Telephone-Letter Mail Competition: A First Look

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Preface

In this report we reviewed the use of postal letter mail service and telephone service and evidence of actual or potential competition between these services. We have aggregated basic data, discussed possibilities and constraints of substitution and summarized much of the relevant literature. The report is not a definitive economic or statistical analysis of the subject.

This report presents usage data through 1977. Appendix H includes new summary data for 1978 and 1979. The substantial increases in letter mail volume during these years invites renewed interpretation of the analyses presented in Chapters V and VII.

Readers interested in the subject of telephone and letter mail usage might wish to investigate four recent publications which were not available at the time this report was prepared:

Brandon, Belinda B., ed. The Effect of the Demographics of Individual Householders on their Telephone Usage. Cambridge, MA: Ballinger Publishing Co., 1981.

Economic Studies Group, Management Consulting Services Division, Coopers and Lybrand, Inc. and Ecosometrics, Inc. Study on Competition and Demand in Component Markets of the Mailstream. Final Report. Washington, D.C.: Mail Classification Research Division, United States Postal Service, June 1980.

Institute for Social Research, University of Michigan. Nonhousehold Mailstream Study. Final Report. Washington, D.C.: Mail Classification Research Division, United States Postal Service, July 1980.

Taylor, Lester D. Telecommunications Demand: A Survey and Critique. Cambridge, MA: Ballinger Publishing Co., 1980.

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I. BACKGROUND AND SUMMARY

Since the introduction of the telegraph and later the telephone, there has been continuing speculation as to the eventual impact of telecommunications upon traditional postal services. In earlier days these speculations about competition resulted in attempts to nationalize telecommunications services in the U.S.[1] More recent developments in telecommunications and computers and in such functional applications as electronic funds transfer have caused many policy makers to conclude that the U.S. Postal Service (USPS) must enter the telecommunications field or face a lengthy and perhaps fatal battle of competitive attrition.[2]

Most policy discussions of this subject are premised upon the eventual emergence of large-scale electronic message systems (EMS) or development of new systems entailing major social and structural changes such as Electronic Funds Transfer Systems (EFTS) or personal computers in the home.

Of existing telecommunications systems, however, the largest and most pervasive is the voice telephone network. Voice telephony has operated alongside the postal system since 1876. It provides immediate and inter-

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[1] See, for example, proposals by Postmasters General Jonathan Creswell (Annual Reports of the Postmaster General, Washington, D.C., 1872, 1873), John Wanamaker (Marshall Cushing, The Story of Our Post Office, Boston: A. M. Thayer, 1893, pp. 994-1007), and Albert Sidney Burleson (John Brooks, Telephone: The First Hundred Years, New York: Harper and Row, 1975, p. 149).

[2] Report of the Commission on Postal Service, Vol. 1, Washington, D.C.: GPO, 1977, pp. 19-24; Benjamin Franklin Bailar, Postal Service -- Political Birthright or Economic Choice? Economic Club of Detroit, March 8, 1976; U.S. Postal Service, The Necessity for Change, Washington, D.C.: GPO, Dec. 10, 1976, pp. 30, 31; Roger K. Salaman, Office of Telecommunications, Testimony Before the Subcommittee on Postal Operations and Services of the Committee on Post Office and Civil Service, U.S. House of Representatives, Washington, D.C., April 6, 1977; Hearings Before the Subcommittee on Communications of the Committee on Commerce, Science and Transportation on S.3229, 95th Cong., 2d sess., ser. 95-123 (1978); and Charles H. Wilson, "Cloudy Days for the Mails", The Washington Star, July 8, 1977.

active message transmission at prices which generally are perceived to be higher than, but perhaps competitive with, postal message services.

The objective of this study was to examine recent trends in the relative price and demand for letter mail and telephone services with a view toward identifying any historical or ongoing substitution of telephone calling for letter mail use.

This process was complicated by several problems including locating appropriate data (Chapter II), the structural and functional differences between telephone and letter mail communications (Chapter III), and the different price structures used for the two systems (Chapter IV).

While our findings at this time are necessarily tentative, they do suggest that some substitution of telephone use for letter mail use has been occurring since 1970:

1 - During the 1970 - 1977 period, the growth in letter mail volumes has been slight and occasionally negative. The volume of telephone calls -- local and toll -- increased appreciably during the same period.

2 - Relative to national economic growth, the 1970 - 1977 growth in telephone volumes appreciably exceeded the growth trend of the 1960's. During the same period, the growth in letter mail volume relative to economic growth dropped significantly below the growth trend of the 1960's.

3 - The year-by-year growth of toll telephone messages in the 1970's was not sufficiently high to explain the lack of letter mail volume growth on a message-for-message

basis. This discrepancy might be partially accounted for by the ability of one telephone call to substitute for more than one letter.[3]

4 - During the 1970 - 1977 period, the real price of postage for letter mail climbed; the real price of local and toll telephone service (as measured by average revenue per call) dropped.

5 - Between 1950 and 1977 the total number of "paid messages" (total letters plus total toll calls including Wide Area Telephone Service and Private Line Service) appears to have been constant relative to Real Disposable Personal Income (DPI). This suggests that after allowing for economic growth, the market for message services is a zero-sum game. The letter mail "share" of this market dropped from 93% in 1950 to 75% in 1977.

This finding may be critical to both the telephone and postal systems, given the potential introduction of new electronic message systems and speculations about stagnation of long-term economic growth in the U.S.

6 - Based upon our current knowledge of letter mail use (which is slight but improving), telephone substitution may continue to reduce letter mail use. Massive shifts are unlikely in the immediate future, however, because a large portion of current letter mail volume does not lend itself to telephone substitution.

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[3] Another possible explanation lies in the possible use of non-telephone alternatives to USPS letter mail use including intracompany mail services and private courier services.

We expect to publish an updated and expanded version of this working paper subsequent to its review. At that time, we expect to incorporate 1978 data on letter mail and telephone use. We also hope to use new data from the USPS/University of Michigan study of mail flows among businesses, government agencies and other institutions (The "Non-Household" Mailstream Study).[4] We also hope to develop comparable data on the use of mail and telephone service for Canada and selected international flows.

[4] University of Michigan, "Non-Household Mailstream Study." Ann Arbor, forthcoming.

II. DATA: SOURCES AND PROBLEMS

A. An Overview

In most research papers, discussions of the scope and validity of data used normally are relegated to footnotes and appendices. For this paper, the subject deserves greater visibility.

The U.S. Postal Service and the American telephone industry share four characteristics when we speak of data:

1 - Both the Postal Service and the telephone industry have operated as virtual monopolies for most of their respective lives. As a result, information concerning types of customers, customer demands and needs, etc., is both relatively new and somewhat skimpy. Many of the detailed time series cited within this report have been initiated only in the past five or ten years.

2 - Given increased competitive pressures in recent years, both the Postal Service and the telephone industry have developed more comprehensive market information, but both are increasingly inclined to protect it from potential competitors. Both USPS and American Telephone and Telegraph (AT&T), for example, collect information on message flows among major cities, but both consider it to be proprietary.

3 - AT&T is the largest single corporate employer in the United States and the U.S. Postal Service is the third (General Motors is second). Given the size of these institutions, it is conceivable that information which

is desirable and useful for this type of study exists and is readily available, but that its existence and availability was unknown to the author.

4 - In many regards, the systems operated by USPS and the telephone industry are opaque to the operators. The literature on telecommunications, for example, contains extensive speculation as to what portion of telephone traffic is devoted to data transmission as opposed to "messages". The answer is in no way obvious to the telephone system since practically anyone can couple a terminal to their regular telephone and use it for data transmission or message transmission. To the telephone network, it's just another telephone call.

B. Letter Mail Data

Most of the letter mail data used in this report are derived from the Revenue and Cost Analysis System of the U.S. Postal Service which reports information quarterly and annually on revenues and pieces of mail. Because letter mail volumes are seasonal and because the USPS fiscal year is divided into unequal quarters,[5] these data require adjustment to calendar quarters to allow comparison with other time series. The Postal Service provided us with adjusted data for 1957 through 1976. We made similar adjustments for the 1950-1956 period and for 1977.

[5] The Postal Fiscal Year is comprised of 13 "Accounting Periods" of four weeks each. The first postal "quarter" of each fiscal year includes four Accounting Periods, and each of the other three quarters include three Accounting Periods.

Information on the distribution of letter mail by distance is reported quarterly by the USPS in the National Service Index. As suggested by the title of the report, this information is gathered for purposes of monitoring and managing service performance. As a result, reporting definitions used in the National Service Index have been changed occasionally between 1969 and 1979 in order to reflect changes in management structure. This subject is discussed at greater length in Chapter VII.

C. Telephone Data

1. General

Unless otherwise specifically noted, all telephone data used in this report have been provided by the American Telephone and Telegraph Company.

Many of the time series used within this report include data for the entire telephone industry. Others are for the Bell System only. While we have noted this distinction throughout, readers should be aware of the occasional variations. In many instances we have used AT&T data to reflect overall trends in the industry because industry-wide reporting was incomplete or inconsistent.

For those readers not intimately acquainted with the telephone industry, Table II-1 provides a brief overview of some statistical relationships between the Bell System and the independent telephone companies. We believe that the statistical relationships between Bell and the Independents have been sufficiently stable that broad trends in telephone usage within the Bell System might be extrapolated with reasonable confidence to the industry as a whole, at least for the periods under consideration.

Table II-1

Comparative Statistics for AT&T and Independent Companies

	Number of Telephones (millions)		Average Daily Conversations (millions)				Operating Revenues (millions)	
	AT&T	Ind.	AT&T (local)	Ind. (local)	AT&T (toll)	Ind. (toll)	AT&T	Ind.
1976	128	28	462	137	36	9	38,518	6,300
1975	122	27	448	137	33	9	29,591	5,500
1974	118	26	438	136	32	7	26,761	4,920
1973	114	24	414	125	30	7	24,072	4,317
1972	109	23	394	119	27	6	21,388	3,859
1971	104	21	375	121	24	5	18,952	3,202
1970	100	20	356	103	23	4	17,369	2,953
1969	96	19	338	98	21	4	16,058	2,462
1968	91	18	312	93	18	4	14,429	2,152
1967	87	17	299	87	17	4	13,311	1,873
1966	83	16	288	83	15	3	12,419	1,734

Source: U.S. Department of Commerce, Statistical Abstracts: 1973 and 1977; Historical Statistics of the United States; and U.S. Independent Telephone Association, Independent Telephone Statistics, Washington, D.C., Vol. 1, 1978.

2. Message Telecommunications Service (MTS) Data

AT&T provided us with two types of data on MTS use. One series includes monthly and annual totals of Interstate and Intrastate toll calls for 1950 - 1977. These figures represent an actual count of toll calls placed through the long distance facilities of AT&T's Long Lines Department.

AT&T also provided us with sample data on MTS use by type of caller, mileage bands, etc., for the month of October for the 1972 - 1977 period. Throughout this report we annualized this sample data by multiplying by twelve months (cited within this report as "AT&T sample, annualized").

As shown in Table II-2, the total toll calls reported from the sample vary somewhat from the total calls reported as actually counted. These differences may stem from a variety of causes including:

1 - Official telephone company calls are included in the actual count but excluded from the October sample.

2 - Toll calls that both originate and terminate within minority-held Bell companies (Southern New England Telephone Company and Cincinnati Bell) are not included in the actual count but are included in the October sample.

3 - The actual count includes the toll calls handled by independent telephone companies if the call originates in, terminates in, or travels through a Bell System company.

4 - The October sample is collected at the originating exchange and includes calls destined to exchanges operated by independent companies. The sample design

Table II-2

MTS Usage Data
(millions of calls)

Variations between sampled data and actual message counts

	October sample	October actual count	actual count as percentage of sample	October sample x 12	annual total: actual count	actual count as percentage of sample
INTRASTATE						
1977	714	682	95.5%	8566	8012	93.5%
1976	646	616	95.4%	7747	7299	94.2%
1975	601	565	94.0%	7212	6621	91.8%
1974	560	548	97.9%	6725	6261	93.1%
1973	521	513	98.5%	6256	5826	93.1%
1972	467	456	97.6%	5605	5277	94.1%
INTERSTATE						
1977	379	410	108.2%	4553	4832	106.1%
1976	342	365	106.7%	4099	4385	107.0%
1975	330	353	107.0%	3962	4104	103.6%
1974	317	339	106.9%	3799	3937	103.6%
1973	301	320	106.3%	3611	3665	101.5%
1972	269	284	105.6%	3228	3299	102.2%
TOTAL						
1977	1093	1092	99.9%	13,119	12,844	97.9%
1976	987	981	99.4%	11,846	11,684	98.6%
1975	931	918	98.6%	11,174	10,725	96.0%
1974	877	887	101.1%	10,524	10,198	96.9%
1973	822	833	101.3%	9867	9491	96.2%
1972	736	740	100.5%	8833	8577	97.1%

Source: AT&T

assumes that the number of calls originating at exchanges operated by independent companies and terminating in Bell System exchanges are equal to those going from Bell exchanges to Independent exchanges.

Since this report is concerned with overall trends in telephone use, the differences between these time series were not considered to be critical.

Toll calls which both originate and terminate within the territory of an independent telephone company and do not pass through a Bell System facility are not included in either the October sample or the actual count. For the purposes of this study we have assumed that the number of toll calls of this type is not sufficiently large as to disguise or distort overall trends in national telephone use.

MTS calls attributed to independent companies presumably originate from businesses, residences and public telephones. It seems likely that the pattern of origination by caller is similar between Bell customers and independent company customers, but this is less than certain. Independent companies historically have served less urbanized areas than the Bell System. While the "sunbelt shift" and increasing suburbanization may be eliminating some of the historical distinctions between areas served by Bell and the Independents, we would caution against simple extrapolation of Bell customer data to Independent customer data.

3. Wide Area Toll Service (WATS) and Private Line Service (PLS) Data

Wide Area Toll and Private Line Services account for a significant portion of business telephone usage. For the most part, however, these services normally have not been measured on a message-use basis. For the

purposes of this report, we decided to estimate WATS and PLS message volumes -- with recognition of the possibility for a wide margin of error.

Interstate and Intrastate WATS message volumes for 1976 and 1977 are those reported by AT&T based upon the October samples for those years. Using the WATS message counts for 1976 and 1977, and WATS revenues for those years, we calculated the average revenue per message (ARPM) for Interstate and Intrastate WATS calls. For the period 1972 - 1975 we divided reported Interstate and Intrastate WATS revenues by the respective 1976 - 1977 average revenue per message (ARPM) to estimate WATS message volumes.

Prior to 1972, our WATS revenue data were not separated by Inter- and Intrastate. Since the relationship between Inter- and Intrastate WATS revenues was relatively constant for the 1972 - 1977 period (with Intrastate WATS revenues averaging 27.3% of total WATS revenues and ranging between 26.9% and 27.8%), we estimated that WATS revenues were similarly divided historically. We then divided the estimated Interstate and Intrastate WATS revenues by the 1976 - 1977 Interstate and Intrastate average revenues per message to estimate message volumes.

These estimates of WATS message volumes do not allow for price changes over time. Because of this, and because of the need to estimate the Interstate and Intrastate division of WATS revenues prior to 1972, it is safest to assume that the validity of our estimates declines as one moves to earlier years.

Message volumes for Private Line Services were estimated in a similar manner. First, we separated PLS revenues by class of Private Line Service. We assumed for purposes of this study that PL telephone service and Telpak service probably constituted the type of message transmission services most comparable to normal telephone and letter mail usage. We excluded revenues

for Teletypewriter, Data Phone Digital Service, Telegraph, Program Transmission and Multi-Purpose Wideband other than Telpak. Revenues for these services were excluded from our calculations as representing non-comparable services or because of their relatively minor size.

As with WATS, revenues for these services were available on an Interstate and Intrastate basis for the 1972 - 1977 period. Unlike the WATS case, the relationship between Interstate and Intrastate revenues was changing during that period. The Intrastate component of PL telephone service revenues grew from 40.9% in 1972 to 47.9% in 1976 and 1977. We arbitrarily estimated Intrastate revenues as 40% of total PLS telephone revenues for all years prior to 1972.

Between 1972 and 1976, Intrastate revenues for PL Telpak service increased from 11.4% of total Telpak revenues to 16.2%. We estimated Intrastate Telpak revenues to be 10% of total Telpak revenues throughout 1961 - 1971.

Message volumes for PLS were estimated using the same average revenue per message as derived for WATS. This approach assumes that customers normally would not acquire Private Line Service unless it was at least as economical as WATS. In practice, it seems reasonable to assume that the customer moving to PLS expects to save money by moving from WATS to PLS. As a result, PLS message volumes estimated with the average revenue per message for WATS probably are understated to a significant degree.

As noted, these estimated message volumes are subject to a wide margin of error. Given the magnitude and growth of WATS and PLS, however, even these very rough estimates give a more accurate picture of telephone use than that presented by ignoring them.

III. LETTERS AND TELEPHONE CALLS

A. The Functional Potential for Substitution

Both the letter mail system and the telephone system provide message transmission services. It is obvious that some letters can be substituted for some telephone calls and vice versa, but the effectiveness of substitutability between the systems can vary substantially depending upon the nature of the message to be transmitted.

