solutions, Inc report identified the City's values, with respect to IT, as

- providing the highest quality customer services to Portland citizens
- operational efficiency and productivity -- the best value for the tax dollar
- connectivity -- constant, varied means of communicating with citizens
- accessible government -- public servants and information readily accessible at all times
- providing the means for democratic citizen participation in critical affairs of government

In addition, good decision-making and management should be included, since Portland has consistently been ranked one of the best-managed cities in the U S and continuously strives to improve in this area

1.7 Values of IT Strategic Planning

These are the values embraced during the ITSP planning process

- **Flexibility and adaptability** – the City is willing to change current practices as needed to achieve the goals identified in the plan
- **Embracing** a city-wide perspective
- **Focusing** on goals of simplicity and maintainability, recognizing that technical solutions will continue to evolve and will be based on the functional and business needs of the City
- **Engaging** in a cooperative, collaborative process whereby all parties affected by a decision – prior to the time the decision is made – have the opportunity to review and comment on proposed options, and have the assurance that their input will be seriously considered
- **Communicating** needs and plans openly
- **Achieving consensus**, recognizing that consensus-building requires compromise to create solutions that work for all affected parties

2 CURRENT BACKGROUND AND ENVIRONMENT

The bulk of Chapter 2 details research and findings regarding the City of Portland's IT history and present state Certain assumptions had to be made in the writing of the Plan, these are found in Section 2 2

2.1 History

The Impetus

Two significant elements propelled the effort to bring a system-wide perspective to Information Technology issues First, in 1995, as a result of his work with the National League of Cities and Public Technology Inc , City Commissioner Mike Lindberg became aware of IT-related initiatives being undertaken by other cities He was particularly interested in initiatives aimed at electronically extending City services and providing more convenient access to government for citizens Second, in March, 1995, *Financial World* magazine recognized Portland as one of the best-managed cities in the nation, but noted that the City had not developed strategies for addressing the increasingly important role of IT from a system-wide perspective

Objectives

Commissioner Lindberg, in consultation with Mayor Katz and other members of the City Council, presented a resolution which outlined the broad, community-oriented IT issues which the City of Portland needed to address Commissioner Lindberg followed up the resolution by engaging the management consulting firm Executive Solutions, Inc to

- evaluate how system-wide IT was being managed in the organization
- identify the challenges in changing the historical approach
- suggest a method for developing a system-wide IT Strategic Plan, addressing the challenges and realizing the goals set out in the Commissioner's original resolution

Process

Executive Solutions interviewed scores of City staff and managers, surveyed the IT Strategic Planning efforts of other communities, and consulted with a panel of private sector IT leaders The Executive Solutions report identified a number of strengths, weaknesses, opportunities, and challenges, chief among them being that the City of Portland had little tradition of taking a system-wide perspective on IT issues While the phenomenon was not unique to Portland, the City's form of government and the evolution of independent IT operations in large bureaus reinforced separations and limited the recognition of the organization's broader IT needs

Findings

The report indicated that there were certainly many examples of excellence and innovation in the use of IT, but those examples were almost exclusively in the service of a specific bureau's mission and not connected to broad organizational goals The report also indicated that resource limitations put smaller bureaus significantly behind the technological curve

The City Takes Action

Upon accepting the Executive Solutions report, City Council asked the Director of the Office of Finance and Administration to create an IT Strategic Planning unit charged with developing a system-wide IT Strategic Plan and immediately addressing issues identified in the Executive Solutions report An IT Strategic Planning (ITSP) project team was created in August of 1996 Over the following several months, ITSP staff organized multi-bureau task forces to begin addressing immediate issues, drafted supporting documents and work plans for the effort, drafted the resolution formally creating the IT Executive Committee, and convened the ITSP Management Committee

Steps Ahead

The Management Committee made the task forces official and began developing recommendations on issues identified by Commissioner Lindberg, the Executive Solutions report, and the bureau representatives serving on the Management Committee and Task Forces The IT Executive Committee has already acted on several of those recommendations Additional issues were identified in the course of drafting the IT Strategic Plan Staff was directed by the Mayor and City Council to ensure that the necessary steps were being taken to make all IT operations of the City of Portland Year 2000 compliant The Year 2000 compliance project has been well-integrated into the overall ITSP effort

2.2 Assumptions

The breadth of IT issues is such that certain assumptions were made in the writing of this document The following statements are accepted as both true and relevant

- Information Technology has become a critical tool in the modern management of organizations It can improve service delivery, increase efficiencies, and is becoming increasingly essential to interacting with the rest of the world
- Technology is a tool, not an end unto itself Process re-engineering is as important to deriving the full benefit of IT as any particular new technology
- A coordinated approach to IT is now a fundamental requirement for intelligent management of the organization and will make better use of the City's IT investments
- The critical role of IT now requires system-wide investment strategies
- Active multiple-bureau collaboration will produce the greatest likelihood of success in IT strategic planning
- Collaboration and coordination of IT will be for the purpose of supporting both system-wide and bureau-specific business missions
- Information Technology can facilitate access to City services
- City IT must be internally organized and functional before significant services can be reliably offered to residents, businesses, and other community partners
- Portland residents and businesses deserve a first-rate IT environment and access to that environment

"I have traveled the length and breadth of this country and talked with the best people, and I can assure you that data processing is a fad that won't last out the year."

--The editor in charge of business books
for Prentice-Hall, 1957

2.3 Current Systems

a Purpose of the IT Strategic Plan

It would be a mammoth undertaking to determine how much the City has actually invested in IT hardware over the years Based on inventories reported by bureaus during the summer and fall of 1997 and assigning conservative current values to assets, it can be generally estimated that the City owns approximately $8 million in desktop and laptop personal computers, printers, telephones, radios, fax machines, video equipment, and other IT equipment Appendices A1 – A3 include a summary of the number of various IT devices reported throughout the City and their approximate current value Appendices A7 and A8 also identify significant IT hardware assets within each bureau

b Software

City software includes a wide variety of standard off-the-shelf products (including operating systems) and approximately 355 larger or specialty business applications such as IBIS, Permit Plan, Business License System, the Police Data Records System, and the Water/Sewer Billing System Off-the-shelf software reported by bureaus can be categorized according to general function By assigning a conservative current value to each category, it can be estimated that the City has approximately $1 8 million worth of standard software It should be noted, however, that this is only a very general estimate Reported bureau software inventories differed greatly Some bureaus completed an exhaustive review, while others made estimates, or omitted operating systems and utility packages Appendix A4 includes a summary of the various categories of off-the-shelf software reported and an assumed current value of items in each category Appendices A9 – A12 identify "off-the-shelf" software licenses and values within each bureau

Estimating the value of City specialty business application software is a daunting task We know that we have about 355 such applications, but the "value" of application software is primarily in its use to support City business functions Its "cash value" could be said to be the original purchase or development cost, a depreciated value, what the software could be sold for today, or the replacement cost Estimating a realistic cash "value" for the City's 355 different business applications far exceeds the scope of this Strategic Plan

c Networks

Background and Issues

- The City network is actually a large, complex set of local area networks (LANs) and wide area networks (WANs), installed and managed by operating bureaus and connected together via the City's network "backbone" There are currently 262 separate network segments installed in City facilities
- The City's backbone is actually not a single cable segment, but rather a series of segments of various media types linked together by various communications devices At present, it is best to think of the backbone not so much as a physical entity Instead, it is better defined in logical terms based on the *configuration* of attached devices, and the flow of data traffic across it In particular, the ITSP Network Task Force defines the backbone as
  - ✓ **Physically:** Central data communications management equipment (such as routers, bridges, switches, and concentrators) and the cables or trunks extending from those central devices up to but not including routers, bridges, and switches connected to departmental LANs and WANs
  - ✓ **Logically:** A network resource, managed centrally by BIT and shared by different bureaus, linking bureaus co-located at a particular site or between different sites
- Nearly every City office has a LAN installed and is connected to the City backbone
- Historically, each bureau has been responsible for networking decisions (capacity, operating system, and topology) and management (planning, configuration, installation, and operations)
- Some bureaus – i e enterprise-funded and some larger General Fund bureaus – perform all network operations internally, up to and including their connection to the City-wide backbone BIT also installs and manages LANs and WANs as a service to other bureaus under interagency agreements
- A variety of local area network operating systems are in use The predominant server operating systems are DEC VAX/VMS, Microsoft Windows NT, and Novell Netware The predominant protocols are TCP/IP, DECNet, and Netware IPX See Appendix A13
- Currently, responsibility for WAN management is shared among operating bureaus, BIT, and the Bureau of General Services Communications Division (BGS)
  - ✓ BGS is responsible for procurement and installation of the telecommunications components of WANs
  - ✓ BIT is responsible for interfaces to the backbone and for assigning network address ranges
  - ✓ BIT and operating bureaus are responsible for installation, configuration, and management of edge devices (routers, bridges, etc) on the WAN segments they manage and for management of data and applications over the WAN Bureaus may employ BIT to manage edge devices and applications on WANs through interagency agreements

- Currently, eight operating bureaus manage data and applications on WANs in addition to BIT, two bureaus – Fire and Parks – manage the majority (70 of 117) of remote connections About 76 of the City's WAN circuits are Frame Relay circuits, 26 are leased, point-to-point circuits, the rest are a mix of dial-up (8), ISDN (5), microwave (1), and city-owned cable (1)
- Overall, the installed base of the City's network assets are worth approximately $3 26 million

