



Postal Computing Environment

Handbook AS-820

October 2002
Transmittal Letter

A. Explanation. This document describes the current and planned postal computing environment. It contains technical information, design rules, configuration details, and procedures appropriate for guiding the transition from client-server to web-server focused computing. It contains rules and procedures that are intended to improve postal computing. It provides a framework for designing business applications and building IT infrastructure and ensures a solid fit between these two activities.

B. Distribution

1. **Initial.** This handbook is distributed to all officers, Headquarters managers, and district managers of information systems.
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D. Rescission. This handbook supersedes Handbook AS-820, *Postal Computing Environment*, dated June 1999; Memorandum of Policy IT-12-11-2000, *Microsoft Windows 2000 on Desktop and Laptop Computers*; Memorandum of Policy IT-02-26-2001, *Browser Compatibility and Server-based Application Development*; and Memorandum of Policy IT-03-06-2001, *Windows 2000 Servers*.

E. Effective Date. This handbook is effective immediately.

A handwritten signature in black ink that reads "Robert L. Otto". The signature is written in a cursive style with a large, prominent "R" and "O".

Robert L. Otto
Vice President
Information Technology

Summary of Changes

General

This is a major revision of Handbook AS-820, *Postal Computing Environment*, superseding the version published in June 1999. The most important changes to the handbook are summarized on this page.

Handbook Structure

- **Chapter 1, Introduction.** The chapter was restructured and condensed; changes were made in the assignment of responsibilities for the Postal Computing Environment.
- **Chapter 2, Enterprise Architecture.** A Framework for Business Solutions. The application development section was expanded to address *n*-tier application models and provide guidelines for developing applications in a web-centric environment. A short introduction to business processes was added. Minor changes were made to the information architecture section. New sections on enterprise security and infrastructure transition were added.
- **Chapter 3, IT Services.** This chapter was rewritten to introduce the initiative by the Information Technology organization to offer Business/IT Services, a form of technical shared services. These services are described in the chapter.
- **Chapter 4, IT Infrastructure.** Descriptions and specifications for the workstations and servers being deployed by the Advanced Computing Environment (ACE) program were added. Other provisioning specifications were updated as were the usage tables for database servers, application processors, and web servers. The description of the wide area network was updated.
- **Chapter 5, Processes.** This chapter was extensively rewritten to reflect revisions in IT governance that were initiated in conjunction with the ACE program.
- **Appendix A, Acronyms and Abbreviations.** Acronyms and abbreviations were added and deleted.
- **Appendix B, Architectural Blueprints.** No changes were made.

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Contents

- 1 Introduction 1**
 - 11 About This Handbook 1
 - 111 Purpose 1
 - 112 Definition 1
 - 113 Scope 1
 - 114 What the Document Contains 2
 - 12 Importance of the PCE 2
 - 13 USPS Values Affecting the PCE 2
 - 14 Benefits of an Integrated PCE 4
 - 15 PCE Responsibilities 5

- 2 Enterprise Architecture: A Framework for Business Solutions 7**
 - 21 Business Processes 7
 - 22 Application Development Models and Guidelines 8
 - 221 Introduction to the Model 8
 - 222 Application Development Model Example: Java 2 Enterprise Edition (J2EE) 10
 - 223 Application Development Guidelines 10
 - 223.1 Guiding Principles 10
 - 223.2 User Interface 11
 - 223.3 Business Logic 12
 - 223.4 Data Access 13
 - 23 Information Architecture 14
 - 231 Introduction 14
 - 232 Structured Data Architecture Components 15
 - 233 Unstructured Data Architecture Components 16
 - 234 Resources 16
 - 24 Information Security Framework 17
 - 241 Introduction 17
 - 242 Guidelines 17
 - 243 Resources 18
 - 25 Infrastructure Transition 18
 - 251 Introduction 18
 - 252 Guidelines 19

3	IT Services	21
31	Benefits of a Services Approach	21
32	Guidelines	22
33	IT Organization-provided Services	23
331	Application Hosting	23
332	Back Office Processing	24
333	Business Solutions	24
334	Customer Support	24
335	Data Management	25
336	Distributed Applications Management	26
337	Electronic Messaging	26
338	Information Systems Security	27
339	IT Architecture/Standards	27
3310	Software and Hardware Acquisition	28
3311	Telecommunications	28
3312	Resource	29
34	Responsibilities of IT Service Managers	29
35	Specification Template	29
4	IT Infrastructure	31
41	Conceptual Framework	31
411	IT Infrastructure Components	31
412	Computing Functions	33
412.1	Interactive Versus Batch	34
412.2	User Roles	35
413	Computing Boundaries	35
413.1	Locations	36
413.11	Postal Buildings	36
413.12	Nonpostal Locations	39
413.13	Postal Employees and Vehicles	39
413.2	Enterprise	39
413.3	Inter-Enterprise	39
42	IT Infrastructure Guidelines	40
421	Component-Based Guidelines	40
421.1	Workstations	40
421.11	Administrative Workstations	41
421.12	Industrial Workstations	46
421.13	Commercial Workstations	47
421.2	Login Servers	47
421.3	Peripherals	49

Contents

421.4	Function Servers	49
421.5	Database Servers	49
421.6	Application Processors	51
421.7	Special Purpose Devices	52
421.8	Local Area Networks	53
421.9	Wide Area Networks	53
422	Computing Boundary-Based Guidelines	55
422.1	Locations	55
422.11	Postal Buildings	55
5	PCE Processes	57
51	Business/Program, Planning, Development	59
52	Enterprise Architecture Management	59
521	Information Technology Principles Process	60
522	Business Processes Assessment Process	61
523	Technology Research/Monitoring Process	61
524	Development and Renewal Process	62
525	Communications, Consultation, and Training Process	63
526	Guidance Preparation Process	63
53	Application Development and Maintenance	64
54	Evaluation	64
541	Architecture Review Process	65
542	Testing/Certification Process	66
542.1	Architecture Compliance Testing Process	66
542.2	Application Certification Process	67
542.3	Information Security Assurance Process	67
55	Infrastructure Services Development	67
56	IT Infrastructure Change Control	67
57	IT Infrastructure Operations	67
	Appendix A — Acronyms and Abbreviations	69
	Appendix B — Architectural Blueprints	75
B1	Office Building	79
B2	Mail Operations Building	84
B3	Large Associate Office Building	92
B4	Small Associate Office Building	102
B5	Mixed Technology Building	110
	Appendix C — Related Directives	123

Exhibits

Exhibit 2-1	
Representation of Extract from Enterprise Map	8
Exhibit 2-2	
USPS Logical Application Development Model	9
Exhibit 2-3	
Structured Data Architecture Components	16
Exhibit 3-1	
IT Organization-provided Services Hierarchy	23
Exhibit 4-1	
PCE Computing Boundaries	36
Exhibit 4-2	
Backbone Portion of the PRN/MNS	54
Exhibit 4-3	
Lower Network Portion of the PRN/MNS	55
Exhibit 5-1	
PCE Processes Map	57
Exhibit 5-2	
Enterprise Architecture Management Processes Map	60
Exhibit 5-3	
Evaluation Processes Map	65
Exhibit B.1-1	
Sections in an Office Building	79
Exhibit B.1-2	
Office Building Telecommunications Section Layout	80
Exhibit B.1-3	
Office Building Computer Room Layout	81
Exhibit B.1-4	
Office Building Administration Section Layout	82
Exhibit B.1-5	
Office Building Backbone Wiring Template	83
Exhibit B.2-1	
Sections in a Mail Operations Building	84
Exhibit B.2-2	
Mail Operations Building Telecommunications Section Layout	85
Exhibit B.2-3	
Mail Operations Building Computer Room Layout	86
Exhibit B.2-4	
Mail Operations Building Administration Section Layout	87

Exhibits

Exhibit B.2-58 Mail Operations Building Dock/Platform Section Layout	88
Exhibit B.2-6 Mail Operations Building Mail Processing Section Layout	89
Exhibit B.2-7 Mail Operations Building Yard Section Layout	90
Exhibit B.2-8 Mail Operations Building Backbone Wiring Template	91
Exhibit B.3-1 Sections in a Large Associate Office (AO) Building	92
Exhibit B.3-2 Large AO Building Telecommunications Section Layout	93
Exhibit B.3-3 Large AO Building Computer Room Layout	94
Exhibit B.3-4 Large AO Building Administration Section Layout	95
Exhibit B.3-5 Large AO Building Delivery Section Layout	96
Exhibit B.3-6 Large AO Building Dock/Platform Section Layout	97
Exhibit B.3-7 Large AO Building Postal Store Subsection Layout	98
Exhibit B.3-8 Large AO Building Self Service Subsection Layout	99
Exhibit B.3-9 Large AO Building Full Service Subsection Layout	100
Exhibit B.3-10 Large AO Building Backbone Wiring Template	101
Exhibit B.4-1 Sections in a Small Associate Office (AO) Building	102
Exhibit B.4-2 Small AO Building Telecommunications Section Layout	103
Exhibit B.4-3 Small AO Building Administration Section Layout	104
Exhibit B.4-4 Small AO Building Delivery Section Layout	105
Exhibit B.4-5 Small AO Building Postal Store Subsection Layout	106
Exhibit B.4-6 Small AO Building Self Service Subsection Layout	107
Exhibit B.4-7 Small AO Building Full Service Subsection Layout	108

Exhibit B.4-8	
Small AO Building Backbone Wiring Template	109
Exhibit B.5-1	
Sections in a Mixed Technology Building	110
Exhibit B.5-2	
Mixed Technology Building Telecommunications Section Layout	111
Exhibit B.5-3	
Mixed Technology Building Computer Room Layout	112
Exhibit B.5-4	
Mixed Technology Building Administration Section Layout	113
Exhibit B.5-5	
Mixed Technology Building Delivery Section Layout	114
Exhibit B.5-6	
Mixed Technology Building Dock/Platform Section Layout	115
Exhibit B.5-7	
Mixed Technology Building Mail Processing Section Layout	116
Exhibit B.5-8	
Mixed Technology Building Postal Store Subsection Layout	117
Exhibit B.5-9	
Mixed Technology Building Self Service Subsection Layout	118
Exhibit B.5-10	
Mixed Technology Building Full Service Subsection Layout	119
Exhibit B.5-11	
Mixed Technology Building Vehicle Maintenance Section Layout	120
Exhibit B.5-12	
Mixed Technology Building Yard Section Layout	121
Exhibit B.5-13	
Mixed Technology Building Backbone Wiring Template	122

Tables

Table 1-1 PCE Management and Maintenance	5
Table 2-1 N-tier Implementation	10
Table 4-1 MS Windows Compatibility Standards for Workstation Applications	42
Table 4-2 Provisioning Specifications for Administrative Workstations	43
Table 4-3 Provisioning Specifications for Industrial Workstations	46
Table 4-4 Provisioning Specifications for Login Servers	48
Table 4-5 Database Servers	50
Table 4-6 Application Processors	51
Table 4-7 Web Servers	52

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1 Introduction

11 About This Handbook

111 Purpose

This handbook describes the Postal Computing Environment (PCE) and provides:

- Technical information, design guidelines, and procedures to improve postal computing.
- A framework for designing business applications and building information technology (IT) infrastructure.
- The U.S. Postal Service (USPS) design for computing in a Web-enabled environment.

112 Definition

The PCE encompasses people, processes, and IT required for the USPS to operate in an efficient manner to provide its business services. The information technology component, in turn, includes applications, information (including data), IT services, IT security, and IT infrastructure.

113 Scope

All USPS organizations and contractors must use the frameworks provided in this document. While the document provides configuration information about the PCE, the level of detail included is not sufficient for acquiring the IT products and components described. Postal organizations considering buying information technology should use existing IT provisioning vehicles, such as e-Buy, and consult with their Chief Technology Officer (CTO) organization representatives.

IT infrastructure does not include the computers, microprocessors, and software used for mechanized or automated mail processing equipment, material handling systems, self-service/vending systems, and support systems required for proper operation of automated and mechanized mail processing equipment. These process control, self-service, and support systems must, however, meet postal interface standards to access the IT services provided by the IT infrastructure.

114 What the Document Contains

- *Chapter 1, Introduction*, introduces the PCE by explaining the values that affect it, describing the benefits of an integrated PCE, and listing the responsibilities of IT management in maintaining it.
- *Chapter 2, Enterprise Architecture*, addresses business process requirements, application and database design guidelines, data placement guidelines, information security reminders, and technical/infrastructure guidelines.
- *Chapter 3, IT Services*, describes the services that the Information Technology organization provides to and for the USPS.
- *Chapter 4, IT Infrastructure*, presents a conceptual framework for discussing the computer and telecommunications systems needed to support USPS business activities.
- *Chapter 5, Processes*, describes the various processes, procedures, and standard practices being used to create, manage, maintain, and operate the PCE.

12 Importance of the PCE

The PCE described in this handbook is well-suited to meet the near-term challenges posed in the USPS *Transformation Plan*. As noted in the Transformation Plan's Executive Summary, "applying information technology with universal connectivity will enable us to enhance security, add valuable product features, and manage operations in real-time." Many of the initiatives to increase value to the customer, improve operational efficiency, and implement a performance-based culture rely heavily on IT. The specifications, standards, and guidelines presented in this handbook provide the foundation for meeting the challenges of transformation.

13 USPS Values Affecting the PCE

In many cases, USPS technologists must decide between equally effective technical solutions. Sometimes, the selection is based on factors other than technical merit. To improve communication and understanding, this section presents a series of statements that reflect the USPS values and beliefs affecting the PCE decision-making process.

- **Satisfy Postal Business Needs.** The PCE exists to support the business activities of the USPS and the goals of the *Transformation Plan*. All other considerations are secondary until that demand is met. The design guidelines and technical standards presented in this handbook are based on the premise that it is possible to satisfy the demands of the business with an integrated, standards-based computing environment.

Deployment of less than fully compliant applications may be allowed only under special circumstances. Functional, developmental, and IT operational managers must make an informed, collaborative decision

that valid business requirements necessitate a deviation from full compliance.

The PCE is evolutionary, and its continued development is driven by a commitment to meet business requirements, improve services, and manage costs.

- **Recognize Impact of the Installed Base.** The USPS does not replace information technology rapidly. It buys many new devices, but does not discard the old ones. USPS employees still use workstations and servers deployed more than three years ago. Application developers and infrastructure operators must acknowledge their continued use. Because old technology is replaced at widely varying rates, it can take as much as 30 months for new technological capabilities to reach critical mass within the infrastructure.

These technology replacement windows are balanced with a commitment to replace specific underpowered computers when performance is severely impinged by hardware limitations.

- **Deploy Shared Infrastructure.** IT infrastructure and computing resources must be shared where possible. For example, multiple implementations of the same function server, such as a communications gateway, are not fielded to the same building unless and until required to improve performance. Provisioning is driven primarily by performance considerations, not functional or organizational issues.
- **Implement Information Security.** The USPS is committed to creating and maintaining an environment that protects USPS information resources from unauthorized use, modification, disclosure, or destruction. Information security is a risk-based and cost-effective business issue aligned with USPS priorities, industry-prudent practices, and government requirements directed by policy but implemented by business unit managers.
- **Adopt New Technology Deliberately.** The integration of new technology into the IT infrastructure is driven by the USPS' ability to implement support structures. Accordingly, it is not an early adopter of new technology and does not seek "bleeding edge" solutions.

Application designs, including the underlying use of technology, must meet the business requirements, work reliably, be supportable, and be reasonably priced. This means that the USPS might not always opt for the latest or greatest information technology.

- **Weigh Support Costs.** The cumulative cost of support over the life of an application is much higher than the cost of development. Industry estimates range as high as four to one. During application design, this fact, while significant, must be assessed in the context of the overall benefit of the proposed application to the USPS. In some cases, deviations from the existing standards and guidelines presented in the handbook are warranted. Portfolio managers, within the CTO organization, are expected to ensure that proper business and technical decisions are made.

To ensure the success of national deployments while satisfying business requirements, application developers and infrastructure operators are equally responsible for ensuring that installations and operations are well-defined and consistent.

- **Assess Need to Convert Legacy Applications.** The publication of this handbook does not imply or require the conversion of deployed applications that do not meet the guidelines stated here. Applications that do not meet current postal IT standards or these guidelines are labeled *legacy applications*.

The USPS portfolio of existing applications should be reviewed, as appropriate, to determine cost of conversion as compared with additional cost of continued operation. After the review, the application sponsor and the portfolio manager may jointly make a sound business decision about each legacy application. The decision should include consideration of any software and hardware changes, operational and functional requirements, and training issues.

14 Benefits of an Integrated PCE

The benefits of implementing an integrated PCE as described in this handbook are as follows:

- **Ensures Application Interoperability on the User's Computer.** The need for a computing framework is demonstrated most frequently on the user's computer. The capability of users to initiate multiple applications requires that those applications operate in a consistent, predictable manner. This handbook contains design and configuration guidelines that facilitate the interoperability of business applications, personal productivity tools, and workgroup computing contributing to ease of use and improved productivity.
- **Optimizes Use of Limited Support Resources.** The human and financial resources available to the USPS for technical support are limited and must be used wisely. The strategies proposed, such as common application design methodologies, shared access to IT services, reusable infrastructure components, and standard products help the USPS get the most from the available financial and human resources. In addition, the benefits of user and technical staff training are enhanced through the use of standard products and configurations. Trained individuals can use their knowledge at each different assignment or location.
- **Simplifies Application Design to Accelerate Development and Deployment.** This handbook seeks to simplify the design and development of business applications by identifying the configuration and interface specifications of the key postal computing components. In doing so, an application development team does not also have to specify, acquire, and implement computing hardware, such as workstations or servers, and infrastructure services, such as file

transfer or data access. By sharing of components, the time required to field new applications is reduced as is the cost to the USPS.

- **Improves protection of USPS Information and Information Resources.** Information is a critical USPS asset that must be protected. Likewise, the USPS has a sizable financial investment in information resources that are crucial to its mission. These also must be protected. Information security policies and procedures, incorporated into the PCE, safeguard the integrity, confidentiality, and availability of USPS information and protect the interests of the USPS, its personnel, its business partners and the general public.
- **Improves Communication and Cooperation.** Application development and infrastructure operations staffs, whether postal or contractor, use the handbook as a tool to build understanding and cooperation. In a host-centric computing environment, the development staff was able to provide a substantial amount of support because users were able to access only one application at a time. In a Web-enabled computing environment, users, equipped with corporate computers, may have any number of applications underway when encountering a problem. The use of on-site and specialized remote support tools becomes critical. It is equally critical that the applications and operations staffs work together. Through the handbook, development staffs receive information that helps the support staffs. Conversely, development staffs use the document to share needs and concerns with operations and support staffs. *The system users are the beneficiaries of these improvements in communication and cooperation.*

15 PCE Responsibilities

The management and maintenance responsibilities for the PCE are described in Table 1-1.

Table 1-1

PCE Management and Maintenance

Title or Role	Responsibility
<i>Vice President, Information Technology</i>	<ul style="list-style-type: none"> ■ Appoints the members of the Enterprise Architecture Committee (EAC).
<i>Enterprise Architecture Committee</i>	<ul style="list-style-type: none"> ■ Ensures that the PCE evolves in response to new business opportunities and requirements identified by functional organizations or the Enterprise Architecture Forums. ■ Approves changes or exceptions to the postal IT standards and guidelines in this handbook. ■ Appoints members of Enterprise Architecture Forums with concurrence of the members' respective line managers, if required.

Title or Role	Responsibility
<i>Manager, Enterprise Architecture and Standards</i>	<ul style="list-style-type: none"> ■ Chairs the EAC.
<i>Enterprise Architecture Forums</i>	<ul style="list-style-type: none"> ■ Responsible for collaboratively creating, maintaining, and updating the enterprise architecture under EAC guidance and supervision.
<i>Sponsor, Design, and Development Organizations</i>	<ul style="list-style-type: none"> ■ Ensure that proposed applications satisfy legitimate business requirements and comply with the specifications of this handbook.
<i>Infrastructure Designers and Provisioners</i>	<ul style="list-style-type: none"> ■ Ensure that the IT infrastructure is implemented in compliance with postal IT standards and the guidelines in this handbook.
<i>National and local operations and support staffs</i>	<ul style="list-style-type: none"> ■ Proactively adjust the computing infrastructure to meet projected user demands and operational necessities.
<i>Corporate Information Security Office</i>	<ul style="list-style-type: none"> ■ Develops, manages, and publicizes USPS information security requirements. (See Administrative Support Manual (ASM) and Handbook AS-805, Information Security.)

2 Enterprise Architecture: A Framework for Business Solutions

An enterprise architecture provides a conceptual framework for designing, developing, and operating business solutions closely aligned to corporate business goals. Since it is not possible to detail an enterprise architecture in one chapter or even one handbook, this chapter describes some of the business, application, information, and technology models that are part of an enterprise architecture. In addition, it contains application design and development guidelines that are derived from those models and integrated with the other elements of the Postal Computing Environment (PCE).

21 Business Processes

Business models describe the processes addressed by enterprise business solutions. Business processes provide the means to integrate the enterprise components necessary to create dynamic business solutions.

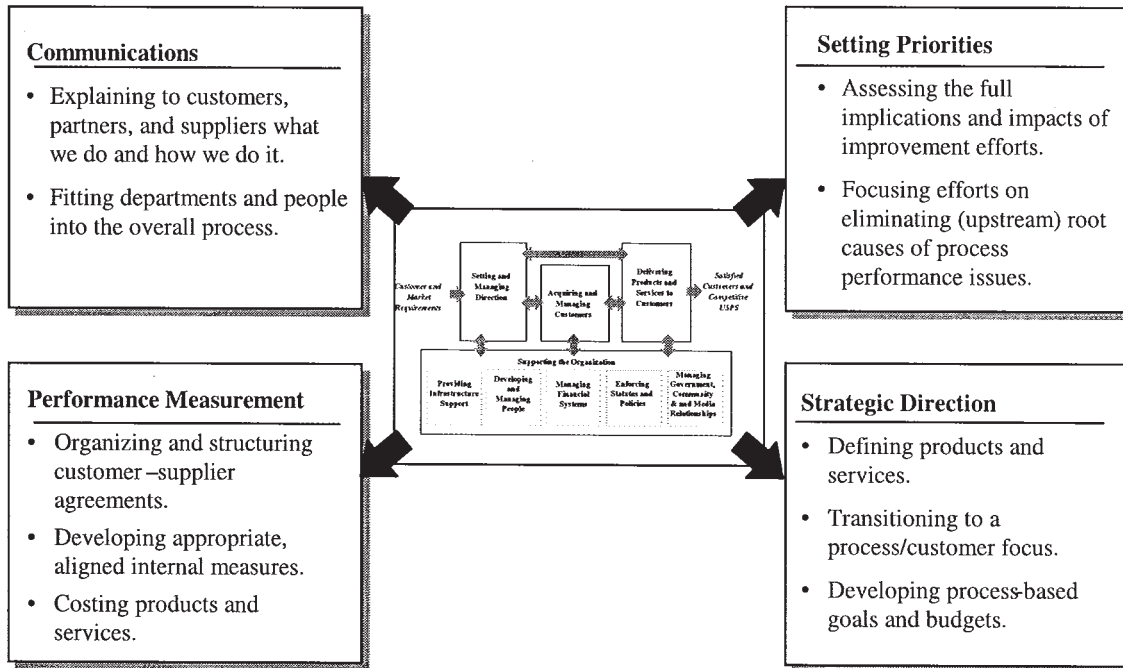
The Enterprise Map

The U. S. Postal Service (USPS) Enterprise Map is a textual description of the organization's current core and enabling processes. The map illustrates process relationships and boundaries at different levels.

The benefits of the Enterprise Map include:

- Developing both end-of-process and in-process metrics.
- Focusing process management efforts on the highest priority processes.
- Identifying and replicating best practices for USPS operations.
- Aligning technology with business processes.

Exhibit 2-1
Representation of Extract from Enterprise Map



The Enterprise Map describes three levels of business process. Each description of a business process encompasses customers, key suppliers, beginning and end points, activities, and key performance measures.

The EMMIT Tool

The Enterprise Map Methodology for Information Technology (EMMIT) is a tool for comparing systems to the Enterprise Map to determine alignment with business processes. All systems designers and developers are required to use EMMIT to identify and compare business processes and provide updates to the Enterprise Map.

Additional References

More information about the enterprise map, its requirements and use, is available through <http://it.usps.gov/standards>.

22 Application Development Models and Guidelines

221 Introduction to the Model

Importance of a Model

This section describes an application development model that serves as the enterprise model for developing business applications in the PCE. The importance of establishing an application development model is increasing as USPS applications move toward a multi-vendor software environment. A single supplier or vendor no longer ensures that all components fit together

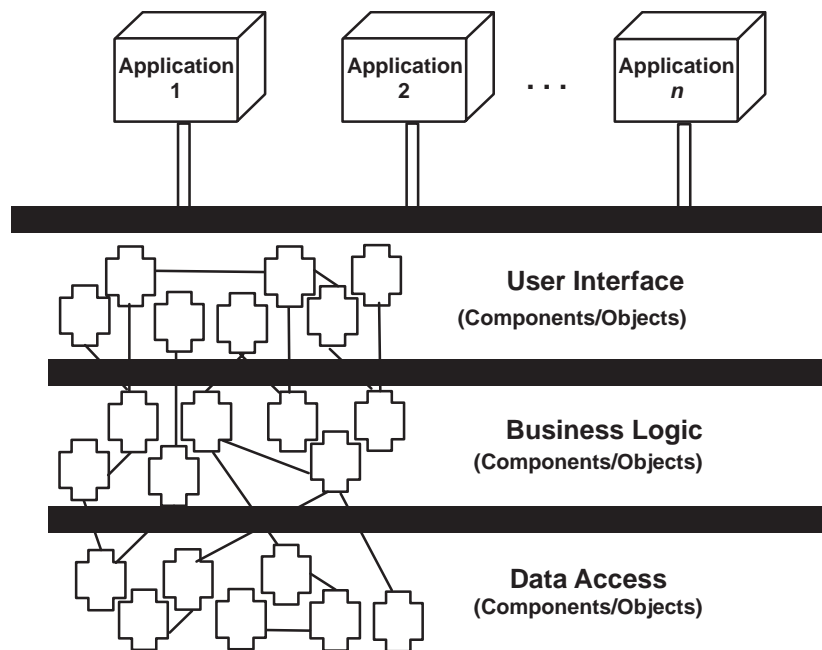
and that changes in technology are compatible with previously constructed applications. That is because no single supplier owns the entire application development environment anymore.

Construction of USPS Applications

USPS business applications are constructed using an application development model with three logical layers as depicted in Exhibit 2-2. Frequently referred to as an *n*-tier model of computing, the tiers or layers represent a logical separation of functions. While not required, in most cases, the logical separation should be duplicated in a physical separation of tiers. The tiers connect through a set of widely accepted, industry standard protocols, services, and software application programming interfaces (APIs).

Exhibit 2-2

USPS Logical Application Development Model



- **User Interface.** This tier is the presentation client that communicates with the user through a graphical user interface (GUI). The code on the client side at this level calls upon the available business logic services to provide business functionality. This user-oriented code may reside completely on the desktop or be partitioned across the desktop and server systems (e.g., as in a browser and a Web server).
- **Business Logic.** This tier consists of one or more sets of functions that execute business rules, enforce business guidelines, process information, and manage transactions.
- **Data Access.** This tier consists of one or more sets of services for managing the *addition, modification, and deletion* of data used by the business logic services **to make decisions and to derive information.**

Benefits of a 3 or n-Tier Model

Separating components into 3 or more tiers creates a model that allows the PCE to keep in step with the direction of today's enabling technology architectures, relational databases, enterprise networking, and low-cost multiple processor servers. An application development strategy based on an *n*-tier model has a number of benefits:

- An application's scalability, performance, and reliability are increased.
- Server components can be replicated and distributed across any number of servers to boost system availability and lower development costs.
- Flexibility increases, allowing application components to be rapidly modified to adapt to changing business rules or economic conditions.

In addition, the use of standard APIs insulates the change in one component from affecting other components. Components are location independent, so system administrators can easily reconfigure system load or introduce new technologies.

USPS applications built using an *n*-tier model usually, but not always, include three or more machines providing a variety of infrastructure services. An application will use services that may be distributed among several servers, as shown in Table 2-1.

Table 2-1
N-tier Implementation

Application	User Interface Service(s)	Business Logic Service(s)	Data Access Service(s)
Finance	Client 1	Server 2	Server 3
Marketing	Client 3	Servers 2 and 4	Servers 3 and 5
Facilities	Clients 1 and 6	Servers 2 and 7	Servers 3 and 5

Using this framework, components of the three tiers can be developed in parallel. Services can be shared/reused by several applications. Application components can be maintained and changed independently of each other.

222 Application Development Model Example: Java 2 Enterprise Edition (J2EE)

[Reserved.]

223 Application Development Guidelines

223.1 Guiding Principles

In most situations, application designers and developers must follow the guiding principles of browser-accessible, browser-independent, and server-based to develop USPS applications.

Server-Based Applications

By building server-based applications, the USPS takes a major step in being able to provide information in a format that is universally accessible. Server-based applications provide information to any properly authenticated and authorized individual, company, or business partner using an industry-leading browser. Access is available without regard to the equipment or methods used to connect to the Internet or Postal Intranet.

Industry and USPS Standards

Application designers and developers must use widely accepted, industry standard, USPS-approved protocols, services, and APIs between the layers of an *n*-tier application. Many of these standards are identified in the remaining sub-sections of chapter 2 or incorporated into the information technology (IT) services described in chapter 3.

Rehabilitation Act Requirements

Designers and developers must build applications to be accessible to persons with disabilities, as required by the Access Board standards enforced by Section 508 of the Rehabilitation Act. For more information, see the USPS 508 Accessibility Resources Web page, <http://blue.usps.gov/508web/>.

223.2 User Interface

Designers and developers must observe the following guidelines for the user interface of USPS applications.

Browser Usage

- Varying degrees of compatibility between industry-leading browsers and server-based applications is an impediment to implementing an e-infrastructure for the USPS. To ensure accessibility by the widest audience possible, designers and developers must make e-commerce and other Internet applications accessible from the browsers on a list maintained by e-Infrastructure Systems Integration, Information Technology. Designers and developers must ensure that plug-ins required for external applications are freely and easily available.
- The client for internally-facing applications accessed from a Microsoft Windows workstation or terminal is the Infrastructure Toolkit version of Microsoft Internet Explorer.
- Developers need only test internally-facing applications with the Infrastructure Toolkit version of Internet Explorer, but should avoid using proprietary features of the browser. In general, developers should only use those features and functions that comply with the World Wide Web Consortium (W3C) standards and guidelines. Examples of these standards include Document Object Model, Cascading Style Sheets 1 and 2, Extensible Markup Language (XML) and related technologies, and Extensible Hypertext Markup Language (XHTML).

Plug-ins

- The browsers may be enhanced with industry-standard plug-ins. Developers must ensure that plug-ins are available with no license fee. Plug-ins required for internal applications are considered desktop software and may be used only after the plug-in is approved through the standard software approval process.

Scripting Languages

- When business functionality warrants executing business logic on the client, browser-independent development tools such as Java applets or various approved scripting languages are an acceptable development approach. To ensure responsive performance, developers should strictly limit applet size.
- Developers must use scripting languages, such as JavaScript™ or Jscript™, carefully and sparingly. These languages frequently act differently across different browsers and different versions of browsers, even though both languages are based on the Electronic Communications Manufacturers Association (ECMA)-262 standard.
- To ensure participation by the widest possible audience, the Application Development Enterprise Architecture Forum will evaluate and select web development tools for the Infrastructure Toolkit (ITK) based on their capability to produce browser-independent code. The forum will avoid, if possible, tools that capitalize on unique, proprietary features of a browser. (The Application Development Enterprise Architecture Forum is one of seven Enterprise Architecture Forums whose responsibilities are identified in Table 1-1.)

Server Communications

- To the extent practicable, the business logic of the application must execute on a Web server or application server or in another back-end system rather than on the client. Ideally, only Hypertext Markup Language (HTML), XHTML, and XML will pass between the Web server and the browser. By executing the business logic on the server or in a back-end system, the developer is able to use standard application development environments and programming languages.

Portals

- Externally facing applications must be designed to be accessed by customers, suppliers and business partners via links through *www.usps.com*.
- Internally facing applications must be designed to be accessed through *blue.usps.gov*.

223.3 Business Logic

Designers and developers must observe the following guidelines for the business logic tier of all USPS applications.

Code Reuse

- Designers and developers must design and build business applications using common user interfaces, standard naming conventions, and existing components and services whenever available. Designers and developers should review USPS applications to increase opportunities for sharing and reusing code. For instance, not every e-commerce application should have its own shopping cart. Likewise, not every application should have its own directory service. New components and services, when required, need to be designed and acquired or developed to meet the needs of the enterprise.

Application Servers

- Designers must design applications modularly so that the modules may be physically located on a web server, on a separate application server, or partitioned on both. Modularity must be considered in the inception phases of any project.
- Designers must design each application so that the location of the hosting servers, be they in a computer operations service center or an application service provider, does not adversely affect functionality, performance, or responsiveness.
- Applications must run on USPS standard application servers and must be fully J2EE compliant without proprietary extensions.

Web Services

- The newest trend in application development and deployment is Web Services. Built upon new industry standards, Web Services promise more complete integration between applications and software components. Those standards are:
 - **Extensible Markup Language.** Allows the delivery of messages and transfer of data using standard tags.
 - **Simple Object Access Protocol (SOAP).** Calls and invokes Web services through HTTP.
 - **Web Services Description Language (WSDL).** Describes the function and format of a Web service.
 - **Universal Description, Discovery and Integration (UDDI).** Lists available Web services and their location on either the Internet or an intranet.

Web Services allow vendors to wrap their sometimes proprietary components and developers to wrap their legacy code in XML. A WSDL file provides a description of each specific service and is published in a UDDI directory for access by others. Applications are then able to access these specific services by calling them through SOAP.

223.4 Data Access

Designers and developers must observe the following guidelines for data access to all USPS applications.

Application Independence

- Data stewards must ensure that structured and unstructured data are managed as corporate resources in a way that makes them available for timely use by potentially all applications and users. To do this, designers must store data in data bases that are not tightly linked to any particular application.
- Designers must ensure that corporate data is always updated through business logic, not directly by an application. This type of update will ensure that the same logic is always applied and when the logic changes, all update programs change uniformly.

Standard Access Methods

- Designers and developers must use industry standard access methods for databases, such as Structured Query Language (SQL), Java Data Base Connectivity (JDBC), or Open Data Base Connectivity (ODBC).
- Data collection activities, being transactional in nature, differ significantly from analysis and reporting applications and so require an application technical architecture that incorporates “assured” data transfer mechanisms.

Role of XML

- XML will play an increasingly important role in providing and supporting interchangeability of data among applications, businesses, and customers. Whenever possible, application developers should incorporate XML coding into their data and document architectures.

23 Information Architecture

231 Introduction

Information architecture, a component of the enterprise architecture, introduces models for defining and describing the structured and unstructured data elements of a corporation and the relationships among them. It provides a basis from which corporate officers and managers make information management decisions, regarding:

- **Sharing of Information Resources.** The information architecture identifies the complex interdependencies among business units. These interdependencies necessitate increased information sharing throughout the corporation.
- **Focusing on Corporate Rather than on Organizational or Application View of the Information.** The information architecture identifies the corporation’s conceptual and logical information requirements across organizational and functional boundaries. Achieving this corporate view is the first step necessary to develop an integrated information base that is essential in integrating components of the enterprise architecture and the PCE. Once in place, the integrated information base can efficiently and effectively support the information needs of the corporation.

All systems development project leaders are required to recognize, relate to, and provide updates to the information architecture.

232 Structured Data Architecture Components

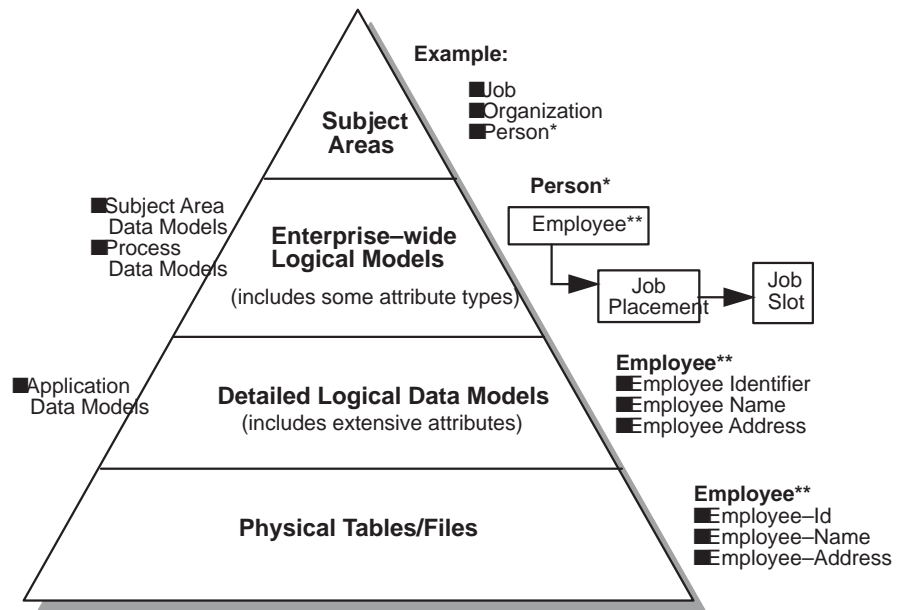
Structured data architecture describes information needs hierarchically, with each level providing additional detail (see Exhibit 2-3). This logical hierarchy facilitates the analysis and management of postal information and supports its use for various purposes from strategic planning to application development. The data architecture components are described as follows:

- **Subject Areas.** These are major categories of information important to the business. They provide the conceptual framework for analysis of the logical information requirements and resources that are independent of organization, business process, and particular application system or technology. This independent view of data may be used by USPS analysts to support strategic planning for information resource management and other initiatives aimed at increasing the understanding, accuracy, security, and value of data as a critical USPS asset.
- **Enterprise-wide Logical Models.** These models consist of business data entities, business relationships, and attributes. The business data entities reflect a more detailed view of the USPS data entity than the subject areas. A *USPS data entity* is a person, place, thing, event, or concept that is important to the USPS (e.g., Employee). The enterprise-wide logical model provides a logical construct and basic business guidelines into which further analysis and design can fit. These models support business process, applications, and subject areas at a high level. These data models later transition through a rigorous logical modeling before any physical modeling is possible.
- **Detailed Logical Data Models.** These include the names and definitions of the associated detailed logical entities, unique identifiers (keys), and relationships between entities within the scope of a given business area. They must comply to the business guidelines of the USPS. They are fully-attributed and normalized. Collectively, the aggregate logical models will help validate the integrity of the enterprise-wide logical models; conversely, the enterprise-wide logical models will also validate each detail logical data model.
- **Physical Tables and Files.** These are the physical entities that describe USPS data as it is physically stored in automated environments. Descriptions of physical entities include the actual entity and attribute names of the data in the database management system (DBMS) or other file management system. This tier is the lowest level and identifies the physical implementation of data pertaining to a particular business subject area (e.g., Employee-ID).

