Chapter 7

Implications for the Telecommunication and Computer Industries, EMS Privacy and Security, and USPS Long-Term Viability

Contents

Chapter 7

Implications for the Telecommunication and Computer Industries, EMS Privacy and Security, and USPS Long-Term Viability

Introduction

Although the primary emphasis of this study is on the U.S. Postal Service (USPS) mailstream and on rates, service, and labor, a discussion of the effects of a USPS role in electronic mail and message systems (EMS) on the telecommunication and computer industries, EMS privacy, and the long-term viability of the Postal Service is included.

Telecommunication and Computer Industries

A major concern expressed in regulatory and judicial proceedings by a number of private sector telecommunication firms, and more recently by data-processing and computer firms, has been that a USPS role in EMS would constitute unfair and perhaps even illegal competition with private industry.

Fairness of USPS Role in EMS

Private firms argue that USPS has the following advantages: 1) the Private Express Statutes (PES), which protect certain mail services from competition; 2) exemption from income taxes; 3) access to the U.S. Treasury for investment funds; 4) public funds appropriated by Congress; and 5) a cost and ratesetting process that is complex and difficult to understand, which makes cross-subsidies possible between different classes of mail.

On rebuttal, USPS has pointed out that the PES protect only letter mail from competition, and then only if it is carried over postal routes and is not time sensitive. A number of competitive alternatives to the USPS letter delivery services exist that are legal and apparently viable. These alternatives include private special messenger services; electronic message alternatives such as telephone, telegraph, telex, and privately offered "electronic mail" services; and certain kinds of media advertising (by newspaper, radio, or television) when serving as a substitute for first-class or third-class advertising mail or direct mail solicitations.[1]

Competitive alternatives to USPS nonletter mail include local and regional private delivery services and successful nationwide delivery services such as United Parcel Service (UPS), Federal Express, and Purolater. In some market segments, such as surface delivery of parcels, the competitive impact on USPS has been severe. For example, in 1957, USPS delivered about 64 percent of total parcel volume and UPS about 36 percent. By *comparison, in 1977,* USPS delivered only about 23 percent

[1]See USPS Marketing Services Division, *Competitors and Competition of the USPS,* vol. XII, September 1978 and updated yearly.

of total volume while UPS delivered 77 percent.[2]

Thus, the so-called "postal monopoly" provided to USPS under the PES is limited to only a few of the many classes of mail service offered by USPS. Available evidence suggests that even among these protected services USPS market power is eroding in the face of competitive alternatives, both electronic and nonelectronic.[3] Nonetheless, the Department of Justice (DOJ), among others, believes that there is a significant chance that a USPS EMS offering (such as E-COM) could be subsidized by revenues from the USPS monopoly on delivery of first-class letter mail.

If E-COM were priced artificially below what it costs, DOJ believes that E-COM might be used at the expense of both conventional first-class mailers and the taxpayers (to the extent that USPS continues to receive public funds appropriated by Congress). DOJ also argues that underpricing of E-COM might discourage other firms from offering a similar service, thereby decreasing competition. In general, the DOJ position is that the existing regulatory structure and oversight process do not provide adequate safeguards against the impacts of E-COM that could be anticompetitive and discriminatory.

With respect to taxes, as an independent Federal Government agency USPS is not legally subject to Federal or State income taxes. Whether or not this is a real competitive advantage is a matter of dispute. USPS argues that under the Postal Reorganization Act and current ratesetting procedures it is effectively prohibited from making a profit; thus, even if it were subject to income taxes USPS generally would pay none because it would have no taxable net income. Also, while USPS does not pay property taxes on USPS-owned property, some State and local property taxes are paid indirectly when USPS is the lessee rather than the owner. Finally, USPS points out that it does not benefit from tax advantages (such as accelerated depreciation) available to private firms, and that any advantage from tax exempt status is more than offset by the costs of service and regulatory requirements imposed on it by the Postal Reorganization Act.[4] Still, to the extent that private EMS firms are profitable and pay income and other taxes, such taxes represent a cost not incurred by USPS. Some firms believe that nonprofit status offers USPS a price advantage over private competitors.