Opportunities and Challenges

- Bureau independence maximizes local utility but creates incompatibilities on a more global scale Greater consistency and standardization would reduce incompatibilities and facilitate information-sharing among bureaus
- The marketplace is maturing in many key areas of networking For example, TCP/IP has emerged as a de facto industry standard for internet working, and systems based on Intel 80x86-compatible chips have resulted in significant LAN standardization, particularly for smaller LANs
- In other areas, the accelerating pace of change makes it difficult to make investment decisions For example, Microsoft and Novell continue to battle for network operating system market share

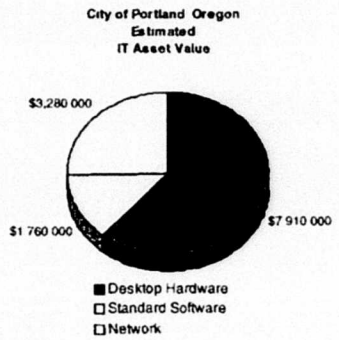
Current Efforts

- The ITSP Network Task Force is developing network standards and policies for consideration by the ITSP Management Committee Standards developed to date include
  - ✓ Backbone protocol TCP/IP
  - ✓ Network management protocol SNMP
  - ✓ TCP/IP and Novell Netware network naming and addressing
- De facto standards exist for wiring (See Appendix A13)
- The Task Force and BGS-telecomm have developed plans for a backbone upgrade and for Domain Name Services (TCP/IP name/address resolution)

Value of the City's Network

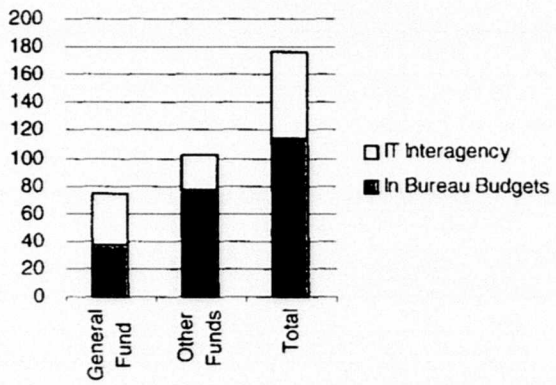
Appendix A13 shows the City's installed base of network equipment and an approximate value for the components

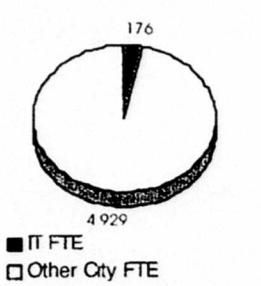
Appendix A13 also shows the installed base of the wiring underlying the network and its approximate value Overall, the installed base of the City's network assets are approximately $3 3 million

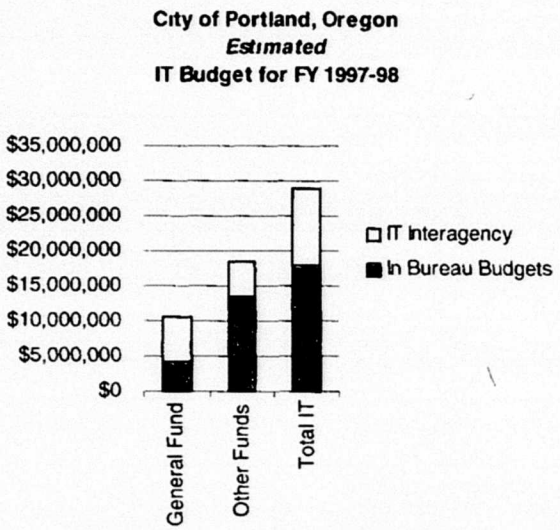


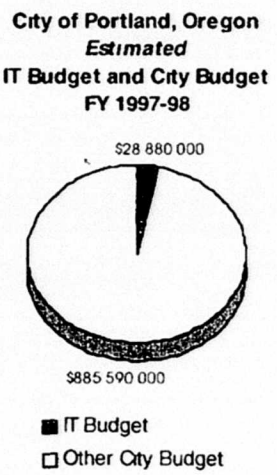
Staffing and Budget

The City currently budgets approximately $29 million for IT and appears to devote about 177 full-time equivalent (FTE) staff to IT functions Roughly two-thirds of the staff and budget resources are included within individual bureau budgets and the remaining third is within the two primary internal IT service provider groups the Bureau of Information Technology (BIT), and the Telecommunications Division of the Bureau of General Services (BGS/Telecomm) It should be noted, however, that these are very approximate estimates









It is also important to note that there can be a major difference between what is *budgeted* for IT and *what is actually spent* Many bureaus typically budget very little for IT and make investments only if other expenses turn out to be less than expected There is currently no consistency in the way bureaus account for *actual* IT investments

The value of these estimates is that they give a very general understanding of the level of current commitment to IT within the City Executive Solutions noted on p 19 of their 1995 report that "the equation for typical technology spending in service businesses is $50 million per $1 billion in budget " If this equation is applied to the City, in rough terms we appear to be under-funding our IT investment by about $17 million annually

Appendices A14 & A15 include details of current IT budget and staffing levels by bureau

2.4 Current Environment

The City of Portland's current IT environment is extensive and varies greatly This section outlines the issues, current situation, and opportunities involved for the following Organization, Finance, Operations, Human Resources, and Public Access

a Organization

Issues

The most significant organizational challenge faced by the City is a change of culture Prior to the ITSP effort, bureaus focused primarily on their own specific missions There was little incentive or formal opportunity for collaboration or consideration of system-wide needs With the possible exception of budget and accounting applications, IT was not viewed as a critical corporate managerial tool Bureaus made fairly autonomous IT decisions, resulting in a set of eclectic and relatively isolated computing environments Bureaus made valid bureau-level, mission-driven, technology decisions From a system-wide perspective, however, the eclecticism and autonomy also led to significant technical incompatibilities, duplications of effort, and minimal creative cross-fertilization There was little "corporate" sense of direction in IT Additionally, the degree to which IT was strategically managed within individual bureaus varied throughout the organization

Current Situation

With the City Council's decision to implement ITSP, the evolution of a more system-wide approach to IT management began to take shape The establishment of the ITSP Executive, later to become the IT Executive Committee, and Management Committees provided a forum for collaborative, organization wide development of policies and practices and obtaining the greatest value out of the City's investment in IT The IT Executive Committee, the product of merging the ITSP and GIS Executive Committees, is the multi-bureau City body with binding decision-making authority for

- research and development of system-wide IT strategies and policies
- investment in core IT systems
- the clarification of roles and responsibilities among IT operations
- resolution of system-wide IT issues
- management of the Corporate Geographic Information Systems (GIS) program

The ITSP Management Committee and its Task Forces continue to research and develop IT policy recommendations as assigned by the Executive Committee or identified by Management Committee participants

Opportunities
With system-wide and bureau-level recognition of IT as a critical management tool, the City can

- have better control of its IT assets
- create a coherent computing and Telecomm environment
- offer an organized and consistent IT presence to the world-at-large
- take advantage of technology to improve internal operations
- improve delivery of services to customers and partners
- meet broader goals and objectives outlined by City Council

Communication, collaboration, and commitment to supporting system-wide standards and guidelines are key elements to the evolving success of ITSP. Regularly updated IT planning will be a consistent element of bureau-level strategic planning and will be driven by both specific bureau business needs and system-wide business requirements

b Finance

Issues
At both the bureau and system-wide levels, the approaches taken to funding IT have not kept pace with the advancing role of IT as a critical business tool Prior to the ITSP effort, there was no system-wide standard for consideration of IT needs or spending in budgets This led to a situation where some larger bureaus developed policies for purchasing, upgrading, and training while the smaller bureaus relied on eking out budget savings to attempt marginal hardware and software improvements and little, if any, training Lacking a comprehensive definition and strategy for core system-wide needs and direction, investment in elements of the core system was done in bits and pieces rather than as part of a system-wide capital review process

Current Situation
The research associated with ITSP and Year 2000 efforts heightened awareness of IT within the City This provided a legitimate reason for pursuing a better understanding of the City's investment in IT The Budget Office is in the process of improving the identification and tracking of bureau investments in IT The IT Strategic Plan will produce strategies for identifying and addressing one-time and ongoing costs associated with establishing organizational standards

Opportunities
Successful implementation of IT Strategic Plan recommendations will lead to

- more accurate information about IT investments in the organization
- a re-examination of current methodologies for funding IT
- assurance that costs associated with IT human and material resources will be strategically addressed to meet both system-wide and bureau-level needs

c Operations - Data Communication and Data Management

Issues

The eclectic, bureau-specific approaches to decision-making in the City's IT environment have produced a predictably wide variety of hardware, protocols, and applications for most aspects of the management and transmission of data While a myriad of approaches was developed for and has adequately served individual bureau business needs, the result was incompatible hardware and software, non-connectivity, and duplicative efforts from a system-wide perspective

This situation radically compromised the ability of the organization to consider or tackle IT business solutions from a multi-bureau perspective, make strategic IT infrastructure investments, make strategic use of the wealth of City-owned data, and conveniently transmit data throughout the organization Additionally, the Gartner Group, a major IT consulting firm, has done research indicating that the cost of IT support is most adversely affected by both the absence of well-managed standards and the inadequacy of user training The City should also consider the re-training needs which may arise from existing jobs and skill sets being made obsolete by technological advances

Individual bureaus have done excellent work in IT but, due to the variety of approaches used by bureaus, the City overall has been unable to derive maximum benefit from that work Furthermore, the organization is unable to realize the managerial benefits of IT tools such as e-mail, scheduling, common databases, common internet-intranet, fully-utilized telecommunications, GIS, multi-bureau work flow, groupware, and so on

