March 1986

POSTAL SERVICE

Information on the Change to Multiline Readers for the Zip + 4 Program
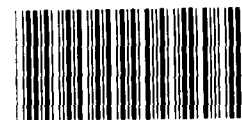
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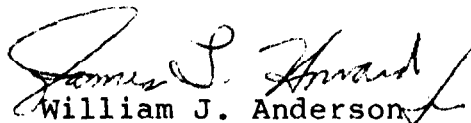GENERAL GOVERNMENT
DIVISION

MAR 28 1986

B-215132

The Honorable William D. Ford
Chairman, Committee on Post
  Office and Civil Service
House of Representatives

The Honorable Mickey Leland
Chairman, Subcommittee on Postal
  Operations and Services
Committee on Post Office and
  Civil Service
House of Representatives

     In your joint letter of November 13, 1985, you asked us to
review the most recent actions taken by the U.S. Postal Service
Board of Governors in connection with the Postal Service's
ZIP + 4 program. Those actions concerned the change in mail
processing technology--from single line optical character
readers to multiline readers--the Service is making for the
ZIP + 4 program.

     You wanted information on a number of issues and our
views. Those issues centered around the changeover to multiline
technology and the Service's latest estimate of how much ZIP + 4
coded mail businesses will provide the Service in coming years.
This report provides the information we collected and our
related views, which we discussed with a representative of your
offices on February 26, 1986.

     As requested by your representative, we did not obtain the
Service's official comments on this report. However, we did
discuss the report's proposed contents with Service officials
and we considered their comments in preparing our final report.
As arranged with your representative, we are sending copies of
this report to the Postal Service Board of Governors and the
Postmaster General. Copies will also be available to other
interested parties upon request. If you have further questions
on the matters discussed in this report, please contact
Mr. Willis Elmore of my staff at the Postal Service on 268-4950.

                                William J. Anderson
                                Director

MULTILINE TECHNOLOGY AND THE
ZIP + 4 PROGRAM

INTRODUCTION

The U.S. Postal Service's ZIP + 4 program consists of two parts: automating the mail processing system and, in conjunction with automation, using a longer ZIP Code (ZIP + 4 code) to process mail. To automate the mail processing system, the Service bought two different types of machines. One machine, an optical character reader, prints a bar code on the envelope representing the ZIP Code or ZIP + 4 code and the other machine, a bar code sorter, reads the bar code for subsequent sorting operations.

The Service bought "single-line" optical character readers (OCR) to read ZIP + 4 codes and print corresponding bar codes. These OCRs, which read the city-state-ZIP Code line of the address block, depend on business mailers to place ZIP + 4 codes on mail. However, another type of OCR--a "multiline" OCR--has become available that reads at least four lines of the address block, searches an internal directory for that address' ZIP + 4 code, and prints the corresponding bar code. To print a bar code on a mailpiece, a multiline OCR does not need a ZIP Code or ZIP + 4 code on the piece if it can read and locate the address in its directory. (However, the cost effectiveness of multiline OCRs is enhanced when mailers put ZIP + 4 codes on their mail.)

During the summer of 1985, the Postal Service Board of Governors instructed the Service to replace the single-line technology with multiline technology. The Board decided to make the change because businesses have been relatively slow to use ZIP + 4 codes and the Board saw no immediate upsurge in that use. Ramifications of the change (e.g., how quickly the multiline technology could/should be installed) have added further controversy to the ZIP + 4 program.

OBJECTIVES, SCOPE, AND METHODOLOGY

In a joint letter dated November 13, 1985, the Chairman of the House Post Office and Civil Service Committee and the Chairman of its Subcommittee on Postal Operations and Services asked us to review the most recent actions taken by the Postal Service Board of Governors in connection with the ZIP + 4 program. Those actions concerned the switch from single-line technology to multiline technology. In conjunction with that request, the Subcommittee asked us to provide information on such issues as

--how much savings the Service forgoes each workday it
   operates without multiline OCRs,

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--whether the Service will end up with a suitable single-
line-converted-to-multiline machine (the Service plans to
convert some of its single-line OCRs to multiline
technology),

--what use, if any, will be made of the single-line OCRs
that are not converted to multiline technology, and

--whether the Service's latest estimate of future ZIP + 4
use is realistic.

In order to respond to the request in a timely fashion, we
essentially limited our work to gathering (including the
interviewing of appropriate Service officials) and reviewing
information readily available at the Postal Service headquarters
as well as utilizing past ZIP + 4 reports issued by us and the
congressional Office of Technology Assessment.

SERVICE PROPOSED HEDGE
WHEN PHASE II OCRs PURCHASED

The Service purchased the single-line OCRs in two batches
or phases and before the second purchase of 403 machines was
made in July 1984, the Service considered purchasing multiline
OCRs. (The first purchase--Phase I--included 252 single-line
OCRs.) As we reported in an earlier study,[1] the Service
decided against a multiline purchase because it believed
multiline OCRs

--would cost much more to buy and maintain than single-line
OCRs,

--would substantially delay Phase II automation which would
result in a substantial loss of savings, and

--would only marginally increase savings over single-line
machines as ZIP + 4 usage grew to the 90-percent level
expected by the Service (or 50 billion pieces of
First-Class Mail).