On the subject of access to the U.S. Treasury for investment purposes, the Postal Reorganization Act authorizes USPS to issue and sell obligations not to exceed $10 billion outstanding at any one time. As of September 30, 1980, USPS long-term debt totaled about $1.84 billion, consisting of $250 million in Postal Service bonds and $1.59 billion in notes payable to the Federal Financing Bank.[5] USPS observes that "private industry obtains various forms of financial aid including loans from the Treasury. Moreover, private firms do not operate under the same statutory or practical limits on their borrowing authority as does the USPS."[6] In addition, the Secretary of the Treasury has the option not to pledge the full faith and credit of the U.S. Government for USPS bond issues if the Secretary determines that it would not be in the public interest, although the Secretary has never exercised this option. Clearly, USPS competitors do not have comparable access to the U.S. Treasury for purposes of long-term borrowing, a factor that becomes even more significant when money is tight and interest rates are high.

USPS also receives annual appropriations from the U.S. Government as authorized by the Postal Reorganization Act. In fiscal year 1980, the annual appropriations totaled $1.6 billion, which included $828 million for public service costs and $782 million for revenue forgone due to free and reduced rates for certain mail services.[7] Some USPS competitors have

[2]Ibid., p. 25.
[3]Ibid.
[4]Sept. 18,1980,letter to OTA from Charles R. Braun, USPS Assistant General Counsel, pp. 11-12.
[5]*Annual Report of the Postmaster General* fiscal 1980, p. 21.
[6]Letter from Braun, op. cit., p. 11.
[7]*Annual Report of the Postmaster General* fiscal 1980, p. 24.

argued that this constitutes an unfair public subsidy to the USPS. However, the revenue forgone subsidy is intended to reimburse the USPS for the revenue given up or "forgone" as a result of providing mail service free (for the blind and handicapped) or at a reduced rate (e.g., for library materials, nonprofit bulk mail, and classroom publications), as required by the Postal Reorganization Act.

Likewise, the public service subsidy is intended to reimburse USPS "for public service costs incurred by it in providing a maximum degree of effective and regular postal service nationwide."[8] In any event, the public service subsidy was reduced from $828 million in fiscal year 1980 to approximately $468 million in fiscal year 1981. * The fiscal year 1982 continuing resolution provided a public service appropriation of about $221 million, and the Omnibus Budget and Reconciliation Act of 1981 reduced the public service authorization to $100 million for fiscal year 1983 and $0 for fiscal year 1984. The phasing out of the public service subsidy minimizes or eliminates any competitive advantage this may have given to USPS. DOJ and some private firms have expressed concern that there is nothing to prevent a future administration and Congress from reinstituting the subsidy, thereby possibly resulting in a significant USPS advantage over private industry in any competitive activity.

The USPS cost and ratesetting process is admittedly complex, which has led some private firms to be concerned about possible hidden cross-subsidies. These firms are particularly concerned about cross-subsidies from conventional mail services to EMS services; that is, the use of revenues from conventional mail to subsidize EMS costs which would keep down the rates for EMS services. OTA has not independently verified USPS costs and revenues by class of mail. However, the Postal Reorganization Act generally prohibits cross-subsidization between classes of mail and includes the requirement that "each class of mail or type of mail service bear the direct and indirect postal costs attributable to that class or type plus that portion of all other costs of the Postal Service reasonably assignable to such class or type."[9]

In addition, all USPS rate requests are subject to usually extensive and lengthy hearings conducted by the Postal Rate Commission (PRC) at which all postal rates (for all classes of mail and service) normally are considered. Many USPS competitors and mail users participate in these hearings, along with USPS, PRC and the Officer of the Commission (charged with representing the interests of the general public), and occasionally other Government agencies (such as, in the E-COM proceeding, the Departments of Commerce and Justice). Given the statutory requirements and the adversary regulatory process in which all interested parties are represented (and which itself is subject to judicial review), postal cross-subsidies would seem to be rather difficult to hide. Nonetheless, there is no absolute guarantee against cross-subsidies since the allocation of indirect and institutional costs is always somewhat arbitrary (in any organization), and the statutory criteria included in the Postal Reorganization Act may not be necessarily as applicable or appropriate now as they were when it was enacted in 1970. Some private firms are concerned that the rates initially set for E-COM service do not fully reflect the actual costs, and that at the present time there may be a hidden cross-subsidy of E-COM by other classes of mail. OTA has not independently evaluated this concern. However, the public record indicates that the PRC approved the E-COM rate of 26¢ based on an estimated capital cost of $7.4 million and first year volume of 12.5 million messages (240,000 per week). In comparison, the actual capital cost of E-COM is apparently close to $39 million, with volume averaging about 25,000 messages per week for the first 6 months of 1982.