Current Situation

The increasing trend towards multi-bureau, collaborative ITSP, Telecomm, and GIS efforts is evidence of organization-wide understanding that IT systems and all City data are critical corporate assets which, without significantly interfering with bureau missions, should be planned, constructed, and managed as such Bureaus are working together to identify and resolve impediments to providing City government with a reliable, adaptable, user-friendly computing and telecommunications environment

Bureaus worked with ITSP and the Year 2000 project to begin the City's first system-wide inventory of hardware and software In collaboration with GIS, bureaus are helping to create the first maps of City IT resources in the metropolitan area Together, bureaus narrowed several City e-mail systems down to two systems capable of exchanging mail and transmitting attachments Finally, the organization agreed on a single system allowing organization-wide e-mail and scheduling Bureaus have acted jointly to create the City's first set of technical network protocol standards, the first system-wide policies for IT use and electronic record retention, and have taken the first step in establishing World Wide Web publishing standards

Opportunities

Unless significant improvements are made in the system-wide usability of City IT resources, little of the extended electronic access and new ways of doing business can be realized ITSP, in coordination with GIS, will develop recommendations for establishing a high-performance IT infrastructure and a strategic collaborative approach to system-wide data management ITSP will also develop corporate intranet strategies and standards

This approach will ultimately

- allow significantly improved use of the City's data assets
- improve communication
- reduce instances of hardware and software redundancy and incompatibility
- provide common guidelines for consideration of new applications or technologies
- improve system performance
- increase ease of maintenance

d Human Resources

Issues

The best IT systems in the world are only as good as the people who use and maintain those systems Rapid evolution is a defining characteristic of IT To make the best use of IT, users, support staff, and high-level managers require systematically-updated training and education At present, the amount of training users or support staff can expect varies widely throughout the organization, even within similar classifications Users are conscious that the capacities of applications and technologies are under-utilized for lack of training Managers are becoming increasingly conscious of the need for a better understanding of IT Recent research indicates City of Portland classification and compensation rates for many IT classes have fallen behind the requirements of the workplace and the realities of the marketplace, making it increasingly difficult to attract and retain a leading-edge IT talent pool The organization should also consider re-training needs which may arise from existing jobs and skill sets being made obsolete by technological advances

Current Situation

The City of Portland has re-evaluated and is in the process of modifying classification and compensation schedules for IT positions Bureaus have a strong desire to improve user capacity and reduce the dependency on support staff The Gartner Group's research indicates that 3 days of training per user seems to provide the maximum positive impact on employee skill levels and associated support costs Bureaus also recognize the need to update the skill sets of existing support staff Although the City's Technology Learning Center has made training more accessible, identifying sufficient resources for user training remains a significant challenge, since the degree of investment in user training varies from bureau to bureau

Opportunities

With appropriate system-wide IT competency guidelines, updated classification-compensation information for IT positions, and sufficient commitment to training for all relevant City employees, the City of Portland can develop and retain a more IT-proficient workforce Reliable system performance and competent users are essential to deriving maximum benefit from the City's IT investment and to providing quality service to customers

e Public Access

Issues

The percentage of the citizenry (both businesses and individuals) owning computers and using the Internet and sophisticated telecommunications is steadily increasing The educational system is cultivating a future workforce that will view computer-based interaction in much the same way previous generations viewed the telephone IT will be ubiquitous The City of Portland must improve its IT presence and capacity to succeed in the inevitable new environment

Technology opens the door to innovative new forms of citizen interaction with and expectations for government E-mail, read-only databases, kiosks, electronically-extended access, and interactive exhibits are among the many technological options to improve the quantity and quality of citizen interaction with government Technology can make it easier for citizens to gain access to information, conduct transactions, and provide input into public decision-making

The present hurdle is the lack of system-wide or bureau-level strategic planning time invested in evaluating and responding to the opportunities presented by current and anticipated Information Technologies The impact of the new uses of IT should not be underestimated IT's expanded scope will demand new ways of doing business

Even with all of the advances being made in public acceptance and use of IT, there are some outstanding concerns The City and its municipal partners must consider the IT have-nots Though more and more omnipresent, IT is still expensive Access to the technology is still an issue for a large portion of the population Area governments will likely need to pursue strategies for creating a highly-inclusive, metropolitan IT environment

Current Situation

No system-wide, coherent, user-friendly approach to electronically-extending public access can be reasonably entertained until the City has established an infrastructure and done the bureau-level business processes planning to support this kind of activity Opening new avenues of citizen and private sector interaction will be crucial Some degree of electronic extended access is being offered in the form of information presented via the World Wide Web, FAX, and Telecomm More sophisticated interaction, including electronic financial transactions, is still in the future and will require serious deliberation to make sure that coordinated approaches are developed across the organization The City's multi-bureau Blueprint 2000 effort to improve the permitting process is an example of IT's central role in rethinking traditional business practices

Opportunities

The tangible public access benefits of an improved IT environment are on the horizon Bureaus are individually and collaboratively considering business-driven opportunities for improved services, but the high-profile, system-wide push for greater electronic extended access awaits a more fully-integrated City IT environment It is the ITSP's mission to create that cohesive City environment

2.5 Special Issues

a. GIS

The City's GIS program is dedicated to establishing a system that creates, integrates, maintains, and distributes high-quality, geo-referenced information to enhance decision-making capabilities and improve delivery of City services

GIS will continue to lead the multi-bureau collaborative effort to address spatial data issues and will partner with ITSP to address non-spatial data issues The goals are to document the inventory of databases, establish stewardship standards policies and agreements, and facilitate development of the infrastructure and procedures necessary to support a high-level of data compatibility, data integration, access, and security In addition, a successful effort should reduce the costs of application development and data management

The completion of the ITSP Strategic Objectives, particularly the first six (see Chapter 3 2a & b, page 33), is critical to the organization's ability to fully reap the benefits of the investment in the corporate GIS program

b Year 2000 Readiness

Almost all observers of IT issues are aware of the global concern over countless major computer programs which were not designed to be in operation through the end of the century Many programs may not properly interpret the change of the millennium and may therefore misread, miscalculate, and improperly record millions of date-based records and transactions

All City computing assets, including hardware, software, networks, and embedded microprocessors, are being assessed for Year 2000 (Y2K) readiness The greatest difficulties with Y2K are typically with older, custom, legacy, software systems running in a mainframe environment Each of the four major mainframe-based systems and its status are as follows

- IBIS Financial System -- being updated with Y2K-compliant modules supplied by the vendor
- Water/Sewer Billing System -- being replaced
- Lien Accounting System -- rebuilt several years ago and Y2K issues addressed at that time
- Police Data Records System -- being modified by in-house staff

The City also has approximately 355 other large specialty business application systems, about half of which appear to be Y2K-compliant Another 10% are not compliant, and assessments are still underway for another 30% A preliminary assessment indicates that desktop hardware and embedded chip issues are probably trivial at this point A comprehensive assessment and testing of the network has yet to be performed, but initial research indicates that the network appears to present only minor problems as well

The City has assigned a full-time project manager for the overall Y2K compliance effort, but individual City bureaus remain responsible for ensuring that their systems will continue to function after the year 2000 Bureaus must continue with analysis of software and systems, prioritizing situations which demand attention, establishing schedules for coordinating and completing the work, and assigning and dedicating staff to complete the tasks

c IBIS

The Integrated Business Information System (IBIS) is the City's financial system Feedback from IBIS users indicates that IBIS has both significant strengths and weaknesses Strengths include tight audit trail and general ledger control, the system is stable and performs basic "batch" functions well, and system responsiveness is generally very quick In general IBIS is an excellent accounting system but its current configuration is antiquated IBIS is not the versatile, user-friendly, financial management system which might better serve the needs of the organization The current configuration of IBIS cannot do complex forecasting or what-if scenarios, and IBIS data must frequently be copied by hand and re-entered for use in other City applications Employees have expressed a strong desire to have IBIS brought up to a more contemporary level of sophistication

d. CBIS

The Customer Billing Information System (CBIS) is responsible for generating water and sewer bills for residents of Portland served by the Bureau of Water Works and the Bureau of Environmental Services (BES), and for recording and tracking payments made by the system's customers CBIS is a mainframe-based system with significant Year 2000 problems which would require a major programming effort to fix It also lacks the flexibility and functionality desired by Water and BES staff

The Water Bureau is leading the joint effort with BES to replace the system and has hired EMA, Inc , an IT consulting group, to guide the process Due to the new customer billing system, the Water Bureau is upgrading its network infrastructure and has worked collaboratively with the BIT and BGS Backbone/WAN upgrade effort to maximize the overall system-wide benefits

3 STRATEGIC OBJECTIVES

Overall, the City's core IT strategic direction is to integrate its IT resources into a more cohesive whole – to bring the various systems, networks, and projects together into a more consistent unit that operates like a single system Having established goals (Chapter 1) and assessed the current IT environment in the City (Chapter 2), the next step is to establish objectives for enabling the City to close the gaps between its current and desired IT environment

3.1 Framework

IT progress can be illustrated as a pyramid (see Figure 3-1) [1] At Level 1, the base of the pyramid, organizations build an IT infrastructure (computers, networks, etc) and work to optimize it IT is used to improve efficiency and cut costs At Level 2, organizations with a stable infrastructure build competence, initiate new processes, and work on business process re-engineering IT adds value and provides for change At Level 3, the peak of the pyramid, IT is fully integrated into the organization's business processes IT is a business enabler, central to the progress of the organization itself