The voice telephone service has inherent superiority over letter mail service in a number of areas. It is immediate and interactive. Assuming completion of a telephone call to the intended "addressee", the caller has immediate confirmation of "delivery" of the message.

Letter mail service is inherently superior to the telephone in providing a hard copy for storage or reference, which can be vital for legal purposes as well as convenient. (This may be considered a disadvantage for some uses.) Letter mail also is unobtrusive; the message can be read or acted upon at the convenience of the recipient.

These features of the present day telephone and mail systems suggest that some functional uses of one system are not necessarily amenable to the other, almost regardless of pricing. It is as ludicrous to think of little Suzie Jones writing her mother a letter asking to be picked up from school today as it is to think of armies of clerks telephoning millions of customers to relate their monthly billings.[6]

While recognizing that these functional differences exist, it also seems reasonable to assume that a body of message communications exists that

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[6] As a long-run proposition, telephonic billing might be more realistic, given computer storage of bills coupled with technologies for voice storage and voice synthesis.

that can go by mail or by telephone depending upon the price. Thus, messages such as a birthday greeting, an order for merchandise, an invitation, or a change to a price list conceivably can travel by either system. Presumably, enlightened customers choose between them based upon their perception of the real cost and value of the competing services.

B. Cost, Value, and Price

Ensuing sections of this report describe and discuss the structure of pricing for letter mail and telephone services. Postal rates and telephone tariffs are, however, an incomplete measure of the comparative price (or cost) incurred by users of either system. This section identifies and describes some of the user cost factors entailed in choosing between the letter mail and telephone systems. This is not a definitive treatment of the subject, but it should suggest some of the difficulties involved in attempting to compare "prices" between the two systems.

1. Letter User Costs

a. Materials

By definition, a message transmitted by the letter mail system must be recorded on some corporeal vehicle. Users of the mails thus incur costs for stationery, business forms, greeting cards or other mailing materials. While the costs of such materials vary greatly, it seems reasonable to assume that material costs alone may equal the actual postage rate for each message sent by mail.[7]

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[7] As of April 1979, the Dartnell Target Survey (Dartnell Institute of Business Research, Chicago, Ill., April 1979) estimated the average cost of materials for a business letter as $0.19 compared to $0.15 for postage.

b. Preparation and handling costs

A message sent by mail must be written, typed, printed or otherwise recorded in some way. The cost for doing this obviously varies with the type of message. In the case of business correspondence, for example, the cost of dictating, transcribing and typing a letter may exceed $5.00.[8] Additional copies of the same letter to other addresses, however, may cost only pennies for preparation.

Mail users also may incur additional message handling costs in terms of internal mailroom personnel and equipment, transporting messages to and from a post office, etc.

c. Opportunity or "time" costs

Delayed transmission of a message may cause mail users to incur costs. A day's delay in communicating a correction to a price list, for example, might cause a company to lose a sale or underprice a transaction. Use of coupons and business-reply cards or envelopes might be "cheaper" in soliciting business than use of an In-WATS "800" telephone number, but the latter may encourage more "impulse buying" by customers.

2. Telephone User Costs

a. Access or system costs

Basic access charges for telephone system users are discussed below under telephone pricing (p. 21). It should be noted here, however, that efforts to redirect messages from the letter mail system to the telephone

[8] The Dartnell Institute of Business Research (ibid.) estimates the total cost of a dictated business letter as $5.59.

system may cause the user to incur significant new costs in terms of acquiring additional telephone lines, extensions, or specialized equipment (Private Automated Branch Exchanges, recorders, etc.) that are not reflected in message tariffs.

b. Documentation costs

Some messages transmitted by telephone may require documentation in the form of a recording, dictation or separate transmission of a confirming letter or additional details. In such cases, the telephone message may be redundant.

c. Labor costs

In 1977 business originated toll telephone calls averaged 4.1 minutes in duration. The direct labor costs of a caller being paid the minimum wage ($2.90 per hour in 1979) would be only 20 cents. For a manager earning $50,000 per year, the labor cost of the average 4.1 minute business call would be $1.68. Given such variability in labor costs, it is hard to generalize on the "total cost" of using the telephone.

d. Opportunity or "time" costs

The nominal cost of transmitting a message by telephone may understate the true cost if the intended recipient is unavailable, thus necessitating an additional call or calls. Insurance against this situation in the form of person-to-person toll rates is available but expensive. Likewise, a "busy" or unanswered phone may require frequent return calls, which may be "free" in terms of telephone charges, but cause the user to expend time. Use of the telephone also may entail time (and money) lost in introductory "chit-chat", discussions of the weather "at that end", etc. (Such pleasantries may also increase the cost of letters.) Such pleasantries may have value, of course, in terms of "good will", "customer relations", etc.

IV. PRICE STRUCTURE AND PRICING TRENDS

A. Letter Mail Price Structure

While the U.S. Postal Service offers numerous categories of services at differing prices, the price structure for message transmission is relatively simple. Between 1918 and 1976, the Postal Service offered two basic services for messages, Airmail and First Class Mail. In 1976, Airmail effectively was combined into First Class Mail.

In 1979 there were four basic prices for First Class Mail service:

1 - Post cards at ten cents;

2 - Letters at 15 cents for the first ounce and 13 cents for each additional ounce

3 - Presorted letters at 13 cents per ounce; and

4 - Presorted cards at nine cents.

Since 1944, all First Class rates have been distance-insensitive. "Local" First Class Mail cost one cent less than "non-local" between 1918 and 1920 and again between 1934 and 1944. Up until 1968, "drop" letters also cost one cent less than the regular First Class rate, but since these required deposit and pick-up at the same post office, they accounted for very little mail volume. The basic rate provides for delivery anywhere in the United States, its territories and Mexico and Canada as well.

Major changes in postal pricing over the past decade include:

1 - Restructuring of the Third Class Single Piece subclass to effectively exclude greeting cards (1968);

2 - Implementation of degressive rates (i.e., charging less for additional ounces than for the first ounce) for additional ounces in First Class Mail (1975);

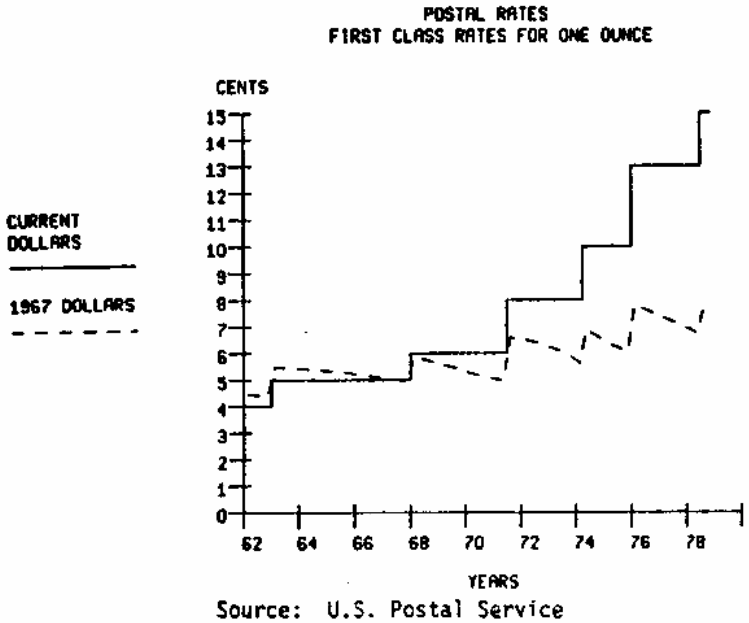
3 - Combining Airmail into First Class Mail, de facto (1976), de jure (1977); and

4 - Implementation of discount rates for large quantities of presorted First Class Mail (1976).

B. Price Trends and Projections

As illustrated in Figure IV-1, nominal postal message prices have climbed significantly in recent years. The basic First Class letter rate increased 160% during the 1967 - 1977 period.

Figure IV - 1



Source: U.S. Postal Service

In terms of "real" price (based on the Consumer Price Index, 1967 = $1.00), the price of a First Class stamp climbed 44% between 1967 and 1977. These price increases commonly have been ascribed to general inflation, the declining real value of the Public Service Subsidy appropriated to the Postal Service, labor settlements since postal reorganization in 1970, the pricing of First Class Mail to cross-subsidize other classes of mail, and a host of other factors.

According to the U.S. Postal Service, the rates for First Class Mail implemented in May 1978 will be unchanged through 1980, "provided inflation is kept under control" in the economy at large.[9]

C. Telephone Price Structure

Telephone message pricing is more complex than postal pricing. Telephone users traditionally have paid fixed fees for "access" to the system and local usage by rental of a telephone wired to a local exchange. Users also pay on a per message (or toll) basis for calls going beyond the local exchange. Prices for calls within or between exchanges within a state are regulated by that state. Prices for calls going between exchanges in different states are regulated by the Federal Communications Commission. The following sections describe the price structure and recent trends for the local, Interstate and Intrastate components of telephone service.

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[9] Speech by Postmaster General William F. Bolger, National Press Club, Washington, D.C., December 6, 1978.

1. Local Telephone Service

a. Price structure

The most common type of pricing for local telephone service is "flat rate" pricing. As of 1977, 90% of residential telephones and 54% of business telephones within the Bell System operated on "flat rate" pricing. Under "flat rate" pricing users rent the telephone instrument and have unlimited local exchange service for a predetermined monthly fee. Additional charges (tolls) are incurred for calls beyond the local exchange area. With "flat rate" pricing, local calls essentially are "free goods" once the "access" charge has been paid; a caller placing 75 local calls per month pays no more than a neighbor placing ten calls.

A major and related feature of "flat rate" local telephone pricing involves the marked and conscious discrimination in basic subscriber fees charged to business customers as opposed to residential customers. Since the earliest days of the telephone system, business customers (as self-described or as listed in the telephone directory) have paid approximately twice the basic rate for rental of a local line as residential customers. Over time, this price discrimination has been justified on a variety of grounds:

1 - Telephone service was more important or of a greater value to businesses, and "cheap" residential service increased the number of people that businesses could call;

2 - In an era of unmetered local calling, business customers presumably used their telephones more frequently than residential customers, particularly during peak daytime calling periods;

3 - For business customers the costs of telephone services are a business expense which can be deducted from taxes, thus considerably reducing the effective price differential.

Prices for "local" telephone service vary substantially. One cause of the variation is that local rates are regulated by the individual states. Another major source of variance is the difference in the scope of local exchange service. In one city, local exchange service may embrace an entire metropolitan area, while in another, the local exchange may cover only a small portion of the city.

An alternative to "flat rate" pricing of local service entails the use of "message unit" charges. As a result, telephone companies may offer a selection of local telephone services. One package might include unlimited calling for an entire metro area, another the use of message unit pricing beyond a given number of calls and another just "lifeline" service with all outgoing calls being billed.

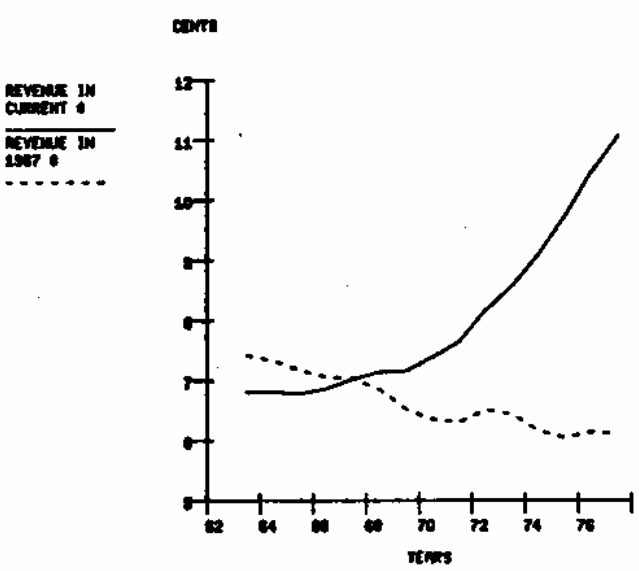
b. Recent trends and projections

Figures IV-2 and IV-3 illustrate trends in local revenue per local call and local revenue per main telephone.

Using these measures as surrogates for the price of basic local telephone service, it would appear that the real price of basic services has declined substantially in recent years.

Figure IV - 2

LOCAL REVENUE PER LOCAL CALL

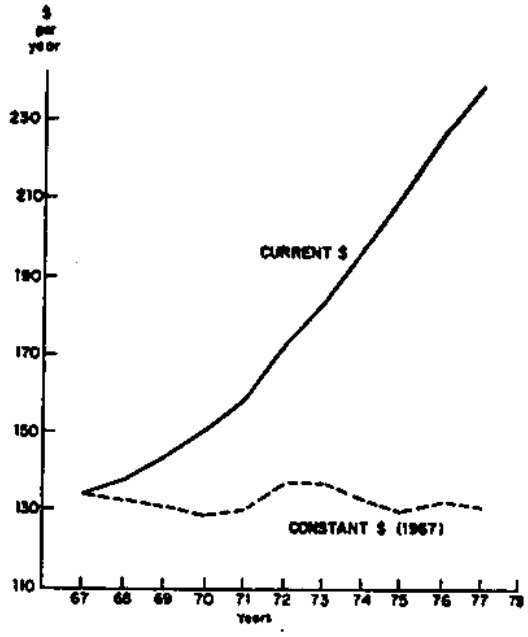


(BELL SYSTEM ONLY)

Source: AT&T

Figure IV - 3

LOCAL SERVICE OPERATING REVENUES PER MAIN AND EQUIVALENT MAIN TELEPHONE



(BELL SYSTEM ONLY)

Source: AT&T

Two other factors affecting the price of local telephone service are hidden within the trend of average revenue per local call:

1 - Over the years, local telephone service in many areas was offered on a single-party line (at a higher rate) and two-, three-, four-, or multi-party lines at lower rates. Between 1957 and 1977, however, the proportion of residences with other than single-party service declined from 55% to less than 8% (Bell System only).

2 - Part of the increase in the average revenue per local call reflects increased revenues from the rental of extension phones and other equipment. In 1950, for example, for every ten residence main telephones,

there was only one extension phone. By 1970, there were five extensions for every ten residence main telephones, and seven extensions for each ten in 1977 (Bell System only).

Thus part of the nominal increase in local telephone revenues represents upgrading in service quality by expansion of single-party service and acquisition of extension telephones. Allowing for these trends, the "real" cost of basic local telephone service has dropped substantially over the years.

This long-term down trend may not continue. Representatives of the telephone industry assert that the price of basic local exchange service has been kept low by cross-subsidies from toll services and business equipment rentals. They contend that increased competition in the intercity telecommunications market and in the interconnection market will require telephone companies to reduce their rates in those markets and to increase prices for local exchange service so as to fully reflect the cost of providing that service.

A related development in pricing basic local telephone service is the possibility of converting to usage-sensitive pricing or Local Measured Service (LMS). With LMS, subscribers pay a fixed monthly "access" charge and also are billed by the number, time of day and week, and duration of their local calls.

A 1979 study by Jeffrey Rohlfs of AT&T concluded that economically efficient pricing of telephone services would entail implementation of separate charges for access and local usage and a 50% increase in local

service revenues. Long distance rates would be reduced to approximately half of current rates.[10]

2. Toll Telephone Pricing

a. Interstate price structure

Letter mail pricing -- in terms of postage rates, at least -- is very simple compared to telephone toll pricing.[11] There are a number of Interstate toll services, the most important and most familiar being Message Telecommunications Service (MTS).

For Interstate telephone calls, Message Telecommunications Service charges range from seven cents to $3.55 (Figure IV-4). Like letter mail postage rates, MTS toll rates vary in relation to the length of a message, but in minutes as opposed to ounces. Unlike postage rates, toll rates also vary depending upon the time of day or week in which the call is originated (rate period) and the distance between the local exchanges of origin and destination (mileage band). Additionally, toll rates vary with the degree of operator assistance required, the method of billing the call (collect, third-party billing), and the degree of assurance of message completion required or desired (person-to-person vs. station-to-station). While these variations have postal analogues in terms of registered mail, some certified mail, return receipt requested-certified, and business reply mail, comparisons are difficult.

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[10] Jeffrey Rohlfs. Economically-Efficient Bell System Pricing. Bell Laboratories, Murray Hill, New Jersey, 1978, Bell Labs Economic Discussion Paper 138. (Also appears as Attachment 4 to a letter from AT&T to Congressman Van Deerlin, October 31, 1978.)

[11] The traditional simplicity of postal pricing may be more of a vice than a virtue in economic terms. See U.S. Postal Service, op. cit., Appendix III.