- Data Warehouse.** This is a portion of the corporate data architecture that serves as a single integrated source of data occurrences. It can be partitioned into subsets called *data marts* to support particular business user groups. The inventory consists of data collected from legacy application sources and is structured in accordance with the standard corporate data architecture metadata formats.

Exhibit 2-3

Structured Data Architecture Components



233 Unstructured Data Architecture Components

[Reserved.]

234 Resources

The following data architecture resources are available through <http://it.usps.gov/standards>:

- Enterprise Information Repository.** The Enterprise Information Repository (EIR) is a single source for structured data standards and standard process descriptions. It contains the complete enterprise-wide structured data resource of entities and attributes
 The EIR also provides structured data element naming standards and procedures for entering new data into the repository.
- Data Stewardship.** Organizational responsibilities for defining, using, and maintaining corporate data resources are found in Management Instruction (MI) AS-830-93-4, *Data Stewardship*.
- Information.** Guidelines on accessing structured data for information are in MI-AS-830-93-8, *Coordinating Access to Data From National Information Systems*.

The directive provides guidance for sharing data in databases and files of national information systems, establishes responsibility for systems analysis and programming costs that may be incurred to provide the data, and encourages early consideration of the field management's need for information system data during systems development rather than after deployment.

- **Structured Data Procedures and Standards.** Structured data standards and procedures for logical design, data modeling are located in Section 8 of the IT organization guidance document entitled *Software Process Standards and Procedures (SPSP)*.
- **Information Systems Resources.** Information systems resources include trained data administrators to provide guidance and access to these standards. To request data administration assistance, call 202-268-2815.

24 Information Security Framework

241 Introduction

An enterprise information security architecture provides the framework for implementing comprehensive information security to protect the confidentiality, integrity, and availability of USPS information resources.

The primary function of this architecture is to ensure a common level of understanding and a common basis for designing and implementing risk-based, cost-effective security for USPS information resources that align with USPS priorities, industry-prudent practices and government requirements. An enterprise information security architecture links various initiatives, policies, procedures, infrastructure, and tools to USPS business and information security requirements.

Handbook AS-805, *Information Security*, and the USPS Administrative Support Manual (ASM) provide policy and procedures reflective of an enterprise information security architecture.

242 Guidelines

- Information security policies contained in Handbook AS-805 apply to all information systems, business applications, infrastructure services, telecommunications networks, and related sources which are sponsored by, operated on behalf of, or developed for the benefit of the USPS. Information security requirements and the Information Security Assurance (ISA) process must be incorporated into all project plans.
- In the future, Handbook AS-805-I, *Information Security: Web Development Standards*, will provide special security guidelines for Web-based application development.

243 Resources

Information security services and associated information security policies are contained in Handbook AS-805, *Information Security*. The handbook is available through <http://it.usps.gov/standards>.

25 Infrastructure Transition

251 Introduction

From “GoldTape”

The USPS is in transition from a distributed computing infrastructure that was attuned to client-server application development and deployment to an infrastructure optimized for browser-accessible, server-based applications. The client-server infrastructure was commonly referred to as “GoldTape.” It was the corporate standard for most of the 1990s.

To “ACE”

The “Advanced Computing Environment” (ACE) is the name of the client or workstation component of the evolving *n*-tier application development infrastructure.

ACE will encompass the Intel-based desktop and laptop computer systems, running Microsoft Windows operating systems, used by the management and administrative functions across the USPS. The environment will embody the following tenets:

- Internet standards apply.
- Applications are web-based and run on servers.
- Data is structured and maintained distinctly from applications.
- A single security model is used throughout.
- A homogeneous network operating system runs on all systems.
- An enterprise directory is fully leveraged.
- Standards-based messaging is provided as a core service.
- A thin client user interface is promoted.

252 **Guidelines**

Application designers should be cognizant of the following:

- Each workstation is equipped with a set of standard applications that includes Adobe Acrobat Reader, JetForm FormFlow 99 (or BLOC Development Corp. F3Fill), Microsoft Internet Explorer, Microsoft NetMeeting, Microsoft Office, Microsoft Windows Media Player, Microsoft Windows Terminal Services Client, Maxmate Viewer, Norton Anti-virus, WinZip, and WRQ Reflection for the Web (a 3270 emulator).
- Each workstation is configured to use Microsoft Windows print and file services.
- Only users registered with the User Authentication and Access Control service may access an ACE workstation. Only users and workstations registered with the User Authentication and Access Control service may access network-based computing resources and information.
- Users may install additional productivity-improving software on the local drive of an ACE workstation with the permission of their manager. The software must be properly licensed and meet appropriate USPS standards.
- In the event of a system malfunction requiring restoration of the workstation, locally installed software will not be reinstalled by national customer support.
- Databases are hosted on servers physically separate from application and web servers.

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3 IT Services

This chapter describes the services that the Information Technology (IT) organization provides to and for the U. S. Postal Service (USPS).

Definition of Services

In all cases, services are characterized by standard interfaces, repeatable processes, measurable levels of performance, and pro-rated costs.

Services may be defined as follows:

- A grouping of functions that together provides an end-to-end solution to a business need.
- A capability provided to the corporation that requires a dedicated IT organizational unit.
- An end-to-end function for which a business unit would “pay” to receive the benefit.

Each service also includes the following:

- A professional service component that relies on subject matter experts and their knowledge, skills, and abilities.
- A technical service component that relies on technology, usually software or firmware, to perform the specified function.

The mix of these two components in any particular service varies along a continuum. Some services are very dependent on human activity; other services rarely require human intervention.

31 Benefits of a Services Approach

IT organization-provided services furnish standard methods of solving common computing needs for multiple applications. These services simplify application development by eliminating the need to design a new solution to the same problem for each application. They also simplify the overall support and operation of the USPS’ computing systems by creating consistency among its business applications.

Specifically, the benefits of a services approach include:

- Standard processes and procedures ensure that access to information technology services will be a consistent experience.
- Performance standards are published for each service using a common template. The focus is on measurable performance and clearly

accountable costs. A service manager is assigned to each service offering to ensure accountability. (See section 3.4 for a description of the responsibilities of a service manager and section 3.5 for a summary of the service specification template.)

- Standard interfaces (e.g., application programming interfaces) are published for each service. Standard interfaces protect applications from changes in the provisioning of the service. These standard interfaces rely on industry standards where available and appropriate.
- Services simplify the application design process by relieving the application architect of the burden of redesigning utility functions for each application. The architect is able to focus on critical business functions. Services will also reduce the number of products listed in the Infrastructure Tool Kit, thus again, simplifying the design process.
- Services reduce complexity and increase reliability in the infrastructure. Services are tested, repeatable solutions to standard application needs. They are utilities that, once built, are reused often.
- By reusing previously-tested services, application certifications and deployments are faster and easier. Services minimize the need to design, develop, test, certify, and deploy new application-specific infrastructure components.
- References and links to services are integrated in appropriate places throughout the Integrated Solutions Methodology (ISM) and are accessed through <http://it.usps.gov/standards>.

32 Guidelines

This section provides IT services guidelines to be used in developing and fielding applications for use in the USPS. These guidelines apply to all applications that will be accessed from or deployed within the PCE.

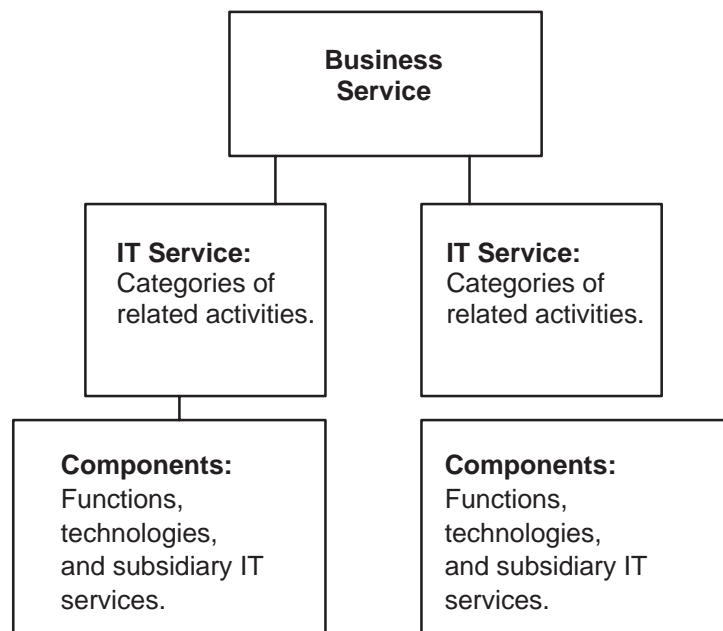
- The use of existing IT services is mandatory.
- Fees may be assessed to cover the costs of providing an IT service.
- A service level agreement is required for access to IT services. Levels of performance, performance metrics, and points of contact must be clearly stated in the service level agreement.
- Performance and cost must be equitable and reasonable.
- Portfolio managers coordinate the resolution of service quality issues with IT service managers or providers on behalf of their clients.
- The requesting organization (i.e., application sponsor) must provide funding proportional to expected future use when an expansion or enhancement of a service offering is required.
- Non-USPS application service providers are only to be used for those functions that cannot be performed internally.

33 IT Organization-provided Services

IT organization-provided services are presented and described hierarchically. Business Services are the top level. These are fairly broad descriptions of functions that the IT organization performs for the USPS. Each business service includes two or more IT services. IT services are categories or classes of related activities that contribute to the fulfillment of the business service. Individual IT services are comprised of components. Components include functions, technologies, and subsidiary IT services that are combined to fulfill the service specifications. Each of the current business services and its subordinate IT services are described in the following sections.

Exhibit 3-1

IT Organization-provided Services Hierarchy



331 Application Hosting

The Application Hosting Service provides secure, reliable computing services for the business units of the USPS. These services are provided on a broad range of operating platforms in a variety of locations thus ensuring that business applications are optimally deployed, operated, and supported. Two IT services support Application Hosting.

- **Application, Database, and Web Hosting.** This service provides the processing/storage capacity to operate and maintain databases, business applications, and web sites. This service addresses browser, terminal-host, and client-server access to an application, database, or web platform regardless of computing boundary. It also provides the necessary facility and personnel support services to house, operate, and service the hosted infrastructure components.

- **Disaster Recovery.** This service provides several levels of business continuity and disaster recovery to postal managers responsible for critical business applications and information. This service provides the wherewithal for functional area managers to plan and execute disaster recovery plans and tests for applications and systems. Federal mandates and USPS policy require that such capabilities and plans be in place and tested for all critical business applications and systems.

332 **Back Office Processing**

The Back Office Processing Service provides the underpinning for the operation of the USPS by ensuring that employees are accounted for (timekeeping) and paid (payroll). These services are closely aligned with the management of employee records. Two IT services support Back Office Processing.

- **W2/1099 Processing.** This service ensures that every person employed by the USPS receives the appropriate earnings statement. This information is extracted from the payroll information.
- **Payroll Processing.** This service manages the payroll lifecycle. It receives inputs from the time and attendance system, ensures proper distribution of payroll checks and earnings statements, executes the direct transfer of funds to employee accounts, and prepares the data required for end of year earnings statements.

333 **Business Solutions**

The Business Solutions Service provides application development, enhancement, and maintenance to the portfolio of systems that enable the USPS to achieve its business objectives. Two IT services support Business Solutions.

- **Business System Design and Development.** This service includes the analysis, design, development, testing, and deployment activities involved in applying IT to help solve business problems. This service also incorporates software elements and development environments necessary to build applications.
- **Business System Maintenance and Enhancement.** This service focuses on maintaining, correcting, and enhancing the performance of existing production systems. By regularly repairing and updating the existing production systems to reflect changes in the business process, technology, or applying new ways to access and use data, the value and usefulness of the existing production systems is sustained and extended.

334 **Customer Support**

The Customer Support Service provides the "helping hand" that users of USPS information technology infrastructure, applications, and systems occasionally require. This IT service ensures that users have access to the tools, applications, and information that they need to do their jobs. The

service also manages the refreshment of the applications and the technology. Two IT services provide Customer Support.

- **Desktop Support and Operations.** This service provides, configures, installs, and supports an organization's desktop computer hardware and software. Responsibility includes essential but unnoticed background tasks such as account administration, maintenance of backups, disk space management, email database management, and hardware monitoring. The Advanced Computing Environment (ACE) Program is replacing or updating the IT components supported by this service.
- **Help Desk.** Help Desk Services provides basic support to resolve or escalate application and technical problems for users of USPS systems. The Help Desk provides 24x7 coverage for supported applications. It provides a hierarchy of technical experts through which complex and difficult problems may be escalated.

335 Data Management

The Data Management Service provides the secure gateway to corporate information for all properly authorized users and applications. The service ensures that data is accurate and available. The service entails acquisition of data from disparate sources and positioning of the data for easy access by business applications and authorized users. Business applications use the data to provide information necessary to enable the USPS to function as a viable 21st century enterprise. Six IT services support Data Management.

- **Corporate Data Acquisition (CDAS).** CDAS promotes the sharing of structured data across the enterprise and provides integrated views of data derived from operational systems in the USPS. CDAS is responsible for providing data from source operational systems to the data warehouse/data mart service, as well as making selected data available to users and systems of the USPS via its own data stores.
- **Corporate Data Presentation.** This service provides a centralized set of data presentation tools to enable customized views of standard corporate reports and *ad hoc* report generation functionality.
- **Data Transfer.** This service provides various capabilities for moving data between applications, databases, or file systems. The capabilities address data integrity, confidentiality, responsiveness, and geographic location.
- **Data Warehouse.** This service ensures that corporate data is stored in a data repository such that it is available for use and query by multiple business applications. This is the authoritative source for corporate data.
- **Database Support.** This service provides a stable production database environment across the range of USPS standard platforms to meet the functional requirements of USPS applications. This service ensures that access to USPS corporate information stored in production databases has maximum availability to users through dedicated, consistent, and professional management services.

- **Data/Information/Document Management.** This service includes all the technologies and techniques required to manage the information resources of the USPS. This includes all structured and unstructured data. It addresses the need to create data definitions (meta-data) for all data elements and maintain these definitions in a repository. It includes any Extensible Markup Language (XML) tags adopted for USPS data elements. The need to manage web content and documents throughout their respective life cycles are also addressed by this service.

336 **Distributed Applications Management**

This service provides the capabilities that enhance the availability and performance of all other applications, systems, and services. This service includes system and network management disciplines implemented through people, processes, and technology. Distributed Applications Management uses four IT services.

- **Distributed System Configuration Management.** This service manages the process for moving software through packaging, certification, piloting, and deployment. The service focuses on the activities that must be completed in preparation for deployment rather than day-to-day operations.
- **End-to-end Monitoring.** Through this service, maximum systems availability is provided. The service features professional, consistent management practices and procedures for both operating systems and databases.
- **Facility Infrastructure Design and Engineering.** This service provides experienced IT staff who are able to design and engineer communications systems and services, based on structured wiring principles, for postal installations nationwide. This service includes voice and data communications including private branch exchanges (PBXs) and local area networks (LANs).
- **Technology Engineering.** Technology Engineering provides server and workstation design, engineering, and integration services for commercial off-the-shelf (COTS) software on Microsoft Windows and Novell NetWare platforms.

337 **Electronic Messaging**

The Electronic Messaging Service provides the means for users to electronically send text messages and data files to other employees, suppliers, partners, customers, and anyone in the world who has an email address. The service is available around the clock. Two IT services support this business service.

- **Electronic Mail Support.** This service provides the messaging backbone that supports the electronic messaging service. This entails distribution of the messaging client, user support, engineering of the "post office" servers, and administration.

- **Blackberry Support.** This service provides support for the users of the Resources in Motion Blackberry devices.

338 **Information Systems Security**

The Information Systems Security Service sets the direction, strategic goals and compliance necessary to ensure the integrity and protection of USPS applications, information, and technologies through processes, procedures, tools, and awareness. This service is a fundamental part of most of the other IT services. Information Systems Security is provided by four IT services.

- **Information Security Assurance.** The USPS is committed to creating and maintaining an environment that protects information resources from unauthorized use, modification, disclosure, or destruction. To ensure that information security controls and processes are implemented to protect information resources, the Information Security Assurance (ISA) program has been developed to evaluate information security and manage the risks associated with the deployment of information resources and new technologies.
- **Securing the Infrastructure.** The service develops, implements and operates a variety of technologies and techniques to protect the USPS information systems and technology infrastructure from unauthorized access and malicious behavior. This service monitors the security of USPS information resources and provides overall perimeter protection for the communications/network infrastructure.
- **Strategies and Compliance.** This service implements the overall strategy to achieve an appropriate level of security by creating effective policies and procedures that apply across the entire corporation; conducting internal reviews and assessments to ensure the integrity and protection of USPS applications, information, and technologies; and coordinating and monitoring Office of the Inspector General and external audits. It produces awareness and training media (e.g., web site, publications, events, multi-media) to educate management, promote workforce awareness, and improve technical skills in relation to security. It reports metrics that measure security improvement across the corporation or that address problems of employee acceptable use of information resources.
- **User Authentication and Access Control.** This service authenticates users and controls what they are allowed to do with USPS information resources. Service includes user registration, identification, verification, authentication, and authorization using a wide variety of technologies. This service is often provided in whole or in part by directories.

339 **IT Architecture/Standards**

The IT Architecture/Standards Service is responsible for creating and maintaining the policies, procedures, standards, guidelines, and processes that ensure that IT Services, and other activities of the IT organization, meet the business requirements of the USPS. Two IT services support IT Architecture/Standards.

- **Business/Technical Architectures.** This service focuses on the coordination of architectural components required by and for an enterprise architecture. It provides the foundation for reviews of proposed application technical architectures as well as the basis for proposing new IT services.
- **IT Standards and Compliance.** This service provides the guidance and standards necessary to ensure that the applications can be quickly and efficiently integrated into the infrastructure. It provides the clear and easy to understand solution frameworks necessary to enable the timely and efficient development and delivery of systems in support of business customers.

3310 **Software and Hardware Acquisition**

This service relieves the burden on sponsors, developers, and service providers by providing the products and services that meet corporate IT standards. This service also ensures that the USPS is able to negotiate the most beneficial agreements possible by consolidating requirements into advantageous solicitations. Two IT services support Software and Hardware Acquisition.

- **Corporate Software Support.** This service focuses on the acquisition of software through the establishment of corporate licenses.
- **IT Acquisitions.** This service focuses on the acquisition of IT technology and professional services in support of the business needs of the USPS.

3311 **Telecommunications**

The Telecommunications Service provides the technological underpinnings for data and voice communications between and among employees, customers, partners, and suppliers. The service is content neutral, but implemented in accordance with security and privacy policies and guidelines. Telecommunications is comprised of four IT services.

- **Local Area Network.** This service provides data communications connectivity within USPS facilities using wire-line and wireless technologies and designs.
- **Remote Access.** This service provides the capability for authorized users, generally employees and selected contractors, to directly access the Postal Routed Network.
- **Telephony/Voice.** This service provides for local and long-distance audio communications as well as enhancements and add-ons such as call forwarding, call waiting, speed dialing, and last number redial. Wireline and cellular implementations of this service are included.
- **Wide Area Network.** This service provides data communications connectivity between USPS locations. It also provides secure connectivity with USPS business partners.

3312 Resource

The technical specifications for the active IT services are available on-line through <http://it.usps.gov/standards>.

The specification template is described in section 3.5.

34 Responsibilities of IT Service Managers

A service manager is designated for each IT service. IT service managers ensure that quality IT services are consistently delivered according to published performance standards. IT service managers and their staffs:

- Provide an end-to-end perspective of the service offering.
- Monitor service quality; update performance standards.
- Monitor and resolve service and logistics problems/issues.
- Propose and implement service enhancements.
- Review and approve major service delivery mechanism improvements.
- Create and maintain IT service specifications (see section 3.5).
- Manage provisioning process to implement IT service.
- Manage funding process in support of IT service.
- Implement designs for new IT services approved by Enterprise Architecture Committee (EAC).
- Provide consultative assistance to business application and IT service designers and recommend training for respective IT service.
- Communicate enterprise architecture, related standards, and IT services to peers, managers, and key IT suppliers.
- Review and recommend industry standards to appropriate Enterprise Architecture Forum.
- Review and recommend product adds/changes/deletes to appropriate Enterprise Architecture Forum.

35 Specification Template

The IT service manager creates a technical specification for each IT service for which they are responsible. Each specification contains the data elements identified in this section.

Name identifies the service.

Description defines what the service is and what it is not. The description includes diagrams of the service architecture.

Service Manager identifies the individual with end-to-end responsibility for the service.

Functional Attributes describe the capabilities of and tasks performed by the service. The description must include a detailed discussion of the security features provided and issues addressed by the service.

Performance Attributes describe measurable characteristics of the service related to user satisfaction and end-to-end performance. Where available and relevant, national and international standards are referenced.

Security Attributes describe the security features associated with the service and the description must include a detailed discussion of the security features provided, and how they are implemented. The discussion may reference integration into specific security services.

Demarcation Attributes identify the physical and logical interfaces between two services, between an application and a service, or between an infrastructure component and a service. This discussion needs to describe the interoperability of the service with other IT services deployed within the Postal Computing Environment. Where available and relevant, national and international standards are referenced.

Cost Attributes describe the cost model on which the service is based and any direct costs incurred by parties whose applications invoke the service.

Provisioning Specifications describe the components, products, and subordinate services that currently provide the infrastructure service. The specification includes appropriately detailed diagrams of the service design, as implemented, and a comprehensive “parts” list.

Availability provides a digest of service availability and an indication of implementation plans.

Statement of Direction describes ongoing work or planned upgrades to the service.

Service Invocation provides instructions for parties who wish to use the service. These guidelines define appropriate interface specifications based on the demarcation attributes; identify any information that must be provided by the party requesting to use the service or service; and present the service-level agreement derived from the performance attributes.

4 IT Infrastructure

This chapter describes the information technology (IT) infrastructure of the Postal Computing Environment (PCE). In it, the basic concepts and language used to describe computing in the U. S. Postal Service (USPS) are defined and the IT infrastructure guidelines to be used in developing and fielding applications for use in the USPS are identified. These guidelines apply to all applications that will be accessed from or run on postal standard workstations or servers.

41 Conceptual Framework

The IT infrastructure is described in terms of a conceptual framework, which consists of:

- **IT Infrastructure Components.** These are a series of generic computing and communication device categories. These generic device categories are referred to throughout this handbook.
- **Computing Functions.** These are generic types of computer-to-computer interactions that are used in applications.
- **Computing Boundaries.** These are the physical and logical structures associated with postal locations and the postal data communications network.

411 IT Infrastructure Components

There are nine generic computing and networking devices comprising the basic components of the PCE, as described below. Virtually every type of computing device, from mainframe computers to compact disk-read-only-memory (CD-ROM) drives, can be comfortably placed in one of these generic categories. This section includes general descriptions of the basic components; detailed descriptions and configuration information are provided in Section 4.2, *IT Infrastructure Guidelines*.

1. **Workstations.** A workstation is a personal computing or communications device used by postal employees or customers to access and run business applications. Workstations may be deployed for administrative, industrial, or commercial use. The model configuration is dependent on where the workstation is located, how it is used, and the needs and characteristics of the user. Desktop, laptop, network, and handheld computers, fixed-function terminals, Mobile

Data Collection Devices (MDCDs), personal digital assistants (PDAs), point-of-service (POS) terminals, and telephones are examples of workstations.

2. **Login Servers.** A login server is a computer running a network operating system (NOS) and providing, at a minimum, access control, file services, and print services to users at workstations. The login server acts as the single entry point by which users gain access to all shared corporate computing resources.
3. **Peripherals.** Standard postal peripherals include, but are not limited to, laser and ink-jet printers; image scanners with or without optical character recognition capability; modems; fax machines; telephone answering devices; telephone interfaces; and multimedia devices such as speakers and microphones.
4. **Function Servers.** Function servers are special purpose computers placed at selected locations to perform specific utility functions for a variety of applications or users. While most are based on standard personal computer hardware, the operating systems vary by function. Examples include fax servers, CD-ROM servers, interactive voice response (IVR) units, and automatic call distribution (ACD) systems.
5. **Database Servers.** Database servers host application databases. High-end microcomputers and midrange systems are typically used to host local, departmental, and performance cluster databases. Large-scale computers are typically used as hosts for national application databases.
6. **Application Processors.** Application processors are generally used to support the following types of applications:
 - Web-based applications deployed on either the Internet or the Postal Intranet.
 - Distributed applications that require more computing power than a workstation can provide and when some of the processing is done away from the user workstation.
 - Applications designed to run in the traditional mainframe or minicomputer environment where terminal devices are used to access shared computers.
 - Terminal servers are a special type of application processor that provides a browser-like interface to traditional client-server applications. These servers will be used to facilitate the transition from traditional client-server applications to *n*-tier, server-based applications.
7. **Special Purpose Devices.** Special purpose devices are computing devices used to meet narrowly defined or application-specific computing requirements. For example, these devices are often used to meet special data collection requirements and may include badge readers, bar code scanners, and MDCD docking stations. The distinction between a function server and a special purpose device frequently depends on the number of applications accessing the device and the robustness of the design.

8. **Local Area Network.** An Ethernet local area network (LAN) provides high-speed connectivity between workstations, peripherals, and servers within a building or campus. Both the cabling systems (e.g., optical fiber, unshielded twisted pair, thick coax, or thin coax) and the LAN components (e.g., repeaters, concentrators, hubs, Ethernet switches, and bridges) are included in this category. This category also includes wireless LAN components. The building or campus LAN is operated, managed, and maintained as a single entity, even when bridges, routers, or Ethernet switches are used to segment the LAN to improve performance.
9. **Wide Area Network.** A multi-protocol-routed network provides connectivity between locations, whether postal or nonpostal. The wide area network (WAN) includes routers connected to LANs, the external communications circuits used to connect the routers, the modems used to call into routers, and externally facing switches to connect the USPS to the Internet and business partners.

412 Computing Functions

Computing functions are the activities routinely performed by, with, or at a computer. The functions described in this section deal primarily with interactions between two or more computer systems. The operational characteristics of the listed computing functions differ in terms of the workload placed on the various IT infrastructure components. Some functions place a heavy load on a workstation, some rely on the operation of a function server, and some require the existence of a high bandwidth communication channel.

Currently there are eleven generic functions that form the foundation of the PCE. Those functions are:

1. **Operate as a Workstation.** This function encompasses the interactive computing functions performed by application software running on a workstation that do not require interaction with a database server, application processor, or function server. Self-contained applications (e.g., Microsoft Word, Excel, or Outlook) running on LAN-attached computers are performing this function even when a login server is being used to provide security, file services, and/or print services.
2. **Operate as a Distributed Client.** This function includes the interactive computing functions that involve sending a structured query language (SQL)-, a remote procedure call (RPC)-, a message broker, an object request broker (ORB)-, or a simple object access protocol (SOAP)-style request to an application or database and receiving the response.
3. **Operate as a Web Client.** This computing function allows a workstation to interact with the vast resources available on the Internet and the USPS Intranet.
4. **Operate as a Terminal.** This interactive computing function allows a workstation to emulate some type of computer terminal to gain access to application processes running on a different computer. It is typically used to gain access to an application processor running a multi-user

operating system, such as Z/OS, Open Virtual Machine Storage (OpenVMS), or Unix.

5. **Access a Function Server.** This is the interactive computing function through which workstations gain access to specialized functions, such as calculate a rate or find a ZIP+4 for an address.
6. **Initiate File Transfers.** This function is for moving computer files between peer processes operating on different computing platforms. Traditionally, this involves moving a copy of a file from a tape or disk on one computer to a tape or disk on a second computer. In interactive mode, this function is initiated by a user who supplies the origination and destination locations for the file or files to be transferred. In a batch mode, this function is initiated by a timer or event, where origin and destination locations must be provided by the processes.
7. **Process a Print Request.** This function routes a file to a printer. In interactive mode, the file is identified by a user and is routed to a printer generally designated by the user. In batch mode, this function is initiated by a timer or event, and the file and printer are designated by the processors.
8. **Generate a Report.** This is a computing function where a stored routine extracts data from a file or database, formats the data into a report, and routes the results to either an electronic mailbox or a printer. In batch mode, the function is initiated by a timer or event. In interactive mode, the process is initiated by a user.
9. **Poll a Device.** This is a batch computing function where a master device monitors the status of subordinate devices by polling. The poll may also be used to trigger some other batch function or to collect data from the polled device and pass it to a designated location.
10. **Send a Message.** This is a batch computing function where a device sends a message to a peer or master device. The message may be a report, a response, or a request. The difference from the Poll a Device function is that this action generally occurs asynchronously. The message may be triggered by a timer or event within the device.
11. **Scan an Image.** This is a batch computing function where a scanner captures an image in a bit mapped format. The subject may be textual or graphical, including photography. The event is usually triggered by a feeder device.

412.1 **Interactive Versus Batch**

The distinction between interactive and batch functions is an important consideration for systems and application design. Interactive or attended functions are initiated by a user at a workstation or system console. Although two or more interactive applications may be active, a user can usually only give his or her attention to one application at a time. Batch or unattended functions are performed by a computer system based on a predetermined schedule or in response to a triggering event, which can be a user request. Batch functions may be monitored at a workstation or system console, but the operation of the function is not dependent on user intervention.

412.2 User Roles

User roles, and the computer system privileges that those roles include, define the availability of computing functions within and across postal locations. The two categories of user roles and the different tasks they perform are:

1. **Application User.** An application user performs end-user or production functions that are typical of accessing and running an application. This concept applies to custom business applications, database applications, or commercial off-the-shelf (COTS) applications.
2. **Support User.** A support user, also called administration, or maintenance user, performs a wide variety of functions, frequently on an *ad hoc* basis, to ensure trouble-free performance for the application user. Because of the technical nature of their responsibilities, these users generally have additional system privileges that allow them to perform their job. Although support users are typically information systems professionals, an individual can play either or both roles. For instance, a LAN administrator creating an Excel spreadsheet would be functioning as an application user. The same LAN administrator, installing a new version of Excel, would be functioning as a support user.

413 Computing Boundaries

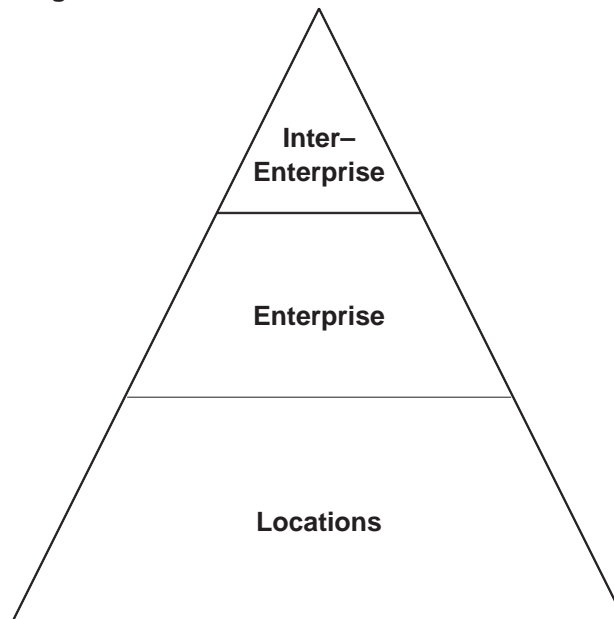
The supported PCE computing functions typically fall within one or more postal computing realms:

- Locations.
- Enterprise.
- Inter-enterprise.

These realms originally had physical connotations and boundaries. As computing technology has evolved, those boundaries have begun to blur. However, they are still useful in explaining the availability of postal computing functions. Changes in the availability of functions define the boundaries of these computing realms.

Exhibit 4-1 illustrates the realms and demonstrates that the number and variety of supported computing functions shrink as the organizational distance between the computers involved in the interaction increases. The richest set of computing functions is available for interactions between computers within single locations. The most restrictive list of computing functions applies to interactions between postal computers and computers outside the USPS (e.g., inter-enterprise).

Exhibit 4-1
PCE Computing Boundaries



Financial considerations and technical constraints make it inappropriate to support the entire set of computing functions throughout the entire PCE. The three computing realms are useful in explaining the limits that previous postal technology choices place on its computing strategies.

413.1 **Locations**

USPS IT is not restricted to postal facilities. This section describes three types of locations where postal IT may be placed and used:

1. Postal buildings.
2. Nonpostal locations.
3. Postal employees and vehicles.

413.11 **Postal Buildings**

Introduction

A building is a physical structure where postal activities occur. A campus of two or more buildings located on adjacent plots of land is considered by the PCE to be a building. The types of information systems technology needed in a given building are determined by the postal functions performed in that building. Postal buildings are generally referred to by the primary postal functions performed in them; however, multiple postal functions can be performed within a building. A generic naming convention for postal buildings is used to describe the technology strategy for various postal environments, including office, mail operations, large and small associate office (AO) or station, special use, and mixed-technology buildings.

- **Office Buildings.** This category includes places where management, administration, and support functions are performed in an office environment, such as:
 - Accounting service centers.
 - Area offices.
 - Business centers.
 - Corporate relations service centers.
 - Distribution network offices.
 - District offices.
 - Facilities service centers and offices.
 - Human resources service centers.
 - Labor relations field offices.
 - Managing counsels field offices.
 - Purchasing and materials service centers.
 - Rates and classification service centers.
 - Statistical programs service centers.

The total number of facilities within this category is less than 300. While the number of staff located in each facility varies, the supporting technology is generally consistent. Buildings in this category are generally equipped with structured wiring, a LAN, administrative workstations, a GoldTape login server or access to an Advanced Computing Environment (ACE) login server, and a dedicated WAN connection. Function servers, database servers, application processors, and special purpose devices are installed as needed to meet local or functional needs. The LAN installed in an office provides a very high bandwidth communications channel between all computing devices in the building. The availability of this high bandwidth, coupled with the needed computing resources, makes it possible to support all the applicable computing functions within the context of a single building.

- **Mail Operations Buildings.** This category represents the vast array of mail processing facilities, such as:
 - Air mail centers and facilities.
 - Bulk mail centers.
 - Eagle Hub Expedited Mail Operations and Hub Management.
 - Processing and distribution (P&D) centers and facilities.
 - Priority mail processing centers.

The number of buildings in this category is approximately 400. These buildings are generally equipped with structured wiring, a LAN, administrative and industrial workstations, a GoldTape login server or access to an ACE login server, and a dedicated WAN connection. Function servers, database servers, application processors, and special purpose devices are installed as needed to meet local or functional needs. The LAN installed in a mail operations building provides a very high bandwidth communications channel between all computing devices in the building. The availability of this high bandwidth, coupled

with the needed computing resources, makes it possible to support all the applicable computing functions within the context of a single building.

- **Large AO or Station Buildings.** The USPS has over 8,000 buildings in this category. They typically have a small administrative unit, several automated retail windows, and/or delivery functions. Deployed technology may include a delivery unit computer (DUC) and a postmaster's workstation.

The POS and associate office infrastructure (AOI) programs transformed the IT in these types of postal buildings. The POS program replaced the limited function integrated retail terminals (IRTs) with multifunctional retail workstations. The AOI program installed an Ethernet LAN, an AOI server, and dedicated WAN connectivity in each facility. Larger ACE servers, deployed in a few key locations, are now replacing the AOI servers

- **Small AO or Station Buildings.** The USPS has over 25,000 buildings in this category. They typically have a small administrative area, retail windows, and possibly city or rural delivery functions. The POS program replaced the limited function IRTs with multifunctional retail workstations. Many of the larger sites in this category received controller POS workstations, which perform some of the AOI server functions. Some offices also have a personal computer for light office automation tasks.
- **Special Use Buildings.** Throughout the USPS, there are buildings that do not fit into any of the aforementioned categories. Headquarters and Engineering are such buildings, as are many of the buildings that house many of the Headquarters-related units. Special use buildings include:
 - Engineering center.
 - Headquarters, including offices in northern Virginia.
 - Information technology centers.
 - Maintenance Technical Support Center.
 - Material Distribution Center.
 - National call centers.
 - National Center for Employee Development.
 - National Customer Support Center.
 - Philatelic Fulfillment Service Center.
 - Remote encoding centers.
 - William F. Bolger Center for Leadership Development.

These buildings, being few in number and not replicated throughout the field, will be dealt with individually. In all cases, however, postal standard IT services, products, tools, and components are used in these buildings.

- **Mixed-Technology Buildings.** It is clear that some office or mail operations buildings will also house retail and delivery units normally supported with an AOI server. Both office/mail operations and AO-based technology solutions will be installed in these buildings. The

office and operations portions of the building will be supported with the GoldTape server, and the retail and delivery areas will be supported by the AOI server or access to an ACE server. As the GoldTape components and services are replaced by ACE, the technology in these buildings will be standardized.

413.12 **Nonpostal Locations**

Increasingly, postal equipment with an IT component is placed in nonpostal locations, such as malls or train stations. Alternatively, postal-provided information systems are being developed for placement in mailers' facilities. This category provides a placeholder for addressing IT requirements generated outside postal-owned or -leased facilities.

413.13 **Postal Employees and Vehicles**

The appropriate mobile technology is being provided to sales people, marketing representatives, and letter carriers. Letter carriers are equipped with MDCDs as part of the Signature and Delivery Confirmation programs. In addition, vehicles are being equipped with global positioning systems (GPSs) and mobile communications. For instance, some delivery vehicles are being outfitted with GPS and emergency notification communication capability.

413.2 **Enterprise**

Computer-to-computer interactions between locations within the USPS exist within the enterprise computing boundary of the PCE. These interactions cross multiple data communications circuits. The computing functions supported for these interactions are limited to those that can operate within the bandwidth limitations of the Wide Area Network IT Service.

413.3 **Inter-Enterprise**

Computer-to-computer interactions between postal computers and computers operated by outside organizations and individuals exist within the third computing boundary of the PCE. The USPS has a variety of specially-engineered physical connections to other companies and organizations. The solution set includes dedicated point-to-point circuits, switched access to postal access points, the Internet, and some use of value-added networks (VANs). Use of the Internet Protocol (IP) family is strongly preferred for interactions with outside entities but, in special cases, the Systems Network Architecture (SNA) suite is still supported. Connections to computers operated by individuals are most often made over the Internet using World Wide Web (WWW) technology.

42 IT Infrastructure Guidelines

This section provides IT infrastructure guidelines to be used in developing and fielding applications for use in the USPS. These guidelines apply to all applications that will be accessed from or run on postal standard workstations or servers. The IT infrastructure guidelines are organized using the elements of the conceptual framework presented above. The guidelines are presented as follows:

- **Component-Based Guidelines.** These guidelines are organized according to the nine generic IT infrastructure components defined in Section 4.4.1. It also contains provisioning specifications including configuration information about the products being deployed as part of the IT infrastructure.
- **Computing Boundary-Based Guidelines.** These guidelines are stated in terms of the three computing boundaries defined in Section 4.1.3.
- **Computing Function-Based Guidelines.** These guidelines, for the most part, are stated in terms of supported communications protocols for each function. They are presented in tabular form in Section 4.2.3 and combine the concept of user roles, computing boundaries, and computing functions to indicate the supported computing strategies.

421 Component-Based Guidelines

The guidelines in this section are presented in terms of the nine generic IT infrastructure components defined in Section 4.1.1, *IT Infrastructure Components*. The following sections provide high-level information concerning the configuration or operational characteristics of each of the components in a category. The guidelines apply to all devices that fit into the generic category, regardless of the application being implemented or operated. Also provided is configuration information about the products being deployed as part of the IT infrastructure.