[8] 1 bid., p. 20.

*$1,25 billion continuing appropriation to USPS for fiscal year 1981 less $782 million revenue forgone subsidy.

[9] 39 USC 3622(b)(3). Institutional costs are also apportioned by class or service based on statutory criteria.

Legality of USPS Role in EMS

From a strictly legal perspective, some private firms have argued that a USPS role in EMS (other than delivery of hardcopy output) is beyond the mandate of the Postal Reorganization Act of 1970, and is in direct conflict with Federal Communications Commission (FCC) regulations promulgated pursuant to the Communications Act of 1934 and with Office of Management and Budget regulations concerning Federal Government procurement of goods and services from and competition with the private sector.

The Postal Reorganization Act mandates USPS to "provide prompt, reliable, and efficient service," "give the highest consideration to the requirement for the most expeditious collection, transportation, and delivery of important letter mail," and "emphasize the need for facilities and equipment designed to create . . . a maximum degree of convenience for efficient postal services . . . and control of costs to the Postal Service."[10] Thus, USPS views its use of electronic equipment and technology as consistent with the Postal Act and as a simple extension of its prior use of, for example, automated sorting machines to carry outpostal policy as defined in the act. From this perspective, EMS technology would be considered, along with the stagecoach, pony express, railroad, truck, and airplane, as another step in a long succession of new technologies used to expedite the provision of postal services. No private firm or Government agency has successfully challenged the USPS interpretation on legal grounds. In its original Opinion and Recommended Decision, PRC supported the use of EMS technology by USPS although it differed with USPS in the application of that technology. More specifically, the PRC recommended that USPS provide only the printing, enveloping, and hardcopy delivery functions and not the telecommunication function.[11]

The PRC Recommended Decision was based substantially on its finding that "the general obligation imposed on regulatory agencies to consider and promote competitive policies applies to this Commission."[12] The PRC decision was also based on the clearly procompetitive policy of FCC and the fact that the FCC asserted jurisdiction over the original USPS E-COM proposal, primarily on the grounds that it included telecommunication transmission functions to be provided by a telecommunication firm (Western Union), which was subject to FCC jurisdiction under the Communications Act of 1934.[13] PRC concluded that competition would be best served if USPS did not provide telecommunications. This also permitted PRC to avoid both a possible regulatory impasse with FCC and any direct concession of FCC jurisdiction over postal services per se.

USPS subsequently appealed the FCC ruling which asserted jurisdiction over E-COM. However, the appeal was dismissed and the FCC ruling vacated as moot by the court in view of the PRC Recommended Decision and USPS cancellation of the Western Union contract.* Thus, the court did not rule on the merits, and the legal jurisdiction of FCC over USPS involvement in EMS remains unclear.

However, regulatory developments since the FCC ruling on E-COM suggest that so-called "enhanced services" such as electronic mail may not be subject to active FCC regulation under title II of the Communications Act. In other words, as long as USPS does not own and operate its own telecommunication transmission system and uses telecommunication services of firms who are regulated as providers of so-called "basic services, " the USPS EMS offerings would not necessarily be regulated by FCC.[14] The applicable FCC decision, known as *Computer II,* is still under regulatory reconsideration and judicial challenge, and also may be affected by congres-

[10] Public Law 91-375, sec. 101(a), (e), and (g).
[11] U.S. Postal Rate Commission, *Opinion and Recommended Decision on Electronic Mail Classification Proposal* docket No. MC78-3, Dec. 17, 1979, pp. 278ff.
[12] Ibid., p. 52 (caps and underlining removed).
"Ibid., pp. 36-51.
*See related discussion in ch. 3.
[14] Dec. 8, 1980, letter to USPS from Philip L. Verveer of FCC.

sional revision of the Communications Act. As noted in chapter 2, S. 898 as passed by the Senate would limit FCC jurisdiction to USPS EMS services involving USPS leasing of telecommunications from private firms, and then only to establishing costs of the telecommunication portion of the EMS service and to assuring that such service is offered by a separate organizational entity within USPS.

