

Overview

The United States Postal Service (USPS) is in the midst of implementing a major postal automation program. This program includes acquisition of a large number of optical character readers (OCRs) and bar code sorters (BCSs) along with adoption of the extended 9-digit ZIP code (known as ZIP + 4).

This postal automation program is intended primarily to reduce the amount of labor required to process mail, and secondarily to improve the quality of mail service. Since labor accounts for about 85 percent of total postal costs, reductions in the labor component of mail processing offer the greatest potential to cut current postal costs and restrain future cost increases.

USPS has already developed a national ZIP+4 directory, and since October 1, 1983, has been encouraging business mailers to use ZIP+4. Mailers receive a discount of 0.5 cent per piece of ZIP+4 presort first class mail when OCR-readable (can be read by optical character readers) and mailed in batches of 500 or more letters. For ZIP+4 non-presort first class mail, mailers receive a discount of 0.9 cent per piece, when OCR-readable and mailed in batches of at least 250 letters. Use of ZIP+4 is voluntary. At present, very few mailers (59 as of late May 1984) have converted to ZIP+4.

Use of ZIP+4 allows USPS to sort letters down to the city block, building, or post office box, whereas the 5-digit zip code permits sorting only to the level of a smaller post office zone or a geographical area within a larger post office zone. The optical character readers are intended to read the ZIP+4 code, translate it into a bar code, and apply the bar code (with an ink jet printer) to the lower right-hand corner of the envelope. From then on, the letter can be sorted automatically by barcode sorters down to the level of carrier routes. All intermediate manual sorting is eliminated.

To carry out the automated sorting, USPS has already bought 252 OCRs and 248 BCSs (Phase I of the automation procurement) at a combined cost (including ancillary equipment and installation expense) of \$234 million. USPS expects this equipment to be fully installed and operational by the end of 1984. And USPS has received bids on procurement of an additional 403 OCRs and soon will be soliciting bids on an additional 452 BCSs (Phase II of the automation procurement). USPS has allocated \$450.2 million for this procurement, of which \$363 million is for capital expenditure.

The central issue addressed by this OTA technical memorandum is whether the current USPS automation strategy is technically and economically sound, and whether USPS should proceed to actual procurement of this equipment as planned or revise its strategy in whole or in part.

OTA concluded that the current postal automation strategy, while technically feasible, is not likely to achieve the greatest projected economic return to USPS when the uncertainty in ZIP+4 usage is taken into account.

USPS has based their "strategy on achieving 90 percent ZIP+4 usage (among large business mailers) within 5 years, and 27 percent after 1 year. Current estimates indicate that first year (1984) ZIP+4 usage will fall far short of original USPS projections. Based

on the preponderance of available evidence, OTA concluded that it is quite unlikely that ZIP+4 usage will grow as fast as assumed by USPS.

Therefore, while the current USPS strategy of using single-line OCRs would provide an economic return considerably greater than not automating at all, other strategies offer a better return on investment, net present value, and net cash savings than the current strategy, especially if one assumes ZIP+4 usage at the lower range of alternate projections.

These other strategies involve extensive use of a competitive technology -- the multi-line optical character reader. Whereas the single-line OCR can read only the "last line" of an address (defined as city, State, and 5-or 9-digit ZIP code), the multi-line OCR can read up to four lines of the address and can process a large amount of 5-digit ZIP mail to the 9-digit level. In other words, the multi-line OCR is not as dependent on use of ZIP+4 to realize savings from automation.

OTA concluded that, whereas the multi-line OCR may not have been a technically viable alternative 3 or 4 years ago when USPS made its initial decision to go with single-line OCRs, the multi-line OCR is now fully competitive. OTA found that the multi-line OCR performs as well as the single-line OCR in processing 9-digit ZIP mail, and significantly better than the single-line OCR in processing 5-digit ZIP mail to the 9-digit level. The purchase and/or conversion and maintenance costs of the multi-line OCR are expected to be only marginally higher than the single-line! and the difference is negligible when compared to the additional savings expected over the life of the investment.

Based on the results of OTA's cash flow modeling, the strategy offering the greatest economic return to USPS would be for USPS to proceed with the Phase II single-line OCR procurement, but simultaneously initiate release-loan testing (and any necessary related research and development) on single- to multi-line conversion, and then convert all single-line OCRs to multi-line as soon as possible, regardless of the level of ZIP+4 use. OTA has designated this the automatic conversion strategy.