421.1 Workstations

The PCE includes the following three classes of workstations. Each class addresses a different environment, type of user, and type of job function:

1. **Administrative.** Administrative workstations are used by managerial, administrative, and clerical staff in office environments. This class also includes mobile workstations, which may be used almost anywhere.
2. **Industrial.** Industrial workstations are used by window clerks, mail handlers, and letter carriers, among others, in post offices, retail outlets, mail processing facilities, and on the street.
3. **Commercial.** Commercial workstations are used by postal customers to access postal services and information. This class also includes workstations provided to business partners for purposes of work sharing.

These workstations can be expected to accommodate specific assistive technologies as appropriate to satisfy the requirements of Sections 501, 504, and 508 of the Rehabilitation Act. Assistive technologies are not deployed as standard equipment with the workstation, but are installed when appropriate.

421.11 **Administrative Workstations**

The administrative class of workstations includes two types:

1. **General Purpose Workstations.** These are standard desktop, laptop, or notebook microcomputer systems relying on the Microsoft Windows family of operating systems.
 - **Stationary Workstations.** These are standard desktop microcomputer systems that are permanently attached to a LAN or WAN.
 - **Mobile Workstations.** These are standard laptop or notebook microcomputer systems occasionally connected to the LAN or WAN.
2. **Special Purpose Workstations.** These are specially equipped microcomputer systems engineered to meet the unusual needs of a special purpose work force. Examples of currently approved and deployed special purpose workstations include:
 - **Development Workstations.** These are designed to meet the needs of IT professionals who design and develop business applications. Development workstations are usually permanently attached to a LAN and WAN. They operate under Windows NT Workstation.
 - **National Call Center Workstations.** These are engineered to meet the performance and reliability requirements of the agents working in the national call centers. These workstations are permanently connected to a LAN and WAN. They operate under Windows NT Workstation.
 - **Palm-sized and Handheld Devices.** These are designed to meet the needs of mobile professionals for communications capabilities linked to the functionality of a personal information manager (PIM). These devices are occasionally connected to the WAN via switched wireline or wireless telecommunications.

Some officers, managers, and employees are using a special handheld device optimized for sending and receiving electronic mail. Compaq Corporation markets the device as part of their iPAQ product line. It is based on technology developed by Resources in Motion (RIM). The device is referred to as an iPAQ Blackberry. The devices have the functionality of a PIM plus the capability of wirelessly sending and receiving email.

Guidelines

The following guidelines apply to all administrative workstations except palm-sized and handheld devices:

- Table 4-1 shows the preferred and minimum acceptable MS-Windows compatibility standards for GoldTape and ACE workstation applications designed for application users. Standards are shown for both classes of workstations since the pace of conversion from GoldTape to ACE is uncertain at this time.
- Applications operating on these workstations must use TrueType fonts.
- Since these workstations are capable of running multiple concurrent applications, the standard workstation configuration cannot be changed dynamically by any application.
- These workstations are based on Intel Corporation's Pentium microprocessor architecture family.

Table 4-1

MS Windows Compatibility Standards for Workstation Applications

GoldTape

Application Type and Audience	Standard
COTS applications for wide distribution and/or long-term use.	Applications sold with the "Designed for Windows NT® and Windows® 95" compatibility logo.
COTS applications for narrow distribution and/or very short-term use.	Applications sold with the "Designed for Windows NT® and Windows® 95" compatibility logo.
Custom applications for wide distribution and/or long-term use.	Applications written to Win32 and Winsock 2 application programming interfaces (API).
Custom applications for narrow distribution and/or very short-term use.	Applications written to Win32 and Winsock 2 APIs.

ACE

Application Type and Audience	Standard
COTS applications for wide distribution and/or long-term use.	Applications sold with the "Designed for Windows 2000 and NT®" compatibility logo.
COTS applications for narrow distribution and/or very short-term use.	Applications sold with the "Designed for Windows 2000 and NT®" compatibility logo.
Custom applications for wide distribution and/or long-term use.	Applications written to Win32 and Winsock 2 API.
Custom applications for narrow distribution and/or very short-term use.	Applications written to Win32 and Winsock 2 APIs.

Provisioning Specifications

The locations and deployment characteristics for the two general categories of administrative workstations are described in Table 4-2 below. Since general purpose workstations deployed as part of the GoldTape environment are being replaced by ACE workstations, configuration information is provided for both types of workstations where appropriate.

Table 4-2

Provisioning Specifications for Administrative Workstations

GoldTape Workstations:	
Stationary Units	<ul style="list-style-type: none"> ■ Locations: Some Headquarters-related units, area offices, district offices, P&D centers and facilities, bulk mail centers, business centers, large and small AOs, retail stores, carrier stations, and air mail centers and facilities. ■ Deployed Minimum Configuration: Developers must note that applications targeted for the DUC must be approved by the DUC Configuration Board, c/o Manager, Delivery Systems Support, Delivery and Retail. Developers should assume the baseline hardware configuration listed below for stationary GoldTape workstations. <ul style="list-style-type: none"> ■ Microsoft Windows 95B operating system. ■ Intel Pentium CPU running at 133 MHz. ■ 32-MB RAM. ■ 2-GB hard disk drive configured as Drive C:. ■ 3.5" floppy drive configured as Drive A:. ■ SVGA video card with 1-MB video memory. ■ Standard SVGA monitor, supporting 640 x 480 pixels and 256 colors. ■ Enhanced keyboard with a minimum of 101 keys. ■ Windows-compatible mouse. ■ 10 Mbps Ethernet LAN card.
Mobile Units	<ul style="list-style-type: none"> ■ Locations: Potentially anywhere. ■ Deployed Minimum Configuration: For application development purposes, assume that the baseline configuration of a mobile GoldTape workstation includes the following characteristics: <ul style="list-style-type: none"> ■ Microsoft Windows 98/2000 operating systems. ■ Intel Pentium CPU running at 133 MHz. ■ 32-MB RAM. ■ 2-MB hard disk drive configured as Drive C:. ■ 3.5" floppy drive configured as Drive A:. ■ SVGA video card with 1 MB video memory. ■ Standard SVGA monitor, supporting 640 x 480 pixels and 256 colors. ■ ITU V.90 internal modems. ■ Windows-compatible mouse.

ACE Workstations:	
Stationary Units	<ul style="list-style-type: none"> ■ Locations: Headquarters and some Headquarters-related units. ■ Deployed Minimum Configuration: For application development purposes, assume that the baseline configuration of a stationary ACE workstation includes the following characteristics: <ul style="list-style-type: none"> ■ Microsoft Windows 2000 or XP Pro operating system. ■ Intel Pentium 4 CPU running at 1.7 GHz. ■ 256-MB RAM. ■ 20-GB hard disk drive configured as Drive C:. ■ 1.44-MB diskette drive configured as Drive A:. ■ 16x/40x DVD-ROM optical drive with DVD-RAM read. ■ NVIDIA Vanta 16-MB 4X AGP graphics card. ■ Standard SVGA monitor, supporting 1024x768 pixels and 256 colors. ■ Integrated AC97 audio with internal speaker. ■ Easy access keyboard with PS/2 connector. ■ 2-button scroll mouse with PS/2 connector. ■ Integrated Intel PRO/100 VM NIC.
Mobile Units	<ul style="list-style-type: none"> ■ Locations: Potentially anywhere. ■ Deployed Minimum Configuration: For application development purposes, assume that the baseline configuration of a mobile ACE workstation includes the following characteristics: <ul style="list-style-type: none"> ■ Microsoft Windows 2000 or XP Pro operating system. ■ Mobile Intel Pentium III CPU running at 1.06 GHz. ■ 256-MB RAM. ■ 20-GB hard disk drive configured as Drive C:. ■ 1.44-MB diskette drive configured as Drive A:. ■ DVD-ROM optical drive. ■ ATI Mobility Radeon, 64-bit video graphics with 16-MB DDR SDRAM. ■ TFT XGA monitor, supporting 1024 x 768 pixels and 256 colors. ■ 102-key compatible keyboard. ■ Dual pointing devices (Pointstick and Touchpad). ■ 10/100 NIC integrated on system board. ■ Type III Mini PC V.90 modem.

Special Purpose Workstations:	
Development Workstations	<ul style="list-style-type: none"> ■ Locations: Determined case-by-case. ■ Deployed Minimum Configuration: Designers of new applications must coordinate through Information Technology with the specific project teams to determine the development target configuration for these systems.
National Call Center Workstations	<p>Locations: National call centers.</p> <p>Deployed Minimum Configuration: For application development purposes, assume that the baseline configuration of a national call center workstation includes the following characteristics:</p> <ul style="list-style-type: none"> ■ Intel Pentium CPU running at 133 MHz. ■ 48-MB RAM. ■ 1.2-GB hard disk drive configured as Drive C:. ■ 3.5" floppy drive configured as Drive A:. ■ CD-ROM configured as Drive D:. ■ SVGA video card with 2-MB video memory. ■ 17" SVGA monitor supporting 1024 x 768 pixels and 256 colors. ■ Enhanced keyboard with a minimum of 101 keys. ■ Windows-compatible mouse.
Palm-sized Devices	<ul style="list-style-type: none"> ■ Locations: Potentially anywhere. ■ Deployed Minimum Configuration: For application development purposes, assume that the baseline configuration of a palm-sized device includes the following characteristics: <ul style="list-style-type: none"> ■ 8-MB RAM. ■ Backlit 240 x 320 gray scale display. ■ IrDA serial interface. ■ Compact flash slot. ■ Limited set of function keys, but no keyboard.
Handheld Devices	<ul style="list-style-type: none"> ■ Locations: Potentially anywhere. ■ Deployed Minimum Configuration: For application development purposes, assume that the baseline configuration of a handheld device includes the following characteristics: <ul style="list-style-type: none"> ■ 16-MB RAM. ■ Backlit 640 x 240 color display (256 colors). ■ IrDA serial interface. ■ Type II PC card slot. ■ Compact flash slot.
iPAQ Blackberry	<ul style="list-style-type: none"> ■ Locations: Potentially anywhere. ■ Deployed Minimum Configuration: For application development purposes, assume that the baseline configuration of a handheld device includes the following characteristics: <ul style="list-style-type: none"> ■ 5-MB RAM. ■ Backlit 160 x 160 LCD display . ■ RS-232 serial port (cradle). ■ 35-key QWERTY-style keypad.

421.12 **Industrial Workstations**

This class includes ruggedized workstations and personal digital assistants used by postal employees in the performance of core business functions. These devices are used in retail areas, in mail processing areas, and on the street as opposed to the office environment that characterizes the most prevalent use of administrative workstations. Single function, handheld devices, such as bar code scanners, are considered Special Purpose Devices and are described later in this chapter. The three types of industrial workstations and the operating systems used are:

1. POS Workstations. These operate under Windows NT Workstation.
2. MDCDs. These operate under the MS-DOS operating system and C or C++ programming environments.
3. PDAs (TBD).

Provisioning Specifications

The provisioning specifications for the industrial workstations are in Table 4-3 below.

Table 4-3

Provisioning Specifications for Industrial Workstations

<p>Point-of-Service Workstations (IBM)</p>	<ul style="list-style-type: none"> ■ Locations: Large and small AOs and retail stores. ■ Deployed Minimum Configuration: For application development purposes, assume that the baseline configuration of a point-of-service workstation is: <ul style="list-style-type: none"> ■ AMD K-6 CPU running at 266 MHz. ■ 64-MB RAM. ■ 3.2-GB hard disk drive configured as Drive C:. ■ 3.5" floppy drive configured as Drive A:. ■ SVGA video card with 1-MB video memory. ■ Standard SVGA monitor, supporting 640 x 480 pixels and 256 colors. ■ Enhanced keyboard with a minimum of 101 keys. ■ Windows-compatible mouse. ■ 10 Mbps Ethernet LAN card.
<p>Point-of-Service Workstations (NCR)</p>	<ul style="list-style-type: none"> ■ Locations: Large and small AOs and retail stores. ■ Deployed Minimum Configuration: For application development purposes, assume that the baseline configuration of a point-of-service workstation is: <ul style="list-style-type: none"> ■ Intel Pentium MMX CPU running at 233 MHz. ■ 64-MB RAM; (terminal controller versions have 128 MB RAM). ■ 4-GB hard disk drive configured as Drive C:. ■ 3.5" floppy drive configured as Drive A:. ■ SVGA video card with 1-MB video memory. ■ Standard SVGA monitor, supporting 640 x 480 pixels and 256 colors. ■ Enhanced keyboard with a minimum of 101 keys. ■ Windows-compatible mouse. ■ 10 Mbps Ethernet LAN card.

Mobile Data Collection Devices	<ul style="list-style-type: none"> ■ Locations: Delivery units. ■ Deployed Minimum Configuration: For application development purposes, assume that the baseline configuration of a MDCD is: <ul style="list-style-type: none"> ■ Intel 80386 CPU running at 33 MHz. ■ 512-KB executable RAM. ■ 1-MB flash memory. ■ LCD with electroluminescent backlight. ■ 9 line x 20 characters graphical display. ■ 36 key alphanumeric keyboard. Optional 20 key numeric keyboard. ■ Infrared transmitter/receiver; optical data transfer to 38.4-kB.
Personal Digital Assistant	<ul style="list-style-type: none"> ■ Locations: TBD. ■ Deployed Minimum Configuration: TBD.

421.13 **Commercial Workstations**

This class, commercial workstations, is provided by the USPS for use by its customers. The Customer Service Terminal will be a multipurpose, self-service, Internet-access computer that issues stamps, applies postage, prints forms, and looks up ZIP+4 Codes for retail customers. Another type of commercial workstation will be provided to business partners for purposes of work sharing. Guidelines and provisioning specifications for commercial workstations are under development.

421.2 **Login Servers**

The login server environment continues to change in response to new application requirements and product evolution, and to improve the stability of the operating environment. Up until recently, the great diversity in the intensity of local area computing required that two types of login servers be defined:

1. **GoldTape Login Servers.** GoldTape servers are used in larger locations with heavy computing demands, such as Headquarters-related units, area and district offices, and mail processing buildings.
2. **AOI Login Servers.** AOI servers were used in post offices, retail stores, and delivery units where the computing demands are less intense.

Currently, ACE Login Servers are replacing AOI servers. In the future, ACE servers will also replace all the GoldTape servers, as they are doing in Headquarters already. ACE servers, however, are not deployed in the same physical location as the server they are replacing. Fewer, larger servers are deployed in key locations providing nation-wide coverage.

The following information represents current thinking about anticipated login server configurations for both GoldTape and ACE login servers. It is supplied to provide guidance to application developers and system operations staff.

Provisioning Specifications

The locations and deployment characteristics for the login servers are described in Table 4-4 below.

Table 4-4
Provisioning Specifications for Login Servers

GoldTape Login Server	<ul style="list-style-type: none"> ■ Locations: Headquarters, Headquarters-related units, area offices, district offices, mail operations centers and facilities, bulk mail centers, and business centers. ■ Deployed Minimum Configuration: For application development purposes, assume that the baseline configuration of a GoldTape Login server is: <ul style="list-style-type: none"> ■ Novell NetWare 4.X NOS. ■ Intel Pentium CPU running at 166 MHz. ■ 256-MB RAM. ■ 1-GB hard disk configured as Drive C:. ■ 13-GB disk space sharable as NetWare volumes. ■ 3.5" floppy drive configured as Drive A:. ■ CD-ROM drive. ■ 10/100 NIC. ■ Characteristics and Services: Some of the characteristics and services available at a login server include: <ul style="list-style-type: none"> ■ The server's disk drives are divided into five NetWare volumes: <ol style="list-style-type: none"> 1. SYS: contains the standard NetWare files. 2. USER: contains the home directories for all users. 3. DATA: contains all COTS application software and shared data areas. 4. NATAPPS: contains application software and data areas for national applications. 5. PRINT: contains the NDS based print queues. ■ The server has an 8-mm DAT tape drive attached, and routine backups are made using Cheyenne's ARCserve IT for NetWare (version 6.6 with support pack 4 is being used). Developers who need their application's files backed up must work with Client Server Technology Engineering (CSTE) to have their requirements included in the standard configuration. ■ The server has a standard method to schedule the loading, unloading, and execution of NetWare NLMs. Developers who need to load NLMs should work with CSTE to have the appropriate files updated and the NLMs verified to ensure compatibility with the standard build. ■ The server runs Btrieve 6.15 to support standard LAN applications and system software. Close coordination must be done between Btrieve and the office automation applications to ensure that they all run correctly. Developers who need to use Btrieve should contact CSTE to get the latest version information. ■ CSTE is responsible for the management of shared Windows files on the login server. This would include the following file types, at a minimum: INI, CFG, EXE, VBXs, and DLLs. Developers must work with CSTE to determine which version of the shared files is currently supported. ■ CSTE is responsible for the management of all NetWare NLMs. Developers should work with CSTE to determine which version of the standard NLMs is currently being supported.
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ACE Login Server	<ul style="list-style-type: none"> ■ Locations: Any facility connected to the PRN. ■ Deployed Minimum Configuration: For application development purposes, assume the baseline configuration of an ACE login server is: <ul style="list-style-type: none"> ■ Microsoft Windows 2000 NOS. ■ 8 Intel Pentium III Xeon CPUs running at 700 MHz. ■ 16-GB RAM. ■ Two 18.2-GB hard disk drives. ■ Integrated internal RAID capability and external tape support; 291.2-GB maximum internal storage. ■ Integrated 1.44-diskette drive. ■ 24x IDE CD-ROM drive. ■ Dual port 10/100 Fast Ethernet NIC. ■ Characteristics and Services: TBD.
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421.3 Peripherals

The current guidelines and provisioning specifications for IT infrastructure peripherals include:

- Laser printers with features and functions comparable to a Hewlett-Packard (HP) LaserJet 4 are available on standard LANs in office or mail operations buildings. These printers are configured to support PCL5. PostScript support is not generally available.
- Application sponsors and developers who require printers with capabilities not provided by the HP LaserJet 4 or comparable printer, such as color, must coordinate the acquisition and deployment of these special purpose printers with Field/Customer Care Operations, Information Technology.
- Local LAN administrators whose application users require printers with capabilities not provided by the HP LaserJet 4 or comparable printer, such as color, may acquire and install additional printers to meet local requirements.

421.4 Function Servers

Detailed configuration and interface information for function servers is maintained by Customer Care Operations (CCO), Information Technology.

421.5 Database Servers

Database servers are used throughout the USPS with the following guidelines applied:

- Multi-user database management systems (DBMSs) must be deployed on database servers.
- Widely used, multi-user DBMSs, database server operating systems, and computing platforms are shown in Table 4-5.

Table 4-5
Database Servers

DBMS	Class*	Operating System	Computing Platform	Comments/Reference
DB2	1	Z/OS	Large-scale-class computers only	Recommended for national data.
IDMS	2	Z/OS	Large-scale-class computers only	
Microsoft SQL Server	4	Windows Family of Servers	Intel Pentium-class computers	Restricted for systems management server (SMS) within MS-Back Office.
Microsoft Access	1	Windows 9x	Intel Pentium II, Pentium Pro, and Pentium-class computers	Recommended for small workgroup data.
Non-Stop SQL	4	Tandem Guardian	Tandem	Restricted to International Business.
ORACLE	1	Solaris	Sun Sparc computers (super server-class)	Recommended for performance cluster and consolidated performance cluster data.
ORACLE	1	Windows Family of Servers	Intel Pentium-class computers	Recommended for facility, consolidated facility, and performance cluster data.
ORACLE	1	Windows Family of Servers	Super server-class computers	Proposed for consolidated facility, performance cluster, and consolidated performance cluster data.
ORACLE	1	Z/OS	Large-scale-class computers only	Recommended for national data.
ORACLE	2	VMS or OpenVMS	Digital Alpha, MicroVAX, or VAX	
Rdb	2	VMS or OpenVMS	Digital Alpha, MicroVAX, or VAX	
SAS	4	Z/OS	Large-scale-class computers only	Restricted to International Business.

***NOTE:**

Class 1 — Products and combinations of products that are part of the core infrastructure. These products are deployed throughout the PCE and fully supported.

Class 2 — Products and combinations of products that are widely deployed, but no longer part of the core infrastructure. These products may not be used for new development and will not be used for substantive enhancements to existing applications unless unusual circumstances warrant. Products or combinations of products currently in use but not listed in these tables are also classified as class 2.

Class 3 — New products or combinations of products that are being reviewed for inclusion into the core infrastructure. During the review, these emerging products may be used to meet technical requirements not satisfied by the core products. Readers should note while some products in this emerging class will be moved into the core infrastructure (class 1), many will end up in class 2, 4, 5, or 6.

Class 4 — Products or combinations of products that are being used to meet very specific business needs, also called niche products. These products usually represent one-of-a-kind solutions that meet narrow or short-term requirements.

Class 5 — Obsolete products or combinations of products that are actively being eliminated from the PCE. An expiration date is usually established after which the product will not be supported.

Class 6 — Products or combinations of products that have been removed from the infrastructure.

Provisioning Specifications

Host Computing Services (HCS), Information Technology, maintains the provisioning specifications for database servers using the Linux, Z/OS, and Solaris operating systems. CCO maintains the provisioning specifications for database servers using the Windows family of server operating systems.

421.6 Application Processors

Application processors are used throughout the USPS with the following guidelines:

- Widely used application processor operating systems and computing platforms are shown in Table 4-6.
- Web server software, operating systems, and computing platforms are shown in Table 4-7.

Table 4-6

Application Processors

Operating System	Class*	Computing Platform	Comments/Reference
Solaris	1	Sun Sparc computers (super server-class)	Recommended for consolidated performance cluster- and selected national-access applications.
Tandem Guardian	4	Tandem	Restricted to International Business.
VMS or OpenVMS	2	Digital Alpha, MicroVAX, or VAX	
Windows Family of Servers	1	Intel Pentium-class computers	Recommended for facility- and selected performance cluster-access applications.
Z/OS	1	Large-scale-class computers only	Recommended for national-access applications and transaction processing.
<p>*NOTE:</p> <p>Class 1 — Products and combinations of products that are part of the core infrastructure. These products are deployed throughout the PCE and are fully supported.</p> <p>Class 2 — Products and combinations of products that are widely deployed but no longer part of the core infrastructure. These products may not be used for new development and will not be used for substantive enhancements to existing applications unless unusual circumstances warrant. Products or combinations of products currently in use but not listed in these tables are also classified as class 2.</p> <p>Class 3 — New products or combinations of products that are being reviewed for inclusion into the core infrastructure. During the review, these emerging products may be used to meet technical requirements not satisfied by the core products. Readers should note while some products in this emerging class will be moved into the core infrastructure (class 1), many will end up in class 2, 4, 5, or 6.</p> <p>Class 4 — Products or combinations of products that are being used to meet very specific business needs, also called niche products. These products usually represent one-of-a-kind solutions that meet narrow or short-term requirements.</p> <p>Class 5 — Obsolete products or combinations of products that are actively being eliminated from the PCE. An expiration date is usually established after which the product will not be supported.</p> <p>Class 6 — Products or combinations of products that have been removed from the infrastructure.</p>			

Table 4-7
Web Servers

Web Servers	Class*	Operating System	Computing Platform	Comments/Reference
IBM HTTP Server (based on Apache)	1	Solaris	Sun Sparc computers (super server-class)	Foundation for WebSphere Application Server.
IBM HTTP Server (based on Apache)	1	Z/OS	Large-scale-class computers only	Foundation for WebSphere Application Server.
IBM HTTP Server (based on Apache)	3	Windows Family of Servers	Intel Pentium-class computers	
iPlanet Web Server, Enterprise Server	3	Solaris	Sun Sparc computers (super server-class)	Foundation for iPlanet Application Server.
iPlanet Web Server, Enterprise Server	3	Windows Family of Servers	Intel Pentium-class computers	
Microsoft Internet Information Server	1	Windows Family of Servers	Intel Pentium-class computers	Recommended for use by performance clusters only; not recommended for national applications.
Oracle HTTP Server (based on Apache)	3	Solaris	Sun Sparc computers (super server-class)	Foundation for Oracle 9i Application Server.
Oracle HTTP Server (based on Apache)	3	Windows Family of Servers	Intel Pentium-class computers	
<p>*NOTE:</p> <p>Class 1 — Products and combinations of products that are part of the core infrastructure. These products are deployed throughout the PCE and are fully supported.</p> <p>Class 2 — Products and combinations of products that are widely deployed but no longer part of the core infrastructure. These products may not be used for new development and will not be used for substantive enhancements to existing applications unless unusual circumstances warrant. Products or combinations of products currently in use but not listed in these tables are also classified as class 2.</p> <p>Class 3 — New products or combinations of products that are being reviewed for inclusion into the core infrastructure. During the review, these emerging products may be used to meet technical requirements not satisfied by the core products. Readers should note while some products in this emerging class will be moved into the core infrastructure (class 1), many will end up in class 2, 4, 5, or 6.</p> <p>Class 4 — Products or combinations of products that are being used to meet very specific business needs, also called niche products. These products usually represent one of a kind solutions that meet narrow or short- term requirements.</p> <p>Class 5 — Obsolete products or combinations of products that are actively being eliminated from the PCE. An expiration date is usually established after which the product will not be supported.</p> <p>Class 6 — Products or combinations of products that have been removed from the infrastructure.</p>				

Provisioning Specifications

HCS, Information Technology, maintains the provisioning specifications for application processors using the Linux, Z/OS, and Solaris operating systems. CCO, Information Technology, maintains the provisioning specifications for application processors using the Windows family of server operating systems.

421.7 Special Purpose Devices

The provisioning specifications for special purpose devices are maintained by the sponsoring organizations.

421.8 **Local Area Networks**

LANs are used throughout the USPS with the following guidelines and provisioning specifications:

- LAN technology in postal facilities must comply with the LAN IT Service specifications.
- Because of the potential for serious security vulnerabilities, wireless access points cannot be added to facility LANs without the prior approval of the Network Connectivity Review Board.
- Ethernet is the standard for postal LANs. Any existing installation meeting the Ethernet standard may be used and will be supported.
- Ethernet switches, not routers, are the preferred technology for segmenting LANs within a building.
- LANs must be installed, operated, and maintained in accordance with Handbook AS-805, *Information Security*.
- The wiring plan for new LAN installations must comply with the USPS structured wiring standards. Horizontal or workstation wiring must be unshielded twisted pair, and vertical or backbone wiring must be optical fiber. In this context, new LANs or wiring systems include:
 - New facility construction.
 - Major renovations to existing facilities.
 - The installation of new telephone systems needing wiring upgrades.
 - The extension of LAN services to an area of a facility not currently wired for a LAN.

421.9 **Wide Area Networks**

The Postal Routed Network/Managed Network Services (PRN/MNS) is the WAN used by the USPS. The guidelines regarding PRN/MNS are as follows:

- PRN/MNS connectivity, where established, should be used in lieu of special purpose connections, whether dedicated or switched circuits.
- IP protocols are routed throughout the network.

Provisioning Specifications

The PRN/MNS links postal buildings, vehicles, and employees using a high-speed backbone and 15 network access points (see Exhibit 4-2).

- **Backbone.** The backbone consists of a fully meshed network of 15 nodes connected using high-speed frame relay over private virtual circuits.
- **Network Access Points.** The 15 network access points are known as postal virtual points of presence (PVPs). Each PVP is connected using high-speed frame relay to two backbone network nodes to ensure redundancy. Each PVP could serve as many as 4,080 postal LAN-based facilities using frame relay over private virtual circuits. To improve performance, LAN-based facilities within the same

performance cluster will normally be connected to the same router within the assigned PVP.

- Each postal facility may be equipped with a primary and backup path to the PRN/MNS (see Exhibit 4-3).
 - **District Office Building.** The primary and backup connections are dedicated links from separate routers in the district office building to different routers within the assigned PVP. The service delivery point (SDP) is the LAN side of the router.
 - **Area Office or Mail Operations Building.** The primary and backup connections are dedicated links, partly leased line, mostly private virtual circuit, from separate routers in the area office or mail operations building to different routers within the assigned PVP. The SDP is the LAN side of the router.
 - **Large Associate Office.** The primary connection is a dedicated 56 kbps link from a router in the large associate office to a router within the assigned PVP. A Very Small Aperture Terminal (VSAT) and satellite network provide backup capabilities for most sites. A dial on demand circuit using Integrated Services Digital Network (ISDN) is available at sites not equipped with VSAT capabilities. The SDP is the LAN side of the router.
 - **Small Associate Office.** The primary and backup connections are provided by satellite using VSAT. The SDP is the hub side of the satellite indoor unit (IDU).

Exhibit 4-2
Backbone Portion of the PRN/MNS

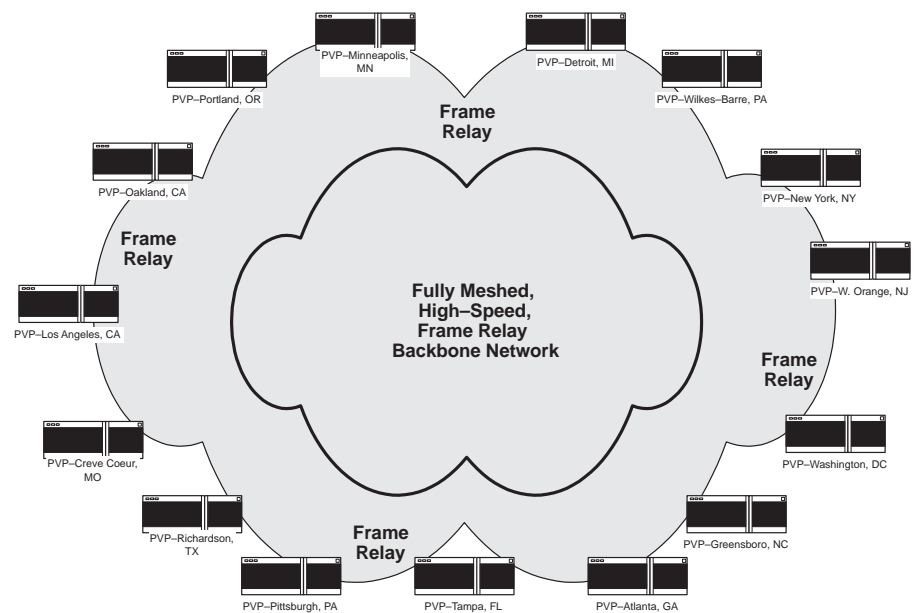
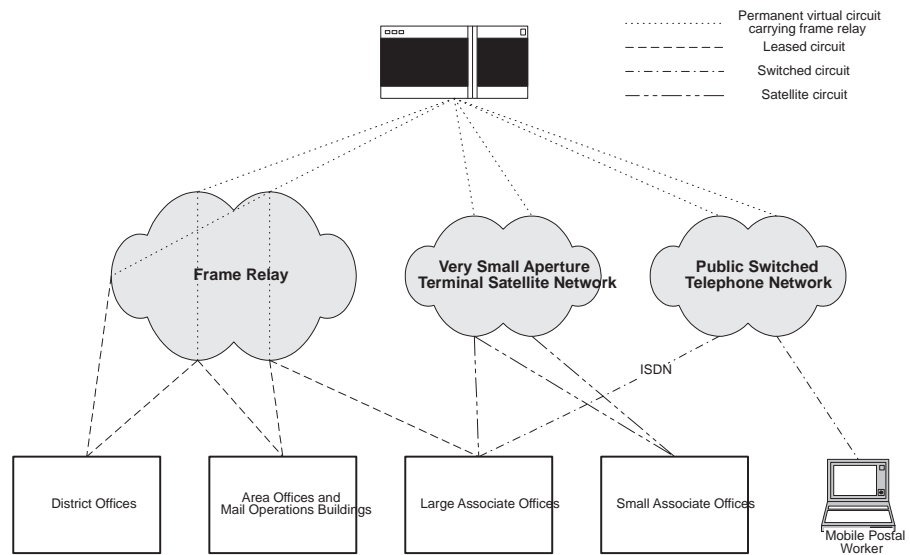


Exhibit 4-3
Lower Network Portion of the PRN/MNS



422 Computing Boundary-Based Guidelines

These guidelines are presented in terms of the three computing boundaries defined previously in Section 4.1. The following sections provide high-level guidance for application characteristics, deployment, or operation within the various boundaries in the PCE and apply to all IT systems installed and operated in postal facilities.

422.1 Locations

Postal locations include postal buildings such as office or mail operations buildings, station buildings, large and small AO buildings, and others. The location's computing boundary also includes some nonpostal locations, as well as postal employees and vehicles.

422.11 Postal Buildings

The computing guidelines for **Office or Mail Operations Buildings** include:

- GoldTape login servers are installed in these types of buildings. In the future, ACE login servers located in a few strategic network facilities will serve these buildings.
- Workstations installed in this type of building should be designed to connect to a LAN. While initially the computer may be operated as a stand-alone, experience suggests that, sooner or later, most computers are connected to a LAN.
- Roles and Responsibilities
- Application developers must ensure that applications targeted for these facilities are designed so that they operate successfully from a remote server in a Web-enabled environment.
- Employees who are responsible for installing, operating, and/or supporting the infrastructure should make every reasonable effort to

ensure that standard services and operating methods are used in buildings under their control; for example, the vast majority of users should print using shared network printers.

- The local information systems staff is authorized to make reasonable decisions concerning the installation of peripherals, such as printers, modems, scanners, or compact disk-read write (CD-RW), to meet individual users' business needs.

The computing guidelines for **Large AO or Station Buildings** include:

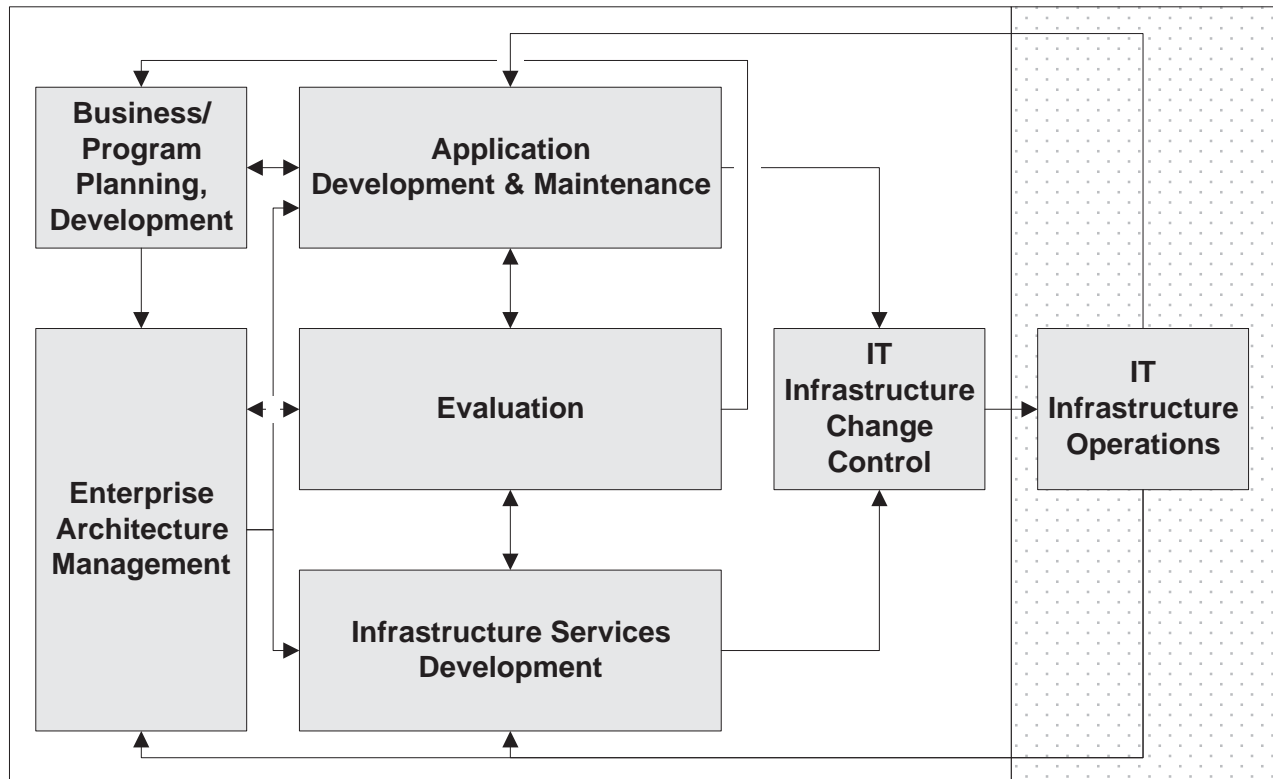
- ACE login servers located in a few strategic network facilities are replacing the AOI login servers.
- Workstations installed in this type of building should be designed to connect to a LAN. While initially the computer may be operated stand-alone, experience suggests that, sooner or later, most computers are connected to a LAN.
- All workstations must be capable of acting as ACE server clients.
- Roles and Responsibilities

5 PCE Processes

The decentralized nature of the Postal Computing Environment (PCE) requires the implementation of both structure and discipline to ensure that business applications, infrastructure services, and information technology (IT) components work together effectively. Thus, it is necessary, in addition to publishing design guidelines and technical specifications, to define the processes, procedures, and responsibilities regarding the PCE's operation and use.

Exhibit 5-1 presents a map of the clusters of processes used to create, manage, maintain, and operate the PCE. The processes in these clusters are introduced below and further described in this chapter. Future iterations of this handbook will provide detail regarding processes, related procedures, and responsibilities as they are defined.

Exhibit 5-1
PCE Processes Map



The processes described in this chapter are organized as follows:

- **Business/Program Planning, Development.** These processes provide the information technology adjunct to the corporate processes for business case development, including the preparation and review of a decision analysis report (if required). The processes in this cluster provide an opportunity for the Enterprise Architecture Committee (EAC) and the Enterprise Architecture Forums to influence the technology component of major business initiatives at an early stage.
- **Enterprise Architecture Management.** This is a critical and complex set of linked processes. These processes govern many of the key decision-making elements of the (functional) IT governance structure. These processes are intended to keep an enterprise architecture fully synchronized with the U.S. Postal Service (USPS) business strategies and initiatives as well as industry standards. They also seek to ensure that stakeholders are aware of the architecture, IT policies, and IT strategies. Further, they are the means for better ensuring compliance with the architecture by providing application and service developers with design packages to assist and guide the creation of business solutions and infrastructure services.
- **Application Development and Maintenance.** This describes the methods, standards, and procedures being implemented and used for application development and maintenance. The goal of this collection of processes is to reduce life cycle cost of application development, while increasing software quality and programmer productivity. The processes seek to integrate preferred portfolio providers (PPP) development methodologies with the architectural direction established by the USPS.
- **Evaluation.** This includes a number of architecture-based reviews and assessments under the supervision of the EAC. The purpose of these processes is to ensure that proposed business solutions and infrastructure services fully and properly utilize the USPS enterprise architecture and to determine that the “as-built” version of an application or service reflects the previously approved design document.
- **Infrastructure Services Development.** This describes the processes used to manage the life cycle of an infrastructure service focusing on concept, planning, design, implementation/operation, enhancement, and abandonment.
- **IT Infrastructure Change Control.** These processes manage the transition from architecture to computing environment. These processes control the implementation/ deployment of IT components, infrastructure services, and business applications; monitor end of life for IT components; and provide a repository for release levels and version control. These processes, however, do not determine if or when a change is made to the PCE.
- **IT Infrastructure Operations.** This includes the diverse cluster of processes required to plan, operate, maintain, and update the software, utilities, services, and components that comprise the IT infrastructure.