More recently, various computer service and data-processing firms, among others, have expressed concern that a USPS role in Generations I or II EMS, let alone Generation III, could violate Federal Government policy (expressed, for example, in OMB Circulars A-76 and A-121) that the Government should not produce goods and services otherwise available from the private sector and should not compete with private firms, except as a last resort. USPS has procured the computer and electronic equipment for E-COM from private firms, but USPS operation of E-COM is construed by some to constitute a computer-based electronic message processing service.[15] It is unclear whether or not this is any different from USPS owning (through purchase from private manufacturers) and operating its own fleet of nearly 120,000 vehicles as it does now.[16]

At present, the use of computers and message processing in the E-COM service is internal to USPS, and serves to convert the electronic input to hardcopy output within a given postal facility. As long as USPS is not involved in telecommunication or electronic delivery, there is no direct competition with private Generation III EMS providers. However, various Generations I and II electronic mail providers and computer service bureaus believe that USPS to some extent is competing with them. These firms have suggested several alternatives (discussed in ch. 8) to establish what would be, in their judgment, a cooperative rather than competitive relationship. As mentioned in chapter 2, H.R. 4758, introduced in the 97th Congress and the subject of extensive hearings by the House Government Operations Subcommittee on Government Information and Individual Rights,[17] would appear to have the effect of prohibiting USPS from providing data-processing or telecommunication services to non-Federal entities or persons unless explicitly authorized by statute.

Competition Between Generations II and III

Other implications for the telecommunication and computer industries are also difficult to assess. The market penetration projections suggest that by 2000, even with 100-percent Generation II EMS stimulation, Generation III EMS volume (end-to-end electronic mail including electronic delivery) would exceed Generation II EMS volume. The sum of electronic funds transfer (EFT) (a form of Generation III) plus Generation III EMS would exceed Generation II EMS by the mid-1990's. Under the high but plausible Generation II EMS growth alternative, as shown in figure 3, Generation III EMS would surpass Generation II EMS by 1990, and EFT plus Generation III EMS would exceed Generation II EMS as early as 1985. However, Generation II EMS volume could still be substantial in 2000 and beyond, even though the Generation II market share would be declining.

To some extent, perhaps until 1990, Generation II EMS would compete with Generation III EMS for relative but not absolute market share. In developing the market penetration model, OTA assumed that development of Generation III EMS and EFT would be largely independent of the USPS role in EMS (short of a role in electronic delivery or ownership and operation of telecommunications). * Preliminary review of the initial responses to the USPS invitation for telecommunication industry participation in E-COM indicates that

[15] See Association of Data Processing Service Organizations, position paper on "Government Provision of Electronic Message Services," Feb. 16, 1982.

[16] *Annual Report of the Postmaster General* fiscal 1980, p. 14.

[17] See statements of Philip M. Walker of GTE-Telenet and William D. English of Satellite Business Systems before the Oct. 5, 1981, hearings of the House Government Operations Subcommittee on Government Information and Individual Rights.

*See app. A.

none of the major domestic Generation III EMS providers (such as Tymnet, GTE-Telenet, or Satellite Business Systems) indicated a desire for dedicated access to E-COM facilities. Whether this is because of continuing uncertainty over E-COM rates and service and/or because they perceive E-COM as irrelevant to, or as a competitive threat to, their own marketing and product development plans is not known.