Figure IV - 4

1977 MTS Interstate Rate Schedule

ISSUED JULY 1, 1977

LONG LINES—SCHEDULE NO. 1
INTRA U.S.—MAINLAND

RATE TABLE

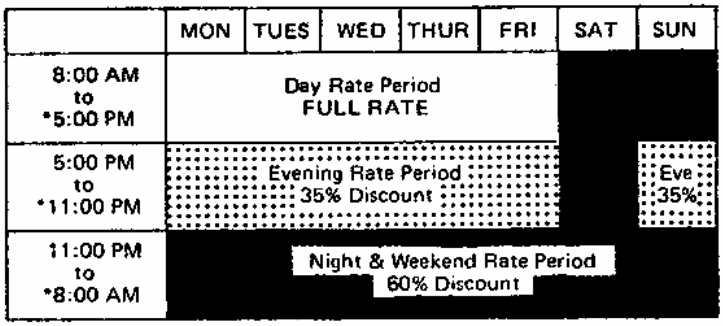
Intra U.S.—Mainland Message Telephone Mileages and Corresponding Rates

DIAL STATION-TO-STATION, OPERATOR STATION-TO-STATION, PERSON-TO-PERSON

RATE MILEAGE	RATE STEP	# DIAL STATION-TO-STATION INITIAL PERIOD 1 MIN			OPERATOR HANDLED		APPROX. ADDL. MIN. ALL MESSAGES EACH ADDITIONAL MINUTE		
					Station-To-Station	Person-To-Person			
					ALL DAYS, ALL HOURS			**	**
		Day	Evening 35% Discount	Night 60% Discount	Initial 3 Minutes	Initial 3 Minutes	Day	Evening 35% Discount	Night 60% Discount
1 - 10	01	.19	.12	.07	.45	1.45	.09	.06	.04
11 - 16	02	.23	.14	.09	.60	1.60	.12	.08	.05
17 - 22	03	.27	.17	.10	.80	1.80	.14	.10	.06
23 - 30	04	.31	.20	.12	1.00	2.00	.18	.12	.08
31 - 40	05	.35	.22	.14	1.10	2.10	.21	.14	.09
41 - 55	06	.39	.25	.15	1.35	2.35	.25	.17	.10
56 - 70	07	.41	.26	.16	1.60	2.60	.27	.18	.11
71 - 124	08	.43	.27	.17	1.75	2.75	.29	.19	.12
125 - 196	09	.44	.28	.17	1.85	2.85	.30	.20	.12
197 - 292	10	.46	.29	.18	1.95	2.95	.32	.21	.13
293 - 430	11	.48	.31	.19	2.00	3.05	.34	.23	.14
431 - 925	12	.50	.32	.20	2.05	3.15	.34	.23	.14
926 - 1910	13	.52	.33	.20	2.15	3.30	.36	.24	.15
1911 - 3000	14	.54	.35	.21	2.25	3.55	.38	.25	.16

**When providing these approximate amounts to customers say "The rate is approximately _____cents for each additional minute". (Rates are maximum and actual additional minute charges may be less due to discount rounding down.)

RATE DISCOUNTS AND APPLICATION PERIODS



DISCOUNTS

Discounts apply to total charges for Dial Station-to-Station messages and to total Additional Minute Charges only for Operator Station-to-Station and Person-to-Person messages with total fractional amounts rounded down to the lower cent.

* to but not including

Applicable only to sent paid calls dialed from a business or residence telephone or calls placed from such telephones with an operator where facilities are not available for dial completion.

Source: AT&T Long Lines Tariff Schedule, 1977

RATE SCHEDULE
EFFECTIVE SEPTEMBER 13, 1977

While the MTS Interstate rate structure does employ mileage or distance-sensitive pricing, the mileage bands themselves are "universal". Thus a 225-mile call between New York and Washington is charged the same as a 225-mile call between Minot, North Dakota, and Aberdeen, South Dakota, although it can be argued that volumes on the former link would result in lower marginal costs than on the latter.

As noted in IV.4, above, the price structure for letter mail has been changed a number of times in the last decade. The Interstate MTS rate structure has been changed more dramatically. Major changes in the MTS structure include:

1 - Redefinition of rate periods to include an "evening" period (Rate Period 2) between 6:00 and 8:00 pm (1965), changed to 5:00 pm to 7:00 pm (1969), and expanded to 5:00 pm to 11:00 pm (1971);

2 - Narrowing the weekend period (Rate Period 4) by redefining Sunday evening to the "evening" period (1971);

3 - Institution of "customer-dialed" rates (1971);

4 - Implementation of one-minute minimum rates (vs. three minutes) for calls at night (1971), and implementing one-minute minimum rates for all other rate periods (1975);

5 - Consolidation of night and weekend rates (Rate Periods 3 and 4) (1975).

The Interstate MTS schedule for 1977 consists of 70 rates for the first increment of usage (ranging from seven cents to $3.55). Going to the second increment of usage (in minutes) produces another 42 discrete rates (ranging from 11 cents to $3.93, including the first increment).

Unfortunately -- for research purposes -- this is but the first layer of the onion for telephone pricing. Interstate users also may arrange for Foreign Exchange Service (FX), WATS and PLS. Some of these services, moreover, might be purchased from Specialized Common Carriers. Pricing of these services also varies by rate period, volume, mileage band and origination of the call (In-WATS vs. Out-WATS).

b. Price trends and projections

MTS Interstate rates have changed substantially in recent years, but the direction of the price change depends upon the duration and distance of a specific call and the rate period in which it is made.

Figure IV-5 illustrates the changing pattern of Interstate MTS rates for a three-minute daytime call as reflected in the tariff schedules for 1961, 1971, and 1977. Figure IV-6 illustrates the pattern of rates for a three-minute call between nine and eleven pm on a weeknight for the same years. Figure IV-7 shows the "cheapest" rate available for calling a given distance for 1961, 1971, and 1977, assuming that the caller can complete his message in the minimum increment of time and schedule his call in the rate period that offers the lowest price.

These illustrations suggest a number of observations concerning Interstate MTS rates:

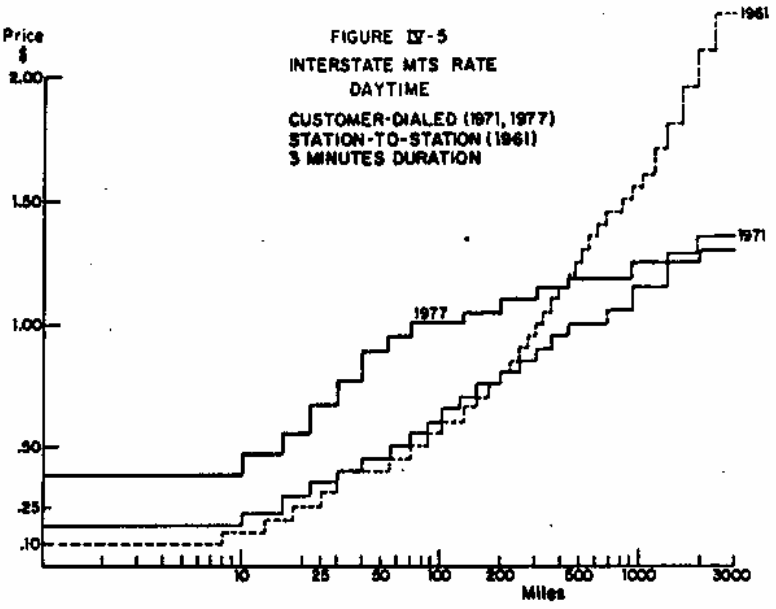


FIGURE IV-5
INTERSTATE MTS RATE
DAYTIME
CUSTOMER-DIALED (1971, 1977)
STATION-TO-STATION (1961)
3 MINUTES DURATION

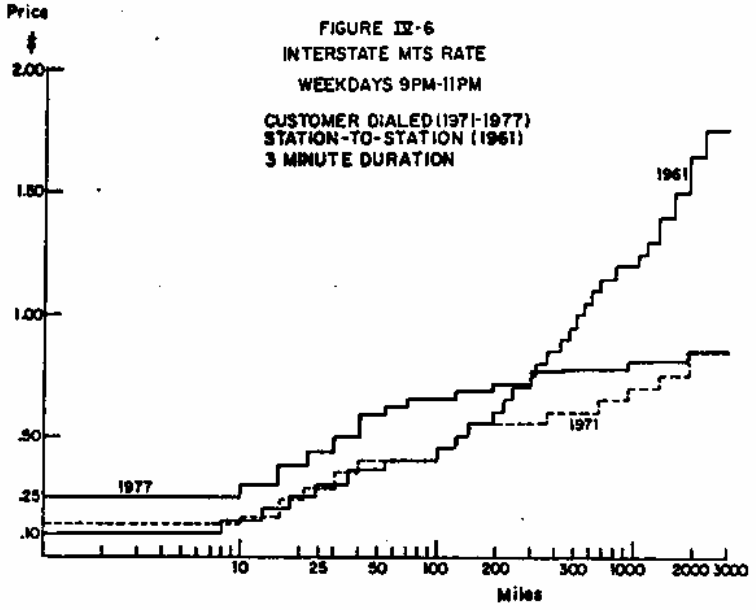


FIGURE IV-6
INTERSTATE MTS RATE
WEEKDAYS 9PM-11PM
CUSTOMER DIALED (1971-1977)
STATION-TO-STATION (1961)
3 MINUTE DURATION

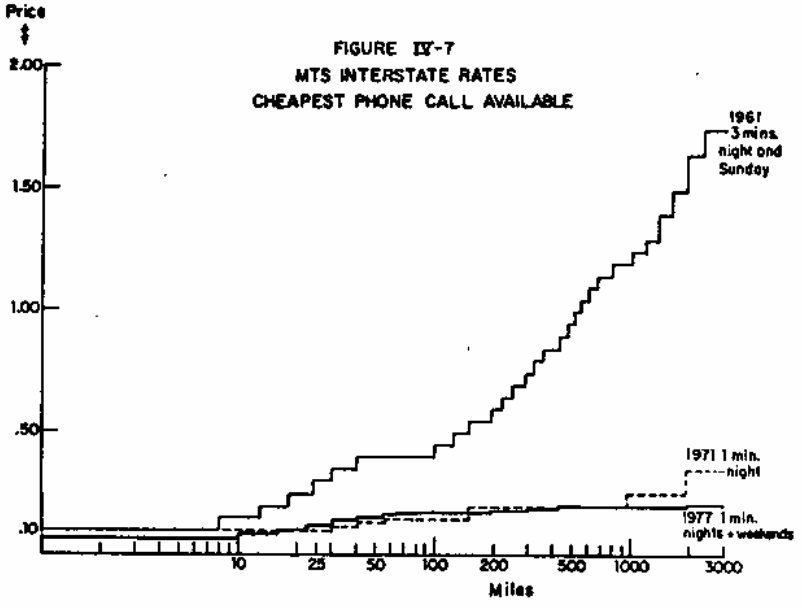


FIGURE IV-7
MTS INTERSTATE RATES
CHEAPEST PHONE CALL AVAILABLE

Source: National Association of Regulatory Utility Commissioners. Long-Distance Telephone Rates, Washington, D.C., December 1977, Table 51; June 1971, Table 52, p. 80; and November 1971, Table 54.

1 - Between 1961 and 1971, rates for a three-minute call during the prime daytime period declined significantly for calls going more than 250 miles and increased slightly for most calls going shorter distances.

2 - Between 1971 and 1977, rates for a three-minute daytime call declined slightly for calls going beyond 1360 miles and climbed significantly in all other mileage bands.

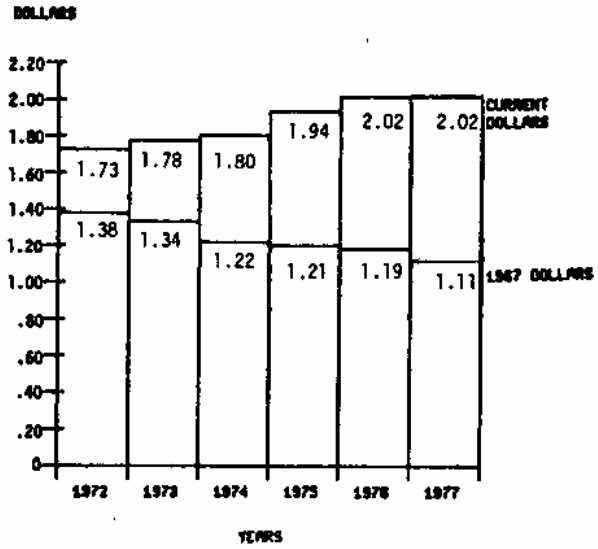
3 - A similar pattern appears for calls placed after 9:00 pm on weekdays. The implementation of "after 9:00" rates in May 1963 resulted in substantial rate reductions for calls going beyond 220 miles. Rates for calls of more than 196 miles were reduced even more between 1963 and 1971. Between 1971 and 1977, however, there have been significant rate increases in all calls travelling less than 1910 miles.

4 - The "minimum" rate available fell for all mileage bands between 1961 and 1977 because of the implementation of one-minute minimum rates.

Figure IV-8 illustrates the 1972-1977 trend in ARPM:

Figure IV - 8

HTS INTERSTATE
AVERAGE REVENUE PER MESSAGE



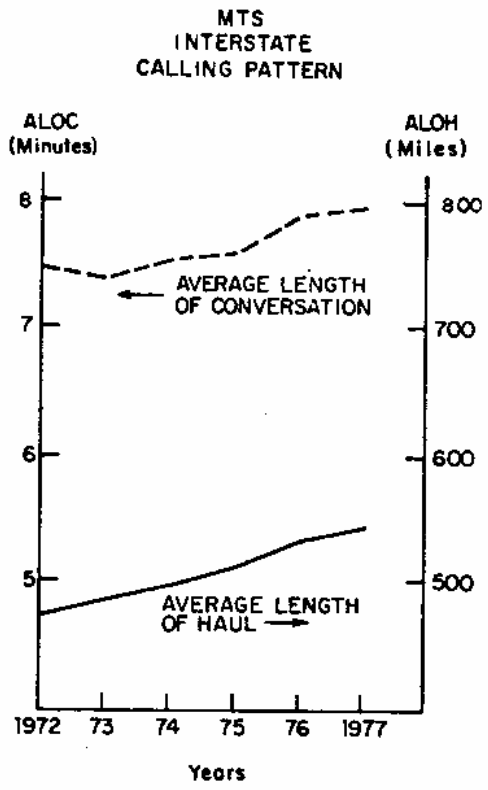
Source: AT&T sample, annualized

Viewed in terms of current dollars, ARPM has climbed substantially while dropping in constant 1967 dollars. While this pattern superficially suggests a simple commentary on inflation, it actually represents two countervailing trends:

1 - Part of the nominal increase in average revenue per message is a function of increases in the average length of haul (ALOH) and average length of conversation (ALOC) as shown in Figure IV-9.

2 - The nominal increase in ARPM probably has been retarded by implementation of sub-three-minute rates and the relative stability of nominal prices for longer distances and for nights and weekends.

Figure IV - 9



Source: AT&T sample, annualized

The increase in the nominal average revenue per message also is attributable to the combination of usage patterns with the pattern of rate increases. Figures IV-10, IV-11 and IV-12 illustrate the 1977 distribution of MTS Interstate calls by distance and duration. Review of these patterns suggests that rate increases have been applied to those mileage bands where volume is greatest and rate decreases or rate stabilization have been applied to mileage bands where volume was lowest. Implementation of sub-three-minute rates has offered lower rates for some users, but most calls, being longer than two minutes, have been subjected to higher rates.