The shaded box in Exhibit 5-1 indicates that most of these activities occur “behind the wall” or “within the glass house” and generally outside the purview of this directive. The feedback loops, however, are critical for enterprise architecture development and renewal and for assessing the performance of applications and infrastructure services.

51 Business/Program, Planning, Development

As noted in section 2.1, the Enterprise Map Methodology for Information Technology (EMMIT) is the tool used to evaluate proposed business applications with regard to USPS business processes recorded on the Enterprise Map. All development projects are required to utilize EMMIT to recognize, relate to, and provide updates to the Enterprise Map.

Information and instructions regarding the Enterprise Map and EMMIT may be found through <http://it.usps.gov/standards>.

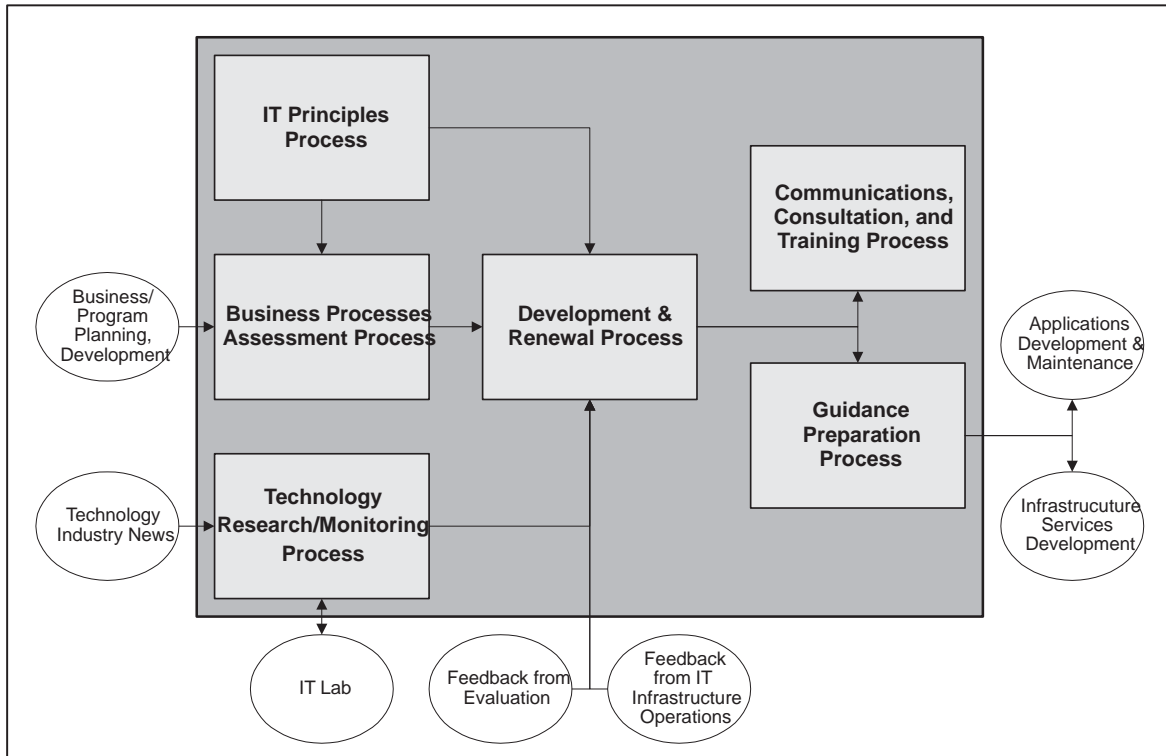
52 Enterprise Architecture Management

The Enterprise Architecture Management processes describe critical activities that support the creating, updating, and sharing of an enterprise architecture. These activities are structured so that an enterprise architecture is closely linked to USPS corporate strategies, business plans, and information technology principles. The value of an enterprise architecture is to create guidance for system developers and infrastructure operators. Through this guidance, applications may be designed, developed, and implemented more efficiently. Guidance is essential to the introduction of new application design paradigms, such as *n*-tier, as described in Chapter 2. An enterprise architecture also provides the blueprints for creating services-based infrastructure. Infrastructure services, as described in Chapter 3, provide another essential part of an infrastructure optimized for rapid application development and deployment.

Exhibit 5-2 demonstrates how the analysis-oriented processes on the left side feed the creation/renewal process in the center. The output of this process is then disseminated to support application and infrastructure service development. The feedback received from Evaluation and Operations is critically important. Collectively, these processes are the most important activities of the Enterprise Architecture Forums.

Information regarding enterprise architecture is available through <http://it.usps.gov/standards>.

Exhibit 5-2

Enterprise Architecture Management Processes Map

521 Information Technology Principles Process

- **Description.**

The purpose of this process is to regularly identify and modify the information technology principles. Principles are a form of management guidance that enable decision-making at the lowest possible level within the organization. They provide a means of ensuring rapid and accurate decisions by staff and first-line management. The body of principles governing information technology should be reviewed annually.

- **Essential Inputs.**

- USPS strategic direction.
- Existing principles.

- **Key Tasks.**

- Identifying the need to update or revise the existing principles.
- Updating and revising the existing principles.
- Publishing approved changes to the principles.

- **Principal Deliverables.**

- Revised/updated principles.

- Key Participants.
 - Selected Officers.
 - Chief Technology Officer organization (CTO) and Information Technology Organization Portfolio Managers.
 - Enterprise Architecture Committee.
 - Enterprise Architecture Forums.

522 **Business Processes Assessment Process**

- Description.

Under this process, the business plans and processes of the USPS are analyzed with the intent of determining repeatable business patterns and identifying future technical requirements. The repeatable patterns become one of the key organizing principles for the presentation of an enterprise architecture to the technical and business communities. The business plans and processes are reviewed quarterly. Out of cycle reviews may be undertaken if events warrant.
- Essential Inputs.
 - USPS business plans and strategies.
 - Strategic and policy principles.
- Key Tasks.
 - Assessing business processes and plans.
 - Defining business patterns.
- Principal Deliverables.
 - Repeatable business patterns.
 - New business requirements.
- Key Participants.
 - CTO and IT Organization Portfolio Managers.
 - Enterprise Architecture Committee.
 - Enterprise Architecture Forums.
 - Preferred Portfolio Providers.

523 **Technology Research/Monitoring Process**

- Description.

The purpose of this process is to ensure that the USPS is able to meet changes in business needs with appropriate technology solutions. An effective research and monitoring process will enable the USPS to incorporate “emerging” technologies and standards in the guidance given to application developers, service providers, and infrastructure operators. The process is continuous, guided by directions from the EAC.
- Essential Inputs.
 - Research request by EAC.
 - New or changed standards.
 - New or changed technology.

- Key Tasks.
 - Developing a research direction and plan to guide research activities.
 - Conducting research and producing findings.
 - Assessing research recommendations.
- Principal Deliverables.
 - Research report on technologies or standards.
- Key Participants.
 - CTO and IT Organization Portfolio Managers.
 - Enterprise Architecture Committee.
 - Enterprise Architecture Forums.
 - IT Lab.

524 **Development and Renewal Process**

- Description.

The development and renewal of an enterprise architecture is at the heart of the Enterprise Architecture Management cluster of processes. This continuous process seeks to keep an enterprise architecture fully coordinated with the USPS business strategies and initiatives as well as industry standards.
- Essential Inputs.
 - Technical principles.
 - Repeatable business patterns.
 - New business requirements.
 - Research on technologies or standards.
 - New business pattern.
 - Architectural review exception.
 - Certification failure of recommended architecture.
 - Performance degradations.
- Key Tasks.
 - Developing technology alternatives.
 - Assessing technology patterns.
 - Coordinating with stakeholders.
- Principal Deliverables.
 - Pattern books with supporting documentation.
 - Infrastructure blueprints with supporting documentation.
 - Services/standards-based products list.
 - New/revised infrastructure services specifications.
- Key Participants.
 - CTO and IT Organization Portfolio Managers.
 - Enterprise Architecture Committee.
 - Enterprise Architecture Forums.
 - IT Services Managers.
 - Preferred Portfolio Providers.

525 **Communications, Consultation, and Training Process**

- **Description.**

This process seeks to ensure that stakeholders are aware of the architecture, IT policies, and IT strategies. The communications program is pro-active and promotional. Consulting services offered by the architecture forums are of equal importance in ensuring that the stakeholders are properly and fully utilizing an enterprise architecture. This process also includes a module for identifying training opportunities regarding methodologies, technologies, and standards adopted by the USPS.
- **Essential Inputs.**
 - Pattern books with supporting documentation.
 - Infrastructure blueprints with supporting documentation.
 - Services/standards-based products list.
 - New/revised infrastructure services specifications.
- **Key Tasks.**
 - Creating and disseminating communications to stakeholders.
 - Consulting with stakeholders.
 - Identifying appropriate training for stakeholders.
- **Principal Deliverables.**
 - Announcements.
- **Key Participants.**
 - CTO and IT Organization Portfolio Managers.
 - Enterprise Architecture Committee.
 - Enterprise Architecture Forums.
 - IT Services Managers.
 - Preferred Portfolio Providers.
 - Integrated Business Systems Solutions Centers Staffs.

526 **Guidance Preparation Process**

- **Description.**

The guidance processes are the means for better ensuring compliance with the architecture by providing application and service developers with design packages to assist and guide the creation of business solutions and infrastructure services.
- **Essential Inputs.**
 - Pattern books with supporting documentation.
 - Infrastructure blueprints with supporting documentation.
 - Services/standards-based products list.
 - New/revised infrastructure services specifications.

- Key Tasks.
 - Preparing development guidance.
 - Coordinating with stakeholders.
- Principal Deliverables.
 - Application Development Guidelines.
 - Infrastructure Services Guidelines.
- Key Participants.
 - CTO and IT Organization Portfolio Managers.
 - Enterprise Architecture Committee.
 - Enterprise Architecture Forums.
 - IT Services Managers.
 - Preferred Portfolio Providers.

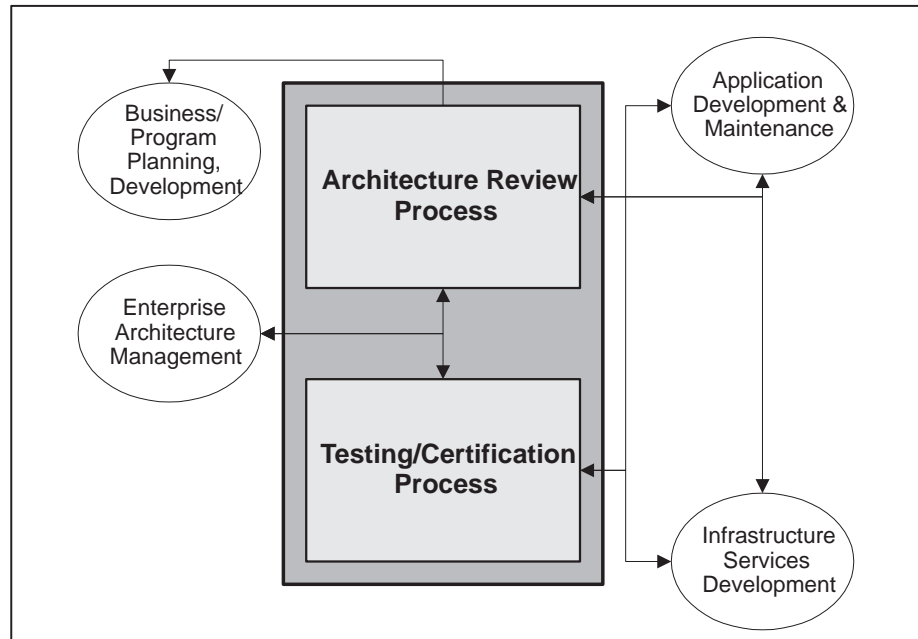
53 Application Development and Maintenance

Application Development and Maintenance processes, information, and instructions are available at the Integrated Solutions Methodology (ISM) and Electronic Software Process Standards & Procedures web pages accessed through <http://it.usps.gov/standards>.

54 Evaluation

The processes clustered under Evaluation affect the development of applications and infrastructure services at different times in the systems development life cycle. The Architecture Review Process occurs in conjunction with system design. The process must be successfully completed before development begins. Architecture Compliance, a component of the Testing process, occurs near the end of the development cycle. These tests are intended to assure that the “as-built” system conforms to the approved architecture and design specifications. Certification tests are conducted to ensure that the application or service will integrate into the existing computing environment. Information Security Assurance is another component of testing that ensures the continued security of the PCE.

Exhibit 5-3
Evaluation Processes Map



541 **Architecture Review Process**

- **Description.**

The purpose of this process is to ensure that proposed business solutions and infrastructure services fully utilize and reflect the USPS enterprise architecture. The process is used for new applications or services as well as enhancements to existing applications or services. The process includes an appeals procedure that ensures a timely, definitive resolution to any architectural disagreements.
- **Essential Inputs.**
 - Pattern books with supporting documentation.
 - Infrastructure blueprints with supporting documentation.
 - Services/standards-based products list.
 - New/revised infrastructure services specifications.
 - Business application architectures and design specifications.
 - Infrastructure services architectures and design specifications.
- **Key Tasks.**
 - Select projects to review.
 - Assess architectural conformance of projects.
 - Adjudicate sponsor dissent.
 - Provide new direction/requirements to architecture forums.

- **Principal Deliverables.**
 - EAC-approved business application architectures and design specifications.
 - EAC-approved infrastructure services architectures and design specifications.
 - Requirements for additions and updates to enterprise architecture.
- **Key Participants.**
 - CTO and IT Organization Portfolio Managers.
 - Enterprise Architecture Committee.
 - Enterprise Architecture Forums.
 - Corporate Information Security.
 - Application Sponsors (Business unit managers).
 - Preferred Portfolio Providers.
 - IT Services Managers.
 - IT Services Providers.

542 **Testing/Certification Process**

542.1 **Architecture Compliance Testing Process**

- **Description.**

The Architecture Compliance Testing Process is used to determine that the “as-built” version of an application or service integrates into the computing environment as planned in the EAC-approved design document. The feedback mechanism provides a means to monitor the effectiveness of the governance activities and highlight the need for architectural changes or new service offerings.
- **Essential Inputs.**
 - Pattern books with supporting documentation.
 - Infrastructure blueprints with supporting documentation.
 - Services/standards-based products list.
 - EAC-approved business application architectures and design specifications.
 - EAC-approved infrastructure services architectures and design specifications.
- **Key Tasks.**
 - Assess application or infrastructure service comparing “as-built” architecture to EAC-approved architecture and design specifications.
- **Principal Deliverables.**
 - Certifications of architectural compliance for applications or infrastructure services.
 - Requirements for additions and updates to enterprise architecture.

- Key Participants.
 - Enterprise Architecture Committee.
 - Enterprise Architecture Forums.
 - Application Sponsors (Business unit managers).
 - Preferred Portfolio Providers.
 - IT Services Managers.

542.2 **Application Certification Process**

While the details of the Application Certification Process may vary depending on the type of application and the intended computing platform, *all* applications must be certified before being introduced into the PCE. The goal of certification is to ensure that new or revised applications work as intended within the PCE and that they do not adversely affect existing applications. Information describing the methods, standards, and procedures used for application certification is available through <http://it.usps.gov/standards>.

542.3 **Information Security Assurance Process**

As stated in section 2.4, information security requirements and the Information Security Assurance process must be incorporated into all project plans. Information describing the methods, standards, and procedures used for Information Security Assurance is accessed through <http://it.usps.gov/standards>.

55 **Infrastructure Services Development**

[Reserved.]

56 **IT Infrastructure Change Control**

The IT Change and Configuration Management process is fully accessible through <http://it.usps.gov/standards>.

57 **IT Infrastructure Operations**

Most of the processes and procedures covering infrastructure operations regulate the activities of Customer Care Operations, Corporate Information Security, and Host Computing Services. The principal guides are Handbooks AS-802, *ADP System Operating Standards*, and AS-805, *Information Security*. There are also numerous management instructions in the AS-8XX series that address specific operational activities. See <http://it.usps.gov/standards>.

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Appendix A

Acronyms and Abbreviations

The following acronyms and abbreviations are used in this document.

ACD	automatic call distribution
ACE	Advanced Computing Environment
AGP	accelerated graphics port
AMD	Advanced Micro Devices
AO	associate office
AOI	associate office infrastructure
API	application programming interface
ASM	Administrative Support Manual
CCO	Customer Care Operations (Information Technology)
CDAS	Corporate Data Acquisition Service
CD-ROM	compact disk read-only memory
CD-RW	compact disk-read write
COTS	commercial off-the-shelf
CPU	central processing unit
CSTE	Client Server Technology Engineering (Information Technology)
CTO	Chief Technology Officer
DAT	digital audio tape
DB2	Database-2 (IBM)
DBMS	database management system
DOS	disk operating system
DUC	delivery unit computer
DVD-RAM	digital versatile disk-random access memory

DVD-ROM	digital versatile disk-read only memory
EAC	Enterprise Architecture Committee
ECMA	Electronic Communications Manufacturers Association
EIR	Enterprise Information Repository
EMMIT	Enterprise Map Methodology for Information Technology
FTP	File Transfer Protocol
GB	gigabyte
GHz	gigahertz
GPS	global positioning system
GUI	graphical user interface
HCS	Host Computing Services (Information Technology)
HP	Hewlett-Packard Company
HTML	Hypertext Markup Language
HTTP	Hypertext Transfer Protocol
IBSSC	Integrated Business Systems Solution Center
IDMS	Integrated Database Management System (IBM)
IDU	indoor unit
iPAQ	not an acronym or abbreviation (HP/Compaq product family)
IP	Internet Protocol
IP/NCP	Internet Protocol/Network Control Protocol
IP/NFS	Internet Protocol/Network File System
IPX	Internetwork Packet Exchange (Novell)
IPX/NCP	Internetwork Packet Exchange/Network Control Protocol (Novell)
IPX/SPX	Internetwork Packet Exchange/Sequenced Packet Exchange (Novell)
IrDA	infrared data access
IRT	integrated retail terminal
ISA	Information Security Assurance
ISDN	Integrated Services Digital Network
ISM	Integrated Solutions Methodology
IT	information technology

ITK	Infrastructure Tool Kit
ITU	International Telecommunications Union
IVR	interactive voice response
J2EE	Java 2 Enterprise Edition
JDBC	Java database connectivity
kB	kilobyte
kbps	kilobits per second
LAN	local area network
LCD	liquid crystal display
MB	megabyte
Mbps	megabits per second
MDCD	Mobile Data Collection Devices
MHz	megahertz
MI	management instruction
MMX	not an acronym or abbreviation (Intel Pentium chip family)
MNS	Managed Network Services
MS-DOS	Microsoft disk operating system (Microsoft)
NDS	Novell Directory Service (Novell)
NFS	Network File System
NIC	network interface card
NLM	NetWare loadable module (Novell)
NOS	network operating system
ODBC	open database connectivity (Microsoft)
OpenVMS	Open Virtual Machine Storage (Compaq)
ORB	object request broker
OS	operating system
OS/2	Operating System/2 (IBM)
PBX	private branch exchange
PCE	Postal Computing Environment
PCL5	Printer Control Language 5 (HP)

P&D	processing and distribution
PDA	personal digital assistant
PIM	personal information manager
PO	post office
POS	point-of-service
PPP	Point-to-Point Protocol preferred portfolio provider
PRN	Postal Routed Network
PRN/MNS	Postal Routed Network/Managed Network Services
PSTN	Postal Satellite Training Network public switched telephone network
PVP	postal virtual point of presence
QWERTY	not an acronym or abbreviation (type of keyboard)
RAID	redundant array of independent (or inexpensive) disks
RAM	random access memory
RIM	Resources In Motion
RPC	remote procedure call
SDP	service delivery point
SDRAM	synchronous dynamic random access memory
SMS	Systems Management Server (Microsoft)
SNA	Systems Network Architecture (IBM)
SOAP	Simple Object Access Protocol
SPSP	Software Process Standards and Procedures
SQL	structured query language
SVGA	Super Video Graphics Array
TBD	to be determined
TCP/IP	Transmission Control Protocol/Internet Protocol
Telnet	Telecommunications Network (remote access protocol)
Telnet/3270	Telecommunications Network (remote access protocol) 3270
TFT	thin film transistor
UDDI	Universal Description, Discovery, and Integration
URL	Uniform Resource Locator

USPS	United States Postal Service
VAN	value-added network
VAX	virtual address extension
VSAT	very small aperture terminal
VT	virtual terminal
WAN	wide area network
WSDL	Web Services Description Language
WWW	World Wide Web
W3C	World Wide Web Consortium
XGA	extended graphics array
XHTML	Extensible Hypertext Markup Language
XML	Extensible Markup Language
Z/OS	Z operating system (IBM)

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Appendix B

Architectural Blueprints

This appendix includes architectural blueprints of the technology used in:

- Office buildings.
- Mail operations buildings.
- Large associate office (AO) buildings.
- Small AO buildings.
- Mixed technology buildings.

Facility Model

The Facility Model is an analytical tool used to develop and maintain the Postal Service Technical Architecture. The model provides a way to conceptually and visually represent major classes of postal facilities. The model is used to analyze, organize, and relate information technologies, services, and applications to classes of postal facilities.

In this appendix, elements of the Facility Model are used to highlight the information technology components in five types of facilities. These drawings are referred to as blueprints.

Sections and Facility Types

Sections and Facility Types are the key elements of the Facility Model. Sections describe generally contiguous physical spaces within postal facilities where specific postal activities are performed. In most cases, the supporting technology is unique to each section. Some sections are divided into subsections. Subsections are either physically attached to or organizationally aligned with each other, but each section is a place for different activities that use unique technology.

Because sections are modular, they may be used as building blocks for constructing models of classes of postal facilities. The model for each class of facility is referred to as a Facility Type. Each Facility Type is a unique combination of sections.

Sections

Ten sections are presently identified in the Facility Model:

1. **Administration.** The Administration section is the physical space in which administrative, management, and support functions are performed. An administration section is included in all Facility Types because administrative activities, such as time and attendance, payroll, and personnel, must occur wherever postal employees work. As the management responsibility associated with a particular Facility Type increases, so does the complexity of the information technology in the Administration section. For instance, the postmaster of a small Associate Office may have only a telephone and a personal computer, while an Area Office has a large local area network.
2. **Computer Room.** The Computer Room section is the physical space set aside within a postal facility for shared computing resources, such as login servers, database servers, application processors, function servers, and special purpose devices. In larger facilities, the Computer Room may have climate control, dedicated power, and controlled access. In smaller facilities, the Computer Room may, in fact, be a locked closet. The smallest facilities do not have a Computer Room.
3. **Delivery.** The Delivery section is the physical area where letter carriers prepare mail for delivery, which includes sorting mail in final walk sequence, loading mail into delivery vehicles via a low platform, and unloading collections and undeliverable mail. In the Delivery section, supervisory personnel use workstations to monitor workload and performance. Also located there are Delivery Confirmation scanner cradles for downloading and recharging of handheld scanners.
4. **Dock/Platform.** The Dock/Platform section is the area for accepting and dispatching mail to and from postal facilities or mailers. The acceptance function includes receipt of mail from window and box collections, other postal facilities, and directly from mailers. Acceptance is accomplished by unloading a tractor-trailer or a truck parked at a bay. The dispatch function begins with the loading of a postal-owned or -contracted vehicle. When not in service, postal tractor-trailers are stored in the yard.
5. **Postal Employees and Vehicles.** The Postal Employees and Vehicles includes the activities of letter carriers and delivery vehicles while delivering the mail. Increasingly, information technology is being used to assist letter carriers; for example, personal digital assistants will store and display reminders of accountable mail, delivery hold orders, or mail forwarding instructions. Information technology will be used to locate postal delivery vehicles along their routes. Regardless of its ultimate form, information technology will be used to support letter carriers and to provide communication between letter carriers and the delivery unit.
6. **Mail Processing.** Although mail processing equipment varies by class and type of mail, the infrastructure required to support the mail processing function does not. Thus, a Mail Processing section represents the workroom floor for all types of mail processing facilities.

The section combines mail preparation, sortation, and distribution with a supporting maintenance unit.

7. **Retail.** The Retail section comprises the areas where postal products and services are provided directly to customers. The Retail subsections are Full-Service, Postal Store, and Self-Service.
 - The Full-Service subsection is a public-access area in a postal facility with counter units staffed by postal employees or contracted representatives. At these window units, postal customers may request various services (e.g., change of address), purchase postal products (e.g., stamps, money orders), or pick up mail items. A Full-Service subsection is generally included with a Box Lobby but may be a stand-alone unit in a retail area.
 - The Postal Store subsection is a public-access area, staffed by postal employees, that is set aside for the purchase of postal products. This subsection differs from Full-Service in that customers handle and inspect merchandise before purchase. Purchases are processed at a check-out counter. The Postal Store subsection is generally located with the Full-Service subsection and a Box Lobby.
 - The Self-Service subsection is a public-access area where postal customers may acquire information or products without postal employees' help. The Self-Service subsection may be part of a postal facility, located with Full-Service subsection and Box Lobby; however, the Self-Service subsection may also be a stand-alone unit that includes vending machines and information kiosks in public places.
8. **Telecommunications.** The Telecommunications section is the physical area housing the wiring center for the facility. The wiring center includes the main distribution frame, connection blocks, and associated support hardware such as Ethernet switches, local area network concentrators and hubs, and wide area network routers. Telephony equipment, such as the PBX, and video conferencing equipment are also located in this section. The Telecommunications section is usually located adjacent to the Computer Room. In large facilities, the Telecommunications section is connected to Intermediate Telecommunications Rooms by the backbone wiring system. In smaller facilities, the Telecommunications section is directly connected to the Information Outlets within the functional sections by the horizontal wiring system.
 - The Intermediate Telecommunications Room (ITR) is where backbone cable is terminated and cross-connected to horizontal distribution cable via an intermediate distribution frame. The ITR houses cross-connect facilities and may contain auxiliary power supplies for terminal equipment located at the user work location. ITRs are strategically placed throughout the facility to provide services where needed and are patched into the facility's Telecommunications Room. The ITRs are connected to the

- Information Outlets within the functional areas by the horizontal wiring system.
- The Information Outlets (IOs) are the connection points on walls, on floors, and in ceilings where users, systems, and building services plug into the wiring infrastructure. These connection points are similar in principle to AC electric outlets or telephone jacks. They may be configured in various ways depending on their use.
9. **Vehicle Maintenance.** The Vehicle Maintenance section is an area for the administration and maintenance of postal vehicle fleets. These activities are generally performed at Vehicle Maintenance Facilities, which may be collocated with other postal facilities. Administration is concerned with vehicle history, maintenance records of vehicles, inventory control, and cost accounting. Maintenance refers to the actual maintenance performed on delivery and other postal vehicles.
 10. **Yard.** The Yard section includes the grounds, parking areas, gates, and any tractor-trailers parked within the yard. The yard is used in postal activities and protects postal property. The gate is an access control point to the yard as well as an information gathering point for postal vehicles entering or leaving the yard. Many smaller facilities do not have an enclosed yard with a gate.

Facility Types

Sections are used as building blocks for constructing models of classes of postal facilities. The model for each class of facility is referred to as a Facility Type. Each Facility Type is a unique combination of sections. The blueprints for five Facility Types are presented in this appendix as follows:

<i>Facility Type</i>	<i>Section</i>
B.1 Office Building	Administration, Computer Room, and Telecommunications
B.2 Mail Operations	Administration, Computer Room, Dock/Platform, Mail Processing, Telecommunications, and Yard
B.3 Large Associate Office	Administration, Computer Room, Delivery, Dock/Platform, Retail, and Telecommunications
B.4 Small Associate Office	Administration, Delivery, Retail, and Telecommunications
B.5 Mixed Technology	Administration, Computer Room, Delivery, Dock/Platform, Mail Processing, Retail, Telecommunications, Vehicle Maintenance, and Yard