However, shortly before awarding the Phase II OCR contract,
the Service told two congressional subcommittees that it planned
to initiate a strategy to ensure that it had the capability to

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[1]Comparative Review Of Single-Line And Multiline Optical
Character Readers Used In Mail Processing (GAO/GGD-84-78,
Aug. 7, 1984).

convert the single-line machines to multiline reading.[2] To develop this capability, the Service planned to have the companies that manufactured the single-line OCRs each develop-- at the Service's expense--a prototype conversion kit for their respective machines.

The Service subsequently established a timetable for prototype development. It said contracts to develop the prototypes would be awarded in early 1985, that prototypes should be available by late 1986, that testing of the prototypes would occur in 1987, and the decision whether to convert could be made by the end of 1987. This decision would depend on such factors as ZIP + 4 usage levels and prototype performance.

BOARD REQUIRES IMMEDIATE
CHANGE TO MULTILINE TECHNOLOGY

Before the developmental contracts could have been awarded, the initiative was suspended while the Board of Governors reevaluated the entire ZIP + 4 program. This reevaluation, according to one governor, was prompted by the mailing public's apparent lack of acceptance of the ZIP + 4 code. The Board's Technology and Development Committee undertook the reevaluation and, in July 1985, the committee chairman reported that

"The single-line machines now on order are simply not adequate to process mail effectively at present [ZIP + 4] usage levels. On the other hand, with [multiline read] capability we can achieve substantial savings whether or not mailers use the ZIP + 4 code. The [multiline] machines will produce the greatest return if mailers do use the ZIP + 4 code."

She went on to say that the Service must take immediate steps to develop multiline capability.

As a result of the Board's reevaluation and policy change, the Service has embarked on a two-pronged program to acquire multiline technology:

--Convert the 403 single-line OCRs purchased in Phase II to multiline technology. (The 252 Phase I OCRs would not be converted.)

--Purchase up to 250 new multiline OCRs. (These would replace the Phase I machines.)

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[2]June 14, 1984, statement of the Senior Assistant Postmaster General for Operations before the House Subcommittees on Postal Operations and Services and Postal Personnel and Modernization.

As the Service did before purchasing the Phase I and Phase II OCRs, it will conduct a performance test between competing machines before awarding the contract to convert the Phase II OCRs and the contract to manufacture new multiline OCRs. (The Service refers to these new OCRs as Phase III OCRs.) Testing is scheduled to begin in May 1986 for conversion kits and in June 1986 for Phase III OCRs. Two companies--ElectroCom Automation, Incorporated and Recognition Equipment, Incorporated--are competing for the conversion contract and the Phase III OCR contract. The Service plans to award both contracts in August 1986.

As we testified before the Subcommittee on Postal Operations and Services in June 1984 and again in June 1985,[3] we believe the key to whether the Service should switch from single-line to multiline technology is the eventual level of ZIP + 4 usage by business mailers. We hold that view because the extent of savings each technology will produce is directly related to the ZIP + 4 usage level. Actual ZIP + 4 use has been far less than the Service anticipated, and the Board of Governors has concluded that acceptable usage levels will be reached much slower than previously expected and that multiline OCRs are needed to realize immediate savings. We have no basis for disagreeing with the Board's decision to switch to multiline technology.

Mail must be OCR readable
regardless of technology used

Regardless of whether the technology is single-line or multiline, automated mail processing inherently requires mail that is OCR readable--free of characteristics such as faded printing which lower the mail's chances of being correctly read and sorted. Manufacturers have improved the capability of OCRs; for example, machines that competed for the Phase II contract performed better than the OCRs purchased several years earlier for Phase I. Even so, the readability quality of the mailpiece itself remains a critical element to the full success of the automation program. Mail that OCRs cannot read must be processed in the more expensive manual-mechanical system, the same system the Service wants to minimize with automation. As

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[3]June 14, 1984, statement of the Director of the General Government Division before the House Subcommittees on Postal Operations and Services and Postal Personnel and Modernization and the June 25, 1985, statement of the Director of the General Government Division before the House Subcommittee on Postal Operations and Services.

we indicated in two prior reports,[4] the Service must work with
and gain the cooperation of business mailers in enlarging the
volume of OCR readable mail.

Like readability, mailers' use of ZIP + 4 codes enhances
the effectiveness of multiline OCRs. In fractions of a second,
a multiline OCR must read the address on a mailpiece and
correctly locate that address in its directory. To achieve this
match between mailpiece and directory, the directory must
contain all of the common variations of an address; for example,
Eye Street, I Street, Eye Street NW, I Street NW, NW Eye Street
and NW I Street or "street" spelled out and abbreviated. If a
match cannot be achieved, a nine digit bar code cannot be
printed unless the address on the mailpiece contained the
ZIP + 4 code. Mail not barcoded to nine digits must eventually
be processed in the more expensive manual-mechanical processing
system.

