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BEFORE THE
POSTAL RATE COMMISSION
WASHINGTON, D.C. 20268-0001

MAILING ONLINE SERVICE

Docket No. MC98–1

SUPPLEMENTAL DIRECT TESTIMONY
OF
CHONG BUM LIM
ON BEHALF OF
UNITED STATES POSTAL SERVICE

RATE COMMISSION
DOCKETED
JAN 1 4 1999
OFFICE OF THE SECRETARY

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SUPPORTING LIBRARY REFERENCE:

USPS MC98-1/27 : Mailing Online Unit Cost List

Direct Testimony
Of
Chong Bum Lim

AUTOBIOGRAPHICAL SKETCH

1   My name is Chong Bum Lim. I am a Consultant with the Washington

2   Consulting Practice at PricewaterhouseCoopers, LLP. I have held this position

3   since May 1998, focusing on Internet strategies and development of Web

4   solutions within the Electronic Business Solutions group, which was created

5   within the Washington Consulting Practice to provide specific expertise in

6   electronic commerce solutions utilizing Internet technologies.

7   Previously, I was an Internet Consultant with General Electric Information

8   Services (GEIS), where I defined requirements for Web-based electronic data

9   interchange (EDI) projects. Before that, I was the marketing manager with IDSI,

10   an Internet Service Provider, where I defined business costs for Internet access.

11   Additionally, I worked for Warner, Blue & Mahan, a strategic consulting firm,

12   developing a business plan that projected revenue and cost streams for a new

13   pharmaceutical joint-venture.

14   I earned an MBA from The College of William & Mary. I completed my

15   Bachelor's of Science Degree at The George Washington University, majoring in

16   computer engineering.

I. PURPOSE OF TESTIMONY

1   **I.   PURPOSE OF TESTIMONY**

2   The purpose of this testimony is to present the total information

3   technology costs for Mailing Online (MOL), which is a program under PostOffice

4   Online (POL). POL also includes Shipping Online (SOL). The costs are based on

5   systems requirements for MOL during the experimental phase, Program Years

6   1999 and 2000 (which under the current schedule, corresponds to July 1999

7   through June 2001). Information technology costs consist of dedicated hardware,

8   software, telecommunications/networking, and related personnel and service

9   costs that will be incurred for MOL. In order to ensure that MOL costs are not

10   understated, a conservative approach was taken to provide all MOL cost related

11   to the experiment.

12   The respective sections of this testimony summarize the results, explain

13   the methodology used to categorize the costs, provide a functional overview of

14   the system, and provide detailed costs of MOL information technology.

II.   SUMMARY OF RESULTS

Table 1 summarizes total costs over the two-year MOL experiment, separated by functional area and cost category. Functional areas and cost categories are discussed in further detail in Section IV, Mailing Online Functional Overview.

Table 1: Summary of Total Information Technology Costs

Item	Functional Areas	Notes	Hardware	Software	Telecom & Networking	Personnel	Services	Total
1	Systems Dev. & Imp.	Table 5, Line 4	$2,959,346	$1,219,789	$1,702,256	$0	$6,420,991	$12,302,382
2	Admin Mgmt & Maint	Table 5, Line 8	$0	$350,000	$0	$1,880,000	$3,917,568	$6,147,568
3	Help Desk	Table 5, Line 11	$0	$32,424	$0	$530,000	$1,539,957	$2,102,381
4	Print Sites	Table 5, Line 14	$152,626	$0	$51,264	$0	$1,800,050	$2,003,940
5	Total		$3,111,972	$1,602,213	$1,753,520	$2,410,000	$13,678,566	$22,556,272

Table 2 separates total information technology costs for the experiment into one-time costs and variable costs, thus conforming to witness Seckar's analysis presented in response to interrogatory PB/USPS-T2-2 (Tr. 5/1050-51). One-time costs consist mainly of hardware, software, and installation and development services, while variable costs consist mostly of personnel and labor.

Table 2: One-Time Versus Variable Costs

Description	Notes	One Time Cost	Variable Program Year 1999	Variable Program Year 2000	Total
Systems Dev. & Imp.	Exhibit G, Line 16	$10,397,982	$952,200	$952,200	$12,302,382
Administrative Mgmt & Maintenance	Exhibit G, Line 24	$350,000	$2,919,364	$2,878,205	$6,147,568
Help Desk	Exhibit G, Line 30	$320,784	$766,000	$1,015,597	$2,102,381
Print Sites	Exhibit G, Line 36	$51,264	$790,030	$1,162,646	$2,003,940
Total		$11,120,030	$5,427,594	$6,008,648	$22,556,272

II. SUMMARY OF RESULTS

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2   Table 1 summarizes total costs over the two-year MOL experiment,

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4   categories are discussed in further detail in Section IV, Mailing Online Functional

5   Overview.

Table 1: Summary of Total Information Technology Costs

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Print Sites	Table 5, Line 14	$152,626	$0	$51,264	$0	$1,800,050	$2,003,940
Total		$3,111,972	$1,602,213	$1,753,520	$2,410,000	$13,630,262	$22,507,967

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7   into one-time costs and variable costs, thus conforming to witness Seckar's

8   analysis presented in response to interrogatory PB/USPS-T2-2 (Tr. 5/1050-51).

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Print Sites	Exhibit G, Line 36	$51,264	$790,030	$1,162,646	$2,003,940
Total		$11,120,030	$5,411,373	$5,976,564	$22,507,967

1   III. **METHODOLOGY**

2   This section describes the five-step methodology for gathering and

3   estimating MOL costs. This methodology is illustrated in Diagram 1 below.