B1 Office Building

Exhibit B.1-1
Sections in an Office Building

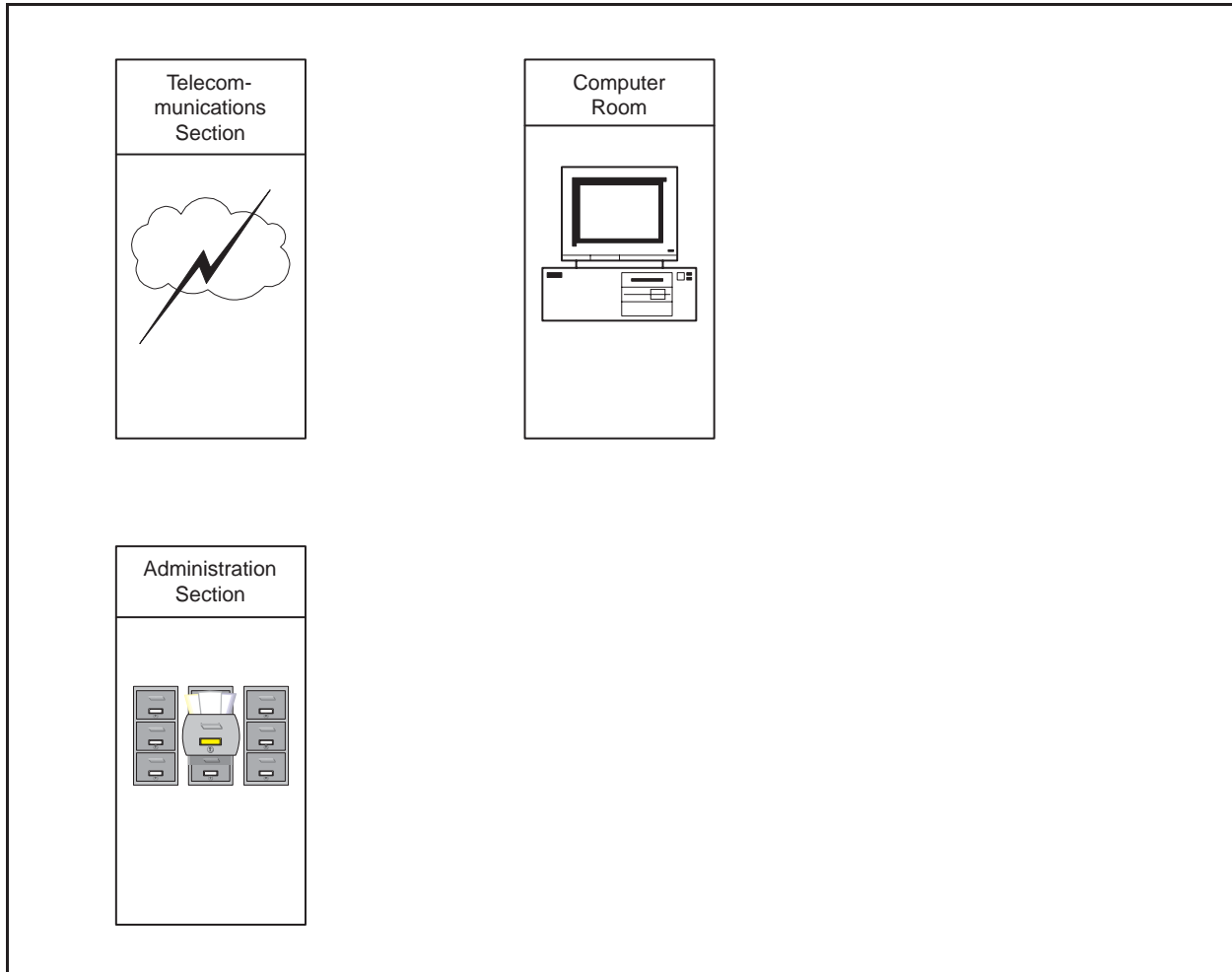


Exhibit B.1-2
Office Building Telecommunications Section Layout

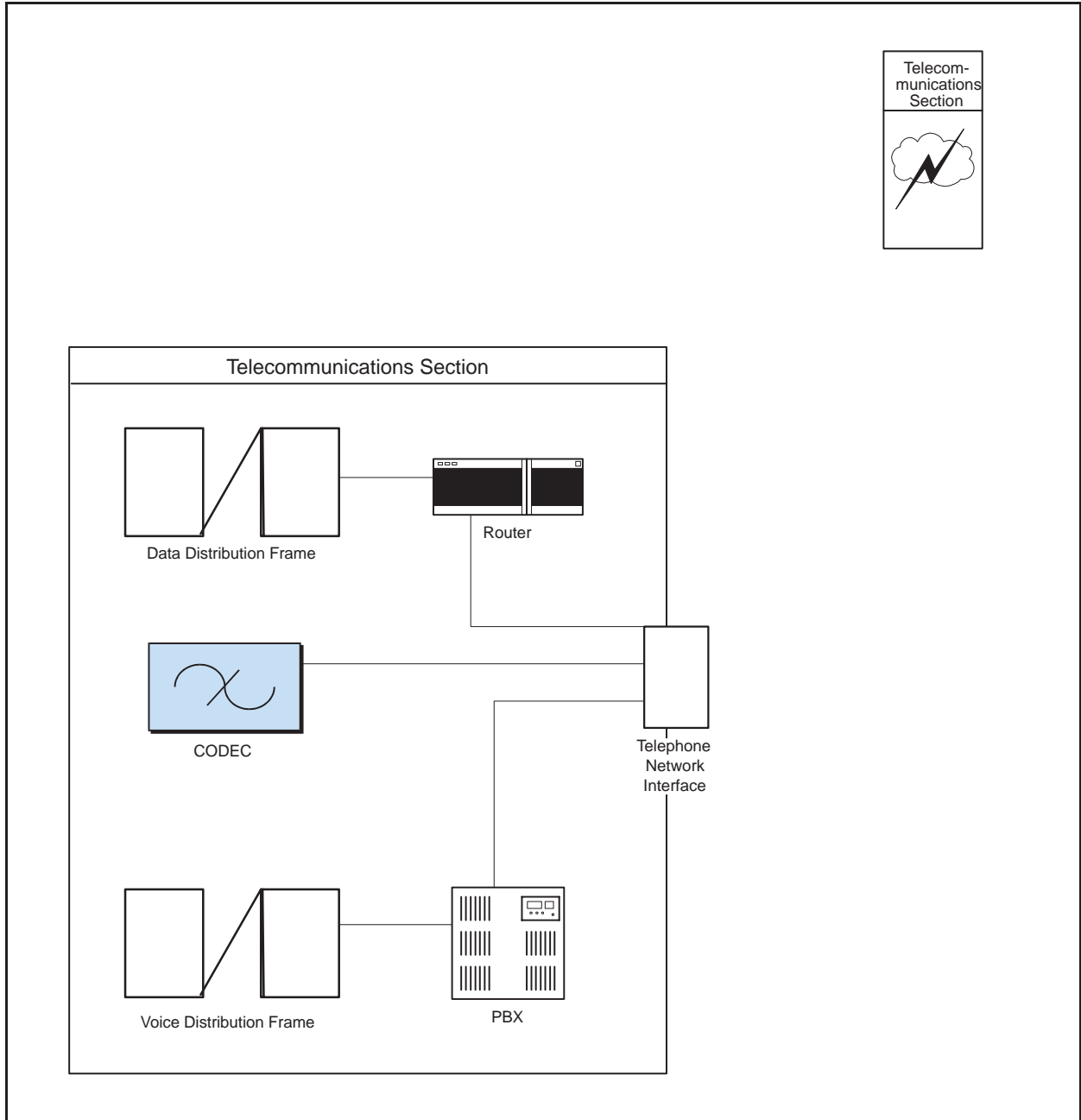


Exhibit B.1-3
Office Building Computer Room Layout

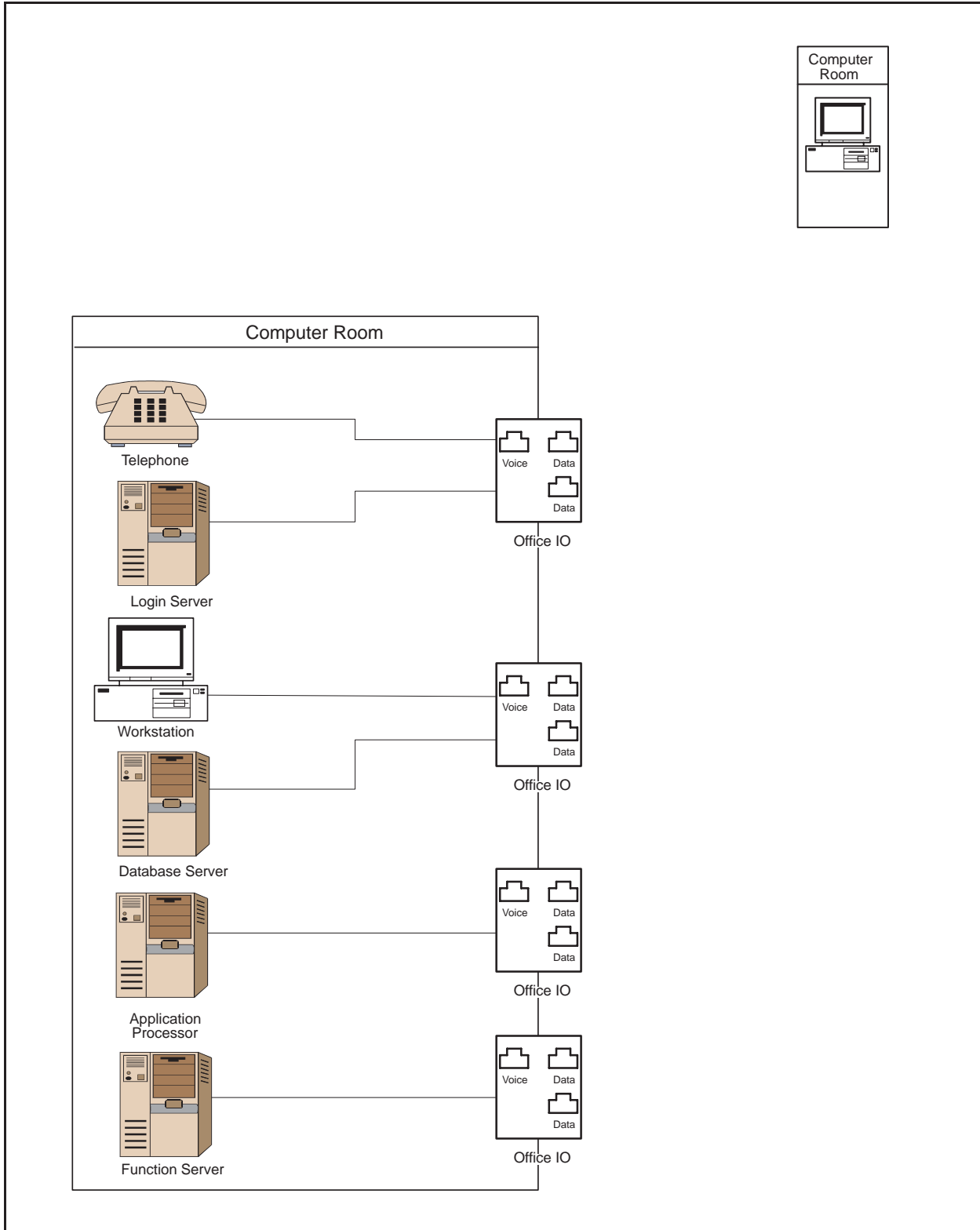


Exhibit B.1-4
Office Building Administration Section Layout

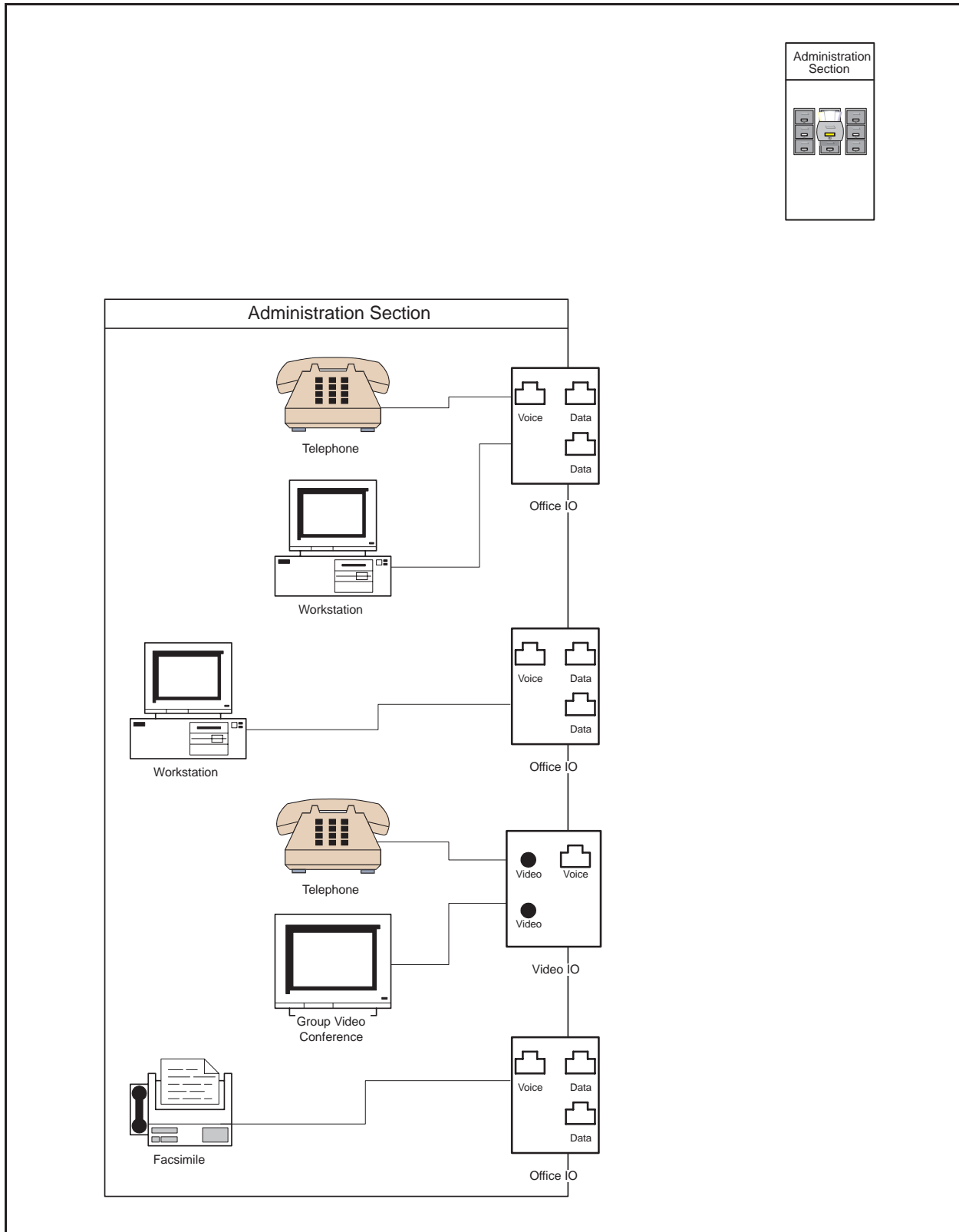
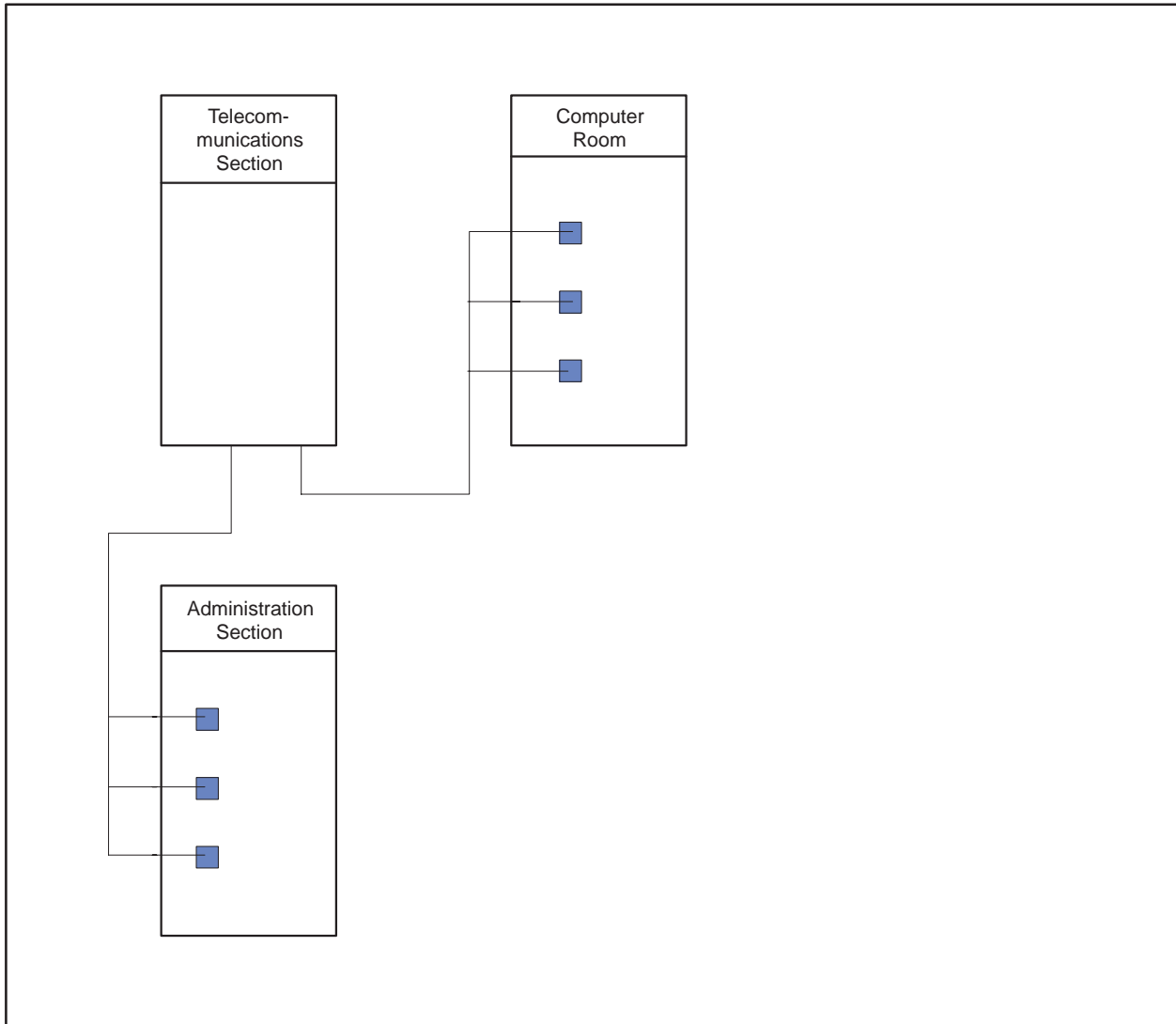


Exhibit B.1-5
Office Building Backbone Wiring Template



B2 Mail Operations Building

Exhibit B.2-1
Sections in a Mail Operations Building

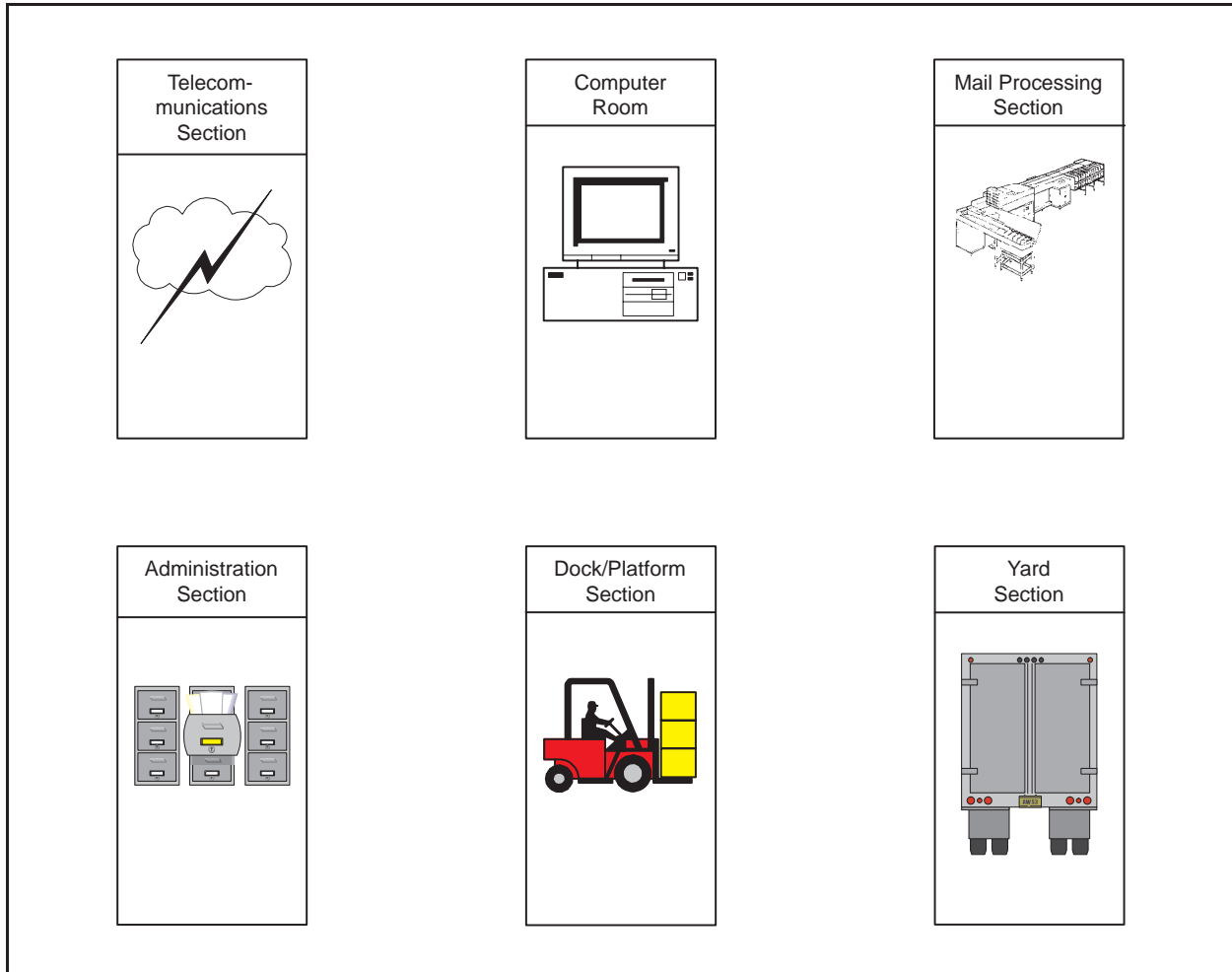


Exhibit B.2-2
Mail Operations Building Telecommunications Section Layout

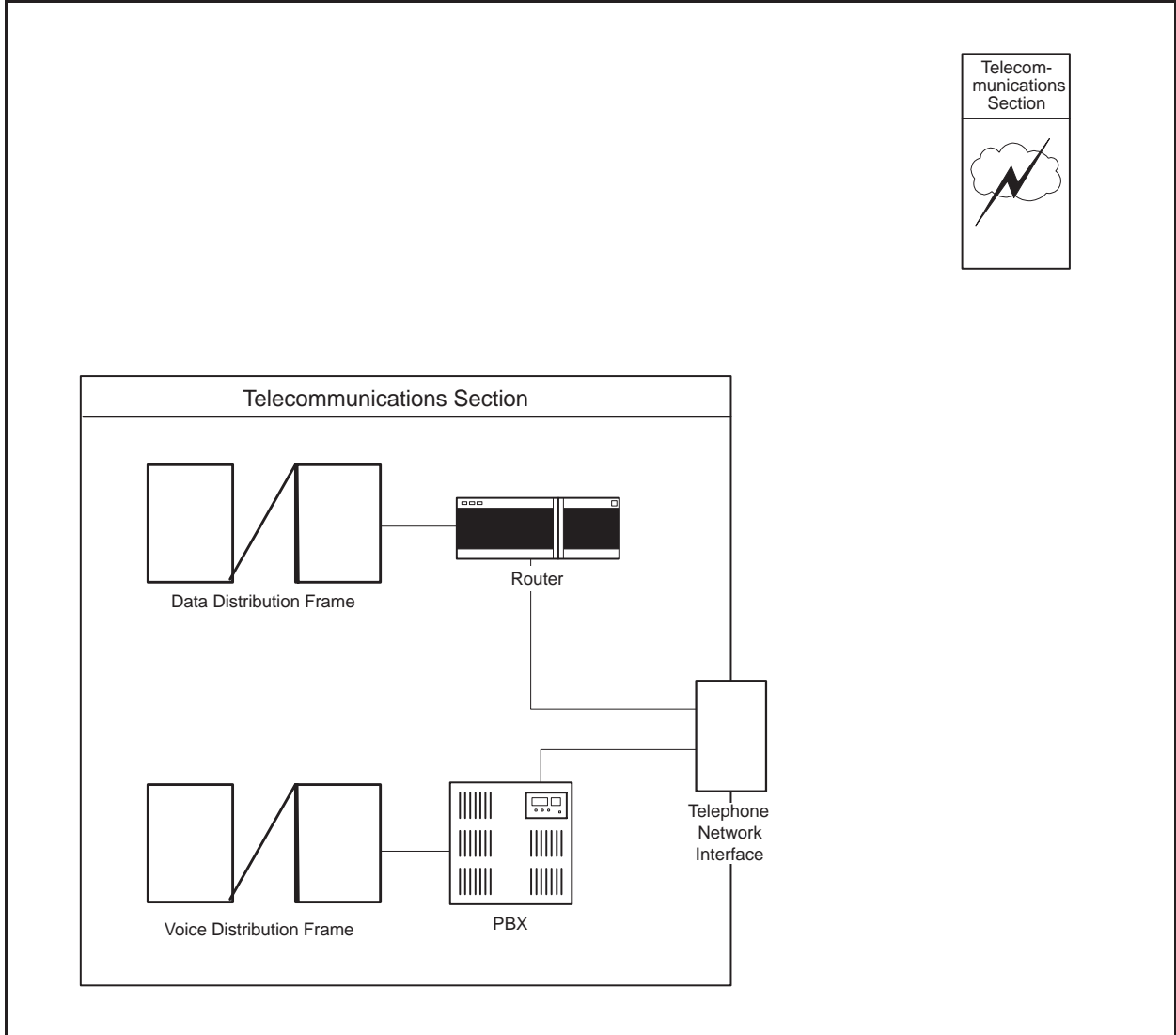


Exhibit B.2-3
Mail Operations Building Computer Room Layout

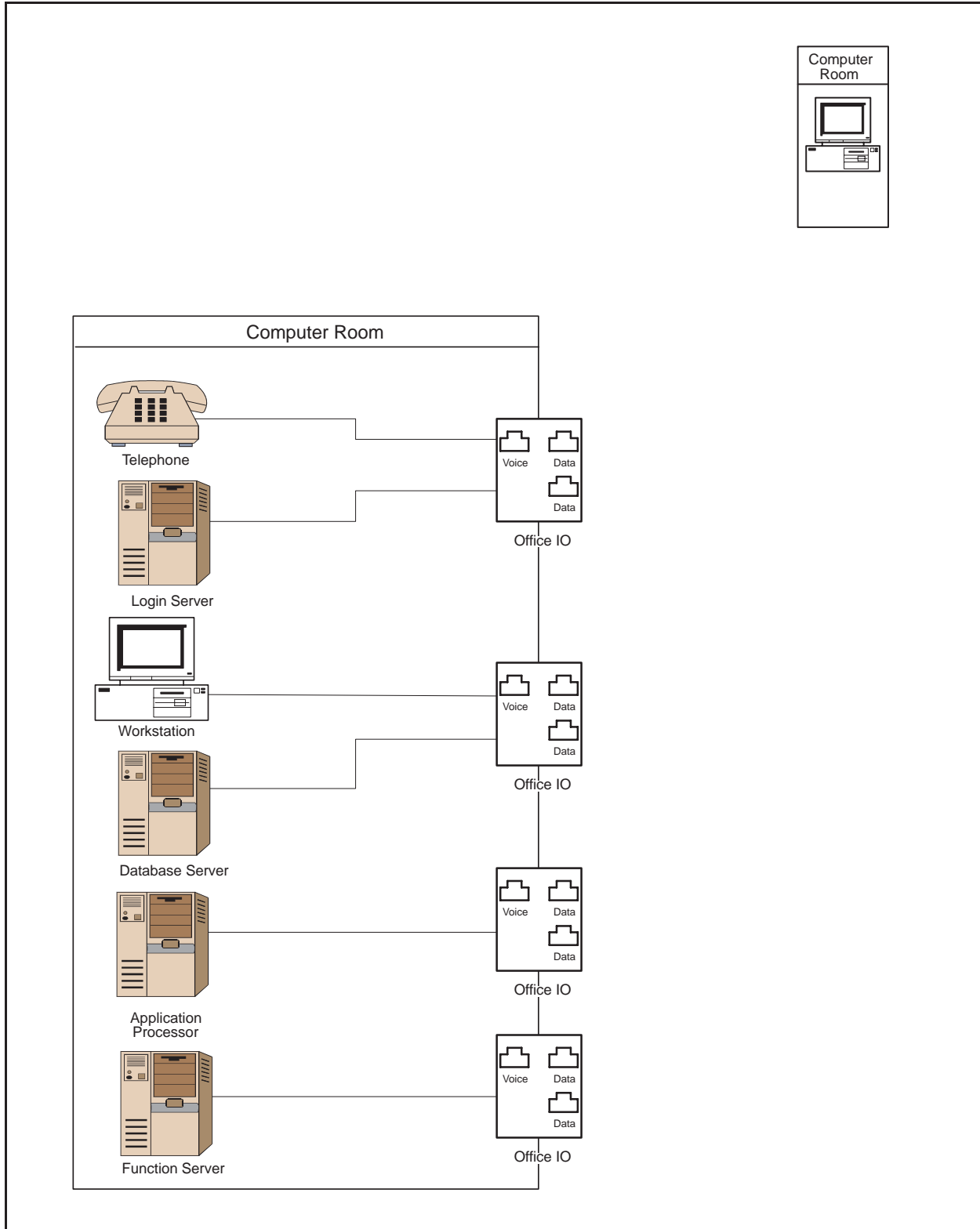


Exhibit B.2-4
Mail Operations Building Administration Section Layout

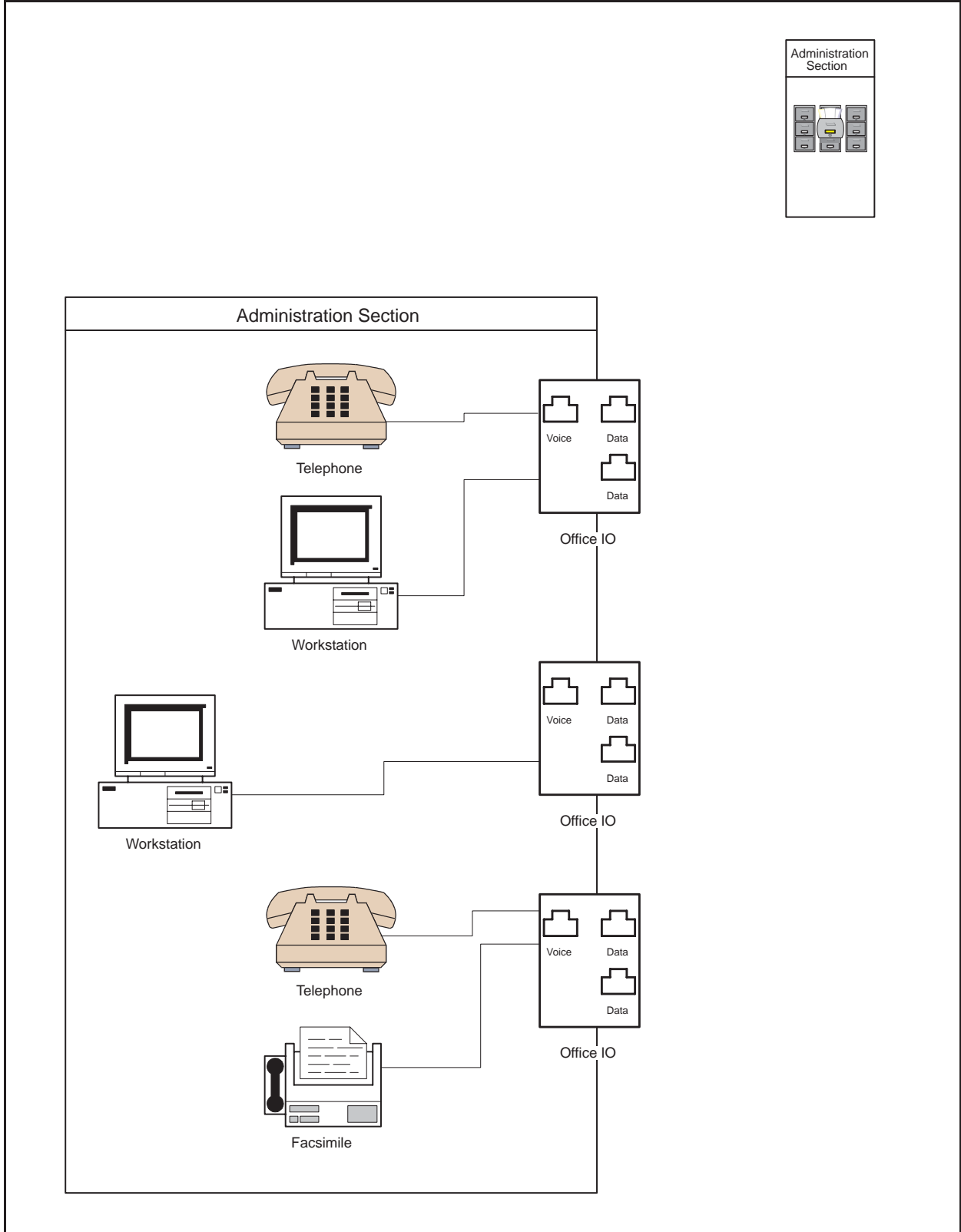


Exhibit B.2-5
Mail Operations Building Dock/Platform Section Layout

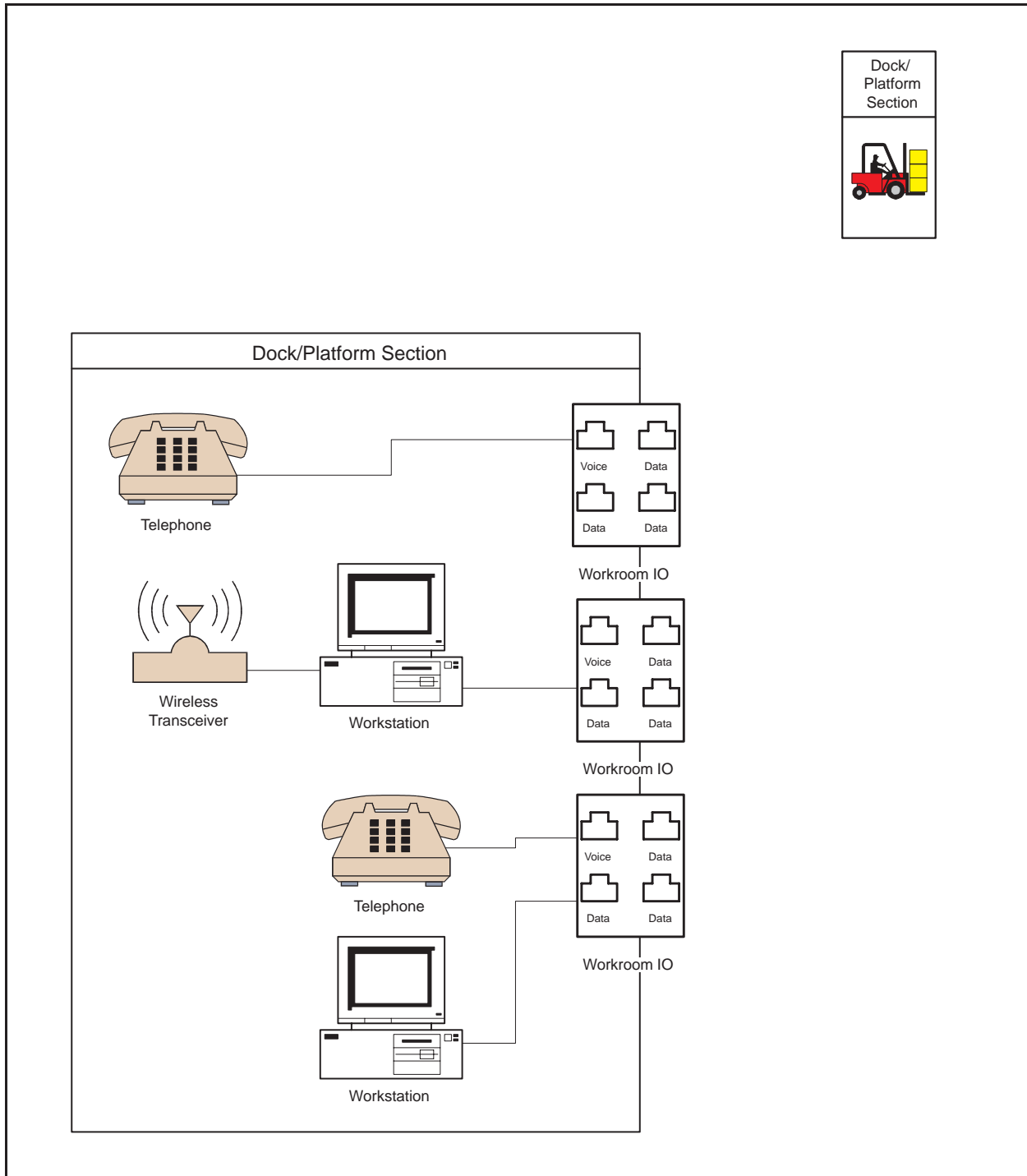


Exhibit B.2-6
Mail Operations Building Mail Processing Section Layout

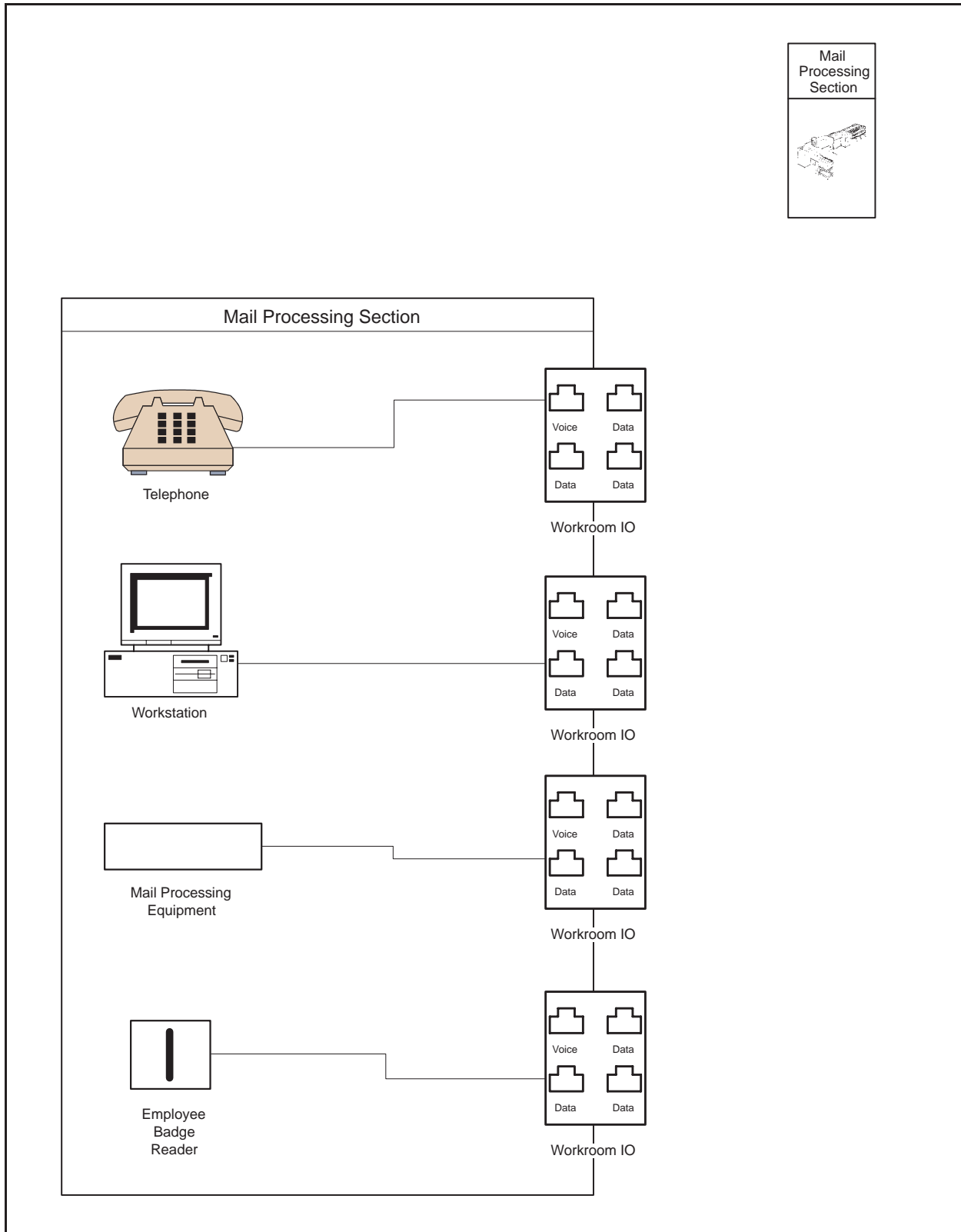


Exhibit B.2-7
Mail Operations Building Yard Section Layout

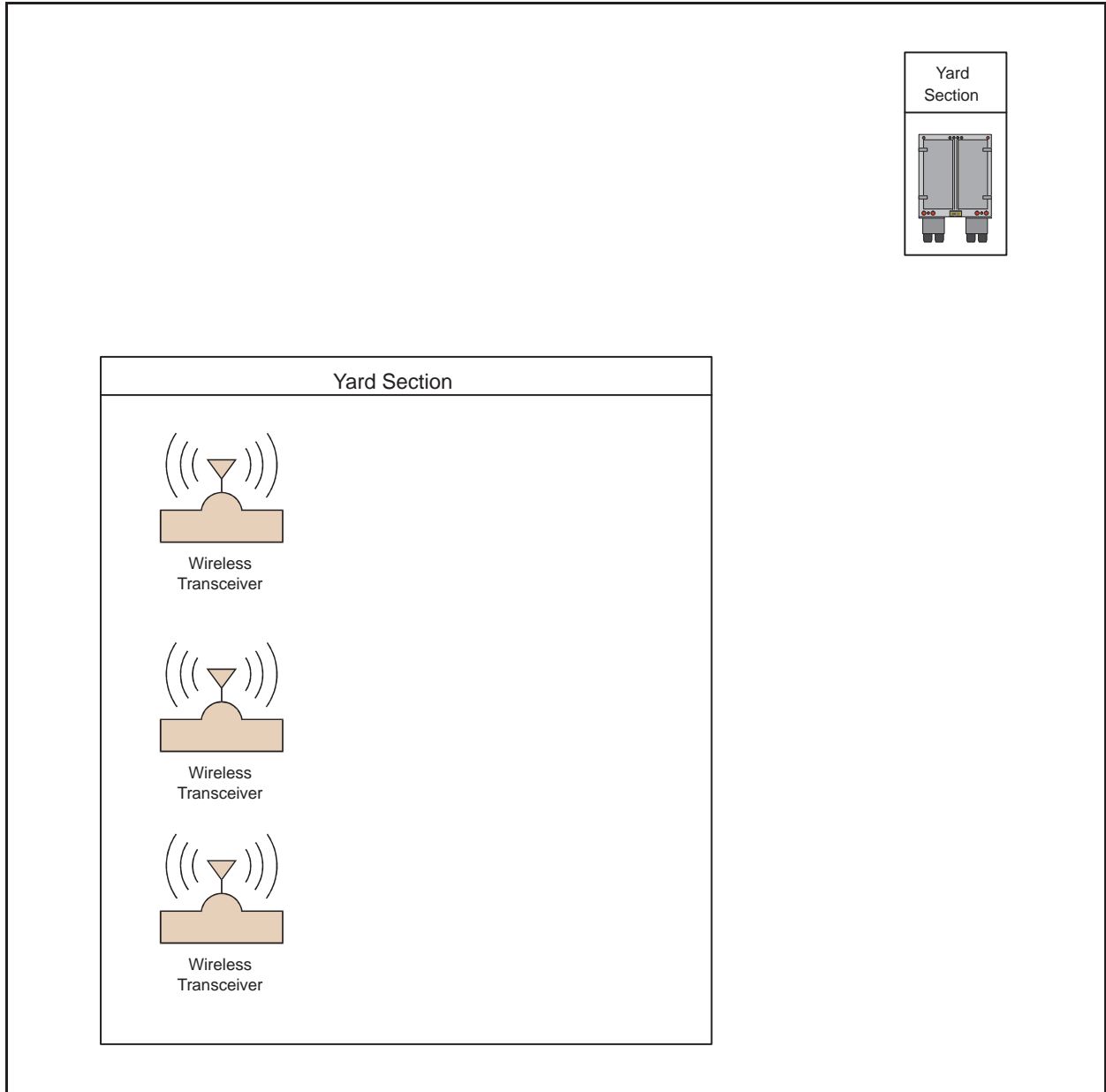
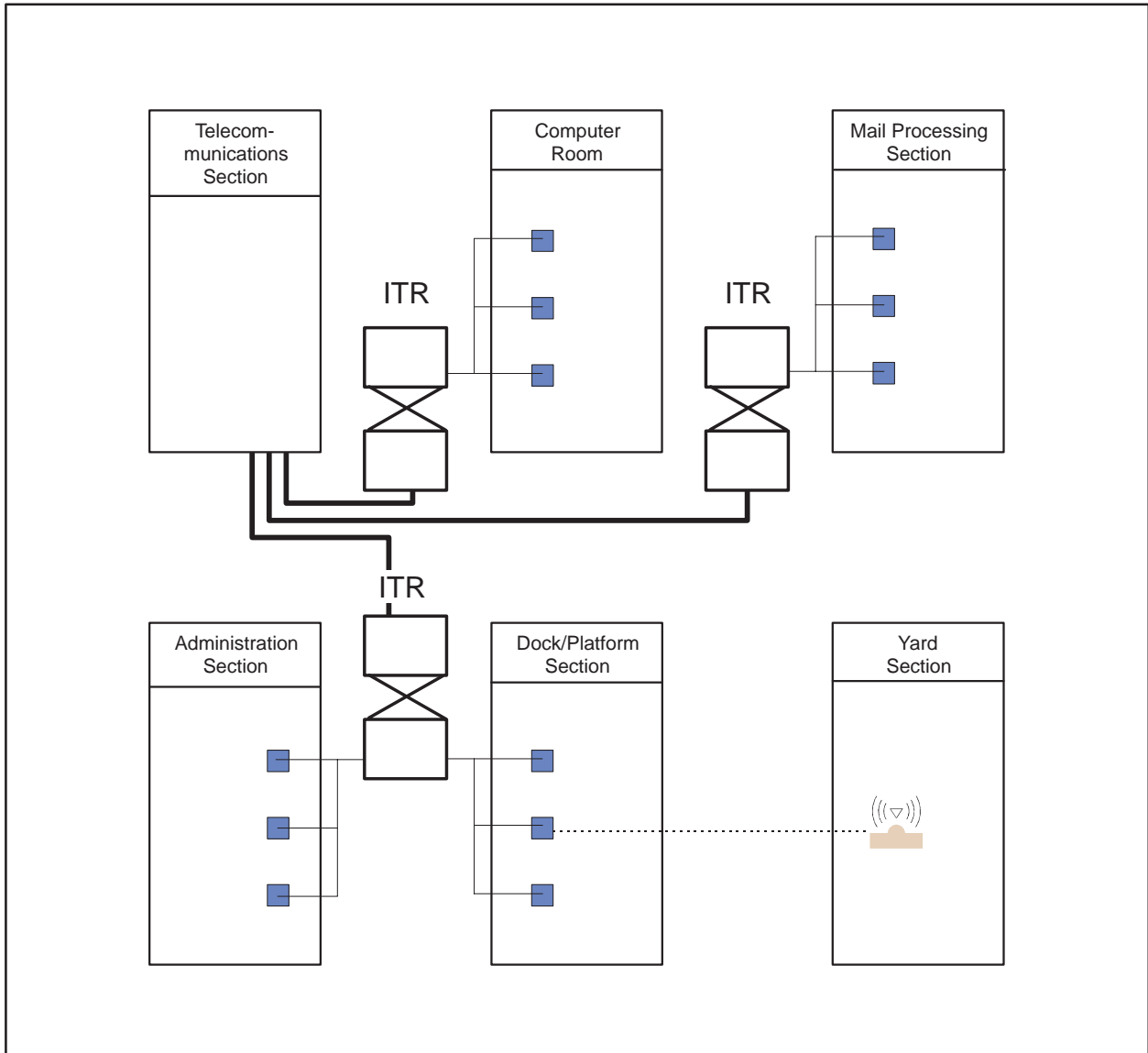