It should be noted that changes in MTS Interstate rates are related to system utilization. Figure IV-13 illustrates the 1977 pattern of telephone calling in relation to the overall telephone system capacity. The

Figure IV - 10

1977

DISTRIBUTION OF TOTAL MTS INTERSTATE LONG DISTANCE MESSAGES BY MILEAGE

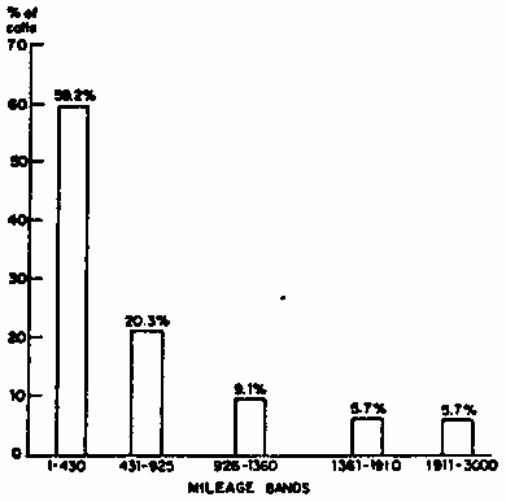


Figure IV - 11

1977

DISTRIBUTION OF TOTAL MTS INTERSTATE LONG DISTANCE MESSAGES BY DURATION

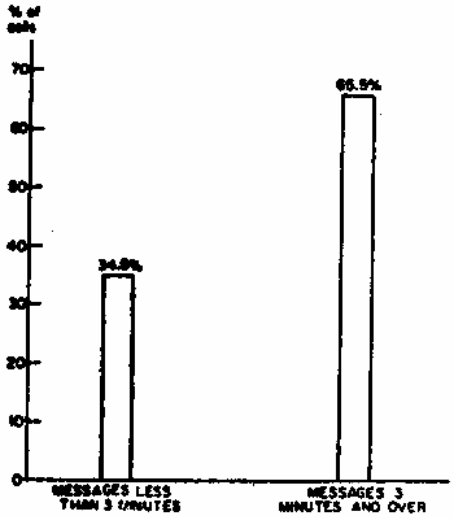
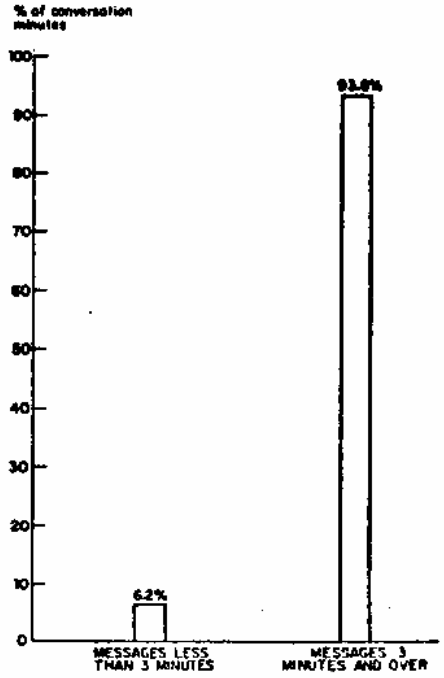


Figure IV - 12

1977

DISTRIBUTION OF TOTAL MTS INTERSTATE CONVERSATION MINUTES BY DURATION OF MESSAGE



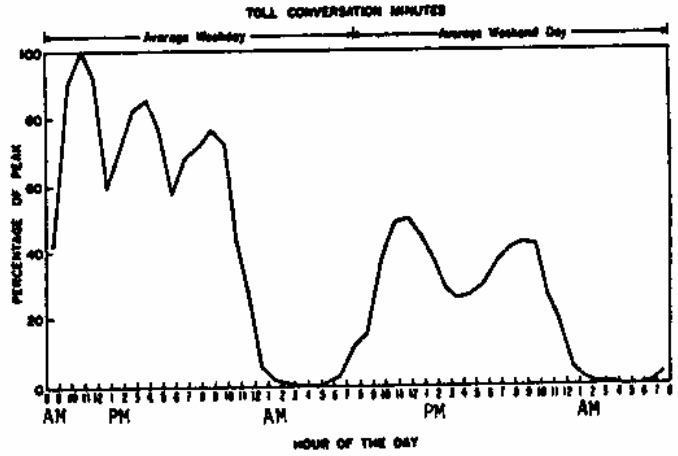
Source: AT&T sample, annualized

general trend in MTS Interstate price changes between 1961 and 1977 appears to minimize use at peak periods and encourage use during off-peak periods (see Figures IV-5, 6 and 7).

Figure IV - 13

Calling Patterns as Functions of When Calls are Made

(New York Telephone Co.)



Source: New York Public Service Commission. Testimony of Yog R. Varma on Category Cost Study, Case No. 26426, Albany, NY, September 4, 1975.

The future of MTS Interstate prices is cloudy. The application of new technologies in electronic switching, satellite transmission, optical fibers, etc., and growing competitive pressures probably can be expected to produce an overall downward trend in prices. Legislative and regulatory developments might result in exceptions to this pattern. For example, modification or elimination of universal mileage band pricing could result in price increases for calls between remote or low-volume exchanges.

c. Intrastate price structure

Compared to Intrastate MTS pricing, MTS Interstate rates are a simple matter. A single body, the Federal Communications Commission, approves the rates for each class of service. The structure of Intrastate toll rates represents a picture of fifty-fold complexity.

In 1977, for example, only six of the 48 contiguous states used the same mileage band pricing as used by the FCC for Interstate MTS. Three states had Intrastate MTS rates higher than Interstate tolls for equivalent mileages. Intrastate MTS tolls for 11 states were consistently lower than Interstate tariffs. The remaining 28 states had Intrastate MTS rates which were higher than Interstate rates for some distances and lower than Interstate rates for others.[12]

Rates for Intrastate MTS vary among states in other, less obvious, ways. Rate period definitions vary among states, and so do policies for determining the basic local exchange area. Rates for WATS and Private Line Services vary likewise.

Using average revenue per message as a surrogate, it appears that MTS Intrastate rates, like Interstate rates, have climbed in nominal terms while falling in terms of constant 1967 dollars (Figure IV-14). It should be noted that the nominal ARPM for Intrastate calls has increased more than that for Interstate calls between 1972 and 1977 (24% vs. 17%) despite the relative stability in the average length of call and the average length of haul for Intrastate messages (Figure IV-15).

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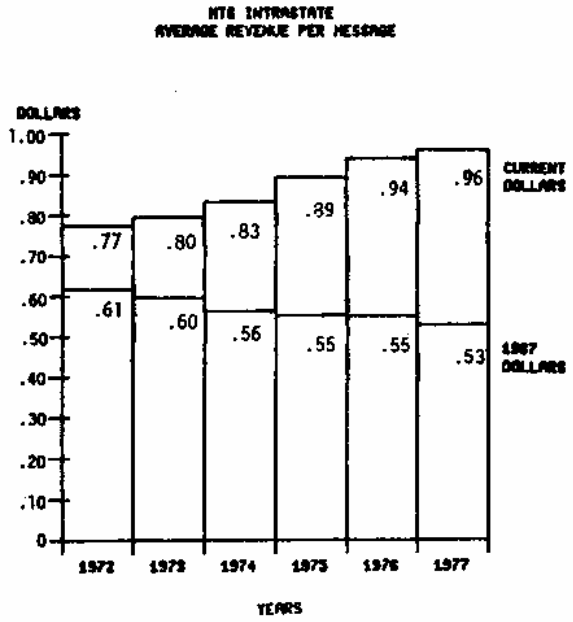
12 AT&T. Federal-State Joint Board, Request No. JB-50, April 1, 1977.

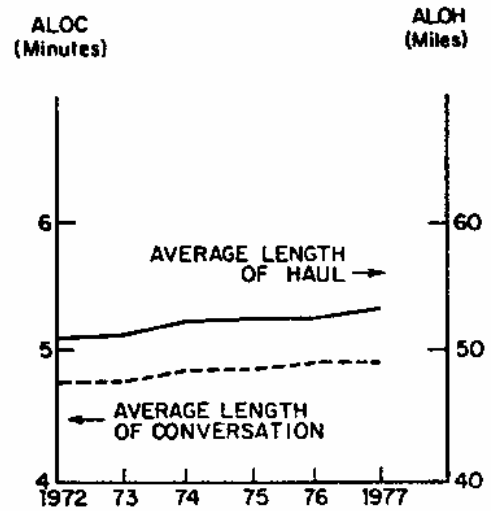
Figure IV - 14



Source: AT&T sample, annualized

Figure IV - 15

MTS
INTRASTATE
CALLING PATTERN



Source: AT&T sample, annualized

If generalizing on current Intrastate telephone pricing is difficult, projecting changes is impossible. Since Intrastate toll services normally use the same telephone terminal equipment, the same wires and the same switching equipment as local telephones and Interstate toll service, Intrastate pricing is dependent upon cost allocation procedures and pricing policies for those services. The future price of Intrastate toll services, therefore, will depend upon a variety of decisions concerning the public value and efficiency of monopoly and competition in the telephone industry generally.

V. TRENDS IN LETTER MAIL USE AND PERCEIVED PRICE EFFECTS

In 1967, Postmaster General Lawrence F. O'Brien stated:

> Without any additional mail revolutions to complicate matters we will be facing a flood-tide of 100 billion pieces of mail within a few years.[13]

In 1977, Postmaster General Benjamin Bailar said:

> Perhaps the most important issue facing the Postal Service is that the long term economic viability of the system is very seriously threatened by a number of factors largely beyond our control. One is that mail volume may well have reached its all-time peak ...unless rates are kept artificially low through higher subsidies.[14]

While these statements refer to mail in general, they describe a shift in letter mail use as well. The contrast between them suggests that the demand for letter mail services underwent significant change between 1967 and 1977. This chapter reviews the historical trend in letter mail use and the perceived effects of postage price increases.

Figure V-1 depicts annual letter mail volumes between 1950 and 1977. For the entire period, letter mail volume grew by 109%, a compound average growth rate of 2.8% per year.

Figure V-1 also indicates that the trend in letter mail use has not been consistent over time. During the 1963 - 1970 period, letter mail volume increased at an average annual rate of 4.5%; between 1970 and 1977 the rate was less than 1%. (See Appendix A for annual volumes and rates of change.)

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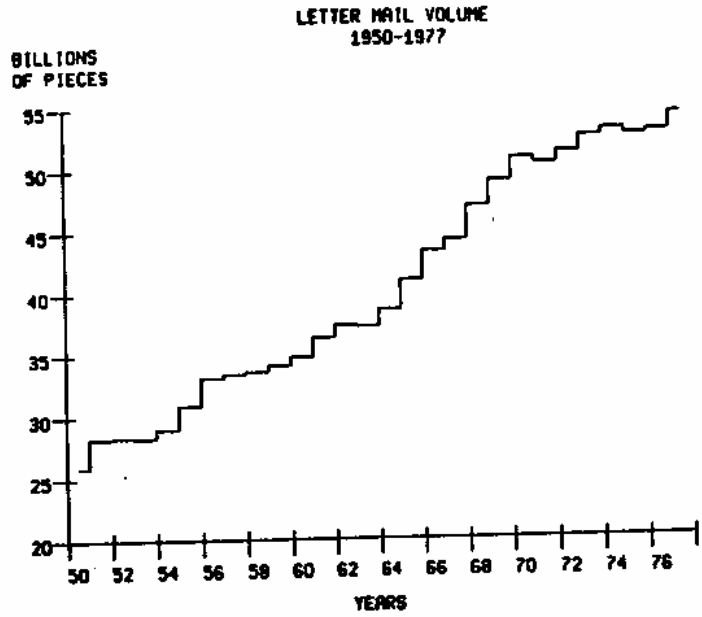
[13] Speech, PMG Lawrence F. O'Brien, "Briefing for Industry", Departmental Auditorium, Washington, D.C., November 3, 1967.

[14] Speech, PMG Benjamin F. Bailar, "Facing Reality: Hard Choices and Tough Decisions", Comstock Club, Sacramento, Calif., February 7, 1977.

Figure V - 1



IN THIS REPORT, UNLESS OTHERWISE NOTED, "LETTER MAIL" INCLUDES FIRST CLASS AND AIR MAIL.

Source: U.S. Postal Service

Actual letter mail volume for 1977 was 54.2 billion pieces. As shown in Table V-1, this represents a considerable shortfall from the volume which might be expected based upon historical trends.

Table V-1

Projected 1977 Letter Mail Volume Based Upon Historical Trends

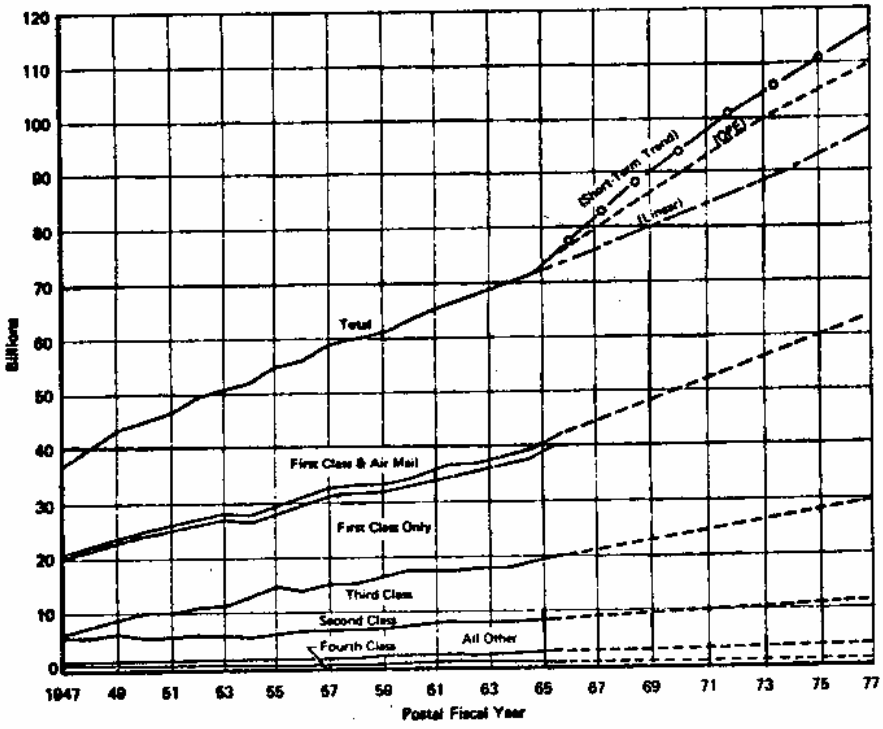
Period	Actual Average Annual Rate of Growth	Projected 1977 Volume
1950 - 1970	2.8%	62 billion pieces
1960 - 1970	3.8%	66 billion pieces
1963 - 1970	4.5%	69 billion pieces

Growth during the 1970 - 1977 period also fell considerably short of earlier projections. In 1968, for example, the Report of the President's Commission on Postal Reorganization included a ten-year projection of mail volumes. As shown in Figure V-2, this report projected letter mail volume (First Class and Airmail) to reach 64 billion pieces by 1977 -- compared to the actual 1977 volume of 54 billion pieces.

Figure V -2

Mail Volume By Classes

1968 Projection



Source: Post Office Department and Arthur D. Little, Inc.

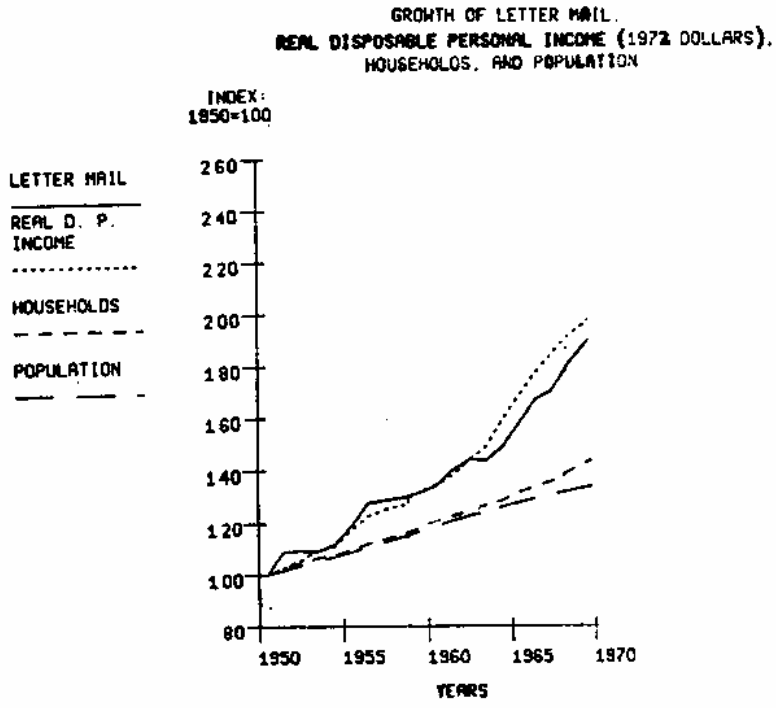
FIGURE 8.1.2 MAIL VOLUME BY CLASSES

Source: Arthur D. Little, Inc., "Forecasts of Postal Volume and Postal System Requirements," Annex to the Report of the President's Commission on Postal Organization," Vol. 4, June 1968, p. 8.4.

The actual letter mail volume for 1977 was somewhere between eight billion and 15 billion pieces less than that which might be expected based upon earlier trends and forecasts. Little wonder, then, that Postmaster General Bailar foresaw a long-term erosion in the demand for letter mail service in his speech of February 1977.

Defining the "demand" for letter mail service is a complex task. As with all goods and services, the demand for letter mail service is shaped by macro-economic and demographic forces. Figure V-3 portrays the growth of letter mail volume between 1950 and 1970 compared to the growth in Real Disposable Personal Income (1972 dollars), households and population. During this period the growth of letter mail volume (up 96%) exhibits a high correlation with the growth in Real Disposable Personal Income (up 105%). This suggests that the income of mail users has been a major determinant of the demand for letter mail service.

Figure V - 3

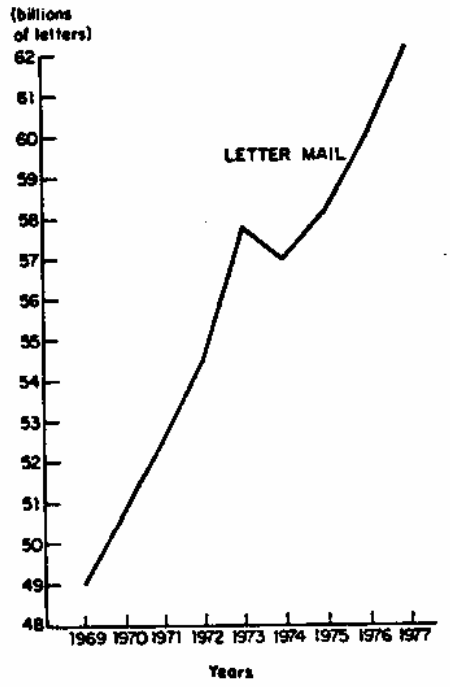


Source: U.S. Postal Service

User income, as measured by Real DPI, increased at a lesser rate during the 1970's than during the 1950's and 1960's (3.2% per year vs. 3.7% per year). Between 1960 and 1969, letter mail volume increased by .9% for each 1% increase in Real DPI. Figure V-4 depicts an extrapolation of this projected trend from 1969 to 1977. Using this approach, the letter mail volume for 1977 -- 62.3 billion pieces -- is consonant with the 1968 projection of mail volume, given slower economic growth during the 1970's.

