USPS LR-J-157

ADDITIONAL
REMOTE COMPUTER READ (RCR)
DECISION ANALYSIS REQUESTS

INTRODUCTION

Library reference USPS LR-J-157 is a category 4 library reference being filed in response to MMA/USPS-T22-4(E2).

REMOTE COMPUTER READING

ENGINEERING AND TECHNICAL SUPPORT DEPARTMENT

OCTOBER 1991

BOARD OF GOVERNORS

Request for
Additional Funding for

REMOTE COMPUTER READING

Engineering and Technical Support Department

October 1991

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REMOTE COMPUTER READING

REMOTE COMPUTER READING

EXECUTIVE SUMMARY

Board of Governors approval for $21.0 million in expense funding is requested for developmental efforts in Remote Computer Reading (RCR). This is the continuation of a previous task to competitively develop, test, and evaluate technologies to automatically read handwriting and poor machine print which the MLOCR cannot read. RCR is a component of the Remote Bar Coding System (RBCS). The result of this task will be the competitive selection of an RCR unit that can be deployed in an RBCS production environment.

To meet the 1995 automation goal, the U.S. Postal Service must continue to increase the amount of bar-coded mailpieces while lowering labor costs. RCR provides the potential to reduce the number of RBCS encoding operators by utilizing more cost effective electronic means to determine ZIP+4 codes (and Delivery Point Bar Codes) for mailpieces which the MLOCR cannot read.

BACKGROUND

The U.S. Postal Service developed the Remote Bar Coding System (RBCS) to automate the processing of letter mail that is currently rejected from the Multiline Optical Character Readers (MLOCRs). As now developed, the RBCS receives images of rejected mailpieces from MLOCRs and uses operator key entry of the address to determine the appropriate delivery point information. In the future, images from Advanced Facer Cancellers (AFCs) will be transmitted in the same manner. To reduce the labor required in the key entry effort, the U.S. Postal Service requires RCR equipment to automatically determine delivery point codes for images in the RBCS image

stream. In this effort, computers are used to aid in processing electronic images instead of relying entirely on operators.

Electronic images of non-MLOCR readable mail will be lifted at the MLOCR and AFCS. All lifted images will then be processed by RCR. With RCR, delivery point codes for electronic images of mailpieces are determined by computer, rather than by operators using video terminals. Although the MLOCR and RCR both use computers to determine delivery point codes, the MLOCR is designed to reject letters it cannot read within about 180 milliseconds.

RCR uses algorithms different from those in an MLOCR that are more attuned to reading handwritten addresses or degraded print. Cycling images through the "off line" RCR system will take advantage of these different algorithms and processing times and will result in reading at least 25% to 50% of the mailpieces in the RBCS image stream. Ultimately, RCR will also read images lifted by the AFCS.

Resolution of the delivery point code resulting from the RCR process will be returned directly to the RBCS, where it will then be reunited with the appropriate mailpiece at the bar code sorter. Those images that RCR cannot resolve will be sent to video encoding terminals for resolution by operators.

Pictorial overviews of RBCS and RCR are shown in Figures 1 and 2, respectively.

APPROACH

The probability of success for this technical approach is high. The capability to automatically perform basic character recognition on

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handwritten and poor-quality machine-printed images already exists in private industry.

As stated in the February 1990 Decision Analysis Report (DAR) for Phase I of the Automated System, our initial estimate of the cost to develop RCR was $6.0 million. Our efforts to develop on a fast track basis have raised the actual funding requirement to $8.3 million.

It is now time to integrate this technology into our automated equipment. This will be done by competitively seeking companies to provide operational prototypes for evaluation and production acquisition. The cost of this continued development and evaluation effort is projected to be $21.0 million.

Based on past experience, the cost of this integration effort and increased competition should be more than offset by a reduction in the acquisition cost of the production equipment.

The RCR development effort has been divided into two groups: Limited Competition and Full Competition. Limited Competition is designed to enable RCR technology to be deployed starting the summer of 1993. We will be evaluating Limited Competition units in the fall of 1992.

The Full Competition effort is designed to provide a longer development cycle to take advantage of emerging technologies and ensure greater competition for future RCR buys. The products of the Full Competition effort will be evaluated in the summer of 1993 and will be deployed in early 1994.

The combined estimated cost of both efforts is $29.3 million, which includes $8.3 million committed to date.

Multiple developmental contracts were awarded to companies for each RCR effort. Each company must demonstrate the ability to take electronic images

of non-MLOCR readable mailpieces and electronically determine their appropriate ZIP or ZIP+4 bar codes. Each effort consists of four phases. The first phase consists of a demonstration of the effectiveness of their technology in reading letter mail addresses. In the second phase, a benchmark is developed in order to judge the quality of the design. The third phase is the development and test of a prototype system. The prototype will then be integrated into the existing RBCS in the fourth phase.

WORK ACCOMPLISHED TO DATE

Three companies were selected to participate in the initial RCR development effort: AEG, TRW Financial Systems, and Westinghouse. During the spring of 1991, after the initial assessment period, only TRW and AEG showed enough progress to continue their developmental efforts. TRW is continuing Limited Competition efforts, while AEG is continuing under the Full Competition effort. We are reviewing proposals by other Full Competition participants who desire to move up to the Limited Competition effort.

RCR performance tests to date show that of the printed mail rejected by the MLOCR, RCR resolved over 50% to ZIP+4. It also resolved over 35% of the handwritten mailpieces to the 5-digit ZIP level. Analysis of these results showed the potential for achieving higher ZIP+4 resolution rates with further developmental efforts. In addition, industry experts predict that the handwriting recognition capability will improve significantly in the next few years.

Fourteen vendors of RCR technology are pursuing either the Limited Competition or the Full Competition effort. For the Full Competition effort, contracts have been awarded for a ninety day technological

assessment. Each contractor will propose appropriate equipment and technology to meet or exceed the minimum required performance. (Minimum performance is 65% of non-MLOCR readable machine printed mail and 45% of handwritten mail read to at least the 5 digit level.) It is the contractor's responsibility to select the technical strategy that optimizes his performance, consistent with the U.S. Postal Service specified requirements. The contractor's performance will be competitively ranked on the basis of a performance model. Those firms with the best potential for meeting our requirements will be asked to provide an integrated RCR system for evaluation.

BENEFITS AND SAVINGS

RCR offers the potential to process a large percentage of machinable but non-MLOCR readable letter mail in the automated mailstream without use of labor-intensive operator keying. If we assume an average of only 25% accept rate for RCR and a labor cost of $13.89 per hour, a national RBCS system will yield savings of $100 million per year. The benefits of RCR will include:

- o Reduced labor cost for manual key entry
- o Reduced facilities cost associated with key entry labor and staff
- o Reduced cost for telecommunication of images to the off-site encoding facility.

FUNDS REQUESTED

Efforts associated with continuing the existing RCR work are projected to cost $21.0 million. This includes a contingency of $1.3 million to cover

unexpected variances in costs. The following table shows the breakout of the funds needed:

	Expense ($ Millions)
Limited Competition RCR	7.4
Full Competition RCR	12.3
Contingency	1.3
TOTAL	$21.0

WORK TO BE DONE

The U.S. Postal Service has laid the groundwork to develop and test a Remote Computer Reading subsystem for the Remote Bar Coding System. The next step is to develop and evaluate RCR under live operating conditions, thus positioning us to expeditiously pursue a production effort.

SCHEDULE

Our schedule calls for the completion and test of the Limited Competition RCRs in the Fall of 1992 and Full Competition completion in the summer of 1993. A detailed schedule follows:

Milestone	Limited Competition	Full Competition
Issue Solicitation	March 1991	March 1991
Award Phase 1 Contracts	April 1991	June 1991
Complete Phase 1	September 1991	September 1991
Board Approval	October 1991	October 1991
Start Phase 2	October 1991	October 1991
Complete Phase 2	October 1992	June 1993
Deploy Production Units	June 1993	March 1994

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CONSIDERATION OF ALTERNATIVES

The alternative to RCR is to use operators for keyboard entry of addresses from all mailpieces that enter the Remote Bar Coding System. When the RBCS concept was initially developed, it was anticipated that some form of electronic recognition of mailpiece addresses would eventually be employed to offset the high cost of operator key entry.

RCR is a viable alternative to key entry. It provides an additional automated method of resolving addresses prior to intervention by operators. The success achieved by RCR will influence the number of operators needed to perform the RBCS key entry function.

CONCLUSION

Preliminary tests with industry have shown that, although not in a configuration for Postal application, the RCR hardware is currently available as commercial off-the-shelf equipment. A combined machine print and handwritten read rate of 40% has already been demonstrated.

The use of Remote Computer Reading provides the opportunity for even greater efficiencies in bar coding letter mail. Although not a current part of this effort, features inherent in this system can also be applied to other types of mail.

RECOMMENDATION

Remote Bar Coding System is the most promising approach available to incorporate non-MLOCR readable mail into the automated system. Combining RBCS with Remote Computer Reading adds even greater flexibility and potential. The combined system offers savings potential exceeding $100 million per year.

Therefore, it is recommended that $21.0 million be approved for the continued development, integration, and testing of Remote Computer Reading.

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REMOTE BAR CODING SYSTEM + RCR

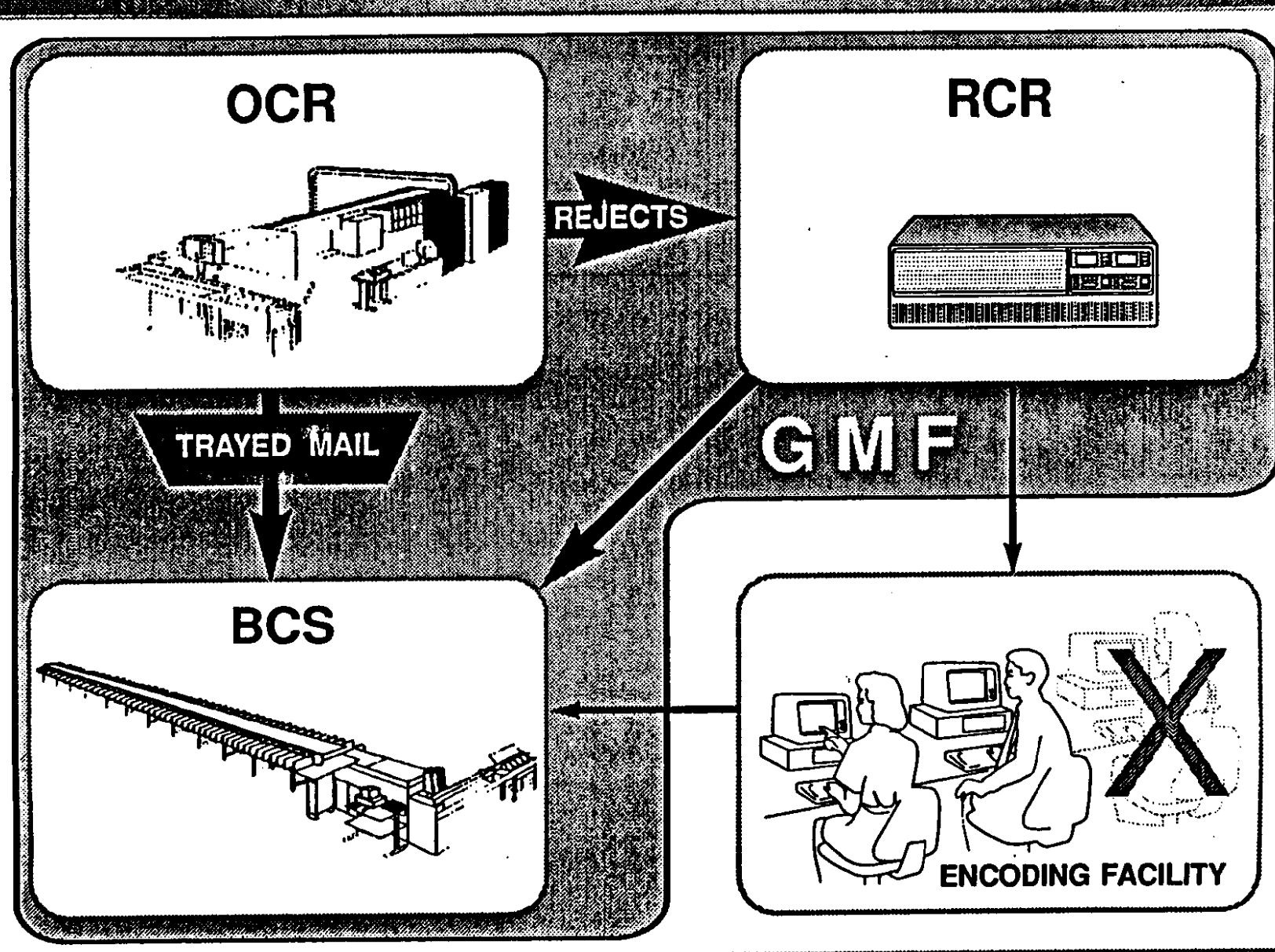

FIGURE 1

DESCRIPTION OF RCR

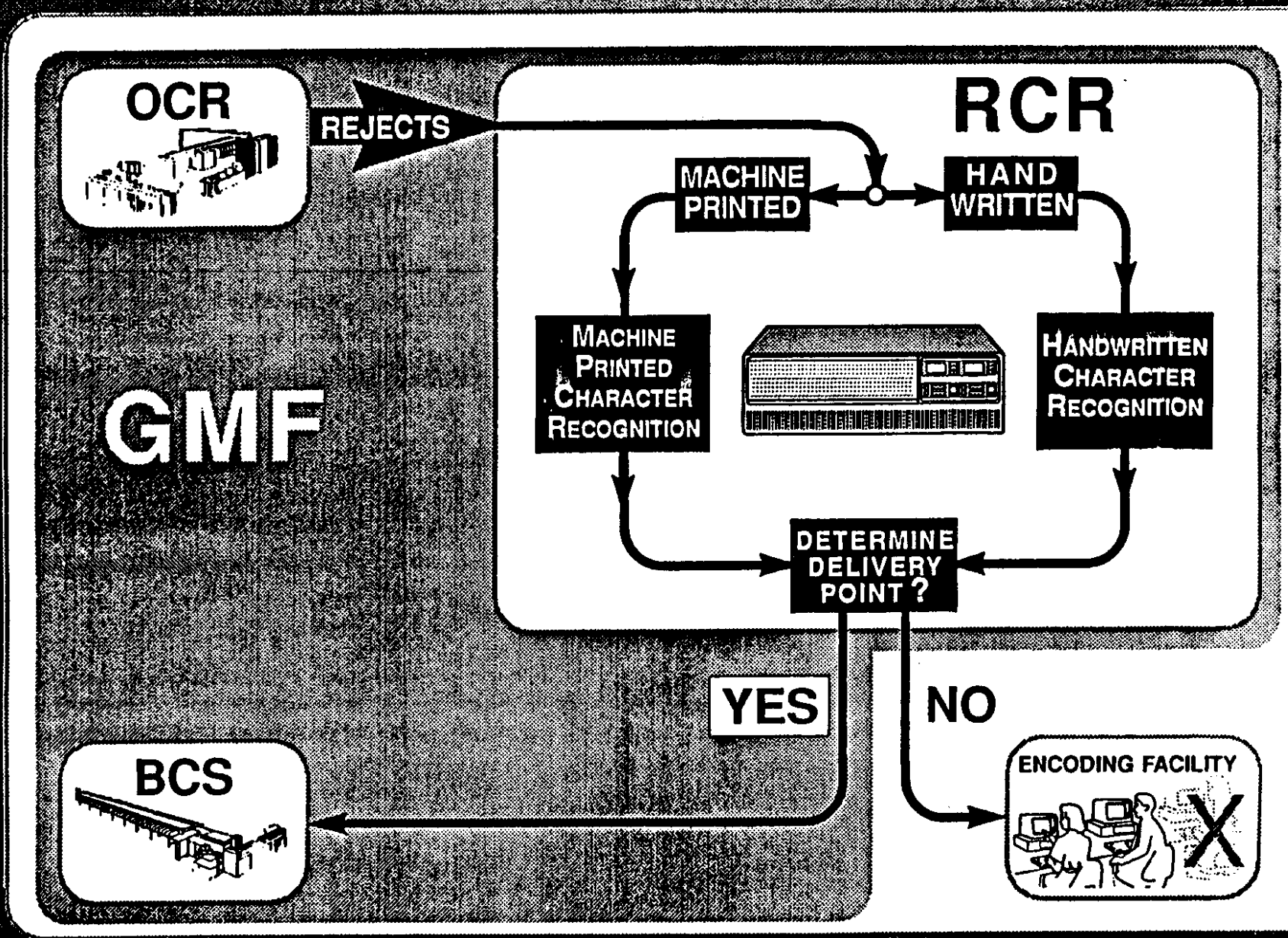

FIGURE 2

RESTRICTED INFORMATION

ADDITIONAL 22 RBCS SITES

DECISION ANALYSIS REPORT

OPERATIONS SUPPORT

NOVEMBER 24, 1992

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22 ADDITIONAL REMOTE BAR CODE SYSTEMS

EXECUTIVE SUMMARY

The Phase I Bar Coding Automation program, approved by the Board of Governors in 1990, set forth a multi-phased plan to further automate processing and reduce postal costs through the use of bar codes. The deployment of equipment authorized in Phase I will be completed in April 1993.

Phase II of the Bar Coding Automation program was approved by the Headquarters Capital Investment Committee in April 1992. This project, with an investment of $1.6 billion, proposed the purchase of 2,188 Delivery Bar Code Sorters, 2,749 Wide Area Bar Code Reader Upgrades, and 120 Remote Bar Coding Systems (RBCSs). The RBCS plan consisted of two encoding methods: Remote Video Encoding, which utilized contract labor and Remote Computer Reading, which would allow computer resolution of addresses, instead of manual encoding.

After further extensive review by senior management, it was determined that the Phase II program would be further phased, to allow significant issues, including technology changes and the pending arbitration decision on contracting out the Remote Bar Coding System keying, to be resolved. While results from the arbitration decision will not be known for several months, there is a need for bridge funding of the RBCS portion of the Phase II program, in order to maintain a procurement source and ensure that potential savings are not delayed. This document presents the justification for the procurement of 22 additional RBCS systems, to supplement the 25 systems approved in Phase I.

This proposal requests funding of $114.4 million in capital and $.3 million in expense funds for equipment sufficient to expand a limited version of the RBCS to 22 additional sites. The following is a breakdown of this investment (in millions):

	Capital	Expense
160 MLOCR Image Lift Subsystems	$ 66.2	$0.2
22 Image Processing Subsystems	30.1	0
3,008 Keying Terminals	8.5	0
78 Output Processing Subsystems	9.6	0.1
Total	$114.4	$0.3

These 22 systems are justified in context with the overall 268 site RBCS network. Projections show that this total system yields a return on investment (ROI) of 31 percent, using contract labor. The 22 systems shown above, when combined with the other investments necessary to equip the 22 sites and fully support the use of the bar codes generated by the equipment (including additional delivery bar code sorters yet to be approved) produce an ROI of 35.4 percent, with a net present value (NPV) of $453 million.

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JUSTIFICATION

Entire 268 Site RBCS Network

The goal to produce a fully automated letter mailstream is the driving impetus behind our bar coding automation efforts. The ability to automate mail that is not bar coded by customers and cannot be bar coded by MLOCRS can only be achieved by some form of manually intense encoding system. The RBCS is the most efficient system for producing these bar codes. (An explanation of the RBCS system is included in Attachment 1.)

RBCS is the key ingredient for ensuring that the maximum savings from our automation program are realized. It is the discrete event that drives field planning, because it represents the only mechanism capable of generating a rapid build-up of bar coded volumes. This, in turn, promotes earlier activation of automated operations. Moreover, of our three bar coding sources (customers, MLOCRs and RBCSs), the RBCS represents the only internally-controlled portion capable of overcoming the deficiencies of the others. These influences of the RBCS are not easily quantified, and are often overlooked by separate analysis of this system.

We did, however, attempt to isolate the benefits of the RBCS. The finds show that this investment decision rests strongly on contracting out the Remote Video Encoding keying operations. A fully implemented RBCS network, using contract labor, will produce net operational savings of just under $700 million annually beginning in 1997.

22 RBCS Sites

Our ability to contract out this function has been challenged by the union which would perform this work. However, delaying this investment decision until the Spring of 1993 when the arbitration decision is final could jeopardize a timely implementation of RBCS. Slippages to date, as we reexamined the program, have already stretched our major RBCS suppliers to the limit. Without an additional commitment of funds by early December 1992, a major supplier of several key RBCS components plans to cease operating this business. Finding a new supplier and establishing the required production lines could cause schedule delays of 12 months or more.

Moreover, waiting until next spring would also put strong pressure on the Postal Service to re-compete this procurement action. Should this occur, significant additional delays could occur. Therefore, failure to move forward now with a limited buy of RBCS equipment could delay the entire RBCS program and the projected savings would not be achieved as planned.

MINIMIZING RISKS

Preserving Deployment Schedule

This limited buy of 22 additional RBCS systems is being presented now to preserve our deployment schedule, while minimizing risks. By moving forward now, we can keep suppliers in production and be positioned to expand rapidly if a favorable arbitration decision is received in the spring. Risks are reduced by limiting funding to the minimum equipment required to keep production on track.

New Remote Computer Reading Technology

In addition, the RBCS plan included in the Phase II Bar Coding Automation program consisted of two encoding methods: a) contracted out Remote Video Encoding, and b) Remote Computer Reading, which will utilize computers to resolve addresses. Over time, the need for the labor intensive Remote Video Encoding would be reduced and replaced with Remote Computer Reading.

At the time Phase II was originally proposed, the actual performance of Remote Computer Reading had not been demonstrated. However, Remote Computer Reading equipment is now being tested by the Postal Service. If the Remote Computer Reading equipment meets its performance potential, our analysis shows that a remote bar coding system can be economically supported without the remote video encoding function.

Prior to the Board of Governors final decision regarding the investment requested in this Decision Analysis Report, the actual test results for Remote Computer Reading will be known.

If the test equipment demonstrates an acceptable performance level, the majority of the equipment purchased for the 22 additional RBCS sites could be used for Remote Computer Reading. This is especially important if an unfavorable arbitration decision is reached. An in-house keying scenario dramatically changes the economics from the RBCS system. Keying costs double when using postal (in-house) labor, and operating savings are drastically lowered and are insufficient to justify the investment.

Therefore, if the decision is made not to pursue Remote Video Encoding (through an unfavorable arbitration award and a decision not to perform Remote Video Encoding with more costly postal personnel), over 80 percent, or approximately $91 million, of the cost of equipment purchased for the 22 RBCS sites could be utilized in the Remote Computer Reading environment.[1] This further minimizes the risk of this investment.

[1] Of the equipment requested in this proposal, over 80 percent, or approximately $91 million, would be required to operate an RCR-based bar coding system. That equipment residing in the remote keying site (approximately one half of the Image Processing Subsystem - $15.0 million and the keying terminals - $8.5 million) would not be required under an RCR-only system. This equipment could be used as spares for the existing RBCS sites or alternatively sold back to the contractor for some residual value, thereby further limiting the capital at risk.

ECONOMICS

The economic justification for the 22 additional RBCS sites included in this proposal is provided in this section. Since the justification relies on the assumptions and conditions contained in the Phase II DAR analysis, a brief discussion of the entire 268 site network benefits is necessary.

Entire 268 Site RBCS Benefits

The total investment in the 268 site system of $1,667.2 million generates an ROI of 31 percent, with a net present value of $1,154 million.

This return is generally unaffected by moderate changes to keying productivities and the savings capture rate. It is, however, highly sensitive to our ability to use contract labor for the remote keying operation. The cost of this contract labor averages $13.31 per console keying hour, which includes supervision, space, and telecommunications costs. An in-house operation at today's labor rates would double this hourly cost and completely reverse this decision recommendation. Clearly, the RBCS investment decision rests strongly on our ability to contract out RVE keying operations or alternatively drastically lowering our in-house labor costs.

22 Site RBCS Benefits

The equipment required to completely support 22 additional RBCS sites consists of $271 million in total funds, as shown below, and produces a return on investment (ROI) of 35.4 percent. The savings generated from these 22 sites represents approximately 17 percent of the total savings expected from the entire 268 site RBCS network. The ROI for the 22 additional RBCS sites is higher than the ROI for the total 268 site system due to the higher volume concentration in the 22 sites targeted to receive the equipment. As discussed previously, this investment is justifiable only when using the lower costs of contract keying.

Following are summary results of the cash flow analysis shown on page 9 for 22 RBCS sites.

RBCS Investment	$ 114.7 million
Delivery Bar Code Sorters, Remote Computer Reading Equipment and Advance Facer Canceler Input Subsystems	$ 156.0 million
Total Investment (capital & expense)	$ 270.7 million
Operating Variance	$1,479.9 million
Return on Investment	35.4 percent
Net Present Value	$ 453.0 million

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The funding request presented for approval in this DAR seeks authorization for $114.7 million or 46 percent of the above required investment. (Details of the equipment requested and costs are contained on pages 10-12.) This limits funding to only that equipment that is absolutely necessary to initiate RBCS processing at 22 sites and preserves our overall deployment schedule.

Investments totalling $156.0 million in Advance Facer Canceler input subsystems, RCRs and supporting Delivery Bar Code Sorters necessary to obtain the 35.4 percent ROI are not required at this time. It is important to note that should we eventually proceed with contract remote keying operations, this additional equipment will be required to generate the above investment return.

By moving forward with funding in December, we will keep our RBCS deployment schedule on track. All of the equipment requested in this proposal can be deployed prior to the end of 1993. This limited buy of RBCS equipment is sufficiently large enough to keep suppliers involved, and schedules on track, while limiting risk. Next spring, with a favorable arbitration decision, we will be positioned to move forward without a major slippage in the overall deployment schedule.

A list of the 22 sites scheduled to receive the RBCS equipment is presented in Attachment 2.

RCR-based Bar Coding System Benefits

As discussed previously, Remote Computer Reading technology is capable of justifying most of the equipment requested in this proposal, should the decision be made not to pursue Remote Video Encoding. Our estimate of the resulting ROI and NPV are 15.0 percent and $20 million, respectively.

The benefits from this system are derived from the ability of the RCR to encode slightly more than one-half of all images received, 8 percent to delivery point and 44 percent to the 5-digit level.[2] Benefits, however, would be concentrated in mail processing operations, rather than delivery operations, due to the preponderance of 5-digit coded mail. Of course, an acceptable level of accuracy would be required before proceeding with an RCR-based system.[3]

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[2]These estimates are based on the RCR's potential of encoding 65 percent of printed images (35 percent to delivery point and 65 percent to the 5-digit level) and 45 percent of script mail to the 5-digit level. Printed and script images comprise 35 percent and 65 percent, respectively, of all candidate images, respectively.

[3]With manual encoding, the incidence of RCR encoding errors is not as critical because the keying operation can "catch" and correct most RCR mistakes. An RCR-based system lacks this quality control mechanism.

RECOMMENDATION

It is recommended that $114.4 million in capital and $0.3 million in expense funds be approved for investment in RBCS equipment for 22 additional sites.

This proposal will allow us to limit our risk exposure while avoiding major slippages to the RBCS deployment schedule, thereby preserving the full savings potential of this system.

Pending a favorable contracting out arbitration decision early next spring, this equipment can be combined with additional equipment purchases to produce a Return on Investment of 35.4 percent, with a Net Present Value of $453 million.

22 SITES
RBCS4.WK3

BAR CODING AUTOMATION DAR – FIRST 22 SITES OF PHASE II
RBCS ONLY

FY	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	TOTAL
YEAR	0	1	2	3	4	5	6	7	8	9	10	11	12	13	
CAPITAL INVESTMENT															
IPSS SYSTEMS	$0.0	$0.0	$0.0	($27.6)	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	($27.6)
IPSS TERMINALS	$0.0	$0.0	$0.0	($8.3)	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	($8.3)
DBCS	$0.0	$0.0	$0.0	($84.6)	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	($84.6)
AFCS	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
MLOCR	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
MPBCS	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
ISS MLOCR	$0.0	$0.0	$0.0	($84.6)	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	($84.6)
OSS BCS	$0.0	$0.0	$0.0	($9.4)	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	($9.4)
ISS AFCS	$0.0	$0.0	$0.0	($24.1)	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	($24.1)
WABCR & UPGRADE	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
RCR	$0.0	$0.0	$0.0	($33.6)	($5.3)	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	($38.9)
TELECOMM. TEST EQUIP.	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
TOPS SOFTWARE DEVELOP.	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
CONTINGENCY @ 2.5%	$0.0	$0.0	$0.0	($0.3)	($0.1)	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	($0.4)
SITE PREP	$0.0	$0.0	$0.0	($5.2)	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	($5.2)
PRE-ACTIV.(PILOT) SITES	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
TOTAL CAPITAL INVESTMENT	$0.0	$0.0	$0.0	($263.9)	($5.4)	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	($269.3)
TOTAL EXPENSE INVST.	$0.0	$0.0	$0.0	($1.3)	($0.1)	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	($1.4)
OPERATING VARIANCES															
DBCS SPACE COST	$0.0	$0.0	$0.0	($8.7)	($9.1)	($9.6)	($10.1)	($10.6)	($11.1)	($11.7)	($12.2)	($12.8)	($13.5)	($14.2)	($123.7)
RBCS CONTRACT OUT															
RBCS THIRD PARTY MAINT	$0.0	$0.0	$0.0	($20.5)	($12.3)	($12.9)	($13.6)	($14.3)	($15.0)	($15.7)	($16.5)	($17.3)	($18.2)	($19.1)	($175.3)
RBCS KEYING	$0.0	$0.0	$0.0	($27.6)	($77.5)	($81.5)	($85.6)	($90.3)	($94.9)	($99.8)	($104.8)	($109.8)	($115.3)	($121.1)	($1,007.9)
RBCS CONTRACT OUT TOTAL	$0.0	$0.0	$0.0	($48.1)	($89.8)	($94.5)	($99.4)	($104.6)	($109.8)	($115.3)	($121.1)	($127.1)	($133.5)	($140.2)	($1,183.2)
OPERATIONAL SAVINGS															
MAIL PROC LEVEL 4	$0.0	$0.0	$0.0	$0.0	($35.0)	($37.3)	($39.3)	($41.3)	($43.4)	($45.6)	($47.8)	($50.2)	($52.8)	($55.4)	($446.1)
MPLSM CLERKS	$0.0	$0.0	$0.0	$0.0	$86.3	$102.6	$108.0	$113.7	$119.3	$125.3	$131.6	$138.1	$146.1	$152.3	$1,232.2
MANUAL CLERK	$0.0	$0.0	$0.0	$0.0	$91.3	$97.2	$102.3	$107.7	$113.1	$118.8	$124.7	$130.9	$137.5	$144.4	$1,166.0
CARRIER	$0.0	$0.0	$0.0	$0.0	$69.0	$73.4	$77.3	$81.4	$85.4	$89.7	$94.2	$98.8	$103.8	$108.1	$882.3
TOTAL	$0.0	$0.0	$0.0	$0.0	$221.5	$235.9	$248.4	$261.4	$274.5	$288.2	$302.6	$317.8	$333.6	$350.3	$2,834.3
OPERATIONAL SUPPORT															
MAINTENANCE LABOR	$0.0	$0.0	$0.0	($6.1)	($7.1)	($6.5)	($7.8)	($8.2)	($8.6)	($9.1)	($9.5)	($10.0)	($10.5)	($11.0)	($96.6)
RECURRING SITE SPARES	$0.0	$0.0	$0.0	$0.0	($6.4)	($6.6)	($6.8)	($6.9)	($7.3)	($7.6)	($8.0)	($8.4)	($8.8)	($9.3)	($75.8)
RECURRING DEPOT SPARES	$0.0	$0.0	$0.0	$0.0	($0.5)	($0.6)	($0.6)	($0.6)	($0.6)	($0.7)	($0.7)	($0.7)	($0.8)	($0.8)	($6.6)
TRAINING	$0.0	$0.0	$0.0	($1.3)	($2.6)	($1.1)	($0.6)	($0.6)	($0.9)	($0.9)	($1.0)	($1.0)	($1.1)	($1.1)	($12.7)
RECUR. TDP & DOCUMENTATION	$0.0	$0.0	$0.0	($0.2)	($0.2)	($0.2)	($0.3)	($0.3)	($0.3)	($0.3)	($0.3)	($0.3)	($0.3)	($0.4)	($3.1)
MPLSM MAINT. LABOR REDUCT.	$0.0	$0.0	$0.0	$3.0	$3.2	$3.4	$3.5	$3.7	$3.9	$4.1	$4.3	$4.5	$4.7	$5.0	$43.2
MPLSM MAINT. PARTS REDUCT.	$0.0	$0.0	$0.0	$0.3	$0.6	$1.2	$1.2	$1.3	$1.3	$1.4	$1.5	$1.6	$1.6	$1.7	$13.9
NET OPERATIONAL SUPPORT	$0.0	$0.0	$0.0	($9.4)	($12.9)	($12.5)	($11.3)	($11.9)	($12.5)	($13.1)	($13.7)	($14.4)	($15.2)	($15.9)	($139.7)
OTHER															
UTILITIES	$0.0	$0.0	$0.0	($0.4)	($0.4)	($0.4)	($0.5)	($0.5)	($0.5)	($0.5)	($0.6)	($0.6)	($0.6)	($0.7)	($5.6)
ERROR REDUCTION SAVINGS	$0.0	$0.0	$0.0	$0.0	$9.1	$13.7	$16.7	$19.6	$20.6	$21.6	$22.7	$23.9	$25.0	$26.3	$201.3
SCHEME TRAINING SAVINGS	$0.0	$0.0	$0.0	$0.0	$0.4	$0.4	$0.5	$0.5	$0.5	$0.5	$0.6	$0.6	$0.6	$0.7	$5.4
SYS ENG/DIR & SOFTWARE SUPP	$0.0	$0.0	$0.0	($2.6)	($2.7)	($2.9)	($3.0)	($3.2)	($3.3)	($3.5)	($3.6)	($3.8)	($4.0)	($4.2)	($36.6)
TRANS. COMP. IMPACT	$0.0	$0.0	$0.0	$0.0	($56.5)	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	($56.5)
RECURRING WHITE LABELS	$0.0	$0.0	$0.0	($0.4)	($1.0)	($1.3)	($1.3)	($1.4)	($1.5)	($1.5)	($1.6)	($1.7)	($1.8)	($1.9)	($15.4)
OTHER	$0.0	$0.0	$0.0	($3.5)	($51.1)	$9.6	$14.4	$15.1	$15.8	$16.6	$17.5	$18.3	$19.2	$20.2	$92.2
TOTAL VARIANCES	$0.0	$0.0	$0.0	($66.6)	$58.6	$129.0	$141.9	$149.5	$156.9	$164.6	$173.0	$181.7	$190.8	$200.3	$1,479.9
NET CASH FLOW	$0.0	$0.0	$0.0	($331.9)	$53.2	$129.0	$141.9	$149.5	$156.9	$164.6	$173.0	$181.7	$190.8	$200.3	$1,209.2

ROI = 35.4% NPV = $453

INVESTMENTS FOR THE FIRST 22 SITES OF THE PHASE II BAR CODING AUTOMATION DAR RBCS ONLY

LINE ITEM DESCRIPTIONS

CAPITAL INVESTMENTS

IPSS SYSTEMS
This represents the capital costs associated with the manufacture, delivery, initial site spares, initial maintenance and supervisor training, documentation and installation of 22 RBCS sites. The total capital investment for the item is $27.8 million based on a unit cost of $621,920 per system plus $14.1 million for initial spares, maintenance and supervisor training and documentation.

IPSS TERMINALS
This represents the capital costs associated with the manufacture, delivery and installation of the 3,008 video display terminals (VDT) required as part of the RBCS for the 22 sites. The total capital investment for this item is $8.3 million based on a unit cost of $2,764 per terminal.