Diagram 1: Methodology
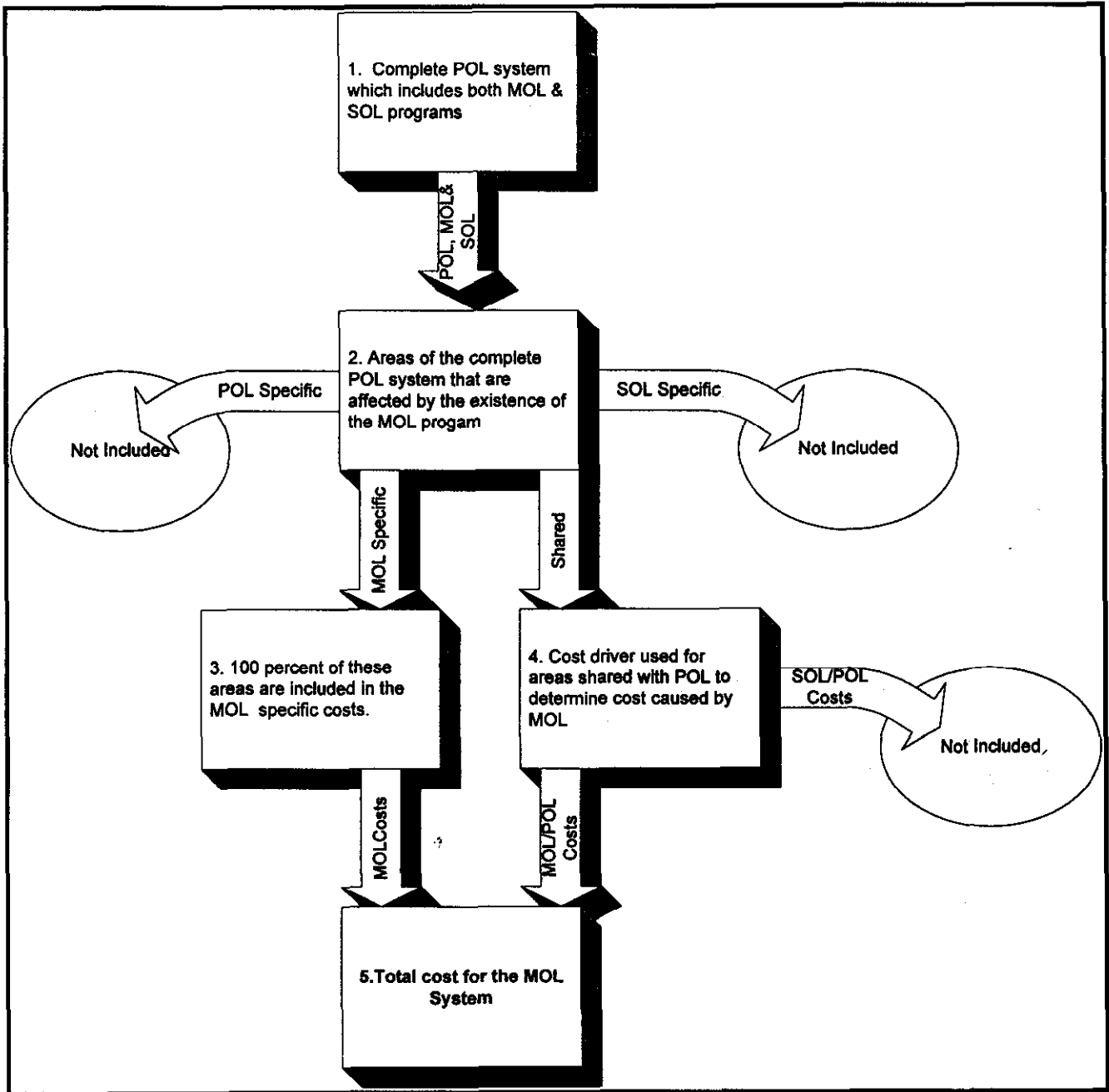
1   As indicated in the diagram above, the first step is to look at the complete

2   POL system (Step 1) and ask the question: "What areas are affected by the

3   existence of the MOL program (Step2)?" This resulted in the identification of two

4   major areas, the areas that are specific to MOL and those that are shared. The

5   functional components specific to MOL were identified (the functional areas are

6   further described in Section IV, Mailing Online Functional Overview) and all

7   those costs were included in the MOL system cost (Step 3). The six functional

8   components shared by MOL and POL include:

9   A. POL Help Desk personnel and related software;
10   B. The Redundant Array of Independent Discs (RAID) storage system for
11   the database server that stores registration and transactional records;
12   C. The RAID storage system for the database server that functions as a
13   Data Mart for management reporting purposes;
14   D. The tape backup system for the POL system;
15   E. Unix Web servers; and
16   F. Telecommunication (T3) connections from the Web server to the
17   Internet.

18   In assigning a portion of the cost of these six shared areas to MOL, ratios

19   were developed based on the most relevant cost driver. The ratios reflect the

20   relationship between MOL and other elements that draw upon the resources of

21   the shared areas outlined above as measured by the drivers. Costs are assumed

22   to be proportional to the driver; that is, MOL's proportion of shared costs is

23   determined by MOL's share of the driver (Step 4). These POL costs that are

24   caused by MOL are termed MOL/POL.

25   The driver used for the help desk (Component A) is based on the number

26   of calls received by the help desk. Data obtained during the market test from

1   11/7/98 to 12/25/98 showed that of all the POL, MOL and SOL calls, 20 percent

2   were MOL-related. Since 20 percent of the driver (number of calls) are for MOL,

3   it is assumed that 20 percent of the cost for the help desk are costs for MOL.