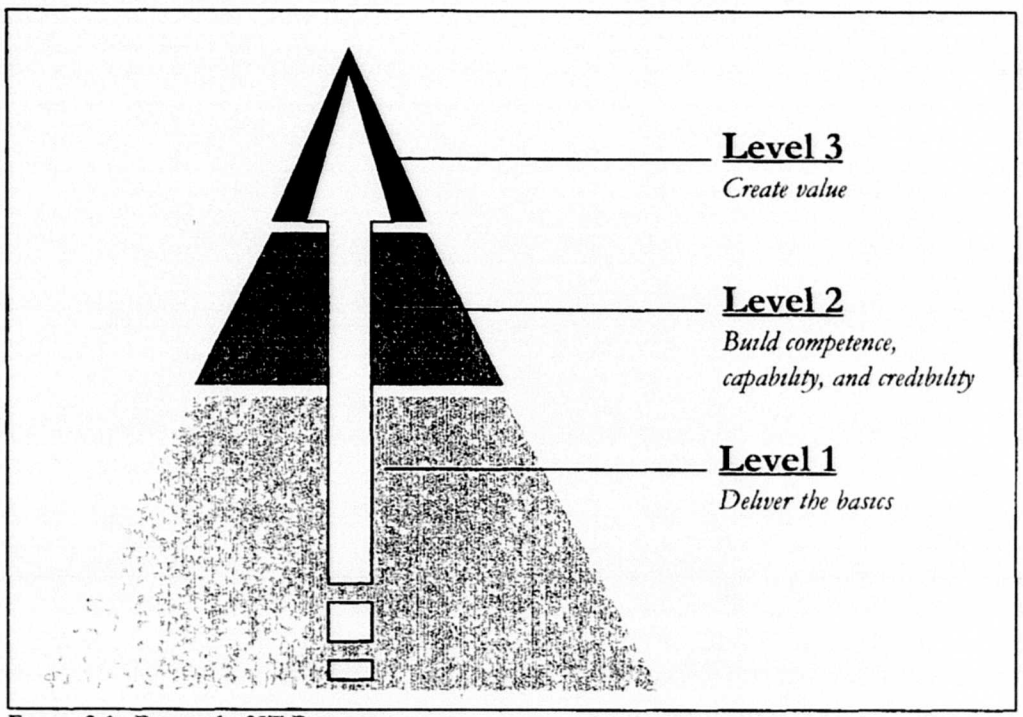


Figure 3-1 Pyramid of IT Progress

The City of Portland has achieved some progress on all three levels simultaneously on a bureau level City-wide, however, significant gaps exist on Levels 1 and 2 Significant progress on Level 3 will occur only when gaps have been plugged on the foundation layers of the pyramid Thus, the strategic objectives outlined below focus on establishing a solid, interoperable infrastructure (Level 1) and applications base (Level 2)

1 Carol Hildebrand, "The Nature of Excellence," *CIO*, August, 1997

3.2 Summary

a. Level 1 -- Develop the City's infrastructure into an integrated, interoperable, well-functioning system

- By June 30, 2000, implement an integrated, high-speed, data communications local area network backbone capable of handling application and information transfer requirements through the year 2005
- Develop and implement an enterprise-wide network design to accomplish the following goals
  - ✓ Develop a shared, City-wide, high-speed wide area network backbone capacity
  - ✓ Optimize the performance, availability, and quality of service of the City LANs and WANs
- Develop and implement standards for City desktop hardware and software by January 31, 2000

b Level 2 -- Initiate new applications and processes, build competence, and re-engineer rather than simply automate current processes

- By June 30, 2000, establish and implement a City-wide strategy for the effective deployment of Internet technology which
  - ✓ develops an integrated City Intranet based on Internet web-browser technology
  - ✓ establishes and implements a coordinated City-wide strategy for connectivity to the Internet
  - ✓ enables "Extranet" connectivity – secure, fully-functional connections and functionality between the Intranets of the City and strategic partners
- Integrate City databases into an enterprise-wide information management system which
  - ✓ enables all City employees to easily gain access to the data they need, regardless of their bureau or the bureau managing the data
  - ✓ By June 30, 2000, establishes clear data stewardship responsibilities for each City database including identification of storage and security and archival responsibilities
  - ✓ integrates all City databases containing geographic information with the GIS Hub by January 31, 2000
- Define and attain City-wide proficiency in the use and management of IT by June 30, 2000

c Level 3 -- Use IT as a business enabler and a key to the organization's progress

- Recommend an organizational structure and responsibilities appropriate for overseeing and managing the City's system-wide IT planning and investment over the next 3-5 years
- Develop a strategy to finance the investments that the City must make in IT over the next 3-5 years

[These issues will be addressed Chapters 4 and 5, respectively]

3.3 High-speed, Integrated Network Backbone

a Findings

- The current backbone is *not* high-speed, many current communications devices cannot handle high-speed communications Client-server and GIS applications will require a high-speed network backbone in the near future
- The current backbone is *not* fully integrated There are multiple independent segments of various media types which either do not interconnect or do so only in a convoluted manner This increases cost and difficulty of maintenance Greater value would be obtained by integrating the various independent segments for failover and sharing of capacity
- Complex routing, firewalls, and incompatible network protocols slow and sometimes block data transmission between LANs This makes integration of information more difficult and more expensive
- Implementation of coherent Internet and Intranet strategies will require an integrated, high-speed City network

b Objective

- By December 31, 2000, implement an integrated, high-speed, data communications local area network backbone capable of handling application and information transfer requirements through the year 2005

c. Strategy

- By June 30, 2000, upgrade central communications devices to deploy 100 megabit to 1 gigabit per second speeds for each LAN and WAN connected to the backbone
- By December 31, 1999, replace the current multiple independent network backbone segments with coordinated, high-speed network segments configured to provide appropriate traffic management and failover
- By June 30, 2000, each bureau must upgrade equipment (bridges, switches, routers) providing connections to the central backbone to 100 Mbps or 1 Gbps speeds by the bureau responsible for the LAN or WAN being connected Where possible, bureaus should implement Ethernet switches to expand bandwidth and reduce the need for routing
- The ITSP Network Task Force has recommended network media, equipment, and backbone interface standards and phase-in implementation plans for Management Committee review These are to be approved by the Executive Committee by July 31, 1998 The standards and implementation plan will enable modular upgrades to occur smoothly on an incremental basis

d. Action Items

STRATEGY	GROUP(S) RESPONSIBLE	DEADLINES
Develop connection, media, equipment standards and modify as needed	Network TF -- proposal & tracking Mgmt /Exec Committees approval	Completed July 31, 1998
Upgrade central equipment	BIT	June 30, 1999
Integrate separate segments	BIT	December 31, 1999
Implement standards connect at 100 Mbps/1 Gbps	Each bureau	June 30, 2000

3.4 Network Design

a Findings

- The City lacks an enterprise-wide networking design Individual bureaus have addressed their networking requirements with individual, single-purpose network solutions The resulting multiple networks are each optimized only to the requirements of that particular bureau
- These networks are often not well-integrated Some are incompatible with one another, others are simply configured in ways which do not facilitate the sharing of information
- The City overall does not obtain sufficient value for its investment For example, redundant WAN connections to the Portland Building result in underutilized capacity in some bureaus, while others have insufficient capacity
- Demand for greater network speed, functionality, and capacity will continue to grow at a rapid rate Planning and coordination are required to obtain maximum return on these investments
- The Office of Cable Communications and Franchise Management, the Bureau of General Services Communications Division, and the Bureau of Information Technology are jointly planning an enterprise wide area network (WAN) that will span all City facilities The network is intended to provide reliable, high-speed backbone communications at low cost throughout City government over an infrastructure capable of accommodating further growth as requirements and technology change A WAN engineering study has begun and upon completion at the end of August, 1998, will provide a Master Network Plan for City-wide WAN implementation
- Negotiations are underway with the City's cable television franchise holder to upgrade the institutional network as part of its project to replace a major portion of its coaxial cable plant over the next three years

b Objective

- Develop and implement an enterprise-wide network design which
  - ✓ optimizes the performance, availability, and quality of service of the City LANs and WANs
  - ✓ develops a shared, City-wide, high-speed wide area network backbone capacity

c Strategy

- By June 30, 1998, establish standards for LANs and WANs in areas including but not limited to
  - ✓ types of data circuits and media to use and under what circumstances
  - ✓ communications equipment
  - ✓ common protocol(s) and addressing
  - ✓ backbone connection strategy/policy
- By December 31, 1998, design a high-capacity enterprise data communications network which connects all City facilities and integrates current and required future infrastructure
- Identify current sites where opportunities exist for combining redundant, uncoordinated capacity, and develop and recommend a strategy for optimizing WAN communications at these sites by December 31, 1998
- By December 31, 1999, implement an enterprise network management system to monitor and operate critical systems connected to the network

d Action Items

STRATEGY	GROUP(S) RESPONSIBLE	DEADLINES
Develop connection, media, equip standards and modify as needed	Network Task Force -- proposal Mgmt/Exec Committees -- approval	March 31, 1998 July 31, 1998
Design high capacity network	BIT, BGS Review by ITSP (Network Task Force, MC, EC)	December 31, 1998
Combine redundant WAN connections	BGS, operating bureaus	December 31, 1998
Implement network management system	BIT	December 31, 1999