The firms that did respond are primarily those providing international EMS service (such as ITT World Communications and Western Union International) seeking to expand into the domestic EMS market; those already providing a domestic EMS service (such as Dialcom, Inc., and Graphnet, Inc.) who presumably see E-COM as a way to increase or at least maintain their own shares of the domestic market; or those with telecommunication expertise who wish to enter anew market (such as TRT Telecommunications Corp.). TRT officials see E-COM "as a unique opportunity to participate in a new venture which has a very large market."[18]

Of the firms who actively opposed USPS involvement in EMS, Graphnet is the only one (as of December 1981) that has indicated an interest in dedicated access to E-COM. Of course, other firms will be able to gain access on a dial-up basis. One major firm with dial-up access, Western Union, has recently made application for dedicated access. Various local telephone companies have apparently expressed an interest, although AT&T has not. Even firms that are primarily in the Generation III business could supplement their service through dial-up access to the Generation II E-COM.*

[18] Richard Yalen, TRT Telecommunications Vice President, as quoted in Michael Selz, "Electronic Mail Service Promises 2-Day Delivery," *The Tampa Tribune*, Dec. 10, 1981, p. 6-B.

*For example, Satellite Business Systems, Tymnet, GTE, and AT&T among others, already offer or have plans to develop nationwide networks with Generation III electronic mail capability.

Innovation and Standards

Some private firms have expressed concern that the entry of USPS into the EMS market might stifle innovation and possibly lead toward adoption of technically inferior standards in the telecommunication industry. While these concerns were justified to some extent with respect to the original USPS proposal for E-COM, the protracted regulatory proceedings before PRC and FCC have had the effect of significantly upgrading the E-COM technology. In essence, the regulatory process in this case had the effect of mandating improvement in the E-COM design.

The final USPS provisions for interconnection between telecommunication providers and E-COM facilities at the 25 serving post offices (SPOs) appear to be substantially responsive to comments received from private firms. 'g USPS is providing four different interconnection arrangements for those firms desiring dedicated access to E-COM facilities, and two different arrangements for dial-up access at each SPO. The interconnection arrangements are summarized in appendix D. The dedicated access interconnection arrangements appear to meet the technical needs of most firms that provided comments to USPS. In addition, USPS has stated that it "will consider providing additional arrangements as necessary and feasible" and "will consider requests to accommodate user-provided interface circuit boards."[20] The dial-up access arrangements will permit dial-up access via any public telephone network.

The E-COM interconnection arrangements use technical standards that are currently accepted in the industry. Thus, it appears that while USPS cannot realistically be expected to be a source of new standards, it is not like-

[19] See USPS, "Telecommunications Connection Arrangements for Postal service Electronic Computer Orginated Mail (E-COM) Service and Invitation for Capacity Planning Cooperation," *Federal Register*, vol. 46, No. 199, Thursday, Oct. 15, 1981.

*"Ibid., p. 50879.

ly to impose inferior standards on the industry as long as current regulatory oversight and safeguards are maintained.

With respect to technology, the picture is less clear. The selection of technology (e.g., computers and printers) for E-COM was made by RCA under contract to USPS, not by USPS itself. Some private firms have questioned whether the best state-of-the-art technology was selected, particularly with respect to the printing equipment. USPS believes that the initial E-COM technical configuration was the best possible using off-the-shelf products with proven reliability, and given the nature of the E-COM market. USPS also believes that it can stimulate innovation in some areas, such as advanced high-volume printing and enveloping technology, where USPS is one of the largest users. However, given the relatively limited expertise of USPS in telecommunication and computer technology, and the rapid rate of private sector development, the mainstream of technological innovation appears to be beyond the scope of the USPS research and development capability, present or planned.

As for market innovation, USPS believes that a Generation II offering like E-COM will help stimulate innovation by private firms. Indeed, as mentioned earlier, some of the smaller firms that applied for dedicated access view E-COM as an opportunity to get into the EMS market and compete with the larger, more well-established firms. But various telecommunication carriers and computer service bureaus have stated that their EMS service innovation will be stifled unless the relationship with USPS is cooperative rather than competitive, and have proposed alternatives (discussed inch. 8) that they believe will encourage maximum innovation in the EMS market.

EMS Privacy and Security

The subject of privacy with respect to EMS includes two components of interest. One is the legal protection afforded such services, and the other is the technical vulnerability of such systems to interception of information, and the willingness and ability of system providers to secure these systems against such interception.[21]

USPS is required by law to maintain "one or more classes of mail for the transmission of letters sealed against inspection."[22] First-class mail, priority mail, express mail, and international letter mail are "sealed against inspection.