ESTIMATES OF ADDITIONAL SAVINGS
THAT COULD BE MISSED BY OPERATING
WITHOUT MULTILINE OCRs

Postal Service Governors want multiline technology
installed as quickly as possible and have expressed concern that
the Service is not moving fast enough to that end. In October
1985, the chairman of the Board's technology committee said
committee members are determined to remain vigilant to every
sign of possible delay. She said

"The apparent high cost of delay--which could be as
much as $1.6 million per day, or even more--is the
primary motivating factor for the Technology
Committee's firm recommendation to acquire [multiline]
processing equipment at the earliest possible time."

The $1.6-million-per-day estimate is based on a graph the
congressional Office of Technology Assessment (OTA) presented in
its June 1984 technical memorandum on the Service's automation
program. The graph compares estimated annual savings from
sorting First-Class Mail with a fully deployed single-line OCR
system with savings from sorting such mail with a fully deployed
multiline OCR system. The estimated savings are stated in 1989
dollars, the first full year of the fully deployed single-line
system. The savings are not reduced by the costs associated
with acquiring and maintaining the automated systems.

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[4]Conversion To Automated Mail Processing Should Continue; Nine-
Digit ZIP Code Should Be Adopted If Conditions Are Met
(GAO/GGD-83-24, Jan. 6, 1983), and Conversion To Automated Mail
Processing And Nine-Digit ZIP Code--A Status Report
(GAO/GGD-83-84, Sept. 28, 1983).

Specifically, the graph compares, at various levels of ZIP + 4 usage by mailers, three different multiline savings estimates--low, medium, and high--to a single-line system estimate. At zero ZIP + 4 usage, the difference between the multiline "high" estimate and the single-line estimate computes to about $1.6 million per workday in the multiline's favor.[5]

GAO's estimates of additional savings

To respond to the Subcommittee's question as to how much savings the Service is missing by not utilizing multiline OCRs, we developed several estimates of the cost savings the Service could be forgoing each workday it operates without multiline OCRs. We obtained our estimates by comparing the cost of processing First-Class Mail on a single-line OCR system versus a multiline OCR system. The difference favored the multiline system and represents the additional cost savings the multiline system could provide over the single-line system if all of the mail processing and machine operating assumptions we used to make the comparison occurred. (The principal assumptions are listed in app. II.) Our estimates do not consider the cost of acquiring and maintaining the automated equipment.

In order to make the comparison useful in today's timeframe, we assumed that all OCRs had been installed by 1985 and that both systems were fully operational in 1985. This is not the actual case because installation of all Phase II OCRs is not scheduled to be completed until 1988 and the Service does not expect to complete the changeover to multiline technology-- conversion of Phase II OCRs and installation of Phase III OCRs--until 1989.

To develop our savings estimates, we followed the Service's current plans for using multiline OCRs to process First-Class Mail. We assumed a nationwide system of 653 multiline OCRs, the number the Service proposes to use. If that number would increase or decrease, our estimates would increase or decrease as well. Multiline OCRs contain internal ZIP + 4 directories, and we assumed each directory contained addresses covering 75 percent of the First-Class Mail originating from an automated

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[5]The Service developed the single-line estimate and OTA's "low" multiline estimate. OTA developed the other two estimates. All three multiline estimates were greater than the single-line estimate until ZIP + 4 usage reached 100 percent. At that point, estimated savings became equal. As ZIP + 4 usage grew to 100 percent, the gap between the multiline and the single- line estimates became smaller. The graph, identified as Figure 8, "Estimates of 1989 Clerk/Carrier Savings," is on page 44a of OTA's Review of Postal Automation Strategy: A Technical and Decision Analysis--A Technical Memorandum (OTA-TM-CIT-22, June 1984).

post office.[6] We used 75 percent because the Service's mail
processing department was thinking of using directories of
around that size when we made our computations in December
1985. The possibility of putting a national directory in each
multiline OCR has been discussed both inside and outside the
Service. In our opinion, a national directory is unnecessary at
this time from a mail processing standpoint.[7]

    We developed our estimates at two levels of ZIP + 4 usage:
one set was developed at a ZIP + 4 usage rate of zero and
another set at a rate of approximately 37 percent. According to
the Service's most recent (summer of 1985) projections of
ZIP + 4 use, about 26 billion pieces of ZIP + 4 coded First-
Class Mail will be available to process in 1989, the year by
which the Service presently expects all the multiline OCRs to be
installed. The 26 billion pieces represents about 37 percent of
all machinable First-Class Mail.