Exhibit B.2-8
Mail Operations Building Backbone Wiring Template



B3 Large Associate Office Building

Exhibit B.3-1
Sections in a Large Associate Office (AO) Building

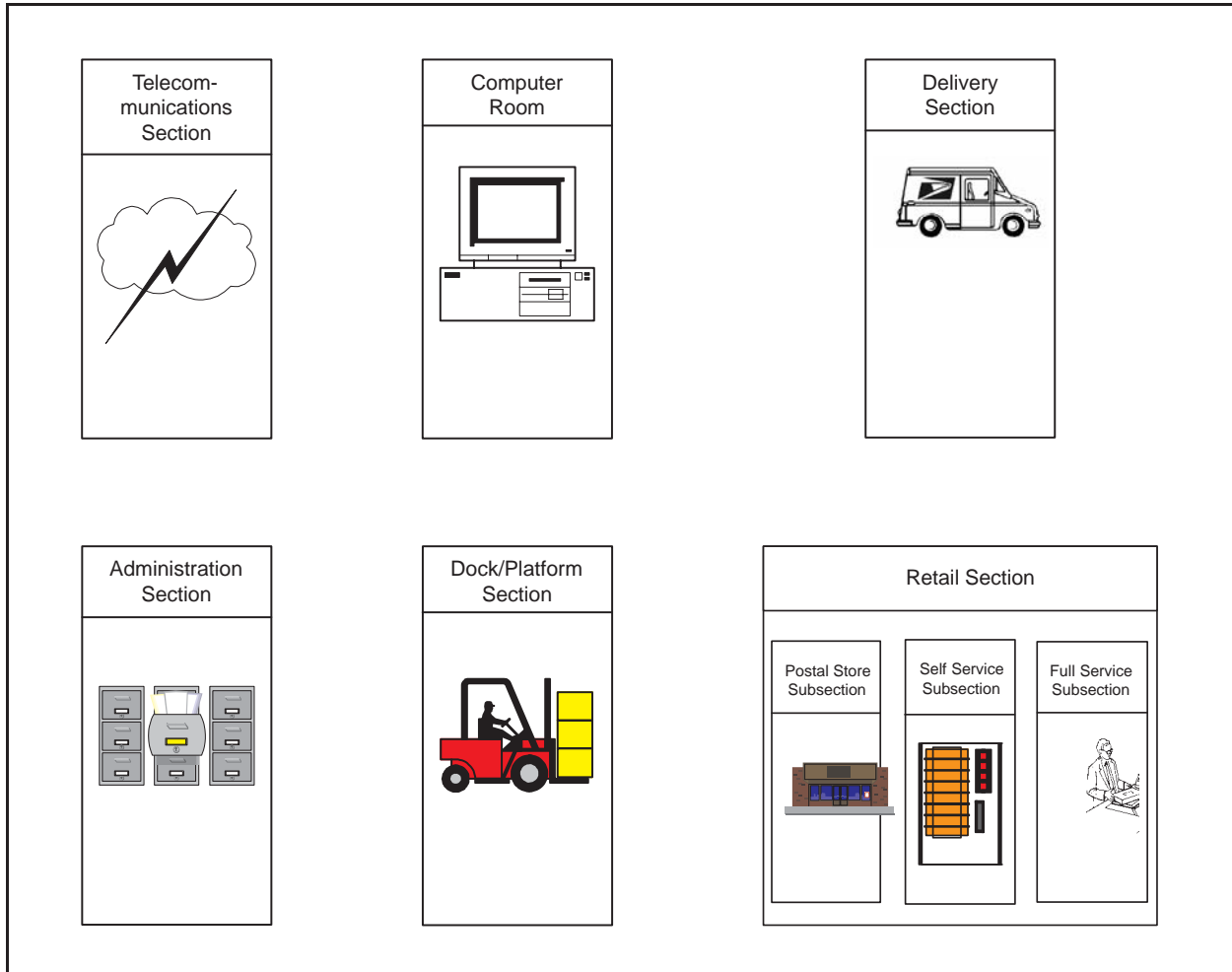


Exhibit B.3-2
Large AO Building Telecommunications Section Layout

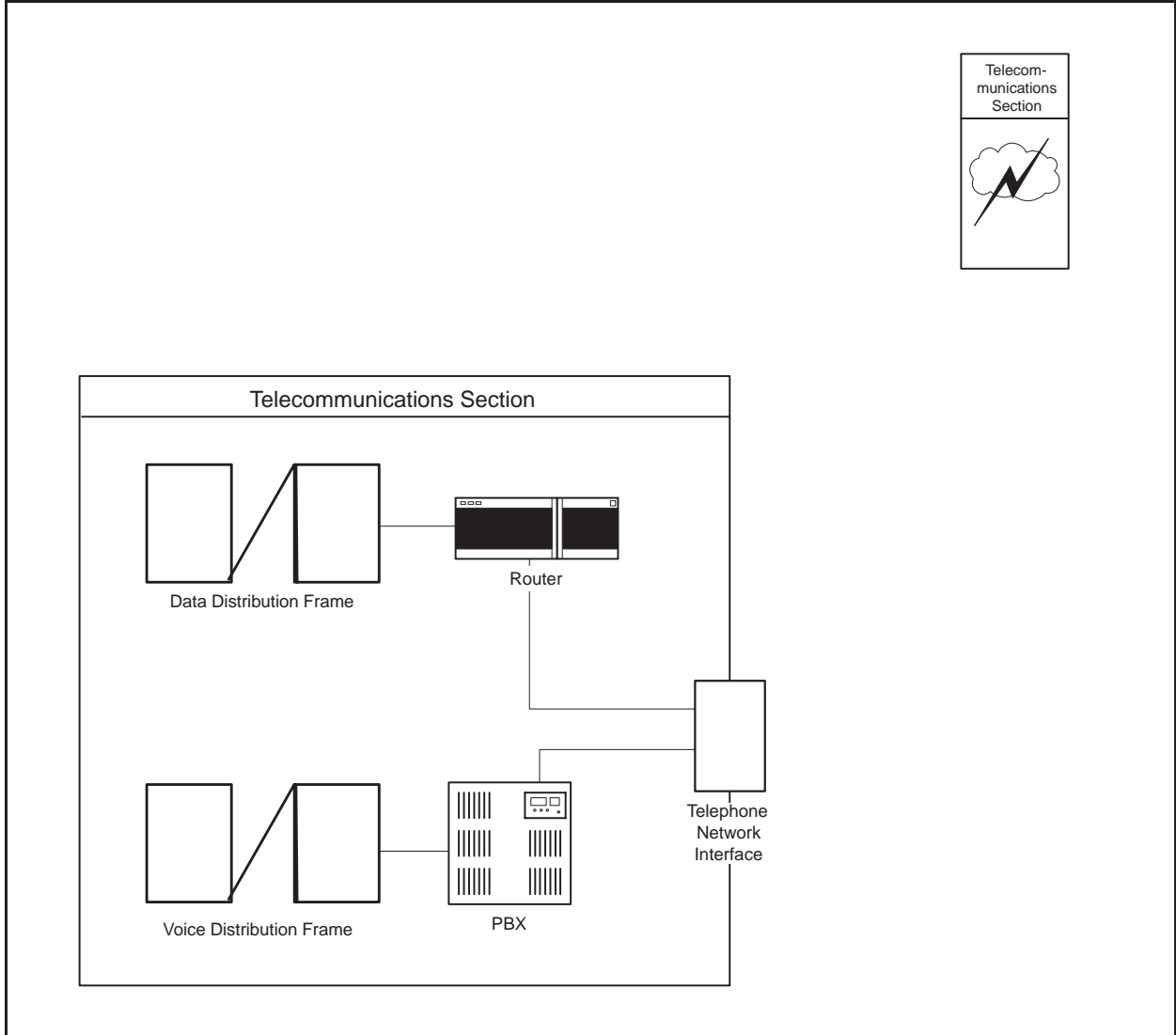


Exhibit B.3-3
Large AO Building Computer Room Layout

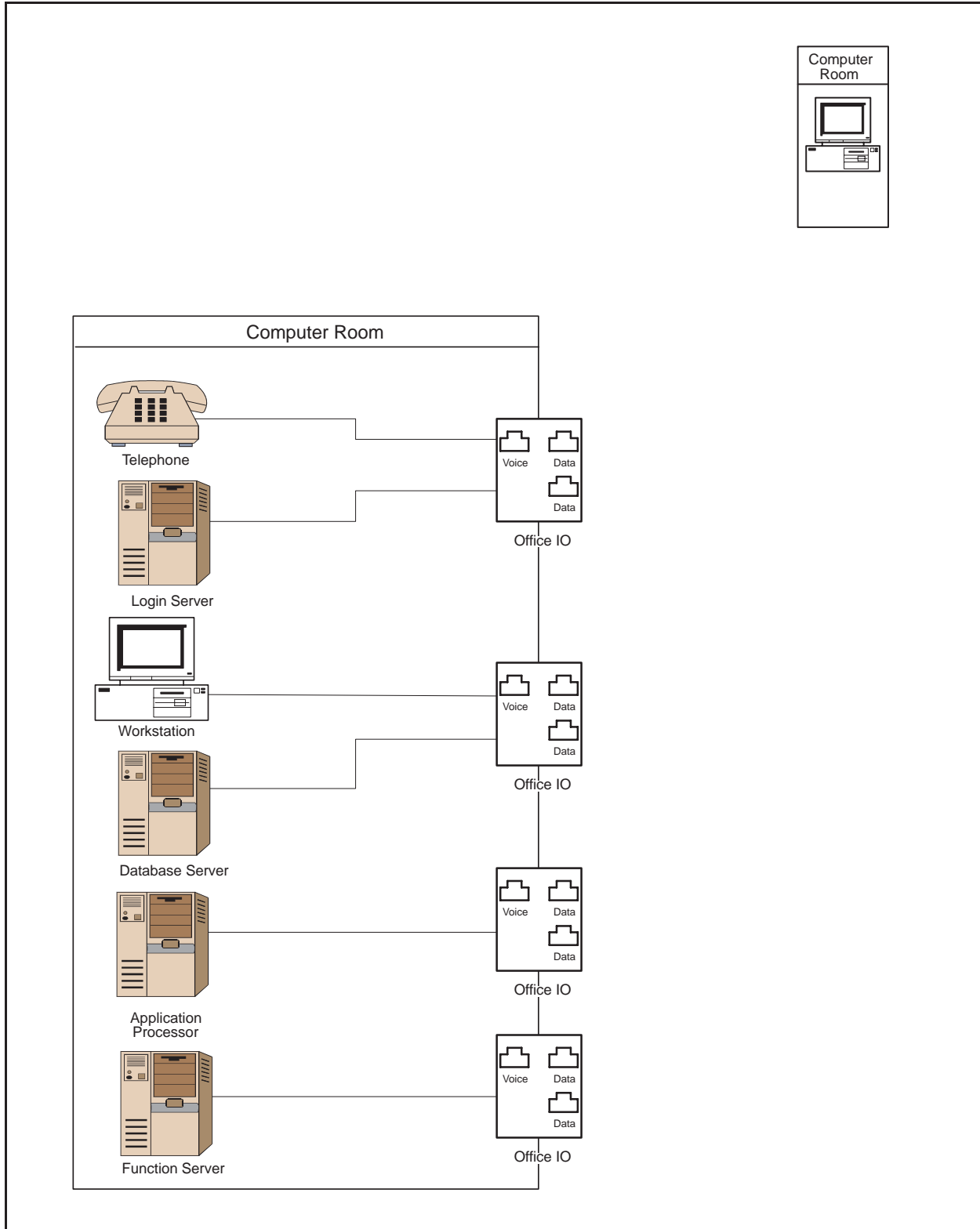


Exhibit B.3-4
Large AO Building Administration Section Layout

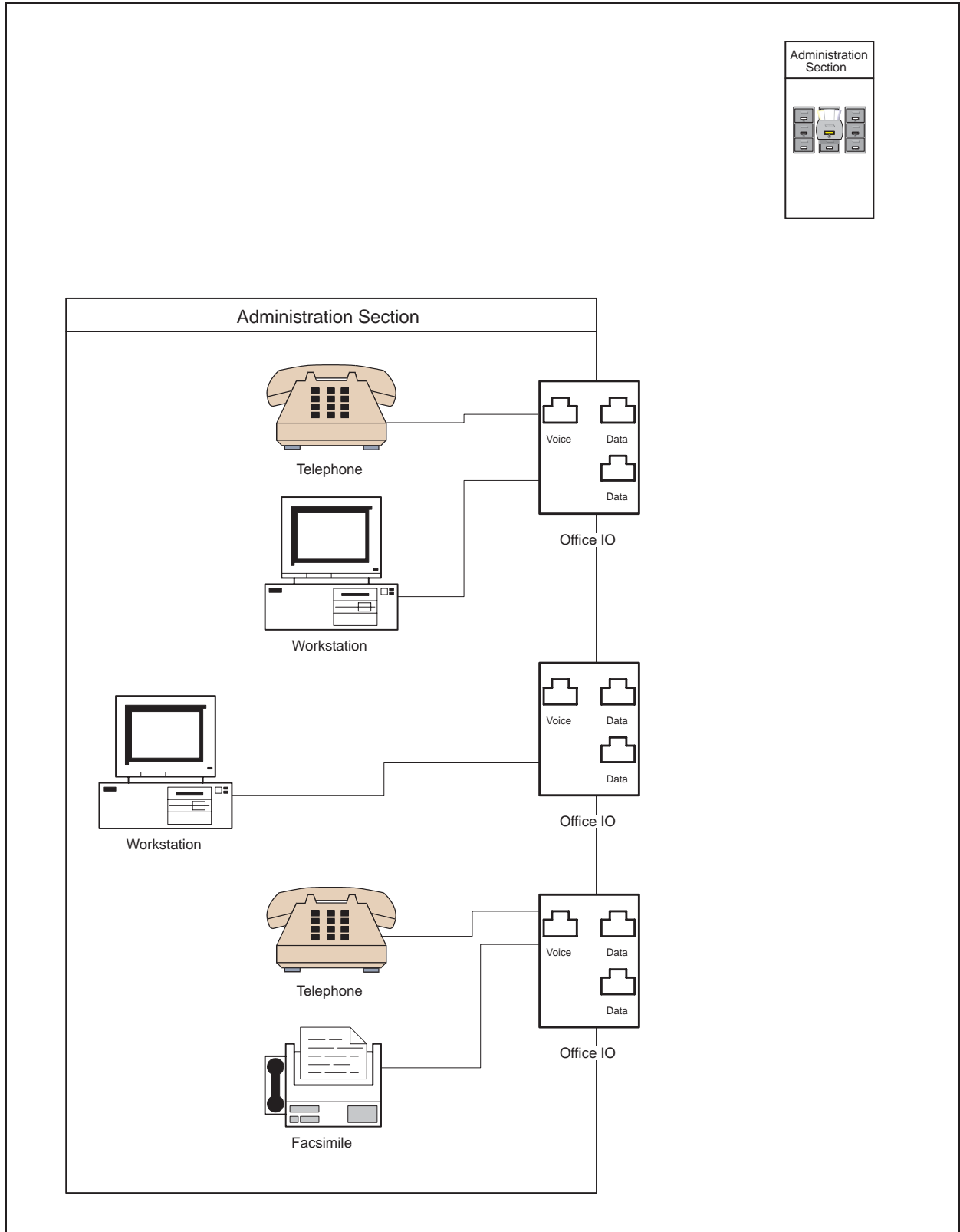


Exhibit B.3-5
Large AO Building Delivery Section Layout

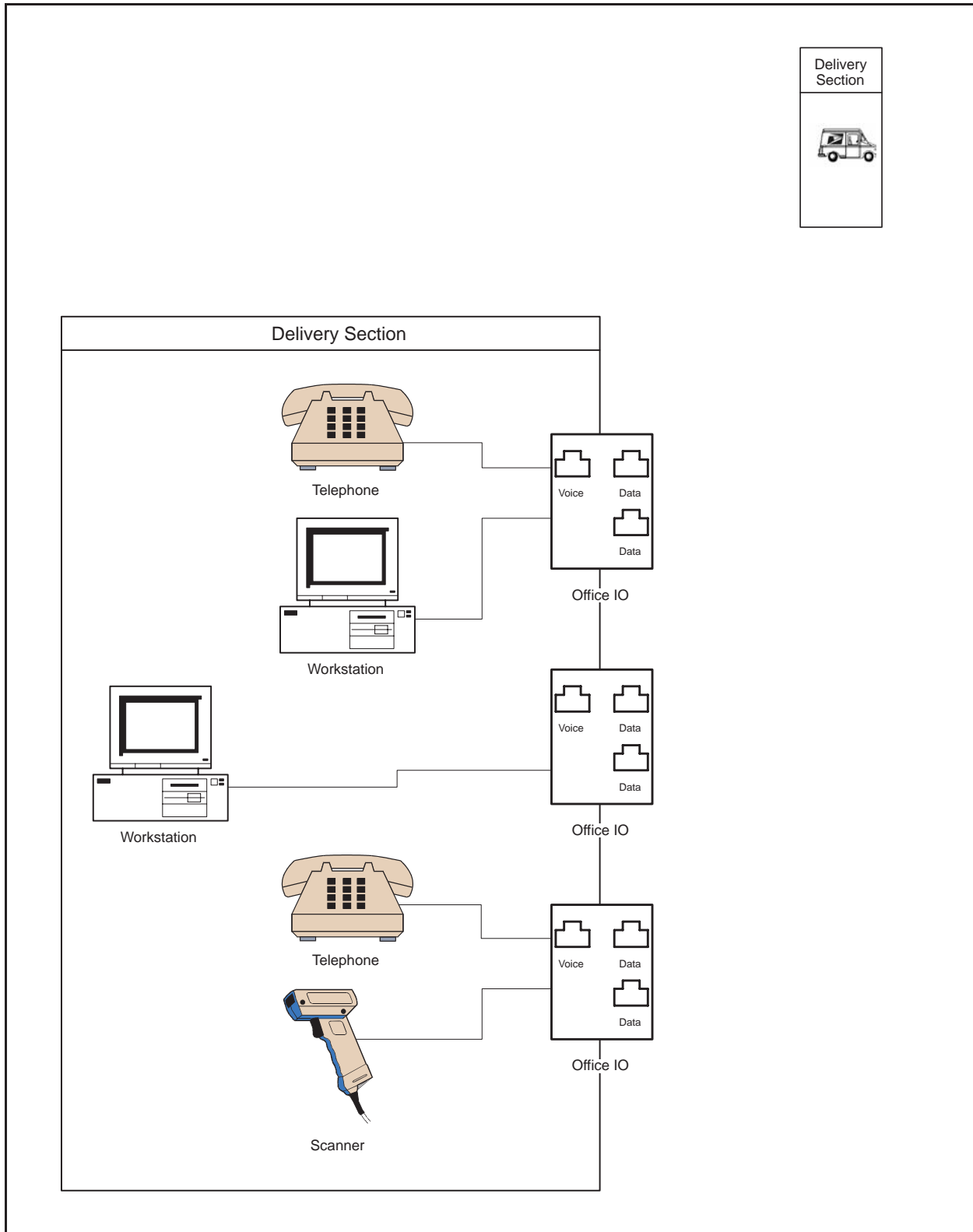


Exhibit B.3-6
Large AO Building Dock/Platform Section Layout

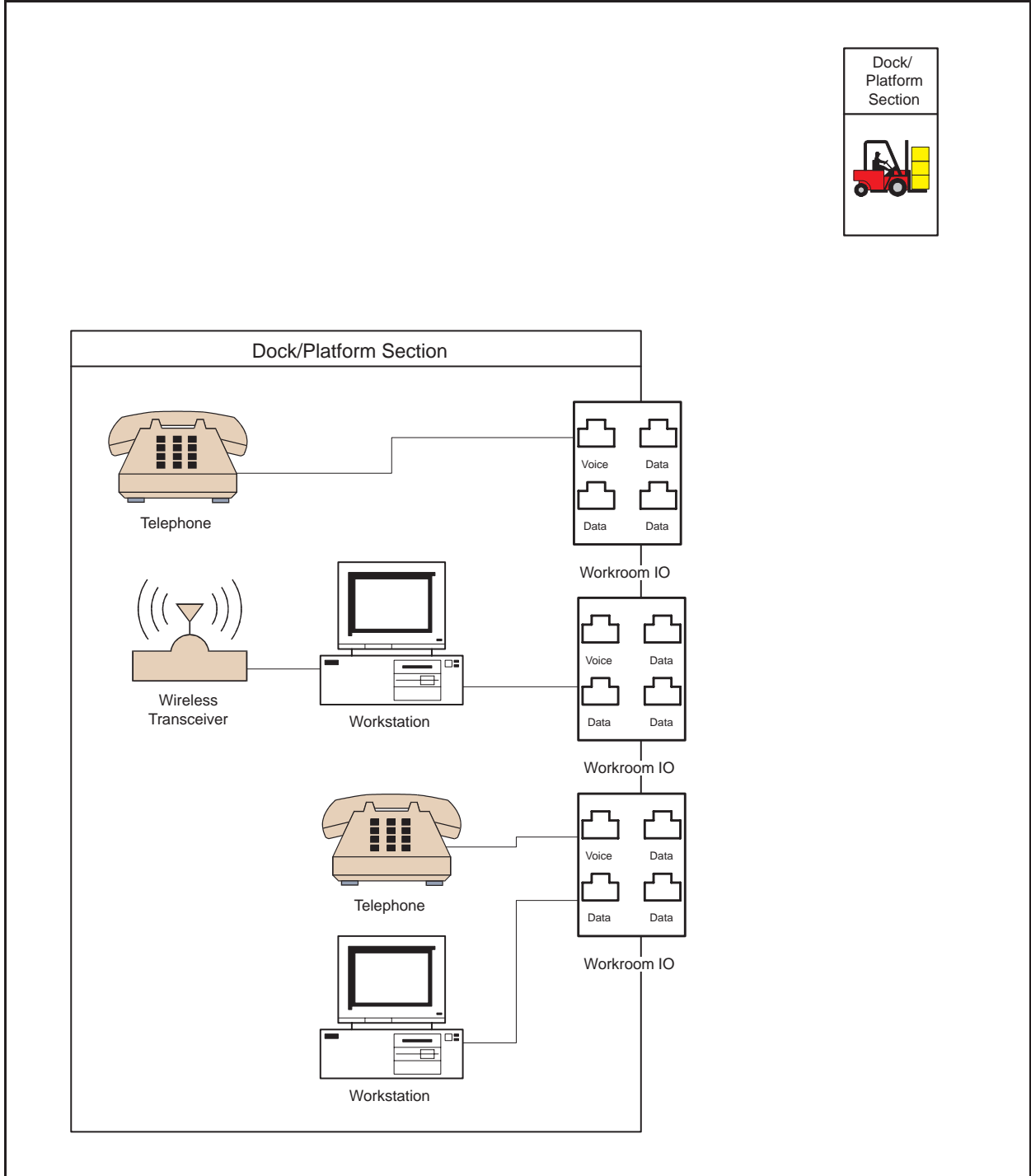


Exhibit B.3-7
Large AO Building Postal Store Subsection Layout

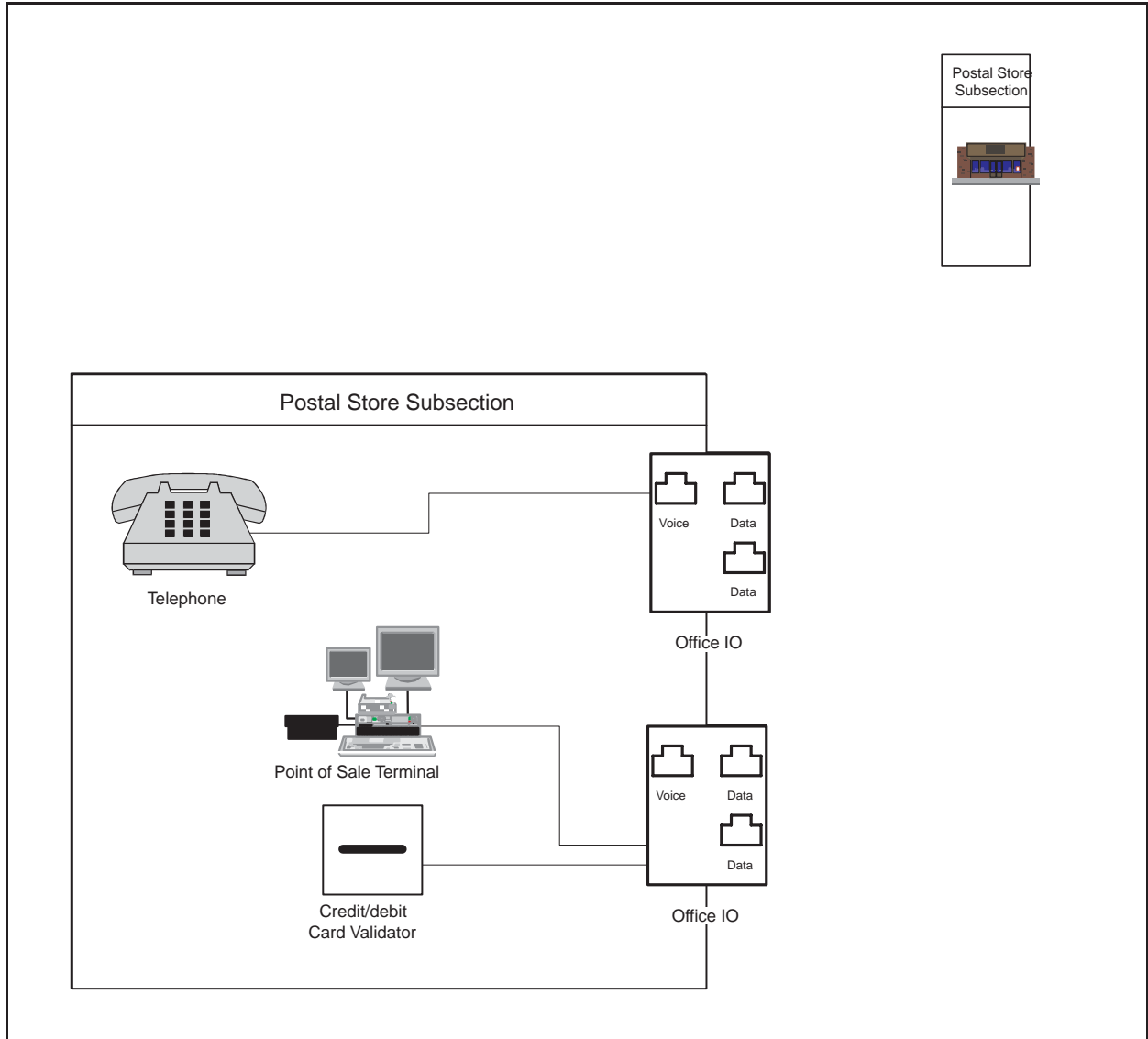


Exhibit B.3-8
Large AO Building Self Service Subsection Layout

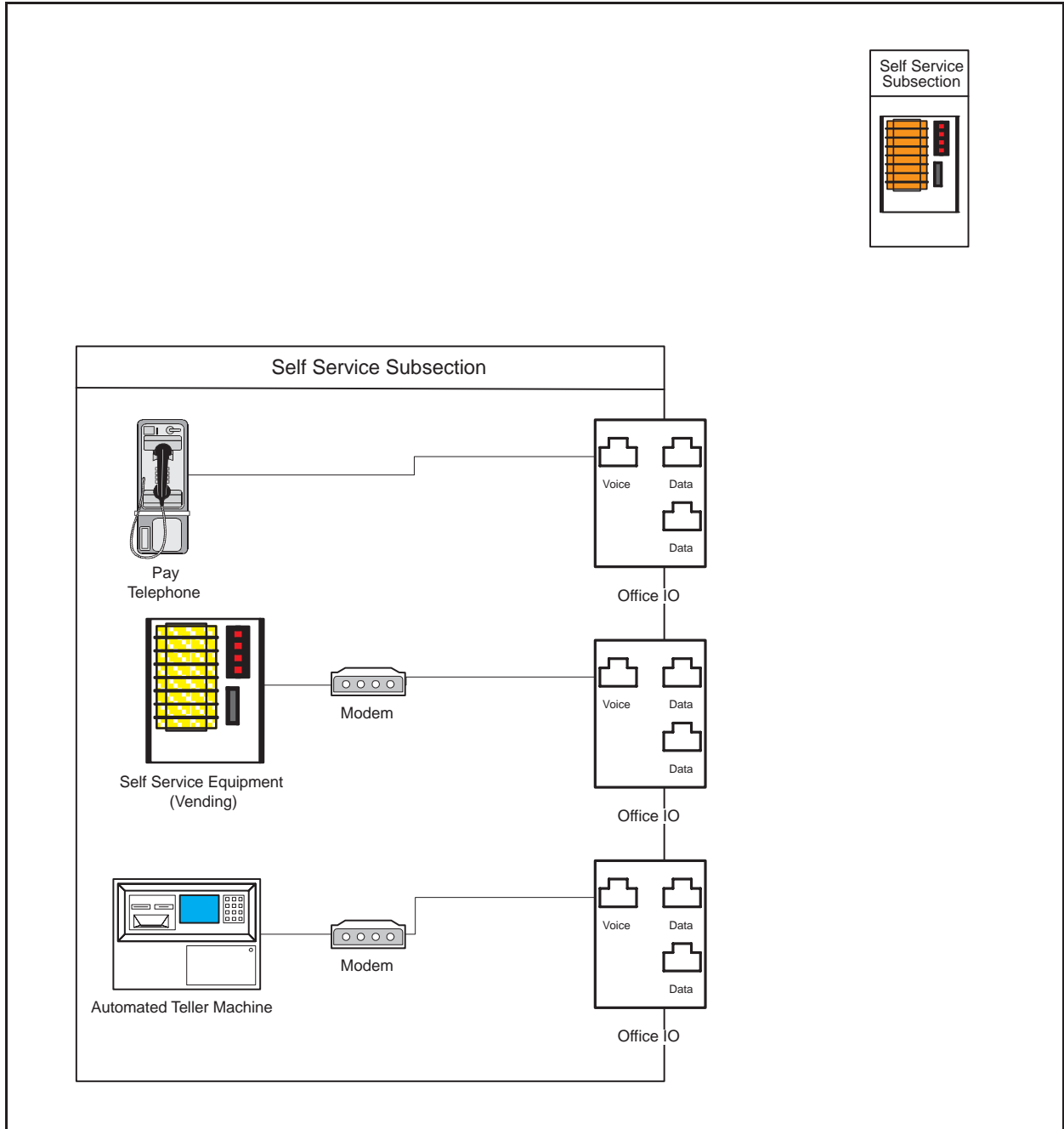


Exhibit B.3-9
Large AO Building Full Service Subsection Layout

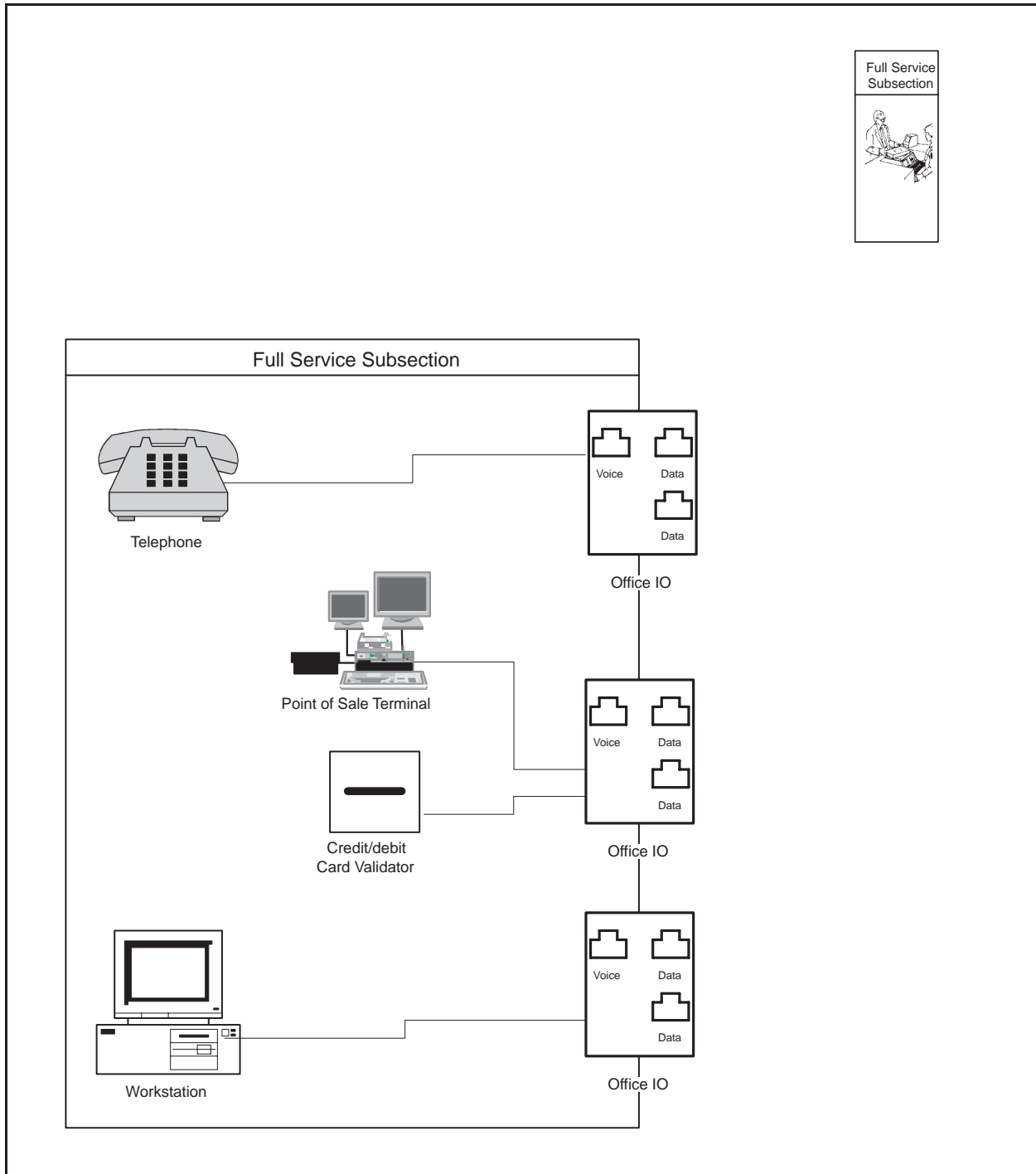
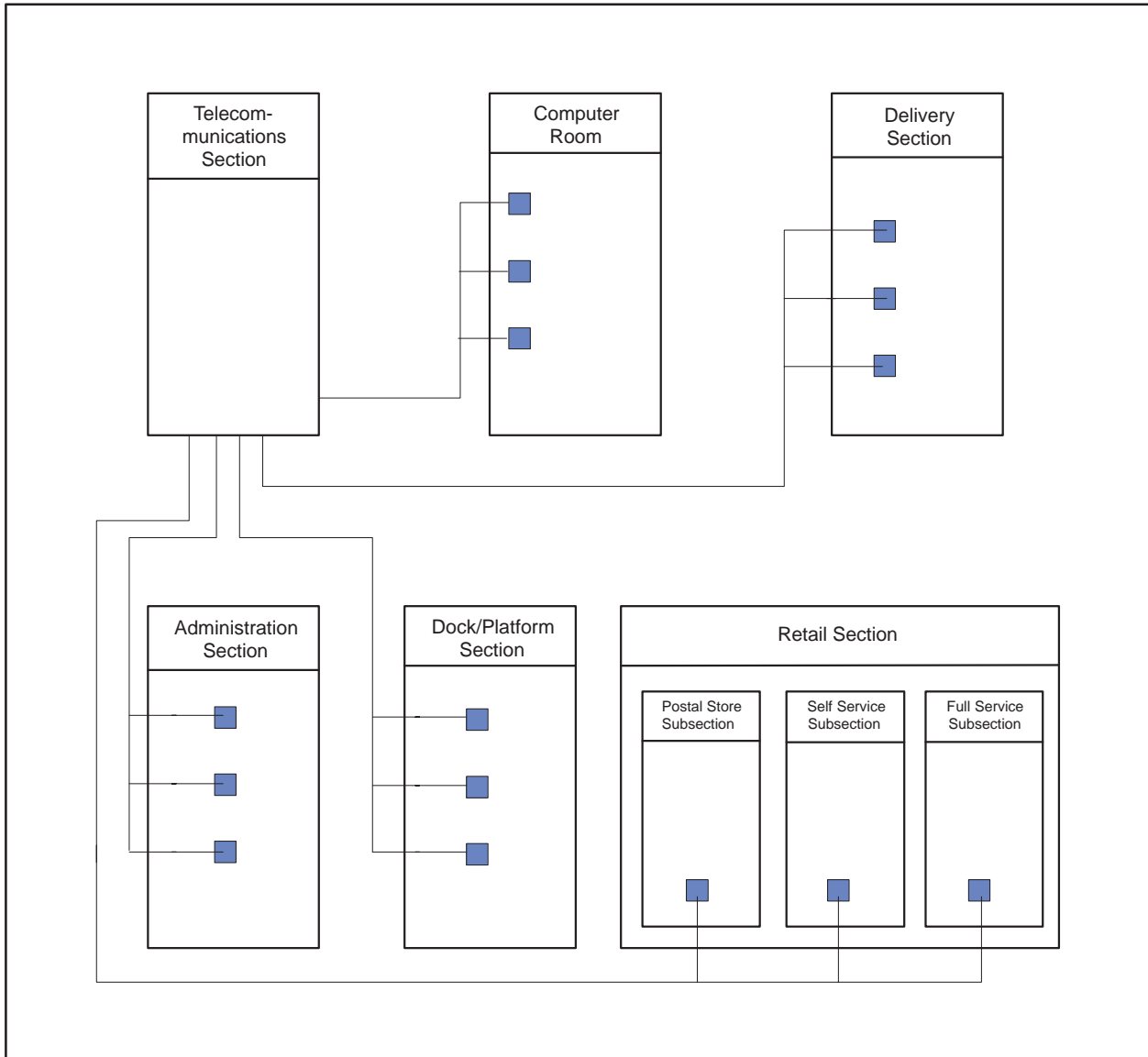