DBCS- This line item includes capital costs associated with the manufacture, delivery, initial site spares, initial maintenance and operator training, documentation and installation of 235 DBCSs required to support the RBCS in the 22 sites. The total capital investment for this item is $84.6 million based on a unit cost of $320,098 per DBCS which includes $15,000 for racks for each DBCS and the Total Organization Productivity System (TOPS) which is the operator maintenance system. The total capital investment also includes $9.5 million for initial spares, training and documentation.

ISS MLOCR
This item includes all capital costs associated with the manufacture, delivery, initial site spares, initial maintenance training, documentation and installation of input subsystem modifications on 160 MLOCRs. This will provide the capability to capture a video image of all non-readable addresses. The total capital investment for this item of $64.6 million is based on a cost of $117,000 per part B MLOCR and $549,455 per Part A MLOCR modification. The additional costs for the Part A MLOCRs includes software modifications to improve the Part A MLOCR read rates. This includes a new MicroVAX computer, 2 Intel 386/2 computers, and 1 Intel 32M byte memory board for each Part A MLOCR to accommodate the ISS modification. The total capital investment also includes $3.0 million for initial spares, training and documentation.

OSS BCS
This line item includes capital cost associated with the manufacture, delivery, initial site spares, and installation of an output subsystem modification on 78 BCSs to provide the capability for the BCS to communicate with the remote bar coding computer system and to spray a bar code on each mail piece. The total capital investment for this item of $9.4 million is based on a cost of $65,297 per BCS modification. The cost of letter mail labeling machines (LMLM) of $162,500 per site is also included in the capital investment. The LMLMs attach blank white labels to letters that will not accept a bar code. This enables a bar code to be sprayed and read on these pieces thereby increasing the amount of mail that can be processed in the automated mail stream. The total capital investment also includes $.8 million for initial spares, training and documentation.

ISS AFCS- This includes capital cost associated with the manufacture, delivery, initial site spares, initial maintenance training, documentation and installation of an input subsystem on each of the 141 Advanced Facer Canceler Systems in the 22 sites to provide the capability to capture a video image of non-OCR readable addresses and to transmit the images to the remote bar coding computer system. The total capital investment for this item is $24.1 million based on a unit cost of $160,000 per AFCS modification plus 1.5 million for initial spares, training and documentation.

RCR- This line item includes capital costs associated with the manufacture, delivery, initial site spares, initial maintenance training, documentation and installation of 120 remote computer reading units. The total capital investment is $38.9 million based upon a unit cost of $300,000 per RCR plus $2.9 million for initial spares, training and documentation.

CONTINGENCY- Capital contingency is calculated at 2.5% of the capital costs for the new hardware and equipment modifications above and is included to accommodate unanticipated changes in projected costs or program requirements. Total capital contingency funding is estimated at $6.4 million.

SITE PREP- Funding in the amount of $5.2 million is provided to prepare sites for the installation of the equipment and the equipment modifications described above. This item includes funding for costs associated with installation of additional electrical power, changes in facility layouts, modifications to interior space, etc.

EXPENSE INVESTMENTS

DBCS- This line item includes expense costs for depot spares. Total funding for this item $.6 million.

ISS MLOCR- This represents expense costs for depot spares. Total funding for this item is $.2 million.

OSS BCS- This represents expense costs for depot spares. Total funding for this item is $.1 million.

ISS AFCS- This line item includes expense costs for depot spares. Total funding for this item is $.1 million.

RCR- This line item includes expense costs for depot spares. Total funding for this item is $.4 million.

OPERATING VARIANCES

DBCS SPACE COST- This line item represents the leasing cost for 235 DBCSs. This cost is based upon 2,000 square feet required for each DBCS at $16.00 per square foot escalated at 5% annually beginning 1991.

RBCS CONTRACT OUT- These line items represent the cost of contracting out the remote keying portion of the remote bar coding system.

NON-RECURRING THIRD PARTY MAINTENANCE represents the maintenance start-up cost for the remote sites.

RECURRING THIRD PARTY MAINTENANCE represents the annual maintenance costs for the remote sites.

KEYING represents the costs of keying at the remote sites.

OPERATIONAL SAVINGS

Labor savings are based on the differential cost of operating the MLOCR and BCS network compared to the operating cost of operating a remote bar coding system deployed to the 22 sites in this proposal. The remote bar coding system will generate a greater amount of bar coded mail that can be distributed on automation instead of labor-intensive MPLSMs and manual cases. The savings also includes the savings in carrier casing time based upon walk-sequencing (Advanced Bar Coding - ABC) for 1994 and beyond. In addition, this analysis includes the carrier savings associated with carrier route costs that are eliminated as a result of routes being abolished. This proposal will reduce the number of carrier letter routes that would otherwise be required by a minimum of 10 percent. These carrier route savings are claimed beginning 1995. The carrier operational savings are lagged six months, while the mail processing savings are lagged four months based upon equipment deployment. The analysis also assumes a

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carrier casing capture rate of 95 percent beginning in 1995. These line items also represent the net supervisor cost/savings required to operate the proposed system and is based upon the following supervisor/employee ratios:

Mail Processor - Automated Equipment	- 1 to 7
Manual Distribution Clerks	- 1 to 20
MPLSM Distribution Clerks	- 1 to 20

No credit was taken for carrier supervision since the majority of carrier supervisors are located in delivery units that would still require a supervisor.

OPERATIONAL SUPPORT- The costs in these line items includes maintenance labor, recurring spares, recurring training, recurring technical documentation, MPLSM maintenance labor savings, and MPLSM maintenance parts savings. Each sub-item is described below:

Maintenance Labor. This item covers the annual cost of the maintenance labor required to keep each equipment type in this proposal operational and in service. This item also includes the cost of baselining equipment to prepare for the ISS and OSS modifications and the cost of relocating floater MLOCRs necessary to complete ISS modifications. The costs of additional maintenance supervisors is also included in the line.

Recurring Site Spares. This line item covers the annual costs of site spare replacement parts required to keep the equipment included in this proposal operational and in service.

Recurring Depot Spares. This line item covers the annual costs of depot spare replacement parts required to keep the equipment included in this proposal operational and in service.

Training. This line item covers the annual recurring training costs due to turnover in personnel for all of the equipment included in this proposal in addition to initial training to be performed by postal service training personnel. This includes training for maintenance technicians, operators and supervisors.

Recurring TDP and Documentation. This line includes the recurring cost of technical documentation packages for all equipment included in this proposal.

MPLSM Maintenance Labor. This request will result in more mail being processed on automation and fewer MPLSMs to process mail in automated sites. This item represents savings in the maintenance technician labor required to keep the fewer MPLSMs operational and in service.

MPLSM Maintenance Parts. This represents the annual cost avoidance of the spare parts required to keep the fewer MPLSMs operational and in service.

OTHER. These line items represent the following:

Utility Costs
This line includes utility costs associated with additional automated equipment and the reduction in MPLSMs.

Error Reduction Savings
This line represents the savings that will result from the decrease in errors in an automated vs mechanized/manual environment. Automation is projected to reduce distribution errors by 2.5% vs. present MPLSM and manual operations.

Scheme Training
Significant build up in bar coded volume and the deployment of RBCS will result in the elimination of practically all scheme training. This line represents these savings.

Systems Engineers, Directory and Software Support
Three systems engineers will be required in each division to monitor and provide divisional support for the Barcoding Automation Program. In addition 1 position for every 8 DBCSs will be required to provide directory support to develop and implement sort schemes for DBCSs. This line item also includes the headquarters and field costs for RBCS contracts administration.

Transitional Complement Impact
The work hour savings potential from our automation efforts present special challenges for ensuring that they are fully realized. This line item accounts for possible short-term complement adjustment problems.

Recurring White Labels
The recurring annual cost of white labels for the white label machines is included in this line based upon projected volume that will require white labels as stated in the OSS/BCS capital investment line item description.

REMOTE BAR CODING SYSTEM

The Remote Bar Coding System (RBCS) is designed to bar code that mail which an MLOCR does not encode at all, or cannot bar code beyond five digits. There are five components that make up this system:

1) Input Subsystem;
2) Remote Computer Reading;
3) Remote Video Encoding;
4) Output Subsystem; and
5) Image Processing Subsystem

Input Subsystem. Video images of non-OCR readable mail will be lifted at the MLOCR or advanced facer canceler system. The technology used to perform this task is referred to as the input subsystem. Letters will be marked on their reverse side with a unique identification bar code and set aside.

Remote Computer Reading (RCR). All lifted images will next be processed by remote computer reading technology. The RCR can be viewed as an off-line optical character reader that electronically attempts to encode mail pieces. The process is somewhat slower than on-line MLOCR systems and uses different types of processes or algorithms to encode mail pieces. It is estimated that RCR encoding will reduce the remote video keying workload by approximately 25 percent.

Remote Video Encoding (RVE). This system provides the means to encode fully those pieces not completely encoded by RCR. This process involves data entry personnel who manually type in address information from projected images.

Output Subsystem. After all images have been processed, mail pieces can be fed to a bar code sorter equipped with an output subsystem which reads the identification code placed on each piece and sprays a bar code representing the address information obtained during the RCR or video encoding process.

Image Processing Subsystem. The system used to tie the above processes together is called the image processing subsystem.

A keyless remote bar coding system would eliminate the labor intensive RVE operation. However, the pieces bar coded during the output subsystem operation would consist only of those encoded by the RCR. Depending upon the level of encoding achieved by the RCR, investment in this scaled down remote bar coding system may be economically justifiable. And, since the majority of the equipment requested in this proposal would be required to operate such a system, the amount of investment exposed to the arbitration decision risk would be minimized.

22 RBCS SITES

KANSAS CITY MO
WESTERN NASSAU NY
PHILADELPHIA PA GMF
SEATTLE WA
ORLANDO FL
OMAHA NE
BOSTON MA
LOUISVILLE KY
PORTLAND OR
ATLANTA GA
NEWARK NJ
MILWAUKEE WI
CLEVELAND OH
LONG BEACH CA
HOUSTON TX
DOMINIC V DANIELS (NO JERSEY)
DETROIT MI
BALTIMORE MD
SALT LAKE CITY UT
DALLAS TX
ROCHESTER NY
SUBURBAN MARYLAND MD

UNITED STATES POSTAL SERVICE.

Decision Analysis Report

FOR

29 REMOTE COMPUTER READERS

ENGINEERING

RESTRICTED INFORMATION

October 7, 1994

DECISION ANALYSIS REPORT
29 REMOTE COMPUTER READERS
ENGINEERING

October 7, 1994

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EXECUTIVE SUMMARY

Introduction

This decision analysis report provides justification for the procurement of 29 remote computer readers (RCR's); twenty-five are to be deployed at the first 25 Remote Bar Coding System (RBCS) sites; three are for training; and one is for Engineering use in further research and development.

The primary benefit of the RCR is that it lowers the keying requirements at the remote encoding centers. The RCR is a computer sub-system of the RBCS which provides an automated method of determining bar code information for (1) letters that can not be resolved by the Input Subsystem Multiline Optical Character Readers (ISS-MLOCR's), and (2), script letters from the Input Subsystem Advanced Facer Cancelers (ISS-AFCS's).

In 1990 the Board of Governors approved Phase I of a multi-phased plan to further automate letter mail processing and reduce postal costs through the use of bar codes. At this time funding for RCR's was not requested because the development and testing of RCR's was not yet completed. The deployment of equipment for 25 RBCS sites authorized in Phase I was essentially completed in April 1993. 5.6 billion images a year are now being processed at these RBCS sites.

In 1993, the initial RCR research program was successfully completed, and nine contractors participated in competitive tests. Requests for proposals were issued in January, 1994. It is anticipated that, with Board of Governors approval of the 120 RBCS DAR by November 1994, the deployment of these 29 RCR's will be completed in December, 1995. In the first full year of deployment in 1996 they will save 1.30 million keyer work hours and at least 2.4 million keyer work hours in the following years. See page 8 for deployment details.

RCR Performance

In 1992 and 1993, RCR's from nine contractors were extensively tested. The better units demonstrated, with reject images obtained from the ISS-MLOCR's in Tampa and South Jersey, that they are capable of finalizing at least 14% of those images to the delivery point and provide additional address information on more than 46% of the images. The detailed analysis of 20,000 images out of 500,000 processed by each RCR tested showed

that the RCR's can reduce the keying work load at the remote encoding centers by at least 25%.

Financial Analysis Summary

The required investment and projected five-year operating variance for the proposed 29 RCR's is summarized below. The assumptions made in the analysis are listed in Appendix B.

Capital Investment	$8,963,956
Expense Investment	$456,750
Total Investment	$9,420,706
Operating Variance	$204,642,025
Return on Investment	262.0%
Net Present Value @ 12.5%	$130,208,850

Recommendation

It is recommended that a capital investment of $8,963,956 and an expense investment of $456,750 be approved for the procurement of 29 Remote Computer Readers.

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I. Introduction

This decision analysis report provides justification for 29 Remote Computer Readers (RCR's). Twenty-five RCR's are to be installed at the first 25 Remote Bar Coding System (RBCS) sites; three are to be used for training; and one is for continued research and development at Engineering.

The primary benefit of the RCR is to reduce the keying requirements at remote encoding centers by providing an additional automated method of resolving addresses. The RCR is a computer system which takes video images of letter mail addresses from two sources: (1) images that can not be fully resolved by the ISS-MLOCR's, and (2), script images from the ISS-AFCS. The RCR applies recognition algorithms to read the address of each image, and, by accessing the national address directory with the address information it acquires from the image, determines all or a portion of the delivery bar code. See Figure 1, page 4.

In the RBCS of today without the RCR, images of mail pieces that are not fully bar coded to delivery point by the ISS-MLOCR's are presented on video screens to operators at remote encoding centers. The operators manually enter address data from the image into a computer which allows the system to determine the correct delivery bar code. The bar code information is temporarily stored in a Decision Storage System and is then sent to the Output Subsystem Bar code Sorter (OSS-BCS) where the bar code is matched to the physical mail piece and printed on the letter. All sortations from this point on can be accomplished with reference to the bar code that has been applied to the letter.

In the RBCS with RCR, images that are not fully resolved by the ISS-MLOCR, and script images from the Input Subsystem Advanced Facer Canceler (ISS-AFCS), are first transmitted to the RCR for resolution. The RCR has more success with these images than the ISS-MLOCR because of two factors: a longer processing time and different processing algorithms. The RCR is not forced to process images at the high speed of ISS-MLOCR's. In addition, the RCR is designed to use algorithms which specialize in script and difficult-to-read images. The RCR can resolve some images to the delivery point; these are sent to the Output Subsystem Bar code Sorter (OSS-BCS) for further processing and sorting. The RCR can partially resolve others; these, along with the images it can not resolve at all, are sent to the remote encoding center for manual encoding. Thus, the RCR provides two mechanisms for reducing keying costs: (1) for about 15% of the images it can resolve and finalize the bar code, thereby completely

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eliminating the need for any manual address keying at the remote encoding center, and (2), for about 46% of the images it can read a portion of the image address, thereby reducing the manual keying required for these images at the remote encoding center. These two effects together can reduce the keying workload at the remote encoding center by more than 25%.

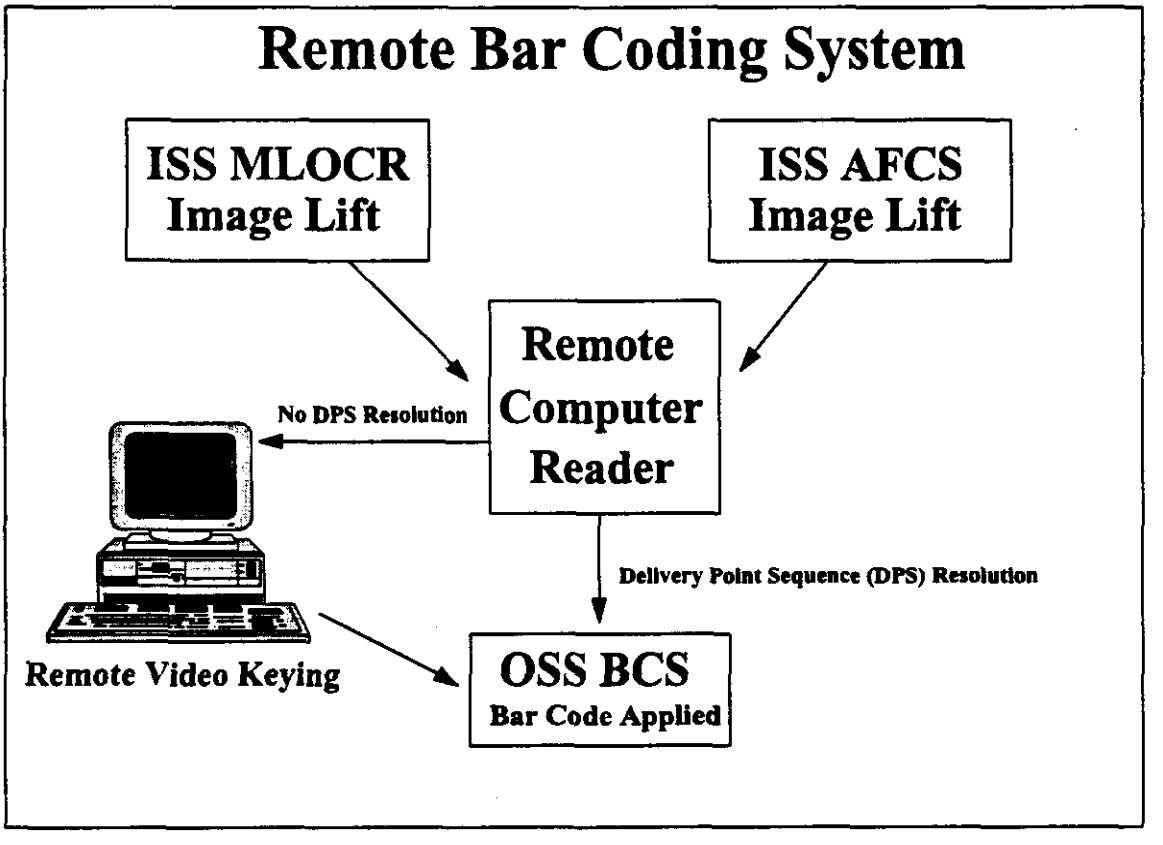

Figure 1

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II. Background

Since 1990 the goal of the Postal Service has been to develop a national network of equipment that would lead eventually to having virtually all letter mail bar coded. In 1990 as part of Phase I of the Bar Coding Automation Program, the Board of Governors approved funding for the first 25 RBCS sites. Funding for RCR's was not requested at this time because their development and testing was not yet complete. The deployment of the equipment approved for the 25 sites was essentially completed in April 1993.

The first 25 RBCS sites were implemented using contract labor, a step which was challenged by the American Postal Workers Union (APWU). The issue went to arbitration for resolution. In May 1993, the arbitrator handed down a decision. In accordance with this decision the APWU and Postal Service came to an agreement and signed a memorandum of understanding in November 1993 which made it possible for the Postal Service to continue RBCS deployment with Postal Service employees. Management is now in the process of implementing the agreement by obtaining offsite keying locations and converting the first 25 sites to operate with Postal Service employees. In accordance with the agreement, all 25 sites must be converted by the end of 1996.

In 1993 the initial research effort toward developing RCR's was successfully completed. It culminated in competitive tests in which nine contractors participated: ELSAG, TRW, Bell & Howell, IBM, CGA, Westinghouse, AEG, Hughes, and AT&T. The RCR performance goals set for the program were met by most of the contractors. Requests for proposals to produce operational units were issued in January, 1994; responses were received in April 1994. The first RCR's can be deployed nine months after a contract is awarded.

III. Economic Analysis

A. Methodology

The economic justification for the 29 RCR's is given in this section. A discounted cash flow analysis was done to derive the return on investment and the net present value of the proposal. The savings were derived by using the RCR test results from the competing contractors' tests conducted in 1992-93 in combination with simulation models designed to compute the cost of keying images. Work-hour savings are based on the difference in RBCS operations with and without RCR's. Detailed assumptions used in these calculations are shown in Appendix B. The resulting cash flow is shown on page 11.

B. RCR Requirements

A total of 29 RCR's are included in this proposal. Since the RCR is specified with a throughput capacity which will allow one RCR to meet the peak volume requirements at any of the 25 RBCS sites in the full-up network, and the prospect of extended RCR downtime is not considered to be a problem, only 25 RCR's are required for the 25 operating sites. An additional three RCR's are needed to conduct maintenance training. One RCR is required at Engineering to continue research into better character-recognition techniques.

C. Savings

Within 15 months after contract award all 25 operational RCR's will be fully deployed. By 1997 these RCR's will be saving 2.4 million work hours worth $42.7 million per year. The potential savings of the RCR depends primarily on (1) the volume that must be keyed without the RCR, (2) the RCR performance, (3) the keyer productivity, (4) the keyer labor rates, and (5), the RCR deployment schedule. These items are discussed in the following paragraphs.

Volume

By April, 1994, our first 25 RBCS sites were processing mail at a rate of 5.6 billion letter-images per year. This includes both mail that is originating and destinating from other sites. It is anticipated that the unbarcoded destinating mail volume will decrease as more RBCS sites come on line and more of the mail in the automation network is bar coded at the origin. On the other hand, the originating RBCS volume will increase as a

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result of normal mail volume growth, and will also increase as the additional ISS-AFCS's and ISS-MLOCR's, yet to be purchased, are deployed at the 25 sites. In balance, we expect that there will be some increase in the RBCS volume during the economic life of the RCR's. In order to be conservative, the address image workload in this analysis is fixed at 1994 levels.

RCR Performance

The projected RCR performance assumed in the analysis was based on the competitive tests conducted by the Postal Service. In these tests, the better RCR's were able to read more than 14% of the images to the delivery point and provide additional address information on more than 46% of the remaining images. Those images that the RCR reads to the delivery point will avoid all keying operations. For those images for which the RCR is able to read only a part of the address, the keying work load is reduced. For example, if the RCR reads only the 5 digit ZIP code of an address, this information will not have to be keyed at the remote encoding center. In the competitive tests, the RCR's were presented with 500,000 images to resolve, two thirds of them script-addressed. 20,000 images randomly selected out of the 500,000 images were scored in detail. An image-by-image analysis of the required keying tasks for these images, with and without RCR, showed that the RCR would reduce the overall direct keying work-hours by at least 25%. By 1997 this will reduce the RBCS keying work hours by at least 2.4 million hours at the first 25 RBCS sites over what it would otherwise be without RCR's.

Keyer Productivity

The 25 remote encoding sites are now operated with contract labor and are in the process of being converted to USPS labor. For the sake of analysis a simplifying assumption is made that these sites will be operated by contractors through the end of 1996 and will be converted to USPS labor by 1997. This assumption tends to understate the savings. While these sites are operated by contractors, a console hour productivity of 700 images per keying hour is assumed. After these sites are converted to a Postal Service operation, an average keying productivity of 587 images per work hour is used. This assumes a basic keying rate of 650 images per hour which is reduced to 587 per work hour to reflect a 10.8% non-productive time for such things as breaks, equipment down time, and personal time.

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Keyer Labor Rates

In the analysis specific site contract labor rates were used for the years through 1996. From 1997 on, labor cost was computed assuming 70% transitional and 30% career Postal work hours.

Deployment Schedule

It is assumed that the first contract for RCR's will be signed in November 94. This contract will have an option for the 29 RCR's in this DAR as well as for the next 120 RBCS sites. After this DAR is approved the option will be exercised. The first three RCR's to come off the production line will be delivered in June 1995 for training; the first unit for mail processing will be delivered in July 1995; and the remaining 25 RCR's will be delivered by the end of December 1995. The deployment of RCR's for the next 120 sites will follow the first 29.

A four months delay is assumed from the time the RCR's are deployed to the time the first savings are credited in the economic analysis.

D. Other Factors

As a result of the RCR reducing the keying work load, the requirement for supervision, space, and tele-communications will also be reduced at the remote encoding centers. These additional cost avoidances were not taken into account in the DAR economic analysis. This adds further to the conservatism of the analysis.

E. Economic Findings

The following is a summary of the economic analysis:

Capital Investment	$8,963,956
Expense Investment	$456,750
Total Investment	$9,420,706
Operating Variance	$204,642,025
Return on Investment	262.0%
Net Present Value @ 12.5%	$130,208,850

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F. Sensitivity Analyses

Sensitivity analyses were conducted to determine the impact of several variables on the merit of the investment.

If the RCR reduces the keying work load by only 15% instead of 25%, the return on investment is reduced from 262.0% to 170.5% and the net present value is reduced from $130,208,850 to $73,408,369.

If the total investment cost is doubled thereby increasing the capital and expense investment from $9,420,706 to $18,841,413 the return on investment is reduced from 262.0% to 141,4% and the net present value is reduced from $130,208,850 to $120,788,144.

If both the keying work load reduction is reduced from 25% to 15%, and total investment cost is doubled from $9,420,706 to $18,841,413 the return on investment is reduced from 262.0% to 94.5% and the net present value is reduced from $130,208,850 to $63,987,663.

G. Conclusion

The analysis indicates that there is a high pay-off and very little financial or technical risk in proceeding with the proposal to procure 29 RCR's.

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IV. Recommendation

It is recommended that a capital investment of $8,963,956 and an expense investment of $456,750 be approved for the procurement of 29 RCR's consisting of 25 operational units plus three for training, and one for further research and development.

29 REMOTE COMPUTER READERS DAR **CASH FLOW ANALYSIS for 29 RCR's**

11/07/94

RCR25J.WK4 Constant Volume

RCR Work Load Reduction= 25.00%

PROJECT YEAR	1	2	3	4	5	6	TOTAL
Number of Units Delivered	10	19					
Capital	($8,537,101)						($8,537,101)
Contingency @ 5%	($426,855)						($426,855)
Total Capital Investment	($8,963,956)						($8,963,956)
Expense	($435,000)						($435,000)
Contingency @ 5%	($21,750)						($21,750)
Total Expense Investment	($456,750)						($456,750)
OPERATING VARIANCES							
Maintenance Labor	($23,055)	($70,203)	($73,713)	($77,399)	($81,269)	($85,333)	($410,973)
Recurring Spares		($205,346)	($625,280)	($656,544)	($689,371)	($723,839)	($2,900,380)
Recurring Training		($11,025)	($33,571)	($35,250)	($37,012)	($38,863)	($155,721)
RBCS Keying Savings		$17,691,944	$44,179,033	$46,387,985	$48,707,384	$51,142,753	$208,109,098
TOTAL VARIANCES	($23,055)	$17,405,369	$43,446,469	$45,618,792	$47,899,732	$50,294,718	$204,642,025
NET CASH FLOW	($9,443,762)	$17,405,369	$43,446,469	$45,618,792	$47,899,732	$50,294,718	$195,221,319

ROI = 262.0% **NPV = $130,208,850** at 12.5% discount rate

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V. Line Item Description

The line items from the cash flow analysis are described in this section.

Capital And Expense Investments

Capital Investment includes the cost of manufacture, delivery, installation, initial training, site prep and site spares. Total capital investment for 29 RCR's is $8,963,956 which includes a 5% contingency cost to accommodate unanticipated changes in projected costs or program requirements.

Expense Investment includes the cost of depot spares. Total cost for this item including a 5% contingency cost is $456,750.

The unit capital and expense investment costs (without contingency cost) are shown in the table below.

Capital	Unit Cost
Hardware	$232,819
Initial Training	$10,000
Site Spares	$46,564
Site Prep	$5,000
Total Capital per RCR	$294,383
Expense	
Depot Spares	$15,000
Total Investment per RCR	$309,383

Operating Variances

Maintenance Labor includes the estimated annual cost of the maintenance labor required to keep the RCR's operational and in service.

Recurring Spares includes the estimated annual costs of spare replacement parts required to keep the RCR's operational and in service.

Recurring Training includes the estimated cost of annual recurring maintenance technician training due to turnover in personnel.

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RBCS Keying Savings

The RBCS keying savings are driven by the factors discussed in pages 6-8: RBCS volume, RCR performance, keyer productivity, keyer labor rates, and the deployment schedule. The savings credited to the RCR are keyer work-hour saving as a result of the RCR being able to resolve 14% of the images to delivery point and by providing some address information to the remote encoding centers for 46% of the RBCS images. The combined effect of the factors is to reduce the keying work-load at the remote encoding centers by at least 25% over what it would be without the RCR's.

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APPENDIX A

RCR Sites

Buffalo, NY
Carol Stream, IL
Cincinnati, OH
Denver, CO
Flushing, NY
Ft Lauderdale, FL
Harrisburg, PA
Indianapolis, IN
Inglewood, CA
Merrifield, VA
Mid-Island, NY
Middlesex-Essex, MA
Minneapolis, MN
Oakland, CA
Phoenix, AZ
Providence, RI
San Antonio, TX
San Diego Midway, CA
Santa Ana, CA
South Florida, FL
South Jersey, NJ
Southeastern, Pa
St Louis, MO
St Petersburg, FL
Tampa, FL

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APPENDIX B
29 RCR DAR ASSUMPTIONS

RCR Savings

The RCR will reduce the RBCS keying work hours by 25%. This is based on the second round of the fast-track RCR tests conducted in 1993 and current simulation models.

RCR Volume

The DAR economic analysis is based on the assumption that RBCS volumes at the subject 25 sites will remain essentially constant at current 1994 levels (5.6 billion per year) during future years. Current image volumes include some incoming-destinating volumes which will gradually drop off while AFCS-ISS and MLOCR-ISS images (not yet generated at these sites) will be added in future years. Since these two factors tend to cancel each other out, a zero-growth assumption is considered to be reasonable and conservative.

RCR Capacity

Each RCR will have the capacity to handle the peak future RBCS volumes at each of the 25 sites in a full-up network. Therefore only one RCR unit will be required for each site.

Productivity

Contract sites: 700 per console hour
USPS sites: 587 per work hour
This assumes a productivity of 650 images per console hour and a 10.8% non-productivity factor.

It is assumed that all 25 sites will continue to be operated by contractors through 1996 at which time they will be converted to a USPS site. This understates savings as some contract sites will be converted before 1996.

RCR Performance

A representative performance is assumed. (Not the best nor the worst of those tested)

Total Finalized	15%
Finalized to DPS or finer	14%
Partial resolution	46%

The RCR's have been specified to operate within the following maximum error limits:

Error in the first five digits:	2%
Error in the add-on	4%

These limitations were achieved during the competitive tests.

RCR Investment

The DAR assumes BOG approval of the current DAR for 120 RBCS's and therefore it is assumed a production contract will be signed in November 94
All 29 units will be delivered by the end of December 95
100% of the investment cost will be incurred in FY 95;

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RCR Investment Cost Estimates

Capital	Unit Cost
Hardware	$232,819
Initial Training	$10,000
Site Spares	$46,564
Site Prep	$5,000
Total Capital per RCR	$294,383
Expense	
Depot Spares	$15,000
Total Investment per RCR	$309,383

5% contingency for capital and expense investment.

RCR Economic Life

The DAR assumes a five year economic life.

RCR Deployment

Assumes a contract is signed in November 1994

June 95	3 RCR's for training
July 95	First article test
December 95	Deployment completed

The DAR economic analysis assumes a 4 month delay before work hour savings begin.

USPS Work Hour Labor Rates for Keying

1997 - $18.67 per work hour
Labor rate is inflated by 5% annually
Assumes a 70/30 work hour split between transitional and career work hours

Contract Hourly Keying Cost

1995	1996
$12.93	$13.58

Maintenance Labor

Maintenance Labor	78	15 hours per week (.5 preventive; 1.0 corrective)
ET-9 1994 work hour rate	$28.15	
1994 Maintenance per RCR	$2,196	
1995 Maintenance	($23,055)	$2,196 x 10 units x 1.05 inflation = $23,055

Recurring Training

10% of initial training

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Recurring Spares

40% of initial spares

RCR Operational Labor

It is assumed that there is an insignificant amount of labor involved in the operation of the RCR.

M. RICHARD PORRAS
VICE PRESIDENT, CONTROLLER

UNITED STATES
POSTAL SERVICE

October 17, 1994

WILLIAM J. DOWLING

SUBJECT: Decision Analysis Report for 29 Remote Computer Readers

The October 7, 1994 Decision Analysis Report (DAR) for 29 Remote Computer Readers (RCRs) has been reviewed and validated.

The DAR requests $8,963,956 in capital funds and $456,750 in one-time expense funds for the procurement, site preparation, and installation of 29 RCRs. Twenty-five of these units are to be deployed one each to the first 25 Remote Bar Coding System (RBCS) sites (with the remaining units to be used for maintenance and further research and engineering tests). The 25 RBCS sites were part of the Bar Coding Automation Phase I program approved by the Board of Governors in April 1990. These sites are presently operated by contractors, but will be transitioned to postal-operated sites by the end of 1996. These RCRs are scheduled for delivery from mid-1995 to mid-1996. They will be combined with the RCR procurement for the next 120 RBCS sites approved earlier this month by the Board of Governors.

Use of RCRs to resolve images by computer will reduce the manual keying workload at the 25 sites. Savings are based on the following assumptions:

- The volume that must be keyed without RCRs. The keyed image volume without RCRs at the 25 sites was held constant throughout the analysis at the projected 1994 level of 5.6 billion pieces.

- RCR performance. RCRs are assumed to reduce the keying workload by 25 percent, based on tests conducted in 1992 and 1993. This 25 percent performance level was held constant throughout the analysis.

- Keyer productivity. The analysis assumed contractor performance of 700 images per keying hour and Postal Service keying productivity of 587 images per workhour.

- Keyer labor rates. The rates were based on current contract costs through 1996 and Postal Service keyer costs for 70 percent transitional employee workhours and 30 percent career level 4 employee workhours from 1997 on.

For simplicity in the analysis, the DAR assumes that contractors will continue to perform the keying at these 25 sites through the end of 1996. However, it is expected that the Postal Service will assume the keying function on a gradual basis during 1995.

The DAR cash flow indicates that the acquisition of the proposed 29 RCRs will provide a Return On Investment (ROI) of 262 percent with a Net Present Value (NPV) of $130.2 million after discounting at 12.5 percent over a five-year operating period. On average, each RCR will save about 66 equivalent positions over what would otherwise be required for RBCS operations without RCRs.

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Since the projected RCR performance is based on test results, a sensitivity analysis was performed to determine the impact of a reduction in performance in a live operating environment. Should the RCRs reduce keying workload by only 15 percent (as compared to the 25 percent assumed in the DAR), the ROI would be reduced to 170 percent and the NPV would be reduced to $73.4 million. Thus, even with a 40 percent reduction in performance, the RCR produces a favorable return.

M. Richard Porras

BOG APPROVAL
DATE:

RESTRICTED INFORMATION

DECISION ANALYSIS REPORT

120 REMOTE BAR CODING SYSTEMS

ENGINEERING

August 26, 1994

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TABLE OF CONTENTS

EXECUTIVE SUMMARY

Introduction

This decision analysis report (DAR) provides justification for the next 120 Remote Bar Coding Systems (RBCS) . These systems will be deployed to 120 processing sites and represent the next logical step in our goal of automating virtually all letter mail operations. The RBCS is one of three sources for bar coding letter mail. The other two are customers and Multiline Optical Character Readers (MLOCRs). The RBCS consists of two encoding methods: 1) Remote Video Encoding, which utilizes manual encoding, and 2) Remote Computer Reading, which allows computer resolution of addresses instead of manual encoding.

Background

The Phase I Bar Coding Automation Program, approved by the Board of Governors in 1990, set forth a multi-phased plan to further automate letter mail processing and reduce postal costs through the use of bar codes. The goal was to bar code virtually all letters by 1995. The deployment of equipment for 25 RBCS sites authorized in Phase I was essentially completed in April 1993.