The sender's choice of the class of mail service determines whether the contents are "sealed against inspection. " Generally it does not matter whether the mail is physically sealed. The message contents of a postcard are legally or constructively sealed, as are the contents of letters opened in the dead letter office to determine to whom they might be delivered. The effect of being "sealed against inspection" is to prohibit the mail from being opened without a warrant, or any use or disclosure of information obtained in the course of opening a sealed letter without a warrant. The Supreme Court has held that mail which is sealed against inspection must be considered as though it had been retained in the sender's home. It cannot be opened without the consent of the sender or addressee, except under the authority of a search warrant issued by a court upon probable cause.[23]

Access to addressor-addressee information, however, is possible without a warrant. Access

[21] This section of the report is based in part on a 1980 USPS memorandum regarding "Applicability of Mail Privacy Legal Protections to Electronic Mail. " For additional general discussion see chs. 7 and 8 of the OTA report *Computer-Based National Information Systems: Technology and Public Policy Issues, OTA-CIT-146,* Washington, D. C., September 1981.

[22] 39 USC 3623(d),

[23] *Ex parte Jackson,* 96 U.S. 727, 732-733 (1877); *United States* v. *Van Leeuwen, 397* U.S. 249, 251-252 (1970).

to the information contained on the envelope of a letter can be secured by convincing designated postal officials that the "mail cover"--as this access is called-is needed to locate a fugitive, to obtain evidence of a crime, or to protect the national security. According to USPS, the number of mail covers is declining and the amount of mail that comes under a mail cover is very small.

The privacy protection afforded to mail content and addressee-addressor information passed through a telecommunication system is less clearly established. First, it does not appear that the postal statutes apply in full measure to information when it is in electronic form, perhaps even if the electronic system is operated by or for USPS and/or if the information is ultimately to be printed out and delivered as first-class mail. This is because of a distinction between information in tangible or corporeal form and information that exists in "incorporeal" form. It is only certain that the postal statutes apply when the letter is a tangible object.

Electronic communication is afforded a measure of protection by other statutes, but the degree of protection is presently somewhat less than that afforded by the postal statutes. Further, the application of these other statutes is confused. Section 605 of the Communications Act of 1934 prohibits the unauthorized disclosure of any communication by wire or radio. However, the enforcement of legal protections is more difficult when mail is in electronic form than in physical form and under the direct supervision and control of USPS.

It seems clear that the postal privacy laws and regulations would apply when an electronic message is printed out in hardcopy form at a postal facility, or printed out elsewhere and deposited into the USPS mainstream. The hardcopy output when delivered over postal routes would remain fully protected as long as it remains in the mainstream. Thus, the physical delivery of hardcopy output and the printing and enveloping of the EMS output at postal facilities would be protected.

However, the telecommunication portion of the EMS service when provided by private firms appears to be subject only to the Communications Act and not to the Postal Reorganization Act. Therefore, for services like E-COM, unless the electronic input of messages to USPS were considered to be an integral part of the service and under USPS jurisdiction, there would seem to be no obvious basis for applicability of the Postal Act.

On the other hand, where USPS provides the telecommunication (as well as the printing, enveloping, and delivery), the electronic portion of a Generation II service could conceivably be protected. USPS notes that the "question of whether these (postal) laws would apply to the electronic portion of any electronic mail services offered by the Postal Service has never been authoritatively tested, " but finds that "there is little in the laws, however, to suggest that they would not."[24] In other words, according to USPS the electronic signals apparently could be construed to represent mail in postal custody even during transmission over the telecommunication portion of a postal EMS service. However, some independent privacy analysts dispute this interpretation and believe that the postal laws do not apply to the telecommunication portion of an electronic mail system.

With respect to security, legal safeguards may offer less than total protection if message contents can be intercepted by third parties with little risk of detection. Thus, security measures are intended to safeguard messages transmitted through electronic systems to protect against eavesdropping. At the present time, it is left to the telecommunication carriers to determine the degree of physical and electronic protection to be provided. Some carriers offer the user the option of encrypting data, and it maybe that a market or a requirement for such protected communication will evolve.

[24] **USPS memorandum,** "Mail Privacy," op. cit., pp. 5-6.