Exhibit B.3-10
Large AO Building Backbone Wiring Template



B4 Small Associate Office Building

Exhibit B.4-1
Sections in a Small Associate Office (AO) Building

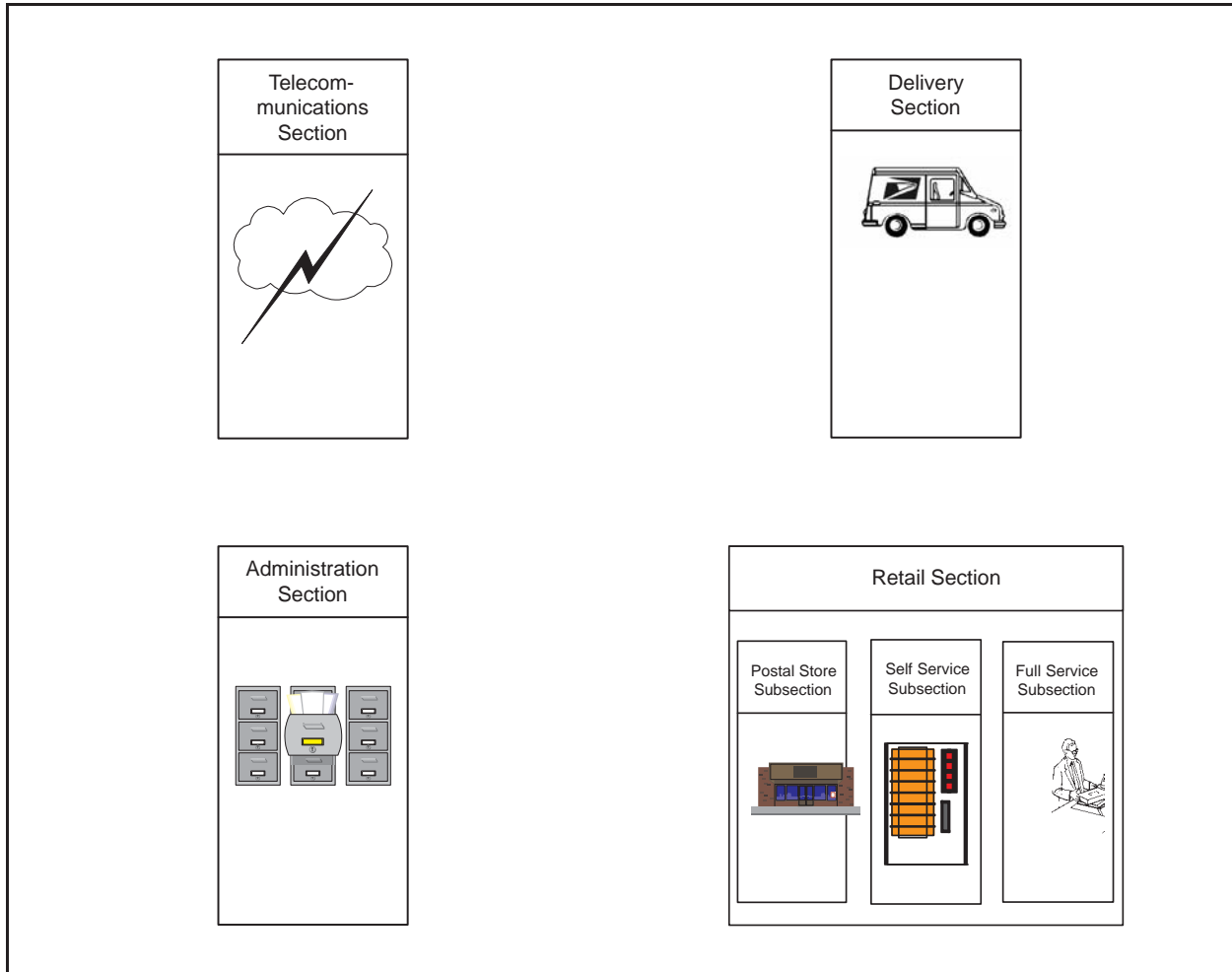


Exhibit B.4-2
Small AO Building Telecommunications Section Layout

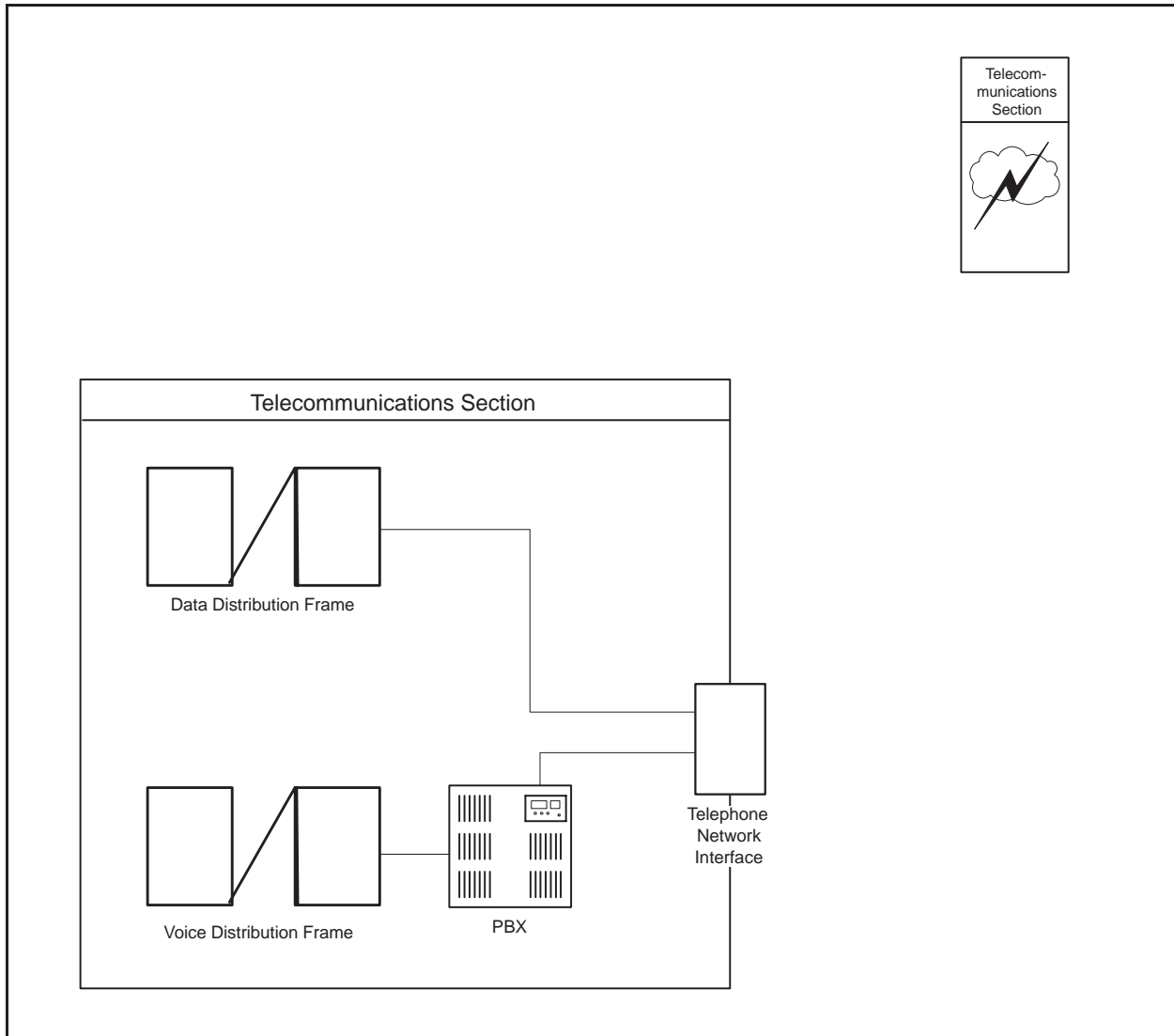


Exhibit B.4-3
Small AO Building Administration Section Layout

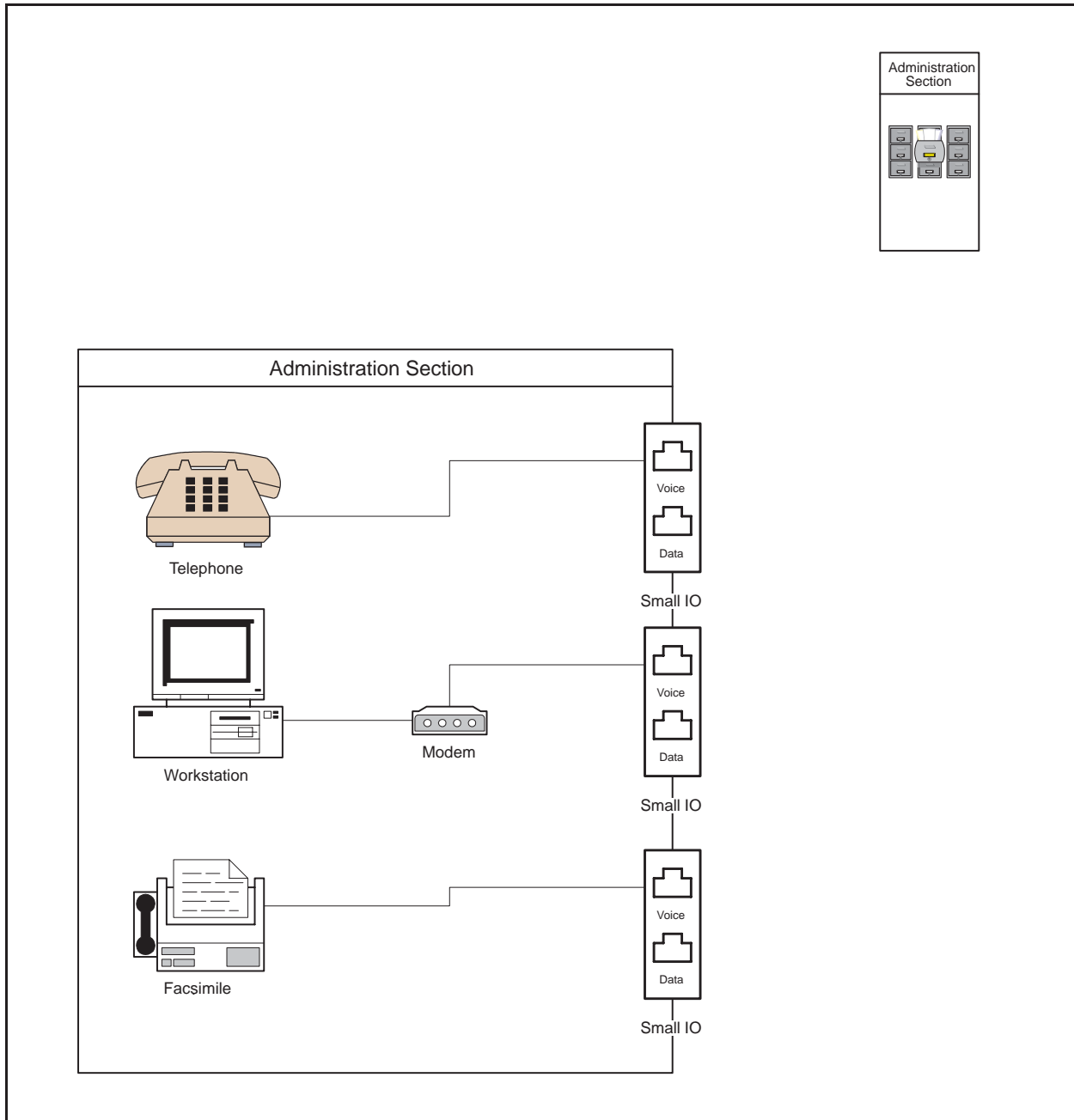


Exhibit B.4-4
Small AO Building Delivery Section Layout

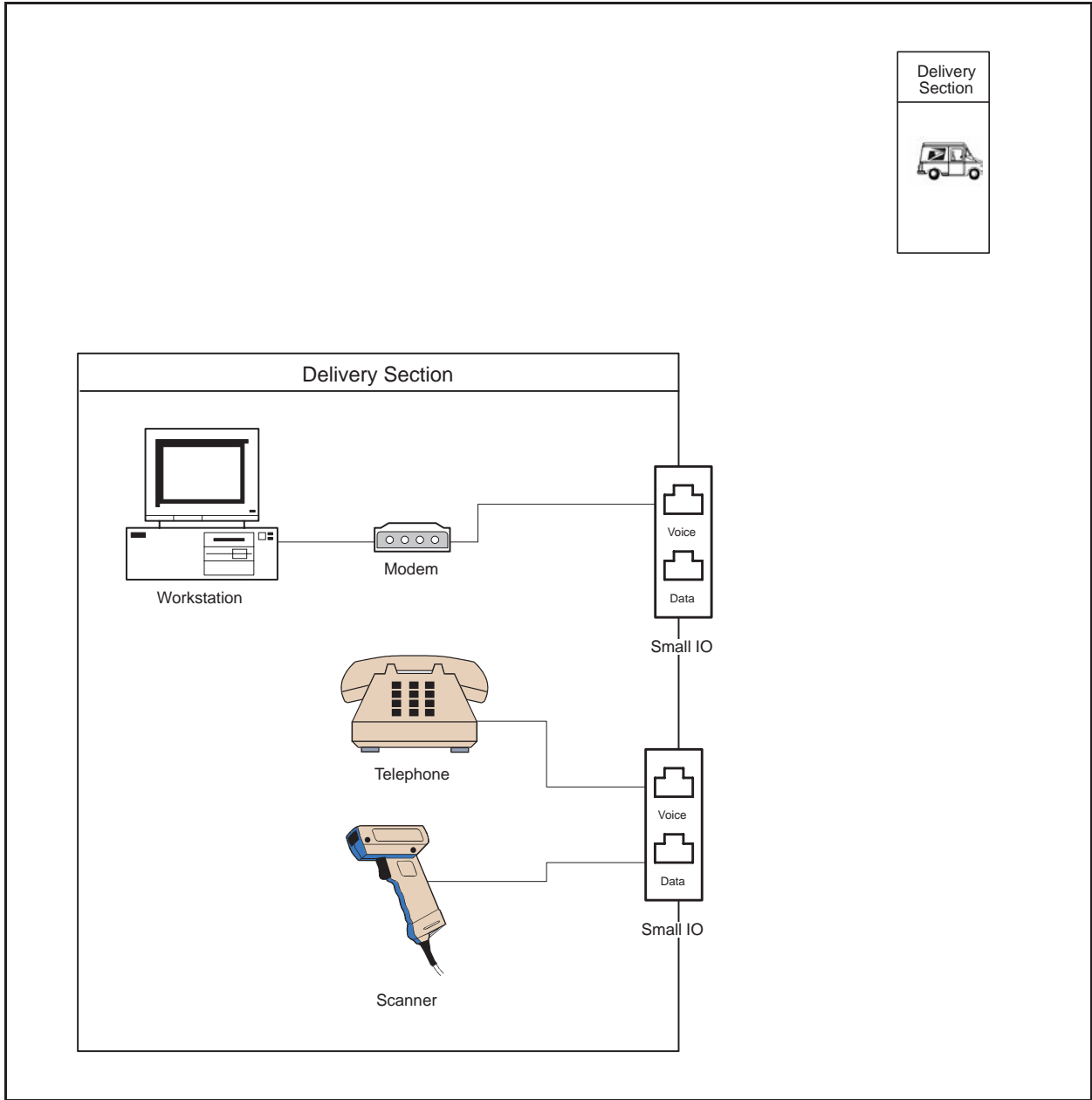


Exhibit B.4-5
Small AO Building Postal Store Subsection Layout

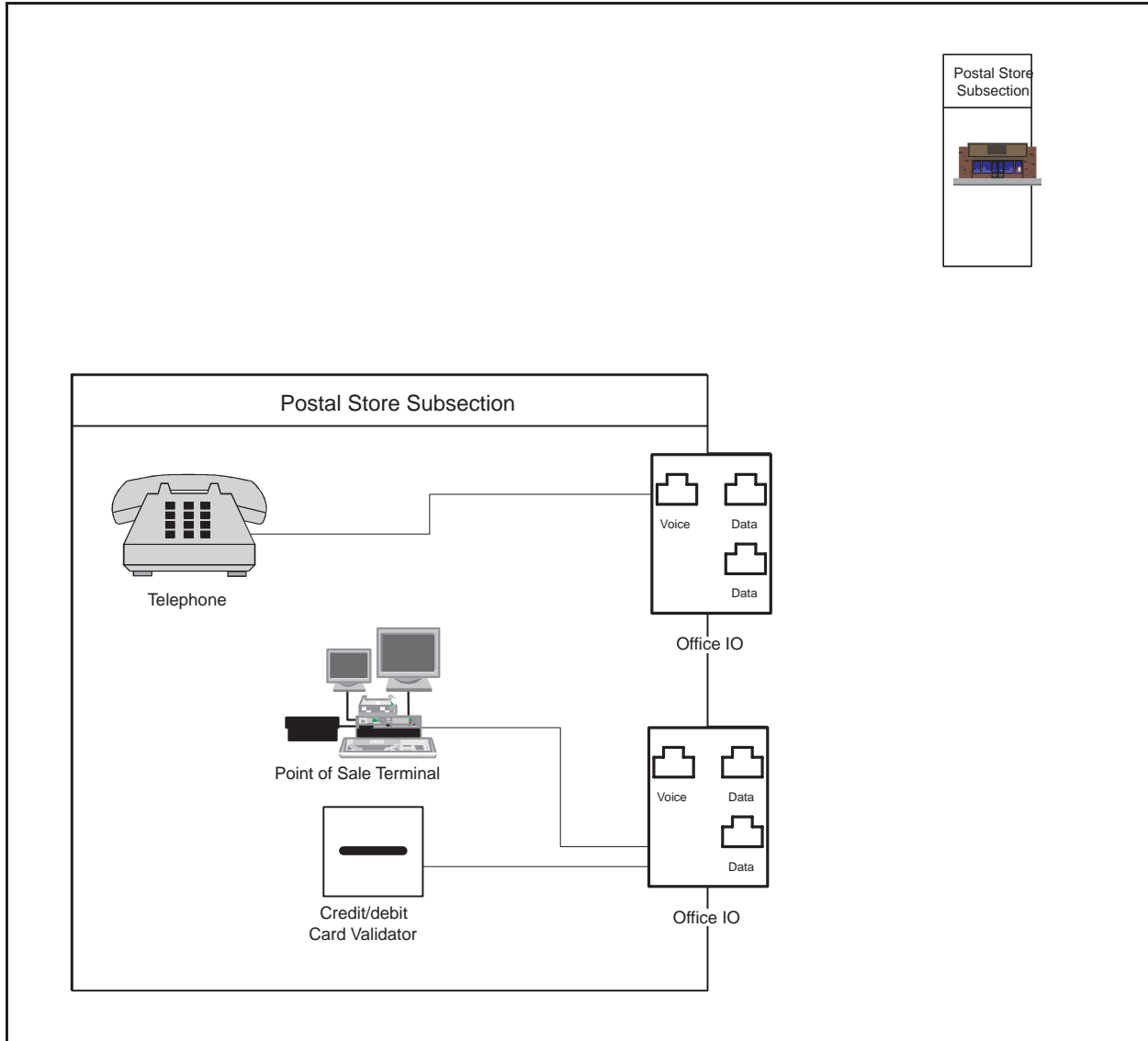


Exhibit B.4-6
Small AO Building Self Service Subsection Layout

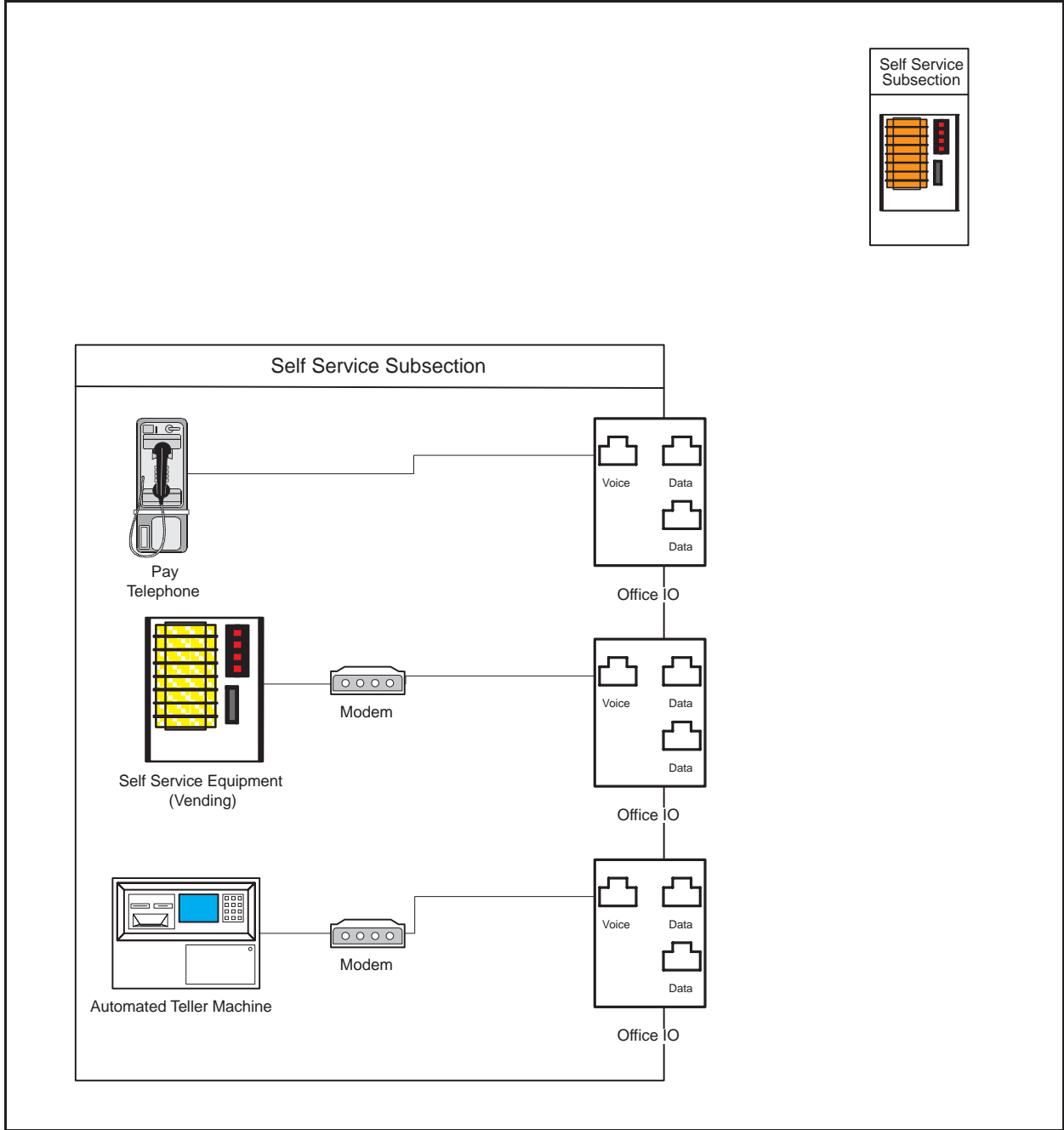


Exhibit B.4-7
Small AO Building Full Service Subsection Layout

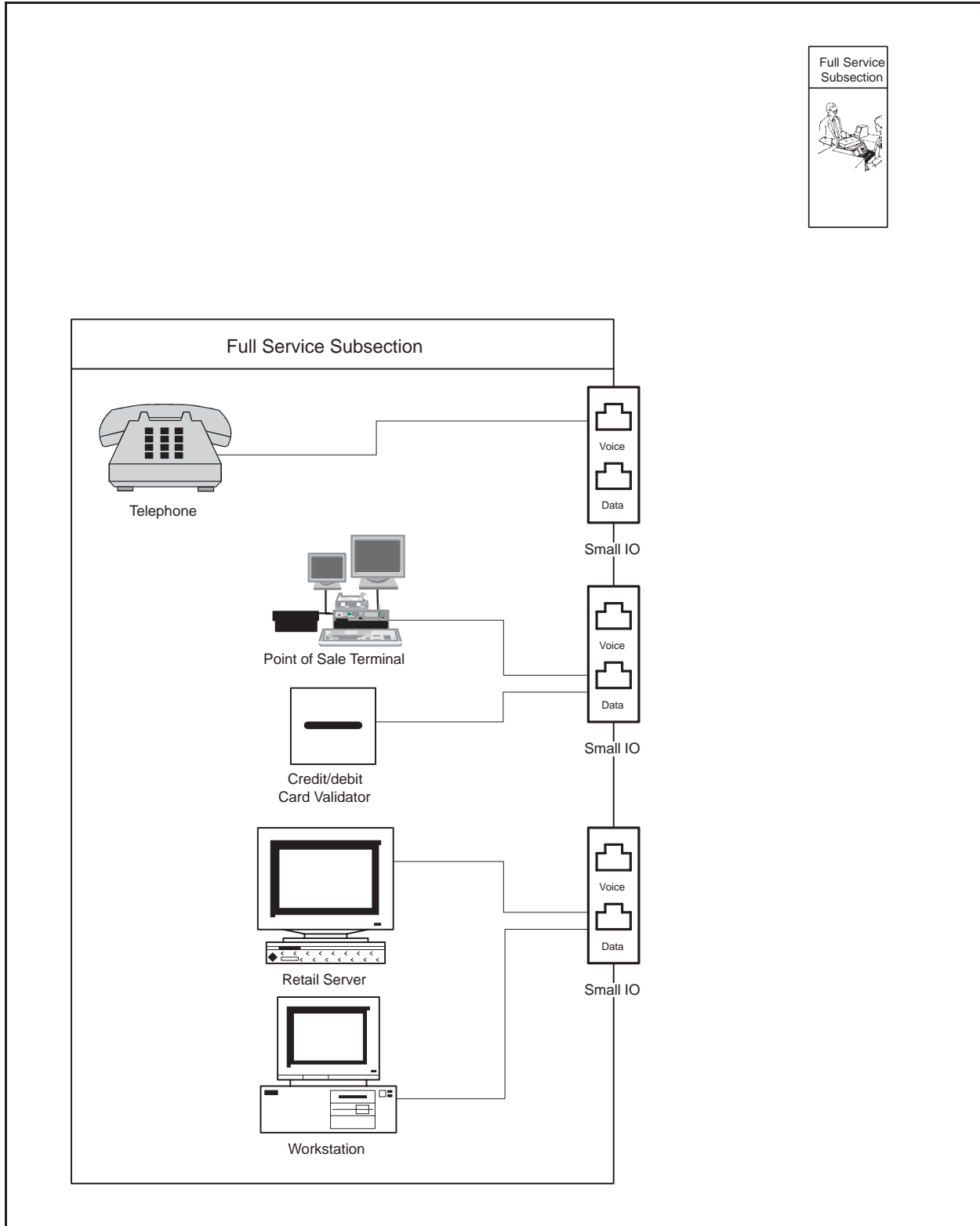
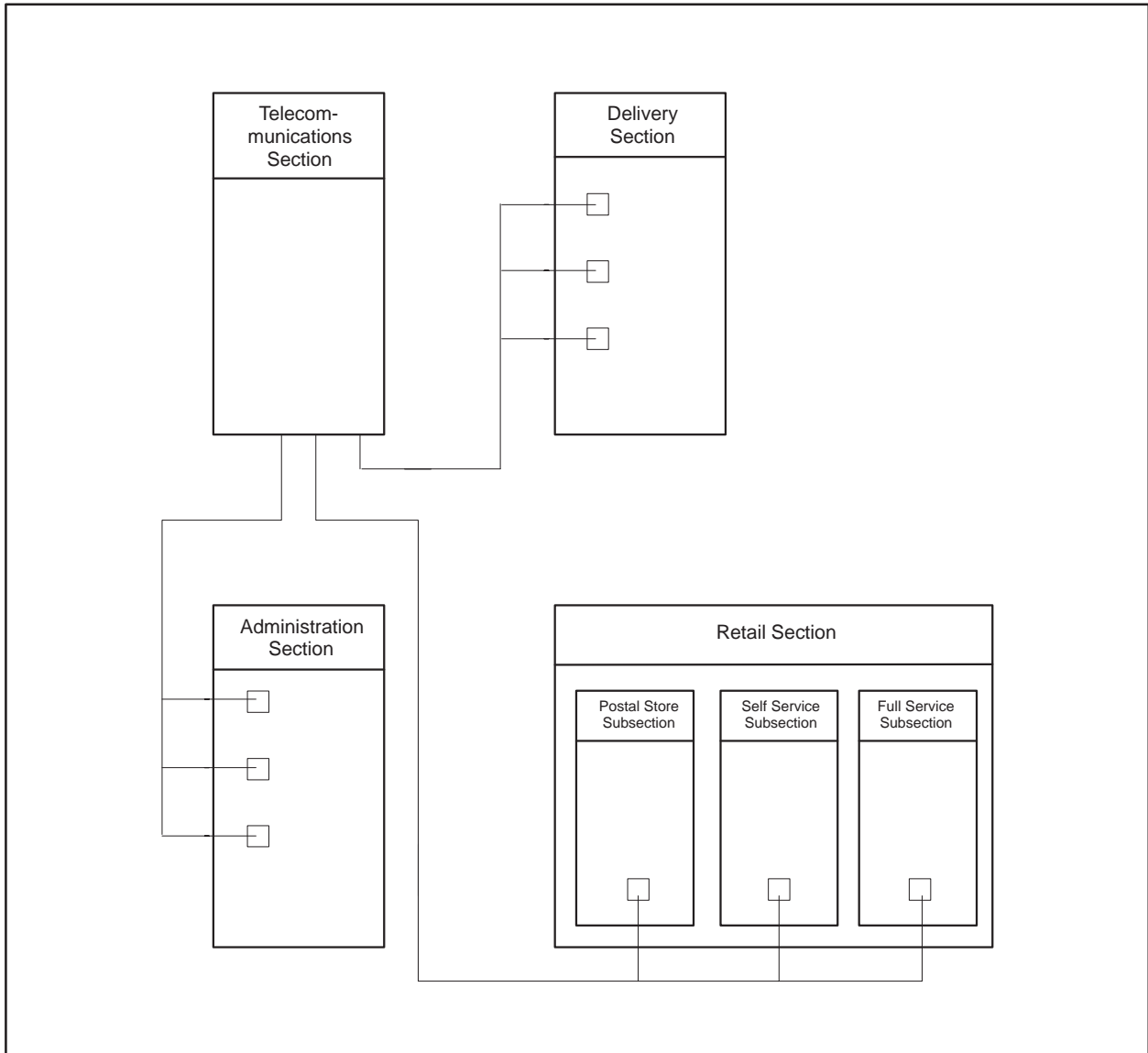