4   Shared functional component B, C, and D (database storage system, data

5   mart storage system, and the tape backup system), are driven by the same cost

6   driver, storage capacity, which was used by the system designers in planning the

7   POL, SOL and MOL systems. The designers projected that 111GB storage

8   would be necessary for the POL and SOL applications while 70GB would be

9   necessary for the MOL application. Therefore, the 70GB portion of the total

10   181GB (38 percent) storage requirement projected forms the basis for the

11   assumption that 38 percent of the cost for these storage systems are caused by

12   MOL.

13   For the Web servers (Component E), two of the four Web servers were

14   incorporated into the design strictly due to requirements of POL. Additionally,

15   one of the two remaining servers was needed for MOL. Thus, one of the Sun

16   4500 web server systems was included as an MOL/POL cost.

17   The planned number of concurrent sessions is the primary driver for

18   assigning costs for the T3 Internet connection (Component F). Based on POL

19   Hardware Architecture requirements, the system was designed to handle 5,000

20   simultaneous MOL user sessions along with 5,000 simultaneous SOL/POL user

21   sessions for a total of 10,000 simultaneous concurrent users. Hence, it follows

1   that a 50 percent ratio (5,000 concurrent MOL users divided by 10,000 total

2   concurrent users) can be applied to the costs for T3 lines.

3   In Step 5 we added the two sets of costs, MOL and MOL/POL costs, to

4   estimate the total Information Technology cost for the MOL experiment. These

5   costs are described in greater detail in the following section, Section IV: Mailing

6   Online Functional Overview.

1   **IV.   MAILING ONLINE FUNCTIONAL OVERVIEW**

2   The basic function of MOL is to provide Postal Service customers with the

3   ability to use the Internet to upload electronic documents for subsequent printing,

4   finishing, entry into the mailstream, and delivery to the appropriate recipient. The

5   technical components needed to provide these capabilities are categorized into

6   the following four functional areas:

7   1. Systems Development and Implementation
8   2. Administrative Management and Maintenance (AM&M)
9   3. Help Desk
10   4. Print Sites

11   Each functional area other than Help Desk contains components that

12   arise exclusively from MOL. Conversely, each functional area other than Print

13   Sites contains shared MOL/POL components. Table 3 below, indicates the

14   functional areas and cost categories that are applicable (X) or not applicable

15   (N/A) to the MOL system.

Table 3: MOL Cost Categories

Description	Hardware	Software	Telecom & Networking	Personnel	Services
MOL System Develop. & Implem.					
MOL	X	X	X	N/A	X
MOL/POL	X	X	X	N/A	X
Administrative Mgmt & Maintenance					
MOL	N/A	X	N/A	X	X
MOL/POL	N/A	N/A	N/A	N/A	X
Help Desk					
MOL/POL	N/A	X	N/A	X	X
Print Sites					
MOL	X	N/A	X	N/A	X

1   **A. MOL-Specific Functional Areas**

2   **1. Systems Development and Implementation**

3   The Systems Development and Implementation costs pertain to the main

4   functional components listed below:

5   ▪ main processing server (MOL controller),
6   ▪ application processors (Cubix Processors),
7   ▪ storage systems,
8   ▪ software applications,
9   ▪ custom software development, and
10   ▪ networking (switches and firewalls) and telecommunication
11   components.

12   The itemized list of materials for each of the hardware, software,

13   telecommunications/networking and services units used in developing and

14   implementing MOL is shown in Exhibit A.

15   **2. Administrative Management and Maintenance**

16   The AM&M functional area consists of all the resource requirements to

17   manage and maintain the MOL System, including the Print Sites. This would

1   include personnel (system administrator, database manager, etc.) and hardware

2   and software tools that are necessary for management and maintenance. The

3   list of items comprising this area is shown in Exhibit C.

4   **3. Print Sites**

5   Contractor-operated print sites receive electronic files, produce physical

6   mail, and enter it at a local postal facility. Related information technology costs

7   encompass local servers and their Frame Relay T1 connections to MOL, plus

8   installation and troubleshooting services from contractors. Ten print sites are

9   projected for the end of the first year of the experiment, and 17 print sites are

10   projected for the end of the second year of the experiment. These costs are

11   itemized in Exhibit F.

12   **B. MOL/POL Costs**

13   As discussed in Section III, Methodology, MOL/POL costs, while shared

14   by MOL and POL, are driven by MOL. The following describes these costs.

15   **1. Systems Development and Implementation**

16   Some POL systems also support MOL. The registration database storage

17   system, for example, stores all users and their activities. Other such cost

18   components include:

19   ▪ Web servers,
20   ▪ The tape backup system for the POL system,
21   ▪ T3 Internet connections, and
22   ▪ Data mart storage system.

1   Costs for these components are assigned according to drivers, such as

2   the number of concurrent sessions or other appropriate drivers (as described in

3   the preceding section) and are detailed in Exhibit B.

4   **2. Administrative Management and Maintenance**

5   MOL drives the POL AM&M resource requirements needed to manage

6   and maintain the MOL system. The primary component here is the service

7   contract for the Web server. Exhibit D provides the details of these costs.

8   **3. Help Desk**

9   All MOL and POL customers have a single, common point of contact --

10   the POL customer Help Desk. MOL users thus generate a portion of POL Help

11   Desk calls, and are therefore assumed to cause personnel, hardware, and

12   software costs. This analysis takes into account MOL-related customer help desk

13   calls.

14   In addition, some help desk calls will require assistance from the technical

15   help desk in San Mateo, which is distinct from the general customer help desk

16   mentioned above.

17   Exhibit E provides the detailed costs of the help desk including the

18   technical help desk.

19   **C. MOL Technical Environments**

20   Three distinct system environments, Production, Staging, and

21   Development, are necessary for MOL, and have been included in the costs. As

1   shown in Table 4, below, these environments are not co-located. Separately, a

2   fourth location, Greenbelt, Maryland, is being used for POL development. Since

3   that location is designated specifically for development of POL and its other

4   constituent services, its costs are excluded from this testimony; those costs

5   would be incurred even if MOL did not exist.