The nature of an EMS service raises some security concerns beyond those encountered in conventional mail delivery. Because messages may be stored for some time (1 week in the case of E-COM), there is the potential for access to an historical file of traffic. Also, EMS systems could easily produce extensive data on sender-addressee patterns. Finally, the hardcopy output of EMS systems maybe vulnerable to unauthorized inspection at the point of printing and/or enveloping. None of these types of security intrusion can be performed as easily or as efficiently in the conventional mail system.

In these respects, electronic mail is more vulnerable than conventional mail. Any EMS alternative that involves telecommunications, whether offered by USPS or by private firms, faces the threat of interception and monitoring of telephone, microwave, and/or satellite transmissions. While available data encryption technology can help to secure telecommunication systems, most transmissions at present are unencrypted and therefore interceptable. To the extent EMS services include growing volumes of sensitive personal, business, and financial information, the incentives to intercept such messages would increase. Some security experts have recommended that USPS provide, in cooperation with telecommunication carriers, an "electronically sealed" message service that offers protection (through encryption) at least equivalent to that of conventional first-class mail.

Electronic mail is also vulnerable to security threats at the electronic switching and computer locations (including printing and enveloping functions). The security of conventional mail is protected by sealed envelopes, diligent monitoring of postal employee activities, locked delivery and route mailboxes, and, as discussed earlier, a variety of postal statutes that provide criminal sanctions for unlawful intrusion by postal employees or private parties. Additional new security measures will be necessary at switching and computer centers involved in providing electronic mail.[25]

[25] For further discussion of privacy and security, see chs. 4 and 5 of the OTA background paper on *Selected Electronic Funds Transfer Issues: Privacy, Security, and Equity, OTA-BP-CIT-12,* March 1982.

USPS Long-Term Viability

The results of the OTA analysis indicate that, regardless of what role USPS plays in Generation II electronic mail, reductions in conventional mail volume due to diversion to Generation III EMS and EFT could reach significant levels by 2000. The threat to conventional mail could come even sooner if Generation III EMS services (all electronic) develop faster than currently anticipated, if the underlying growth in the mainstream is less than the historical average, or if diversion of second- and third-class mail to alternative (nonelectronic) delivery services increases significantly beyond current levels.

Moreover, almost surely by 2000, probably by 1995, and perhaps as early as 1990, Generation III EMS and EFT are likely to catchup to and pass Generation II while it begins to decline. At that point, the volume and revenue "cushion" from Generation II EMS would be reduced, and significant rate increases and/or service and labor force reductions would be likely in order for USPS to maintain a break-even operation without increased public subsidies.

Should Congress concern itself about this possibility now? While the market penetration projections could change somewhat given different assumptions, the only kinds of changes that could radically alter the projections would be a growth rate in the underlying mainstream 50 or 100 percent above the historical average, or a significant delay in the development and introduction of Generation III EMS and EFT services. Neither of these seems very likely in view of aggressive private sector Generation

III EMS activity and the continuing economic trends that work in favor of electronic mail and against paper-based mail, especially for first-class letter mail.

For an important institution the size of USPS, 15 or 20 years is not an excessive lead time for planning an orderly transition. It can also be argued that changes are taking place so fast in the so-called "communications revolution" that by the time USPS actually experienced significant mail diversion, it would be much more difficult to adjust if steps are not taken in advance to avoid a crisis situation. For example, while normal attrition may be able to accommodate any necessary labor force reductions over the next 10 or 15 years, after that time necessary reductions may become rather severe, particularly for volume-sensitive groups of employees such as mail handlers, clerks, and part-time employees. Maintaining good employee morale and career continuity would be difficult at best under these circumstances.

As another example, significant mail diversion could undermine the ability of USPS to carry out its primary mandate "to provide postal services to bind the Nation together through the personal, educational, literary, and business correspondence of the people."[26] Reductions in USPS-delivered mail volume could generate severe financial pressures which would force service and labor cutbacks. This could translate, for instance, into reductions in the number of days of delivery, number of collection points, or number of post offices. Such cutbacks could seriously disadvantage some postal customers who may not have access to satisfactory electronic alternatives, or whose mailing needs are not amenable to electronic transmission.