    We developed our estimates by holding all assumptions and
factors constant except for bar coding rates or "hit" rates.
These rates represent the percentage of mail multiline OCRs can
barcode to nine digits. The percentage is applied to that mail
the OCRs are able to read. (Mail that the OCRs reject as
unreadable is excluded from the base.) We used the three bar
coding rates (60 percent, 65 percent, and 75 percent) OTA used
to estimate multiline savings and added two more (70 percent and
80 percent). The increments--60 to 65, 65 to 70,
etc.--represent improved OCR performance.

    OTA obtained the 60-percent bar coding rate from the
Service, which had determined the rate based on acceptance tests
of five multiline OCRs acquired in 1982 and 1983. OTA concluded
that the Service's 60-percent estimate was pessimistic, with
only a 5-percent chance that actual performance would be equal

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[6]Addresses for the remaining 25 percent could be in the
  multiline directories at destinating post offices (where the
  mail would be sorted for delivery) where it would receive a
  second OCR pass to add the ZIP + 4 code.

[7]We do not believe individual multiline OCRs require a national
  directory at this time because the Service at present cannot
  effectively utilize such a directory. To be effectively
  utilized, the Service should be able to quicken or bypass mail
  processing steps. It is unable to do this because, in part,
  the volume of mail going from one post office to another is
  often too small to justify separating it out from all other
  mail at the originating post office and keeping it separated as
  it is transported from one postal facility to another. This
  inability prevents the Service from bypassing steps.

to or less than the estimate. It concluded that the 65-percent
rate was a reasonable median estimate of multiline performance,
with a 50-50 chance that actual performance would be above or
below that rate. OTA labeled the 75-percent rate as a
reasonably high estimate, with a 5-percent chance that actual
performance would equal or exceed it. We added the 80-percent
rate to account for gains in multiline development that may have
occurred since OTA's 1984 study.

Our estimates of additional savings range from about
$497,000 to just over $1,000,000 per workday, depending on the
level of ZIP + 4 usage and the bar coding rate.

| | Additional savings per workday[a] | |
| Bar coding rate | 0% ZIP + 4 | 37% ZIP + 4 |
(percent)	(thousands)	(thousands)
60	$ 769	$497
65	835	539
70	902	580
75	969	622
80	1,036	663

[a]Savings are based on a 1985 labor cost-per-hour of $17.00 and a
  complete multiline system of 653 OCRs.

Additional savings are less at 37 percent than at 0 percent
ZIP + 4 usage because the single-line system benefits more than
the multiline system from increased ZIP + 4 usage and,
therefore, the savings gap between the two systems lessened.
Our estimates do not consider the costs of purchasing and
maintaining the automated systems. Our estimates would be about
25 percent larger if we assumed savings would not be fully
available until 1989 and assumed an annual wage rate escalation
factor of 6 percent.

CONVERSION OF SINGLE-LINE OCRs
TO MULTILINE TECHNOLOGY

At the Board's direction, the Service changed positions
regarding development and procurement of multiline conversion
kits. Under the June 1984 strategy, the Service planned to have
the single-line manufacturers develop a kit for their respective
machines and the Service planned to pay the manufacturers to
develop the kits. Each manufacturer would have converted its
own machines if the Service decided to convert them. Under the
present strategy, competition will decide which company converts
the single-line OCRs and each competitor uses its own funds to
develop a kit.

The Postal Operations and Services Subcommittee wondered
whether the Service could end up with a less-than-suitable kit

because it refused to fund development. In our opinion, the Service should receive a conversion kit which fulfills its needs because the two companies competing for the conversion contract are also the only competitors for the Phase III contract (to build up to 250 new multiline OCRs). The multiline technology each uses to build a new machine should also go into the conversion kit. Because the companies are competing for contracts worth tens of millions of dollars, a strong incentive exists to build a highly competitive machine and kit.

Testing of kits essential

In our August 1984 report Comparative Review Of Single-Line And Multiline Optical Character Readers Used In Mail Processing (GAO/GGD-84-78), we said the performance level that single-line-converted-to-multiline OCRs could achieve was unknown and could be determined only by designing and building a conversion kit, installing it on a single-line OCR, and testing the converted machine. This is exactly what the Service plans to do before awarding the conversion contract. We obviously agree with that approach notwithstanding our opinion that the Service should receive a conversion kit that fulfills its needs.

We believe that testing after the contract is awarded is also important. This is something the Service has done and will do in connection with the Phase II OCRs. Following an earlier GAO recommendation, the Service recently conducted an extended operational test of one of the first Phase II OCRs off the "assembly line." The test provided the Service useful information for deciding whether to give the manufacturer the "go ahead" to deliver the rest of the Phase II OCRs. (Test results were positive and the go-ahead given.) An extended test of one of the first converted OCRs appears prudent to us. After each Phase II OCR is delivered, it must pass a performance test before the Service accepts it. Service officials told us that the extended test and the individual acceptance tests would be conducted for both the converted and the Phase III OCRs.