Table 4: MOL Systems and Location

Locations	Environment
San Mateo, California	Production and Production Staging
Raleigh, North Carolina	Production backup and backup staging
Reston, Virginia	MOL development and testing

1   **V.   CONCLUSION**

2   The sections of this testimony quantify, via report and projection, the total

3   information technology costs of Mailing Online for the two planned years of

4   experimental service. Respective costs are analyzed in terms of:

5   ▪ Functions: the collection of all of the components of the system
6   organized by the role or the purpose of that set of components (i.e.,
7   System Development and Implementation, Administrative
8   Management and Maintenance, Print Sites, and Help Desk).
9   ▪ Cost Categories: the type of item procured (i.e., Hardware, Software,
10   Telecommunication and Networking, Personnel and Services).
11   ▪ Locations: Geographically separate sites where work is conducted
12   (i.e., San Mateo, Raleigh, Greenbelt).
13   ▪ One-time versus variable: the designation of costs as either required
14   for the initial fielding of the system, or as recurring during the operation
15   of the experiment.
16   ▪ MOL-specific versus MOL/POL: the designation of costs as related
17   only to MOL, or related to both MOL and POL, and driven in part by
18   the existence of the MOL system.

19   Table 5, below, shows a summary of the costs broken out by functions,

20   cost categories, and MOL or MOL/POL designation, and combining both one-

21   time and variable costs for all locations.

Table 5: MOL Cost Matrix

Description	Notes	Hardware	Software	Telecom & Networking	Personnel	Services	Total
MOL System Develop. & Implem.							
MOL	Exhibit A	$1,912,547	$1,215,891	$244,256	$0	$6,260,991	$9,633,685
MOL/POL	Exhibit B	$1,046,799	$3,898	$1,458,000	$0	$160,000	$2,668,697
Subtotal	Sum of Lines 2 & 3	$2,959,346	$1,219,789	$1,702,256	$0	$6,420,991	$12,302,382
Administrative Mgmt & Maintenance							
MOL	Exhibit C	$0	$350,000	$0	$1,880,000	$3,871,233	$6,101,233
MOL/POL	Exhibit D	$0	$0	$0	$0	$46,335	$46,335
Subtotal	Sum of Lines 6 & 7	$0	$350,000	$0	$1,880,000	$3,917,568	$6,147,568
Help Desk							
MOL/POL	Exhibit E	$0	$32,424	$0	$530,000	$1,491,652	$2,054,076
Subtotal	Line 10	$0	$32,424	$0	$530,000	$1,491,652	$2,054,076
Print Sites							
MOL	Exhibit F	$152,626	$0	$51,264	$0	$1,800,050	$2,003,940
Subtotal	Line 13	$152,626	$0	$51,264	$0	$1,800,050	$2,003,940
Total	Sum of Lines 4, 8, 11, & 14	$3,111,972	$1,602,213	$1,753,520	$2,410,000	$13,630,262	$22,507,967

Exhibit A

MOL System Development & Implementation

Item	Description	Manufacturer	Notes	Production[A] San Mateo	Raleigh	Staging[A] San Mateo	Raleigh	Development[A] Reston	Total Quantity[B]	Unit Cost[C]	Extended Cost[D]
1	Hardware										
2	Sun Enterprise 5500	Sun		1	1	1	1	1	5	$30,240	$151,200
3	CPU/Memory Board, 2 empty CPU slots, 2 empty memory banks	Sun		3	3	2	2	3	13	$3,420	$44,460
4	336/333-MHz UltraSPARC Module with 4-MB of cache	Sun		6	6	2	2	6	22	$6,720	$147,840
5	1 G-Byte Memory Expansion (8x128 MB memory modules)	Sun		6	6	2	2	6	22	$7,600	$167,200
6	SBus I/O Board w/ three empty SBus slots, two empty 100 MB/sec FC-	Sun		3	3	3	3	3	15	$7,600	$114,000
7	100 MByte/sec FC-AL GBIC Module	Sun		4	4	2	2	2	14	$600	$8,400
8	8.4-Gbyte (2 x 4.2 UltraSCSI) Disk Board	Sun		1	1	1	1	1	5	$3,700	$18,500
9	Quad FastEthernet 2.0 SBus (QFE)	Sun		2	2	2	2	2	10	$1,995	$19,950
10	Gigabit Ethernet 2.0 Sbus Card	Sun		2	2	2	2	2	10	$2,295	$22,950
11	SBus Ultra Differential F/W SCSI Host Adapter	Sun		3	3	3	3	3	15	$803	$12,045
12	Enterprise Power/Cooling Module, 300W	Sun		2	2	2	2	2	10	$864	$8,640
13	Second Power Sequencer	Sun		1	1	1	1	1	5	$737	$3,685
14	Mounting Bracket for second Power Sequencer	Sun		1	1	1	1	1	5	$110	$550
15	Solaris 7 Server Media Kit	Sun		1	1	1	1	1	5	$53	$265
16	E5500 Installation	Sun		1	1	1	1	1	5	$1,475	$7,375
17	StorEdge A5000 127.4G (14x9.1 GB), 2 interface boards, 3 power supp	Sun		2	2	1	1	1	7	$63,000	$441,000
18	StorEdge rack mount kit	Sun		2	2	1	1	1	7	$450	$3,150
19	Density-DP (3P+3P+3P+3P) CD	Cubix		5	5	3	3	5	21	$3,795	$79,695
20	CPU SP7333,512K L2 Cache, 32 MB RAM, 2 GB HDD	Cubix		20	20	12	12	20	84	$2,476	$207,984
21	SP7333/Density Install Kit	Cubix		5	5	3	3	5	21	$37	$777
22	ERS/FT Break-out Mod - KB, Monitor,Mouse	Cubix		5	5	3	3	5	21	$170	$3,570
23	Memory Upgrade, 32 MB	Cubix		20	20	12	12	20	84	$259	$21,756
24	Cubix Rack	HP		1	1	1	1	1	5	$795	$3,975
25	17-inch monitor	Sun		1	1	1	1	1	5	$480	$2,400
26	Monitor Shelf	HP		2	2	1	1	2	8	$95	$760
27	Keyboard	HP		1	1	1	1	1	5	$25	$125
28	Keyboard Drawer	HP		1	1	1	1	1	5	$59	$295
29	FAST Forward	USPS	(a)	5	5	3	3	5	21	$20,000	$420,000
30	Sum of Lines 2 thru 29									Hardware Subtotal	$1,912,547