The manual encoding operation for these 25 RBCS sites was implemented using outside contract labor, which was challenged by the American Postal Workers Union (APWU). The issue went to arbitration for resolution. Since then the Postal Service went ahead with a "bridge" strategy in which some equipment for the next 22 RBCS sites was bought in order to keep production lines open for critical items and to put us in a position to move ahead quickly with the automation program if a favorable arbitration agreement were received. Management analyses showed that RBCS sites could not be operated cost-effectively using career Postal employees under the salary structure at that time. The Board of Governors approved $114.4 million funding for Image Processing Subsystems (IPSS), terminals, Input Subsystems (ISS) for multiline OCRs (MLOCRs), and Output Subsystems (OSS) for Mail Processing Bar Code Sorters (MPBCS) at the 22 sites. The ISSs for MLOCR-A machines and OSSs were bought and deployed; the ISS-MLOCR-Bs will begin deployment in October of this year; the IPSSs, and terminals were bought, and are currently being deployed.

In May 1993, after an 18 month arbitration procedure, the arbitration decision was received. Subsequent discussions between the Postal Service and the APWU resulted in a Memorandum of Understanding in November 1993 in which the Postal Service would operate the RBCS sites with 70 percent transitional employee work hours and 30 percent career Postal employee work hours. This provision and others made it possible for the Postal Service to justify the operation of the RBCS sites with in-house labor.

This DAR will put us on a schedule to complete the 268 site network in 1997. All items that were part of the 22 "bridge" DAR are now incorporated in this DAR.

Financial Analysis

The following summary indicates the required investment and projected savings for the proposed 120 RBCSs over a ten year operating period.

Investment	(millions)
Capital	$ 1,001.9
Expense	$ 25.1
Total	$ 1,027.0

	At Minimum Expected Performance*	At Desired Performance**
Operating Variances (undiscounted)	$ 2,671 million	$ 4,332 million
Net Present Value (Discounted at 12.5%)	$ 147 million	$ 819 million
Return on Investment	15.4%	26.8 %

Delivery point sequencing represents a new challenge for the organization. This is also an area where a great amount of attention is being directed. Given the importance of delivery point savings to this investment decision, the economics of this proposal are presented over a range of savings levels. The minimum expected performance represents an attainable lower limit and the foundation on which to build savings over time to the desired performance level.

* The minimum expected performance level projects a four year ramp-up in carrier savings achievement, to a maximum 50 percent capture rate.

** The desired performance level projects a three year ramp-up in carrier savings achievement, to a maximum 95 percent capture rate.

Since we are currently in the early stages of delivery point sequencing, the ROI range of 15.4 percent to 26.8 percent is useful for evaluating this proposal.

The following is a breakdown of this investment (in millions):

	Total Required	Previously Approved	Funding Now Deferred	Funding Now Required
120 RBCS	$625.4	$ 110.2	$ 0	$515.2
978 DBCS	275.9	0	275.9	0
RBCS Site Prep	64.2	1.7	0	62.5
DBCS Site Prep	14.7	0	14.7	0
Contingency @ 2.5%	21.7	2.5	6.9	12.3
Total Capital	$1,001.9	$114.4	$297.5	$590.0
Total Expense Investment	$ 25.1	$ .3	$ 5.5	$ 19.3

Note: Numbers may not add due to rounding.

Conclusion

This proposal is to procure all the equipment required for 120 RBCSs including 978 DBCS's which are required to process the additional bar coded mail generated by the RBCS. This increment in the program will allow us to procure the equipment at the best price that is available through the pre-negotiated option quantities that were awarded competitively. It will allow for a smooth expansion of the automation network and limit further delays. The funding required is $1,027.0 million, less $114.7 million previously approved and $303.0 million deferred, for a total of $609.3 million. Funding for the DBCSs is not included but will be required later to support the savings included in this analysis. This funding can be deferred for now since DBCSs will still be produced under the current contract until October 1994. In the near future we will decide what DPS equipment option to pursue. We will then seek funding under a separate request for the DBCSs, and/or the carrier sequence bar code sorters (CSBCS).

The proposed RBCSs will significantly increase bar coded mail volume, which will produce both mail processing savings and, when combined with the purchase of DBCSs, will generate carrier savings. The RBCSs are economically justified and needed at this time to reestablish the forward momentum of the bar coding automation program. The total capital investment of $1,001.9 million will produce a Return on Investment in the range of 15.4% to 26.8% and a Net Present Value in the range of $147 million to $819 million, based on the difference between the minimum expected performance and the desired performance level.

Recommendation

It is recommended that $590.0 million capital and $19.3 million in expense be approved to complete the procurement of 120 RBCSs.

I. Introduction

Our current letter automation goals and strategies were first spelled out in the 1988 Corporate Automation Plan. This plan envisioned a national network of equipment together with customer participation, that would lead to having virtually all letter mail bar coded by 1995. This strategy remains intact today. The only significant departure from the original plan is that recent events have shifted final implementation of the automated network beyond the 1995 time frame.

The Phase I Bar Coding Automation Program, approved by the Board of Governors in 1990, set forth a multi-phased equipment plan to achieve this goal. The deployment of equipment authorized included 1,349 wide area bar code readers (WABCR), 1,228 delivery bar code sorters (DBCS) and equipment for 25 RBCS sites. The first 25 sites are operating with 25 IPSSs, 81 ISS-MLOCRs, 103 OSS-BCSs and 3,339 terminals. The deployment of equipment was essentially completed in April 1993. Funds will be requested in the near future to complete the procurement of the remaining components required at these sites. Remote Computer Reader Equipment for the first 25 sites was not included in the Phase I Bar Coding Automation DAR and will be separately justified in the near future.

The initial 25 RBCS sites were implemented using contract labor which was available at a cost considerably less than career Postal labor. The decision of using contract labor was challenged by the American Postal Workers Union (APWU). The issue went to arbitration for resolution. To prepare for a possible unfavorable arbitration decision, management conducted additional analyses and explored technical alternatives to RBCS, including the use of the remote computer reader (RCR) by itself, without manual encoding. It was concluded that the use of RCR by itself could not justify the investment and had high risk as tests were not completed; other technical alternatives proved to be unattractive. Further study of the use of career postal labor to perform the manual encoding in the RBCS network was shown to have an unacceptable payoff. Consequently, the outcome of the arbitration hearings was extremely significant in justifying further investment in RBCS equipment. Because of this, management proposed a "bridge" strategy to proceed with a limited buy of 22 additional RBCSs to minimize risk and to keep the production lines of critical items open. In December 1992, the Board of Governors approved $114.4 million as part of this bridge strategy for IPSSs, terminals,

OSSs for MPBCSs, and ISSs for MLOCRs; IPSSs and terminals are currently being deployed, while the ISSs for the MLOCR-As and some of the OSSs for mail processing BCSs have been already been installed at the 22 sites.

After conducting hearings and deliberating for 15 months, the arbitrator announced his decision in May 1993. It was not a victory for either side, but it set off a series of discussions between labor and management resulting ultimately in a win-win conclusion. In November 1993, the APWU and the Postal Service signed a memorandum of understanding (MOU) which gives postal service management flexibility and a labor cost structure that justifies the operation of RBCS sites with Postal employees. Management is proceeding to implement this MOU in the 22 RBCS sites of the "bridge" DAR, by obtaining offsite keying locations and making preparations to hire keying staff.

In this DAR we provide justification for the next complete 120 RBCS systems which includes all items that were part of the 22 systems "bridge" DAR. Together with the 25 systems implemented under Phase I of the Bar Coding Automation Program, this will bring the total to 145 sites by 1996. This will put us on a schedule to complete the 268 site network by the end of 1997.

II. RBCS Background

A. Bar Codes and RBCS

The key aspect of the automation program is to reduce operating costs by using bar codes to reduce letter mail processing costs. The goal is to bar code "virtually all" letters using three sources: customers, multiline optical character readers (MLOCRs), and the remote bar coding system (RBCS). RBCS is the system of last resort which bar codes mail that mailers do not barcode and MLOCRs cannot barcode. It is estimated that about 31 billion pieces will be barcoded by RBCS in a full-up (268 site) network. This represents about 28% of the bar codes handled at sites with this equipment.

B. RBCS Components

The main components of the RBCS are the following:

Input Subsystem Multiline OCR (ISS MLOCR)
Input Subsystem Advanced Facer Canceler (ISS AFCS)
Remote Computer Reader (RCR)
Terminals
Output Subsystem Barcode Sorter (OSS BCS)
Image Processing Subsystem (IPSS)

An overview of how the RBCS functions is presented in the following paragraphs.

Candidate mail for the RBCS comes from two sources: the letters identified as addressed in script by the advanced facer canceler (AFCS); and the letters that the MLOCR cannot read at all or can not resolve beyond five digits. The 120 RBCS sites are projected to barcode 19 billion letters annually. (This does not include letters barcoded by customers or the MLOCRs).

The input subsystem of the AFCS (ISS-AFCS) electronically lifts the images of letters addressed in script and transmits the digital images to the remote computer reader (RCR). Similarly, the images of addresses that the MLOCR is unable to resolve at all, or can not bar code beyond five digits, are lifted by the image subsystem of the MLOCR (ISS-

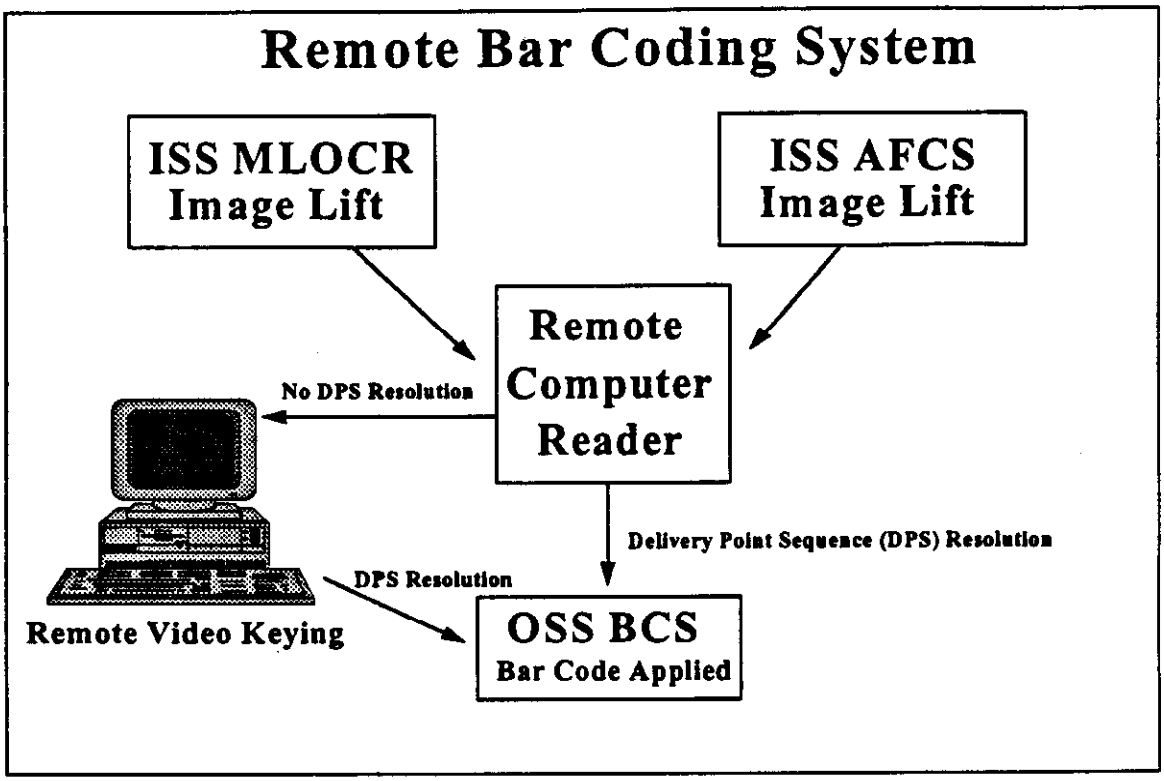
MLOCR) and are transmitted to the remote computer reader (RCR). The letters in both cases are marked on the back side with a unique identification bar code and set aside ultimately to be processed on the Output Subsystem Barcode Sorter (OSS BCS).

The remote computer reader (RCR) is an off-line optical character recognition device that uses advanced techniques to resolve script images and all other difficult to read addresses. Since it operates off-line it can take more time and use additional algorithms not available to the MLOCR to read images. If the RCR is able to resolve the address and determine the appropriate delivery point sequence code, the address information is transmitted to the Output Subsystem Barcode Sorter (OSS BCS). If the RCR is unable to resolve the address and determine the appropriate ZIP code, the image is transmitted to the remote encoding site for manual processing.

Images transmitted to the remote encoding site are presented to operators at video encoding terminals. The operators manually key in the address information into the RBCS which determines the appropriate ZIP codes. The processed address information is transmitted to the Output Subsystem Bar Code Sorter (OSS BCS)

After the images have been processed, the corresponding mail pieces are fed to the Output Subsystem Bar Code Sorter (OSS BCS) where the unique identification code on the back of the mail pieces are read and the associated ZIP codes are retrieved from the information that came from the remote encoding center and RCR. The bar codes representing the ZIP codes are sprayed on the mail pieces which are then sorted on the OSS BCS accordingly.

The Image Processing Subsystem (IPSS) consists of the computers and communication links used to process the address information and link the various subsystems together.



C. Deployment

To meet the goal of bringing the next 120 RBCS sites on line by 1996 the plan is to deploy the first 22 systems by the end of calendar year 1994.[1] Approval of funding requested in this DAR will allow the additional 98 systems to begin deployment in February 1995. A delivery rate of 8 systems per month will complete deployment of the 120 systems by March 1996. To support this ambitious schedule the Systems Implementation Support group within Operations has been designated as the organization responsible for implementing and coordinating the various supporting organizations involved.

[1] This DAR assumes activation of the first 22 RBCS sites begins in July 1994 and is completed in November 1994. This schedule has been advanced with the activation of the first site in April 1994. We have not reflected this in the DAR analysis since the first in-house sites could have a longer ramp-up, and because the effect of this earlier schedule may, at best, have a negligible effect on the economics and recommendation presented in this DAR.

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Initiating in-house keying operations represents the area where the greatest amount of new postal activity will be required. Presently, all keying is performed in remote sites that were established and are operated by outside firms. While in-house operations will still be operated remotely, in locations other than the processing plants that are being served, activating the new Remote Encoding Centers (REC) will now be a postal function. A plan has been prepared which encompasses the key elements for insuring the success of this activity.

Site selection is the starting point in this process. The 120 processing plants in this proposal will be served by 40-50 RECs. The goal is to select locations where an adequate labor force exists to perform the work. Demographic studies play a major role and look at various factors including cost of living, current and future work force content and availability, and unemployment rates. Once potential areas are identified, it is necessary to determine the availability of telecommunication service required to operate the RBCS.

Locating and activating the actual site or building is the next activity. Sufficient and appropriate space must be found to house the REC operations which require about 60 square feet per keying station. The facility space must be properly prepared to accommodate not only the RBCS-related equipment but other support equipment ranging from furniture to time clocks. Equipment installation can then begin. The first 22 plants and their corresponding RECs are shown in Attachment B.

All of these activities will eventually lead to initiating the REC operation. After a 12 week ramp-up period the site will be in a position to operate a full-up system work load.

Staffing the REC will include many activities that have previously been performed by contractors. Management positions, including a REC manager and supervisors must be established, selected and trained. Data Conversion Operator (DCO) and Lead DCO positions must be filled. This will involve testing and qualifying people for these jobs and training them to perform the keying operation. Each REC will require work hours for support functions such as time keeping, custodial, secretarial and administrative work. Headquarters support staff of one manager, one secretary and eight staff positions is also included.

III. RBCS Experience

The following highlights our recent experience.

A. Operating Experience

By April 1993 the last of the 25 Phase I RBCS sites came on-line. The 25 sites plus the 2 early activation sites (EAPS) generated 3 billion bar coded letters in FY 1993. The start up problems are behind us. The average productivity of the first 25 sites in AP 10-11 was 659 images per hour, compared to the required productivity of 650, and the performance continues to improve. In AP 1-2, 1994, the average was over 700 and at some sites the productivity was as high as 860 images per hour. The average missort rate is now 2%, well below the 3% target; and the availability of the system, the percentage of time the system is fully functional and ready to operate when required, is over 99%.

Overall, we are meeting or exceeding our goals which is solid evidence that the technology works and that we can successfully operate the equipment. These sites have proven that the projected keying rate of 650 images per console hour used in this DAR is a reasonable expectation.

B. Remote Computer Reader (RCR)

RCRs developed by nine contractors were extensively tested by the Postal Service in 1992 and 1993. The tests showed that the RCR finalized 15% of the images it received and partially resolved 46% of the images. Finalized images can be transmitted directly to the output system bar code sorter for bar coding and sorting, and require no keying at all. The images that are only partially resolved must be sent to the REC for keying, and to be resolved to their finest sort. The partial resolutions obtained by the RCR reduce the keying workload at the REC. The combined effect of having 15% of the images finalized by the RCR and 46% partially resolved reduces the keying workload at the REC by 26.9%.[2] Throughout the cash flow analysis of the RBCS we have assumed that the RCR reduces the keying work load by 25%. The demonstrated level of performance shows the

[2] These results reflect initial tests of the first 5 units. Later tests of these and additional units are undergoing final analysis; preliminary results indicate significant improvement.

RCR makes a significant contribution to the cost-effectiveness of the RBCS when used as a contributing component of this system.

C. USPS-APWU Memorandum of Understanding (MOU)

In the Memorandum of Understanding[3] between the American Postal Workers Union (APWU) and the Postal Service, signed on 11/02/93, both parties, "In full and complete settlement of all issues related to the implementation of RBCS...." agreed to principles which recognize the value of using Postal employees in fulfilling our automation goals at a cost that will benefit both parties. Two significant items agreed upon that make this possible are: (1) "....The clerical staffing of the RBCS sites will be accomplished by utilizing the ratio of 30 percent career work hours to 70 percent Transitional Employee work hours....", and (2), "...Employees will be required to qualify for RBCS keying at a rate of 7,150 keystrokes per hour at an accuracy rate of 98 percent. Employees will be expected to maintain the performance and accuracy rates required for qualification....". Previous analyses which examined the cost-effectiveness of RBCS showed that RBCS could not be economically justified using in-house labor. Fully loaded hourly costs of Postal Service data entry operations are approximately $29 per hour (1994) versus less than $15 per hour for contracted service. Under the new agreement, the average keying cost will be approximately $20 per hour. Therefore, with a cost structure using 70% transitional employee and 30% career level 4 work hours, RBCS can now be economically justified with in-house labor. Thus, this landmark agreement was able to satisfy the concerns of the Postal Service by keeping the keying wage rate within the limits that will justify the investment, while ensuring that the work will be done exclusively by postal employees.

[3] See Attachment C for a copy of the agreement.

IV. Economic Analysis

The economic justification for the 120 RBCS sites included in this proposal is provided in this section. Since the justification relies on the methodology and assumptions of the total bar coding automation program, a brief discussion of these items is necessary.

A. Methodology

The basis of the economic analysis is a simulation effort conducted at all candidate RBCS sites. The bar coding automation model (BAM) used for this effort is a computer model which simulates mail flows through a baseline system and a proposed operating system to determine changes in work hours between the two. This model also relies on site specific baseline mail volume, arrival profiles, and operating plans to determine equipment requirements. The simulation effort represents a comprehensive review of equipment requirements and operating savings.

RBCS Baseline System

The RBCS baseline operating system represents the current system and is the starting point for determining the benefits of the proposed system. It consists of multiline OCRs (MLOCRs), and bar code sorters to get mail to the delivery point sequence (DPS). The script mail coming from the Advanced Facer Canceler and MLOCR reject mail are processed on multi-position letter sorting machines and manual cases.

RBCS Proposed System

The proposed operating system consists of the baseline system plus RBCS. MLOCR rejects and script mail from the AFCS are processed by the RBCS. Mail that is barcoded by this system is then processed through the automated network instead of being processed in the MPLSM/manual operations as in the baseline system.

The advantage of the 120 RBCS is that of the 22 billion pieces processed, 19 billion are barcoded, and 16 billion destinate in automated sites. This results in lower mail processing costs and greatly reduced carrier costs.

B. DBCS Requirements

978 DBCSs are required to process the additional mail bar coded to delivery point sequence (DPS) by the 120 RBCSs. The RBCSs in the 120 sites will produce 32% of the total DPS mail for these sites when fully deployed. The other 68% of the DPS mail for these sites will come from MLOCRs and customer applied bar codes. 978 DBCSs represent the total DBCSs required to process the RBCS generated DPS volume from the 120 sites.

C. Labor Savings

Labor savings are based on the differential cost of processing script and MLOCR rejected letter mail in a manual-mechanized environment compared to the cost of processing this mail on the RBCS deployed to the 120 sites in this proposal. The RBCS will produce bar coded mail that can be distributed on automation instead of the labor-intensive MPLSMs and manual cases. The 120 sites in this proposal will, when fully operational in 1997, bar code about 19 billion letters annually.

Included in the savings is the impact of modifications of the MLOCR-A machines at the 120 sites which improve their performance to that of the newer MLOCR-B machines. These modifications increase the bar coding rate and the depth of sort to which the mail is bar coded. Full-up annual operational savings from this modification are over $22 million, out of the total annual operational savings in this DAR of over $1 billion.

Savings are also included to account for the reduction in distribution errors in an RBCS environment versus MPLSM processing. It is projected that distribution errors to delivery operations will be reduced by 6.0 percent versus MPLSM operations. This results in less re-handling of missorted letters. This item also includes the error reduction savings resulting from going from MPLSM outgoing processing to automation.

The mail processing savings include the net changes in supervisor costs required to operate the proposed system versus the baseline system. This is based upon the following supervisor/employee ratios:

Automated Equipment	- 1 to 7
Manual Distribution Clerks	- 1 to 20
MPLSM	- 1 to 20
RBCS Keying	- 1 to 30 - 50

The carrier savings are based upon the increase in Delivery Point Sequenced letters as a result of the 120 RBCSs. DPS letters do not require manual casing by carriers. In the baseline system, carriers must sequence mail into delivery order by manually placing it into delivery cases. This manual casing is performed at a standard rate of 18 letters per minute. Mail is removed (pulled-down) from the cases at a rate of 70 letters per minute. The combined rate of both of these activities is 859 pieces per hour.

Delivery sequenced mail completely bypasses the casing and pull-down process. As an offset to these savings, an additional workhour cost has been included which represents miscellaneous office and street time, associated with handling delivery point sequenced mail. This also accounts for the handling of barcoded letters which can not get delivery sequenced due to address and delivery characteristics (i.e., high-rises, etc.). This additional work hour cost is calculated using a rate of 5,000 pieces per hour for all delivery point sequenced mail. When combined with a minimum expected performance capture rate of 50 percent, these additional work hours effectively reduce the carrier savings by two thirds. At the desired performance capture rate of 95 percent, these additional workhours effectively reduce the carrier casing savings by one fifth.

Another savings element from delivery point sequencing is that it will reduce the number of carriers routes that would otherwise be required. Fixed carrier savings of 65 minutes per day for each route eliminated due to delivery sequencing have been incorporated into the DAR. These savings are based on one route eliminated for each twenty hours of direct delivery point sequencing savings at the minimum expected performance. At the desired performance these savings are based on one route eliminated for each ten hours of direct delivery point sequencing savings. These fixed savings are the result of the elimination of activities such as clocking in and out, obtaining mail or keys, checking or preparing a vehicle, attending a safety meeting, training, breaks and travel to and from the route and carrier station.

D. Assumptions

The following is a summary of the most important assumptions used in the analyses.

Capital and Expense Investments

All capital and expense costs reflect the most recent contracting experience.

Included in the image lift investments are modifications for the MLOCR-A machines at the 120 sites which improve their performance to that of the newer MLOCR-B machine. These modifications increase the encode rate of the MLOCR-A machines. A higher encode rate results in more of the mail processed on bar code sorters instead of mechanically or manually.

Destination Keying

Destination keying is the keying of non-bar coded incoming mail. During the transition period, before the RBCS network is fully deployed, mail processing sites will continue to receive a significant amount of non-bar coded mail from outside the RBCS network. In order to maximize savings in this period of transition, RBCS sites send non-barcoded incoming letter mail to the MLOCR and introduce the rejects into RBCS for manual keying and bar coding. This procedure results in savings during the transition period while the percentage of incoming mail without a bar code is relatively high. In this analysis no costs or savings from destinating keying have been included.

RBCS Assumptions

The following are the key RBCS-related assumptions that were used in this analysis:

Keying Productivity

Pieces per console hour	650
Non-productive time factor	10.8%
Pieces per work hour	587
OSS-BCS Accept Rate	84.6%

BCS Accept Rate	
First Pass	98.0%
Subsequent Passes	99.0%
RCR	Reduces keying workload 25%

Throughput and Productivity

Equipment throughput and productivity is based upon actual performance, equipment capabilities and staffing requirements.

Equipment / Operation	Throughput	Productivity (Pieces per hour)
MLOCR	28,396	11,358
MPBCS	32,000	10,419
MPBCS/DBCS Inc Secondary	25,000	7,143
MPLSM		1,229 - 1,511
Manual Processing		631 - 1,000

E. Peak Day Requirements - Average Day Savings

This analysis uses projected average day volume to determine system benefits; equipment requirements are based on peak day volumes.

F. Transitional Year Savings

Two adjustments were made during transitional years to reflect start-up effects:
1) Mail processing savings have been lagged four months while delivery savings are lagged one year after equipment deployment (with the minimum expected performance) and 6 months (with the desired performance); and
2) Carrier savings have been significantly reduced to account for possible short-term complement adjustment problems. (85% in 1995, 70% in 1996, 65% in 1997 and 25% in 1998 with the minimum expected performance. At the desired performance level savings were reduced by 70% in 1995 and 1996 and 50 percent in 1997.)
Additionally, as discussed earlier, no savings are claimed for destinating keying during the transitional years.

These adjustments results in a conservative estimate of transitional year savings and, thus, program benefits.

G. Space

Lease costs are shown in this analysis to reflect space needs and represent the economic impact of obtaining space. However, it should be noted that as keying sites are established an analysis will be performed to determine whether individual sites should be leased or owned.

The annual cost of leasing space for the remote encoding centers (REC) is included in the DAR at a cost of $16.81 (1994 dollars) per square foot. It is assumed 60 square feet of floor space per installed terminal will cover the space requirement for all activities at a REC, including work area, support, administration, maintenance and locker space. Included is the total cost to prepare the REC sites to process images for the 120 RBCS sites. It is understood that some of the REC sites will process images for additional RBCS sites beyond the 120 plants in this DAR. 2,000 square feet is also allocated per DBCS. The DBCS space cost is partially offset by the space savings from reducing the number of MPLSMs as a result of RBCS, based upon 2,600 square feet per MPLSM.

H. Capturing Savings

These 120 RBCS sites will generate operational savings from both the mail processing and delivery operations. Success with capturing mail processing savings has been achieved with previous automation programs and will represent approximately 70 percent of the operational savings in this DAR. These savings will be as a result of the decreased work load in MPLSM and manual operations. The RBCS bar coded mail will decrease the volume of letters that would otherwise be sorted in the MPLSM or manual operations. Consequently, processing plants will decrease staffing in these labor intensive operations.

Although delivery point sequencing represents a relatively new challenge for the organization, we are well positioned to capture these savings. These savings come from moving manual casing operations to automation, similar to what we have already accomplished with previous mail processing savings. The September, 1992 Memorandums of Understanding with the National Association of Letter Carriers (NALC) established a cooperative approach in the planning and implementation of procedures to

achieve the benefits of delivery point sequencing. When agreed upon delivery point sequencing quality levels are initially attained, carriers will cease casing the delivery point sequenced letters and take mail directly to the street. In the short run, this will reduce overtime, assistance, and work hours for part-time, transitional, and casual employees. As delivery point sequencing percentages increase, route adjustments will be made to more effectively align delivery staffing requirements to the reduced work load of the delivery units. The cost of route inspections and adjustments are not included in this DAR. An initial detailed plan to capture the delivery point sequence savings has been developed and is under review (reference attachment D for the Executive Summary of this plan). As stated earlier, the delivery savings are significantly reduced in this DAR in 1995 through 1998 for the minimum expected performance and in 1995 through 1997 for the desired performance. In addition, the minimum expected performance assumes that 50 percent of all projected carrier savings are captured. The desired performance assumes that 95 percent of all projected carrier savings are captured.

I. Deployment Plan

The deployment of the first 22 sites will be completed by the end of calendar year 1994. The remaining sites will begin in February 1995 and continue at a rate of 8 systems per month until all 120 systems are deployed in March, 1996. Reference Attachment A for a list of sites.

The DBCSs in this analysis represent the delivery point sequencing capacity that will be required to sort the barcoded volume generated by the 120 RBCS sites when full-up. Since we will have sufficient capacity for these sites until 1996, the deployment of this delivery point sequencing equipment is not proposed to begin until that time. The analysis is based upon a 1996 deployment of 80 DBCSs per month.

J. Economic Findings

The following are the summary results of the economic analysis:

Capital Investment	$ 1,001.9 million
Expense Investment	$ 25.1 million
Total Investment	$ 1,027.0 million

	At Minimum Expected Performance*	At Desired Performance**
Operating Variances	$ 2,671 million	$ 4,332 million
Return on Investment	15.4%	26.8%
Net Present Value	$ 147 million	$ 818 million

As previously discussed, delivery point sequencing represents a new challenge for the organization. This is also an area where a great amount of attention is being directed. Given the importance of delivery point savings to this investment decision, the economics of this proposal are presented over a range of DPS savings levels. A minimum expected performance level represents an attainable lower limit and the foundation on which to build savings over time to the desired performance level.

* The minimum expected performance level projects a four year ramp-up in carrier savings achievement, to a maximum 50 percent capture rate.

** The desired performance level projects a three year ramp-up in carrier savings achievement, to a maximum 95 percent capture rate.

Since we are currently in the early stages of delivery point sequencing, the ROI range of 15.4 percent to 26.8 percent is useful for evaluating this proposal.

The following is a breakdown of this investment (in millions):

	Capital	Expense
120 Image Processing Subsystems	$ 97.9	3.1
11,520 Terminals	36.3	
548 MLOCR Image Lift Subsystems	146.1	4.9
328 Output Subsystems	60.6	0.3
571 AFCS Image Lift Subsystems	147.2	7.0
120 Remote Computer Readers	97.5	3.9
978 DBCSs	275.9	5.4
Engineering Changes & Telecommunications Test Equipment	39.8	
RBCS Site Prep	64.2	
DBCS Site Prep	14.7	
Contingency	21.7	.6
Total	$1,001.9	$25.1

The following table is a summary of the investments requested in this DAR:

	Capital	Expense
Total Investments	$1,001.9	$25.1
Previously approved for 22 Sites	(114.4)	(.3)
Funding now deferred	(297.5)	(5.5)
Total investments requested	$ 590.0	19.3

V. Recommendation

The investment of $590.0 million in capital and $19.3 million in expense is recommended to fully equip the 120 additional RBCS sites. Funding of $303.0 million for DBCS is not requested at this time. This proposal will increase the amount of bar coded mail resulting in additional mail processing and carrier savings. When the 978 DBCSs are deployed significant carrier savings will also be achieved.

The total capital investment of $1,001.9 million will produce a Return on Investment in the range of 15.4% to 26.8% and a Net Present Value in the range of $147 million to

$819 million, based on the difference between the minimum expected performance and the desired performance level..