Figure V - 4

EXTRAPOLATIONS OF LETTER MAIL VOLUME
BASED UPON ECONOMIC GROWTH
1969 - 1977

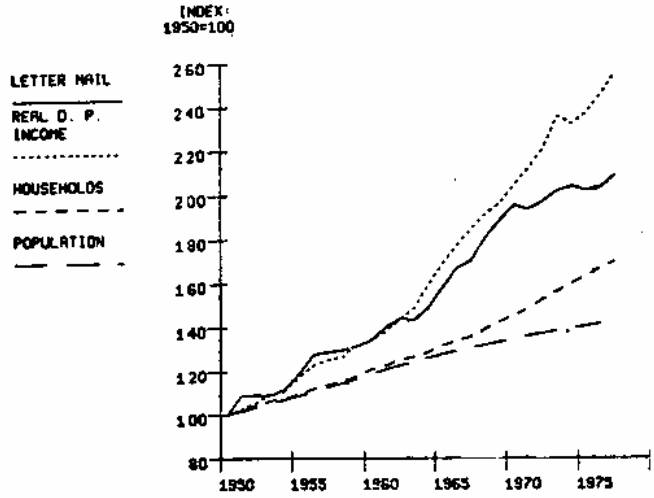


Source: PIRP

The declining rate of income growth during the 1970's seems to account for only a small portion of the decline in the rate of letter mail growth. Instead, as shown in Figure V-5 and Table V-2, the historical correlation between letter mail volume and DPI has deteriorated since 1970.

Figure V - 5

GROWTH OF LETTER MAIL, REAL DISPOSABLE INCOME (1972 DOLLARS), HOUSEHOLDS, AND POPULATION



Source: U.S. Postal Service

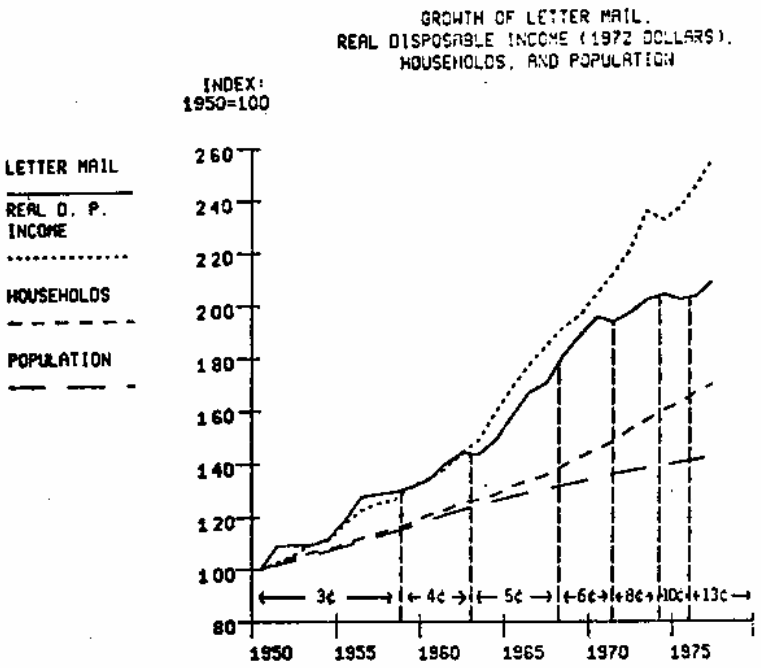
Table V-2

Growth in Letter Mail Volume Compared to Economic Growth

Period	% Change in Letter Mail Volume	% Change in DPI (1972 $)	% Change in Letter Mail Volume for Each 1% Change in Real DPI
1950 - 1960	34.2%	34.7%	.986
1960 - 1970	45.9%	52.2%	.879
1970 - 1977	6.9%	24.9%	.277

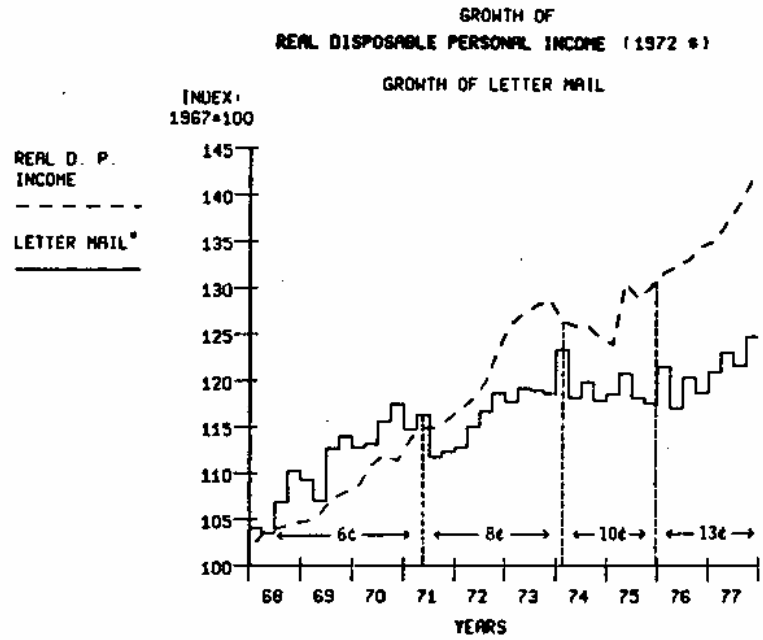
Part of this changing relationship appears to be directly related to the increasing frequency and magnitude of postage rate increases as shown in Figures V-6 and V-7.

Figure V - 6



Source: U.S. Postal Service

Figure V - 7



Source: U.S. Postal Service

Table V-3 summarizes letter mail volume behavior preceding and following major changes in letter mail prices. As indicated in the table, most of these rate increases depressed volume growth during the year (four calendar quarters) following the increase. (The exceptional case of the January 7, 1968, increase is discussed below.)

With the exception of the March 2, 1974, case, the second year following a rate increase exhibited volume growth rates higher than those in the year preceding the rate increase. The overall pattern suggests that rate increases suppress demand for one year, with the "lost" volume being partially "recovered" within the second year.

The increased frequency of rate increases during the 1970's appears to have disrupted this cyclical process. The December 1975 rate increase, which followed the March 1974 increase by 22 months, seemingly retarded any significant "recovery" of mail volume during the second year following the March 1974 increase.

If mailers have reduced letter mail use in reaction to postage rate increases (as opposed to declining real income), their behavior suggests the existence of options to letter mail service. Such options hypothetically include:

1 - the use of Postal services other than Airmail and First Class Mail;

2 - the use of physical delivery services other than those of the United States Postal Service;

3 - the choice to "not communicate";

Table V-3

% Changes in Letter Mail Volume and Real DPI
Preceding and Following Letter Mail Rate Increases[15]

Rate Change	Date	Letter Mail Volume Change Year Preceding Increase	DPI Change Year Preceding Increase	Letter Mail Volume Change Year Following Increase	DPI Change Year Following Increase	Letter Mail Volume Change 2nd Year Following Increase	DPI Change 2nd Year Following Increase
FCM 3¢ to 4¢	8-1-58	1.8	0.7	0	3.9	2.8	2.5
FCM 4¢ to 5¢	1-7-63	2.8	4.2	-0.3	3.4	3.7	7.1
FCM 5¢ to 6¢	1-7-68	2.0	4.1	6.2	3.8	4.3	2.5
FCM 6¢ to 8¢	5-16-71	2.6	4.0	-2.7	3.1	4.5	6.7
FCM 8¢ to 10¢	3-2-74	2.6	4.7	-1.2	-2.0	0.8	4.2
FCM 10¢ to 13¢	12-31-75	-0.9	2.1	0.6	3.5	2.7	4.1

15. Letter mail volumes are based upon quarterly samples but postage rate increases have been implemented in mid-quarter. Since some mailers can advance mailings to "beat" a scheduled increase, a mid-quarter rate increase may appear to coincide with significant quarterly volume increases as shown for 1971 and 1974 in Figure V-7. In order to account for this phenomenon, annual rates of change as shown in Table V-3 are calculated from the quarter following the 1971 and 1974 rate increases.

4 - the use of telecommunications (including telephone services) as a substitute for letter mail.

The fourth option is discussed in greater detail in Chapters VII and VIII of this report. The balance of this chapter is devoted to a preliminary exploration of the other three options.

Substitution of Other USPS Mail Services for Airmail and First Class Mail

Messages may be sent through the U.S. Postal Service by means other than Airmail or First Class Mail. Third Class Mail, for example, serves as a potential substitute for some message transmission.[16]

A review of Third Class Mail volumes does not indicate any obvious pattern of substitution that would explain the decay in letter mail volume growth between 1970 and 1977.[17] Specifically:

1 - "Single Piece Rate" Third Class Mail volume declined throughout the 1970 - 1977 period.

2 - The volume of "Bulk Rate Regular (BRR)" Third Class Mail increased at a slightly greater rate (+12.0%) than that of Airmail and First Class Mail (+10.3%) between 1970 and 1977, but that rate of increase was considerably less than that experienced for Bulk Rate Regular volume during the 1960's. The increase of

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[16] Second Class Mail is used primarily for transmission of weekly and monthly publications. Fourth Class Mail is used primarily for shipping "parcels" or merchandise.

[17] Appendix B contains volume and rate data for Third Class Mail. The volume figures and rates of change cited within this section are based upon fiscal year data, since quarterly data for the subclasses of Third Class Mail were not available to us for years prior to 1975.

First Class Mail rates from six cents to eight cents in 1971 appears to have triggered a short-term shift of volume from First Class to Bulk Rate Regular Third Class. By 1977, however, BRR Third Class volume equalled 31% of FCM volume -- the same as the 1970 volume relationship. Overall, BRR Third Class volume increased by only 1.8 billion pieces between 1970 and 1977, suggesting no major transfer of Airmail or First Class Mail to this service.

3 - The volume of "Non-Profit Bulk Rate" Third Class Mail increased rapidly between 1970 and 1977 (up 66%), but this appears commensurate with growth before 1970. It seems likely that little, if any, of the 2.6 billion pieces of Non-Profit Bulk Rate Third Class Mail added during this period represents a shift from Airmail or First Class Mail use.

Other "postal" services such as Express Mail and Mailgram handle such small volumes (Fiscal Year 1977 combined total volume was 39 million pieces) that they could not represent significant alternatives to the use of Airmail and First Class Mail.[18]

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[18] There is the possibility that volume data at the sub-class level mask demand changes. The volume of Bulk Rate Regular Third Class Mail might be increasing along historical trend lines, for example, while the composition of the total volume includes gains from former First Class Mail and losses of advertising volume to other media including pre-printed newspaper inserts. We are unaware of any information that would document such shifts.

Substitution of "Non-USPS" Physical Delivery Services

The transmission of letters by means other than the U.S. Postal Service is restricted by the existence of the Private Express Statutes (PES), or the "postal monopoly". These statutes effectively prohibit anyone from carrying letters for compensation except under a few special conditions.[19]

Employees of an organization may deliver letters originated by that organization. This type of service (frequently called "self-delivery") is used occasionally by public utilities to deliver bills, or local governments to deliver annual reports, tax bills, etc. The desirability and cost-effectiveness of self-delivery is limited because letters delivered in this manner may not be deposited in recipients' mail boxes because of PES restrictions. While climbing postage rates stimulated many organizations to experiment with self-delivery during the 1970's, this mode of delivery does not appear to account for major changes in letter mail volumes. A 1978 study conducted for the Postal Service estimated that only 18 to 56 million pieces annually were being delivered in this manner.[20] Apparently the need to use special packaging (plastic bags to affix to doorknobs, etc.), customer complaints and other disadvantages resulting from the prohibition on mail box usage have prevented major diversions of letters to self-delivery. It also appears likely that the USPS discount for pre-sorting First Class

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[19] The Private Express Statutes and Their Administration (Washington, D.C.: U.S. Postal Service), June 1973, provides a reprint of the statutes, a review of their history and extensive discussion of their interpretation by USPS and the courts.

[20] The subject study was incomplete in June 1979. This estimated volume range was a preliminary figure provided by Charles C. McBride, General Manager, Mail Classification Research Division, USPS, Washington, D.C.

Mail reduces the economic advantage of self-delivery because it is most attractive for high-density local mailings.

Another exception to the Private Express Statutes allows any third party to offer letter mail delivery service, provided that the Postal Service has been paid the appropriate postage for all the letters being carried. This exception might be used by a mailer who encloses a letter within a package shipped by United Parcel Service. It also is used by mailers who use private courier services on a regular basis.[21] Since there is no centralized reporting of postage paid for this specific purpose, it is impossible to determine whether substantial letter mail volume has been diverted to such private transmission during the 1970's. It seems unlikely, however, that postage rate increases have triggered significant diversion to this mode because mailers resorting to this alternative are faced with paying the increasing cost of postage for First Class Mail, plus the fees of the private carrier.[22]

The Private Express Statutes also provide an exception from the postal monopoly for intracompany mail carried by employees of the company. Many corporations, state governments, universities and other institutions operate internal "intracompany" letter mail delivery services under this exception.

It is not inconceivable that intracompany mail systems have grown to accommodate much of the letter mail "lost" to USPS during the 1970's. The available data, however, present a confusing picture. Xerox Corporation,

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[21] Private special messenger service is excepted from the postal monopoly when not used on a regular basis and when the messenger carries less than 25 letters.

[22] It should be noted that the use of private courier services might be driven not by price, but by mailers' needs for faster or more dependable service than that offered by USPS.

for example, estimated that there were 50.3 billion pages of intracompany documents in 1976, with 16.0 billion (32% of total) distributed by First Class Mail and 34.3 billion (68%) distributed by private mail systems.[23] A 1978 study by Communications Studies and Planning, Limited, (CSP) estimated that there were 10.1 billion items of intracompany mail. Of this 10.1 billion items, CSP estimates that USPS delivers 7.4 billion items and that private systems deliver 2.7 billion items.[24] A 1968 study by Arthur D. Little (ADL) estimated that the U.S. Post Office delivered approximately 1.0 billion pieces of intracompany mail (excluding that going to salesmen's homes), of which .9 billion pieces were Airmail or First Class Mail and .14 billion pieces "bulk supplies and promotions" sent by Third or Fourth Class.[25] (This study did not quantify private delivery of intracompany mail.)

A comparison of the 1968 data from ADL with the 1978 report by CSP would suggest that intracompany letter mail volume handled by USPS has increased by more than 700% in the intervening decade. The Xerox estimate of 16.0 billion pages of intracompany mail distributed by USPS as First Class Mail in 1976 cannot be compared directly to items or pieces, but if we arbitrarily assumed that the average intracompany First Class Mail item consisted of three pages, we would find that intracompany letter mail volumes handled by USPS had increased at a far greater rate (+489% between 1968 and 1976) than that of First Class Mail overall (+12.5% for the same period).

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[23] As reported by Autotransaction Industry Report 6 (March 5, 1979), International Data Corporation, Waltham, Ma.

[24] Data from a proprietary study of the market for electronic message systems provided by Stephen Connell, Director, Communications Studies and Planning, Ltd., London, March 1979.

[25] Report of the President's Commission on Postal Organization, June 1968, Annex, Vol. II, Table 3.7, pp. 3-16.

While the data are confusing and incomplete, it appears that intra-company postal services, self-delivery and courier services have not expanded sufficiently during the 1970's to explain the slowing growth rate of USPS letter mail volume since 1970.

Choosing to "Not Communicate"

While increases in postage rates may cause mailers to seek other means of communicating, it also seems possible that rate increases may cause some mailers to simply stop sending letters. There is at least one historical case to illustrate the nature of this process.

Prior to January 1968, mailers could send seasonal greeting cards in unsealed envelopes via Single Piece Rate (SPR) Third Class Mail for one cent less per piece than postage for First Class Mail. As part of the January 1968 general increase in postage rates, the first step in Single Piece Rate Third Class postage was realigned to match the basic rate for First Class Mail. The rate for First Class Mail was increased from five cents to six cents, and postage for Single Piece Rate Third Class was raised from four cents to six cents.

In the ensuing year, SPR Third Class volume plummeted from three billion pieces annually (FY 1968) to one billion pieces (FY 1969). Despite rate increases, the total volume of Airmail and First Class Mail jumped by 2.9 billion pieces over the same interval. (For comparison, the volume of Airmail and First Class Mail increased by 1.0 billion pieces between FY 1967 and FY 1968.) These figures would indicate a massive shift of volume from SPR Third Class to First Class Mail.