Exhibit A

MOL System Development & Implementation

Item	Description	Manufacturer	Notes	Production[A] San Mateo	Raleigh	Staging[A] San Mateo	Raleigh	Development[A] Reston	Total Quantity[B]	Unit Cost[C]	Extended Cost[D]
31	**Software**										
32	Windows NT	Microsoft		20	20	12	12	20	84	$350	$29,400
33	Postal Soft	USPS		1	1	1	1	1	5	$50,000	$250,000
34	AMS(Address Management System)	USPS		1	1	1	1	1	5	$65,528	$327,640
35	Corel WordPerfect - V. 8.0	Corel		20	20	12	12	20	84	$339	$28,476
36	Microsoft Word - V.6.0	Microsoft		20	20	12	12	20	84	$20	$1,680
37	Microsoft Word - V.7.0	Microsoft		20	20	12	12	20	84	$20	$1,680
38	Microsoft Word - V. 8.0	Microsoft		20	20	12	12	20	84	$20	$1,680
39	Microsoft Publisher	Microsoft		20	20	12	12	20	84	$90	$7,560
40	Adobe PageMaker	Adobe		20	20	12	12	20	84	$525	$44,100
41	Corel Ventura -V.7.0	Corel		20	20	12	12	20	84	$434	$36,456
42	Corel Ventura -V.8.0	Corel		20	20	12	12	20	84	$434	$36,456
43	Quark - V. 3.2	Quark		20	20	12	12	20	84	$1,372	$115,248
44	Quark - V. 4.0	Quark		20	20	12	12	20	84	$1,372	$115,248
45	Pretty Good privacy(PGP)	Network Assoc.		20	20	12	12	20	84	$2,400	$201,600
46	Intel's Lane LanDesk Virus check	Intel		1	1	1	1	1	5	$995	$4,975
47	Adobe PDF - V. 3.0	Adobe		20	20	12	12	20	84	$163	$13,692
48	Sum of Lines 32 thru 47								Software Subtotal		$1,215,891
49	**Telecom & Networking**										
50	Catalyst 5509 Chassis	Cisco		1	1	1	1	1	5	$1,796	$8,980
51	Catalyst 5509 AC Power Supply	Cisco		1	1	1	1	1	5	$2,156	$10,780
52	Catalyst 5509 second AC Power Supply	Cisco		1	1	0	0	0	2	$2,156	$4,312
53	Catalyst 5500/5000 Supervisor Engine III Modulw w/ NFFC II	Cisco		2	2	1	1	1	7	$10,076	$70,532
54	24 Port 10/100TX Backbone Switching (FEC, 802.1Q/ISL,RJ-45)	Cisco		2	2	2	2	2	10	$3,596	$35,960
55	Catalyst 5000 Rel. 4.x SW License, Enhanced Feture Set	Cisco		2	2	1	1	1	7	$2,876	$20,132
56	Catalyst 5000 Route Switch Module	Cisco		1	1	1	1	1	5	$14,396	$71,980
57	C5000 Gigabit Ethernet Switching Module w/o GBICs (3 port)	Cisco		1	1	1	1	1	5	$3,236	$16,180
58	1000BASE-SX "Short Wavelength" GBIC (Multimode only)	Cisco		3	3	3	3	3	15	$360	$5,400
59	Sum of Lines 50 thru 58								Telecom & Networking Subtotal		$244,256
60	**Services**										
61	Certification & Accreditation	Marconi		1	0	0	0	0	1	$464,400	$464,400
62	Enhancements-Software	Marconi		1	0	0	0	0	1	$600,000	$600,000
63	MOL Application Development	Marconi		1	0	0	0	0	1	$5,120,671	$5,120,671
64	MOL Application Test and Doc.	Marconi		1	0	0	0	0	1	$75,920	$75,920
65	Sum of Lines 61 thru 64								Services Subtotal		$6,260,991
66	Sum of Lines 30 48 59 & 65								Total		$9,633,685