VI. Cash Flows and Line Item Descriptions

Cash Flows for:

Minimum Expected Performance

Carrier Savings lagged 1 year after equipment deployment

Carrier Transitional Impact cost as follows:

1995: 85 % of carrier savings
1996: 70 % of carrier savings
1997: 65 % of carrier savings
1998: 25 % of carrier savings

Carrier Savings Capture Rate: 50%

and

Desired Performance

Carrier Savings lagged 6 months after equipment deployment

Carrier Transitional Impact cost as follows:

1995: 70 % of carrier savings
1996: 70 % of carrier savings
1997: 50 % of carrier savings

Carrier Savings Capture Rate: 95%

120 SITES

BAR CODING AUTOMATION (RBCS Only for 120 SITES)

Minimum Expected Performance

RBCS5.WK3 26-Aug-94

YEAR	1993 0	1994 1	1995 2	1996 3	1997 4	1998 5	1999 6	2000 7	2001 8	2002 9	2003 10	2004 11	2005 12	TOTAL
CAPITAL INVESTMENT														
IPSS SYSTEMS	($9.0)	($27.1)	($54.2)	($22.6)										($112.9)
IPSS TERMINALS	($6.5)	($9.6)	($15.3)	($5.0)										($36.3)
DBCS	$0.0	$0.0	($97.6)	($178.3)										($275.9)
TOTAL ISS/MLOCR	($8.1)	($44.3)	($67.7)	($26.1)										($146.1)
OSS BCS	($11.0)	($14.8)	($29.0)	($10.7)										($65.6)
ISS AFCS	$0.0	($15.7)	($67.6)	($73.9)										($157.2)
RCR	$0.0	($18.0)	($37.3)	($12.2)										($67.5)
Additional Engineering & Support Equip.	$0.0	($36.5)	($2.2)	($1.2)										($39.8)
Contingency	$0.0	($4.2)	($9.3)	($8.2)										($21.7)
SITE PREP	($1.6)	($22.3)	($44.4)	($10.6)										($78.8)
TOTAL CAPITAL INVESTMENT	($36.2)	($192.5)	($424.5)	($348.7)										($1,001.9)
EXPENSE INVESTMENT	$0.0	($2.0)	($9.2)	($13.9)										($25.1)
OPERATING VARIANCES														
NET DBCS / MPLSM SPACE	$0.0	$0.0	$0.0	($22.1)	($23.2)	($24.3)	($25.5)	($26.8)	($28.1)	($29.6)	($31.0)	($32.6)	($34.2)	($277.4)
IN-HOUSE RBCS COSTS														
REC MAINTENANCE	$0.0	($13.1)	($45.9)	($57.5)	($54.7)	($57.4)	($60.3)	($63.3)	($66.5)	($69.8)	($73.3)	($76.9)	($80.8)	($719.5)
TELCOMMUNICATIONS	$0.0	($0.1)	($3.4)	($9.0)	($9.9)	($10.4)	($10.9)	($11.4)	($12.0)	($12.6)	($13.2)	($13.9)	($14.6)	($121.3)
REC SPACE	$0.0	($2.9)	($9.5)	($12.8)	($13.5)	($14.1)	($14.8)	($15.6)	($16.3)	($17.2)	($18.0)	($18.9)	($19.9)	($173.6)
OTHER PERSONNEL	$0.0	($15.1)	($59.7)	($66.0)	($95.7)	($101.6)	($112.5)	($118.2)	($124.1)	($130.3)	($136.8)	($143.6)	($150.8)	($1,256.2)
OTHER NON-PERSONNEL	$0.0	($0.7)	($5.6)	($12.3)	($13.3)	($14.0)	($14.7)	($15.4)	($16.2)	($17.0)	($17.8)	($18.7)	($19.6)	($165.1)
KEYING	$0.0	($7.1)	($168.8)	($452.0)	($495.2)	($520.0)	($546.0)	($573.3)	($601.9)	($632.0)	($663.6)	($696.8)	($731.6)	($6,088.2)
RBCS IN-HOUSE TOTAL	$0.0	($39.1)	($292.8)	($611.6)	($682.2)	($717.4)	($759.1)	($797.1)	($836.9)	($878.8)	($922.7)	($968.9)	($1,017.3)	($8,523.8)
OPERATIONAL SAVINGS														
MAIL PROC LEVEL 4	$0.0	$0.0	($35.3)	($156.4)	($181.4)	($190.5)	($200.0)	($210.0)	($220.5)	($231.5)	($243.1)	($255.2)	($268.0)	($2,191.8)
MPLSM CLERKS	$0.0	$0.0	$101.3	$433.1	$503.5	$528.7	$555.1	$582.9	$612.0	$642.6	$674.8	$708.5	$743.9	$6,086.6
MANUAL CLERK	$0.0	$0.0	$102.3	$430.6	$501.1	$526.2	$552.5	$580.1	$609.1	$639.6	$671.6	$705.2	$740.4	$6,058.7
CARRIER	$0.0	$0.0	$7.2	$83.1	$156.8	$168.5	$177.0	$185.8	$195.1	$204.9	$215.1	$225.9	$237.2	$1,856.5
TOTAL	$0.0	$0.0	$175.6	$790.4	$980.0	$1,033.0	$1,084.6	$1,138.9	$1,195.8	$1,255.6	$1,318.4	$1,384.3	$1,453.5	$11,810.1
NET OPERATIONAL SUPPORT														
MAINTENANCE LABOR	$0.0	($4.6)	($17.0)	($38.9)	($37.0)	($38.9)	($40.8)	($42.8)	($45.0)	($47.2)	($49.6)	($52.1)	($54.7)	($468.6)
RECURRING SPARES	$0.0	$0.0	($3.2)	($17.2)	($26.4)	($29.8)	($31.3)	($32.8)	($34.5)	($36.2)	($38.0)	($39.9)	($41.9)	($333.3)
RECURRING MAINT. TRAINING	$0.0	$0.0	($0.1)	($0.8)	($2.6)	($2.7)	($2.9)	($3.0)	($3.1)	($3.3)	($3.4)	($3.6)	($3.8)	($29.3)
RECUR. TDP & DOCUMENTATION	$0.0	$0.0	($0.3)	($0.3)	($0.3)	($0.3)	($0.3)	($0.3)	($0.4)	($0.4)	($0.4)	($0.4)	($0.4)	($3.7)
MPLSM MAINT. LABOR REDUCT.	$0.0	$0.0	$0.0	$10.4	$21.8	$45.7	$48.0	$50.4	$52.9	$55.6	$58.4	$61.3	$64.4	$468.9
MPLSM PARTS REDUCT.	$0.0	$0.0	$0.0	$0.7	$1.4	$2.9	$2.9	$3.0	$3.1	$3.3	$3.5	$3.6	$3.8	$28.2
NET OPERATIONAL SUPPORT	$0.0	($4.6)	($20.6)	($46.1)	($45.1)	($23.1)	($24.4)	($25.6)	($26.9)	($28.2)	($29.6)	($31.1)	($32.6)	($337.6)
OTHER														
UTILITIES	$0.0	($0.0)	$0.2	($0.5)	($0.1)	($0.1)	($0.1)	($0.1)	($0.1)	($0.2)	($0.2)	($0.2)	($0.2)	($1.6)
ERROR REDUCTION SAVINGS	$0.0	$0.0	$3.0	$12.6	$15.8	$16.6	$17.5	$18.3	$19.3	$20.2	$21.2	$22.3	$23.4	$190.2
SCHEME TRAINING SAVINGS	$0.0	$0.0	$1.9	$4.1	$6.4	$9.0	$9.5	$9.9	$10.4	$11.0	$11.5	$12.1	$12.7	$98.6
SOFTWARE SUPPORT	$0.0	($0.3)	($0.3)	($0.3)	($0.3)	($0.3)	($0.3)	($0.3)	($0.3)	($0.3)	($0.3)	($0.3)	($0.3)	($3.4)
TRANS COMP IMPACT	$0.0	$0.0	($6.2)	($58.2)	($101.9)	($42.1)	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	($208.4)
MISCELLANEOUS	$0.0	$0.0	$0.0	$0.0	($0.5)	($0.5)	($0.5)	($0.5)	($0.5)	($0.5)	($0.5)	($0.6)	($0.6)	($4.7)
RECURRING LETTER MAIL LABELS	$0.0	($3.6)	($4.7)	($5.0)	($5.2)	($5.5)	($5.8)	($6.0)	($6.4)	($6.7)	($7.0)	($7.4)	($7.7)	($70.9)
OTHER	$0.0	($3.9)	($6.1)	($47.2)	($85.8)	($22.9)	$20.3	$21.3	$22.4	$23.5	$24.7	$26.0	$27.3	($0.3)
TOTAL VARIANCES	$0.0	($47.6)	($143.9)	$63.4	$143.9	$245.3	$295.9	$310.7	$326.3	$342.6	$359.8	$377.8	$396.7	$2,670.8
NET CASH FLOW	($36.2)	($242.1)	($577.6)	($299.2)	$143.9	$245.3	$295.9	$310.7	$326.3	$342.6	$359.8	$377.8	$396.7	$1,643.9
	ROI =	15.4%	NPV =	$147										

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SITES BAR CODING AUTOMATIO. (RBCS Only for 120 SITES)

Desired Performance

RBCS4.WK3

YEAR	1993 0	1994 1	1995 2	1996 3	1997 4	1998 5	1999 6	2000 7	2001 8	2002 9	2003 10	2004 11	2005 12	TOTAL
CAPITAL INVESTMENT														
IPSS SYSTEMS	($9.0)	($27.1)	($54.2)	($22.6)										($112.9)
IPSS TERMINALS	($6.5)	($9.6)	($15.3)	($5.0)										($36.3)
DBCS	$0.0	$0.0	($97.6)	($178.3)										($275.9)
TOTAL ISS/MLOCR	($8.1)	($44.3)	($67.7)	($26.1)										($146.1)
OSS BCS	($11.0)	($14.8)	($29.0)	($10.7)										($65.6)
ISS AFCS	$0.0	($15.7)	($67.6)	($73.9)										($157.2)
RCR	$0.0	($18.0)	($37.3)	($12.2)										($67.5)
Additional Engineering & Support Equip.	$0.0	($36.5)	($2.2)	($1.2)										($39.8)
Contingency	$0.0	($4.2)	($9.3)	($8.2)										($21.7)
SITE PREP	($1.8)	($22.3)	($44.4)	($10.6)										($78.8)
TOTAL CAPITAL INVESTMENT	($36.2)	($192.5)	($424.5)	($348.7)										($1,001.9)
EXPENSE INVESTMENT	$0.0	($2.0)	($9.2)	($13.9)										($25.1)
OPERATING VARIANCES														
NET DBCS / MPLSM SPACE	$0.0	$0.0	$0.0	($22.1)	($23.2)	($24.3)	($25.5)	($26.8)	($28.1)	($29.6)	($31.0)	($32.6)	($34.2)	($277.4)
IN-HOUSE RBCS COSTS														
REC MAINTENANCE	$0.0	($13.1)	($45.9)	($57.5)	($54.7)	($57.4)	($60.3)	($63.3)	($66.5)	($69.8)	($73.3)	($76.9)	($80.8)	($719.5)
TELCOMMUNICATIONS	$0.0	($0.1)	($3.4)	($9.0)	($9.9)	($10.4)	($10.9)	($11.4)	($12.0)	($12.6)	($13.2)	($13.9)	($14.6)	($121.3)
REC SPACE	$0.0	($2.9)	($9.5)	($12.8)	($13.5)	($14.1)	($14.8)	($15.6)	($16.3)	($17.2)	($18.0)	($18.9)	($19.9)	($173.6)
OTHER PERSONNEL	$0.0	($15.1)	($59.7)	($88.0)	($95.7)	($101.6)	($112.5)	($118.2)	($124.1)	($130.3)	($136.8)	($143.6)	($150.8)	($1,256.2)
OTHER NON-PERSONNEL	$0.0	($0.7)	($5.6)	($12.3)	($13.3)	($14.0)	($14.7)	($15.4)	($16.2)	($17.0)	($17.8)	($18.7)	($19.6)	($165.1)
KEYING	$0.0	($7.1)	($168.8)	($452.0)	($495.2)	($520.0)	($546.0)	($573.3)	($601.9)	($632.0)	($663.6)	($696.8)	($731.6)	($6,088.2)
RBCS IN-HOUSE TOTAL	$0.0	($39.1)	($292.8)	($611.6)	($682.2)	($717.4)	($759.1)	($797.1)	($836.9)	($878.8)	($922.7)	($968.9)	($1,017.3)	($8,523.8)
OPERATIONAL SAVINGS														
MAIL PROC LEVEL 4	$0.0	$0.0	($35.3)	($156.4)	($181.4)	($190.5)	($200.0)	($210.0)	($220.5)	($231.5)	($243.1)	($255.2)	($268.0)	($2,191.8)
MPLSM CLERKS	$0.0	$0.0	$101.3	$433.1	$503.5	$528.7	$555.1	$582.9	$612.0	$642.6	$674.8	$708.5	$743.9	$6,086.6
MANUAL CLERK	$0.0	$0.0	$102.3	$430.6	$501.1	$526.2	$552.5	$580.1	$609.1	$639.6	$671.6	$705.2	$740.4	$6,058.7
CARRIER	$0.0	$0.0	$61.3	$262.5	$305.2	$320.4	$336.4	$353.3	$370.9	$389.5	$409.0	$429.4	$450.9	$3,688.8
TOTAL	$0.0	$0.0	$229.6	$969.8	$1,128.4	$1,184.9	$1,244.1	$1,306.3	$1,371.6	$1,440.2	$1,512.2	$1,587.8	$1,667.2	$13,642.3
NET OPERATIONAL SUPPORT														
MAINTENANCE LABOR	$0.0	($4.6)	($17.0)	($38.9)	($37.0)	($38.9)	($40.8)	($42.8)	($45.0)	($47.2)	($49.6)	($52.1)	($54.7)	($468.6)
RECURRING SPARES	$0.0	$0.0	($3.2)	($17.2)	($26.4)	($29.8)	($31.3)	($32.8)	($34.5)	($36.2)	($38.0)	($39.9)	($41.9)	($333.3)
RECURRING MAINT. TRAINING	$0.0	$0.0	($0.1)	($0.8)	($2.6)	($2.7)	($2.9)	($3.0)	($3.1)	($3.3)	($3.4)	($3.6)	($3.8)	($29.3)
RECUR. TDP & DOCUMENTATION	$0.0	$0.0	($0.3)	($0.3)	($0.3)	($0.3)	($0.3)	($0.3)	($0.4)	($0.4)	($0.4)	($0.4)	($0.4)	($3.7)
MPLSM MAINT. LABOR REDUCT.	$0.0	$0.0	$0.0	$10.4	$21.8	$45.7	$48.0	$50.4	$52.9	$55.6	$58.4	$61.3	$64.4	$468.9
MPLSM PARTS REDUCT.	$0.0	$0.0	$0.0	$0.7	$1.4	$2.9	$2.9	$3.0	$3.1	$3.3	$3.5	$3.6	$3.8	$29.2
NET OPERATIONAL SUPPORT	$0.0	($4.6)	($20.6)	($46.1)	($45.1)	($23.1)	($24.4)	($25.6)	($26.9)	($28.2)	($29.6)	($31.1)	($32.6)	($337.8)
OTHER														
UTILITIES	$0.0	($0.0)	$0.2	($0.5)	($0.1)	($0.1)	($0.1)	($0.1)	($0.1)	($0.2)	($0.2)	($0.2)	($0.2)	($1.6)
ERROR REDUCTION SAVINGS	$0.0	$0.0	$3.0	$12.6	$15.8	$16.6	$17.5	$18.3	$19.3	$20.2	$21.2	$22.3	$23.4	$190.2
SCHEME TRAINING SAVINGS	$0.0	$0.0	$1.9	$4.1	$6.4	$9.0	$9.5	$9.9	$10.4	$11.0	$11.5	$12.1	$12.7	$98.6
SOFTWARE SUPPORT	$0.0	($0.3)	($0.3)	($0.3)	($0.3)	($0.3)	($0.3)	($0.3)	($0.3)	($0.3)	($0.3)	($0.3)	($0.3)	($3.4)
TRANS COMP IMPACT	$0.0	$0.0	($42.9)	($183.8)	($152.6)	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	($379.2)
MISCELLANEOUS	$0.0	$0.0	$0.0	$0.0	($0.5)	($0.5)	($0.5)	($0.5)	($0.5)	($0.5)	($0.5)	($0.6)	($0.6)	($4.7)
RECURRING LETTER MAIL LABELS	$0.0	($3.6)	($4.7)	($5.0)	($5.2)	($5.5)	($5.8)	($6.0)	($6.4)	($6.7)	($7.0)	($7.4)	($7.7)	($70.9)
OTHER	$0.0	($3.9)	($42.6)	($172.8)	($136.5)	$19.2	$20.3	$21.3	$22.4	$23.5	$24.7	$26.0	$27.3	($171.1)
TOTAL VARIANCES	$0.0	($47.6)	($126.6)	$117.2	$241.6	$439.3	$455.4	$478.2	$502.1	$527.2	$553.6	$581.3	$610.4	$4,332.2
NET CASH FLOW	($36.2)	($242.1)	($560.3)	($245.4)	$241.6	$439.3	$455.4	$478.2	$502.1	$527.2	$553.6	$581.3	$610.4	$3,305.2
	ROI =	26.8%	NPV =	$819										

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The cash flow line item descriptions are shown on the following pages. The cash flows are divided into three main sections: capital investments, expense investments, and operating variances.

Capital Investments

IPSS Systems

This represents the capital costs associated with the manufacture, delivery, initial site spares, initial training and installation for the 120 RBCS sites. The total capital for this item is $112.9 million based on a unit cost $509,078 per system for the first 22 systems and $776,567 per system for the next 98 systems. This line item also includes $25.6 million for the initial site spares and training.

IPSS Terminals

This represents the capital costs associated with the manufacture, delivery and installation of the 11,520 video display terminals (VDT) required as part of the RBCS for the 120 sites. The total capital for this item is $36.3 million based on a unit cost of $2,826 per VDT for the first 2,880 VDTs and $3,265 per VDT for the next 8,640 VDTs.

DBCS

This line item represents the capital costs associated with the manufacture, delivery, initial site spares and training, and the installation of the 978 DBCSs required to support the RBCS in the 120 sites. The total capital investment for this item is $275.9 million based on a unit cost of $249,495 plus $31.9 million for initial site spares and training.

ISS MLOCR

This line item represents the capital costs associated with the manufacture, delivery, initial sites spares and installation of the input subsystem and A-Star modifications for 285 MLOCR-A machines and the input subsystem modifications for the 263 MLOCR-B machines. This will provide the capability to capture a video image of all non-readable addresses. The total capital investment for this item is $146.1 million based upon an MLOCR-A unit cost of $350,326 and an MLOCR-B unit cost of $142,992. This item also includes $19.8 million for initial site spares, training, source development and engineering support.

OSS BCS

This line item represents capital cost associated with the manufacture, delivery and installation of output subsystem modifications to 328 BCSs to provide the capability for the BCSs to communicate with the remote bar coding computer system and to spray a bar code on each mail piece. The total capital investment for this item of $65.6 million is based on a unit cost of $72,557 per BCS modification. The cost of two letter mail labeling machines (LMLM) of $325,000 per site is also included in the capital investment for this item, in addition to $2.8 million for initial site spares and training. The LMLMs attach a blank white label to letters that will not accept a bar code. This enables a bar code to be sprayed and read on these pieces thereby increasing the amount of mail that can be processed in the automated mail stream.

ISS AFCS

This line item represents the capital cost associated with the manufacture, delivery, initial site spares, training , documentation and installation of an input subsystem on each of the 571 advanced facer-canceler systems (AFCS) in the 120 sites to provide the capability to capture a video image of non-OCR readable addresses and to transmit the images to the remote bar coding computer system. The total capital for this item of $157.2 million is based upon a unit cost of $223,453 plus $29.6 million for initial spares, training, source development and engineering support.

RCR

This line item represents the capital cost associated with the manufacture, delivery, initial site spares, training, documentation and installation of 120 remote computer reading units. The total capital for this item of $67.5 million is based upon a unit cost of $434,000 plus $15.4 million for initial spares, training and documentation.

Additional Engineering & Support Equipment

This line item includes the capital cost of $4.1 million associated with the manufacture, delivery and installation of telecommunications test equipment to be utilized with the RBCS. This line item also includes $27.3 million for engineering changes to the RBCS and $8.5 million for back-up and hardware needed to convert to USPS encoding.

Contingency

Capital contingency is calculated at 2.5 % of the capital costs for the new hardware and equipment modifications above. This is included to accommodate unanticipated changes in projected costs or program requirements. Total capital contingency in the cash flow is estimated at $21.7 million. The RBCS portion of this contingency is $14.8 million.

Site Prep

Funding in the amount of $78.8 million is provided to prepare sites for the installation of equipment and equipment modifications described above, and REC build-out. The total site prep requested for the RBCS is $64.2 million. This includes the site prep at the P&DC sites in addition to Remote Encoding Center items such as build-out of the RECs, furniture, telephones and electronic time clocks. The DBCS site prep of $14.7 million is based upon a cost of $15,000 per site. This item includes funding for items such as additional power, changes in facility layouts, modifications to interior space, etc.

Expense Investments

Represents depot spares as follows:

IPSS Systems	-	$ 3.1 million
DBCS	-	$ 5.4 million
ISS MLOCR	-	$ 4.9 million
ISS AFCS	-	$ 7.6 million
OSS BCS	-	$ 0.3 million
RCR	-	$ 3.9 million
Contingency	-	$ .6 million

Operating Variances

Net DBCS / MPLSM Space

This line item represents the leasing costs for the 978 DBCSs. This cost is based upon 2,000 square feet required for each DBCS at $19.45 per square foot in 1994 escalated by 5 percent annually offset by the space savings resulting from the reduction in the number of MPLSMs.

In-House RBCS

These line items represent the cost of the remote keying portion of the RBCS.

RBCS REC Maintenance

This line item represents the start-up maintenance of $595,000 per P & DC site served, in addition to annual recurring maintenance of $357,000 per site. This includes the costs of maintenance personnel, furnishings, fixtures, cabinets, tools and test equipment in addition to maintenance training.

Telecommunications

This line item represents the costs of the telecommunications required to enable the RBCS Sites to transmit letter mail images to and from the REC and Processing and Distribution Centers. This is based upon the actual telecommunications costs for the phase I sites, and is calculated at a rate of $0.34 per keying hour in 1994 dollars which equates to a total annual cost for the 120 sites of over $9.9 million.

Space

This represents the annual cost of leasing space, and the custodial cost required to house the remote encoding centers. This includes the space required for terminals, aisles, computers, and all administrative and support space. Lease costs are shown in this analysis to reflect space needs and represent the economic impact of obtaining space. However, it should be noted that as keying sites are established an analysis will be performed to determine whether individual sites should be leased or owned. This costs is based upon the need for 60 square feet per terminal at a 1994 cost of $16.81 per square foot for the space and custodial work. This equates to over $14.1 million for the 120 sites when fully deployed.

Other Personnel

This represents the personnel costs associated with data conversion operator (DCO) training, management, security, time and attendance and secretarial/administrative work, in addition to the cost of DCO non-productive time. The DCO training is based upon 60 hours of initial training per operator, with recurring cost based upon a 6% turnover rate for the career DCOs and 50% turnover for the transitional DCOs. The annual time and attendance costs for the 120 sites is over $6.6 million. The annual security for the 120 sites is over $2.7 million. The non-productive time is included to account for DCO breaks, and other non-keying time. This is based upon a factor of 10.8% and results in a net productivity of 587 images per work hour versus 650 images per console hour. This line item also includes the cost of DPS Program Managers, additional headquarters support staff, in addition to initial and recurring RBCS hiring and training.

Other Non-Personnel

This line represents the non-personnel costs associated with Remote Encoding Centers in the 120 sites; this includes fuel and utilities in the annual amount of over $5.0 million, $5.2 million for supplies and services, and $.4 million for other equipment maintenance.

Keying

This line item represents the costs of keying at the remote sites. This includes the cost for all data conversion operators work hours, lead data conversion operators, and supervision at a ratio of 1 hour of supervisor for every 30 - 50 data conversion operator hours.

Operational Savings

Labor savings are based on the differential cost of processing script and MLOCR rejected letter mail in a manual-mechanized environment compared to the cost of processing this mail on the RBCS deployed to the 120 sites in this proposal. The RBCS will generate a greater amount of bar coded mail that can be distributed on automation instead of the labor-intensive MPLSMs and manual cases. The savings also include savings in carrier casing time based upon DPS versus manual casing. In addition the savings include the carrier savings associated with carrier route fixed costs eliminated as a result of routes being abolished. Included in the savings are the impact of modifications for the MLOCR "A" machines at the 120 sites which improve their performance to that of the newer MLOCR-"B" machine. The main benefit of this is improvement in the bar coding rate and

the depth of sort to which the mail is bar coded. A higher coding rate and greater depth results in more of the mail processed on bar code sorters instead of on MPLSM and manual operations. A carrier casing capture rate of 50 percent is assumed with the minimum expected performance. The desired performance assumes a carrier casing capture rate of 95 percent. The mail processing savings are lagged four months while the delivery savings are lagged one year after equipment deployment (with the minimum expected performance) and six months (with the desired performance).

These line items also include the net supervisor cost/savings required to operate the proposed system. This is based upon the following supervisor/employee ratios:

Mail processor - Automated Equipment	- 1 to 7
Manual Distribution Clerks	- 1 to 20
MPLSM	- 1 to 20

No credit was taken for carrier supervision since the majority of carrier supervisors are located in delivery units that would still require a supervisor.

Operational Support

These line items include the maintenance labor, recurring spares, training and recurring documentation.

Maintenance Labor

This item covers the annual cost of the maintenance labor required to keep all of the equipment in this proposal operational and in service. This item also includes the cost of base lining equipment to prepare for the ISS and OSS modifications and the cost of relocating floater MLOCRs necessary to complete ISS modifications. The cost of additional maintenance supervisors is also included in this line.

Recurring Spares

This item covers the annual recurring cost of site replacement parts required to keep the equipment included in this proposal operational and in service.

Recurring Maintenance Training

This item covers the annual recurring training costs due to turnover in personnel for all of the equipment in this proposal.

Recurring Technical Documentation Packages

This item includes the recurring cost of technical documentation packages for the equipment in this proposal.

MPLSM Maintenance Labor

This proposal will result in more mail being processed on automation and fewer MPLSMs at the automated sites. This item represents savings in maintenance labor required as a result of having fewer MPLSMs operational.

MPLSM Maintenance Parts

This represents the anneal cost avoidance of the spare parts resulting from having fewer MPLSMs operational.

Other

Utility Costs

This item represents utility costs associated with additional automated equipment and the savings associated with fewer MPLSMs.

Error Reduction Savings

This item represents the savings that will result from the decrease in errors in an automated environment versus the mechanized environment. It is projected that distribution errors to delivery operations will be reduced by 6.0 percent versus MPLSM secondary operations. This results in less re-handling of missorted letters. This item also includes the error reduction savings resulting from going from MPLSM outgoing processing to automation.

Scheme Training

The build-up in bar coded volume resulting from RBCS will result in significant reductions in scheme training. This item represents these savings.

Directory and Software Support

One position for every eight DBCSs will be required to provide directory support to develop and implement sort schemes for DBCSs.

Transitional Complement Impact

The work hour savings potential from this program presents special challenges to ensure that they are fully realized. This item accounts for possible short-term carrier route adjustment problems. With the minimum expected performance, the carrier savings in 1995 are offset by a cost equivalent to 85 percent of the carrier savings, 70 percent in 1996, 65 percent in 1997, and 25 percent in 1998. The carrier savings at the desired performance level are offset by 70 percent in 1995, 70 percent in 1996 and 50 percent in 1997.

Miscellaneous

The Louisville, KY and Western Nassau, NY Early Activation Pilot Sites (EAPS) will be updated with the latest standard postal equipment configuration. This line item represents adjustments for this conversion. Since these sites have been bar coding mail with the test equipment, the mail processing savings are offset as a cost to reflect no additional savings for these sites. The keying cost is also offset to reflect savings from converting these sites to postal keying.

Recurring White Labels

The recurring annual costs of white labels for the letter mail labeling (LMLM) machines is included in this line item.

ATTACHMENT A

120 RBCS SITES

Seattle WA	Las Vegas NV
Philadelphia PA	Lehigh Valley PA
Milwaukee WI	Little Rock AR
Baltimore MD	Long Beach CA
Kansas City MO	Los Angeles GMF CA
Portland OR	Louisville KY[4]
Atlanta GA	Madison WI
Newark GMF NJ	Manasota FL
Suburban MD	Manchester NH
Cleveland GMF OH	Manhattan NY
Houston TX	Memphis TN
Newark D.V. Daniels Facility NJ	Mid-Florida FL
Washington DC	NJ Metro
Dallas TX	Nashville TN
Rochester NY	New Brunswick (Kilmer P & DC) NJ
Omaha NE	New Haven CT
Salt Lake City P & DC UT	New Orleans LA
Miami FL	Norfolk VA
Albany NY	North Bay CA
Southern MD, MD	North Houston TX
North County, Santa Ana CA	North Metro GA
Jacksonville FL	North Texas TX
Akron OH	Oklahoma City OK
Albuquerque NM	Orlando FL
Austin TX	Oxnard CA
Baton Rouge LA	Palatine IL
Birmingham AL	Pasadena CA
Boston MA	Pittsburgh PA

[4] Louisville and Western Nassau are early activation pilot sites. It is the intent to update these sites with the latest standard Postal configuration.

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Brockton MA
Brooklyn NY
Canton OH
Cedar Rapids IA
Charleston SC
Charlotte NC
Chattanooga TN
Chicago (Central) IL
Church Street Station NY NY
Columbia SC
Columbus OH
Dayton OH
Des Moines IA
Detroit MI
Dulles VA
Everett WA
Fayetteville NC
Fort Meyers FL
Fort Worth TX
Fox Valley IL
Fresno CA
Grand Rapids IA
Greensboro NC
Greenville SC
Hartford CT
Honolulu HI
Industry (Alhambra) CA
Irving Park IL
Jackson MS
Kalamazoo MI
Kansas City KS
Lansing MI
Portland ME
Raleigh NC
Richmond VA
Rock Island IL
Royal Oak MI
Sacramento CA
Saint Paul MN
San Bernardino CA
San Francisco CA
San Jose CA
Santa Barbara CA
South Suburban IL
Spokane WA
Springfield MA
Springfield MO
Stamford CT
Stockton CA
Summit (West Jersey P & DC) NJ
Syracuse NY
Tacoma WA
Toledo OH
Trenton NJ
Tucson AZ
Tulsa OK
Van Nuys CA
West Palm Beach FL
Western Nassau NY[4]
Westchester NY
Wichita KS
Wilmington DE
Worcester MA
Youngstown OH

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Attachment B

First 22 Plants and RECs

RBCS PLANTS	KEYING SITES
Seattle WA	Salt Lake City UT
Portland OR	Salt Lake City UT
Salt Lake City UT	Salt Lake City UT
Kansas City MO	Wichita KS
Milwaukee WI	Des Moines IA
Omaha NE	Des Moines IA
Baltimore MD	Greensboro NC
Washington DC	Greensboro NC
Southern MD	Charleston WV
Suburban MD	Charleston WV
Birmingham AL	Birmingham AL
Miami FL	Birmingham AL
Jacksonville FL	Birmingham AL
Atlanta GA	Chattanooga TN
Philadelphia PA	Lehigh Valley PA
Cleveland OH	Akron OH
Newark GMF NJ	Newark NJ
North Jersey (DVD) NJ	Newark NJ
Houston TX	Beaumont TX
Dallas TX	Little Rock AR
Rochester NY	Syracuse NY
Albany NY	Albany NY

MEMORANDUM OF UNDERSTANDING
BETWEEN THE
UNITED STATES POSTAL SERVICE
AND THE
AMERICAN POSTAL WORKERS UNION, AFL-CIO

Re: RBCS

In full and complete settlement of all issues related to the implementation of RBCS, the APWU and the Postal Service agree to the following principles:

1. The Postal Service recognizes the value of postal employment in the fulfillment of its automation program and the APWU recognizes the value of cooperation with the Postal Service in the implementation of the automation program.

2. The parties agree that the RBCS keying position is a Data Conversion Operator, PS-4, clerk craft. In addition, the parties agree to utilize the concept of Group Leader - Data Conversion Operator, PS-5, clerk craft, in the RBCS keying sites.

3. The parties will develop the details of an orderly transition of RBCS to postal operations by means of a Joint Task Force on RBCS Implementation which is referenced in paragraph 10 of this Memorandum of Understanding. One of the purposes of the Task Force is to protect service during the transition. The Postal Service is committed to performing all RBCS work with postal employees (career and noncareer) as quickly as operationally possible. The current 25 RBCS contract sites and the 2 EAP sites will be converted to postal operations at the earliest possible date. However, the parties recognize that during the transition phase and in order to maintain service at an existing contract site, there may be unavoidable delays in converting a contract site to a postal operation. Only in such circumstances may the Postal Service extend particular contracts beyond the initial contract term. In no case may such contract extensions continue beyond December 31, 1996. Should the union believe that any contract extension violates the principles in this paragraph, the APWU may immediately proceed to arbitration with priority scheduling.

4. The clerical staffing of the RBCS sites will be accomplished by utilizing the ratio of 30 percent career work hours to 70 percent Transitional Employee work hours (work hours do not include leave hours). The ratio of career work hours to Transitional Employee work hours in RBCS sites is limited to those activities that are related to RBCS operations, which also includes other activities such as administrative support. This ratio of career work hours to Transitional Employee work hours in RBCS sites is a national percentage. The Postal Service is committed to ensuring that the conditions of this provision are met on an ongoing basis.

   The parties recognize that volume and work hours will fluctuate during the course of a fiscal year. It is unlikely that work hour projections will precisely match actual experience. Therefore, there will be a need to monitor work hours and adjust the work hours and/or complement to assure that the national work hour percentages are achieved on average over each fiscal year. The following procedures will be utilized to monitor and adjust work hours/complement to comply with this agreement:

   a. The Postal Service will make the initial projections for volume and work hours in the RBCS operations. Also, the Postal Service will project the career complement at each keying site. The career complement system-wide must be sufficient to work thirty percent of the projected work hours.

b. Commencing with the first accounting period after the start-up of Postal RBCS operations, the parties will meet at least once each accounting period to review actual experience and revised projections. The parties will agree upon any necessary adjustments to the planned career complement work hours.

c. After the first year of Postal RBCS operations, the Postal Service will make work hour and career complement projections by fiscal year. The parties will meet at least quarterly to review actual experience and revised projections. The parties will agree upon any necessary adjustments to the planned career complement work hours.

d. After completion of the first twenty-four months of Postal RBCS operations, the parties will meet to review the actual experience in relation to achieving the agreed upon percentages of thirty percent career work hours and seventy percent Transitional Employee work hours.

If the experience shows difficulty in keeping within a one percent career workhour variance, the parties will resolve the difference and consider appropriate adjustments, such as lump sum payments to identified affected employees and/or other complement adjustment options.

Adjustments in work hours and/or complement are intended to quickly recover any deviation from plan, in order that at the end of the fiscal year, the agreed upon work hour percentages are achieved.

5. The parties recognize that the Transitional Employee complement provides the Postal Service with additional flexibility. It is the intent of the parties that the career workforce, up to the agreed upon percentage, will occupy full-time duty assignments to the extent that there exists 8 hours of work within 9 or 10 consecutive hours, as appropriate.

6. The lock-in period for Data Conversion Operators will be 365 days. The parties agree that each RBCS site will complete the twelve (12) week production ramp-up period before the lock-in period will begin for the full-time Data Conversion Operators in RBCS sites.

7. The Postal Service retains the right to determine the location of the RBCS sites, as well as the right to determine which images are processed at each such RBCS site. A RBCS site processing images for an installation other than the installation in which the RBCS site is situated will be considered an independent installation for purposes of the application of the National Agreement.

8. Consistent with applicable law, the parties will establish procedures which will provide RBCS Transitional Employees with RBCS career opportunities.

9. Employees will be required to qualify for RBCS keying at a rate of 7,150 keystrokes per hour at an accuracy rate of 98 percent. Employees will be expected to maintain the performance and accuracy rates required for qualification, which the parties agree is a fair day's work. There shall be no production standards unless one is promulgated pursuant to Article 34. The parties will jointly work to develop methods of maintaining the throughput and accuracy rates for the system, the training program for qualifying employees as keyers and a system for monitoring performance. The parties will review the keying rate of 7,150 keystrokes per hour and accuracy rates and adjust as appropriate, prior to the implementation of Remote Computer Read.

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10. The parties agree to establish a Joint Task Force to address issues of mutual concern with respect to RBCS implementation. The Joint Task Force on RBCS Implementation will meet to discuss and agree on certain matters, including but not limited to the following topics:

    a. Ergonomics - Ergonomic concerns related to work stations and operational methods shall be jointly addressed through a consultative process. The Joint Task Force will make its initial recommendations to the parties concerning operational methods within 90 days of the date of this Memorandum of Understanding. Thereafter, the Joint Task Force will address either party's continuing concerns.

    b. Group Leader–Data Conversion Operator, PS-5, clerk craft - Prior to the activation of the next 22 RBCS sites, the parties will negotiate the details of such staffing.

    c. Application of Transitional Employee Memoranda of Understanding - Within 30 days of the date of this Memorandum of Understanding, the parties will meet and agree upon which portions of the existing Transitional Employee Memoranda of Understanding shall be applicable to the RBCS Transitional Employees.

    d. Career Opportunities for Transitional Employees - The procedures necessary to provide career opportunities for RBCS Transitional Employees will be completed no later than 120 days of the date of this Memorandum of Understanding.

    e. Information Tracking - The Postal Service will share performance tracking information on RBCS operations with the APWU.

    f. Interaction of a Separate RBCS Site with Other Postal Installations - Prior to the first RBCS site completing its twelve (12) week production ramp-up, the parties shall agree to a procedure for RBCS site career employees to be able to move into an installation or installations in a geographical area contiguous to the RBCS site, after the 365 day lock-in period has been completed. Prior to activation of a Postal RBCS site, the parties shall resolve all issues related to Article 30 of the National Agreement with respect to such RBCS site.

    The parties intend to form sub-committees to address these matters and, unless otherwise indicated, report to the Joint Task Force within ninety days of the date of this Memorandum of Understanding. Failure of the parties to reach agreement on any Joint Task Force matters shall not delay the activation of any RBCS site.

11. The parties agree that the terms of this Memorandum of Understanding and any other agreements which the parties enter as a result of the activities and recommendations of the Joint Task Force on RBCS Implementation shall not be raised during the 1994 National Negotiations or during any related interest arbitration proceedings.

Moe Biller
President
American Postal Workers
Union, AFL-CIO

Dated: 11/2/93

Joseph J. Mahon, Jr.
Vice President
Labor Relations
U.S. Postal Service

Dated: 11/2/93

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Mr. Moe Biller
President
American Postal Workers
Union, AFL-CIO
1300-L Street, N.W.
Washington, DC 20005-4128

Re: HOC-NA-C 13

Dear Moe:

Recently, Thomas J. Valenti, Labor Relations Specialist, Contract Administration, and James Lingberg, Director, Maintenance Division, American Postal Workers Union, AFL-CIO, met in a prearbitration discussion of the above referenced case.

The issue in this grievance concerns the contracting out of maintenance for the Remote Bar Code System (RBCS) equipment.

In full and complete settlement of this grievance and all issues related to RBCS maintenance, the parties agrèe to the following principles:

1. The Postal Service will use maintenance employees to perform RBCS maintenance work at postal operated keying sites. The staffing of these sites with maintenance employees will be consistent with the phase-in of Postal Service keying positions at postal RBCS sites.

2. Maintenance work may continue to be performed by contract personnel for as long as those keying sites are operated by the contractor. During this period, the Postal Service is free to change the site maintenance contractor(s).

3. The parties will develop the details of an orderly transition of the maintenance functions at the postal RBCS sites to postal operations by a joint task force consistent with paragraphs 3 and 10 of the RBCS Implementation Memorandum of Understanding.