3.5 Internet, Intranet, Extranets

a Findings

- The Internet is increasingly becoming the medium of choice by which an organization's corporate image is presented and through which business is conducted
- The public, as well as the business community, expects the City to have well-planned and well-executed Internet and Intranet capabilities, providing citizen access to government information, participation in decision-making, and electronic commerce functionality The City's current capabilities are uncoordinated and do not provide the full range in demand
- Internet technology enables integration of dissimilar networks and data systems at relatively low cost, reducing the need for more expensive data and network conversion efforts
- Internet web browsers are relatively inexpensive and easy to learn, and can be used for a wide range of applications, thus providing high end-user capability at low training costs

b Objective

- By December 31, 1998, establish and implement a City-wide strategy for the effective deployment of Internet technology which
  - ✓ develops an integrated City Intranet based on Internet web browser technology
  - ✓ establishes and implements a coordinated City-wide strategy for connectivity to the Internet
  - ✓ enables "Extranet" connectivity –secure, fully-functional connections and functionality between the Intranets of the City and strategic partners

c Strategy

- Coordinate the City's Internet connections to provide greater capacity and failover capabilities
- Coordinate the City's provision of information and services on the Internet to produce a more consistent image that makes it easier for citizens to obtain information, participate in decision-making, and conduct electronic transactions
- By June 30, 1999, select and develop a pilot application using the City's Internet capabilities which allows persons or businesses to conduct electronic (rather than paper-based) transactions with the City
- By December 31, 1999, develop an Intranet, with accompanying standards and policies, based on Internet web-browsing technology which makes City information readily available to all City staff with access to the network
- By June 30, 2000, develop an "Extranet" – integrate the City's Intranet with a strategic partner's Intranet

d Action Items

STRATEGY	GROUP(S) RESPONSIBLE	DEADLINE
Coordinate Internet connections	Internet Task Force	March 30, 1998
Coordinate Internet information, services	Internet Task Force	December 31, 1998
Select Electronic Commerce pilot project	BIT with Internet Task Force	June 30, 1999
Develop City Intranet	Internet Task Force, BIT	December 31, 1999
Develop Extranet with strategic partner	Internet Task Force, BIT	June 30, 2000

3.6 Information Management

a Findings

- Information is a strategic and valuable asset Proper organization and management of information is critical to at least three core City values
    1 the City's ability to provide the highest quality customer service,
    2 to operate as efficiently and productively as possible,
    3 and to provide accurate and complete information to citizens
- The City has made a huge investment in creating databases Staff are increasingly dependent upon their database information as well as information created and stored by others, including staff in other bureaus
- However, the value currently obtained from the City's investment in information is greatly diminished due to duplication of data and the work required to gather and maintain it, incompatibility of software and data formats, and lack of connectivity among the myriad of City databases
- The cost of doing business escalates the more an organization's databases are isolated, duplicated, or incompatible Data stewardship agreements will ensure that data are entered once, maintained by those with the best knowledge of the information entered, and kept accessible to all those in need of it
- The level of benefit achieved by the GIS project depends critically upon the City's ability to integrate its geographic data across bureaus

b Objective

- Integrate City databases into an enterprise-wide information management system which
    - ✓ enables all City employees to easily gain access to the data they need, regardless of their bureau or the bureau managing the data
    - ✓ by December 31, 1999, establishes clear data stewardship responsibilities for each City database including identification of storage and security and archival responsibilities
    - ✓ integrates all City databases containing geographic information with the GIS Hub by January 1, 2001

c. Strategy

- Establish an Information Management Strategy Task Force (IMTF) whose mission will be to work jointly with the City's GIS Management Committee and staff to
  - ✓ By October 31, 1998, document all City databases into a City-wide "data catalog," including descriptions of the databases and identifications of the data stewards, following the model and process established by the GIS Management Committee
  - ✓ by December 31, 1998, identify areas of duplication and develop recommendations for reducing duplication where appropriate
  - ✓ by June 30, 1999, develop guidelines and standards for database storage and exchange formats for data to be shared across bureaus
  - ✓ by December 31, 1999, develop guidelines for data access/security, table layouts, and database stewardship responsibility for data used across bureaus
- The City will integrate all City databases containing geographic information with the GIS Hub by January 1, 2001

d. Action Items

STRATEGY	GROUP(S) RESPONSIBLE	DEADLINE
Data catalog	Information Management TF	October 31, 1998
Recommendations – eliminate duplication	IMTF	December 31, 1998
Guidelines – storage, exchange	IMTF	June 30, 1999
Guidelines – stewardship	IMTF	December 31, 1999
Create GIS Hub	Corporate GIS Staff	January 1, 2001

3.7 Standards

a Findings

- Standardization of City desktop hardware and software can dramatically lower the total cost of ownership of desktop computers
- Standardization reduces training requirements and allows the City to more broadly extend staff skill development across bureaus
- Standardization facilitates the integration of information systems For example, sending e-mail and sharing documents across bureaus would be simpler and more reliable if the City adopted common e-mail and word processing standards
- The rapid pace of change in hardware and software development means that the City will replace nearly all desktop technology within three years, with or without standards Standards with a three-year timeline can guide and simplify purchase decisions without massive transition costs

b Objective

- By January 1, 2001, develop and implement standards for City desktop hardware and software according to the following criteria
  - ✓ Does it support ***integration*** of City-wide information and Information Technology?
  - ✓ Does it improve the City's ***ability to deliver services***?
  - ✓ Is it ***forward-looking*** and consistent with industry trends? (Is it Internet-compatible? GIS-compatible?)
  - ✓ Does it make our staff more ***productive, efficient, and effective***?
  - ✓ Does it enable user-friendly ***access*** to public information by both citizens and City staff?
  - ✓ Does the ***value*** of the change exceed the ***costs*** over the long term?
  - ✓ Does the change enhance ***cooperative, collaborative*** work processes and effective decision-making in the City?
  - ✓ Is it ***technically feasible***?

c Strategy

- Establish a collaborative, consensus-driven process within the ITSP structure for proposing, setting, updating, and enforcing standards This process means that
  - ✓ by July 31, 1998 the IT Executive Committee will consider standards for desktop hardware and software
  - ✓ the Management Committee is responsible for ensuring that standards are proposed by this date
  - ✓ the IT Executive Committee has final authority on standards decisions
  - ✓ by September 30, 1998, the Management Committee (or ITEC designated subset thereof) will propose implementation and compliance procedures to the Executive Committee
  - ✓ by January 1, 2001, the standards will be fully implemented City-wide
- Recommendations on standards will be developed for at least the following
  - ✓ Desktop operating systems
  - ✓ Minimum and recommended hardware configuration
  - ✓ Office automation software
  - ✓ File exchange format
  - ✓ Desktop databases
  - ✓ Electronic mail / Scheduling
- Standards will clearly state the extent of flexibility and choice left up to the individual bureaus and provide guidelines for preferred options, if any For example, "Standard operating system options are BlueOS and GreenOS BlueOS should be used for Computer Assisted Design and GIS users, otherwise GreenOS should be used "

d. Action Items

STRATEGY	GROUP(S) RESPONSIBLE	DEADLINE
Establish process for standards	IT Executive Committee	Established
Recommend standards	ITSP Management Committee	July 31, 1998
Approve standards	IT Executive Committee	July 31, 1998
Establish implementation process	ITSP Management Committee	September 30, 1998
Implement standards	Bureaus	January 1, 2001
Modify standards	ITSP Mgmt/Exec Committees	as needed

3.8 IT Proficiency

a Findings

- The City has made, and will continue to make, a huge investment in Information Technology The value obtained from this investment hinges upon the staff's ability to use IT effectively
- External pressures to "do more with less" in order to keep taxes down require even greater use of IT and, therefore, more IT-capable staff
- Roles and responsibilities for network management are unclear in some areas Clear definition of roles and responsibilities is needed to ensure smooth operation of the City's networks
- The rapid pace of technological change and the complexity of the City's network environment make it difficult and costly to keep the proper levels and types of staffing available to every bureau
- The Bureau of Human Resources has retained a consultant to study and recommend changes to the City's IT classification and compensation structure The study is expected to be completed by July, 1998

b Objective

- By June 30, 2000, define and attain City-wide staff proficiency in the use and management of City IT

c. Strategy

- By June 30, 1998, define and adopt the types and levels of IT proficiency required by staff in each labor category
- Require these types and levels of proficiency in all future City hiring beginning July 1, 1998
- By September 30, 1998, develop an in-house training capacity to train all City staff on standard hardware and software
- By September 30, 1998, analyze IT skill deficiencies in current staff and determine the training needed by each staff person in order to obtain the required proficiencies
- Provide training as required by June 30, 2000
- Create and implement a Core IT Staff Competencies Strategy which
  - ✓ defines the skill types and levels required to effectively and efficiently manage the City's networks, and defines where and when such skills are needed around the City
  - ✓ compares current types, levels, and distribution of competencies to those required
  - ✓ develops staff competencies where needed, and indicates where resources need to be either increased or redistributed to obtain skill levels where required

d Action Items

STRATEGY	GROUP(S) RESPONSIBLE	DEADLINE
Define proficiencies	ITSP Management Committee, Bureau of Human Resources	June 30, 1998
Require proficiency in hiring	Bureau of Human Resources, operating bureaus	July 1, 1998
Develop training capacity	BIT, Bureau of Human Resources	September 30, 1998
Analyze skill deficiencies	Bureau of Human Resources	September 30, 1998
Develop Core IT Staff Competencies Strategy	ITSP, Bureau of Human Resources	September 30, 1998
Provide needed training	BIT, Bureau of Human Resources	June 30, 2000