Exhibit B

MOL/POL System Development & Implementation

Item	Description	Manufacturer	Notes	Production^A		Staging^A		Development^A	Total	Unit	Extended
				San Mateo	Raleigh	San Mateo	Raleigh	Reston	Quantity^B	Cost^C	Cost^D
1	Hardware										
2	**Web Systems**										
3	Sun Enterprise 5500	Sun		0	0	0	0	1	1	$30,240	$30,240
4	CPU/Memory Board, 2 empty CPU slots, 2	Sun		0	0	0	0	2	2	$3,420	$6,840
5	336/333-MHz UltraSPARC Module with 4-M	Sun		0	0	0	0	4	4	$6,720	$26,880
6	1 G-Byte Memory Expansion (8x128 MB me	Sun		0	0	0	0	2	2	$7,600	$15,200
7	SBus I/O Board w/ three empty SBus slots,	Sun		0	0	0	0	2	2	$7,600	$15,200
8	8.4-Gbyte (2 x 4.2 UltraSCSI) Disk Board	Sun		0	0	0	0	1	1	$3,700	$3,700
9	Quad FastEthernet 2.0 SBus (QFE)	Sun		0	0	0	0	2	2	$1,995	$3,990
10	Enterprise Power/Cooling Module, 300W	Sun		0	0	0	0	2	2	$864	$1,728
11	Second Power Sequencer	Sun		0	0	0	0	1	1	$737	$737
12	Mounting Bracket for second Power Sequen	Sun		0	0	0	0	1	1	$110	$110
13	E5500 Installation	Sun		0	0	0	0	1	1	$1,475	$1,475
14	Sun Enterprise 4500	Sun		1	1	0	0	1	3	$20,160	$60,480
15	CPU/Memory Board, 2 empty CPU slots, 2	Sun		2	2	0	0	2	6	$3,420	$20,520
16	336/333-MHz UltraSPARC Module with 4-M	Sun		4	4	0	0	4	12	$6,720	$80,640
17	1 G-Byte Memory Expansion (8x128 MB me	Sun		2	2	0	0	2	6	$7,600	$45,600
18	SBus I/O Board w/ three empty SBus slots,	Sun		2	2	0	0	2	6	$7,600	$45,600
19	Quad FastEthernet 2.0 SBus (QFE)	Sun		2	2	0	0	2	6	$1,995	$11,970
20	8.4-Gbyte (2 x 4.2 UltraSCSI) Disk Board	Sun		1	1	0	0	1	3	$3,700	$11,100
21	Enterprise Power/Cooling Module, 300W	Sun		2	2	0	0	2	6	$864	$5,184
22	Rack Mounting Rails for Enterprise 4X00 Se	Sun		1	1	0	0	1	3	$302	$906
23	E4500 Installation	Sun		1	1	0	0	1	3	$1,825	$5,475
24	100% Ratio x Sum of Lines 3 thru 23								Ratio Applied Subtotal		$393,575
25	**Database Systems**										
26	StorEdge A5000 127.4G (14x9.1 GB), 2 inte	Sun		3	3	1	1	1	9	$63,000	$567,000
27	**Data Mart Systems**										
28	StorEdge A5000 127.4G (14x9.1 GB), 2 inte	Sun		3	0	0	0	1	4	$63,000	$252,000
29	**Storage System**										
30	Tape Library	Storage TEK		1	0	0	0	0	1	$900,011	$900,011
31	38% Ratio x Sum of Lines 26 thru 30								Ratio Applied Subtotal		$653,224
32	Sum of Lines 24 & 31								Hardware Subtotal		$1,046,799
33	Software										
34	Solaris 7 Server Media Kit	Sun		1	0	0	0	1	2	$53	$106
35	Netscape Enterprise Server for Unix	Netscape		1	0	0	0	1	2	$1,896	$3,792
36	Sum of Lines 34 thru 35								Software Subtotal		$3,898
37	100% Ratio x Line 36								Ratio Applied Subtotal		$3,898

Exhibit B

MOL/POL System Development & Implementation

Item	Description	Manufacturer	Notes	Production^A San Mateo	Raleigh	Staging^A San Mateo	Raleigh	Development^A Reston	Total Quantity^B	Unit Cost^C	Extended Cost^D
38	**Telecom & Networking**										
39	T3 Connection to Internet Installation	Pack Bell/ Uunet		2	1	0	0	0	3	$12,000	$36,000
40	T3 Connection Fee	Pack Bell/ Uunet	(b)	2	1	0	0	0	3	$960,000	$2,880,000
41			Sum of Lines 39 thru 40						Telecom & Networking Subtotal		$2,916,000
42			50% Ratio x Line 41						Ratio Applied Subtotal		$1,458,000
43	**Services**										
44	Brand Dialogue Web Page development	Brand Dialogue		1	0	0	0	0	1	$130,000	$130,000
45	Upgrade of Web Page	Brand Dialogue		1	0	0	0	0	1	$30,000	$30,000
46			Sum of Lines 44 thru 45						Services Subtotal		$160,000
47			100% Ratio x Line 46						Ratio Applied Subtotal		$160,000
48			Sum of Lines 32 37 42 & 47						Total		$2,668,697

Exhibit C

MOL Administrative Management & Maintenance

Item	Description	Manufacturer	Notes	Production[A]		Staging[A]		Development[A]	Total Quantity[B]	Unit Cost[C]	Extended Cost[D]
				San Mateo	Raleigh	San Mateo	Raleigh	Reston			
1	Software										
2	Maintenance Software	USPS		1	0	0	0	0	1	$ 350,000	$ 350,000
3			Line 2						Software Subtotal		$ 350,000
4	Personnel										
5	USPS Maintenance	USPS	(c)	1	0	0	0	0	1	$ 1,880,000	$1,880,000
6			Line 5						Personnel Subtotal		$1,880,000
7	Services										
8	MOL System Maintenance										
9	E5500 Prepaid 4 Hour MTTR, 2 years	Sun	(d)	1	1	0	0	0	2	$4,190	$8,380
10	CPU/Memory Board 4 Hour MTTR, 2 years	Sun	(d)	3	3	0	0	0	6	$9,770	$58,620
11	Catalyst 5509 On-Site Premium Maintenance (2 years)	Cisco	(d)	1	1	0	0	0	2	$16,000	$32,000
12	CISCO7204 On-Site Premium Maintenance (2 years)	Cisco	(d)	1	1	0	0	0	2	$10,000	$20,000
13	Software Maintenance	Compaq		1	0	0	0	0	1	$3,748,500	$3,748,500
14	Print Sites Maintenance										
15	1720 On-Site Premium Maintenance (2 years)	Cisco	(d)	17	0	0	0	0	17	$220	$3,733
16		Sum of Lines 9 thru 15								Services Subtotal		$3,871,233
17		Sum of Lines 3 6, & 16								Total		$ 6,101,233