Before the Phase III contract is awarded, the Service plans to test the performance of the multiline OCRs competing for that contract. Testing is scheduled to begin in June 1986. Although the Service conducted performance tests before purchasing the Phase I and the Phase II OCRs, the decision to test-before-buying Phase III OCRs was not without controversy. The controversy concerned, as we understand it, the need for a competitive run-off inasmuch as Recognition Equipment had a multiline OCR that could process U.S. mail while ElectroCom had to develop such a machine. As a general matter, we agree that the Service should seek competition and test competing machines before buying any phase of OCRs.

Pre-delivery conversion depends
on who wins the contract

        On the basis of the Service's current (as of December 1985)
schedules, the majority of the Phase II OCRs will be delivered
after delivery of the conversion kits is supposed to begin. If
a contract is awarded when scheduled, the Service expects to
begin receiving conversion kits in March 1987. About 40 percent
of the Phase II OCRs are scheduled to be delivered by February
1987; about 60 percent are scheduled to be delivered between
March 1987 and November 1988.

        The extent to which pre-delivery conversion can occur
depends on who wins the conversion contract. ElectroCom is
manufacturing the Phase II OCRs and if it wins the conversion
contract, the Service--according to the Assistant Postmaster
General for Engineering and Technical Support--will undoubtedly
renegotiate the Phase II contract to manufacture the remaining
OCRs as multiline machines as quickly as possible. He said
ElectroCom would continue to produce the Phase II OCRs as
single-line machines if Recognition Equipment wins the
conversion contract. Recognition Equipment would convert the
machines after the Service receives them. He said terminating
the Phase II contract before ElectroCom delivers all ordered
OCRs would be very expensive and impractical.

        The Service estimated that, if ElectroCom's Phase II
contract had been cancelled in December 1985, it would have had
to pay ElectroCom termination costs approaching $126 million
without receiving essentially any benefits from the
expenditure.

USE OF PHASE I OCRs

        The Service has decided against converting the 252 Phase I
OCRs to multiline technology. They will be replaced by new
multiline OCRs. The Service has made no final decision on what
use or uses it will make of the Phase I OCRs. No plan for
redeployment has been prepared.

        The Service decided against converting the Phase I OCRs
because it believes newer OCRs will provide superior performance
and therefore greater savings. This view comes from a
comparison the Service made between different single-line OCRs.
According to the Service, the OCRs submitted for Phase II
testing by the Phase I manufacturers (two different companies
manufactured Phase I OCRs) performed better than the OCRs these
manufacturers submitted several years earlier for the Phase I
competition. Moreover, Phase II test results showed, according
to the Service, that the performance of the OCR selected for
Phase II was about 15 percent better than the performance of the
OCRs furnished for Phase II testing by the Phase I
manufacturers.

In order to decide what to do with the 252 Phase I OCRs, the Service began to examine several options starting in January 1986. The options would employ Phase I OCRs to

--<u>Process more collection mail</u>. Collection mail is that mail householders and businesses deposit in boxes located in buildings or on the street. When the Service determined the number of OCRs to buy, it figured in 60 percent of the collection mail volume rather than the entire volume. More OCRs than the 655 already purchased are needed to process the entire volume. Use of Phase I OCRs in addition to Phase II and III OCRs would provide the Service with more OCRs.

--<u>Act as bar code sorters</u>. The Phase I machines would sort mail by reading the bar codes on each mail piece, the same as bar code sorters do. However, the sorting schemes (instructions) used on bar code sorters may not all be usable on single-line OCRs because of the difference in sorting bins or pockets. Phase I OCRs have 32, 44, or 60 pockets in which to sort mail; bar code sorters have 96 or more pockets.

--<u>Process mail at smaller post offices not now scheduled to be automated</u>. Mail processing operations in 209 offices are scheduled to be automated. These offices were selected because they had enough originating or "outgoing" mail to keep an OCR operating for about 4 hours. Under this option, the Service will look at smaller offices to see if their overall mail volume would justify the installation of a Phase I OCR and the attendant cost (maintenance costs, for example). At such locations, the Phase I machine would be used as both an optical character reader and a bar code sorter.

Because the Phase I OCRs have already been bought and their costs are "sunk," the purchase cost, about $720,000 per machine, is not necessarily a factor in deciding whether the above options are cost effective. Maintenance costs and the availability of space will, however, greatly influence the utilization and placement of the Phase I OCRs.