4. Maintenance staffing of the postal operated RBCS sites will be consistent with the applicable contractual provisions.

Moe Biller
President
American Postal Workers
Union, AFL-CIO

Dated: 11/2/93

Anthony J. Vegliante
Manager
Grievance and Arbitration
Labor Relations

Dated: 11/2/93

MEMORANDUM OF UNDERSTANDING
BETWEEN THE
UNITED STATES POSTAL SERVICE
AND THE
AMERICAN POSTAL WORKERS UNION, AFL-CIO

Re: RBCS Implementation

As soon as possible, the USPS will offer an opportunity to all Joint Bargaining Committee represented employees, to express an interest in one of the RBCS Data Conversion Operator, PS-4, clerk craft jobs in an RBCS site. This solicitation will permit an expression of interest by state, metropolitan area or city.

After the USPS selects a site for an RBCS operation, a notice will be posted for clerk craft employees within the district encompassing the selected site offering full-time and part-time career opportunities in the selected site. A posting shall be made at post offices within the district to inform and invite them to express an interest. For purposes of this Memorandum of Understanding (MOU) only, the term district is defined as the geographical area covered by each of the USPS districts as of the date of this MOU.

Employees requesting reassignment to or bidding for keying positions in the RBCS sites shall be given an opportunity to demonstrate that they meet the minimum qualifications by taking the appropriate examinations. Such opportunities shall be offered to employees who are being considered for the keying positions.

SECTION 1. ASSIGNMENT OF OPPORTUNITIES AT RBCS SITES

A. INDEPENDENT INSTALLATION

The following areas of consideration, in the order listed, shall be utilized for the purposes of offering and awarding career opportunities to employees:

1. Full-time Opportunities

a. Clerk craft from the solicitation and district-wide posting:

(1) Full-time
(2) Part-time flexible
(3) Part-time regular

b. Employees in other crafts represented by the Joint Bargaining Committee who have expressed an interest in

the solicitation will be selected based on their craft seniority or their standing on their part-time flexible roll:

(1) Full-time
(2) Part-time flexible
(3) Part-time regular

2. Part-time Opportunities

Available career part-time opportunities shall be filled in accordance with 1.a. and b. above.

B. PART OF AN EXISTING INSTALLATION

The following procedures and areas of consideration shall be utilized, in the order listed, to initially fill the newly created assignments:

1. Full-time assignments

a. Clerk craft in the installation

(1) Career full-time duty assignments shall be posted and awarded.

(2) If a residual vacancy or vacancies remain, the remaining vacancy or vacancies shall be posted for application office-wide to employees represented by the Joint Bargaining Committee. The full-time duty assignments will be awarded to employees who meet the minimum qualifications as follows:

(a) Clerk Craft

1) Part-time flexible
2) Part-time regular

(b) Employees in other crafts who expressed an interest in the solicitation will be selected based on their craft seniority or their standing on the part-time flexible roll.

1) Full-time
2) Part-time flexible
3) Part-time regular

(c) Clerk craft employees within the district who had expressed an interest in the solicitation or district-wide posting as follows:

1) Full-time
2) Part-time flexible
3) Part-time regular

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(d) All other Joint Bargaining Committee employees who had expressed an interest in the solicitation as follows:

1) Clerk craft

a) Full-time
b) Part-time flexible
c) Part-time regular

2) Other crafts

2. Part-time career opportunities shall be offered to employees who meet the minimum qualifications as follows:

a. Clerk craft within the installation:

(1) Full-time
(2) Part-time flexible
(3) Part-time regular

b. Employees in other crafts within the installation who expressed an interest in the solicitation will be selected based on their craft seniority or their standing on their part-time flexible roll as follows:

(1) Full-time
(2) Part-time flexible
(3) Part-time regular

c. Clerk craft employees within the district who had expressed an interest in the solicitation or district-wide posting as follows:

(1) Full-time
(2) Part-time flexible
(3) Part-time regular

d. All other Joint Bargaining Committee employees who had expressed an interest in the solicitation as follows:

(1) Clerk craft

a) Full-time
b) Part-time flexible
c) Part-time regular

(2) Other crafts

C. SENIORITY

Career employees, who are reassigned to a RBCS site as a result of the implementation of Section 1 of this Memorandum of Understanding, will have their reassignment treated as a detail

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during the 12 week production ramp-up period. At the end of the 12 week period, the reassigned career employees will have their seniority established as the date of the reassignment of the first career employee or the date of the first outside hire at the site whichever is earlier. The provisions of Article 37, Section 2.D.4. shall be used to break any ties in seniority.

D. RELOCATION

Career employees reassigned to a RBCS site as a result of implementation of Section 1 of this Memorandum of Understanding are responsible for payment of all expenses incurred as a result of such reassignments. Such employees are not entitled to per diem, temporary quarters, moving, mileage, or reimbursement for movement of household goods.

SECTION 2. BIDDING RESTRICTIONS

A. INDEPENDENT INSTALLATION

1. After the completion of the 12 week production ramp-up period, an employee who becomes a full-time RBCS Data Conversion Operator for the first time will be restricted from further bidding or voluntary reassignment for a period of 365 days.

2. Former RBCS Data Conversion Operators who bid back to a RBCS Data Conversion Operator duty assignment and require the complete classroom training will be restricted from further bidding for a period of 180 days.

3. The bidding restrictions in (1) and (2) above apply unless such bid is to one of the following:

   a. another RBCS Data Conversion Operator duty assignment;

   b. a duty assignment in a higher level within the installation; or

   c. caused by substantiated medical or health reasons whereby continuation in the RBCS Data Conversion Operator duty assignment would be harmful to the employee.

4. Full-time RBCS Data Conversion Operators may continue to apply for positions in the installation which are filled based on best qualified, including other craft jobs for which they are eligible to apply.

B. PART OF AN EXISTING INSTALLATION

1. After the completion of the 12 week ramp-up period, an employee who becomes a full-time RBCS Data Conversion

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Operator for the first time shall be restricted from further bidding or voluntary reassignment for a period of 365 days.

2. A former RBCS Data Conversion Operator who bids back to a RBCS Data Conversion Operator duty assignment and requires the complete classroom training will be restricted from further bidding for a period of 180 days.

3. The bidding restrictions in (1) and (2) above apply unless such bid is to one of the following:

   a. another RBCS Data Conversion Operator duty assignment;

   b. a job in a higher level; during the 365 days immediately following the 12 week production ramp-up this exception will only apply to bids to Group Leader, RBCS Data Conversion Operator, PS-5, assignment; or

   c. caused by substantiated medical or health reasons whereby continuation in the RBCS Data Conversion Operator duty assignment would be harmful to the employee.

4. Full-time RBCS Data Conversion Operators may continue to apply for positions which are filled based on best qualified, including other craft jobs for which they are eligible to apply.

Moe Biller
President
American Postal Workers
Union, AFL-CIO

Dated: 11/2/93

Joseph J. Mahon, Jr.
Vice President
Labor Relations
U.S. Postal Service

Dated: 11/2/93

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BARCODE AUTOMATION

DELIVERY POINT SEQUENCE PLAN

August 1994

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EXECUTIVE SUMMARY

Background
The Postal Service has been automating letter distribution operations since the early 1980s. Early on, the automation program primarily impacted distribution operations within the plant. With the advent of the Remote Bar Code System (RBCS) and Delivery Point Sequencing (DPS), the management challenges have broadened to include coordinating remote RBCS keying operations with plant operations and coordinating the in-plant sequencing of letters to delivery point with delivery operations.

RBCS Implementation Overview
In 1992, the Postal Service activated its first production RBCS sites. The initial 25 sites have successfully used contractors to provide keying services. However, in a recent Memorandum of Understanding with the American Postal Workers Union, the Postal Service agreed to use postal employees to perform RBCS keying operations. This has required a revision of our original implementation plans and expanded our management role in this program.

DPS Implementation Overview
The Postal Service began delivery point sequencing mail in March 1993. Our first year of experience has shown that mail can be sorted in delivery point sequence at very high levels of accuracy and that, given sufficient volume of delivery point barcoded mail, there is a significant opportunity to realize automation benefits in delivery operations.

By August 1994, we were using barcodes and automated sorting equipment to sequence letter mail into delivery order for more than 42,000 carrier routes thereby reducing the need for carriers to manually sort those letters in the office before delivery. Over 2,100 delivery zones are already receiving some portion of their letter mail sorted in delivery sequence. Our plan is to continue to expand the number of zones and the amount of letter mail being sorted to those zones paced by the barcode sorter capacity and barcoded letter mail in the system.

One of the plan options currently under review is a change in DPS implementation tactics. We are considering a revision to the DPS site selection process which would place more weight on the criteria related to the availability of barcoded letters. One result of this change would be to focus more DPS implementation activities in units supported by RBCS operations. Our experience to date has been that an RBCS operation can make a significant difference in the DPS volumes available to surrounding delivery units. Increased DPS volume is critical to achieving savings in delivery operations.

This focusing strategy may result in a slower increase in the number of DPS zones than was originally anticipated in the short run. However, it will speed up returns from those DPS zones. The decision process underway at this time is assessing the impact on the number of DPS zones and overall program benefits.

Implementation Plan Synopsis

The Barcode Automation Plan is divided into four sections which tie together the organizational responsibilities and the operational activities related to the implementation of RBCS and DPS. Automation implementation responsibilities at each management level from Headquarters through the Plant and Delivery Unit have been identified. Each level is dependent upon the other for success. Close coordination at the Performance Cluster level between Plant and District management is of particular importance in the overall success of this plan. Given the complexity of these programs, a concerted effort is required in all operational areas to ensure that savings are realized.

The Equipment section includes deployment schedules for each of the different types of equipment being deployed.

The Processing and Distribution section identifies responsibilities involved with the activation of new RBCS sites and DPS processing. Changes in mail flow and employee scheduling are key elements of the plan. The maximum generation and use of bar codes is emphasized.

The Delivery section covers the selection and preparation of zones to receive DPS processing. Preparing a delivery unit for delivery point sequencing includes: ensuring that the address management files are accurately prepared, following the implementation procedures agreed upon with the National Association of Letter Carriers and the National Rural Letter Carriers Association, and preparing to adjust routes to ensure that maximum savings are realized.

Finally, each of these elements is tied together in the Tracking section. The plan identifies the activities and results to be tracked at each organizational level. Specific accountability is placed for those items. Responsibility for capture of operational savings is stressed. This will ensure early identification and resolution of problems to keep the plan on track.

Identifying responsibilities and fixing accountability is a key focus of the Barcode Automation Plan. Each of the management levels of the Postal Service has responsibility for the successful implementation of the automation program. The following is an outline of the general responsibilities at each of the levels.

Headquarters

- Develops multi-functional policies, procedures and training programs to support the successful implementation of automation
- Provides equipment, equipment deployment schedules, technical support and other resources as required
- Monitors field performance against plans and takes necessary actions to ensure compliance and realization of program benefits
- Makes changes to equipment, policies, etc., as necessary, to keep programs on track.

Areas

- Manage equipment deployment schedules for the Area

- Coordinate the development of Performance Cluster implementation plans to ensure compliance with national program requirements
- Provide necessary resources to the Performance Clusters to ensure success
- Act as a liaison between performance clusters and Headquarters for resolution of outstanding issues
- Monitor Performance Cluster performance against implementation plans and take necessary actions to ensure compliance and capture of savings

Performance Clusters

- Prepare communication and training programs supporting RBCS and DPS implementation to facilitate the realization of program benefits.
- Coordinate the implementation activities of all the pertinent functions within the Performance Cluster, including but not limited to Human Resources, Finance, Processing and Distribution and Customer Service and Sales through the establishment of multi-functional DPS implementation teams.
- Develop detailed implementation plans at delivery unit and plant levels to synchronize the transition to automated operations
- Ensure that complement plans are in place to minimize the impact on employees
- Establish savings targets
- Monitor operational performance against plan and take necessary action to ensure success against program goals

Plan Review Process

The naming of the Area Vice Presidents was an important opportunity to assess our automation efforts. With a couple of years' worth of experience in RBCS and a year of DPS operations it was an opportune time to take a status check and critique our performance to date. The field experience and perspective of the Area Vice Presidents opened many points of discussion allowing us to identify areas of the plan which needed more thorough review and update.

The process began with an overview in July. Key managers from Area and Headquarters offices then met to clarify concerns, frame out issues, and develop proposals for Senior Management decisions on options to the baseline plan.

The decision to continue the Barcode Generation strategy on its original schedule was made at a follow-up meeting with the Area Vice Presidents in August. A further evaluation of the DPS implementation strategy is underway. Finally, a list of issues requiring further management attention has been developed and is attached.

Table 1

Action Items

Item Description	Responsible Organization	Due Date
Disseminate a revised DPS Implementation Guidelines package	Delivery Policies & Programs	Done
Identify modifications to DBCS End of Run reports necessary for DPS volume tracking	Delivery Policies & Programs and Processing and Distribution	Done
Initiate modifications to DBCS End of Run reports	Engineering	November 1994 January 1995
Develop a system and procedures for tracking DPS implementation and savings	Delivery Policies & Programs, Finance, and Operations Systems	October 1994
Modify Martin-Marietta barcode sorters to correct accuracy of sort problems	Engineering	June 1994 through January 1995
Identify existing DPS delivery units presently unable to get DPS savings because of DPS Target Percentages selected	Area Vice Presidents	Done
Develop savings plans for those units presently unable to achieve savings from DPS	Area Vice Presidents, Labor Relations, Delivery Policies & Programs, and Processing and Distribution	In Progress
Finalize a national DPS zone implementation plan for "performance to plan" tracking	Area Vice Presidents and Delivery Policies & Programs	October 1994
Develop the reports necessary to track Rural Route DPS savings	Delivery Policies & Programs, Finance, and Information Systems	November 1994

Table 2

Action Items

Item Description	Responsible Organization	Due Date **
Develop a decision tree describing MOU requirements, options and alternatives to facilitate local decision making	Contract Administration NALC/Rural and Delivery Policies & Programs	
Develop a plan to enable savings capture in units with bad local agreements	Contract Administration NALC/RURAL and Area Vice Presidents	
Review work methods for handling multiple bundles during street delivery activities	Operations Systems	
Review the criteria for taking DPS mail to the Street	Delivery Policies & Programs	
Identify exposure from changing DPS Target Percentage calculation to a weekly average from a daily average; a) what risk is incurred, and, b) how many sites are effected.	Labor Relations	
Identify and resolve the issues related to the MOU requirement to make route adjustments based upon a zone DPS percentage versus the workload on individual routes	Contract Administration NALC/RURAL	
Identify requirements (resources, training) to enhance our ability to do Route Inspections and better manage delivery units	Area Vice Presidents	
Ensure senior management and stakeholders support managers who will make unpopular changes to get DPS savings	Chief Operating Officer	
Develop means to reduce the amount of mail that by-passes the DPS mail stream	Processing Policies & Programs	
For Carrier Route presort, develop means to facilitate its inclusion into the DPS mail stream and have the worksharing discount be restricted to non-DPS zones	Processing Policies & Programs and Marketing Systems	
Develop means to resolve Plant - Delivery Unit issues surrounding forecasting projected DPS volumes and tracking actual DPS volumes	Area Vice Presidents	
Quantify Facilities Requirements to support DPS	Area Vice Presidents	

** The items in this table are from the August meeting of the Area Vice Presidents and have not been assigned due dates at the time of this printing.

Table 2

Action Items

Item Description	Responsible Organization	Due Date **
Quantify Transportation Requirements to support DPS	Area Vice Presidents	
Develop a strategy to better coordinate the DBCS/CSBCS deployment strategy and DPS Zone selection	Engineering and Area Vice Presidents	
Develop means to facilitate focusing DPS implementation efforts on high opportunity routes	Processing Policies & Programs and Delivery Policies & Programs	
Identify and resolve automation support resource issues related to software development and AMS support.	Software Design and Address Management	
Identify and resolve problems with SPS	Processing Policies & Programs and Software Design	
Develop a less cumbersome and time consuming Station Inputs process/system	Delivery Policies & Programs and Software Design	
Develop a plan for resolving support issues precipitated by an RBCS Targeting strategy.	Engineering and Area Vice Presidents	
Decide whether or not the field will be authorized a DPS Program Manager position	Organizational Structure & Job Evaluation and Operations Support	

** The items in this table are from the August meeting of the Area Vice Presidents and have not been assigned due dates at the time of this printing.

M. RICHARD PORRAS
VICE PRESIDENT, CONTROLLER

UNITED STATES
POSTAL SERVICE

September 2, 1994

MR. DOWLING

SUBJECT: Decision Analysis Report for 120 Remote Bar Coding Systems

The August 26, 1994 Decision Analysis Report (DAR) for 120 Remote Bar Coding Systems (RBCSs) has been reviewed and validated. The DAR indicates a total required investment of $1,001.9 million in capital funds and $25.1 million in expense funds for the acquisition and installation of 120 RBCSs and 978 Delivery Bar Code Sorters (DBCSs). However, since $114.7 million was approved in December 1992 for partial funding of 22 of the 120 RBCSs, and the funding for the 978 DBCSs is deferred, the DAR requests authorization at this time for $590 million in capital and $19.3 million in expense. This includes the advanced funding approved by the Board of Governors on August 29.

The economic analysis is based upon the full investment of $1,027 million. The funding includes Remote Video Encoding (RVE) equipment and Remote Computer Reading (RCR) equipment, both of which require modifications to existing Multiline Optical Character Readers (MLOCRs) and Advanced Facer-Cancelers to lift images for processing at remote sites or by computer resolution. This method of applying bar codes will result in savings in mechanized and manual processing operations and in carrier operations. The clerical and carrier workyear savings will be offset by additional employees and resultant workhour growth required for RVE keying in newly established Remote Encoding Centers, where postal workers will encode images which cannot be resolved through the RCR. However, the lower workhour cost of the RVE employees (with a mix of 30 percent career employee workhours and 70 percent transitional employee workhours) will result in net savings to the Postal Service.

The full investment includes additional DBCSs which will reduce carrier workhours through automated sorting of mail in delivery sequence. Since sufficient bar code sorter capacity exists until 1996, approval of funding for this equipment is not needed at this time; this purchase will require a separate approval in the future. The economics in the DAR depend upon the future purchase of DBCSs or an equivalent number of Carrier Sequence Bar Code Sorters (CSBCSs). If a decision is made not to invest in the DBCSs or CSBCSs, the Return on Investment for the project would be 12.8 percent, as compared to the 26.8 percent Return on Investment shown for the full investment at the desired performance level (the minimum expected performance and desired performance levels are explained on the next page).

The economic analysis supporting this DAR is based on a number of assumptions, including those listed below. Attachment II explains the significance of the assumptions and reflects the sensitivity of changes in these assumptions to the economic benefits contained in this DAR.

- growth in nationwide MLOCR encoded and customer prebarcoded letter mail from 56 billion pieces in FY 1993 to 80 billion pieces in FY 1996 (78 billion of which will occur in the 268-site RBCS network, with 48 billion in the 120 sites in this DAR);
- average RVE keying productivity, phased-in over a four-month period, of 650 images per console hour (which translates to 587 images per work hour), and a performance rate of 7,150 keystrokes per hour at an accuracy rate of 98 percent;
- a 25-percent reduction in potential RVE keying workload due to RCR;

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- a 100-percent capture rate for clerk savings, phased-in over a four-month period; and
- manual, mechanized and automated machine accept rates and productivities, some of which will require improvement from present levels.

In addition, as noted earlier, the economics of the full investment of $1,027 million are strongly influenced by the level of carrier savings achieved. Recognizing the complexity of the capture of carrier savings, management has set both minimum expected performance and desired performance levels for this portion of the total savings in the DAR. The assumptions for these two levels of carrier savings are as follows:

- Minimum Expected Performance - a 50-percent capture rate on carrier workhour savings, phased in over a four-year period.

- Desired Performance - a 95-percent capture rate on carrier workhour savings, phased-in over a three-year period.

These assumptions have been reviewed and accepted by the appropriate functional staffs at Headquarters and by field managers, and accountability has been established. It should be noted that delivery point sequence-related carrier savings projected in previous DARs have not been achieved as yet, due to the complexity of implementation. However, management has indicated that the three-year transition period noted above will provide sufficient time to achieve the minimum expectation of 50 percent of possible savings. It is assumed that this minimum expectation level will form a foundation on which to build savings over time to the desired performance level.

Based on all of the above assumptions, our validation indicates that the project will produce a Return on Investment in the range of 15.4 percent to 26.8 percent, undiscounted savings in the range of $2,670.8 million to $4,332.2 million, and a Net Present Value in the range of $147 million to $819 million, based on the difference between the minimum expectation and desired performance levels.

The equipment in the DAR will be installed over the 1994-1996 period. Net operational savings will begin in 1996 with economic breakeven in 2001 under the minimum expectation level and in 2000 at the desired performance level of savings achievement.

The program is expected to generate the equivalent workyear changes shown in Attachment I. The savings at each postal facility will depend on the particular volumes and characteristics of that office; and operational costs may be incurred at one location, with savings to be achieved at different downstream processing and delivery locations. Improvements in RCR performance or increases in mailer prebarcoding could reduce the requirement for RVE keying in the future. Therefore, it is important that national and site specific management implementation plans be developed to oversee deployment, implementation, equipment performance, barcoding levels, and complement and savings plans.

M. Richard Porras

Attachments

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ATTACHMENT I

RBCS 120 SYSTEM WORKYEAR IMPACTS

MINIMUM EXPECTED PERFORMANCE LEVEL

	1994	1995	1996	1997	1998	1999	TOTAL
CLERKS & MAIL PROCESSORS	0	(3,405)	(10,237)	(1,512)	(40)	0	(15,194)
CARRIERS	0	(82)	(653)	(583)	(1,222)	(748)	(3,288)
RVE CAREER CLERKS	84	1,820	2,965	211	0	0	5,080
RVE TRANSITIONAL CLERKS	262	5,662	9,223	658	0	0	15,805
MAINTENANCE	255	622	308	(268)	(336)	0	581
NET OVERALL INCREASE IN WORKYEARS	601	4,617	1,606	(1,494)	(1,598)	(748)	2,984

(1) = DECREASED WORKYEARS

1 = INCREASED WORKYEARS

DESIRED PERFORMANCE LEVEL

	1994	1995	1996	1997	1998	1999	TOTAL
CLERKS & MAIL PROCESSORS	0	(3,405)	(10,237)	(1,512)	(40)	0	(15,194)
CARRIERS	0	(435)	(1,354)	(1,351)	(2,845)	0	(5,985)
RVE CAREER CLERKS	84	1,820	2,965	211	0	0	5,080
RVE TRANSITIONAL CLERKS	262	5,662	9,223	658	0	0	15,805
MAINTENANCE	255	622	308	(268)	(336)	0	581
NET OVERALL INCREASE IN WORKYEARS	601	4,264	905	(2,262)	(3,221)	0	287

(1) = DECREASED WORKYEARS

1 = INCREASED WORKYEARS

The 30 percent career and 70 percent Transitional RVE clerk workhours will be hired as the Remote Encoding Centers become operational. After a four-month implementation, savings are expected in the Clerk and Mail Processor functions at major processing facilities, as mail is moved up the distribution ladder. Savings in the Carrier function have a longer ramp-up period and are discussed in the validation and in the DAR.

The net workyear impact is a gain in workyears in the range of 287 to 2,984 positions (based on the difference between the Minimum Expected level and Desired Performance level of savings achievement for carrier workhours); however, the lower cost of the RVE Clerks will produce an overall economic benefit.

ATTACHMENT II
120 RBCS SYSTEM ASSUMPTIONS, SENSITIVITIES AND SIGNIFICANT ISSUES

The following pages discuss the significance of various assumptions underlying the Decision Analysis Report (DAR) for 120 Remote Bar Coding Systems (RBCSs). **For carrier savings, the sensitivities are performed against the desired performance level.**

Capture Rate on Carrier Savings

The desired performance level reflects a three-year ramp-up of savings, with 95 percent of potential carrier savings beginning in 1998. One route will be eliminated for every 10 carrier workhours saved.

Sensitivities:

No transitional costs are necessary	ROI increases 6 points
The capture rate is reduced to 80 percent	ROI decreases 4 points
The capture rate is reduced to 50 percent; four-year ramp-up (minimum expectation level)	ROI decreases 11 points

Carrier Casing Rate

The carrier savings are based upon a current rate of casing mail in delivery sequence of 18 letters per minute versus minimal handling with delivery point sequenced mail.

Sensitivity

Casing rate decreased to 16 letters per minute	ROI increases 2 points
Casing rate increased to 20 letters per minute	ROI decreases 2 points

Capture Rate on Clerk Savings

The DAR assumes that 100 percent of the potential Clerk workhour savings will be captured by 1998. These projected savings will come from reductions in Multi-position Letter Sorting Machine (MPLSM) and manual mail processing operations as mail barcoded through RBCS is moved to automated processing. Since previous experience exists with programs targeted reductions in processing workhours due to automation, the capture rate was considered reasonable. However, sensitivity analyses were performed to determine the impact if less than 100 percent of the savings were captured.

Sensitivities:

The capture rate is reduced to 95 percent	ROI decreases 4 points
The capture rate is reduced to 90 percent	ROI decreases 7 points

Remote Video Keying (RVE) Productivity

The DAR assumes 650 images keyed per hour with a 10.8 percent non-productive factor which equates to 587 images keyed per workhour. Current performance by exceeds contracted RBCS sites exceeds 650, with some achieving over 700 images keyed per hour.

Sensitivities:

A 10 percent increase in images keyed per hour	ROI increases 4 points
A 10 percent decrease in images keyed per hour	ROI decreases 4 points

Remote Computer Reader (RCR) Factor

The DAR assumes that the RCR operation will relieve the Remote Keying Operation of 25 percent of its potential workload. Recent tests indicate that RCR has the potential to encode a greater percent of mail in the future.

RCR resolution increases to 35 percent	ROI increases 5 points

Mail Processing Operations Productivity

The DAR assumes that Bar Code Sorter (BCS) operations will have significantly higher productivities in the future than were experienced in FY 1993. This increases projected savings. On the other hand, DAR productivity assumptions used for MPLSM operations are higher than the average FY 1994 field experience and that tends to decrease projected savings.

Sensitivities:

BCS productivity held at FY 93 level	ROI decreases 4 points
MPLSM productivity held at FY 94 level	ROI increases 4 points
Both BCS and MPLSM processing productivity assumptions adjusted as above	Negligible impact

RCR without RVE

Technological change could increase the percentage of mail encoded by RCR, thus substantially reducing the labor intensive RVE keying operation. At present, it is expected that this will not occur for a number of years. To prepare for this eventuality, the RVE keying operation is staffed with 70 percent transitional employee workhours. It is expected that gains in RCR encoding will be accompanied by reductions in RVE staffing, thus increasing the ROI. Since much of the initial investment for RVE will also be needed to lift images for RCR processing, the risk is low.

Sensitivity:

Investments in RCR equipment only; no investment in RVE terminals and no keying	ROI is 11 to 14 percent

RBCS Reject Rates and System Leakage

The DAR assumes that the combined impact of the RBCS Output Subsystem reject rate (mail that could not be barcoded by MLOCRs or the RBCS) and the RVE leakage (images keyed, but no bar code is printed on the mail piece) will be 15.4 percent when the system is implemented, reflecting anticipated improvements from the current reject/leakage rate of 18 percent (earlier rates had been as high as 25 percent before improvements were made). The sponsor anticipates that the rate will go even lower over time based upon operational and technological improvements and full image lift capability. A sensitivity analysis was performed to reflect the impact if the rate was phased in.

Sensitivity:

Reject/leakage rate phased in from current 18 percent to DAR assumption of 15.4 percent	ROI decreases 1/2 point

MPLSM Reductions

The DAR assumes the elimination of 357 MPLSMs in the 120 sites to be served by the proposed Remote Bar Coding Systems. The DAR credits the full savings due to LSM reductions to the proposed RBCS systems.

Sensitivity

Only 50 percent of LSM reduction is achieved	ROI decreases 2 points

Volume and Mail Mix

The DAR contains the following letter mail volume assumptions, with a total nationwide letter and card volume forecast of 125 billion letters in FY 1996 based on Finance's official forecasts.

	Nationwide Actual FY 1993 (Billions)	Modeled Volume in 268 RBCS Sites FY 1996 (Billions)	Prorated Volume at 120 RBCS Sites FY 1996 (Billions)
Customer Prebarcoded	30}	}	}
	} 56	} 78	} 48
MLOCR Encoded	26}	}	}
RBCS Encoded	3	31	19
Subtotal Barcoded	59	109	67
Uncoded	57	9	5
Total Processed Letters & Cards	116	118	72

In addition, the DAR economic analysis assumes that growth in the letter mail mix for the 120 proposed sites is the same as the average for the full-up 268-site automated processing network projected for 1997. Due to this assumption, it is expected that there will be some differences in the actual versus projected mail mix and resultant savings for the 120 sites. However, when the full-up system is implemented, the volume, mail mix and savings should equal the total projected for the 268-site network.

RVE Career Employee Mix

Of the 30 percent career employees who will perform RVE keying, the DAR assumes that 90 percent will be new hires (lower cost) and 10 percent will be clerks who have transferred from other postal facilities.

Sensitivity

75 percent are new hires; 25 percent are transfers — ROI decreases 1/2 point

RBCS Equipment Life

The DAR assumes that all RBCS equipment will have a useful economic life of at least ten years with routine maintenance (recurring spares support is included at 3 percent of the investment cost per year). Thus, the basic DAR economic assumption is that the originally procured equipment will last at least ten years without replacement or significant upgrading. Should technological or other change require replacement or upgrading, such replacement would have to be economically justified.

Note: These sensitivities were performed during the final validation process, during which the ROI increased and decreased based on validation issues. Changes in the ROI do affect the sensitivities. However, it is the relative impact of the sensitivities which is of importance, not the absolute value.

DATE: 10/2/95

UNITED STATES POSTAL SERVICE

DECISION ANALYSIS REPORT

104 ADDITIONAL REMOTE BAR CODING SYSTEMS

ENGINEERING

Restricted Information

July 31, 1995

(114)

104 Additional Remote Bar Coding Systems
Decision Analysis Report

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EXECUTIVE SUMMARY

Introduction

This decision analysis report (DAR) provides justification for 104 additional remote barcoding systems (RBCS) which will barcode letter mail and 279 supporting delivery barcode sorters (DBCSs) to sort this mail to delivery point. When combined with the 145 systems previously approved, this will bring the total number of remote barcoding systems to 249 nationwide. It will also mark the completion of the RBCS-related equipment now planned for a full-up automated system.

Background

The letter automation plan involves generating bar codes and then using those bar codes to lower costs by automating the sorting of letters. There are three sources which will provide bar codes: customers, multiline optical character readers (MLOCRs), and the RBCS. The RBCS is an important part of the overall letter automation program and is designed to barcode mail that customers do not barcode and MLOCRs cannot barcode. While representing the most expensive form of barcoding, the significance of RBCS is that it maximizes the amount of barcoded mail in the system which is crucial to the success of the automation program, particularly, delivery point sequencing.

System Experience

Experience has demonstrated that automation has been successful. Since the automation program's inception in 1989, it has been estimated that approximately $5 billion in direct distribution labor has been saved/avoided. The other area of savings that plays an important role in the decision to invest in RBCS deals with delivery point sequencing. The volume of mail being sequenced has grown considerably. Currently, over 43 million pieces daily are delivery point sequenced and indications show that carrier productivity is increasing as a result. Since 1993, our base year, productivity in the delivery unit has increased 4.5 %. These achievements demonstrate the Postal Service's success in generating and using bar codes to reduce letter mail processing costs.

Economic Analysis

The following summary indicates the required investment and projected savings for the proposed 104 RBCSs and 279 supporting DBCSs over a ten year period:

Capital Investment	$ 334.8 million
Expense Investment	$ 7.0 million
Total Investment	$ 341.8 million

	At Minimum Expected Performance	At Desired Performance
Operating Variances	$ 1,474.4 million	$ 2,073.1 million
Return on Investment	27%	37%
Net Present Value	$ 309 million	$ 568 million

Recommendation

It is recommended that $ 334.8 million in capital and $ 7.0 million in expense be approved to procure 104 additional remote barcoding systems and 279 supporting DBCSs.

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I. Introduction

This decision analysis report provides justification for 104 additional remote barcoding systems (RBCSs) which will barcode letter mail and 279 supporting delivery barcode sorters[1] to process this mail. Total investment-related funding required is $334.8 million in capital and $7.0 million in expense. When combined with the 145 systems previously approved, this will bring the total number of remote barcoding systems to 249 nationwide. It will also mark the completion of the RBCS-related equipment now planned for a full-up automated system. Funding approval this fall will also allow these systems to begin deployment in June of 1996 keeping the Postal Service on schedule to complete deployment of the overall letter automation equipment program by the end of 1997.

The following sections of this report provide details of this investment proposal. Section II describes the overall letter automation program and the role that RBCS plays in this effort. Included is a description of how RBCS works and the implementation activities involved. Section III details the current RBCS experiences and shows recent advances made with delivery point sequencing implementation. Section IV presents the economics of the additional systems and describes the general approach used in the analysis along with the key underlying assumptions. It also includes several key distinguishing features that differentiate these systems from previously approved systems. The report concludes in Section V by recommending funding approval for the 104 remote barcoding systems along with 279 supporting delivery barcode sorters. The supporting cash flows and line item descriptions along with the list of 104 recommended sites are included in appendices A and B, respectively.

[1] The economic analysis underlying the 104 RBCS DAR assumes that the required bar code sorting capacity would be purchased in the form of 279 DBCSs. However, there are two available equipment types; the DBCS and the carrier sequence bar code sorter (CSBCS). Either type can be used to meet the supporting bar code sorting needs in this DAR. While plans at this time indicate that DBCSs are the more likely choice, future events and conditions could support purchasing an equivalent number of CSBCSs instead.

II. RBCS Background

A. Bar Codes and RBCS

The letter automation plan involves generating bar codes and then using those bar codes to lower costs by automating the sorting of letters. This plan will also improve service as both our internal and external measurement systems show that automation enables us to better meet our service commitments.

There are three sources which provide bar codes: customers, multiline optical character readers (MLOCRs), and the RBCS. The RBCS is an important part of the overall letter automation program and is designed to barcode mail that customers do not barcode and MLOCRs cannot currently barcode. While representing the most expensive form of barcoding, the significance of RBCS is that it maximizes the amount of barcoded mail in the system which is crucial to the success of the automation program, particularly, delivery point sequencing.

The 104 systems recommended in this report, along with the previously approved 145 systems will complete the RBCS network now planned for 1997. It is estimated that about 33 billion bar codes will be produced annually by these 249 systems; the 104 systems are projected to contribute approximately 6 billion of these barcoded letters.

The equipment required for the previously approved 145 systems has been funded through several different DARs. The Phase I Bar Coding Automation Program was approved by the Board of Governors in 1990 and included the first 25 systems. Remote computer readers were not included in the funding approved at that time but were subsequently approved in January 1995. Funding for the next 120 systems was approved on two different occasions. In November 1992, funding was approved for most of the equipment for 22 of these systems and in October 1994 funding for the remaining equipment for these 22 systems along with 98 additional systems was approved.

B. RBCS Components

The following main components make up the RBCS:

Input Subsystem MLOCR (ISS MLOCR)
Input Subsystem Advanced Facer Canceler (ISS AFCS)
Remote Computer Reader (RCR)
Terminals
Output Subsystems (OSS)
Image Processing Subsystem (IPSS)

An overview of how the RBCS functions is presented in the following paragraphs.