Exhibit B.4-8
Small AO Building Backbone Wiring Template



B5 Mixed Technology Building

Exhibit B.5-1
Sections in a Mixed Technology Building

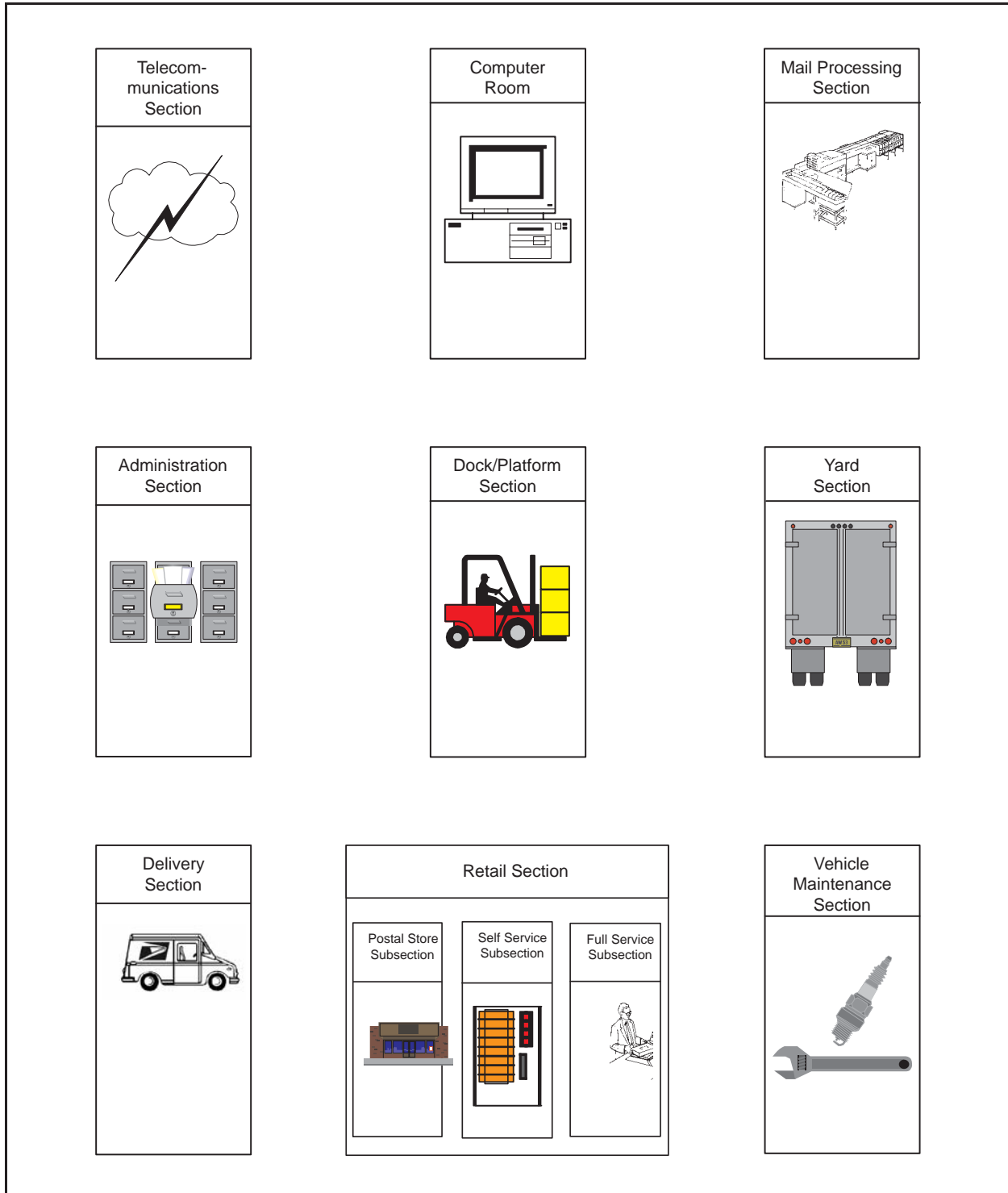


Exhibit B.5-2
Mixed Technology Building Telecommunications Section Layout

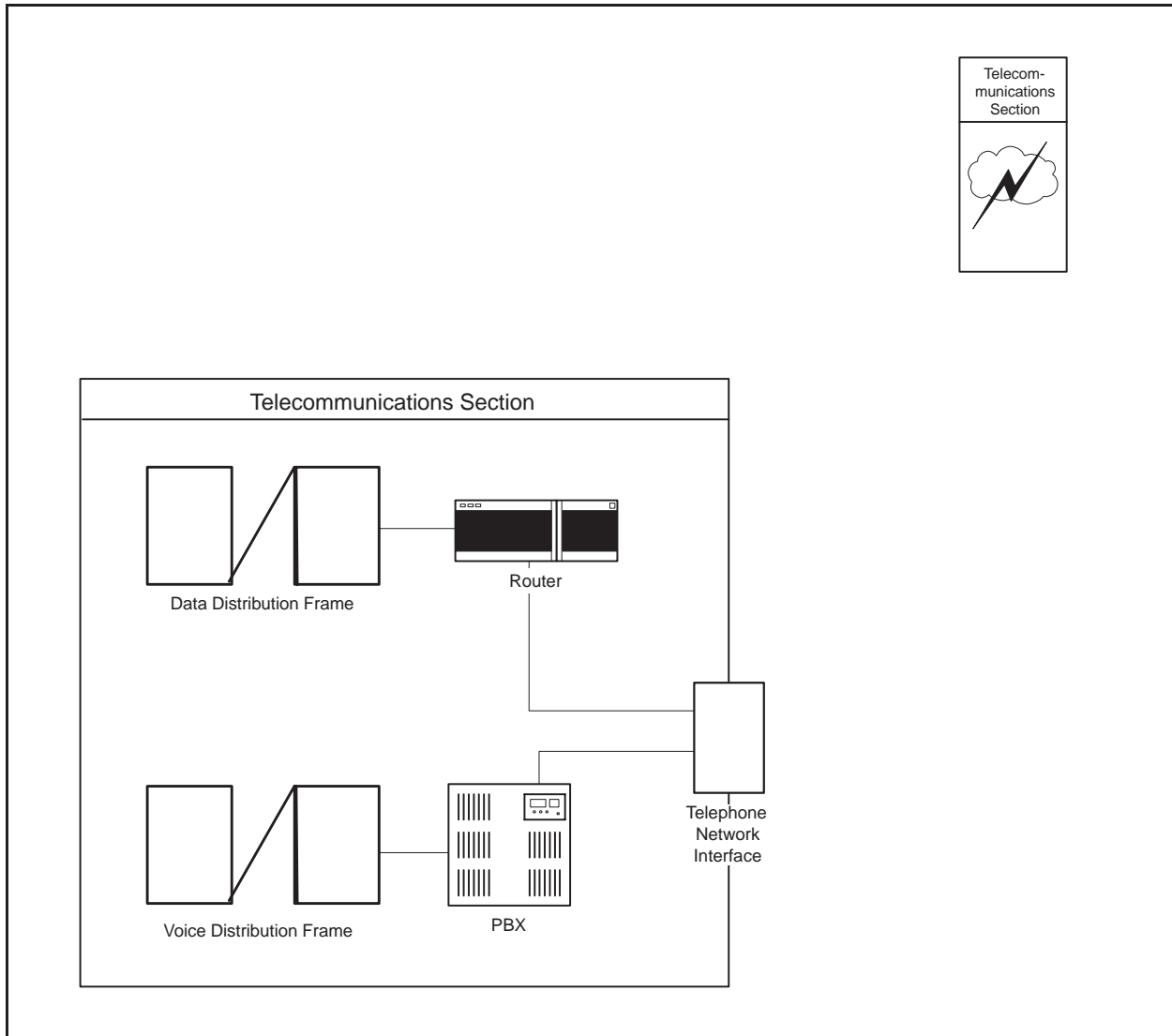


Exhibit B.5-3
Mixed Technology Building Computer Room Layout

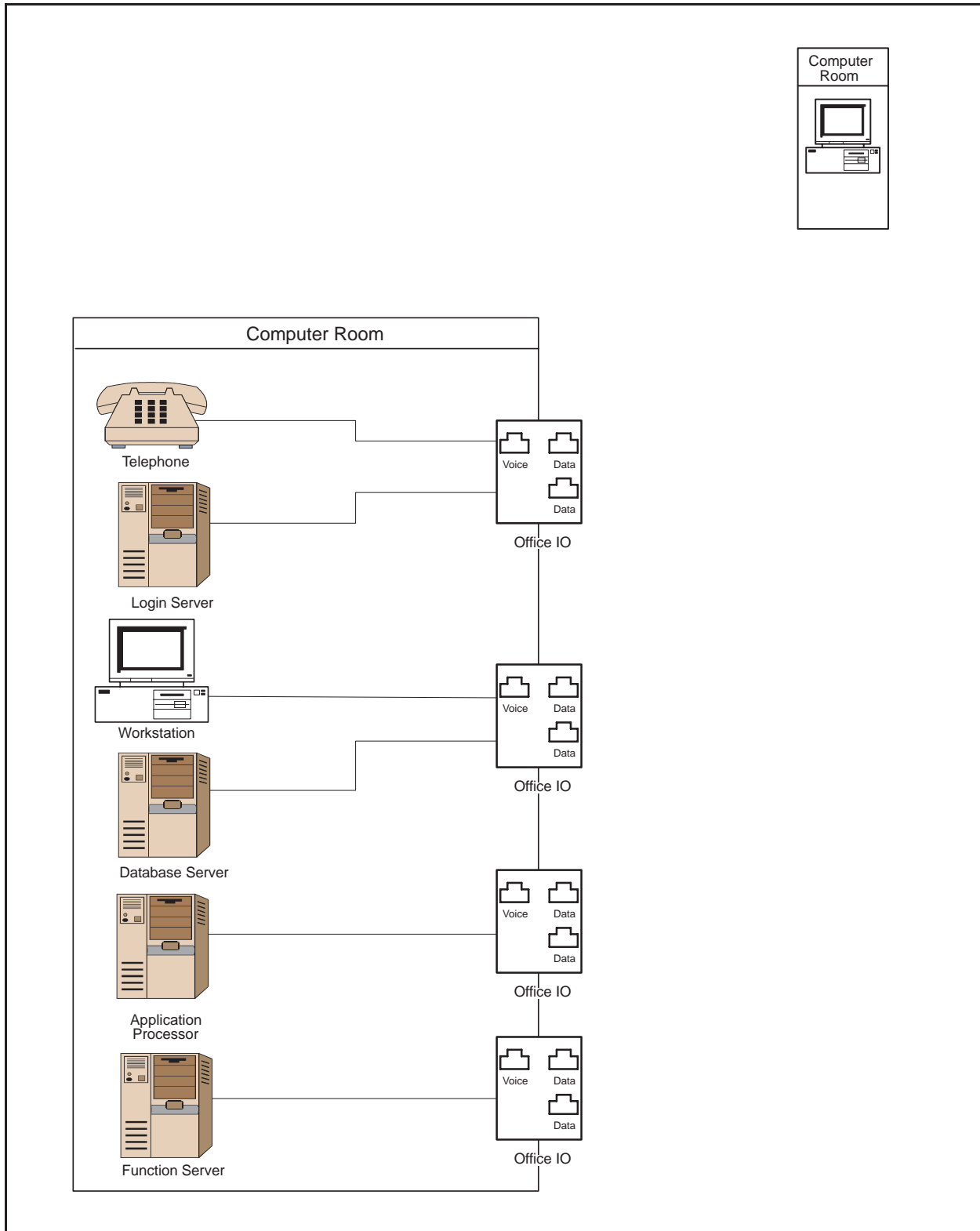


Exhibit B.5-4
Mixed Technology Building Administration Section Layout

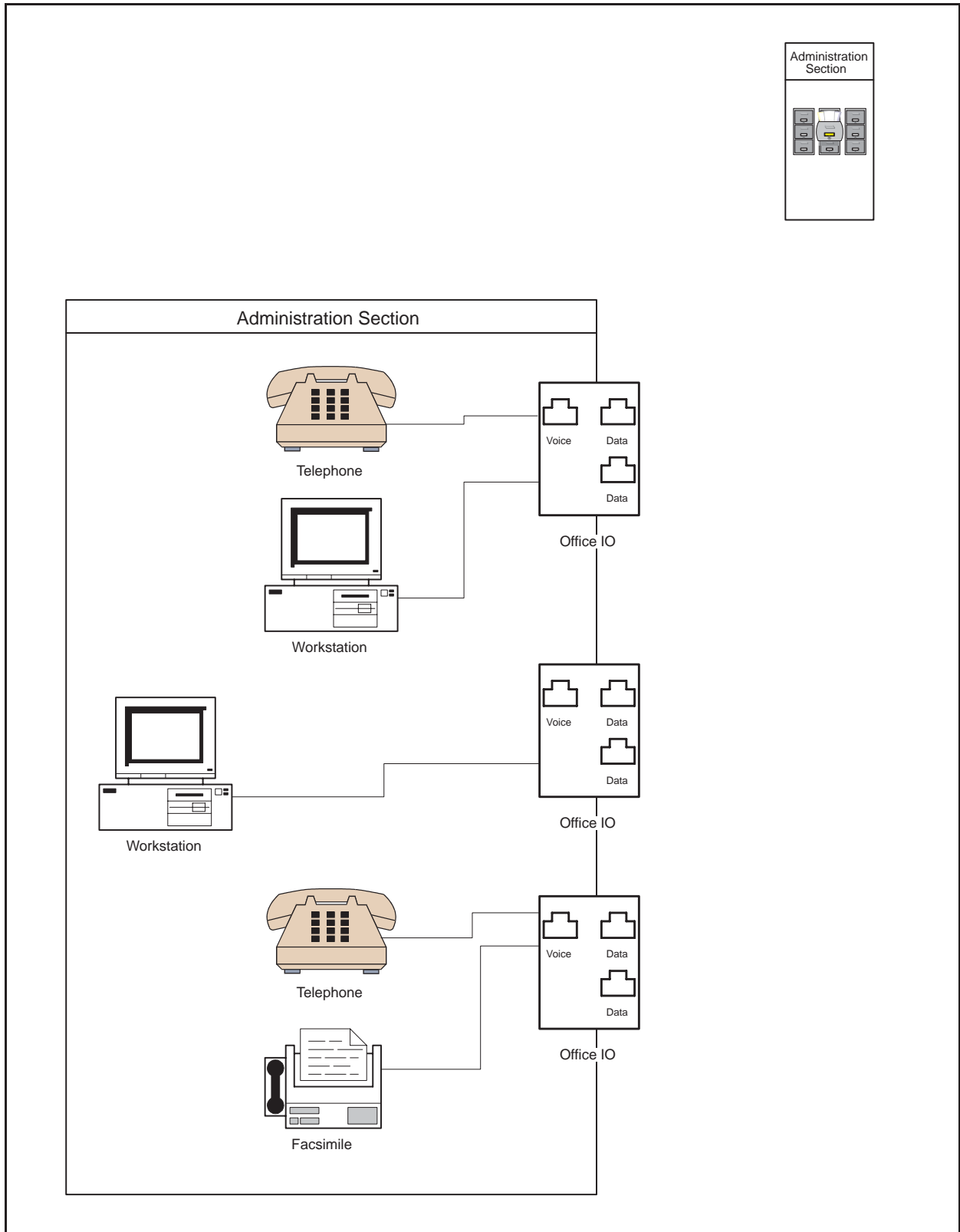


Exhibit B.5-5
Mixed Technology Building Delivery Section Layout

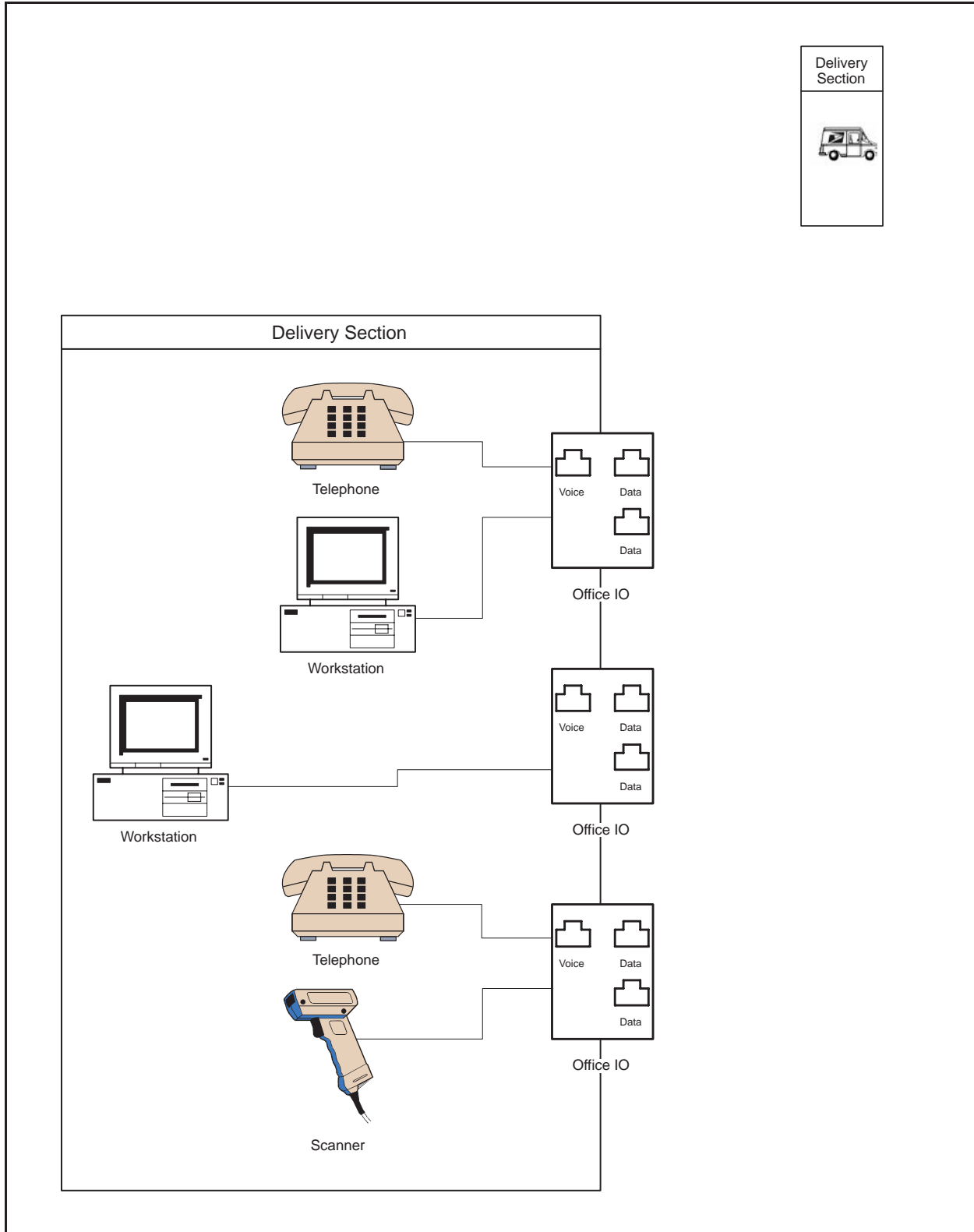


Exhibit B.5-6
Mixed Technology Building Dock/Platform Section Layout

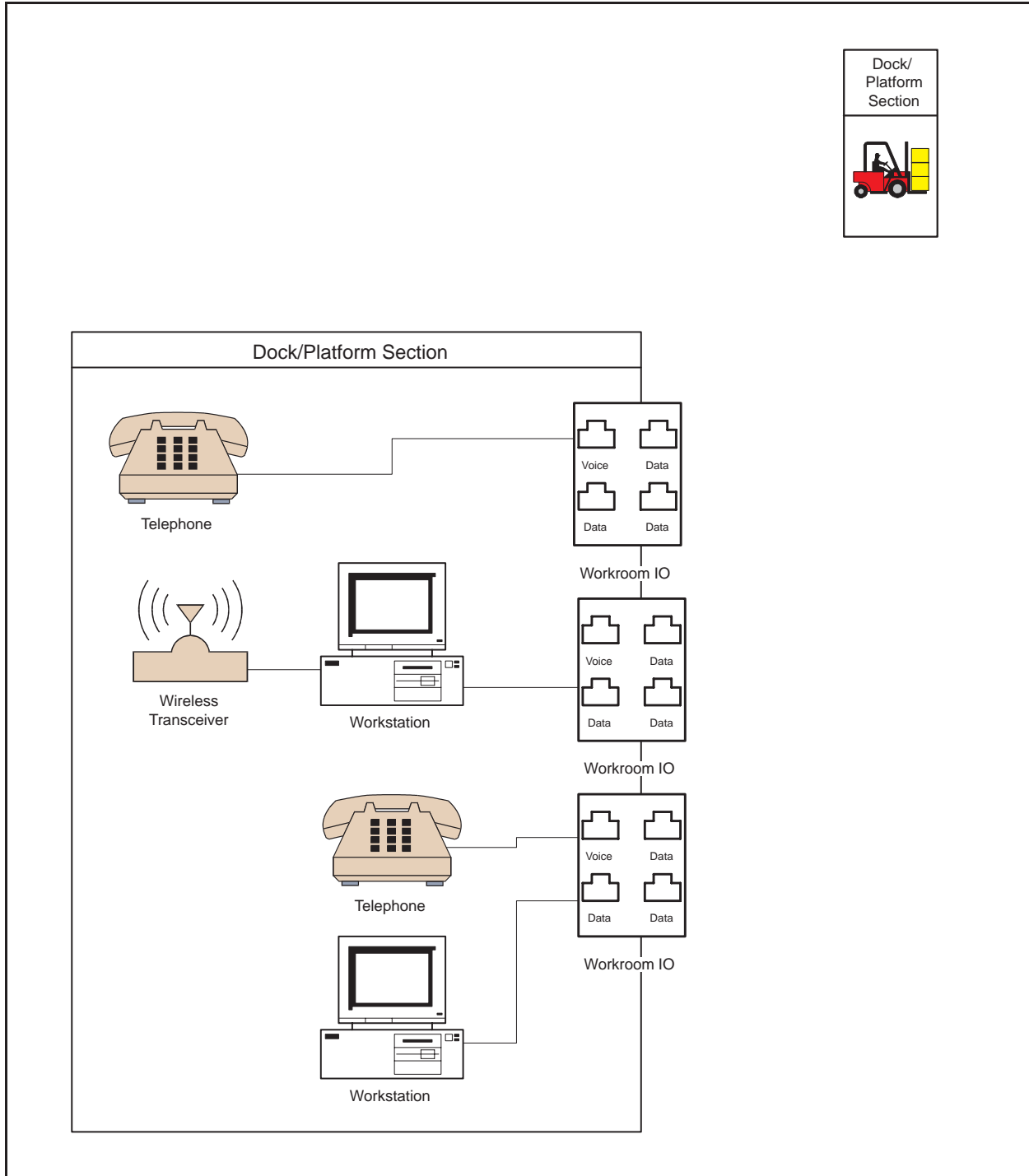


Exhibit B.5-7
Mixed Technology Building Mail Processing Section Layout

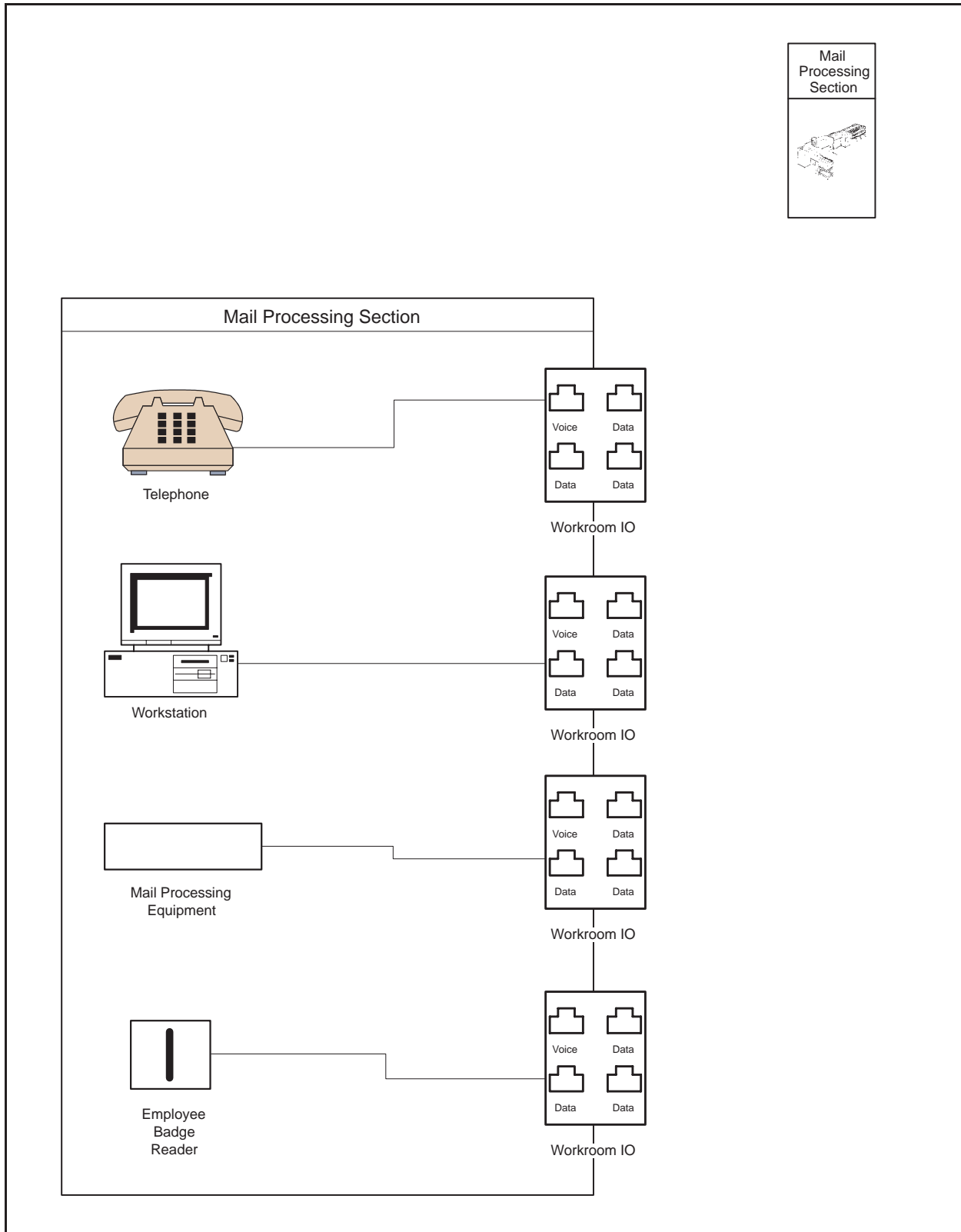


Exhibit B.5-8
Mixed Technology Building Postal Store Subsection Layout

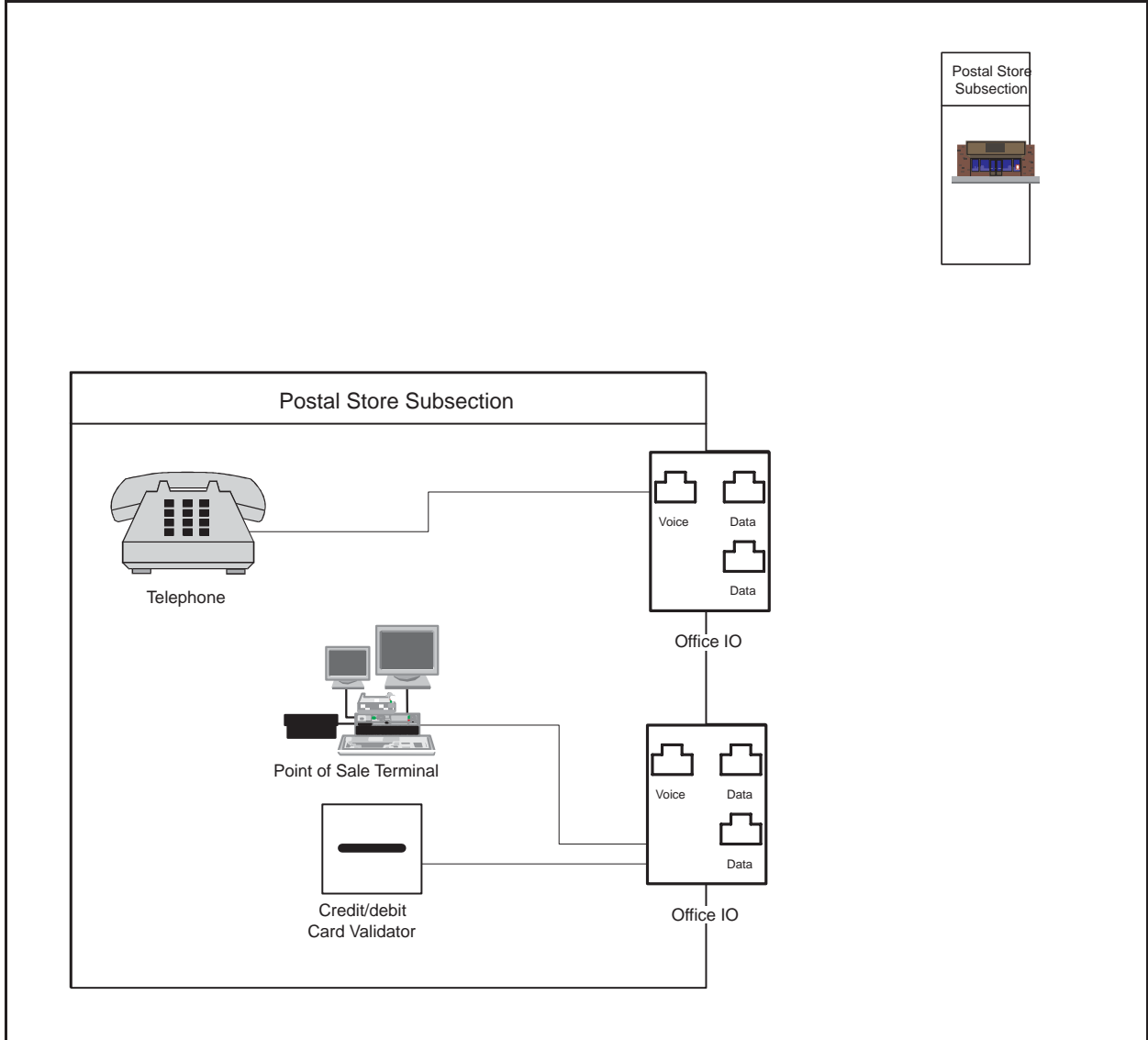


Exhibit B.5-9
Mixed Technology Building Self Service Subsection Layout

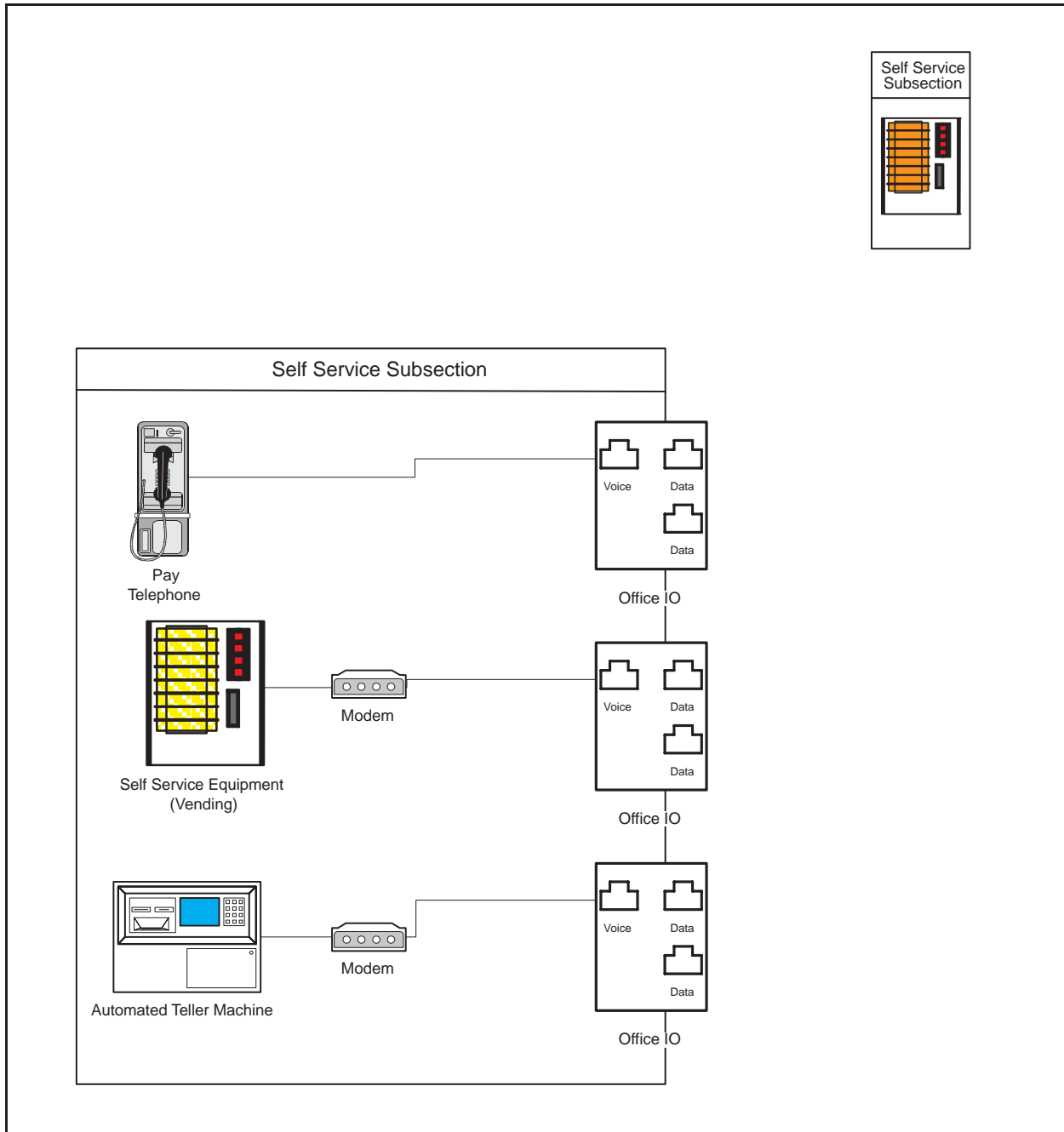


Exhibit B.5-10
Mixed Technology Building Full Service Subsection Layout

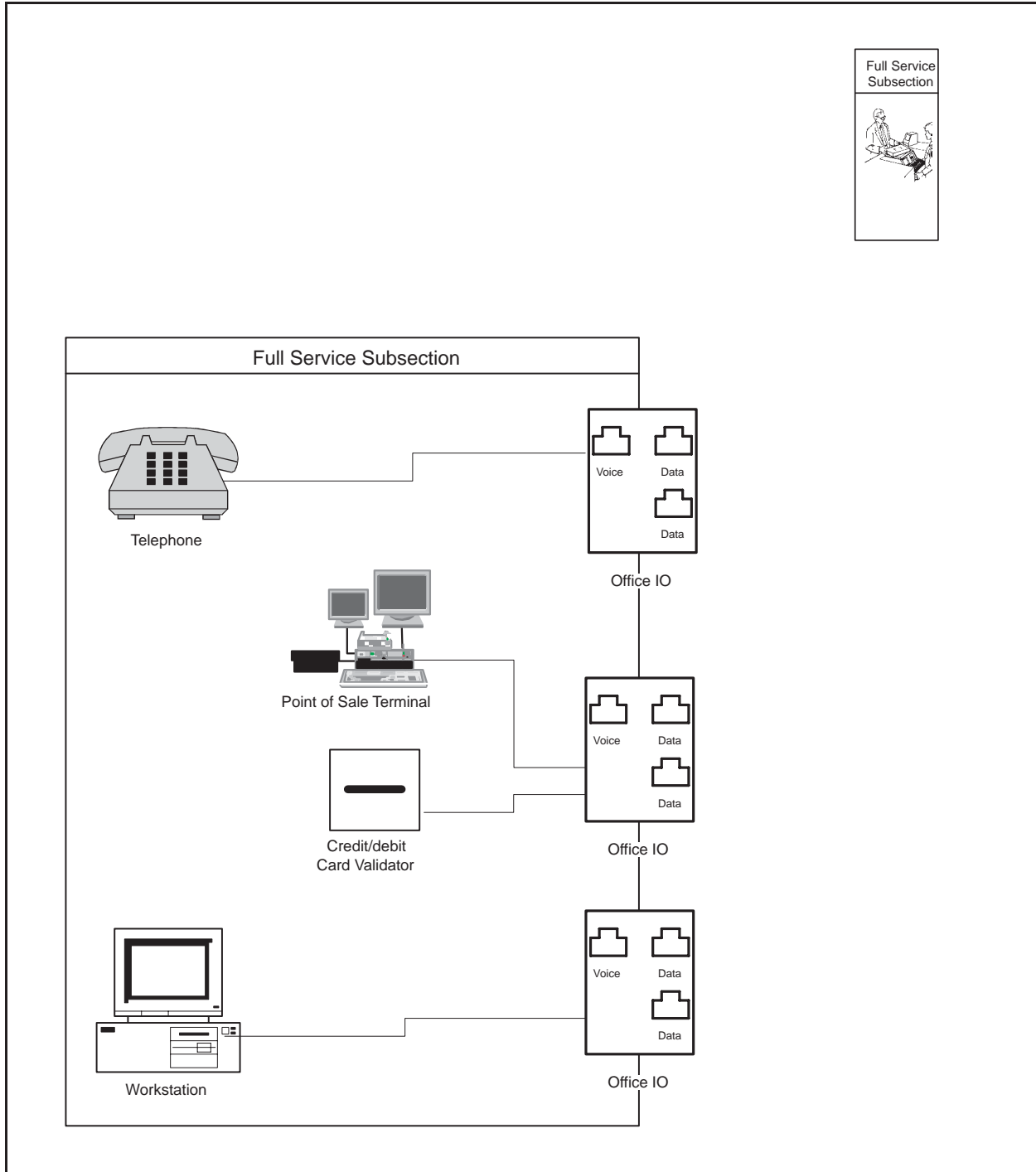


Exhibit B.5-11
Mixed Technology Building Vehicle Maintenance Section Layout

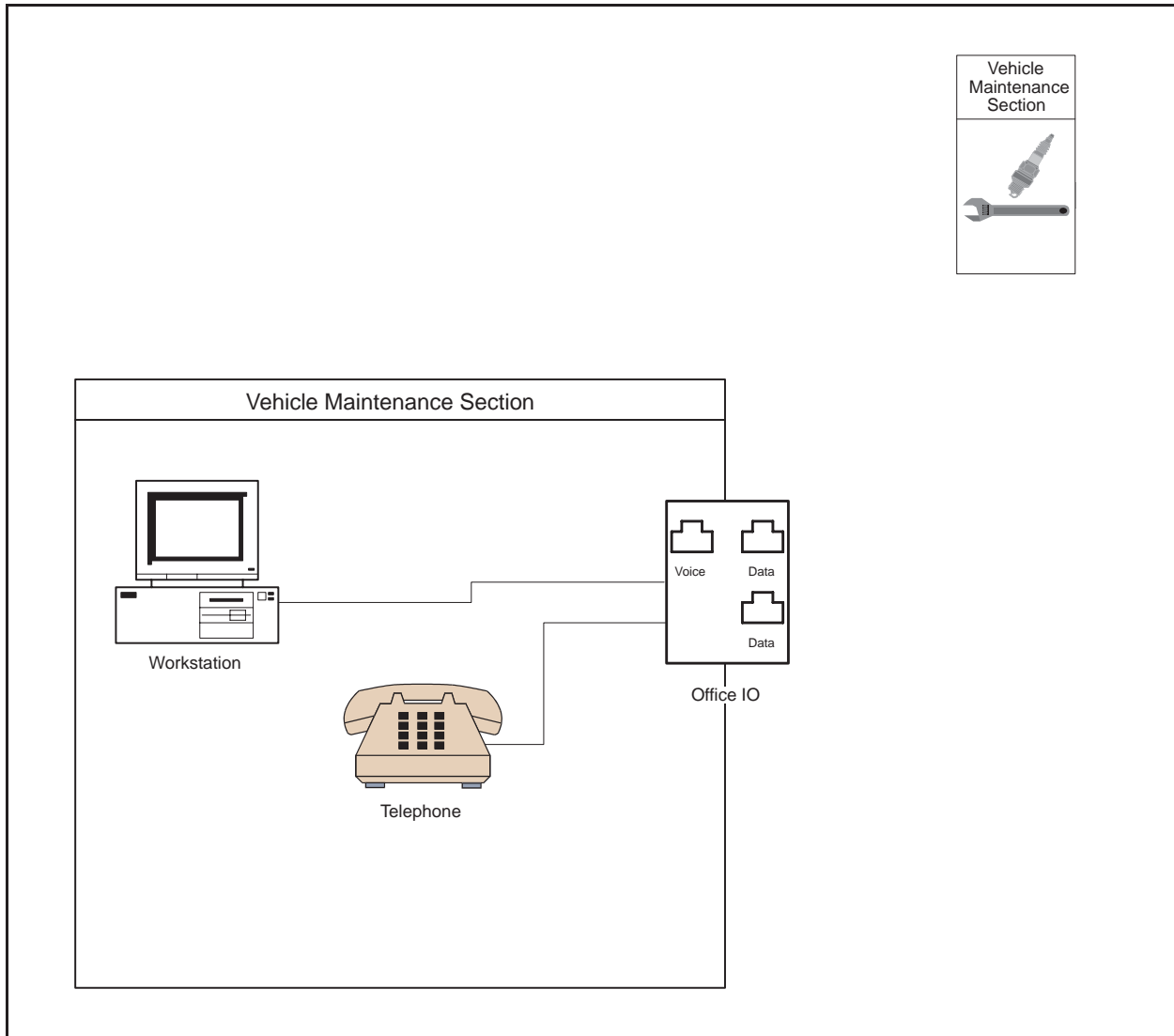


Exhibit B.5-12
Mixed Technology Building Yard Section Layout

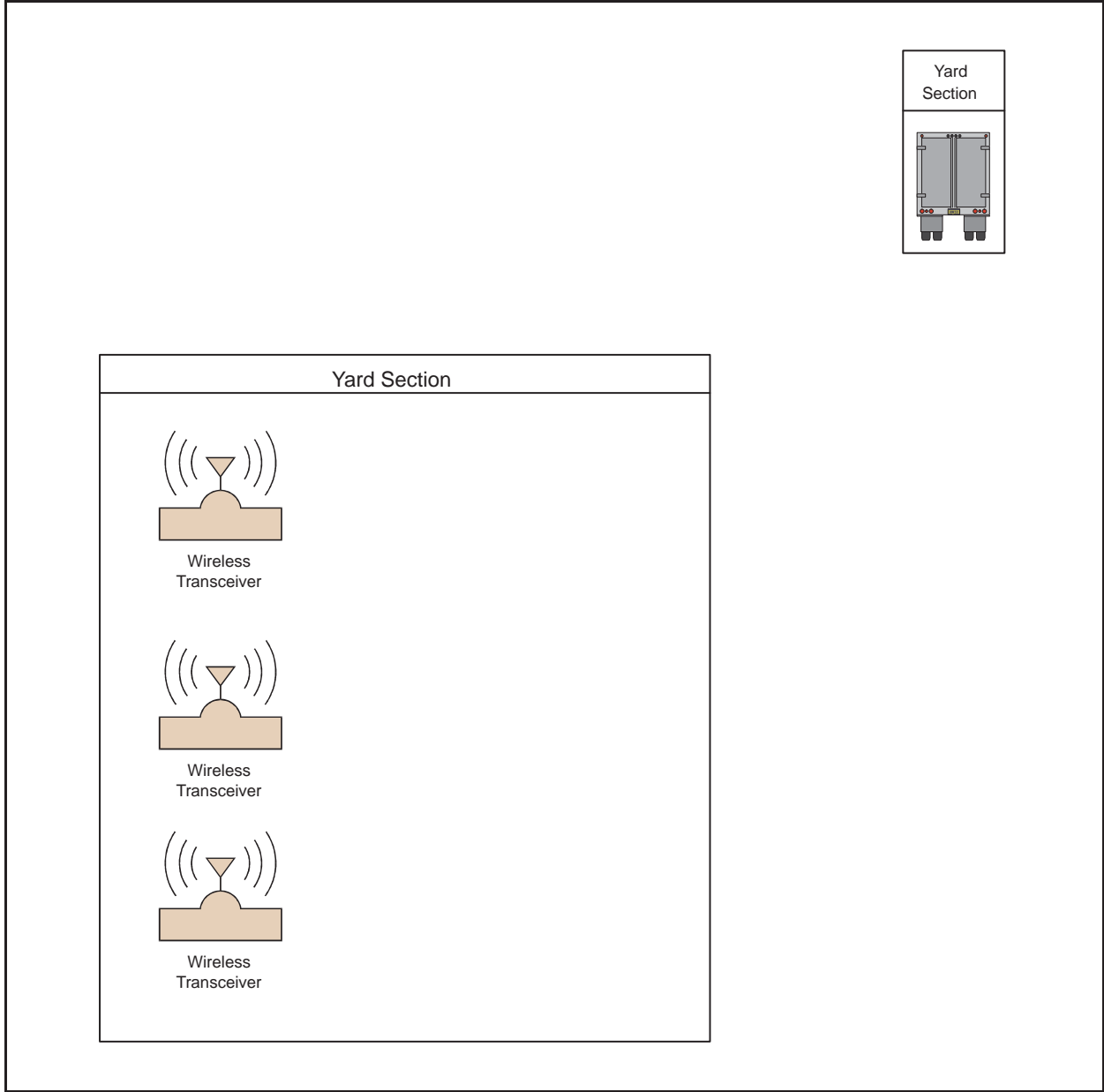
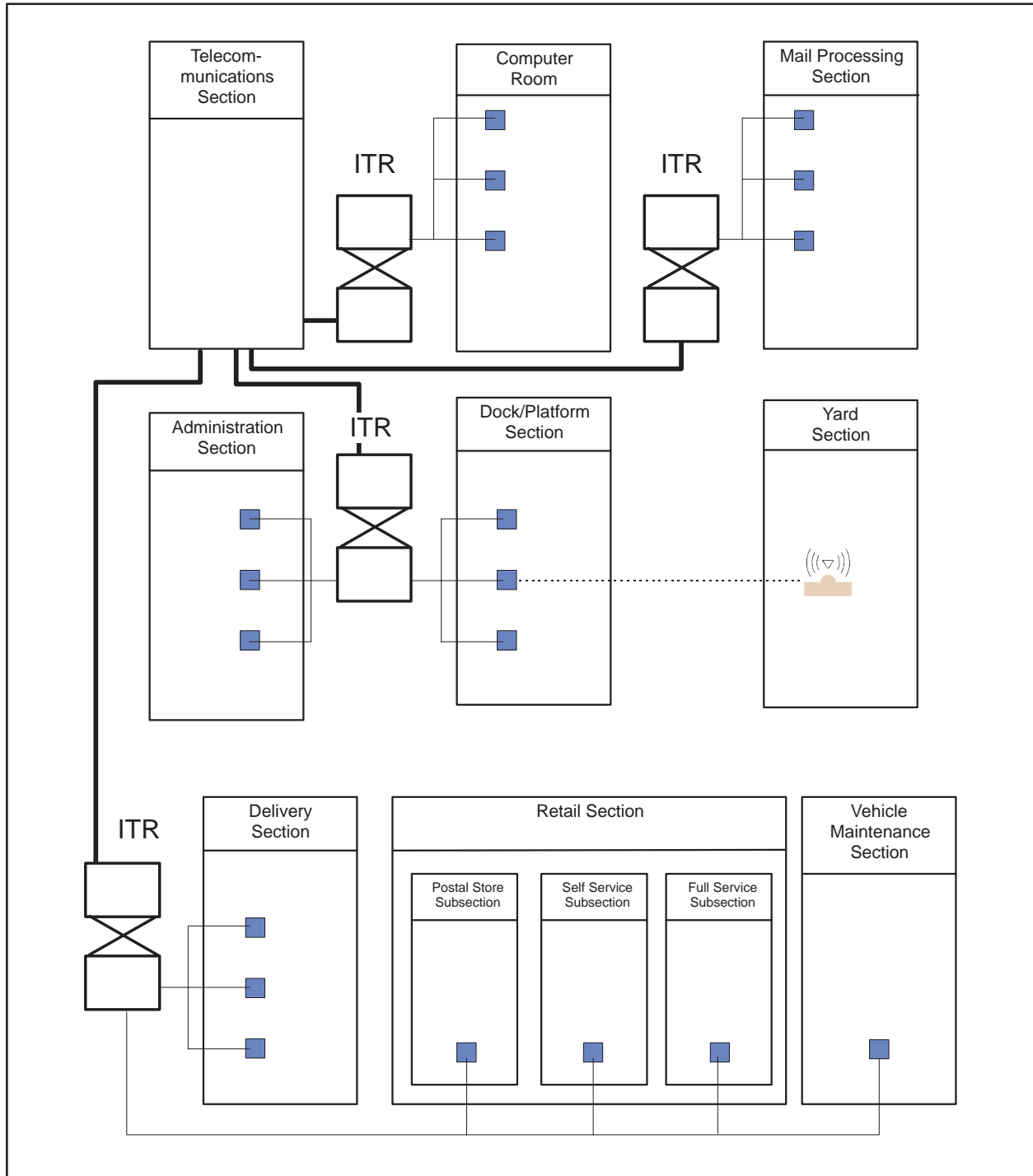


Exhibit B.5-13
Mixed Technology Building Backbone Wiring Template



Appendix C

Related Directives

Reserved.

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