4 ORGANIZATION OF IT MANAGEMENT IN THE CITY OF PORTLAND

If the ITSP is to be carried out successfully, each section of City government needs to be aware of its place within the ITSP as a whole Chapter 4 clearly defines the roles and responsibilities of the IT Executive Committee, the ITSP Management Committee, and various City bureaus and programs

4.1 Organization Objective

Recommend organizational structure and responsibilities appropriate for overseeing and managing the City of Portland's system-wide IT planning and investment over the next 3-5 years

4.2 Findings

- There is a need for system-wide standards and guidelines to promote interoperability and flexibility of communication, and a process for creating these standards and guidelines
- Roles and responsibilities of players in IT management are not well-defined in the City
- The establishment of the ITSP process addressed a number of organizational issues which will need continued attention
  - ✓ absence of an entity responsible for system-wide IT strategic planning and investment
  - ✓ absence of communication, coordination, and accountability for system-wide implications of bureau IT efforts and expenditures
  - ✓ absence of a forum and deliberative body for resolving IT conflicts with system-wide implications
  - ✓ limited ability to realize economies of scale and avoid duplicative/contradictory endeavors

> *"The notion of preparation or readiness concerns itself with the practical question of executable capabilities A strategist does not live in fantasy land The initial act of almost any strategy is to execute the necessary preparatory acts of training, staffing, practice, capacity building, and so on "*
>
> -Bernard Boar, "Strategic Thinking for Information Technology"

4.3 Opportunities

- Support evolution to a more collaborative corporate culture
- Utilize better strategic planning and allocation of resources
- Clarify roles, relationships, and responsibilities
- Derive more benefit from existing resources
- Create a common frame of reference (establish standards and guidelines)

4.4 Organization Strategy

Information and Telecommunications Technologies are becoming increasingly significant to conducting business in almost every aspect of private and public sector operations The need for strategic utilization of these technologies and organization of data by the City of Portland requires long-term, coordinated, and collaborative governance of system-wide IT functions
This will be accomplished via a structure currently consisting of

- the **IT Executive Committee**, a team of Bureau Managers designated by the Mayor and established by City Council Resolution 35560, supported by ITSP staff,
- the **ITSP Management Committee**, a committee of representatives from all City bureaus, which reports to the Executive Committee,
- and the task forces and sub-committees established by the Executive and Management Committees

4.5 Roles and Responsibilities

a The IT Executive Committee	Responsible for:*
The IT Executive Committee (EC) is a team of Bureau Managers designated by the Mayor and City Council to establish, govern, and ensure compliance with City-wide Information Technology and Telecommunications policies, standards and procedures applicable to all bureaus, boards, and commissions	Periodically reporting to City Council
	Periodically updating the IT Strategic Plan
	Determining the need for and setting appropriate binding, organization-wide IT standards and policies
	Fostering system-wide communication, collaboration, and cooperation to accomplish the goals of the ITSP
	Overseeing the work plans of the ITSP Management Committee and GIS Management Committee
	System-wide Strategic/Long-term IT Planning
	Governing and overseeing new City-wide IT initiatives and projects
	Recommending and overseeing financial strategies to support and enhance the City's investments in IT
	Arbitrating IT issues related to system-wide or inter-bureau policies and practices
	Reviewing major IT agreements between the City and other entities for consistency with City-wide IT policies
	Considering and making determinations on bureau requests for exceptions to ITSP polices

The IT Executive Committee defines, from a system-wide perspective, IT roles, relationships, and accountability for those units of City government including

- Bureau of Information Technology
- Bureaus containing significant internal IT staff and operations
- Bureaus with minimal internal IT staff and operations
- ITSP staff
- Bureau of General Services - Telecommunications Services
- Cable and Franchise Management
- Geographic Information Systems

** "responsible for" -- having administrative and budgetary accountability and authority with an expectation of ongoing collaboration with relevant partners and customers*

b ITSP Management Committee	Duties:
Members of the ITSP Management Committee (MC) are designated by Bureau Managers from each City bureau or elected office While responsible for cooperatively addressing issues from a system-wide perspective, members should be the IT leader of, and speak for, their respective bureaus or offices	Attend Management Committee meetings
	Report to the IT Executive Committee
	Address issues identified by the ITSP EC or raised by MC members for research, discussion, and resolution
	Facilitate/support communication and implementation of ITSP policies
	Create and coordinate task forces to address ITSP issues, and identify task force membership
	Define task force work plans
	Review and synthesize recommendations of the task forces
	Submit issues and policy recommendations to EC
	Provide a forum for multi-bureau exchange of information and consensus-building
	Assist bureaus in articulating IT policy and direction to IT staff, Bureau Managers and Commissioners
	Link and integrate ITSP efforts with other City decision-making processes such as budget preparation, IT purchasing, and staff training
	Assist in identifying IT resources
	Plan regularly scheduled meetings

c.1 Bureaus and Programs - ITSP staff	Responsible for:
ITSP staff will be housed in the Office of Finance and Administration	Supporting and reporting to the IT Executive Committee
	Assisting in IT Strategic Plan implementation
	Developing ITSP budget and work plan
	Coordinating ITSP Management Committee and Task Forces
	Providing system-wide communication and education on ITSP issues
	Carrying out collaborative, system-wide strategic planning and pilot projects
	Assisting in meeting system-wide goals for GIS
	Research and special projects

c.2 Bureaus and Programs - GIS	ITSP contains the strategies, policies, procedures, and work plan to:
Geographic Information Systems - Under the direction of the IT Executive Committee, the GIS Management Committee and the Corporate GIS (CGIS) Team develop the Corporate GIS Business Plan	Integrate and distribute GIS data sets
	Integrate GIS with other Information Technologies
	Coordinate GIS projects and budgets
	Help bureaus achieve their GIS goals
	Design and develop corporate GIS applications
	Manage the shared corporate GIS data-set repository
	Maintain and provide access to GIS data models and related data dictionaries
	Negotiate GIS-related intergovernmental agreements
	Ensure that the IT network design provides adequate capacity and connectivity
	Collaborate to achieve system-wide ITSP goals

c.3 Bureaus and Programs - BGS Telecomm	Responsible for:
Bureau of General Services - Telecommunications	Collaborative system-wide WAN* Strategic Planning, engineering, and coordination
	System-wide telecommunications technology infrastructure management
	System-wide telecommunication consulting and contracting implementation
	System-wide wiring of City facilities for telecommunications and data
	Assistance in meeting the system-wide goals of ITSP

c.4 Bureaus and Programs - Cable	Utilizing the City's franchise authority, Cable will:
Office of Cable and Franchise Management (Cable) - Cable will continue to carry out the City's cable regulatory and franchising responsibilities	Be responsible for securing the greatest long-term citizen and City benefit from agreements with private telecommunications and cable providers
	Cooperatively facilitate infrastructure development to support citizen and City access to communications technology (including capacity on cable and fiber systems)
	Jointly develop city-wide and area-wide plans for cost-effective use of franchise-required resources
	Assist in meeting the system-wide goals of ITSP

** Wide Area Networks (WANs) -- telecommunications circuits or facilities aggregated into communications architecture that routes or switches messages between various local area networks (LANs) A WAN typically is composed of multiple telecommunications links, each connecting either remotely or via microwave [circuits], and terminating in digital or analog edge devices WANs typically require circuits to be provisioned from a LAN edge into a larger network switch which may route through multiple switching centers to deliver the traffic to its final destination*

c.5 Bureaus and Programs - BIT	Responsibilities:
Bureau of Information Technology	Collaboratively plan, design, administer, and coordinate system-wide WAN
	Operate system-wide network management system and collaborate with BGS and bureaus for network maintenance
	Administer, operate, and maintain core LAN/WAN backbone
	Operate and maintain core City-wide systems (e g IBIS, Central e-mail server, Internet access, and web hosting)
	Operate and maintain Technology Learning Center
	Operate and maintain the IS Help Desk
	Manage system-wide site licenses and maintenance contracts
	Actively communicate and coordinate IT plans, activities, and IGAs across bureaus
	Participate in ITSP committees and task forces
	Implement and adhere to system-wide standards and guidelines
	Assist in meeting system-wide goals, ITSP goals and other tasks assigned by the ITSP EC
	Provide basic system-wide user support and consultation

c.6 Bureaus and Programs - BIT	By contract or other arrangement with individual bureaus, may be responsible for:
Bureau of Information Technology	Developing, implementing, maintaining, and operating applications systems, including providing programming services
	Installing, administering, and supporting local LAN/WAN and/or desktop systems
	Providing Web services (development and maintenance) for Internet and Intranet presence
	Managing bureau software licenses and maintenance contracts
	Assisting bureaus with purchasing technology (e g serve as brokers or technology acquisition consultants)
	Developing bureau-specific strategic plans
	Supporting and training users
	Other services as agreed with bureaus

c.7 Bureaus and Programs - Other bureaus	Responsible for (but may contract out):
Other bureaus	Identifying lead person(s) for IT issues
	Maintaining current and accurate data
	Participating in ITSP committees and task forces
	Implementing and adhering to system-wide standards and guidelines
	Active system-wide communication of bureau IT plans, activities and IGAs
	Planning, specifying, configuring, and managing local and wide area networks for bureau facilities
	Participating in collaborative LAN and WAN backbone strategic planning, engineering, and coordination
	Local site license/maintenance contract management
	Assuring that all bureau software is legally licensed
	User support and training
	Local applications
	Bureau-specific IT Strategic Planning and R&D
	IT Purchasing
	Bureau World Wide Web and Intranet presence
	Assisting in meeting system-wide goals of ITSP
	IT investment strategy and financing
	All else not addressed by the IT Executive Committee