Inspection of quarterly data, however, suggests that much of the SPR Third Class volume was not transferred to First Class Mail. Much of the

increase in First Class volume did occur in the fourth quarter of the year, as one might expect in looking for a shift in the mailing of seasonal greeting cards. First Class volume increased by 1.1 billion pieces, or 10%, between the fourth quarter of 1968 and 1969, compared to a 5.3% rate of increase for the balance of fiscal 1969. If First Class Mail had increased at the same rate in the fourth quarter as it did for the balance of the year, total First Class and Airmail volume would have increased by 2.4 billion pieces instead of the 2.9 billion-piece increase actually recorded.

It appears likely that this "extra" increase of 0.5 billion pieces of First Class Mail in the fourth quarter represents cards formerly mailed via Single Piece Rate Third Class Mail. Thus of the 2.0 billion piece decline in SPR Third Class volume, it appears that 1.5 billion pieces were lost to the system. Apparently many mailers simply trimmed their mailing of greeting cards when the postage rate was raised from four cents to six cents.

In summary, the growth rate of letter mail volume declined markedly between 1970 and 1977 following 20 years of substantial and relatively consistent growth. While a decline in the growth rate of Disposable Personal Income may explain a small portion of this trend, frequent and substantial postage rate increases appear to have suppressed and occasionally reversed the long-term growth of letter mail volumes. The slowing of letter mail volume growth is not explained by inordinate growth in Third Class Mail volumes, nor in other physical delivery services. It is quite possible that some mailers have reacted to increased postage rates by ceasing to send messages.

Following chapters of this study review recent trends in telephone use and explore the possibility that the post-1970 trend in letter mail volume may be explained by telephone substitution.

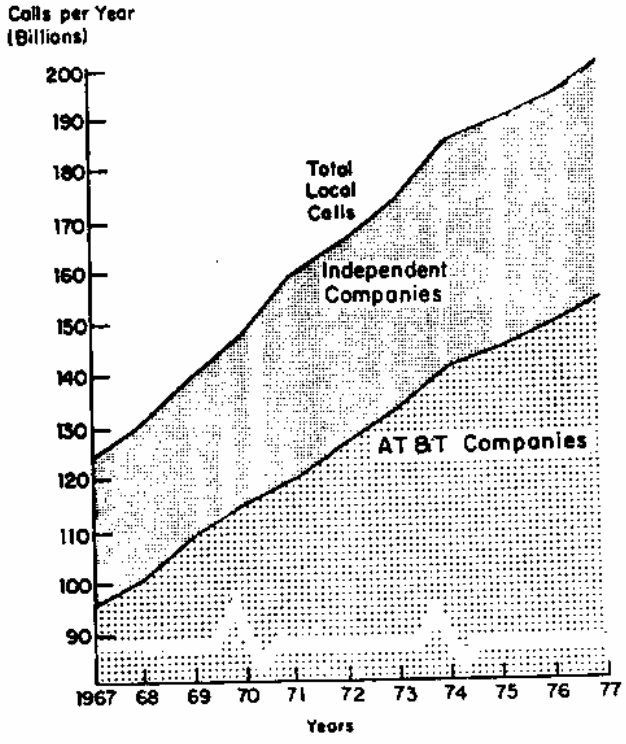
VI. TRENDS IN TELEPHONE USAGE AND PERCEIVED PRICE EFFECTS

A. Local Telephone Service

As discussed previously (Chapter IV), most telephone customers receive local telephone service on a "flat rate" pricing basis. Because of this, and because the real price of local telephone service has changed little in recent years (Figures IV-2 and IV-3), price has not been a deterrent to usage.[26] Figure VI-1 shows the 1967 - 1977 trend for local telephone use.

Figure VI - 1

RECENT TRENDS IN LOCAL TELEPHONE CALLING



Source: AT&T and U.S. Department of Commerce, Bureau of the Census. Statistical Abstract of the United States, 1977. Washington, DC, 1977, p. 574.

[26] This is not to suggest that telephone customers are indifferent to nominal price changes. Data presented later in this chapter indicate measurable customer reaction to price changes for toll service. Likewise, AT&T demand studies indicate significant customer responsiveness to price changes for local service (personal communication with F. E. Nolan, AT&T, New York). It seems unlikely, however, that a telephone user provided service under flat rate pricing will hesitate to make another local call.

Figure VI-2 compares the 1967 - 1977 growth in local telephone calls to the growth in Real Disposable Personal Income, households, and the number of telephones (main and equivalent main) during the same period. This figure suggests:

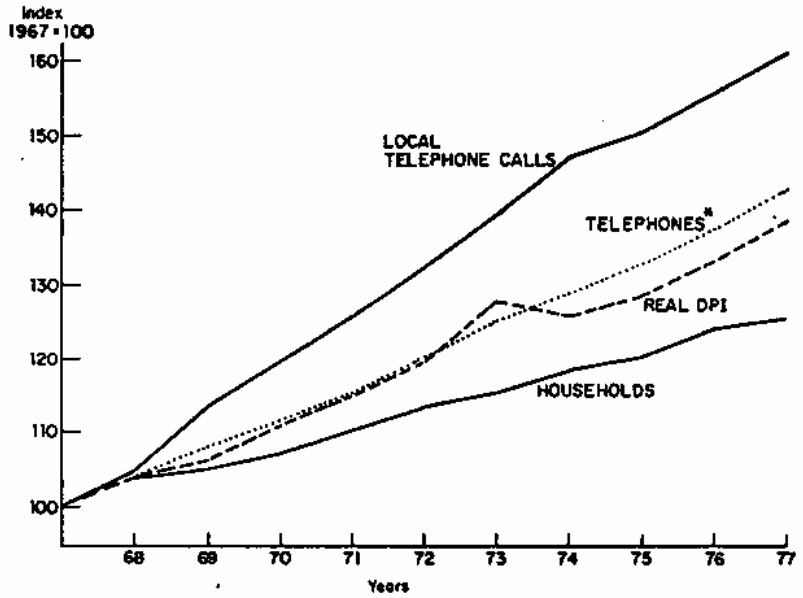
1 - A substantial portion of the growth in the number of telephone calls is the result of new telephones being added to the system.

2 - The growth in the number of households accounts for only 60% of the growth in the number of telephones.

3 - The growth in the number of telephones is closely related to the growth in Real DPI.

Figure VI - 2

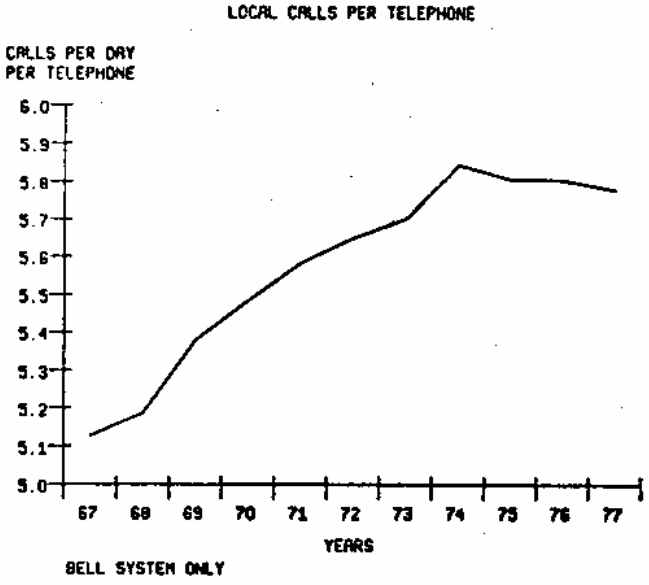
GROWTH IN LOCAL TELEPHONE CALLS, 1967-1977 COMPARED TO GROWTH IN REAL DPI, HOUSEHOLDS AND NUMBER OF TELEPHONES



Source: AT&T
(Bell System Only)
*MAIN AND EQUIVALENT MAIN

Figure VI-3 illustrates local telephone use in relation to the number of telephones (main and equivalent main) installed.

Figure VI - 3



Source: AT&T

There is a growing body of literature suggesting that increased application of usage-sensitive pricing for local telephone service (or Local Measured Service) would suppress or moderate the growth in demand for local telephone service.[27]

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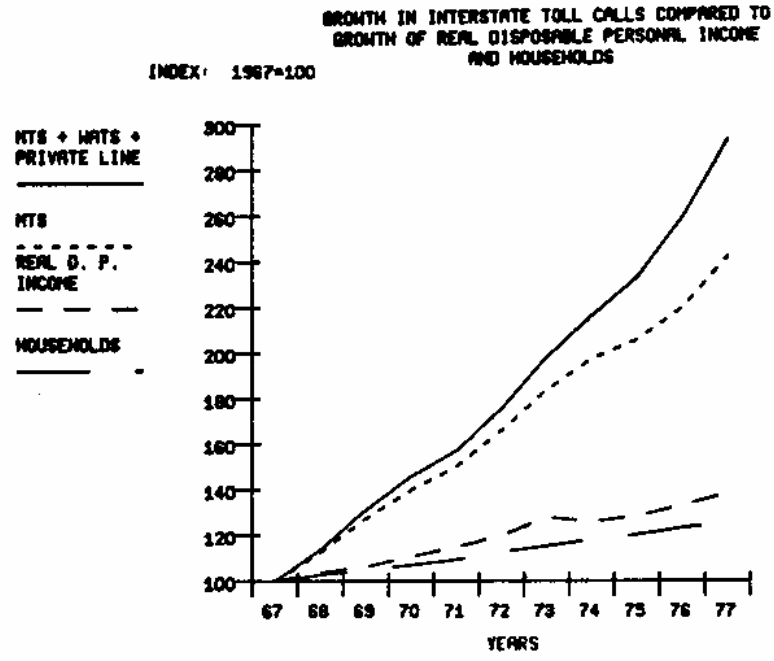
[27] Mitchell, B. M., "Telephone Call Pricing in Europe: Localizing the Pulse," The RAND Corporation, P-6215, January,1979; Alleman, J.H., "The Pricing of Local Telephone Service," U.S. Department of Commerce, Office of Telecommunications, OT 77-14, April 1977; Alleman, J. H.; Jensik, J.; Mitchell, B. M.; and Park, R. E., "The Effect of Local Measured Service on the Distribution of Telephone Use in the GTE Illinois Experiment," Presentations at the Seventh Annual Telecommunications Policy Research Conference, Skytop, Pa., 1979.

B. Interstate Toll Service

The number of Interstate toll calls has climbed continuously for a quarter of a century. The number of Interstate MTS calls grew at a compound rate of 8.5% per year between 1950 and 1977. WATS and PLS usage has grown even more dramatically. Based on our estimates (as discussed in Chapter II), the number of WATS and PLS calls grew at a compound rate of almost 20% per year.

Figure VI-4 shows the 1967 - 1977 growth of Interstate toll calls compared to the growth in households and income during the same period, with all series indexed to 1976 = 100.

Figure VI - 4



Source: AT&T

As indicated by Figure VI-4 and the table below, the growth in Interstate toll calls has consistently exceeded the growth in common economic and demographic indicators. Viewing these indicators as leading or lagging the growth in Interstate toll calls does not produce any simple correlation, nor does use of more detailed indicators such as adult population, consumer credit, etc.

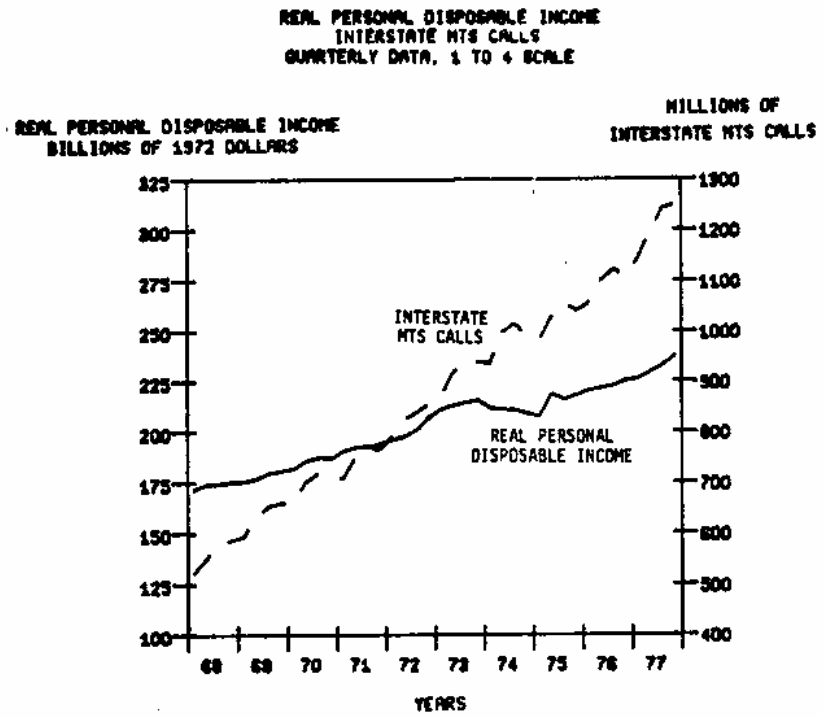
Table VI-1

Compound Annual Growth Rates

Period	Interstate MTS Calls	Interstate MTS & Est. WATS and PLS Calls	Real DPI (1972 $)	House-holds	Total U.S. Population
1950 - 1959	7.0%	7.8%	3.1%	1.7%	1.7%
1960 - 1969	10.3%	12.4%	4.3%	1.8%	1.3%
1970 - 1977	8.2%	10.5%	3.2%	2.3%	0.8%
1950 - 1977	8.5%	10.2%	3.5%	1.9%	1.3%

Figure VI-5, which compares quarterly DPI and MTS calls for 1968 through 1977, illustrates a facet of the problem of analyzing demand for Interstate MTS service. It indicates occasional sensitivity of MTS calling to changes in DPI (e.g., the downturn in calls in the second half of 1974, and the sharp upturn in mid-1975) but no simple collinearity.

Figure VI - 5

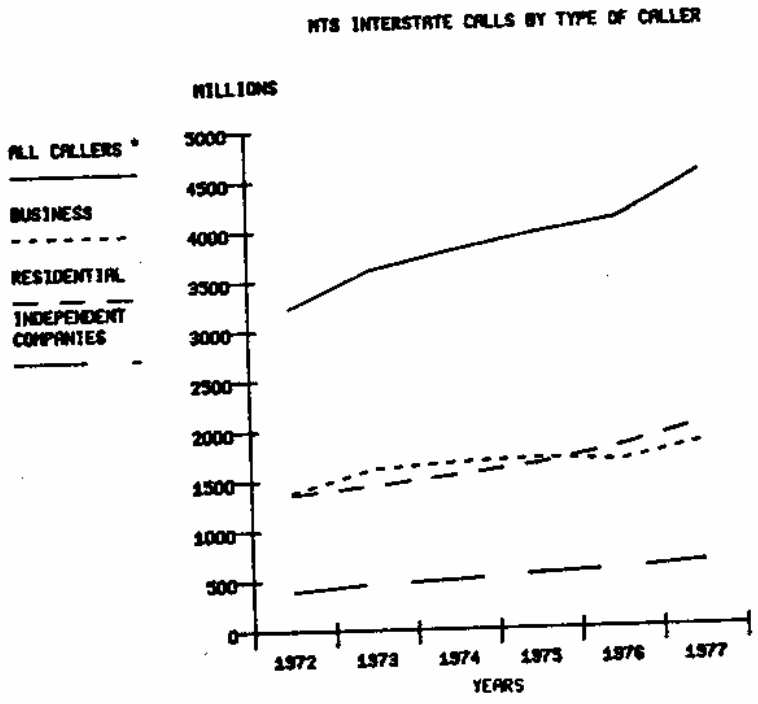


Source: AT&T

Increased regulatory pressures, attempts to introduce competition in the telecommunications industry, and the development of new technologies and services have triggered expanded research on the demand for telecommunications services. Some of this new research focuses upon the differences in demand between business callers and residences. Other studies concern correlations between the demand for telecommunications services and other activities such as intercity travel. While there is a growing body of literature on the subject, there remains considerable disagreement as to the basic importance of factors underlying demand.

In the absence of a generally accepted method for determining the long-term demand for Interstate telephone services, identifying user reaction to changes in Interstate MTS rates is difficult. Figures VI-6, 7, 8, 9 and 10 illustrate the 1972 - 1977 trends in Interstate MTS calling.