<u>MAILERS' USE OF ZIP + 4</u>

Notwithstanding the switch to multiline technology, the Service remains committed to having businesses address their mail with ZIP + 4 codes. This commitment, while now focusing on

First-Class Mail, extends to all classes of mail. In September
1985, the Service told a congressional subcommittee that

>   "The Postal Service views the ZIP + 4 code as
> providing the grid on which we will base our future
> operating strategies for both mail processing and
> delivery operations. We plan to maximize its use on
> all classes of mail and will rely on the ZIP + 4
> code as the major vehicle for productivity
> improvements in postal operations. In the long run,
> ZIP + 4 coding is essential to rate stability and to
> more accurate and consistent service."[8]

Service's ZIP + 4 projections

In the past, the Service predicted the processing of 50
billion pieces of ZIP + 4 coded First-Class Mail in 1989, the
first full year in which the single-line OCR system would be
fully operational. It maintained that estimate even after
significantly lowering estimates for earlier years.[9] Although
the 50-billion-pieces-by-1989 estimate shaped all other
estimates, it was not, to our knowledge, backed up by a reliable
market study or needed to provide a favorable return on
investment in a single-line OCR system.

The Service's ZIP + 4 usage estimates quickly maximized
savings from the automated system. These same estimates, in
effect, oversold the system and were detrimental to the Service
when members of Congress and others asked why they were not
being achieved and why they were being substantially lowered.

Current ZIP + 4 estimate

This past summer the Service again revised its ZIP + 4
usage projections and it no longer expects to process 50 billion
pieces of ZIP + 4 mail in 1989. (The new projections are
predicated upon past growth trends and assumptions and will

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[8]September 13, 1985, statement of the Senior Assistant
Postmaster General, Management Information and Research
Technology Group, before the Subcommittee on Government
Information, Justice and Agriculture, House Committee on
Government Operations.

[9]The Service used the 50-billion-pieces-by-1989 estimate in its
January 1984 automation proposal to the Board of Governors.
The proposal sought funding for the Phase II portion of the
automation program. The estimates were revised in the summer
of 1984, after the Service saw that ZIP + 4 was off to a slow
start.

undoubtedly change as the trends and assumptions change.) The
new projections and the two earlier sets of estimates follow.

Year	Summer 1985 estimate	Summer 1984 estimate	Jan. 1984 estimate
	(billions of pieces of First-Class Mail)		
1984	-	-	7.7
1985	6.0[a],[b]	6.8	20.9
1986	10.3[a]	13.2	31.4
1987	15.5	27.0	41.8
1988	20.7	40.0	48.4
1989	27.0	50.0	50.0
1990	39.1	-	-
1991	46.0	-	-
1992	50.2	-	-
1993	53.3	-	-
1994	56.6	-	-
1995	58.7	-	-
1996	60.8	-	-
1997	62.9	-	-
1998	65.0	-	-

[a]The estimates for 1985 and 1986 were constructed before the
summer of 1985.

[b]The Service monitors how much First-Class, ZIP + 4 mail it
receives. That volume in fiscal year 1985 was about 6.2
billion pieces. About 3.4 billion of the 6.2 billion pieces
was reportedly business and courtesy reply mail. (For such
mail, the address--including the ZIP + 4 code--a letter is
going to is preprinted on the envelope.)

The Service considers the summer 1985 estimate as a short-
term (1989 and before) and a long-term (1990 and after)
projection. The short-term projection is a mixture of past
growth trends, assumptions, and professional judgments. The
past growth trends used were the first few years of the First-
Class Mail ZIP Code presort program and the ZIP + 4 program
since its October 1983 inception. The assumptions used
for the short-term projection include

   --The postage discount for presorted ZIP + 4 mail would
     increase in 1987. In November 1985, the Service
     announced it had set aside its plans to increase the
     discount. (The plan called for an increase to 1 cent per
     qualifying letter. The discount remains at 0.5 cent per
     letter.) As a result, the Service lowered the 1989
     estimate from 27 billion pieces to 26 billion pieces.
     Earlier years decrease by smaller amounts.

   --The Service would increase the technical support
     available to mailers who are adding or interested in
     adding ZIP + 4 codes to address files. Under this

assumption, the Service would provide mailers information
and advice on how to go about converting address files to
ZIP + 4 and how to resolve particular problems
encountered in making the conversion. The information
and advice would come from employees (and/or contractor-
supplied personnel) particularly knowledgeable of the
ZIP + 4 directory's construction, techniques for adding
ZIP + 4 codes to computerized address files, and
computers. (In January 1986, the Service hired Computer
Sciences Corporation to provide the technical support;
two technical support representatives are assigned to
each of the Service's five regions.)

--Sorting requirements for presorted ZIP + 4 mail would be
made easier in 1986. Businesses presort First-Class Mail
by separating or bundling letters by their ZIP Code. Ten
or more letters having the same five-digit code are put
together. Letters not fitting into any five-digit bundle
are sorted by the first three digits of the code; those
with the same three digits are bundled together. Each
three-digit separation must contain at least 50 letters.

The Service plans to publish final regulations in 1986
(calendar year) to eliminate five-digit sorting when most
letters are addressed with ZIP + 4 codes and destined for
automated post offices. (The proposed regulations
require ZIP + 4 codes on at least 85 percent of the
letters in a mailing.) The three-digit requirement will
remain.