Exhibit D

MOL/POL Administrative Management & Maintenance

Item	Description	Manufacturer	Notes	Production^A		Staging^A		Development^A	Total	Unit	Extended
				San Mateo	Raleigh	San Mateo	Raleigh	Reston	Quantity^B	Cost^C	Cost^D
1	**Services**										
2	**Web System Maintenance**										
3	E4500 Prepaid 4 Hour MTTR, 2 years	Sun	(d)	1	1	0	0	0	2	$3,628	$7,255
4	CPU/Memory Board 4 Hour MTTR, 2 years	Sun	(d)	2	2	0	0	0	4	$9,770	$39,080
5	Sum of Lines 3 thru 4								Services Subtotal		$46.335
6	100% Ratio x Line 5								Ratio Applied Subtotal		$46,335
7	Line 6								Total		$46.335

Exhibit E

MOL/POL Help Desk

Item	Description	Manufacturer	Notes	Help Desk[A]	Total Quantity[B]	Unit Cost[C]	Extended Cost[D]
1	Software						
2	Microsoft Publisher	Microsoft		14	14	$90	$1,260
3	MS Office 97 Professional. Ed. Prof. Li	Microsoft		14	14	$104	$1,456
4	Quark V. 4.0	Quark		14	14	$752	$10,528
5	PageMaker V. 6.5 win95/NT	PageMaker		14	14	$525	$7,350
6	Corel Ventura V.8.0	Corel		14	14	$469	$6,566
7	Corel WordPerfect Suite Prof. 8.0	Corel		14	14	$376	$5,264
8		Sum of Lines 2 thru 7				Software Subtotal	$32,424
9		100% Ratio x Line 8				Ratio Applied Subtotal	$32,424
10	Personnel						
11	Help Desk Mgr	USPS	(e)	1	1	$200,000	$200,000
12		20% Ratio x Line 11				Ratio Applied Subtotal	$40,000
13	Technical Help Desk	USPS	(f)	1	1	$490,000	$490,000
14		100% Ratio x Line 13				Ratio Applied Subtotal	$490,000
15		Sum of Lines 12 & 14				Personnel Subtotal	$530,000
16	Services						
17	Help Desk on-going cost	Compaq		1	1	$6,016,462	$6,016,462
18	Help Desk one time	Compaq		1	1	$1,441,800	$1,441,800
19		Sum of Lines 17 thru 18				Services Subtotal	$7,458,262
20		20% Ratio x Line 19				Ratio Applied Subtotal	$1,491,652
21		Sum of Lines 9,15 & 20				Total	$2,054,076

Exhibit F

MOL Print Sites

Item	Description	Manufacturer	Notes	Production[A]		Staging[A]		Development[A]	Total Quantity[B]	Unit Cost[C]	Extended Cost[D]
				San Mateo	Raleigh	San Mateo	Raleigh	Reston			
1	Hardware										
2	Ultra 5 w/ 333Mhz UltraSPARC-IIi 2MB L2 cache,	Sun		17	0	0	0	0	17	$4,495	$76,415
3	17-inch Entry Color Monitor	Sun		17	0	0	0	0	17	$480	$8,160
4	10/100BaseT FastEthernet PCI Adapter 2.0	Sun		17	0	0	0	0	17	$695	$11,815
5	10/100BaseT Modular Router w/ 2 WAN slots & Cis	Cisco		17	0	0	0	0	17	$1,292	$21,964
6	Cisci 1700 IOS IP/FW PLUS IPSEC 56	Cisco		17	0	0	0	0	17	$1,008	$17,136
7	1-Port TI.Fractional T1 DSU/CSU WAN Interface C	Cisco		17	0	0	0	0	17	$720	$12,240
8	Cisco 1700 16MB to 20MB DRAM Factory Upgrade	Cisco		17	0	0	0	0	17	$288	$4,896
9	Sum of Lines 2 thru 8								Hardware Subtotal		$152,626
10	Telecom & Network										
11	Cisco 7204, 4-slot chassis, 1 AC Supply	Cisco		1	1	0	0	0	2	$2,880	$5,760
12	Cisco 7200 Dual Ac Power Supply Option	Cisco		1	1	0	0	0	2	$2,160	$4,320
13	Cisco 7200 Series IOS IP 56 Feature Set	Cisco		1	1	0	0	0	2	$4,608	$9,216
14	Cisco 7200 Input/Output Controller with Fast Ethem	Cisco		1	1	0	0	0	2	$1,800	$3,600
15	Cisco 7200 Network Processing Engine, 4 MB SRA	Cisco		1	1	0	0	0	2	$4,680	$9,360
16	Cisco 7200 NPE 64 MB DDRAM Upgrade Kit	Cisco		1	1	0	0	0	2	$432	$864
17	1-Port HSSI Port Adapter	Cisco		2	2	0	0	0	4	$4,320	$17,280
18	Cisco 7200 I/O PCMCIA Flash Memory, 16 MB Opti	Cisco		1	1	0	0	0	2	$288	$576
19	HSSI Cable, Male to Male Conn.	Cisco		2	2	0	0	0	4	$72	$288
20	Sum of Lines 11 thru 19								Telecom & Networking Subtotal		$51,264
21	Services										
22	Print Site Installation/Support	Compaq		1	0	0	0	0	1	$81,250	$81,250
23	T1 Installation	MCI		17	0	0	0	0	17	$2,000	$34,000
24	T1 Service	MCI	(g)	17	0	0	0	0	17	$99,106	$1,684,800
25	Sum of Lines 22 thru 24								Services Subtotal		$1,800,050
26	Sum of Lines 9 20 & 25								Total		$2,003,940