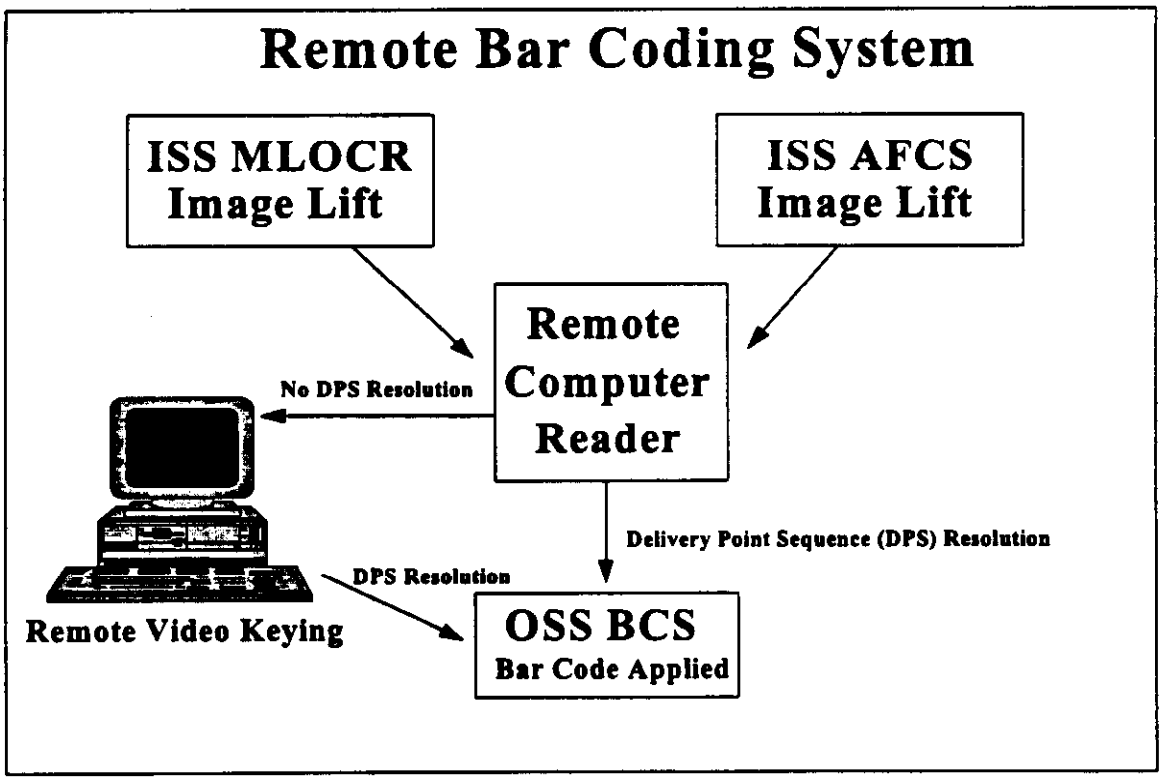
Candidate mail for the RBCS comes from two sources: the script addressed letters identified by the advanced facer canceler system (AFCS); and letters that the MLOCR cannot read at all or can not resolve beyond five digits. The process begins with image lifting. The Input Subsystem of the AFCS (ISS-AFCS) electronically lifts the images of letters addressed in script. Similarly, the images of addresses that the MLOCR is unable to resolve at all, or can not bar code beyond five digits, are lifted by the Image Subsystem of the MLOCR (ISS-MLOCR). The letters in both cases are marked on the back side with a unique identification bar code and set aside for later processing. All images are then transmitted to the remote computer reader (RCR).

The RCR is an off-line optical character recognition device that uses advanced techniques to resolve script images and other difficult to read addresses. Since it operates off-line it can take more time and use additional algorithms not available to the MLOCR. If the RCR is able to resolve the address and determine the appropriate delivery point bar code, processing of the image is completed. If the RCR is unable to completely resolve the address, the image is transmitted to a remote encoding center (REC) for manual processing.

Images transmitted to the remote encoding center are presented to operators at video terminals. The operators manually key the address information into the system which determines the appropriate ZIP codes.

After the images have been processed, the corresponding mail pieces are fed to a Barcode Sorter equipped with an Output Subsystem (OSS). The unique identification code on the back of the mail pieces are read and the associated ZIP codes are retrieved from the information that came from the remote encoding center and RCR. The bar codes representing the ZIP codes are sprayed on the mail pieces which are then sorted on the OSS BCS accordingly.

The Image Processing Subsystem (IPSS) consists of the computers and communication links used to process the address information and link the various subsystems together.



C. Deployment and Implementation

To meet the goal of bringing the next 104 RBCS sites on line by the end of 1997, the plan is to deploy these systems from June 1996 through July 1997 at a delivery rate of 8 systems per month. To support this ambitious schedule the Systems Integration Support

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group within Operations Support has been designated as the organization responsible for implementing and coordinating the various supporting organizations involved.

Site selection is the starting point in this process. As detailed in section IV, the 104 processing plants in this proposal will be served by a maximum of 22 RECs. The goal in selecting a site for these RECs is to select locations where an adequate labor force exists to perform the work. Demographic studies play a major role and look at various factors including cost of living, current and future work force content and availability, and unemployment rates. Once potential areas are identified, it is necessary to determine the availability of telecommunication service required to interconnect the RBCS.

Locating and activating the actual site or building is the next activity. Sufficient and appropriate space must be found to house the REC operations which require about 60 square feet per keying station. The facility space must be properly prepared to accommodate not only the RBCS-related equipment but other support equipment ranging from furniture to time clocks. Equipment installation can then begin.

The next stage in establishing a REC is staffing the center. Management positions, including a REC manager; two Managers, Remote Encoding Operations (REO); Supervisors, an Industrial Engineer, and an Administrative Secretary must be hired and trained. Staff positions include Maintenance ETs, Data Conversion Operators (DCO) and DCO/Group Leaders. Filling these positions will involve testing and qualifying people for these jobs and then training them to perform their duties. Each REC will require work hours for support functions such as time keeping, maintenance and administrative support.

The completion of these activities leads to the initiation of the REC operation. After a 12 week ramp-up period the site will be in a position to operate a full-up system work load.

III. RBCS Experience

As discussed previously, 145 RBCSs have been approved to date. Sixty five of these systems are already on-line as of July 31, 1995 and the remaining 80 are being implemented at a rate of 8 per month. This section highlights the experiences to date with both RBCS and delivery point sequencing. Delivery point sequencing is a key source of savings expected from these systems.

A. System Operating Experience

Operating experience with the RBCS can be divided into two categories: technology and remote keying operations. Technologically, the system has proven quite successful. As highlighted below, the RCR technology has been thoroughly tested and has exceeded expectations.

The remote keying operation is undergoing significant change. The first 25 systems were initially contracted out. This activity was challenged by the major postal service unions and after lengthy hearings went to an arbitrator for resolution. Subsequent discussions between the Postal Service and the APWU resulted in a Memorandum of Understanding in November 1993. It brings this operation "in-house" using a work force consisting of 70 percent transitional employee work hours and 30 percent career postal employee work hours.

Much progress is being made with implementing and running in-house remote keying operations. Presently, 29 postal RECs are on-line supporting 40 plants. These RECs are processing nearly 480 million images per accounting period at a productivity that is approaching 750 images per console hour. To date, this aspect of the Postal Service RBCS program has been extremely successful.

B. Remote Computer Reader (RCR)

RCRs developed by nine contractors were extensively tested by the Postal Service in 1992 and 1993. The tests showed that the RCR finalized 15% of the images it received and partially resolved 46% of the images. Finalized images can be transmitted directly to the bar code sorter output subsystem for bar coding and sorting, and require no keying at

all. The images that are only partially resolved must be sent to the REC for keying, and to be resolved to their finest sort. The partial resolutions obtained by the RCR reduce the keying workload at the REC. The combined effect of having 15% of the images finalized by the RCR and 46% partially resolved reduces the keying workload at the REC by 26.9%. Therefore, throughout the economic analysis of the RBCS we have assumed that the RCR reduces the keying work load by 25%. The demonstrated level of performance shows the RCR makes a significant contribution to the cost-effectiveness of the RBCS when used as a contributing component of this system.

C. Delivery Point Sequencing

While generating bar codes and processing bar codes are important aspects of the letter automation program, the ultimate goal is to lower the cost of handling mail. Experience has demonstrated that automation has been extremely successful in producing mail processing benefits, saving and avoiding about $5 billion in direct distribution labor operations since 1989. The next significant area of savings that play an important role in the decision to invest in RBCS deals with delivery point sequencing. And, even though capturing savings from this activity represents one of the biggest challenges today, the Postal Service is overcoming the obstacles and recent trends highlight that we are headed in the right direction to realize these delivery-related savings as well.

Much progress has been made with delivery point sequencing since it was first initiated in March of 1993. Just over 2,500 barcode sorters have been deployed to support this activity. Currently (accounting period 8, 1995), this equipment is being used to sequence mail for more than 63,000 carrier routes, nearly twice that (32,000 routes) of just a year ago. The volume of mail being delivery point sequenced continues to grow as well. The favorable trend shows that sequenced mail volume more than doubled from the end of fiscal year 1993 to the end of the first quarter of 1994 and since then has almost quadrupled; nearly 8 billion pieces have been sequenced to date in 1995. We have also seen indications that carrier productivity is increasing. Since the last quarter of 1993, the base period, productivity in the delivery unit has increased 4.5 %. These achievements demonstrate the Postal Service's success in generating and using bar codes to reduce letter mail processing costs.

This success is the result of shifting from the start-up phase of the program, overcoming learning curves in distribution and delivery operations, and applying new tools to facilitate management. Key among those tools are systems enabling postal managers to track delivery point sequence volumes, the quality or delivery point sequence mail, and the savings being captured as a result of delivery point sequence implementation. Those systems make it easier for District and Area level managers to identify effective management approaches in successful sites and communicate that experience to managers in new and struggling sites. The Delivery Point Sequence Savings Tracking System, which was the result of a collaboration of the Inspection Service, Finance and Operations Support, exemplifies the cross-functional program support efforts which have contributed to the increasing level of success with the delivery point sequence program.

IV. Economic Analysis

The economic justification for the 104 RBCS sites included in this proposal is provided in this section. Since the justification relies on the methodology and assumptions of the total bar coding automation program, a brief discussion of these items is necessary.

A. Methodology

The basis of the economic analysis is a simulation effort conducted at all candidate RBCS sites. The bar coding automation model used for this effort is a computer model which simulates mail flows through a baseline system and a proposed operating system to determine changes in work hours between the two. This model also used site specific baseline mail volume, arrival profiles, and operating plans to determine equipment requirements. The simulation effort represents a comprehensive review of equipment requirements and operating savings.

RBCS Baseline System

The RBCS baseline operating system represents the current system and is the starting point for determining the benefits of the proposed system. It consists of MLOCRs, and bar code sorters to sort mail in delivery sequence order. The script mail coming from the Advanced Facer Canceler and MLOCR reject mail are processed on multi-position letter sorting machines and manual cases.

RBCS Proposed System

The proposed operating system consists of the baseline system plus RBCS. MLOCR rejects and script mail from the AFCS are processed by the RBCS. Mail that is barcoded by this system is then processed through the automated network instead of being processed in the MPLSM/manual operations as in the baseline system.

The advantage of the 104 RBCS is that about 6 billion additional pieces annually will be processed in our automated network. This results in lower mail processing costs and reduced carrier costs.

B. Distinguishing Features of 104 Systems

The 104 systems included in this report will serve plants that are generally smaller than those served by the previously approved 145 RBCSs. These smaller plants exhibit certain characteristics that, along with some planned technological developments, will alter how they are equipped and operated. These features fall into three main areas.

Processing plants per REC

The relatively small size of the plants included in this report will require fewer serving RECs than required for the previously approved 145 plants and systems. Since each REC has certain associated fixed costs of operating the facility, the costs per RBCS (plant) site is less than previously required.

The 104 processing plants in this proposal will be served by a maximum of 22 new RECs. While there will likely be opportunity to locate some of the new keying operations in an existing REC, the average REC for these new systems will be capable of supporting about 5 processing plants. Fifty three RECs will support the previously approved systems for 145 processing plants, approximately a 3 to 1 ratio.

Shared IPSS

As described earlier, the Image Processing Subsystem (IPSS) consists of the computers and communication links used to process the address information and link the various subsystems together. Up until now, all 145 RBCS sites have been approved with their own IPSS. The IPSS is made up of an Image Control Unit (ICU), a Decision Storage Unit (DSU), and a Image Processing Unit (IPU). These are apportioned between the plant and the REC. The IPU is the portion located solely at the REC; it makes up approximately 45% of the total cost of the IPSS. The combination of technological developments and the size of these sites will allow one IPU to serve up to 5 separate processing plants for the remaining 104 sites. This significantly reduces the system cost for each site and greatly benefits the economics in this DAR.

OSS for Delivery Barcode Sorters

The output subsystem described earlier was originally developed to be retrofitted onto existing mail processing bar code sorters. However, many of the 104 sites in this report do not have a sufficient quantity of these barcode sorters or have older mail processing

barcode sorters that are not compatible with the OSS. To resolve this problem, the plan is to purchase some OSS retrofits for use with DBCSs, so the DBCS can be used for either OSS or DPS operations. Since all of these sites will have delivery barcode sorters and since the delivery barcode sorters are more current technology, a developmental effort has been initiated to adapt an OSS so that it can be installed on these barcode sorters where necessary. The plan is to use the existing delivery barcode sorters for both mail processing and delivery sequencing operations. However, to protect against future processing problems that could arise if there is a conflict in operating windows, additional DBCSs are included as a contingency for outgoing processing at the sites where there is a BCS shortage.

C. Bar Code Sorter Requirements

Two hundred and seventy nine DBCSs are required to process the additional mail bar coded to delivery point sequence (DPS) by the 104 RBCSs. The RBCSs in the automation network will produce 33% of the total DPS mail when fully deployed. The other 67% of the DPS mail will come from MLOCRs and customer applied bar codes. Two hundred and seventy nine DBCSs represent the total barcode sorting capacity required to sequence the barcoded volume generated from the 104 new RBCS sites.

D. Labor Savings

Labor savings are based on the differential cost of processing script and MLOCR rejected letter mail in a manual-mechanized environment compared to the cost of processing this mail on the RBCS deployed to the 104 sites in this proposal. The RBCS will produce bar coded mail that can be distributed on automation instead of the labor-intensive MPLSMs and manual cases. The 104 sites in this proposal will, when fully operational in 1998, bar code about 6 billion letters annually.

Savings are also included to account for the reduction in distribution errors in an RBCS environment versus MPLSM processing. It is projected that distribution errors to delivery operations will be reduced by 6.0 percent versus MPLSM operations. This results in less re-handling of missorted letters. This item also includes the error reduction savings resulting from going from MPLSM outgoing processing to automation.

The mail processing savings include the net changes in supervisor costs required to operate the proposed system versus the baseline system. This is based upon the following supervisor/employee ratios:

Automated Equipment	- 1 to 7
Manual Distribution Clerks	- 1 to 20
MPLSM	- 1 to 20
RBCS Keying	- 1 to 30 - 50

The carrier savings are based upon the increase in Delivery Point Sequenced letters as a result of the 104 RBCSs. DPS letters do not require manual casing by carriers. In the baseline system, carriers must sequence this mail into delivery order by manually placing it into delivery cases. This manual casing is performed at a standard rate of 18 letters per minute. Mail is removed (pulled-down) from the cases at a rate of 70 letters per minute. The combined rate of both of these activities is 859 pieces per hour.

Delivery sequenced mail completely bypasses the casing and pull-down process. As an offset to these savings, an additional workhour cost has been included which represents miscellaneous office and street time, associated with handling delivery point sequenced mail. This also accounts for the handling of barcoded letters which can not get delivery sequenced due to address and delivery characteristics (i.e., high-rises, etc.). This additional work hour cost is calculated using a rate of 5,000 pieces per hour for all delivery point sequenced mail. When combined with a minimum expected performance capture rate of 50 percent, these additional work hours effectively reduce the carrier savings by almost two thirds. At the desired performance capture rate of 95 percent, these additional workhours effectively reduce the carrier casing savings by one fifth.

Another savings element from delivery point sequencing is that it will reduce the number of carriers routes that would otherwise be required. Fixed carrier savings of 65 minutes per day for each route eliminated due to delivery sequencing have been incorporated into the DAR. These savings are based on the assumption that one route will be eliminated for each ten hours of direct delivery point sequencing savings. These fixed savings are the result of the elimination of activities such as clocking in and out, obtaining mail or

keys, checking or preparing a vehicle, attending a safety meeting, training, breaks and travel to and from the route and carrier station.

E. Assumptions

The following is a summary of the most important assumptions used in the analyses.

Capital and Expense Investments

All capital and expense costs reflect the most recent contracting experience.

RBCS Assumptions

The following are the key RBCS-related assumptions that were used in this analysis:

Keying Productivity		
Images per console hour		650
Non-keying factor		10.8%
Pieces per work hour		587
MLOCR (010, 020 & 020B) Accept Rate		77.4%
MLOCR (3rd Class) Accept Rate		64.4%
OSS-BCS Accept Rate		84.6%
BCS Accept Rate		
First Pass	98.0%	
Subsequent Passes	99.0%	
RCR	Reduces keying workload 25%	

Throughput and Productivity

Equipment throughput and productivity is based upon equipment capabilities and staffing requirements.

Equipment / Operation	Throughput	Productivity (Pieces per hour)
MLOCR	28,396	11,358
MPBCS	32,000	10,419
MPBCS/DBCS Inc Secondary	25,000	7,143
MPLSM		1,229 - 1,511
Manual Processing		631 - 1,000

Volume Assumption

The volume projections are derived using the aggregate of site specific volumes from the barcode automation model and the latest finance projection for growth. The system is sized using 1996 as the basis for volume projections. The RBCS volume is driven by the total volume projection less MLOCR and customer barcoded volumes.

F. Peak Day Requirements - Average Day Savings

This analysis uses projected average day volume to determine system benefits; equipment requirements are based on peak day volumes.

G. Transitional Year Savings

Two adjustments were made during transitional years to reflect start-up effects:
1) Mail processing savings have been lagged four months while delivery savings are lagged one year after equipment deployment (with the minimum expected performance) and 6 months (with the desired performance); and
2) Carrier savings have been significantly reduced to account for possible short-term complement adjustment problems. (85% in 1997, 70% in 1998, 65% in 1999 and 25% in 2000 with the minimum expected performance. At the desired performance level savings were reduced by 70 percent in 1997 and 1998 and 50 percent in 1999.)

These adjustments results in a conservative estimate of transitional year savings and, thus, program benefits.

H. Space

Establishing RECs will require additional facility space. Lease costs are shown in this analysis to reflect space needs and represent the economic impact of obtaining the space.

The annual cost of leasing space for the remote encoding centers (REC) is included in the DAR at a cost of $18.53 (1996 dollars) per square foot. It is assumed 60 square feet of floor space per installed terminal will cover the space requirement for all activities at a REC, including work area, support, administration and maintenance. Included is the total cost to prepare the REC sites to process images for the 104 RBCS sites. Space costs have also been included for the supporting barcode sorters in this request. Space costs allocated for these machines are based upon 2,000 square feet per DBCS, however, they are partially offset by the space savings from reducing the number of MPLSMs as a result of RBCS, based upon 2,600 square feet per MPLSM. Although a recent survey identified enough existing space to house all the additional supporting DBCS needed, the DBCS space cost has been incorporated in the economic evaluation to allow for the costs of other equipment or operations that may need to be relocated as well as to cover any unforeseen space shortages.

I. Capturing Savings

These 104 RBCS sites will generate operational savings from both mail processing and delivery operations. Success with capturing mail processing savings has been achieved with previous automation programs. These savings will be as a result of the decreased work load in MPLSM and manual operations. A 100% savings capture rate is used in the economic analysis for all mail processing operations. The RBCS bar coded mail decreases the volume of letters that would otherwise be sorted in the MPLSM or manual operations. Consequently, processing plants will decrease staffing in these labor intensive operations.

Although delivery point sequencing represents a relatively new challenge for the organization, we are well positioned to capture these savings and have seen some positive signs already. These savings come from moving manual casing operations to automation, similar to what we have already accomplished with previous mail processing savings.

The September, 1992 Memorandums of Understanding with the National Association of Letter Carriers (NALC) established a cooperative approach in the planning and implementation of procedures to achieve the benefits of delivery point sequencing. When agreed upon delivery point sequencing quality levels are initially attained, carriers will cease casing the delivery point sequenced letters and take mail directly to the street. In the short run, this will reduce overtime, assistance, and work hours for part-time, transitional, and casual employees. As delivery point sequencing percentages increase, route adjustments will be made to more effectively align delivery staffing requirements to the reduced work load of the delivery units. The cost of route inspections and adjustments are not included in this DAR. As stated earlier, the delivery savings are significantly reduced in this DAR in 1997 through 2000 for the minimum expected performance and in 1997 through 1999 for the desired performance. In addition, the minimum expected performance assumes that 50 percent of all projected carrier savings are captured. The desired performance assumes that 95 percent of all projected carrier savings are captured.

J. Deployment Plan

The 104 systems will begin deployment in June 1996 and continue at a rate of 8 systems per month until all 104 systems are deployed in July 1997 for a total of 249 RBCSs to date. Reference Attachment A for a list of sites.

The DBCSs in this analysis represent the delivery point sequencing capacity that will be required to sort the barcoded volume generated by the 104 RBCS sites when full-up. If funding is approved, the DBCSs will be deployed during calendar year 1997.

K. Economic Findings

The following are the summary results of the economic analysis:

Capital Investment	$ 334.8 million
Expense Investment	$ 7.0 million
Total Investment	$ 341.8 million

	At Minimum Expected Performance*	At Desired Performance**
Operating Variances	$ 1,474.4 million	$ 2,073.1 million
Return on Investment	27%	37%
Net Present Value	$ 309 million	$ 568 million

As previously discussed, delivery point sequencing represents a new challenge for the organization. This is also an area where a great amount of attention is being directed. Given the importance of delivery point savings to this investment decision, the economics of this proposal are presented over a range of DPS savings levels. A minimum expected performance level represents an attainable lower limit and the foundation on which to build savings over time to the desired performance level.

* The minimum expected performance level projects a four year ramp-up in carrier savings achievement, to a maximum 50 percent capture rate.

** The desired performance level projects a three year ramp-up in carrier savings achievement, to a maximum 95 percent capture rate.

Since we are currently in the early stages of delivery point sequencing, the ROI range of 27% to 37% is useful for evaluating this proposal.

The following is a breakdown of the investment (in millions):

	Capital	Expense
104 Image Processing Subsystems	$ 74.4	$ 2.6
3424 Terminals	11.2	0.0
193 MLOCR Image Lift Subsystems	35.4	1.2
233 OSSs & Outgoing BCS Capacity	59.3	0.3
177 AFCS Image Lift Subsystems	21.6	2.2
104 Remote Computer Readers	21.6	0.4
279 DBCSs	70.2	0.2
Telecommunications Test Equipment	3.5	0.0
RBCS Site Prep	25.0	
DBCS Site Prep	5.2	
Contingency	7.4	0.2
Total	$ 334.8	$ 7.0*

The total capital investment of $ 334.8 million will produce a Return on Investment in the range of 27% to 37% and a Net Present Value in the range of $309 million to $568 million, based on the difference between the minimum expected performance and the desired performance level.

* Due to rounding.

V. Recommendation

The investment of $ 334.8 million in capital and $ 7.0 million in expense is recommended to fully equip 104 additional sites with RBCS capability and to add 279 DBCSs to the automated network.

APPENDIX A

Cash Flows and Line Item Descriptions

Cash Flows and Line Item Descriptions

Cash Flows for:

Minimum Expected Performance

Carrier Savings lagged 1 year after equipment deployment

Carrier Transitional Impact cost as follows:

1997: 85 % of carrier savings
1998: 70 % of carrier savings
1999: 65 % of carrier savings
2000: 25 % of carrier savings

Carrier Savings Capture Rate: 50%

and

Desired Performance

Carrier Savings lagged 6 months after equipment deployment

Carrier Transitional Impact cost as follows:

1997: 70 % of carrier savings
1998: 70 % of carrier savings
1999: 50 % of carrier savings

Carrier Savings Capture Rate: 95%

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PHASEIII SIT

BAR CODING AUTOMATION - (RBCS 104 SITES)

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Minimum Performance

YEAR	1995 0	1996 1	1997 2	1998 3	1999 4	2000 5	2001 6	2002 7	2003 8	2004 9	2005 10	2006 11	TOTAL
CAPITAL INVESTMENT													
IPSS SYSTEMS	($4.7)	($28.5)	($41.2)	$0.0									($74.4)
IPSS TERMINALS	($1.0)	($5.0)	($5.1)	$0.0									($11.2)
DBCS	$0.0	($25.9)	($44.2)	$0.0									($70.2)
TOTAL ISS/MLOCR	($2.9)	($14.4)	($18.0)	$0.0									($35.4)
OSS BCS/DBCS	($5.4)	($23.2)	($30.6)	$0.0									($59.3)
ISS AFCS	$0.0	$0.0	($4.7)	($16.9)									($21.6)
RCR	($1.5)	($8.4)	($11.7)	$0.0									($21.6)
TELECOM TEST EQUIPMENT	$0.0	($0.8)	($2.8)	$0.0									($3.5)
CONTINGENCY @ 2.5%	($0.4)	($2.7)	($4.0)	($0.4)									($7.4)
SITE PREP	$0.0	($19.9)	($10.3)	$0.0									($30.2)
TOTAL CAPITAL INVESTMENT	($16.0)	($128.8)	($172.7)	($17.3)									($334.8)
EXPENSE INVESTMENT													
DEPOT SPARES	$0.0	($0.9)	($3.8)	($2.2)									($7.0)
OPERATING VARIANCES													
NET DBCS / MPLSM SPACE	$0.0	$0.0	($11.7)	($12.1)	($12.6)	($13.0)	($13.5)	($14.1)	($14.6)	($15.1)	($15.7)	($16.3)	($138.6)
IN-HOUSE RBCS COSTS													
REC MAINTENANCE	$0.0	($2.8)	($12.8)	($8.8)	($9.1)	($9.5)	($9.8)	($10.2)	($10.6)	($11.0)	($11.4)	($11.8)	($107.7)
TELCOMMUNICATIONS	$0.0	($0.0)	($0.7)	($1.1)	($1.1)	($1.1)	($1.2)	($1.2)	($1.3)	($1.3)	($1.4)	($1.4)	($11.8)
REC SPACE	$0.0	($0.9)	($4.0)	($4.1)	($4.3)	($4.4)	($4.6)	($4.8)	($4.9)	($5.1)	($5.3)	($5.5)	($47.9)
OTHER PERSONNEL	$0.0	($8.9)	($35.4)	($17.3)	($18.0)	($18.7)	($19.4)	($20.1)	($20.9)	($21.7)	($22.5)	($23.4)	($226.2)
OTHER NON-PERSONNEL	$0.0	($1.4)	($8.3)	($6.2)	($6.5)	($6.7)	($7.0)	($7.2)	($7.5)	($7.8)	($8.1)	($8.4)	($75.0)
KEYING	$0.0	($5.3)	($106.6)	($166.6)	($172.9)	($179.5)	($186.3)	($193.4)	($200.7)	($208.3)	($216.3)	($224.5)	($1,860.2)
IN-HOUSE RBCS COSTS	$0.0	($19.3)	($167.7)	($204.1)	($211.8)	($219.9)	($228.2)	($236.9)	($245.9)	($255.2)	($264.9)	($275.0)	($2,328.9)
OPERATIONAL SAVINGS													
MAIL PROC LEVEL 4	$0.0	$0.0	($29.4)	($80.9)	($84.8)	($88.0)	($91.3)	($94.8)	($98.4)	($102.2)	($106.0)	($110.1)	($885.9)
MPLSM CLERKS	$0.0	$0.0	$75.7	$206.1	$216.1	$226.4	$235.0	$243.9	$253.2	$262.8	$272.8	$283.2	$2,279.3
MANUAL CLERK	$0.0	$0.0	$75.5	$207.5	$217.5	$225.8	$234.4	$243.3	$252.5	$262.1	$272.1	$282.4	$2,273.2
CARRIER	$0.0	$0.0	$2.2	$44.3	$68.2	$71.9	$74.6	$77.4	$80.4	$83.4	$86.6	$89.9	$679.7
OPERATIONAL SAVINGS	$0.0	$0.0	$124.0	$379.1	$420.1	$436.0	$452.6	$469.8	$487.7	$506.2	$525.4	$545.4	$4,346.3
NET OPERATIONAL SUPPORT													
MAINTENANCE LABOR	$0.0	($1.7)	($15.7)	($17.0)	($17.6)	($18.3)	($19.0)	($19.7)	($20.5)	($21.3)	($22.1)	($22.9)	($195.8)
RECURRING SPARES	$0.0	$0.0	($2.0)	($11.8)	($13.8)	($14.3)	($14.8)	($15.4)	($15.9)	($16.5)	($17.1)	($17.8)	($139.4)
RECURRING MAINT. TRAINING	$0.0	($3.1)	($15.6)	($8.3)	($7.1)	($7.4)	($7.6)	($7.9)	($8.2)	($8.6)	($8.9)	($9.2)	($91.9)
MPLSM MAINT. LABOR REDUCT.	$0.0	$1.1	$2.2	$4.6	$4.8	$5.0	$5.2	$5.4	$5.6	$5.8	$6.0	$6.2	$51.7
MPLSM PARTS REDUCT.	$0.0	$0.1	$0.2	$0.4	$0.4	$0.4	$0.4	$0.4	$0.4	$0.5	$0.5	$0.5	$4.0
NET OPERATIONAL SUPPORT	$0.0	($3.7)	($30.8)	($32.2)	($33.3)	($34.6)	($35.9)	($37.3)	($38.7)	($40.1)	($41.6)	($43.2)	($371.3)
OTHER													
UTILITIES	$0.0	($0.0)	($1.1)	($1.1)	($1.1)	($1.1)	($1.2)	($1.3)	($1.3)	($1.4)	($1.5)	($1.6)	($12.6)
ERROR REDUCTION SAVINGS	$0.0	$1.1	$4.6	$5.0	$5.2	$5.4	$5.6	$5.8	$6.0	$6.2	$6.5	$6.7	$56.1
SCHEME TRAINING SAVINGS	$0.0	$0.0	$2.1	$5.9	$6.2	$6.4	$6.7	$6.9	$7.2	$7.4	$7.7	$8.0	$64.5
SOFTWARE SUPPORT	$0.0	$0.0	($2.2)	($2.3)	($2.4)	($2.5)	($2.6)	($2.6)	($2.7)	($2.9)	($3.0)	($3.1)	($26.2)
TRANS COMP IMPACT	$0.0	$0.0	($1.8)	($31.0)	($45.0)	($18.0)	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	($95.8)
RECURRING LETTER MAIL LABELS	$0.0	($0.4)	($1.7)	($1.8)	($1.9)	($1.9)	($2.0)	($2.1)	($2.2)	($2.2)	($2.3)	($2.4)	($21.0)
OTHER	$0.0	$0.7	$0.1	($25.3)	($36.9)	($11.7)	$6.5	$6.7	$6.9	$7.1	$7.4	$7.6	($32.9)
TOTAL VARIANCES	$0.0	($22.3)	($86.0)	$105.4	$123.4	$156.8	$161.4	$166.3	$195.4	$202.9	$210.5	$218.5	$1,474.4
NET CASH FLOW	($16.0)	($152.0)	($262.6)	$85.9	$123.4	$156.8	$161.4	$166.3	$195.4	$202.9	$210.5	$218.5	$1,132.6
NET PRESENT VALUE	$309												
ROI	27%												

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PHASEIII) BAR CODING AUTOMATION - ( ) / for 104 Additional Sites))

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Desired Performance

YEAR	1995 0	1996 1	1997 2	1998 3	1999 4	2000 5	2001 6	2002 7	2003 8	2004 9	2005 10	2006 11	TOTAL
CAPITAL INVESTMENT													
IPSS SYSTEMS	($4.7)	($28.5)	($41.2)	$0.0									($74.4)
IPSS TERMINALS	($1.0)	($5.0)	($5.1)	$0.0									($11.2)
DBCS	$0.0	($25.9)	($44.2)	$0.0									($70.2)
TOTAL ISS/MLOCR	($2.9)	($14.4)	($18.0)	$0.0									($35.4)
OSS BCS/DBCS	($5.4)	($23.2)	($30.6)	$0.0									($59.3)
ISS AFCS	$0.0	$0.0	($4.7)	($16.9)									($21.6)
RCR	($1.5)	($8.4)	($11.7)	$0.0									($21.6)
TELECOM TEST EQUIPMENT	$0.0	($0.8)	($2.8)	$0.0									($3.5)
CONTINGENCY @ 2.5%	($0.4)	($2.7)	($4.0)	($0.4)									($7.4)
SITE PREP	$0.0	($19.9)	($10.3)	$0.0									($30.2)
TOTAL CAPITAL INVESTMENT	($16.0)	($128.8)	($172.7)	($17.3)									($334.8)
EXPENSE INVESTMENT													
DEPOT SPARES	$0.0	($0.9)	($3.8)	($2.2)									($7.0)
OPERATING VARIANCES													
NET DBCS / MPLSM SPACE	$0.0	$0.0	($11.7)	($12.1)	($12.6)	($13.0)	($13.5)	($14.1)	($14.6)	($15.1)	($15.7)	($16.3)	($138.8)
IN-HOUSE RBCS COSTS													
REC MAINTENANCE	$0.0	($2.6)	($12.6)	($8.8)	($9.1)	($9.5)	($9.8)	($10.2)	($10.6)	($11.0)	($11.4)	($11.8)	($107.7)
TELCOMMUNICATIONS	$0.0	($0.0)	($0.7)	($1.1)	($1.1)	($1.1)	($1.2)	($1.2)	($1.3)	($1.3)	($1.4)	($1.4)	($11.6)
REC SPACE	$0.0	($0.9)	($4.0)	($4.1)	($4.3)	($4.4)	($4.6)	($4.8)	($4.9)	($5.1)	($5.3)	($5.5)	($47.9)
OTHER PERSONNEL	$0.0	($8.9)	($35.4)	($17.3)	($18.0)	($18.7)	($19.4)	($20.1)	($20.9)	($21.7)	($22.5)	($23.4)	($226.2)
OTHER NON-PERSONNEL	$0.0	($1.4)	($6.3)	($6.2)	($6.5)	($6.7)	($7.0)	($7.2)	($7.5)	($7.8)	($8.1)	($8.4)	($75.0)
KEYING	$0.0	($5.3)	($106.6)	($166.8)	($172.9)	($179.5)	($186.3)	($193.4)	($200.7)	($208.3)	($216.3)	($224.5)	($1,860.2)
IN-HOUSE RBCS COSTS	$0.0	($19.3)	($167.7)	($204.1)	($211.8)	($219.9)	($228.2)	($236.9)	($245.9)	($255.2)	($264.9)	($275.0)	($2,328.9)
OPERATIONAL SAVINGS													
MAIL PROC LEVEL 4	$0.0	$0.0	($29.4)	($80.9)	($84.8)	($88.0)	($91.3)	($94.8)	($98.4)	($102.2)	($106.0)	($110.1)	($885.9)
MPLSM CLERKS	$0.0	$0.0	$75.7	$206.1	$216.1	$226.4	$235.0	$243.9	$253.2	$262.8	$272.8	$283.2	$2,279.3
MANUAL CLERKS	$0.0	$0.0	$75.5	$207.5	$217.5	$225.8	$234.4	$243.3	$252.5	$262.1	$272.1	$282.4	$2,273.2
CARRIER	$0.0	$0.0	$30.4	$120.2	$131.5	$136.5	$141.7	$147.1	$152.7	$158.5	$164.5	$170.8	$1,353.9
OPERATIONAL SAVINGS	$0.0	$0.0	$152.3	$455.0	$462.4	$500.7	$519.7	$539.5	$560.0	$581.3	$603.4	$626.3	$5,020.4
NET OPERATIONAL SUPPORT													
MAINTENANCE LABOR	$0.0	($1.7)	($15.7)	($17.0)	($17.6)	($18.3)	($19.0)	($19.7)	($20.5)	($21.3)	($22.1)	($22.9)	($195.8)
RECURRING SPARES	$0.0	$0.0	($2.0)	($11.6)	($13.8)	($14.3)	($14.8)	($15.4)	($15.9)	($16.5)	($17.1)	($17.8)	($139.4)
MAINT. TRAINING	$0.0	($3.1)	($15.6)	($8.3)	($7.1)	($7.4)	($7.6)	($7.9)	($8.2)	($8.6)	($8.9)	($9.2)	($91.9)
MPLSM MAINT. LABOR REDUCT.	$0.0	$1.1	$2.2	$4.6	$4.8	$5.0	$5.2	$5.4	$5.6	$5.8	$6.0	$6.2	$51.7
MPLSM PARTS REDUCT.	$0.0	$0.1	$0.2	$0.4	$0.4	$0.4	$0.4	$0.4	$0.4	$0.5	$0.5	$0.5	$4.0
NET OPERATIONAL SUPPORT	$0.0	($3.7)	($30.6)	($32.2)	($33.3)	($34.6)	($35.9)	($37.3)	($38.7)	($40.1)	($41.6)	($43.2)	($371.3)
OTHER													
UTILITIES	$0.0	($0.0)	($1.1)	($1.1)	($1.1)	($1.1)	($1.2)	($1.3)	($1.3)	($1.4)	($1.5)	($1.6)	($12.6)
ERROR REDUCTION SAVINGS	$0.0	$1.1	$4.8	$5.0	$5.2	$5.4	$5.6	$5.8	$6.0	$6.2	$6.5	$6.7	$58.1
SCHEME TRAINING SAVINGS	$0.0	$0.0	$2.1	$5.9	$6.2	$6.4	$6.7	$6.9	$7.2	$7.4	$7.7	$8.0	$64.5
SOFTWARE SUPPORT	$0.0	$0.0	($2.2)	($2.3)	($2.4)	($2.5)	($2.6)	($2.6)	($2.7)	($2.9)	($3.0)	($3.1)	($26.2)
TRANS COMP IMPACT	$0.0	$0.0	($21.3)	($84.1)	($65.8)	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	($171.2)
RECURRING LETTER MAIL LABELS	$0.0	($0.4)	($1.7)	($1.8)	($1.9)	($1.9)	($2.0)	($2.1)	($2.2)	($2.2)	($2.3)	($2.4)	($21.0)
OTHER	$0.0	$0.7	($19.3)	($78.4)	($59.7)	$6.3	$6.5	$6.7	$6.9	$7.1	$7.4	$7.6	($108.3)
TOTAL VARIANCES	$0.0	($22.3)	($77.2)	$128.2	$165.0	$239.4	$248.5	$258.0	$267.8	$277.9	$288.5	$299.4	$2,073.1
NET CASH FLOW	($16.0)	($152.0)	($253.8)	$108.8	$165.0	$239.4	$248.5	$258.0	$267.8	$277.9	$288.5	$299.4	$1,731.3
NET PRESENT VALUE	$568												
ROI	37%												

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The cash flow line item descriptions are shown on the following pages. The cash flows are divided into three main sections: capital investments, expense investments, and operating variances.