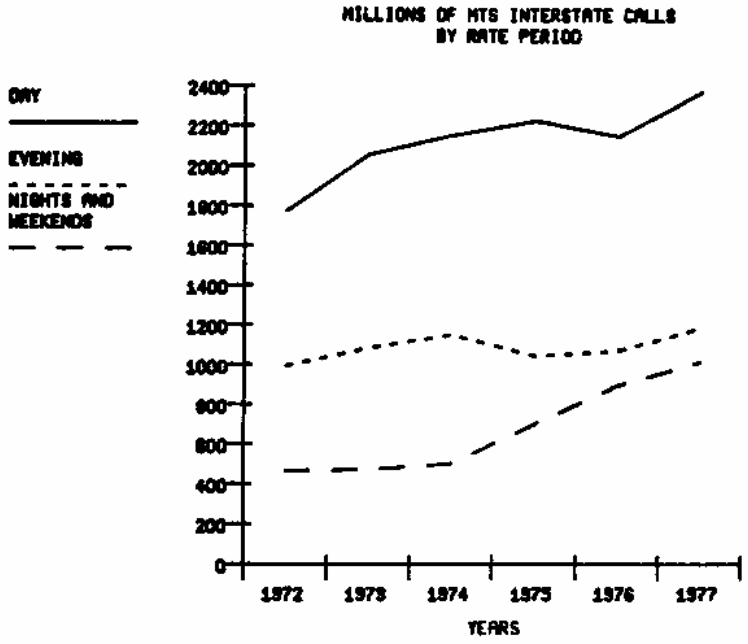
Figure VI - 6



Source: AT&T sample, annualized

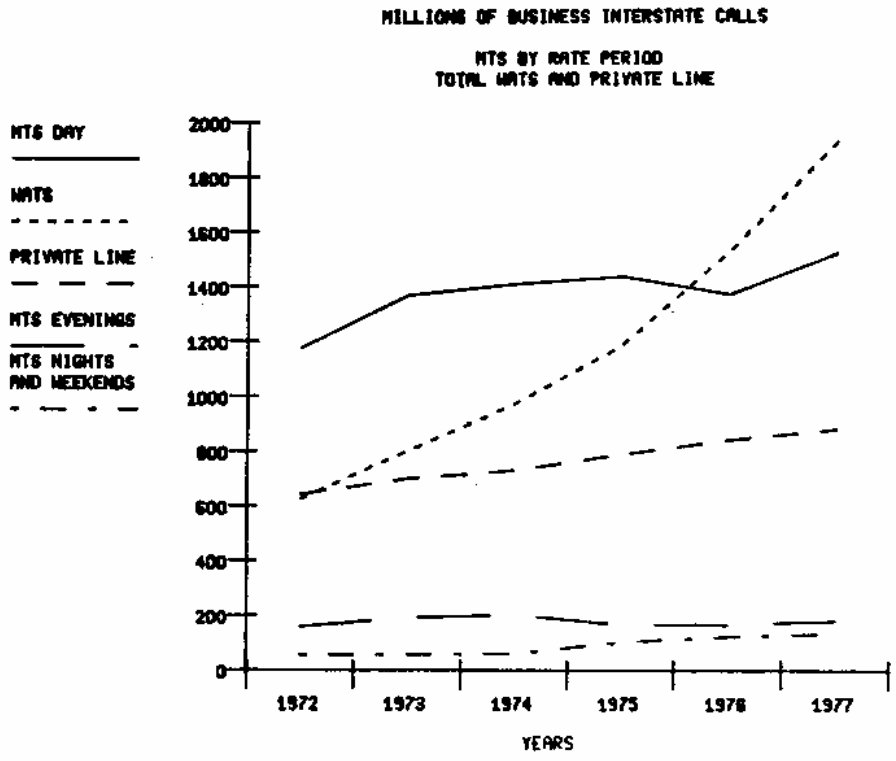
* IN THIS REPORT, "ALL CALLERS" INCLUDES PUBLIC PHONE AS WELL AS BUSINESS, RESIDENTIAL, AND INDEPENDENT COMPANY USERS.

Figure VI - 7



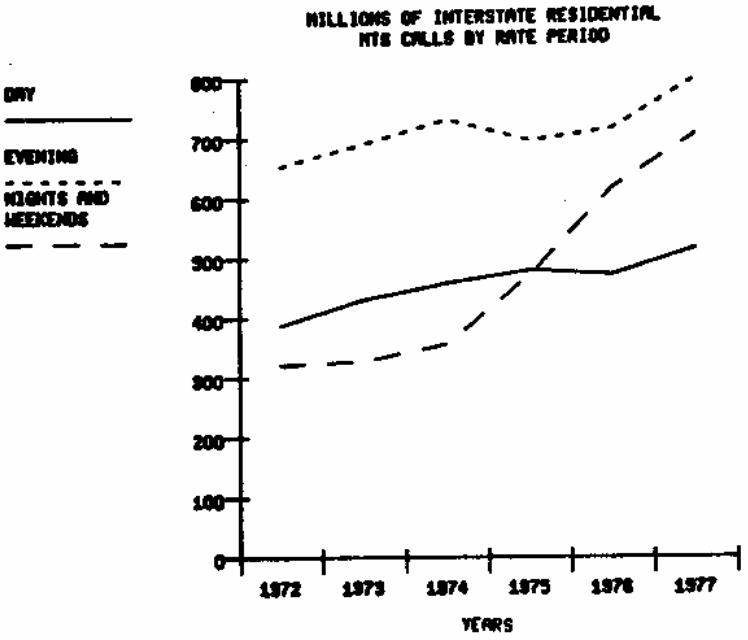
Source: AT&T sample, annualized

Figure VI - 8



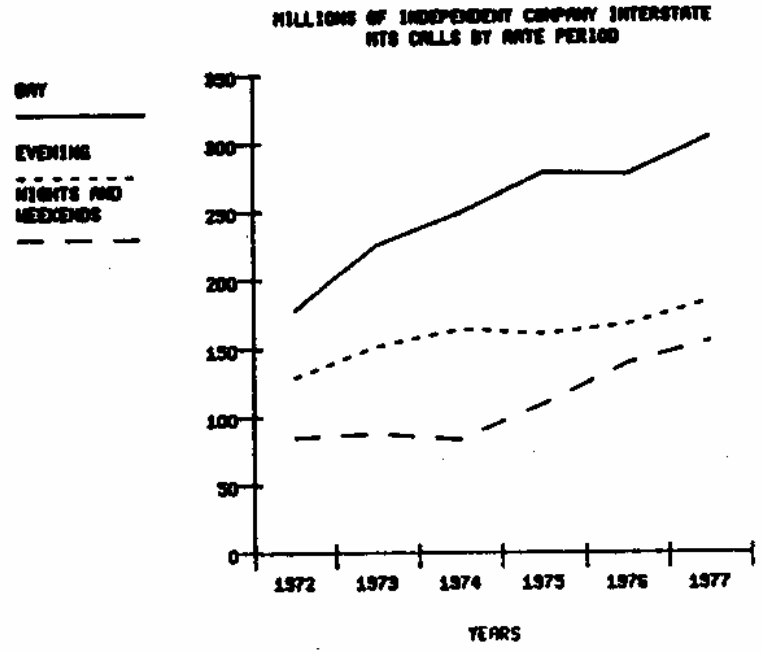
Source: AT&T sample, annualized

Figure VI - 9



Source: AT&T sample, annualized

Figure VI - 10



Source: AT&T sample, annualized

Reviewing these calling trends in light of Interstate MTS rate changes does indicate some significant user reaction. As noted in Chapter IV, MTS Interstate rates have been changed in a differentiated manner and in a number of separate steps.

Figure VI-11 illustrates the percentage change in Interstate MTS rates by rate period and mileage bands between 1973 and 1977. Comparing different periods for changes in rates (1973 - 1977) with changes in calls (1975 - 1977) is partially a matter of convenience since detailed calling data by mileage band was available to us for only the 1975 - 1977 period.

Aside from convenience, however, comparing a longer period of rate changes to a shorter period of demand makes sense if we assume that there is a lag in consumer response to price changes. Common sense would suggest the likelihood of such a lag in response to changes in Interstate MTS rates. Residential users and small businesses would recognize the rate changes by changes in their monthly bills. Eventually they would discover and react to changed rate patterns. Large business users monitoring rate matters might anticipate rate changes, but reactions, in terms of changing telecommunications services or changing business practices, would require significant time for implementation.[28]

The changes in Interstate MTS rates as shown in Figure VI-11 are based upon a customer-dialed three-minute call. Rate Period One (RP1) is 8:00 am to 5:00 pm on weekdays; Rate Period Two (RP2), 5:00 pm to 11:00 pm Sunday through Friday; and Rate Periods Three and Four (RP3 & 4)

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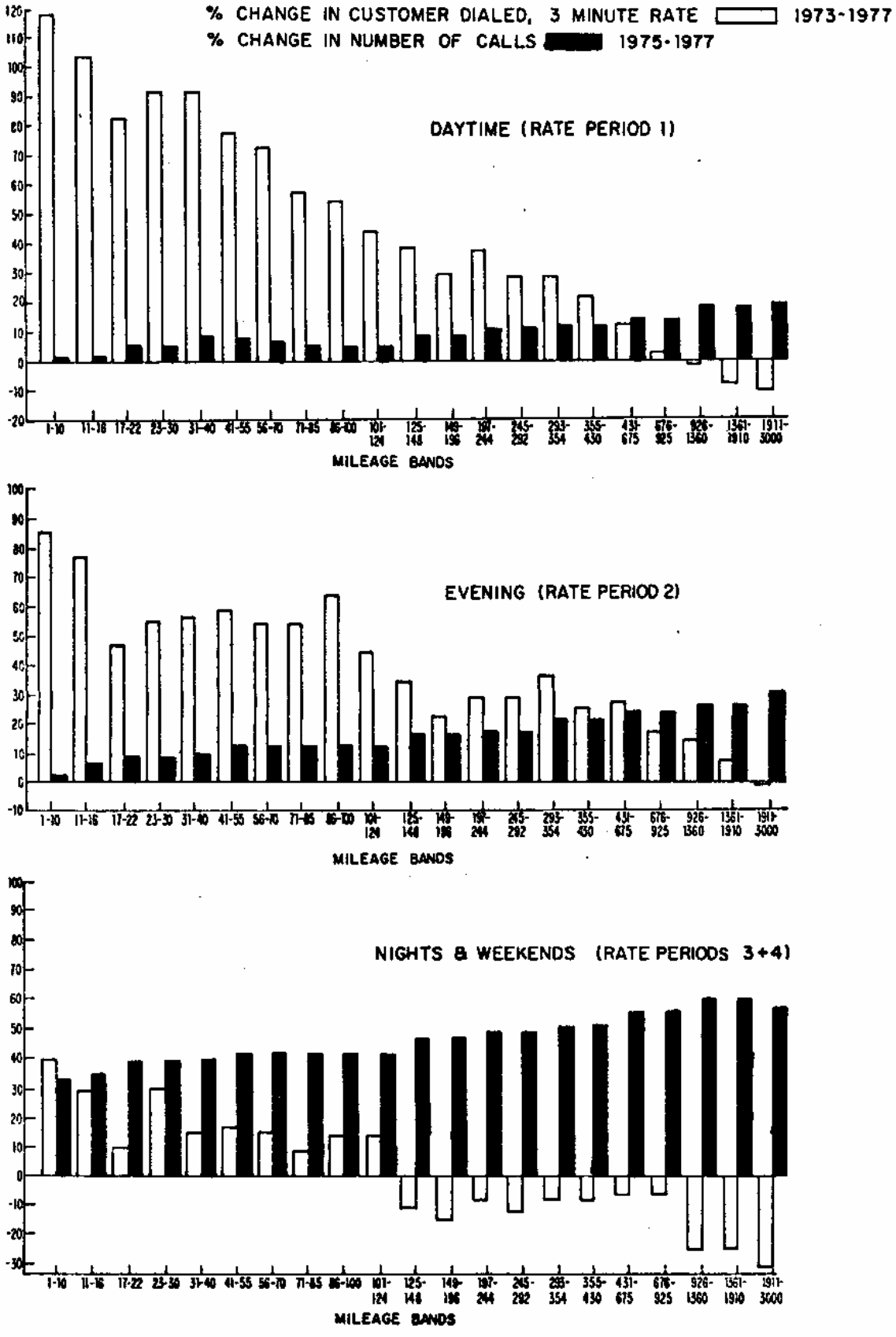
[28] For a fuller discussion of such lags -- and demand response in general -- see R. R. Auray, "Customer Response to Changes in Interstate MTS Rates," Assessing New Pricing Concepts in Public Utilities: Proceedings of the Institute of Public Utilities Ninth Annual Conference, Michigan State University, East Lansing, 1978.

Figure VI - 11

INTERSTATE MTS



Source: AT&T sample, annualized, and AT&T Long Lines Tariff Sheets

are for all nights between 11:00 pm and 8:00 am, plus all of Saturday and until 5:00 on Sunday.[29]

As shown in these figures, Interstate MTS rates have been increased substantially for most mileage bands in Rate Periods One and Two. For Rate Periods Three and Four, rates were increased for calls of less than 125 miles and cut for all calls beyond that. The rate increases for Rate Period One -- exceeding 50% on all calls of less than 101 miles -- are particularly notable because the rates in this rate period were the highest to begin with.

User response to these changes can be described as generally linear with the least increase in calling (2%) occurring in the rate period and mileage band where rates increase most (118% for RP1, 1 - 10 miles) and the highest increase in calls (56 to 62%) occurring where rates were cut the most (25 to 32% for RP3 and 4 beyond 925 miles).

While Figure VI-11 reflects rate changes implemented between 1973 and 1977, most of the significant changes during this period were the result of tariffs implemented on March 9, 1975. (See Appendix C.)

Referring back to Figure VI-7 (Interstate MTS Calls by Rate Period), one can see the decline in the number of daytime calls that occurred between 1975 and 1976. The same decline can be seen in Figures VI-8 and 9 showing business and residence calls for 1972 - 1977.

Figure VI-8 strongly suggests that business users have reacted to the large rate hikes for daytime calls primarily by vastly increased use of WATS.

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[29] As shown in Figure IV-4, p. 27, daytime rates (RP1) are highest. Evening rates (RP2) are set at 65% of the daytime rate, and the rates for nights and weekends (RP3 & 4) are set at 40% of the daytime rate.

Figure VI-9 indicates that residential users reacted to rate increases by switching calls from the evening and daytime (RP1 & 2) to nights and weekends (RP3 & 4).

User reaction among both business and residential users suggests a certain "halo" effect. Between 1975 and 1976, for example, the number of messages and the number of conversation minutes declined in daytime (RP1) mileage bands which did not experience rate increases in 1975. Presumably users reacted to rate changes during the rate period generally without precise discrimination as to the specific mileage bands which incurred rate increases. (See Appendix C.)

C. Intrastate Toll Service

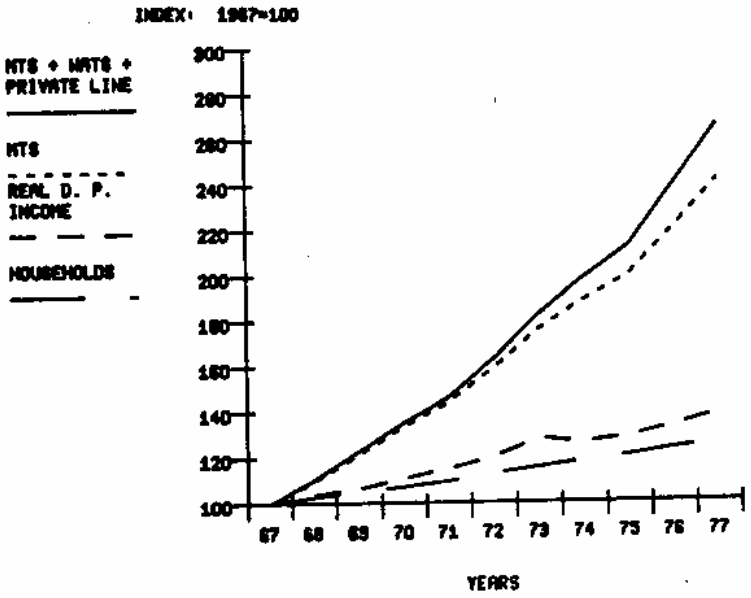
Intrastate MTS calling volumes historically dominated Interstate volumes. In 1950, for example, there were 2.7 Intrastate MTS calls for each Interstate MTS call. This dominance has declined over time. In 1960, there were 1.9 Intrastate MTS messages for each Interstate message and 1.6 by 1970, a ratio which has held almost constant through 1977.

During the 1972 - 1977 period, the volume of Intrastate MTS calls grew somewhat faster than that of Interstate MTS calls (52% vs. 46% using actual annual counts and 53% vs. 31% using sample data), while Intrastate WATS calls increased at about the same rate (210%) as Interstate WATS (209%). Intrastate Private Line calls increased much faster (93%) than Interstate PLS volumes (41%).

Figure VI-12 illustrates the 1967 - 1977 growth in Intrastate toll calling compared to the growth of Real DPI and households.