Exhibit G

Derivation of One-Time & Variable Costs

Item	Description	Notes	One Time Cost	Variable Program Year 1999	Variable Program Year 2000	Total
1	Systems Dev. & Imp.					
2	*MOL*					
3	*Hardware*	Exhibit A, Line 30	$1,912,547	$0	$0	$1,912,547
4	*Software*	Exhibit A, Line 48	$1,215,891	$0	$0	$1,215,891
5	*Telecom. & Networking*	Exhibit A, Line 59	$244,256	$0	$0	$244,256
6	*Services*					
7	*Certification & Accreditation*	Exhibit A, Line 61 divided by 2 years	$0	$232,200	$232,200	$464,400
8	*Enhancements - SW*	Exhibit A, Line 62	$600,000	$0	$0	$600,000
9	*MOL Application Development*	Exhibit A, Line 63	$5,120,671	$0	$0	$5,120,671
10	*MOL Application Test and Doc.*	Exhibit A, Line 64	$75,920	$0	$0	$75,920
11	*MOL/POL*					
12	*Hardware*	Exhibit B, Line 32	$1,046,799	$0	$0	$1,046,799
13	*Software*	Exhibit B, Line 37	$3,898	$0	$0	$3,898
14	*Telecom. & Networking*	(h)	$18,000	$720,000	$720,000	$1,458,000
15	*Services*	Exhibit B, Line 47	$160,000			$160,000
16	Subtotal		$10,397,982	$952,200	$952,200	$12,302,382
17	Administrative Mgmt & Maintenance					
18	*MOL*					
19	*Software*	Exhibit C, Line 3	$350,000	$0	$0	$350,000
20	*Personnel*	Exhibit C, Line 6 divided by 2 years	$0	$940,000	$940,000	$1,880,000
21	*Services*	(i)	$0	$1,956,196	$1,915,037	$3,871,233
22	*MOL/POL*					
23	*Services*	Exhibit D, Line 6 divided by 2 years	$0	$23,168	$23,168	$46,335
24	Subtotal		$350,000	$2,919,364	$2,878,205	$6,147,568
25	Help Desk					
26	*MOL/POL*					
27	*Software*	Exhibit E, Line 9	$32,424	$0	$0	$32,424
28	*Personnel*	Exhibit E, Line 15 divided by 2 years	$0	$265,000	$265,000	$530,000
29	*Services*	(j)	$288,360	$484,779	$718,513	$1,491,652
30	Subtotal		$320,784	$749,779	$983,513	$2,054,076
31	Print Sites					
32	*MOL*					
33	*Hardware*	(k)	$0	$89,780	$62,846	$152,626
34	*Telecom. & Networking*	Exhibit F, Line 20	$51,264	$0	$0	$51,264
35	*Services*	(l)	$0	$700,250	$1,099,800	$1,800,050
36	Subtotal		$51,264	$790,030	$1,162,646	$2,003,940
37	Total		$11,120,030	$5,411,373	$5,976,564	$22,507,967

Endnotes

A   Quantity of Hardware, Software, Telecom & Networking, Personnel, and Services for Production, Staging, Development, and Help Desk for each geographical area.

B   Total Quantity equals the sum of quantities for a given line item.

C   All Unit Costs used in this analysis are referenced in Library Reference MC98-1/27. Most of the unit costs were provided by the contractors to the Postal Service, primarily using the Manufactured Suggested Retail Price (MSRP). Other unit costs were obtained through communication with the designers of the systems. Some items have been priced using the nearest equivalent part available to the Postal Service from current contracts. If the Postal Service price list did not contain the item or if the price was not easily attainable, the MSRP of the item was used.

D   Extended Cost equals Total Quantity x Unit Cost.

(a)   FAST Forward Unit Cost equals ($10,000 per year) x (2 years).

(b)   T3 Connection Fee Unit Cost equals ($40,000 fee per month) x (12 months) x (2 years).

(c)   USPS Maintenance Unit Cost equals ($940,000 per year) x (2 years).

(d)   Original 5 year maintenance cost was multiplied by 2/5 in order to calculate cost for 2 years worth of maintenance.

(e)   Help Desk Mgr Unit Cost equals ($100,000 per year) x (2 years).

(f)   Technical Help Desk equals ($245,000 per year) x (2 years).

(g)   T1 Service Unit Cost equals [($5,200 service fee per month) x (12 months) x (10 sites in Program Year 1999) + ($5,200 service fee per month) x (12 months) x (17 sites in Program Year 2000)]/ (17 total sites).

(h)   Exhibit B, Telecom & Networking One Time Cost equals (Line 39) x (50% Ratio), Variable Costs for each of the Program Years equals (Line 40/ 2 years) x (50% Ratio).

(i)   Variable Costs for Program Years 1999 and 2000 derived from Compaq.

(j)   Exhibit E, One Time Cost equals (Line 18) x (20% Ratio), Variable Costs for Program Years 1999 and 2000 derived from Compaq.

(k)   Exhibit F, Year 1999 equals (10 sites x Sum of Lines 2 thru 8 for Unit Costs), Year 2000 equals (7 sites x Sum of Lines 2 thru 8 for Unit Costs).

(l)   Exhibit F, Year 1999 equals ($5,200 service fee per month x 12 months x 10 sites) + ($2,000 installation fee per site x 10 sites) + (Print Site Installation/Support of $56,250),

Year 2000 equals ($5,200 service fee per month x 12 months x 17 sites) + ($2,000 installation fee per site x 7 sites) +(Print Site Installation/Support of $25,000).