5 FINANCING CREATION OF A QUALITY IT INFRASTRUCTURE

The major changes required for Portland to implement its ITSP will not happen without the appropriate financial investments As with any long-term program, the City must plan accordingly now in order to have a successful IT future

5.1 Financing Minimum Standards Upgrades

a To bring systems used by all bureaus up to a minimum standard

The Information Technology Executive Committee shall consider the following optional approaches and will work with OF&A to develop IT funding strategies to be incorporated in long-term financial planning processes Appropriations necessary to bring all City-wide systems up to minimum standards shall be made and fully funded through existing cost-sharing arrangements, if available If no cost-sharing arrangement exists for a City-wide system, a one-time appropriation shall be made to the organizations responsible for the systems This appropriation will be made from each fund in proportion to the number of IT users, actual usage, or other cost sharing mechanism, as determined by the IT Executive Committee

b To bring systems shared by more than one bureau up to a minimum standard

Appropriations necessary to bring all shared systems up to minimum standards shall be made and fully funded through existing cost-sharing arrangements, if available If no cost-sharing arrangement exists for a shared system, a one-time appropriation shall be made to the organization primarily responsible for the shared system This appropriation will be made from each fund in proportion to the number of IT users with access to the shared system , actual usage, or other cost sharing mechanism, as determined by those sharing the system

c To bring bureau systems up to a minimum standard

One-time appropriations necessary to bring all bureau systems up to minimum standards shall be made to bureaus from their respective funds

d Options

If the IT Executive Committee determines that it is in the City's best interest to minimize financial impacts, systems may be brought up to a minimum standard over a period of not more than two years, with a priority given to City-wide systems

5.2 Financing Maintenance of a Quality IT Infrastructure

a City-wide systems

- The Information Technology Executive Committee shall consider the following optional approaches and will work with OF&A to develop IT funding strategies to be incorporated in long-term financial planning processes
- Organizations responsible for City-wide systems shall develop multi-year maintenance and replacement plans for keeping all system components up to at least minimum standards This includes a review and validation of any existing cost-sharing arrangements or creation of appropriate cost-sharing arrangements if none exist
- The IT Executive Committee shall review and approve the multi-year maintenance and replacement plan and cost sharing arrangements
- System IT Accounting Structures shall be created in organizations responsible for City-wide systems They will be funded annually beginning not later than FY 1999-00, in accordance with multi-year maintenance and replacement plans and cost sharing arrangements
- System IT Accounts may be spent at any time for City-wide systems in accordance with the multi-year maintenance and replacement plans They may also be spent on other City-wide system needs with the advice and consent of the IT Executive Committee

b Shared systems

- A multi-year maintenance and replacement plan for keeping all system components up to at least minimum standards shall be developed cooperatively for each shared system by the bureaus which share it This includes a review and validation of any existing cost-sharing arrangements or creation of appropriate cost-sharing arrangements if none exist
- Shared IT System Accounts shall be created in organizations primarily responsible for each shared system They will be funded annually beginning not later than FY 1999-00, in accordance with the multi-year maintenance and replacement plan and cost sharing arrangements
- Shared IT System Accounts may be spent at any time for shared systems in accordance with the multi-year maintenance and replacement plan They may also be spent on other shared system needs, with the advice and consent of the IT Executive Committee and those sharing the system

c Bureau systems

- Bureaus are expected to maintain their IT system components, including hardware, software, IT staffing, and user training up to at least minimum standards
- Each bureau shall develop a multi-year maintenance and replacement plan for all of its IT system components
- Bureau IT accounts shall be created in each fund for each bureau
- Each bureau shall include in its annual budget proposal transfers of appropriations to their IT account, beginning no later than FY 1999-00, in accordance with the bureau's multi-year maintenance and replacement plan
- Each General Fund bureau shall receive a permanent target budget adjustment to enable them to fund their required contribution to their bureau IT account
- Bureau IT accounts may be spent at any time at the bureau's discretion for bureau systems, IT staffing, or staff IT training, in accordance with the multi-year maintenance and replacement plan, or for other bureau system needs

"We could be looking at every home as a virtual government office Secure Internet, electronic commerce and WWW technologies will greatly enhance government programs and communications capabilities. We are just beginning to realize their potential for improving education, health care, human services, and other government programs."

-John Brophy, CEO Lockheed Martin IMS

5.3 Financing Strategic IT Objectives

Strategic IT Objectives identified in this Plan, or subsequently approved by the IT Executive Committee, shall be paid for through City-wide cost-sharing arrangements and appropriated within the Bureau of Information Technology (BIT) These arrangements could include the general overhead model or the rate model administered by BIT The IT Executive Committee will directly manage implementation of Strategic Objectives and may utilize BIT, contract for assistance with outside vendors and consultants, or use other bureaus through interagency agreement

Appendix B summarizes the estimated cost of financing the Strategic Objectives contained within this plan and attempts to identify whether these costs will likely represent "new" money or merely require redirection of existing resources

5.4 Other Recommendations

IT investments are not limited only to the cash available through the IT account structure City organizations may continue to propose IT changes and upgrades through normal operating and capital budgeting processes

- City-wide systems, shared systems, and bureau systems may be maintained at levels higher than minimum standards
- For any City-wide, shared, or bureau system not now up to minimum standards, the next IT expenditure made from existing appropriations shall contribute to achieving those standards
- The Office of Finance and Administration shall prepare instructions for bureaus for using the existing IT accounting structure to record all expenditures for IT purposes All bureaus shall use this accounting structure for all IT expenditures
- The Budget Manual shall include instructions that all future Add Packages and other budget proposals include IT costs for hardware, software, system impacts, support staff and training, and that multi-year financial projections include IT replacement factors
- The Budget Manual shall include instructions that all City facility remodeling, renovation, or construction projects include IT factors

6 FURTHER EFFORTS

The Strategic Objectives addressed in the preceding chapters of this document outline a course of action for several Level One and Level Two City-wide issues There are other issues which merit attention at some point However, the City is not poised to take action in all areas for several reasons

- limited resources
- the need to resolve some fundamental infrastructure issues first, before other higher-level issues can be addressed successfully
- the need to gather more information, develop strategies, and assess costs in other areas

Nevertheless, while decisions have not yet been reached in these areas, it is important to note the progress that the City has made and the efforts that should be expended toward resolving outstanding issues

6.1 City-wide Financial Information System

The City's financial system (IBIS) consists of a number of standard Geac (formerly Dunn & Bradstreet) modules running on an IBM mainframe computer In addition, customized interfaces to some modules have been developed to link them to other City applications

a. Strengths

- Stable accounting system which performs basic "batch" functions well
- Tight audit trail and general ledger control
- Quick system responsiveness (screen refresh, transaction processing, etc)

b Weaknesses:

- Inflexible and difficult for most users (For example, for a single transaction inquiry, multiple screens must often be navigated to obtain various bits of information which the user must then piece together on paper)
- Lack of links to financial forecasting models
- Lack of integrated multi-year budget development module
- Awkwardness in the current implementation of the City's Chart of Accounts structure
- Lack of a relational database architecture, making integration with other City information systems difficult
- Lack of Year 2000 compliance in many modules, including the Payroll module (Testing and implementation of upgraded, compliant modules [as well as related City systems] required the purchase of additional mainframe capacity This purchase has been completed and the efforts to implement IBIS upgrades are on schedule, with Purchasing, Accounts Payable, and Budgetary Control completed and operational, and the remaining modules in progress or scheduled)

c Opportunities

- After the year 2000, immediate pressure for system fixes will be removed, and an opportunity to perform a thorough review of financial information system needs can be conducted without the imposition of artificial deadlines like those imposed by Year 2000 concerns
- Geac has developed a relational database version of IBIS software to which some of its customers have upgraded or are in process of upgrading Other financial information system options exist as well, including using a different base system, adding a more user-friendly front-end, and adding or developing enhanced financial reporting and forecasting capabilities

d Action Item

- The Office of Finance and Administration shall lead a collaborative, participatory, City-wide review of customer needs to define options and strategies on financial information systems

6.3 Data Center

After the passage of Measure 47 which reduced and capped property taxes, the City of Portland and Multnomah County initiated a review of programs to identify potential savings from consolidating various operations Consolidation of the central Data Centers of the two organizations was identified for possible savings

The City and County conducted a joint study and concluded that savings could accrue, but that consolidation would result in service interruptions and reduced service levels At the time, there was some uncertainty in both organizations about the level of capacity each would need for Year 2000 testing Within the City, there was uncertainty about the length of time that the Water Bureau would continue to need mainframe resources Given these uncertainties, the two organizations concluded that it would be prudent to wait until the City completed its IT Strategic Plan before making major changes

At present, Year 2000 testing appears to be a significant factor in increasing both organizations' need for mainframe capacity in their respective data centers In addition, the Water Bureau's schedule indicates that they will continue to demand mainframe capacity through at least October, 1998 Any conversion before then would be highly disruptive to the Water Bureau, and any conclusion afterward infringes upon Year 2000 testing Therefore, it does not seem advantageous to consider merging data centers until after January, 2000