Businesses that presort and use ZIP + 4 will have a
choice. They can sort to three digits only or follow the
old method and sort to three and five digits. Either
way, they will receive the same discount for each
qualifying letter; currently, 4 cents for presorting and
0.5 cent for using ZIP + 4. (The First-Class Mail
carrier route presort program is not affected by the
forthcoming regulations. Neither is the ZIP Code presort
program when a mailer is not using ZIP + 4.)[10]

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[10]In January 1986, the proposed final regulations on the three-
digit presort program were published in the Federal Register
for comment. Among the comments received were those of the
Postal Rate Commission which raised (1) certain issues
concerning the size of the discount for presorted ZIP + 4 mail
(possibly too large) and (2) certain legal issues it believed
the Service should address. As of March 13, 1986, the Service
was working on its response to the Commission's comments and
to the other comments it received, all in preparation for
issuing the final regulations possibly during the spring of
1986.

Simply because they are so much lower, the current estimates of ZIP + 4 usage through 1989 appear more realistic than the two preceding sets. In connection with some earlier work we did concerning ZIP + 4, we estimated that annual ZIP + 4 volume by the end of fiscal year 1987 (September 1987) would be --under the forecasting methodology we used--somewhere between 12 billion and 15 billion pieces of First-Class Mail. To make this estimate, we used ZIP + 4 "sales" figures through March 15, 1985, reported by the Service's Customer Services Department. We assumed that the sales pace--for actual conversions to ZIP + 4 and commitments to convert--that existed through March 15, 1985, would continue through the end of fiscal year 1987. The Service estimates it will process around 15.5 billion pieces of ZIP + 4 mail in 1987.

However, given the introduction of multiline OCRs and the absence of market studies, we have no real basis to say how near or far the estimates are to what may occur through 1989. We think the introduction of multiline OCRs will generate further confusion among businesses as to whether they should adopt ZIP + 4, especially if, as Service officials told the Board of Governors' technology committee, multiline OCRs lessen the value of the ZIP + 4 discount.

The long-term estimates (1990 and after) are simply conjecture as to what might occur if several assumptions hold. Among the assumptions are:

--the projections through 1989 are achieved and

--postage discount programs are restructured so that
  ZIP + 4 use is a necessary part of receiving the largest
  discounts.

We understand that the restructuring idea is being researched and, if adopted, would be included in the next omnibus rate proposal. Before enactment, such proposals are reviewed in public hearings by the Postal Rate Commission.

While we can only speculate, the installation of multiline technology could well depress ZIP + 4 growth until the Service secures support from the mailing industry for its current strategy to maximize ZIP + 4 use on First-Class Mail and all other classes of mail.

To guide the future course of the ZIP + 4/automation program the Service has prepared a ZIP + 4 business plan with a stated goal of making maximum efficient use of the ZIP + 4 code. The plan's introduction states that

"The foundation of the Postal Service's mail
distribution system and universal delivery network is
the ZIP + 4 code. The Postal Service intends <u>to make</u>
<u>maximum use of the expanded ZIP Code on all classes of</u>
<u>mail.</u> The codes have become the 'grid' on which
distribution and delivery operations will be based.
The Postal Service and its customers will receive the
greatest cost efficiencies available by utilizing the
ZIP + 4 address in all phases of mail preparation.

"Accordingly, product and pricing strategies will,
reflect the value of ZIP + 4 coding to the Postal
Service. <u>Basic postage rates and incentives will</u>
<u>reflect the operating efficiencies which the Postal</u>
<u>Service realizes from mail bearing the customer-</u>
<u>applied ZIP + 4 code.</u>" (Underscoring supplied)

The Service's stated intention of achieving maximum use of
ZIP + 4 codes on all classes of mail by changing basic postage
rates and incentives is probably a natural and appropriate step
to take in automating mail sorting operations. Nevertheless,
this represents a far-reaching change in strategy. When the
ZIP + 4 program was implemented in October 1983, it was with the
publicly stated intention of having business mailers use ZIP + 4
codes on First-Class rather than all classes of mail and the
rate structure of First-Class Mail was amended to provide an
incentive for such use. (The Service indicated too that the
program would someday apply to third-class mail.)

Assumptions in Comparing Multiline OCR Systems With a Single-Line OCR System

We developed several estimates, on a per workday basis, of the additional cost savings multiline OCRs could provide the Postal Service over single-line OCRs. To develop the estimates, we compared the savings that multiline OCR systems could achieve processing First-Class letter mail to the savings the single-line OCR system could achieve. The single-line system is what the Service would use if a multiline system was not installed. The principal assumptions we used to make the comparison follow.

1. Both multiline and single-line OCRs and bar code sorters process mail at 10,000 pieces per workhour.

2. No enrichers--equipment that separates OCR readable mail from non-OCR readable mail--are present in either system. Thus, an OCR processing originating mail will be unable to read 30 percent of the mail and OCRs processing presorted mail will be unable to read 20 percent of the mail. There is no difference in cost for processing mail rejected by the two systems. Also, mail successfully processed on one OCR can be successfully processed on another OCR or bar code sorter.