Capital Investments

IPSS Systems

This represents the capital costs associated with the manufacture, delivery, initial site spares, initial training and installation for the 104 RBCS sites, as well as 2 IPSSs for the Technical Training Center (TTC). The total capital for this item is $74.4 million based on a unit cost $701,923 per site. The cost of the IPSS has been significantly reduced from the previous buy due to an enhancement that allows the portion of the IPSS located at the REC to be shared amongst up to 5 sites. This line item also includes initial site spares and training.

IPSS Terminals

This represents the capital costs associated with the manufacture, delivery and installation of the 3424 video display terminals (VDT) required as part of the RBCS for the 104 sites. The total capital for this item is $11.2 million based on a unit cost of $3,265 per VDT.

DBCS

This line item represents the capital costs associated with the manufacture, delivery, initial site spares and training, and the installation of the 279 DBCSs required to support the RBCS in the 104 sites. The total capital investment for this item is $70.2 million based on a DBCS unit cost of $251,487 which includes initial site spares and training.

ISS for the MLOCR

This line item represents the capital costs associated with the manufacture, delivery, initial sites spares and installation of the input subsystem for 36 MLOCR-A machines and the input subsystem modifications for the 157 MLOCR-B machines. This will provide the capability to capture a video image of all non-readable addresses. The total capital investment for this item is $35.4 million based upon an MLOCR-A unit cost of $199,613 and an MLOCR-B unit cost of $171,269. This item includes initial site spares, training, 3 MLOCR-A ISSs for the TTC and 4 MLOCR-B ISSs for the TTC.

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OSS for the BCS

This line item represents capital cost associated with the manufacture, delivery and installation of output subsystem modifications to 233 bar code sorters to provide the capability for a combination of MPBCSs and DBCSs to communicate with the remote bar coding computer system and to spray a bar code on each mail piece. The TTC also requires Output subsystem modifications to 8 MPBCSs and 2 DBCSs. The capital investment for the item of $24.3 million is based on a unit cost of $67,718 per MPBCS modification and $159,735 per DBCS modification. Although the cost of a DBCS modification is more expensive than the MPBCS modification, it will be necessary only at sites where a MPBCS shortage exists and will provide other processing benefits. Also, included in the this line item are additional funds of $17.5 million to provide for outgoing barcode sorting capacity. These funds will be required only if it proves operationally infeasible to run both the OSS and delivery point sequencing operation on the same DBCS. This line item also includes the cost of one letter mail labeling machines (LMLM) of $168,178 per site which brings the total capital investment to $59.3 million. The LMLMs attach a blank white label to letters that will not accept a bar code. This enables a bar code to be sprayed and read on these pieces thereby increasing the amount of mail that can be processed in the automated mail stream.

ISS for the AFCS

This line item represents the capital cost associated with the manufacture, delivery, initial site spares, training , documentation and installation of an input subsystem on each of the 177 advanced facer-canceler systems (AFCS) in the 104 sites to provide the capability to capture a video image of non-OCR readable addresses and to transmit the images to the remote bar coding computer system. The total capital for this item of $21.6 million is based upon a unit cost of $122,175 including initial spares and training.

RCR

This line item represents the capital cost associated with the manufacture, delivery, initial site spares, training, documentation and installation of 104 remote computer reading units, as well as 3 for the TTC. The total capital for this item of $21.6 million is based upon a unit cost of $202,002 which includes initial spares, and training.

Telecommunications Test Equipment

This line item includes the capital cost of $3.5 million associated with the manufacture, delivery and installation of telecommunications test equipment to be utilized with the RBCS.

Contingency

Capital contingency is calculated at 2.5 % of the capital costs for the new hardware and equipment modifications above. This is included to accommodate unanticipated changes in projected costs or program requirements. Total capital contingency in the cash flow is $7.4 million.

Site Prep

Funding in the amount of $30.2 million is provided to prepare sites for the installation of equipment and equipment modifications described above, in addition to REC repair and alterations costs. The total site prep requested for the RBCS is $25.0 million. This includes the site prep at the P&DC sites in addition to Remote Encoding Center items such as build-out of the RECs, furniture, telephones and electronic time clocks. The DBCS site prep of $5.2 million is based upon a cost of $15,000 per DBCS. This item includes funding for items such as additional power, changes in facility layouts, modifications to interior space, etc.

Expense Investments

Represents depot spares as follows:

IPSS Systems	-	$ 2.6 million
DBCS	-	$ 0.2 million
ISS MLOCR	-	$ 1.2 million
ISS AFCS	-	$ 2.2 million
OSS BCS	-	$ 0.3 million
RCR	-	$ 0.4 million
Contingency	-	$ 0.2 million

Operating Variances

Net DBCS / MPLSM Space

This line item represents the space leasing costs for the 279 DBCSs. This cost is based upon 2,000 square feet required for each DBCS at $19.23 per square foot in 1997 offset by the space savings resulting from the elimination of 39 MPLSMs at 2,600 sq. ft. each.

In-House RBCS

These line items represent the cost of the remote keying portion of the RBCS.

RBCS REC Maintenance

This line item represents the start-up maintenance of REC sites served and the annual recurring maintenance per REC. This includes the costs of maintenance personnel, furnishings, fixtures, cabinets, tools and test equipment in addition to maintenance training.

Telecommunications

This line item represents the costs of the telecommunications required to enable the RBCS Sites to transmit letter mail images to and from the REC and Processing and Distribution Centers.

Space

This represents the annual cost of leasing space to house REC operations. This includes the space required for terminals, aisles, computers, and all administrative and support space. Lease costs are shown in this analysis to reflect space needs and represent the economic impact of obtaining space.

Other Personnel

This represents the indirect support personnel costs associated with DCO and supervisor training, management, secretarial/administrative work, and recruitment and hiring. The recurring DCO training and recruitment and hiring is based upon a 6% turnover rate for the career DCOs and 50% turnover for the transitional DCOs.

Other Non-Personnel

This line represents the non-personnel costs in the Remote Encoding Centers that will support the 104 P&DCs. It includes fuel and utilities, supplies and services, miscellaneous expenses, printing, travel, and all other non-personnel expenses required to operate a Remote Encoding Center.

Keying

This line item represents the costs of keying at the remote sites. This includes the direct labor cost for all data conversion operators (DCO) work hours, lead data conversion operators, and supervision at a ratio of 1 hour of supervisor for every 30 - 50 data conversion operator hours.

Operational Savings

Labor savings are based on the differential cost of processing script and MLOCR rejected letter mail in a manual-mechanized environment compared to the cost of processing this mail in a RBCS environment.

Mail Processing Level 4

This line item represents the additional mail processors costs incurred to process the newly generated mail on automated equipment. Included are costs for the required additional mail processor workhours and supervision workhours at the rate of 1 hour of supervision for every 7 hours of additional mail processor hours.

MPLSM Clerks

This line item represents the savings in MPLSM processing costs. Included are the savings from the reduction in MPLSM clerk workhours and supervision workhours at the rate of 1 hour of supervision saved for every 20 hours of MPLSM processing hours saved.

Manual Clerks

This line item represents the savings in manual clerk distribution workhours. Included are savings from the reduction in manual clerk workhours and supervision workhours at the rate of 1 hour of supervision saved for every 20 hours of manual processing hours saved.

Carrier

This line item represents the savings in carrier workhours. Included are savings form carrier casing related costs along with carrier route fixed costs eliminated as a result of routes being eliminated. A carrier casing capture rate of 50 percent is assumed with the minimum expected performance. The desired performance assumes a carrier casing capture rate of 95 percent. The delivery savings are lagged one year after equipment deployment (with the minimum expected performance) and six months (with the desired performance). No credit was taken for carrier supervision since the majority of carrier supervisors are located in delivery units that would still require a supervisor.

Net Operational Support

These line items include the maintenance labor, recurring spares, training and recurring documentation.

Maintenance Labor

This item covers the annual cost of the maintenance labor required to keep all of the equipment in this proposal operational and in service. This item also includes the cost of base lining equipment to prepare for the ISS and OSS modifications. The cost of additional maintenance supervisors is also included in this line.

Recurring Spares

This item covers the annual recurring cost of site replacement parts required to keep the equipment included in this proposal operational and in service.

Recurring Maintenance Training

This item covers the annual recurring training costs due to turnover in personnel for all of the equipment in this proposal.

MPLSM Maintenance Labor

This proposal will result in more mail being processed on automation and 39 fewer MPLSMs at the automated sites. This item represents savings in maintenance labor required as a result of having fewer MPLSMs operational.

MPLSM Maintenance Parts

This represents the annual cost avoidance of the spare parts resulting from having 39 fewer MPLSMs operational.

Other

Utility Costs

This item represents the net utility cost changes associated with additional automated equipment and the savings associated with fewer MPLSMs.

Error Reduction Savings

This item represents the savings that will result from the decrease in errors in an automated environment versus the mechanized environment. It is projected that distribution errors to delivery operations will be reduced by 6.0 percent versus MPLSM secondary operations. This results in less re-handling of missorted letters. This item also includes the error reduction savings resulting from going from MPLSM outgoing processing to automation.

Scheme Training

The savings in scheme training due to reduced volumes in MPLSM and manual operations.

Directory and Software Support

One position for every eight DBCSs will be required to provide directory support to develop and implement sort schemes for DBCSs.

Transitional Complement Impact

An added cost to offset projected carrier savings to provide for a gradual phase-in of net carrier savings. This item accounts for possible short-term carrier route adjustment problems. The carrier savings in 1997 are offset with the minimum expected performance by 85 percent, 70 percent in 1998, 65 percent in 1999, and 25 percent in

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2000. The carrier savings at the desired performance level are offset by 70 percent in 1997, 70 percent in 1998 and 50 percent in 1999.

Recurring Letter Mail Labels

The recurring annual costs of labels for the letter mail labeling (LMLM) machines is included in this line item.

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APPENDIX B

SITES INCLUDED IN DAR FOR 104 ADDITIONAL RBCSs

104 RBCS SITES

Amarillo TX
Anchorage AK
Asheville NC
Augusta GA
Bangor ME
Beaumont TX
Billings MT
Binghamton NY
Bismarck ND
Bloomington IL
Boise ID
Bowling Green KY
Bridgeport CT
Bronx GPO NY
Burlington VT
Cape Girardeau MO
Champaign IL
Charleston WV
Charlottesville VA
Chattanooga TN
Clarksburg WV
Columbia MO
Corpus Christi TX
Daytona Beach FL
Duluth MN
Eau Claire WI
El Paso TX
Elmira NY
Erie PA
Eugene OR
Evansville IN
Everett GMF WA
Lexington KY
Lima OH
Lincoln NE
Lubbock TX
Lynchburg VA
Macon GA
Mankato MN
Marysville CA
McAllen TX
Mid-Hudson GMF NY
Midland TX
Mobile AL
Monmouth GMF NJ
Montgomery AL
Muncie IN
New Castle PA
Olympia WA
Oshkosh WI
Pasco WA
Pensacola FL
Peoria IL
Portsmouth NH
Reading PA
Reno NV
Roanoke VA
Rochester MN
Rockford IL
Rockland NY
Rocky Mount NC
Saginaw MI
Salem OR
Salinas CA

Fargo ND
Fayetteville AR
Flint MI
Florence SC
Fort Wayne IN
Frederick MD MPC
Gainesville FL
Gary IN
Grand Island NE
Green Bay WI
Gulport MS
Hickory NC
Honolulu HI
Huntington WV
Huntsville AL
Kokomo IN
Lafayette IN
Lafayette LA
Lakeland FL
Lancaster PA
Savannah GA
Scranton PA
Shreveport LA
Sioux City IA
Sioux Falls SD
South Bend IN
Springfield IL
St Cloud MN
Staten Island NY
Tallahassee FL
Topeka KS
Traverse City MI
Tyler TX
Utica NY
Waco TX
Waterbury CT
Waterloo IA
Wausau WI
Wilkes Barre PA
White River Junction VT

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M. RICHARD PORRAS
VICE PRESIDENT, CONTROLLER

UNITED STATES POSTAL SERVICE

August 7, 1995

MR. DOWLING

SUBJECT: Decision Analysis Report for 104 Additional Remote Bar Coding Systems

The Decision Analysis Report (DAR) for 104 additional Remote Bar Coding Systems (RBCSs) dated July 31, 1995 has been reviewed and validated.

This DAR indicates a total required investment of $334.8 million in capital funds and $7.0 million in expense funds for the acquisition and installation of 104 additional RBCSs, 279 additional Delivery Bar Code Sorters (DBCSs), and a maximum of 22 additional Postal operated Remote Encoding Centers (RECs).

This DAR is consistent with the bar code automation program to phase in the acquisition of automation equipment and will complete the RBCS network. The funding presented in this DAR includes Remote Video Encoding (RVE) equipment and Remote Computer Readers (RCRs) as well as image processing subsystems for retrofit onto existing Multi-line Optical Character Readers (MLOCRs), Bar Code Sorters (BCSs) and Advanced Facer-Canceler Systems (AFCSs). These systems will support 104 offices in addition to the 145 already funded for the same systems via previous DARs. This DAR will bring the total to 249 sites, 3,629 DBCSs, and 75 RECs funded for RBCS automation and Delivery Point Sequencing (DPS) to date.

The systems proposed in this DAR are expected to result in additional workhour savings by further reducing MPLSM and manual mail processing operations in our smaller processing plants and by providing additional bar coded letter volume to enhance carrier savings due to DPS. However, as with previously approved remote encoding systems, Clerk and Carrier workhour savings will be offset by the additional employees and workhour growth required for remote encoding. RECs will utilize a planned mix of 30 percent career and 70 percent transitional Postal workhours to resolve address images that cannot be resolved by either the MLOCRs or RCRs. The lower workhour cost of REC employees will result in a net savings. The expected net workyear impact on different labor types is illustrated in Attachment I.

Also shown on Attachment 1, is the net operating budget change as a result of this investment. In the year 2000, the first full-up operating year, it is projected that the operating budget will be reduced by $157 to $239 million, depending on perfromance level achieved.

The economic justification for these systems is based on a number of key assumptions which have been sensitivity tested using analytical models. Attachment II summarizes these sensitivity tests for the following topics:

- Bar Coded volume percentages by source
- Remote Computer Reader resolution factor
- Impact of technological improvements in RCRs
- Number of MPLSMs to be eliminated by new operations
- Capture Rate on expected Carrier and Clerk workhour savings
- Mail Processing and Delivery Point Sequencing productivity levels
- Remote Video Keying productivity
- Savings in the smallest offices

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Because the economic justification of these systems is heavily dependent on the ability to capture carrier savings, we continue to evaluate the two scenarios used with the previous RBCS-120 DAR, namely, a "minimum expected" and a "desired" performance level for carrier savings. The assumptions for these two levels of carrier savings are:

> Minimum Expected Performance - a 50 percent capture rate on carrier workhour savings phased in over a four-year period.
>
> Desired Performance - a 95 percent capture rate on carrier workhour savings, phased in over a three-year period.

As mentioned above, the use of two evaluation scenarios to project performance was originally used in conjunction with the 120 RBCS DAR, approved in 1994. The assumptions supporting the 120 RBCS DAR and this request for 104 additional RBCS sites have been reviewed and accepted by the appropriate functional staffs at Headquarters and by field managers, and accountability has been established. It should be noted, that due to phase-in of projected savings because of the complexity of implementation, delivery point sequence-related carrier savings projected in the 120 RBCS DAR have not been achieved as yet. However, management has indicated that the three-year transition period noted above will provide sufficient time to achieve the minimum expectation of 50 percent of possible savings for both DARs. It is assumed that this minimum expectation level will form a foundation on which to build savings over time to the desired performance level. It should also be noted that the equipment deployment funded by the previously approved 120 RBCS DAR is not complete and net savings are not scheduled to be achieved until 1997. (Please refer to Attachment III.) However, there has been an indication of improvement in in-office carrier productivity as a result of DPS.

Based on these definitions, we have validated the two cash flows presented in this DAR. The Minimum Expected Performance has been validated to have a 27 percent Return on Investment (ROI) with a Net Present Value (NPV) of $309 million. The Desired Performance has been validated to have a 37 percent ROI with a NPV of $568 million. Both cash flows have been discounted at 12.5 percent over a ten-year evaluation period.

As shown on Attachment III, deployment of previously deployed equipment continues and is expected to be completed by June 1996. The equipment included in this DAR is planned for installation during 1996 and 1997. Net operational savings will begin in 1998 with economic break-even in 2002 under the minimum expectation level, and in 2001 at the desired performance level of savings achievement.

The program in this DAR is expected to generate the equivalent workyear changes shown in Attachment I. The savings at each postal facility will depend on the particular volumes and characteristics of that office. Operational costs may be incurred at originating facilities while savings are achieved at different downstream destinating processing and delivery locations. Improvements in RCR performance or increases in mailer precoding could reduce the requirement for RVE keying in the future. Therefore, it is important that national and site specific management implementation plans be developed to oversee deployment, implementation, equipment performance, bar coding levels, and complement and savings plans.

This project must be submitted to the Board of Governors for final approval.

M. Richard Porras

Attachments

cc: Mr. Henderson, Ms. Regan, Mr. Kane, Mr. Shipe

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RBCS 104 DAR WORKYEAR IMPACTS

MINIMUM EXPECTED PERFORMANCE LEVEL

	1996	1997	1998	1999	2000	5-YEAR Total
CLERKS & MAIL PROCESSORS	-17	-2229	-3579	-56	-0	-5880
CARRIERS	-3	-18	-238	-185	-490	-933
REC CAREER CLERKS	57	1063	566	0	-0	1685
REC TRANSITIONAL CLERKS	159	2992	1593	0	0	4744
MAINTENANCE	63	405	-81	-11	0	377
NET OVERALL CHANGE IN WORKYEARS	259	2213	-1739	-252	-490	-7
NET OPERATING BUDGET CHANGE (Millions)	-$22	-$86	$105	$123	$157	$277

-1 = DECREASED WORKYEARS/DOLLARS
1 = INCREASED WORKYEARS/DOLLARS

SIRED PERFORMANCE LEVEL

	1996	1997	1998	1999	2000	5-YEAR Total
CLERKS & MAIL PROCESSORS	-17	-2229	-3579	-56	-0	-5880
CARRIERS	-3	-185	-488	-501	-1163	-2341
REC CAREER CLERKS	57	1063	566	0	-0	1685
REC TRANSITIONAL CLERKS	159	2992	1593	0	0	4744
MAINTENANCE	63	405	-81	-11	0	377
NET OVERALL CHANGE IN WORKYEARS	259	2046	-1990	-568	-1163	-1416
NET OPERATING BUDGET CHANGE (Millions)	-$22	-$77	$128	$165	$239	$433

-1 = DECREASED WORKYEARS/DOLLARS
1 = INCREASED WORKYEARS/DOLLARS

ATTACHMENT II

RBCS-104 DAR ASSUMPTIONS, SENSITIVITIES AND SIGNIFICANT ISSUES

This attachment discusses the significance of various assumptions underlying the Decision Analysis Report (DAR) for 104 additional Remote Bar Coding Systems (RBCSs). The sensitivities are performed against the desired performance level.

Capture Rate on Carrier Savings

The desired performance level reflects a three year ramp-up of Carrier savings with 95% capture of full potential carrier savings beginning in year 2000. The DAR also assumes the elimination of one route for every 10 carrier workhours saved.

Sensitivities:

If no transitional costs are necessary	ROI increases 8 points
If the capture rate is reduced to 50% and given a four year ramp-up (minimum expectation level)	ROI decreases 10 points

Capture Rate on Clerk Savings

This DAR assumes that all of the potential Clerk workhour savings due to reductions in Multi-position Letter Sorting Machine and manual sorting operations will be captured due to either attrition or reassignment of labor to other operations. This assumption was sensitivity tested as follows:

Sensitivity:

The capture rate was reduced to 90%	ROI decreases 7 points

Remote Video Keying Productivity

This DAR assumes an Image Keying Productivity of 650 images per console hour in combination with a non-productive workhour factor of 10.8%. Recent Inspection Service reports indicate a higher keying rate (over 750 per hour) but a larger non-productive factor (25%). This data was used in a sensitivity test of the DAR workhour model.

Sensitivity:

With Keying Productivity of 750 and a non-productive factor of 25%	ROI increases 1 point

Remote Computer Reader (RCR) Factor

This DAR continues to assume that the RCR will relieve the remote keying operation of 25% of its potential workload. The DAR workhour model was sensitivity tested by increasing the RCR factor from 25% to 35% holding all other assumptions constant.

Sensitivity:

If RCR resolution increases to 35%	ROI increases 5 points and Keying Hours reduce 15%

Mail Processing Operations Productivity

There is concern that the mail processing productivity assumptions used in the DAR workhour model are significantly different from the year-to-date FY-1995 experience. To evaluate this concern the model used for this DAR was modified to include year-to-date actual national average MODS productivity's in lieu of the DAR assumptions which were based on previous projected productivity estimates.

Operation		DAR Assumes	YTD FY-95
DPS two-pass	1st Pass	7,143 Pcs /Wkhr	7,540 Pcs/Wkhr
DPS two-pass	2nd Pass	7,143	16,010
BCS	871-875	10,419	6,561
BCS Inc. Sec	876	7,143	4,186
MLOCR	831	11,358	5,671
OSS	971-975	9,251	9,545
MPLSM081		1,511	1,339
	083	1,372	1,194
	084-085	1,427	1,241
	086	1,229	1,109
MANUAL	030	645	544
	043	664	601
	150	631	467
	160	662	522

Sensitivities:

The combined impact of using YTD FY-95 mail processing productivities in place of the assumptions used in this DAR increases Mail Processing Clerk savings by 15.7% raises the RBCS-104 Net Present Value by 48% from $568 to $835 million, increases ten-year undiscounted net savings by 28% from $2.1 to $2.7 billion and increases the ROI by 11 points (from 37% to 48%).

Barcoded Letter Volume Percentages

There is concern that the MLOCR encode rate assumed in this DAR (26% of national letter volume) is higher than may be expected with a full up system. MLOCRs barcoded 17% of the national letter volume in AP-9 of 1995. If this assumption is higher than what may actually be achieved, then RBCS letter and image volumes will be greater than those indicated in either of the RBCS DARs.

A sensitivity analysis was performed wherein MLOCR accept rate assumptions within the DAR model were reduced so that MLOCRs barcoded 18% of the national letter volume instead of the 26% used in the RBCS DARs. The amount of customer pre-barcoded mail was held constant at 35.6% of national letter volume.

Assumptions	RBCS-104 DAR	Sensitivity Test	Actual AP 9-95
Customer Encoded	35.6%	35.6%	34.1%
MLOCR Encoded	26.1%	18.0%	16.7%
Resulting Projections			
RBCS Encoded	26.0%	32.9%	7.6%
Uncoded	12.3%	13.5%	41.6%
Total National Letter Volume	100.0%	100.0%	100.0%

Sensitivities:

When MLOCR encoded volumes are changed from 26.1% to 18% with other assumptions held constant: RBCS volumes and keying workhour costs increase 26%. Mail Processor Level 4 workhour costs increase 11%. MPLSM workhour savings increase 15%. Manual Clerk savings increase 6%. Carrier savings increase 5%. Assuming the additional RBCS volume is absorbed without additional RECs and without further capital investment, the overall project ROI increases from 37% to 40%.

MPLSM Reductions
This DAR assumes the elimination of an additional 39 MPLSMs beyond those planned for elimination during the transition to RBCS in the 120 sites in the previously approved DAR. A sensitivity test was conducted to evaluate the impact of reducing MPLSMs by only half the amount assumed.

Sensitivity:
If MPLSM reductions are only 50% of the 39 assumed in the DAR. ROI decreases 1 point

Small Office Savings
There has been some concern that the smallest offices scheduled to receive RBCSs might not have volume enough to generate sufficient savings to warrant the incremental investment. For this reason a minimum office model was used to determine the Incremental Return on Investment (IRR) for the smaller offices scheduled for RBCS.

Sensitivities:
There are three sites scheduled for RBCS in this DAR with IRR less than 20%. All have IRR greater than 12.5%. These sites require a total of $7.7 million in additional capital investment to process less than 80,000 pieces each of OSS volume per day. If these three sites are excluded from the network (i.e. 101 sites instead of 104), the ROI for this DAR goes up 1 point from 37% to 38% while the Net Present Value over ten years is reduced from $568 to $565 million at a 12.5% discount rate.

Technological Improvements in RCR
Some concern has been expressed that technological improvements in the ability of Remote Computer Readers (RCR) to read hand-writing will significantly reduce keying volume such that the Postal Service may not need as many keying stations or RECs as planned in the RBCS DARs.

Sensitivities:
The BAM was sensitivity tested by increasing the RCR workload impact factor from 25% to 35% (a 40% increase) while all other assumptions were held constant. If keying workhours are reduced by 15.4%, the ROI increases 5 points (from 37% to 42%). In addition, the flexibility of having transitional employees will allow for appropriate reductions in workhours (REC or other) if technological advances are achieved.

RBCS Equipment Life
This DAR continues the basic assumption that the originally procured equipment will last at least ten years without replacement. Should technology or other reasons make replacement desirable before the end of this initial ten year period, such replacements or upgrades would have to be economically justified on a separate basis.

ATTACHMENT III

RBCS PROGRAM TIMELINE & DELIVERY POINT SEQUENCING SAVINGS EXPECTATIONS

		DEPLOYMENT		DELIVERY POINT SEQUENCING SAVINGS	
NUMBER OF RBCSs	BOARD FUNDING APPROVAL	BEGIN	COMPLETION	INITIAL	FULL-UP
25	APR 1990	FEB 1992	MAY 1993*	N/A**	N/A*
22	DEC 1992	APR 1994	AUG 1994	1995	1998
98	OCT 1994	APR 1995	JUN 1996	1995	1998
104	Future Decision	JUN 1996	JUL 1997	1997	2000

* First 24 sites were completed by November 1992.

** Not applicable - Phase I Bar Coding Automation included the first 25 Remote Bar Coding Systems. This DAR did not reflect any Delivery Point Sequencing savings; only sector/segment savings were included.

DECISION ANALYSIS REPORT

Remote Computer Reader Handwriting Recognition Upgrade

ENGINEERING

RESTRICTED INFORMATION
February 11, 1998

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Decision Analysis Report
RCR Handwriting Recognition Upgrade

INTRODUCTION

This decision analysis Report (DAR) requests funding not to exceed $183.9 million in capital and $3.6 million in expense to upgrade the handwriting recognition technology of 254 Remote Computer Readers (RCR). The upgrade has a target of improving the rate at which the RCR can read and resolve handwritten-addressed mail by 25 percentage points from the present level of 25% to a target of 50%. It is planned to let a sole source incentive contract to accomplish this whereby the vendor will be paid in proportion to the recognition improvement achieved. The requested capital includes $21 million to cover the possibility that the contractor may achieve a recognition rate greater than the target rate of 50%. If the target improvement of 25 percentage points is achieved, a minimum return on investment of 53% is anticipated based on work hour savings in Remote Encoding Centers (RECs) using assumptions detailed in Appendix C.

BACKGROUND

Our current letter automation goals and strategies were first spelled out in the 1988 Corporate Automation Plan. This plan set forth a course for a national network of equipment that, with customer participation, would lead to having virtually all letter mail barcoded. Letters with barcodes are processed efficiently through our automated system. It is approximately eight times less costly to process a letter with our current automated system than to process it manually. For this reason accurate application of barcodes to non-barcoded mail is vital. The barcodes are applied to letters in three ways:

1) Customer applied barcodes
2) Machine applied barcodes at the RCR and the Multiline Optical Character Reader (MLOCR) through computer address recognition
3) Keying of barcodes at Remote Encoding Centers.

The 54 Remote Encoding Centers, with over 25,000 employees and nearly $600 million in annual cost, represent the most expensive means of barcode application. Therefore, a focus of Engineering is to reduce the keying workload at the Remote Encoding Centers by improving computer address recognition technology. RCRs are expected to see approximately 13 billion

hand-addressed images in the automated system. This DAR proposes an upgrade that will improve RCR recognition of these images and thereby reduce the keying costs at the Remote Encoding centers by approximately $89 million per year.

As a result of previous decisions by the Board of Governors, 254 RCRs have been deployed. These RCRs reduced keying work hours at the Remote Encoding Centers by over 25%, primarily by recognizing and encoding machine-printed addresses. However, the RCR recognition rate of hand-addressed mail was below 2%. In January 1997, the Board of Governors approved an upgrade of the RCRs with the Handwriting Address Interpretation (HWAI) technology. This upgrade was deployed in all systems by October 1997, and has currently taken the recognition rate of handwritten addressed mail from less than 2% to approximately 25%. This 25% is the current baseline.

PROPOSED UPGRADE

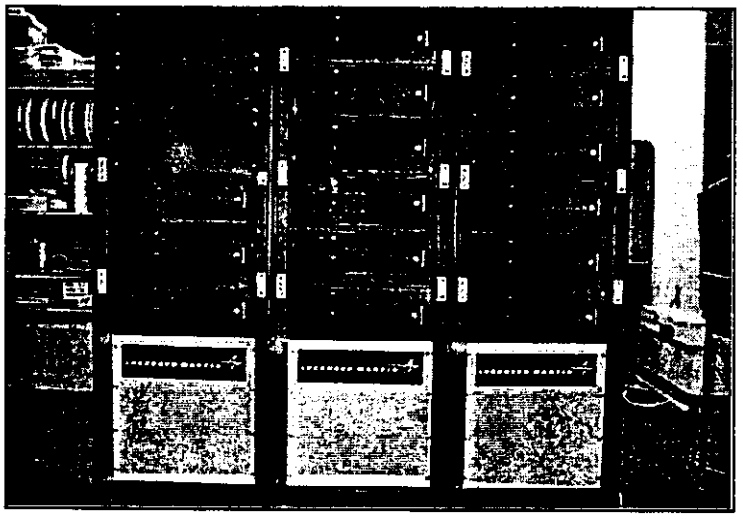
The essential elements of the proposed upgrade are as follows:

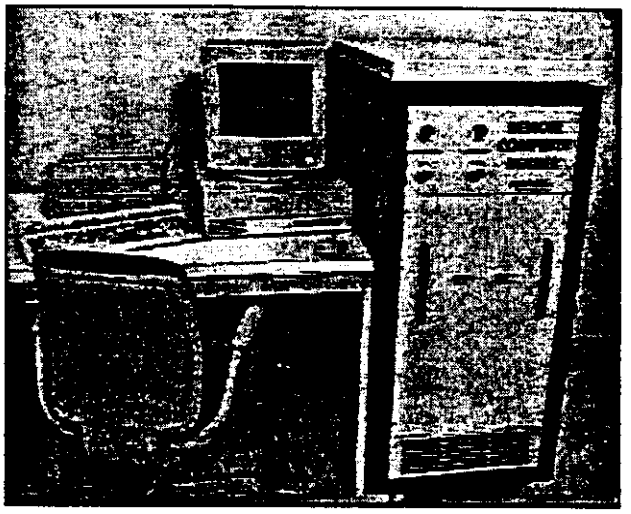
(1) Early deployment of a large hardware upgrade that will allow the RCRs to maintain their throughput level, despite anticipated greater processing requirements.

(2) Incremental software releases which exploit a variety of technologies to improve the recognition of handwritten address mail to 50% from the current rate of 25%.

(3) Payments to the contractor to be based on demonstrated RCR performance improvements above the current baseline. Rigorous tests will be conducted by USPS Engineering to verify increases in RCR performance.

As software advances are made during deployment, previously deployed sites will receive the most current software updates. Assuming contract award will take place in June 1998, completion of hardware deployment and all software upgrades is scheduled for February 1999.





RCR Components

ECONOMIC ANALYSIS

Basis of Savings

The primary benefit from higher RCR recognition of handwritten addresses is the reduction in keying work hours at Remote Encoding Centers. A two-month lag in capturing savings, from the time the upgrade is fully deployed, has been included to allow for attrition of personnel at Remote Encoding Centers.

Deployment Schedule

The 254 RCR upgrades will be deployed between July 1998 and February 1999, with a substantial portion of the upgrades in place prior to the 1998 holiday mailing season. Additional software upgrade releases will take place as they are developed.

Procurement Plan

The procurement plan envisions a negotiated sole source incentive contract in which the contractor is paid according to a schedule tied to verified recognition improvement. The contract will include all necessary hardware, software integration, installation, initial site spare parts, and depot spare parts.

Several software releases are expected during the course of the contract. Tests will be conducted by the USPS, using a large representative national sample of handwritten addressed letter mail images to verify performance improvements, and compliance with throughput and error rate parameters. The contract will specify (1) that error rates cannot increase above the current level, and (2), that the throughput rate for the RCR at each site may not decrease below current levels.

Economic Findings

The total funding authorization requested in this DAR is $187.5 million. This amount includes $21 million as a contingency to pay incentive costs in case a recognition rate greater than 50% is achieved. The following is a summary of the five year economic analysis based on achieving a 25 percentage point improvement.

For 25 Percentage Points of Improvement - Target Scenario

	($000)
Capital Investment	$162,887
Expense Investment	$ 3,575
Total Investment for Target Scenario	$166,462
Above Target Performance Contingency	$ 21,000
Total Investment for Approval	$187,462

Expected Results - Target Scenario

Total Operating Variance (undiscounted)	$508,157
Net Present Value @ 11.8%	$182,927
Return on Investment	53%

Appendix D shows the results of a project sensitivity analysis for varying degrees of RCR improvement.