6.4 Partnerships

A significant industry trend is for organizations to form partnerships with IT vendors This is intended to reduce the "total cost of ownership" of IT In a normal partnership, the buyer agrees to purchase 100% of needed IT products and services from the supplier, usually setting rigorous standards on a specific set of technology options The supplier, who now works in a homogenous environment, extends lower prices The amount of payment is determined in part by the performance of the system, according to mutually agreed measures

While this option is intriguing and the goal of lowered costs is one the City shares, the City is not in the position to take advantage of partnerships at this time Partnerships require that the basic infrastructure (Level One) is optimized and that applications (Level Two) are mature and standardized The greatest value is realized when an organization reaches Level Three – where IT plays a strategic role in managing an organization Thus, significant work remains before the City will be prepared to consider a partnership arrangement In particular, the Strategic Objectives of this plan must be implemented first This option should be considered when this plan is reviewed and revised in 3-5 years

6.5 Moving Onward

In addition to developing strategies on these unresolved issues, several steps must be taken in the near future to assure successful implementation of this plan

- ITSP staff must lead development of implementation plans for IT Strategic Objectives
- All bureau budgets must include resources for IT Strategic Plan implementation
- All bureaus must update their individual IT plans or, in some cases, draft new ones ITSP staff will develop model IT plans to guide those bureaus that need to create new plans

Conclusion

The IT Strategic Plan is the key that unlocks the door to a 21st century City government for Portland It marks a significant departure from the way the City once engaged Information Technology and establishes a new era of decision-making, planning, and service delivery rooted in a collective IT vision The ITSP sets coherent, consistent strategies which define IT as a core corporate function serving both corporate and departmental needs Ultimately, there will be better management of and convenient access to municipal information for all who need it citizens, officers in patrol cars, Parks maintenance staff, building inspectors, planners, managers, City Council, Portland's businesses, and other governments

The City of Portland's plan is to use IT to meet the challenges of the first years of the next millennium Its success will be determined by a top-to-bottom, system-wide commitment to a strategic outlook on IT multi-bureau collaboration, regular analysis of customer and organizational business needs, and consistent strategic investment in the overall IT infrastructure The physical IT infrastructure will be both reliable and adaptable The core applications and data which traverse the infrastructure will be readily compatible and consistently accessible to the entire organization Employees who use the technologies and those who support the IT infrastructure and applications will be adequately trained in order to realize the maximum benefit from the City's investment in IT

Rapid technological change and the evolving needs of municipal government demand that these strategies be reviewed regularly This plan lays out the first steps Once a coherent IT infrastructure is in place, the City will expand the focus onto applications and re-engineering issues, as well as onto the community needs for technology-enabled services Preliminary collaboration on this next phase must begin even as the infrastructure-building tasks in this document are being completed Through continual collaboration in planning strategies with a City-wide perspective, the IT plan will enable the City of Portland to offer our community accessible, effective, and efficient government

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Glossary

Blueprint 2000 - A multi-bureau City of Portland project aimed at re-engineering the permitting process

Electronic mail, E-mail or e-mail - Messages and attached documents or files sent or received via City internal computer systems and networks or external systems and networks such as the Internet

Ethernet - A network connectivity hardware/architecture protocol which manages the transmission of data between machines in a distinct way Available at differing capacities, each requiring different types of connecting cable and network cards (*Token Ring* is another network data transmission/management protocol)

Extranet - A browser-accessible environment wherein two firewalled networks (generally belonging to two otherwise unrelated organizations) share a secure connection

Failover - Back-up or redundant resource activated when primary system fails, as in a failover water line, failover electrical line, or failover data connection

GIS (Geographic Information Systems) - An organized collection of computer hardware, software, geographic/spatial data, and personnel designed to efficiently capture, store, update, manipulate, analyze, and display all forms of geographically referenced information

Host - Any computer on a network that is a repository for services available to other computers on the network

IGAs - Inter-governmental agreements

Internet technologies - The range of computer-based communication technologies, services, and capabilities, including electronic mail, world wide web, file transfer protocol, and newsgroups, available through interconnected public and private networks which have agreed to follow certain standards and conventions

Intranet - A World Wide Web browser-accessible environment within the confines of a firewall, not accessible to anyone outside the firewall

LAN (Local Area Network) - Two or more computers and peripherals at a single location (usually an office or home) that are connected by phone lines or coaxial cable

Non-spatial data – Generally any information stored in a database format In this case all data not already included in the GIS data catalog

SNMP (Simple Network Management Protocol) - A protocol for examining and modifying settings for LAN/WAN connected devices such as bridges and routers

Spatial data - Information about the locations, shapes, and relationships among geographic features, usually stored as coordinates and topology

TCP/IP (Transmission Control Protocol/Internet Protocol) - An application which facilitates the correct transportation and re-assembly of data between computers Its key feature is that it is platform independent Once installed, it works with Mac, Windows, OS2, etc

WAN (Wide Area Network) - Generally a private, long-distance network that uses leased lines to connect computers or LANs For the purposes of the IT Strategic Plan telecommunications circuits or facilities aggregated into communications architecture that routes or switches messages between various local area networks (LANs) A WAN typically is composed of multiple telecommunications links, each connecting either remotely or via microwave (circuits), and terminating in digital or analog edge devices WANs typically require circuits to be provisioned from a LAN edge into a larger network switch which may route through multiple switching centers to deliver the traffic to its final destination

Web, World Wide Web, or WWW - A vast array of information (in text, video, graphics, or sound) accessible via a subset of Internet standards and protocols (HTML) which allows consistent information presentation, display, and interaction by diverse computers, such as Macs, Windows, and Unix machines The three components to the WWW are a server, which stores and "presents" documents created with HTML, browser software at the user workstation that gains access to, reads, and displays these documents, and the network (generally the Internet) connection linking the user to the server A key characteristic of the WWW information is its interconnectedness via non-hierarchical links

Web browser - Access tool or software for visiting Web sites (Mosaic and Netscape are two examples) Most browsers allow access to text, graphics, video, and sound

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RESOLUTION NO. 35723

Adopt an Information Technology Strategic Plan for the City of Portland (Resolution)

WHEREAS, The Portland City Council has identified the significant degree to which Information Technologies have and will continue to transform the lives of individual citizens, the private sector, government, and international economies, and

WHEREAS, The Portland City Council recognizes that Information Technologies are an integral and critical element in providing the citizens of Portland with modern, efficient, accessible, and reliable government, and

WHEREAS, to establish and maintain a current, coherent, compatible, reliable, well coordinated and adaptable system of Information Technologies the City of Portland requires ongoing Information Technology strategic planning and clear objectives, and

WHEREAS, The Portland City Council directed the Information Technology Executive Committee to create and continually update an Information Technology Strategic Plan for the purposes of

a Establishing a long-term mechanism for managing system-wide Information Technology planning and implementation
b Developing and implementing policies to support a well coordinated and compatible Information Technology infrastructure
c Strategic leveraging of City investments in Information Technologies
d Using Information Technologies to provide quality service delivery to citizens and increased opportunities for citizen input
e Using Information Technologies to improve work processes between bureaus within City government
f Providing faster access to a wider range of information for citizens and within government
g Promoting job quality and a skilled adaptable employees
h Creating partnerships with the appropriate education and economic development communities
i Creating partnerships with other governments
j Protecting and promoting the information technology and
k telecommunications interests of Portland citizens, and

WHEREAS, the Information Technology Executive Committee, representing a cross section of City government has collaboratively developed the City of Portland's first organization-wide Information Technology Strategic Plan, and

35723

NOW, THEREFORE, BE IT RESOLVED The Information Technology Strategic Plan is the guiding document for the strategic development, management and coordination of Information Technologies in City government, and

BE IT FURTHER RESOLVED The Information Technology Executive Committee is responsible for the maintenance and continuous improvement of the Information Technology Strategic Plan, and

BE IT FURTHER RESOLVED The Information Technology Strategic Plan be updated annually and progress reports be provided to City Council on a semi-annual basis, and

BE IT FURTHER RESOLVED that all City of Portland Bureaus will actively support the and participate in the implementation and evolution of the Information Technology Strategic Plan, and

BE IT FINALLY RESOLVED The City Council of Portland hereby adopts the Information Technology Strategic Plan, attached hereto as Exhibit A

ADOPTED by Council SEP 02 1998
Art Alexander OFA
Mayor Katz

BARBARA CLARK
Auditor of the City of Portland
By Deputy

Britta Olson

S-1317 **SUBSTITUTE**

Agenda No

RESOLUTION NO. 35723

Title

Adopt an Information Technology Strategic Plan for the City of Portland (Resolution)

INTRODUCED BY	DATE FILED SEP 1 1998
MAYOR VERA KATZ	Barbara Clark Auditor of the City of Portland
NOTED BY COMMISSIONER	
Affairs	By Cay Kershner Deputy
Finance and Administration Mayor Katz/ea	For Meeting of
Safety	
Utilities	ACTION TAKEN
Works	
BUREAU APPROVAL	
Bureau Finance and Administration	
Prepared by A Alexander Date 9/1/98	
Budget Impact Review __ Completed __ Not Required	
Bureau Head Tim Grewe Tim Grewe/ea	

AGENDA		FOUR-FIFTHS AGENDA	COMMISSIONERS VOTED AS FOLLOWS		
				YEAS	NAYS
Consent	Regular X	Francesconi	Francesconi		
NOTED BY		Hales	Hales	✓	
City Attorney		Kafoury	Kafoury	✓	
City Auditor		Sten	Sten	✓	
City Engineer		Katz	Katz	✓	