3. Each OCR processes 150,000 pieces of non-presorted originating mail and 64,300 pieces of presorted mail per day.

4. Fifty percent of the originating mail remains in the local area.

5. Twenty percent of the mail processed on an OCR can go directly to a secondary sort on a bar code sorter, bypassing a primary sort.

6. Mail rejected from the automated systems and sorted manually or mechanically (multi-position letter sorting machines) is processed at 1,175 pieces per workhour.

7. For the multiline system, addresses for 75 percent of the originating mail can be found in the directory at origin. At the destinating area, the directory contains 100 percent of the addresses.

8. A complete multiline system will consist of 653 optical character readers.

9. All OCRs--single-line and multiline--are in place in 1985 and the single-line and multiline systems are fully operational in 1985.

Workday savings were computed using the above assumptions and a 1985 Postal Service labor rate of $17 per hour.

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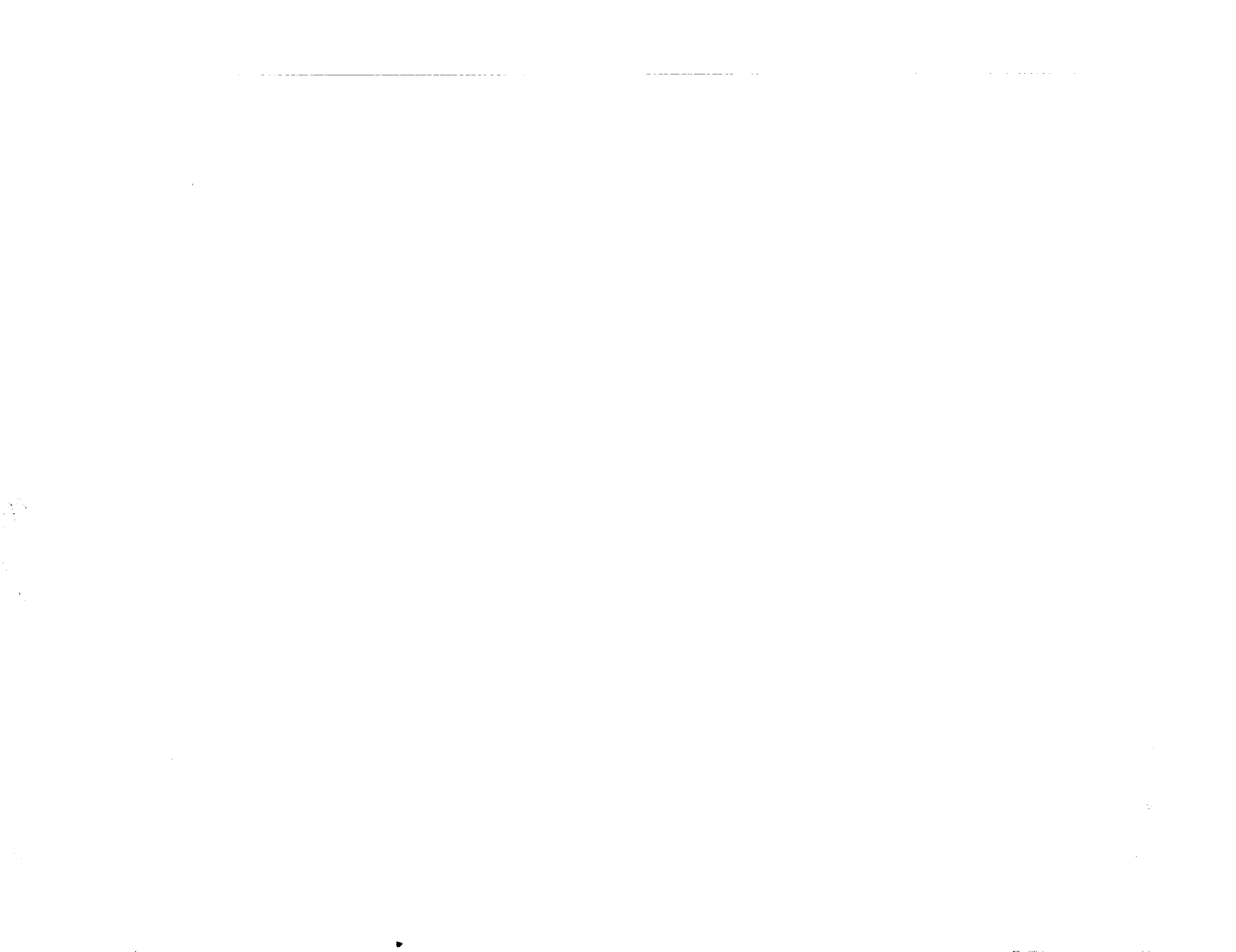
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