On the other hand, the projections in chap-s ter 4 indicate that USPS still is likely to have a significant though reduced volume of conventional nonelectronic mail in 2000—perhaps 70 billion to 75 billion pieces.[27] Thus, it would seem that, with orderly planning, enough of the basic USPS infrastructure could be maintained to provide adequate conventional mail services, although at reduced service levels. Also, new ways might be identified for USPS to carry out some of the elements of its statutory mandate, such as to "provide prompt, reliable, and efficient service to (postal) patrons in all areas and to render postal services to all communities,"[28] and to "provide a maximum degree of effective and regular postal services to rural areas, communities, and small towns where post offices are not self-sustaining."[29]

Generation II EMS might be able to help USPS maintain adequate service levels to rural and less populated areas that would be unable to sustain cost-effective conventional mail service at present levels under reduced mail volume. Indeed, in some rural and very remote areas where even Generation II EMS delivery might be cut back, USPS might consider contracting with Generation III EMS providers to assure regular electronic delivery to individual homes and offices or, at a minimum, perhaps to provide self-service electronic hardcopy printers in post offices or other public locations. Of course, Generation III EMS providers may find it profitable to provide such services on their own without any USPS involvement. These possibilities warrant further research.

Generation II EMS might also help USPS maintain reduced rates for certain classes of mail, such as educational and nonprofit mailings, that have been partially subsidized by the annual revenue forgone appropriation from public funds. Even if the revenue forgone subsidy is reduced, the cost advantages of Generation II EMS over conventional mail might permit the continuation of a lower rate to those many nonprofit and educational organizations that depend on the mail for their livelihood.

---

[26] Public Law 91-375, sec. 101(a).

[27] Several studies have concluded that a significant volume of paper-based mail will continue almost indefinitely. See Henry B. Freedman, "Paper's Role in an Electronic World," The *Futurist*, October 1981, pp. 11-16; and Robert W. Anthony, et al., An *Exploratory Assessment of Computer Assisted Makeup and Imaging Systems*, The George Washington University Program of Policy Studies in Science and Techology, Washington, D. C., Jan. 31, 1980.

[28] Public Law 91-375, Sec. 101(a).

[29] Public Law 91-375, Sec. 101(b).

It also seems likely that Generation II EMS service could help to meet the needs of small mailers of all kinds, even though the service may be of greatest absolute economic benefit to large mailers. For example, as of February 1982, over 90 business mailers had applied to USPS for technical certification to use E-COM service, including such high volume mailers as Shell Oil Co., Equitable Life Assurance Co., and Merrill Lynch Pierce Fenner & Smith. However, at least three of the telecommunication carriers that have applied for dedicated access (ITT World Communications, TRT Communications Corp., and Netword, Inc.) intend to offer batch mailings from low-volume mailers to meet the 200-message minimum volume requirement for E-COM use. A spokesman for ITT World Communications has indicated that "ITT would allow customers to mail as few as 25 letters per mailing" and then consolidate orders to meet E-COM volume requirements.[30]

In the longer term, it is possible that a USPS Generation II EMS capability, perhaps combined with a scaled-down version of the USPS infrastructure and delivery network, could be used to provide other Federal Government services. For example, with proper interconnection and technical enhancements, a Generation II system might be used by USPS to provide printing and delivery of various Government forms and documents.[31] This kind of role would, of course, compete to some extent with functions now carried out by the Government Printing Office, the National Technical Information Service, and other Federal agencies, but might prove to be more cost effective in the long run. This role might even be extended to include provision of abstracts of and indexes to Government forms, documents, and other kinds of Government information. These possibilities, too, deserve further study.

[30] Selz, "Electronic Mail," op. cit.

[31] See Robert W. Anthony, Lynne Filderman, Henry Freedman, and Henry H. Hitchcock, Strategy *for Decisions: APWU and the Electronic Information Revolution,* The George Washington University Program of Policy Studies in Science and Technology, Washington, D. C., Mar. 1, 1980; and Alfred M. Lee and Arnim H. Meyburg, *The Impact of Electronic Message Transfer on USPS Operations,* Working Paper No. 3, Cornell University Program on Science, Technology, and Society, September 1980. Also see "Electronic Computer Orginated Mail," *Technology Watch* vol. 2, No. 2, December 1981, p. 2.