Under conditions of high and median ZIP+4 usage, automatic conversion indicates a marginally greater (\$40 to \$180 million) net present value compared to the single-line OCR strategy. (Note: Net present value was calculated by discounting future cash flows at 15 percent per year.) But under low ZIP+4 usage, automatic conversion shows a substantially greater net present value of \$250 to \$820 million compared to single-line. As for total net cash flows (undiscounted) over the life of the investment (1985-98), at high ZIP+4 use, savings rate, and multi-line performance, automatic conversion shows a \$560 million greater cash flow. All other things being equal, this increases to \$790 million at median ZIP+4 usage and a dramatic \$3.62 billion at low ZIP+4 usage, compared to single-line. [n the out years (1994-98), under these conditions, automatic conversion shows a greater annual net cash flow in the range of \$440 to \$580 million.

In essence, the substantially greater performance and savings of the multi-line OCRs with non-ZIP+4 mail far more than offset the slightly higher conversion and maintenance costs, such that multi-line OCRs offer a clear economic (as well as technical) advantage over single-line OCRs. Put more simply, if USPS were starting from scratch today, multi-line OCRs would appear to be the logical choice.

The automatic conversion strategy assumes that conversion of single-line OCRs to multi-line capability is technically feasible and legally viable and could be accomplished with no degradation in performance. Questions have been raised as to whether the single-line OCR vendors would have the ability to do the conversions and/or whether other vendors -- perhaps more experienced with multi-line OCRs -- would be able to do the conversions without having access to proprietary information. A possible solution would be to reissue the Phase II request for proposals (RFP) with additional criteria on single- to multi-line convertibility and/or with a procurement split between single- and multi-line OCRs.

A split procurement would be intended to provide a stronger push to further improve multi-line OCR performance and perhaps provide a greater incentive for competition in the development of both multi-line OCRs and single- to multi-line conversion kits. OTA found that, overall, a 90-10 split procurement shows the second highest projected economic return, only marginally less than automatic conversion but higher than hedge conversion.

Under the 90-10 split procurement option, USPS would cancel the current Phase 11 procurement, immediately reissue an RFP for 90 percent of the single-line OCRs (363 instead of 403), and simultaneously initiate release-loan testing of the multi-line OCR. A new RFP for procurement of the other 10 percent of Phase 11 OCRs, but using multi-line technology (40 multi-line OCRs), would be issued as soon as possible, probably in about 2 years. The single-line OCRs (252 from Phase I and 363 from Phase II) would be converted to multi-line as soon as a conversion kit has been successfully developed and tested.

The 90-10 option would result in a delay of about 2 to 3 months in procurement of the 90 percent Phase 11 single-line OCRs (the time required to reissue the RFP and receive and evaluate new bids). Procurement of the other 10 percent would be delayed about 2 to 3 years (the time required to complete release-loan testing of, issue an RFP on, and receive and evaluate bids for multi-line OCRs). OTA found that the cost of this delay for 10 percent of the Phase II procurement is very small, and would be negligible if the split procurement resulted in significantly higher multi-line OCR performance than would otherwise be the case.

In sum, the 90-10 split procurement option is intended to reduce the uncertainty associated with automatic conversion by providing a greater incentive to companies to further improve multi-line OCR performance and to develop the best possible conversion kits.

OTA is not recommending one option over another, but simply pointing out the trade-offs involved. The automatic conversion shows the highest projected economic return, followed in order by the 90-10 split procurement, hedge conversion, and 50-50 split procurement. All of these options depend on conversion kits that provide high multi-line performance.

The principal question is how to stimulate development of the best possible conversion kit. OTA believes that some outside competition would help achieve this objective, and that it will be necessary to provide incentives to attract the best companies. One incentive is to keep open the decision on which company will do the

conversions pending the results of several competitive development and testing efforts. This means that the best performing company would have a good chance for the conversion contract (estimated at about \$130 million). A second incentive is the opportunity for participating companies to use the R&D results on the world market, even if USPS does not buy any multi-line OCRs. A third incentive would be the prospect of competing for the 10 percent of the Phase II procurement reserved for multi-line OCRs (estimated at \$34 million) under a split procurement option.

Thus, a 90-10 split procurement option could involve several elements: reissuing the Phase II RFP for 363 (rather than 403) single-line OCRs; initiating competitive release-loan testing on multi-line OCRs; and awarding several development contracts for conversion kits, either all on a competitive basis or at least one on an open competitive basis even if the others are awarded sole source to Phase I and Phase II single-line OCR companies.

In addition to revising current automation strategy to give greater emphasis to multi-line OCRs, USPS may also wish to strengthen its commitment to research and development, which is still well below industry averages, and aggressively pursue further opportunities for improved performance of postal automation.