RESTRICTED INFORMATION

RISK

Technical risk associated with this program is low. The hardware used with the upgrade consists of standard computer equipment. The software is based on proven concepts, and will be thoroughly tested and verified for performance.

The economic risk associated with this program is also low. Prior to entering into a contract, there will be a "proof of concept" test in March at which time the contractor will demonstrate the current achievable level of performance. If the results are less than the 8.3% points of improvement in handwritten addressed mail finalization needed to meet the 20% return on investment hurdle rate for generative projects, the Postal Service will decide whether to postpone or halt the program. If the contract is awarded, an initial performance verification test will be conducted, during which the contractor must again demonstrate a minimum of 8.3% points of improvement in handwritten addressed mail finalization. If this hurdle rate is not met, the Postal Services' liability will be limited to $15 million. This $15 million will be used for upgrading the throughput capability of selected sites in order to meet operational requirements of the existing system. After satisfying the 8.3% improvement hurdle rate, payments to the contractor will be tied to verified performance. Appendix D shows the relationship between the maximum expected investment total and the projected performance improvement at various levels.

RECOMMENDATION

It is recommended that $183.9 million in capital and $3.6 million in expense, for a total authorization not to exceed of $187.5 million, be approved to procure and install 254 RCR Handwriting Recognition Upgrades.

Appendices

Appendix A: Cash Flow

Appendix B: Description of Cash Flow Line Items

Appendix C: Major Assumptions

Appendix D: Sensitivity Analysis

Appendix E: Program Plan

APPENDIX A

CASH FLOW - RCR HANDWRITING RECOGNITION UPGRADE

TARGET SCENARIO

($000'S)

FISCAL YEAR	1998	1999	2000	2001	2002	2003	2004	TOTAL
PROJECT YEAR	0	1	2	3	4	5	6	
NO. OF INSTALLATIONS	84	170	0	0	0	0	0	254
CAPITAL INVESTMENT								
HARDWARE (254 SYSTEMS)	($40,239)	($109,226)						($149,465)
SOFTWARE INTEGRATION								
INSTALLATION								
ADDITIONAL PROCESSING CAPACITY								
INITIAL SITE SPARE PARTS								
SITE PREPARATION	($1,642)	($3,323)						($4,965)
ACCEPTANCE TESTING	($350)	($350)						($700)
CONTINGENCY @ 5%	($2,112)	($5,645)						($7,757)
TOTAL CAPITAL INVESTMENT	($44,343)	($118,544)						($162,887)
EXPENSE INVESTMENT								
DEPOT SPARES	($828)	($2,247)						($3,075)
TEST DECKS	($135)	($365)						($500)
TOTAL EXPENSE INVESTMENT	($962)	($2,613)						($3,575)
TOTAL INVESTMENT	($45,305)	($121,157)						($166,462)
OPERATING VARIANCES								
QA COSTS - LABOR	($359)							($359)
QA COSTS - NON LABOR	($105)							($105)
RECURRING SPARE PARTS	($165)	($508)	($516)	($524)	($533)	($541)	($550)	($3,338)
ANNUAL MAINTENANCE SUPPORT	($9)	($183)	($218)	($223)	($228)	($233)	($238)	($1,331)
LABOR SAVINGS		$37,153	$91,128	$93,133	$95,182	$97,276	$99,416	$513,289
TOTAL OPERATING VARIANCES	($638)	$36,462	$90,394	$92,386	$94,422	$96,502	$98,628	$508,157
NET CASH FLOW	($45,943)	($84,695)	$90,394	$92,386	$94,422	$96,502	$98,628	$341,695
RETURN ON INVESTMENT	53%							
NET PRESENT VALUE @ 11.8%	$182,927	For 25% Points of Handwritten Address Recognition Improvement						

RESTRICTED INFORMATION

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Appendix B:
Description of Cash Flow Line Items

HARDWARE (254 SYSTEMS) :	Disk drives, memory and circuit boards required to maintain throughput levels at the RCR sites with the proposed software upgrade. Amount also contains funding for selected site upgrades, and National Directory Support System hardware upgrade.

THE MARKED (*) ITEMS ARE INCLUDED IN HARDWARE ESTIMATE.

* SOFTWARE INTEGRATION:	Integration of the software upgrades into the existing RCR system.
* INSTALLATION:	Effort and travel associated with sending teams to each site for installation of hardware and software.
* ADDITIONAL PROCESSING CAPACITY:	Amount required to upgrade current processing capacity to be consistent with current volume levels.
* INITIAL SITE SPARE PARTS:	Items required at the site level to ensure the operational availability of the equipment.
SITE PREPARATION:	Preparation of each site for installation of the equipment, including minor structural and electrical alterations, and additional cooling capacity as required.
ACCEPTANCE TESTING:	Amount required to conduct performance verification and acceptance tests.
CONTINGENCY @ 5%:	Amount to support unforeseen requirements.
DEPOT SPARE PARTS:	Spare parts needed at the depot to support field replenishment requirements.

TEST DECKS:	Funding to gather and consolidate test deck information, and other expense efforts as required.
QA COSTS - LABOR:	USPS labor effort required for pre deployment testing and evaluation.
QA COSTS - NON LABOR:	Non labor costs, primarily travel and accommodations, required for pre deployment testing and evaluation.
RECURRING SPARE PARTS:	Replenishment of site spare part stocks to ensure operational availability of units.
ANNUAL MAINTENANCE SUPPORT:	The incremental labor required to provide adequate maintenance of this upgrade at the site.
LABOR SAVINGS:	Labor savings are based on the keying work hours avoided at the Remote Encoding Centers. The savings are lagged two months after the completion of installation for all upgrades.

Appendix C:
Major Assumptions

Volumes

- National annual script letter mail volume (ODIS '97): 14.8 Billion
- Less script through non-automated offices: 1.1 Billion
- Less script finalized by the MLOCR: 0.6 Billion
- Script mail volume available to RCR: 13.1 Billion

Remote Encoding Center (REC) Performance

- Console productivity: 757 images per console hour.
- Function 1 productivity: 571 images per work-hour.
- Effective productivity: 604 images per work-hour (less training and supervision).
- DAR assumes no savings in supervision.

RCR Performance

- Baseline performance will be verified by USPS tests after inclusion of all previously funded recognition improvement modifications (e.g., HWAI).
- As a result of this upgrade, performance will improve up to 25 percentage points above the baseline recognition rate for RCR processed handwritten addressed images.
- Contract incentives will proportion investment costs to verified performance improvements (Ref. Appendix D)

Savings

- REC sites will capture 95% of the modeled savings.
- Savings will begin 2 months after deployment completion.
- DAR assumes no additional maintenance training is required.

Economic Factors

- REC 70/30 composite labor rate: $17.36 per hour (FY 1999)
- Labor rate is escalated 2.2% per year.
- 7.3% is the cost of capital.
- 4.5% is the generative project risk factor.
- 11.8% is the discount rate used for present value calculations.

Schedule

- Board of Governors approval, May 1998.
- A contract award for 254 upgrade kits is made by June 1998.
- Deployment is suspended through November and December of 1998.
- The deployment of the 254 upgrade kits will be completed by February 1999.

APPENDIX D: INVESTMENT VS. IMPROVEMENT SENSITIVITY ANALYSIS

(1) RCR Finalization Rate	(2) RCR Finalization Improvement	(3) Total Investment (000)	(4) Savings Work Hours Per Year	(5) NPV (000)	(6) Return on Investment
55%	30%	$187,462	6,163,603	$231,609	57%
Target Scenario					
50%	25%	$166,462	5,136,336	$182,927	53%
45%	20%	$145,492	4,109,069	$134,217	47%
40%	15%	$124,523	3,081,802	$85,506	38%
35%	10%	$103,554	2,054,534	$36,795	26%
33.3%	8.3%	$96,424	1,705,264	$20,234	20%
25%	0%		– Baseline –		

NOTES

(1) Resulting total RCR finalization rate for handwritten address images.
(2) Improvement in recognition of handwritten address images over baseline.
(3) Combined capital and expense investment; includes incentive contract payment up to $4 million per point of improvement over baseline.
(4) REC site savings due to reduced keying workload.
(5) Over 5 year period, discounted at 11.8%.
(6) Over a 5 year estimated project life.

RESTRICTED INFORMATION

DECISION ANALYSIS REPORT

Recognition Improvement Program

ENGINEERING

RESTRICTED INFORMATION
3/22/00

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1.0 Introduction

This decision analysis report recommends that the Board of Governors authorize the expenditure of $125.20 million in capital funds and $5.95 million in expense funds, for a total of $131.15 million, to upgrade the technology used in the optical character recognition of letter mail addresses. The funding requested will cover upgrades to existing and approved but not yet deployed Optical Character Reader (OCR) equipment including Multiline Optical Character Readers (MLOCRs), Low Cost Optical Character Readers (LCOCRs), and Delivery Bar Code Sorters with Input and Output Subsystems (DIOSS).

Our efforts in improving recognition rates for letter mail have been extremely successful. The current total system recognition rate for mail introduced to the OCRs is 82 percent, and with the technology upgrade recommended in this report, we expect to increase this rate by an additional 6 percent. We are requesting funding to cover up to an 8 percent improvement in recognition rate in case the contractor(s) are able to achieve improvements above our 6 percent target.

The projected savings are based on improvements to the total system recognition capability which includes our Remote Computer Readers (RCRs). However, we expect most of the improvements to be associated with increases in machine-imprinted address recognition rates since the majority of mail handled by our OCRs falls in that category. Pay for performance contracts will be awarded in which the selected contractor(s) must meet or exceed designated performance goals to be compensated, and they will only be compensated for the performance improvements actually achieved.

2.0 Background

One goal set forth in the U.S. Postal Service's Five Year Strategic Plan is to improve our total factor productivity at a rate equal to or better than the rate of improvement in the private sector. In support of this goal, we have focused much of our attention on improving recognition by our MLOCRs and RCRs, which in turn improves productivity because mail can be sorted without manually keying in addresses through the Remote Bar Coding System.

The Postal Service's letter automation goals and strategies were first defined in our 1988 Corporate Automation Plan. This plan envisioned a national network of equipment that, with customer participation, would allow barcoding of virtually all letter mail for automated sorting. We have been able to accomplish our letter automation goals through the use of two types of equipment: (1) equipment that produces barcodes—MLOCRs and the Remote Bar Coding System; and (2) equipment that processes barcodes—Mail Processing Bar Code Sorters, Delivery Bar Code Sorters, and Carrier Sequence Bar Code Sorters.

The Recognition Improvement Program is part of a continuing effort by the Postal Service to reduce processing costs by improving recognition technology. A number of previously approved programs have been successful in improving recognition capabilities of letter mail addresses:

- MLOCR Co-Directory System – March 1996 Board approval with deployment completed in November 1996;
- MLOCR Co-Processor System – December 1996 Board approval with deployment completed in September 1997; and
- RCR Handwriting Recognition Upgrades – January 1997, May 1998, and May 1999 Board approvals with the last incremental software release expected in November 2000.

The Co-Directory system is a second address lookup directory connected to an MLOCR that provides an increase in the number of delivery point barcodes applied directly by the MLOCR.

While the Co-Directory system provides a duplicate means of looking up a letter's address in order to determine the correct barcode, the Co-Processor system provides a duplicate means of locating the address block and determining the characters on the address. These enhancements work together to increase the amount of delivery point barcodes provided at the initial letter handling, thereby reducing the need for more expensive manual keying via the Remote Bar Coding System.

The RCR Handwriting Recognition Upgrade program is expected to ultimately provide a recognition rate of 75 percent of all handwritten addresses. The first of three Decision Analysis Reports funded the addition of handwriting recognition software to the RCR and at some high volume sites, added hardware that provided more processing power to maintain the required throughput. The second report funded incremental software releases that increased the recognition of handwritten addresses to 57 percent as well as additional hardware required to maintain the required throughput. Deployment of the hardware and software necessary to achieve the 57 percent recognition rate was completed in June 1999.

The goal of the third and most recent effort of the RCR Handwriting Recognition Upgrade program is to increase the RCR recognition rate to 75 percent for handwritten addresses and to increase machine-imprinted address recognition rates by 8 percentage points. Incremental software releases are being evaluated on a pay for performance basis. Deployment of the first software release was completed in November 1999; it resulted in handwritten and machine-imprint address accept rate improvements of about 6.8 and 13.7 percentage points, respectively (exceeding the Decision Analysis Report's expectations for machine-imprint improvements). Additional incremental software releases are expected to eventually increase the handwritten address recognition rate to 75 percent by November 2000. No further increases in machine-imprint recognition rates are expected from this program.

The success of our many recognition improvement programs has allowed the Postal Service to establish plans for reducing the number of Remote Encoding Centers from 55 to 27 by June 2001. Since manual keying is the most expensive means of barcode application, reducing the keying workload at Remote Encoding Centers by improving address recognition capabilities continues to be a key goal for the Postal Service.

3.0 Description

The funding requested will be used to upgrade the recognition capabilities of three letter mail processing machines: MLOCRs, LCOCRs, and approved but not yet deployed Delivery Bar Code Sorters with Input and Output Subsystem (DIOSS) capabilities. All of the DIOSS equipment is expected to be deployed by October 2000, which is three months before we plan to start deployment of these hardware and/or software upgrades.

The goal of the technology upgrade recommended in this report is to improve total system image recognition by 6 percent for letter mail processed by the OCRs. We expect most of the improvements to be associated with increases in machine-imprinted address recognition rates since over 90 percent of mail handled by our OCRs falls in that category. With this additional improvement, we will be able to further reduce the number of Remote Encoding Centers required.

We recognize that MLOCRs may be phased out in the future and replaced with additional DIOSS equipment. If this occurs before FY 2006, capturing the savings projected in this report will be assured because any future DIOSS procurements will be required to provide us with the same recognition improvements as contracted for under the scope of this decision analysis report.

4.0 Economic Analysis

4.1 Basis of Savings

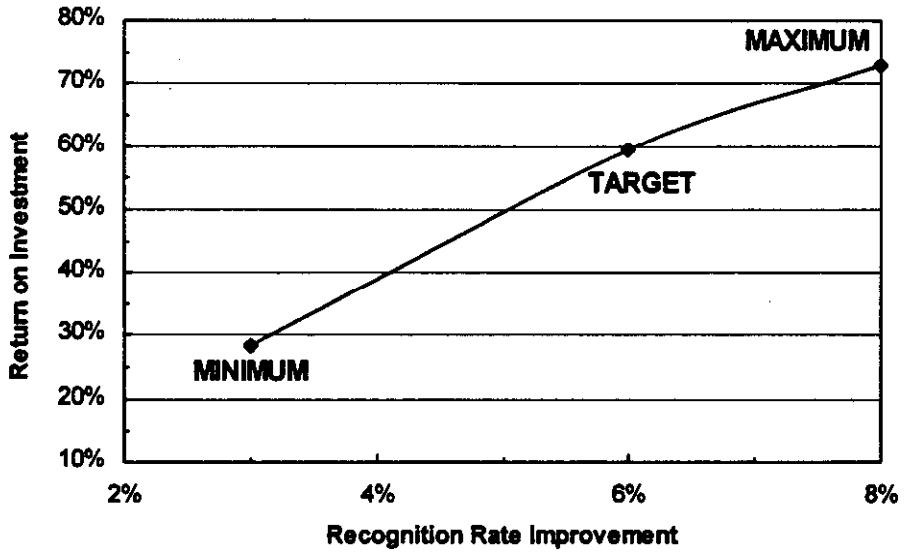
The primary benefit from increased OCR recognition rates will be a reduction in keying workhours required at Remote Encoding Centers. Cost savings from this program are expected to be about $64.77 million annually for a 6 percent improvement in system read rate.

Actual performance improvements will be measured through formal tests using 100,000 images collected at 15-20 sites. The vendors will be required to compete using the same images to determine their rate of improvement. The basis of savings is calculated on improvement benefits to the total system recognition capability, which includes the Remote Computer Readers.

We have allocated $20 million to cover reductions in three types of error rates associated with finalized mail pieces. The successful vendor(s) will have an opportunity to provide a second release of their software solution within six months of the First Article Test to make error improvements provided they do not lower the finest sort and finalized rates and throughput of the system. They will be compensated for each one tenth of a point improvement in error rate achieved in relation to the baseline error rate existing in the equipment and software deployed at that time.

The target scenario assumes a 6 percent increase in read rate over the baseline system and a capture rate of 90 percent. The contingency scenario reflects a maximum improvement of 8 percent and a capture rate of 90 percent. Appendix 4 lists the major assumptions used in this analysis and Appendix 5 contains a sensitivity analysis that shows varying degrees of recognition improvement with return on investment expectations as illustrated in the chart below.

Return on Investment Expectations
at Varying Recognition Rate Improvements



4.2 Financial Summary

The $131.15 million in total investment requested in this report includes provisions for up to $19.73 million as additional incentive to pay the contractor if recognition rate improvements are

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achieved above the 6 percent target. Following is a summary of the required investment and expected savings from this program.

RECOGNITION IMPROVEMENT PROGRAM
INVESTMENT SUMMARY

Capital Investment	$85,472,372
Error Reduction Incentive	$20,000,000
Total Capital Investment for Target Scenario	$105,472,372
Total Expense Investment for Target Scenario	$5,950,000
Total Investment for Target Scenario	$111,422,372
Above 6% Target Performance Capital Contingency	$19,727,628
Total Investment Requested for Approval	$131,150,000

Expected Results

	Target Scenario	Contingency Scenario
Operating Variances	$339,808,759	$459,299,667
Net Present Value @ 10% discount rate	$149,161,178	$221,584,882
Return on Investment	59.4%	72.9%

Appendices 1 and 2 contain the year-by-year cash flows necessary to achieve the target and contingency scenarios, respectively. Appendix 2 contains descriptions of the cash flow line items.

5.0 Risk

The technical, operational, and financial risks associated with this program are low since incentive-based, pay for performance contracts will be awarded. Also any hardware used for the upgrades will be standard computer equipment. The software will be based on proven concepts and will be thoroughly tested and verified for performance. The Postal Service will conduct first article tests on all proposed recognition improvements to ensure they meet our requirements.

6.0 Plan and Recommendation

6.1 Procurement and Deployment Plans

The first contract award(s) under this program will be for MLOCR and DIOSS upgrades. We anticipate approximately four contractors will bid on this effort. The contract(s) will include all necessary hardware, software, software integration efforts, and logistics. In the future, we plan to award a separate contract for OCR upgrades on all LCOCR machines.

All DIOSS equipment currently under contract is expected to be deployed by October 2000, which is a three months prior to the start of deployment of the upgrades requested in this report. The

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recognition improvement program upgrades associated with this report are scheduled to be deployed from January 2001 through June 2001. A program schedule is included as Appendix 5.

6.2 Milestone Schedule

Activity	Completion Date
Board of Governors Approval	June 2000
MLOCR/DIOSS Upgrade Contract Award(s)	September 2000
First Article Test – MLOCR/DIOSS Upgrade	November 2000
Begin Deployment – MLOCR/DIOSS Upgrade	January 2001
End Deployment – MLOCR/DIOSS Upgrade	June 2001
LCOCR Upgrade Contract Award	February 2001
First Article test – LCOCR Upgrade	May 2001
Deployment - LCOCR Upgrade	June 2001

6.3 Recommendation

It is recommended that $125.20 million in capital funding and $5.95 million in expense funding, for a total of $131.15 million, be approved to procure and install hardware and software associated with the Recognition Improvement Program. This amount will cover up to an 8 percentage point improvement in system recognition rates for letter mail that is introduced at our OCR processing equipment.

Appendix 1
Recognition Improvement Program Cash Flow
Target Scenario ($000)

Fiscal Year	2001	2002	2003	2004	2005	2006	Total
Project Year	0	1	2	3	4	5	
No. upgrades deployed	1,191	0					1,191
Capital Investment							
MLOCR and DIOSS Hardware/Software	$ (52,030)						$ (52,030)
LCOCR Hardware Modifications	$ (1,575)						$ (1,575)
LCOCR Software Development/Modification	$ (375)						$ (375)
Error Rate Reduction Incentive	$ (20,000)						$ (20,000)
Quality Assurance	$ (2,000)						$ (2,000)
Program Support	$ (400)						$ (400)
Acceptance Testing (data acquisition, truthing, etc.)	$ (1,000)						$ (1,000)
Site Preparation	$ (10,000)						$ (10,000)
San Mateo Directory Hardware Support	$ (200)						$ (200)
Contractor Maintenance Support	$ (500)	$ (500)					$ (1,000)
Contractor Training Development & Delivery	$ (2,901)						$ (2,901)
Initial Site Spares	$ (6,667)						$ (6,667)
Maintenance Documentation	$ (1,060)						$ (1,060)
Contingency	$ (6,266)						$ (6,266)
Total Capital Investment	**$ (104,972)**	**$ (500)**					**$ (105,472)**
Expense Investment							
Depot Spares	$ (5,950)						$ (5,950)
Total Expense Investment	**$ (5,950)**	**$ -**					**$ (5,950)**
Operating Variances							
Recurring Spares	$ -	$ (614)	$ (625)	$ (635)	$ (646)	$ (657)	$ (3,177)
Annual Postal Maintenance Labor		$ (549)	$ (562)	$ (576)	$ (591)	$ (606)	$ (2,884)
Initial Maintenance Training (Field Labor)	$ (6,221)						$ (6,221)
Initial Maintenance Training (ED Non-Labor)	$ (30)						$ (30)
Recurring Maintenance Training (Field Labor)		$ (956)	$ (980)	$ (1,005)	$ (1,030)	$ (1,056)	$ (5,027)
Recurring Maintenance Training (Non-Labor)		$ (24)	$ (25)	$ (25)	$ (26)	$ (26)	$ (126)
Program Support Travel (Non-Labor)	($500)						$ (500)
Site Preparation - Postal Labor	($700)						$ (700)
Labor Savings	$ 18,539	$ 67,381	$ 69,135	$ 69,021	$ 67,916	$ 66,481	$ 358,473
Total Operating Variances	**$ 11,089**	**$ 65,237**	**$ 66,943**	**$ 66,779**	**$ 65,624**	**$ 64,137**	**$ 339,809**
Net Cash Flow	**$ (99,834)**	**$ 64,737**	**$ 66,943**	**$ 66,779**	**$ 65,624**	**$ 64,137**	**$ 228,386**
Return on Investment	59.4%						
Net Present Value	$ 149,161						
Total Percentage Points of Improvement	6%						
Capture Rate	90%						

Appendix 2
Recognition Improvement Program Cash Flow
Contingency Scenario ($000)

Fiscal Year	2001	2002	2003	2004	2005	2006	Total
Project Year	0	1	2	3	4	5	
No. upgrades deployed	1,191	0					1,191
Capital Investment							
MLOCR and DIOSS Hardware/Software	$ (69,373)						$ (69,373)
LCOCR Hardware Modifications	$ (2,100)						$ (2,100)
LCOCR Software Development/Modification	$ (500)						$ (500)
Error Rate Reduction Incentive	$ (20,000)						$ (20,000)
Quality Assurance	$ (2,000)						$ (2,000)
Program Support	$ (400)						$ (400)
Acceptance Testing (data acquisition, truthing, etc.)	$ (1,000)						$ (1,000)
Site Preparation	$ (10,000)						$ (10,000)
San Mateo Directory Hardware Support	$ (200)						$ (200)
Contractor Maintenance Support	$ (500)	$ (500)					$ (1,000)
Contractor Training Development & Delivery	$ (2,901)						$ (2,901)
Initial Site Spares	$ (6,667)						$ (6,667)
Maintenance Documentation	$ (1,060)						$ (1,060)
Contingency	$ (8,000)						$ (8,000)
Total Capital Investment	**$ (124,700)**	**$ (500)**					**$ (125,200)**
Expense Investment							
Depot Spares	$ (5,950)						$ (5,950)
Total Expense Investment	**$ (5,950)**	**$ -**					**$ (5,950)**
Operating Variances							
Recurring Spares	$ -	$ (614)	$ (625)	$ (635)	$ (646)	$ (657)	$ (3,177)
Annual Postal Maintenance Labor		$ (549)	$ (562)	$ (576)	$ (591)	$ (606)	$ (2,884)
Initial Maintenance Training (Field Labor)	$ (6,221)						$ (6,221)
Initial Maintenance Training (ED Non-Labor)	$ (30)						$ (30)
Recurring Maintenance Training (Field Labor)		$ (956)	$ (980)	$ (1,005)	$ (1,030)	$ (1,056)	$ (5,027)
Recurring Maintenance Training (Non-Labor)		$ (24)	$ (25)	$ (25)	$ (26)	$ (26)	$ (126)
Program Support Travel (Non-Labor)	($500)						$ (500)
Site Preparation - Postal Labor	($700)						$ (700)
Labor Savings	$ 24,719	$ 89,841	$ 92,179	$ 92,027	$ 90,555	$ 88,642	$ 477,964
Total Operating Variances	**$ 17,268**	**$ 87,698**	**$ 89,987**	**$ 89,786**	**$ 88,263**	**$ 86,298**	**$ 459,300**
Net Cash Flow	**$ (113,382)**	**$ 87,198**	**$ 89,987**	**$ 89,786**	**$ 88,263**	**$ 86,298**	**$ 328,150**

Return on Investment		72.9%
Net Present Value	$	221,585
Total Percentage Points of Improvement		8%
Capture Rate		90%

Appendix 3
Description of Cash Flow Line Items

CAPITAL ITEMS:

MLOCR and DIOSS Hardware/Software – Funding of $8,671,649 per point of improvement for upgrading the recognition capability of the existing and planned 875 MLOCR and 211 DIOSS machines. This amount covers system recognition rate improvements over the current baseline of 82 percent for mail introduced to our OCR equipment.

LCOCR Hardware Modifications – Funding of $262,500 per point of improvement for modifying the existing 105 LCOCR machines. This amount covers system recognition rate improvements over the current baseline of 82 percent for mail introduced to our OCR equipment.

LCOCR Software Development/Modification – Funding of $62,500 per point of improvement for upgrading existing LCOCR machine software. This amount covers system recognition rate improvements over the current baseline of 82 percent for mail introduced to our OCR equipment.

Error Rate Reduction Incentive – Funding of $20,000,000 to be used as an incentive to the contractor(s) for reducing three types of error rates associated with finalized mail pieces.

Quality Assurance – Funding of $2,000,000 to support quality assurance activities.

Program Support – Funding of $400,000 to cover contractor support of Automation Purchasing ($200,000) and Program Management activities ($200,000) for 2 years.

Acceptance Testing – Funding of $1,000,000 to support acceptance testing activities such as data acquisition and truthing.

Site Preparation – Funding of $10,000,000 (400 sites @ $25,000 per site) for site preparation activities.

San Mateo Directory Hardware Support – Funding of $200,000 for providing Directory hardware support to San Mateo.

Contractor Maintenance Support – Funding of $1,000,000 ($500,000 per year for 2 years) for contractor software maintenance support activities.

Contractor Training Development & Delivery – Funding of $2,900,640 for maintenance training development and initial delivery by the contractor.

Initial Site Spares – Funding of $6,666,667 for an initial inventory of selected replacement spare parts.

Maintenance Documentation – Funding of $1,059,500 for developing, printing, and shipping Maintenance Handbook and Repair Specifications. Consists of $300,000 for development of Maintenance Handbook, $500,000 for development of Repair Specifications, and $259,500 for printing/shipping of Maintenance Handbooks.

Contingency @ 10% of MLOCR/DIOSS Hardware, Initial Site Spares, Maintenance Documentation, and Contractor Training Development & Delivery costs – These funds will provide for unforeseen cost elements, price adjustments, or minor additional requirements.

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EXPENSE ITEMS:

Depot Spares – Funding of $5,950,000 for an initial depot spare parts inventory of recognition components.

OPERATING VARIANCES:

Recurring Spares – Funding of $603,925 for annual spare parts.

Annual Postal Maintenance Labor – Funding of $531,909 for annual preventive and corrective maintenance (ET-9) and $4,433 for annual field labor (ET-9) used to install recurring spares.

Initial Maintenance Training (Field Labor) – Funding of $6,220,500 for initial field operator and maintenance training (ET-9).

Initial Maintenance Training (ED Non-Labor) – Funding of $29,700 for initial training development and evaluation efforts by Employee Development personnel.

Recurring Maintenance Training (Field Labor) – Funding of $933,075 for annual training of operator and maintenance personnel.

Recurring Maintenance Training (non-Labor) – Funding of $23,925 for non-labor costs associated with annual operator and maintenance personnel training

Program Support – Funding of $500,000 for Program Management travel expenses incurred during deployment.

Site Preparation – Funding of $700,000 for Postal field labor used to support site preparation activities.

Labor Savings – Based on the keying workhours avoided at Remote Encoding Centers (REC Site 30/70). Each 1% improvement in system recognition rate translates to cost savings of $8,095,760 per year. For the target scenario, savings for a 6% total system improvement ($64,766,081) are shown with a 2 month lag before they begin.

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Appendix 4
Major Assumptions

Volumes

- Total of 45.616 billion letters per year are fed to the 875 MLOCRs of which 36.135 billion pieces are considered candidate volume (FY 1999 MODS data)
  - Candidate volume equates to an average of 144,394 letters per day per MLOCR
- Total of 2.327 billion letters per year are fed to the 105 LCOCRs of which 1.843 is considered candidate volume (FY 1999 MODS data)
  - Candidate volume equates to an average of 61,372 letters per day per LCOCR
- Annual Volume Growth Factors: FY2000 – 1.023; FY2001 – 1.012; FY2002 – 1.015; FY2003 – 1.001; FY2004 – (1.026); FY2005 – (1.040); FY2006 – (1.045)
- 286 processing days per year

Remote Encoding Center (REC) Performance

- Effective Productivity: 614 images per workhour
- DAR assumes no supervision savings

System Performance Improvement & Savings

Assumption	Target Scenario	Contingency Scenario
System Recognition Improvement	6%	8%
REC Site Capture Rate	90%	90%
ROI	59.4%	72.9%

- Savings result from reduced keying workhours at REC sites
- Savings will begin 2 months after deployment

Economic Factors

- REC 70/30 composite labor rate: $18.73 per hour (FY 2001)
- Maintenance ET-9 labor rate: $37.17 per hour (FY 2001)
- Postal labor escalation factor: 2.5% per year
- Cost of capital: 5.5%
- Generative project risk factor: 4.5%
- Total discount rate used for present value calculations: 10%

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Appendix 5
Sensitivity Analysis
(Investment vs. Improvement)

(1) Finalization Improvement	(2) Maximum Required Investment	(3) Annual Workhour Savings	(4) Net Present Value	(5) Return on Investment
8%	$131,150,000	4,610,506	$221,584,882	72.9%
Target Scenario				
6%	$111,422,372	3,457,879	$149,161,178	59.4%
4%	$91,694,744	2,305,253	$76,737,474	40.9%
Minimum Scenario				
3%	$81,830,930	1,728,940	$40,525,622	28.4%
2.44%	$76,307,194	1,406,204	$20,246,985	20.0%

NOTES:

(1) Improvement in recognition rate over baseline of 82% for letter mail introduced to the OCRs

(2) Combined capital and expense investment; includes maximum incentive contract payments for improvement of finalization rate and error rate over baseline

(3) REC site savings due to reduced keying workload

(4) Over 5 year period, discounted at 10%

(5) Over a 5 year estimated life

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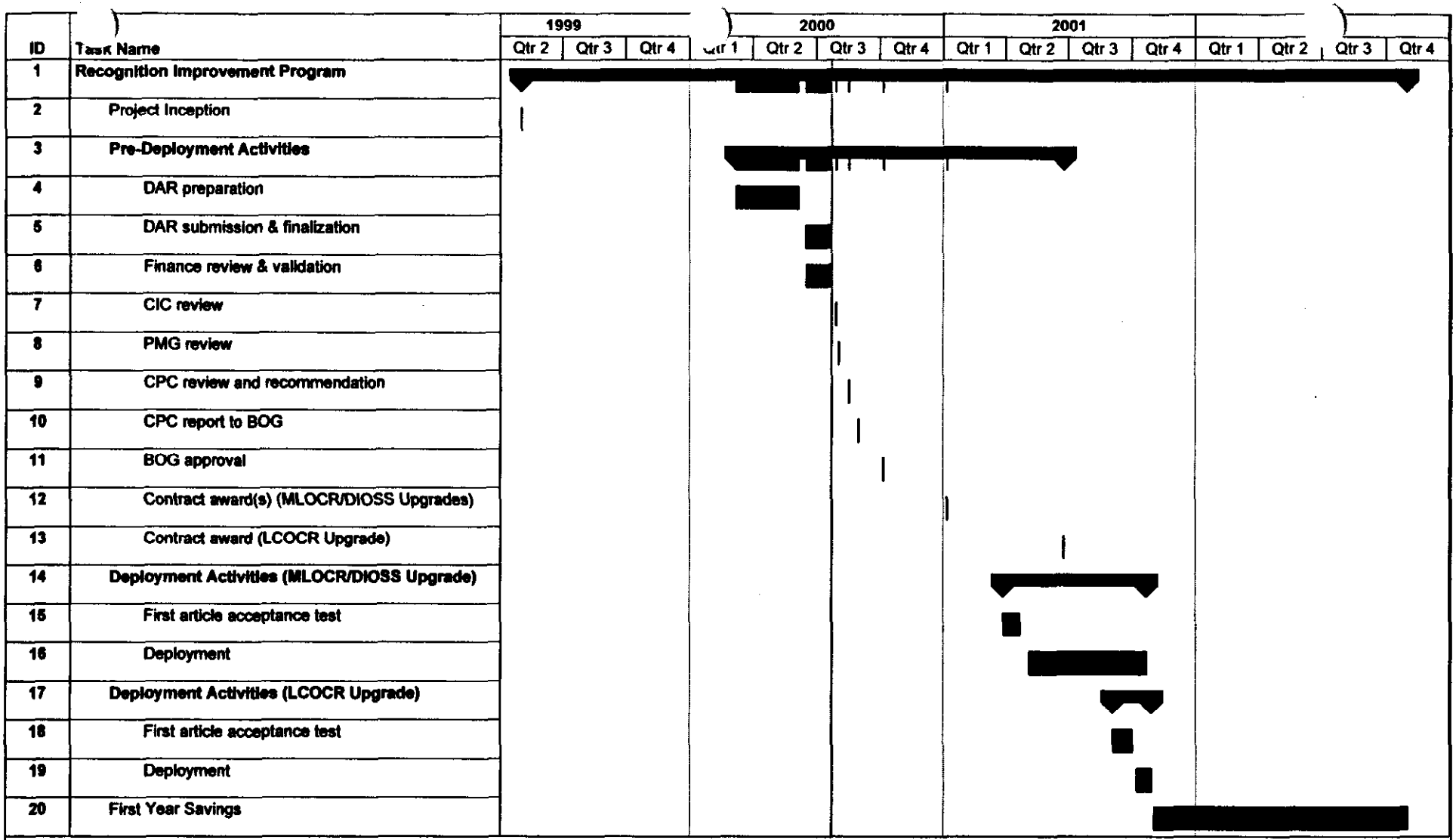

ID	Task Name
1	**Recognition Improvement Program**
2	Project Inception
3	**Pre-Deployment Activities**
4	DAR preparation
5	DAR submission & finalization
6	Finance review & validation
7	CIC review
8	PMG review
9	CPC review and recommendation
10	CPC report to BOG
11	BOG approval
12	Contract award(s) (MLOCR/DIOSS Upgrades)
13	Contract award (LCOCR Upgrade)
14	**Deployment Activities (MLOCR/DIOSS Upgrade)**
15	First article acceptance test
16	Deployment
17	**Deployment Activities (LCOCR Upgrade)**
18	First article acceptance test
19	Deployment
20	First Year Savings

Project: Capital Programs
Date: 3/23/00

Task
Progress
Milestone
Summary
Rolled Up Task
Rolled Up Milestone
Rolled Up Progress

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