Figure VI - 12

GROWTH IN INTRASTATE TOLL CALLS COMPARED TO GROWTH OF REAL DISPOSABLE PERSONAL INCOME AND HOUSEHOLDS



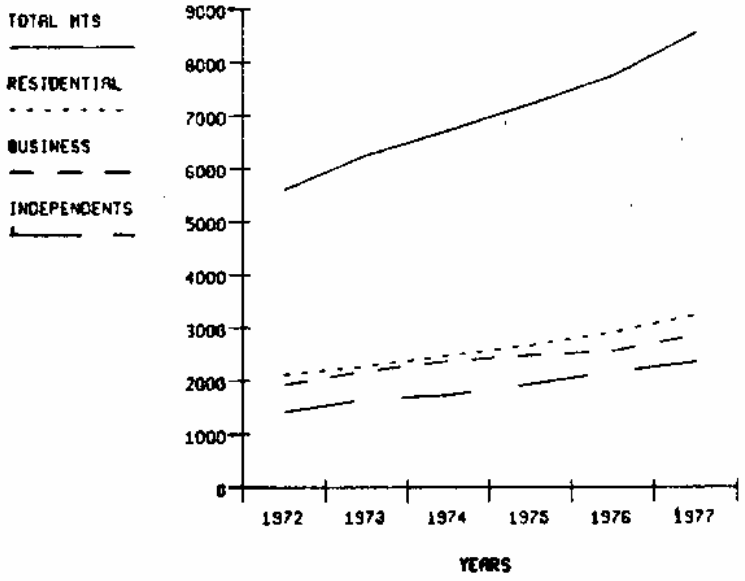
Source: AT&T

Figures VI-13 and VI-14 show recent patterns of Intrastate use by type of caller and by rate period. Figures V-15, 16 and 17 show Intrastate calling for rate periods by types of caller.

In the absence of state-by-state volume data for Intrastate MTS, it is impossible to generalize on price effects. Overall volume patterns for 1972 - 1977 suggest caller behavior similar to that observed in Interstate calling. Residential users are making proportionately more calls on nights and weekends. Business users have been increasing their use of WATS (+210%) and PLS (+93%) far faster than MTS (+49%).

Figure VI - 13

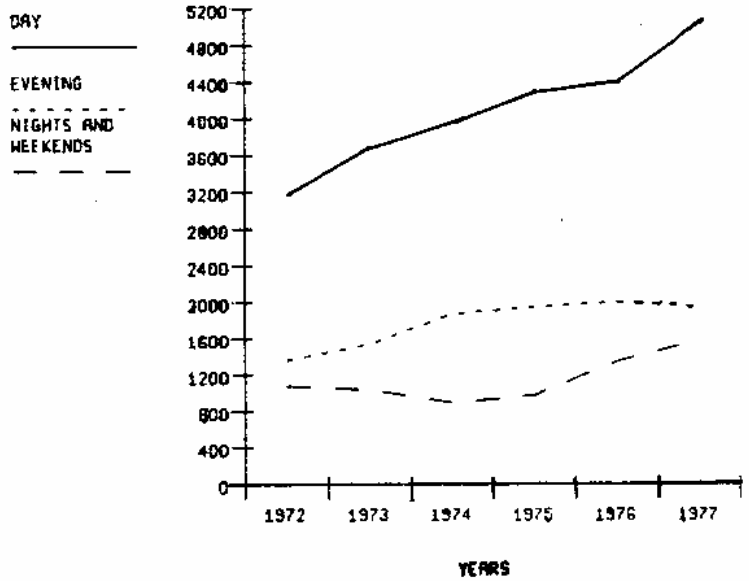
MILLIONS OF MTS INTRASTATE CALLS
BY TYPE OF CALLER



Source: AT&T sample, annualized

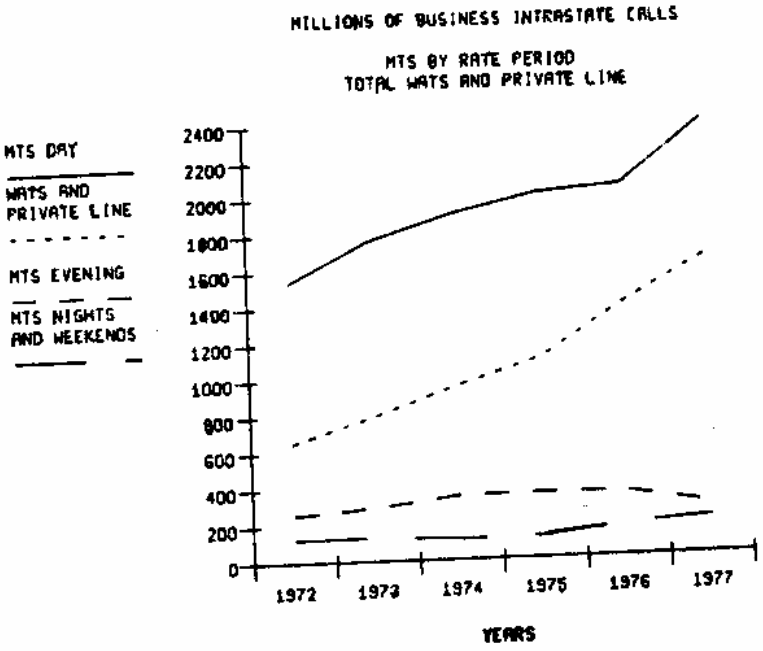
Figure VI - 14

MILLIONS OF INTRASTATE
MTS CALLS BY RATE PERIOD



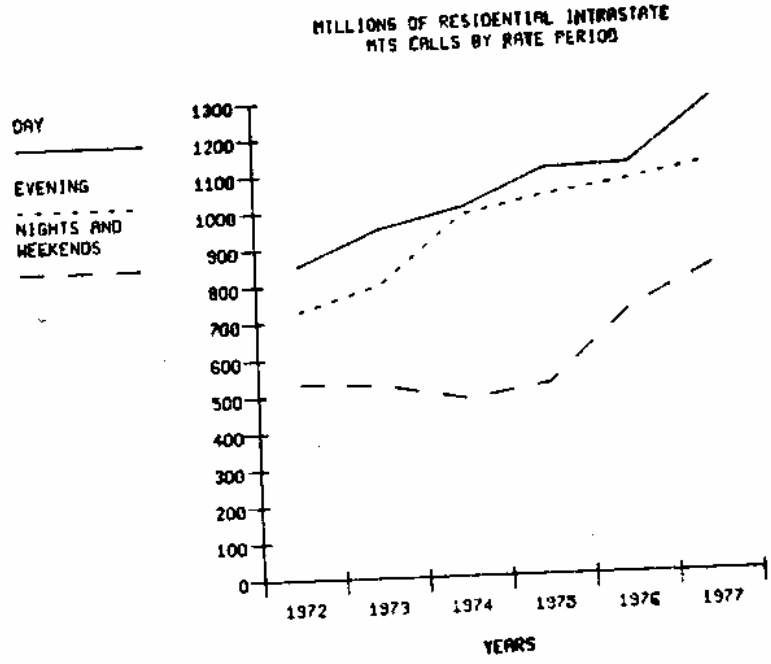
Source: AT&T sample, annualized

Figure VI - 15



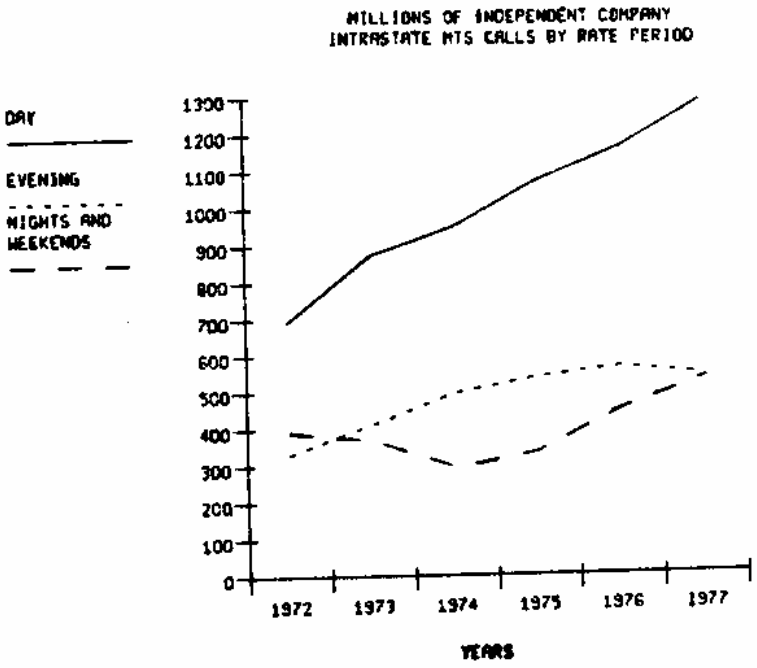
Source: AT&T sample, annualized

Figure VI - 16



Source: AT&T sample, annualized

Figure VI - 17



Source: AT&T sample, annualized

VII. INTERACTION BETWEEN LETTER MAIL AND TELEPHONE USE

Since 1970, letter mail use has stagnated while all types of telephone use have climbed markedly. Conceptually, it seems reasonable to assume that some of the growth in telephone use has been at the expense of letter mail use. This chapter reviews the comparative use of telephone and letter mail services with a view toward identifying areas where substitution may be occurring.

A. Local and Non-Local Use of Letter Mail and Telephone Services

The greatest proportion of all letters and all telephone calls are "local" (see Appendices A and D), but definitions of "local" vary between the postal and telephone systems and neither definition is constant over time.

Local telephone calls traditionally have been those originating and terminating within the same local exchange. Over time, the number of local exchanges has been reduced with a corresponding growth in the area served by individual exchanges. The process of broadening local exchange areas was the result of technology (mechanized and automated switching), demographics (particularly suburban growth), and politics (customers wishing to reach more phones without paying tolls).

In historical postal parlance, a "local" letter is one posted and delivered within the service area of the same post office. Even before attempts to concentrate mail processing activities in the 1960's, this definition of "local" was not always synonymous with telephone or governmental interpretations of "local". As a result, a letter travelling from Washington, D.C., to Bethesda, Maryland, was considered local because

Bethesda was a branch of the Washington, D.C., post office. Conversely, a letter from Manhattan to Brooklyn was non-local because each borough has a separate, "independent" post office.

Since 1963 the Postal Service has pursued a policy of concentrating mail sorting operations in large facilities in order to provide sufficient volumes to use letter sorting machines. These "sectional center facilities" or SCF's" (normally identified by the first three digits of the Zip Code) have eliminated, for operational purposes, any real meaning of "local" mail. With the evolution of SCF's, practically all mail originating in Rhode Island would be sorted in Providence with mail destined to Rhode Island addresses returned to "local" post offices for final delivery.

In some metropolitan areas, the boundaries of sectional center facilities may approximate those of a "local" telephone exchange. In many instances they do not. Moreover, the number of SCF's and their boundaries have been changed frequently over the years.

Figure VII-1 shows "local" letter mail volumes and "local" telephone calls for the 1969 - 1977 period. Figure VII-2 shows the same volume and calling data divided by Real Disposable Personal Income.

The "local" letter mail volumes shown in these figures are those reported on a quarterly basis by the USPS National Service Index. The "local" telephone data are for the Bell System only.

While these figures portray a sharp decline in "local" letter mail volumes since 1970, discussions with USPS personnel suggest that this apparent decline probably stems from definitional and reporting changes.[30] Analysis of data on Intra-SCF/Inter-SCF letter mail volumes also shows sudden

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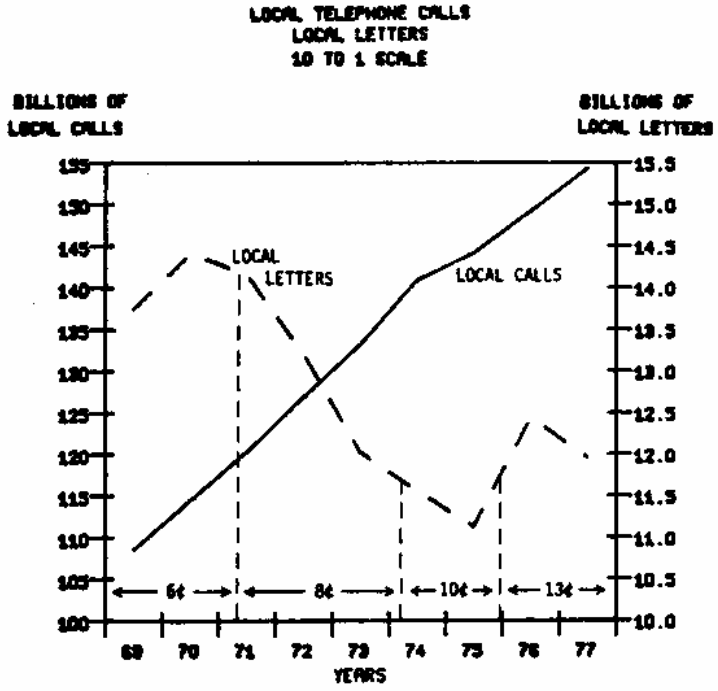
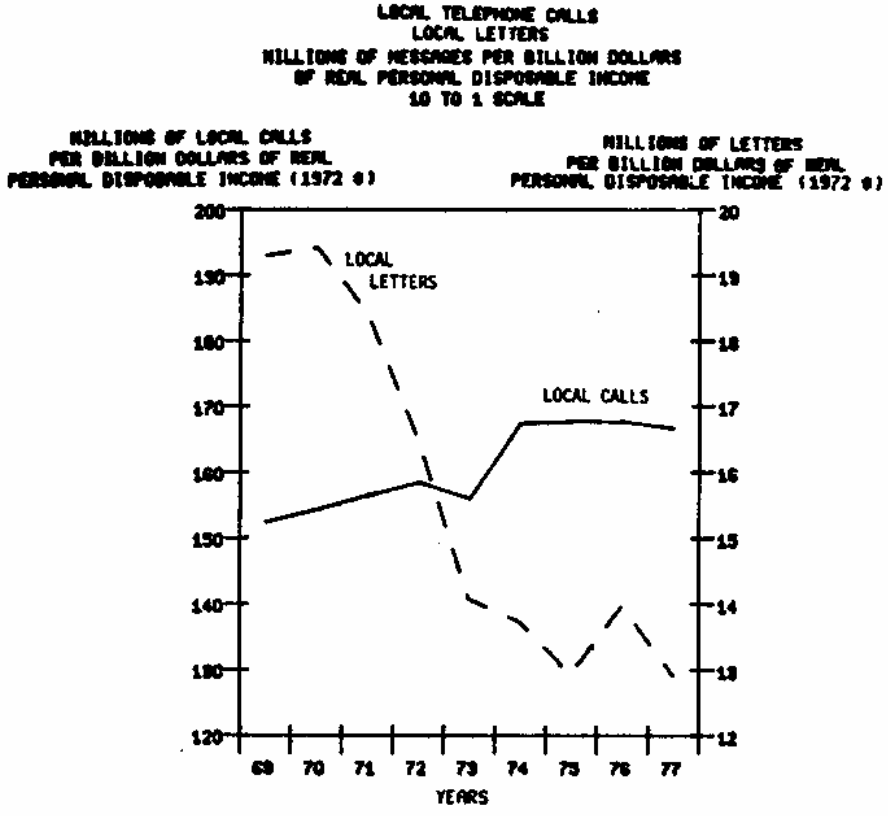
[30] Conversations and correspondence with C. Seeman, Manager, Administrative Statistics Branch, USPS, Washington, D.C., April 1978.

Figure VII - 1



Source: AT&T and U.S. Postal Service

Figure VII - 2



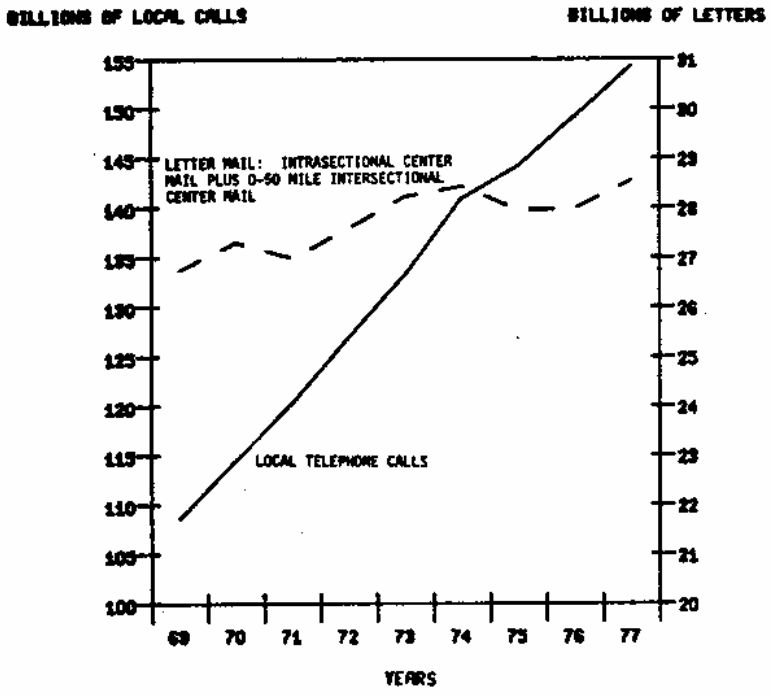
Source: AT&T and U.S. Postal Service

and dramatic shifts which are more likely to be the result of changes in data systems than changes in mailing patterns (see Appendix D).

Figures VII-3 and VII-4 show local telephone calls and letter mail volumes for all Intra-SCF mail and Inter-SCF mail travelling less than 50 miles. Assuming that most changes in SCF boundaries affect mail volumes travelling short distances, this definition may present a more accurate picture of recent trends in mail usage.

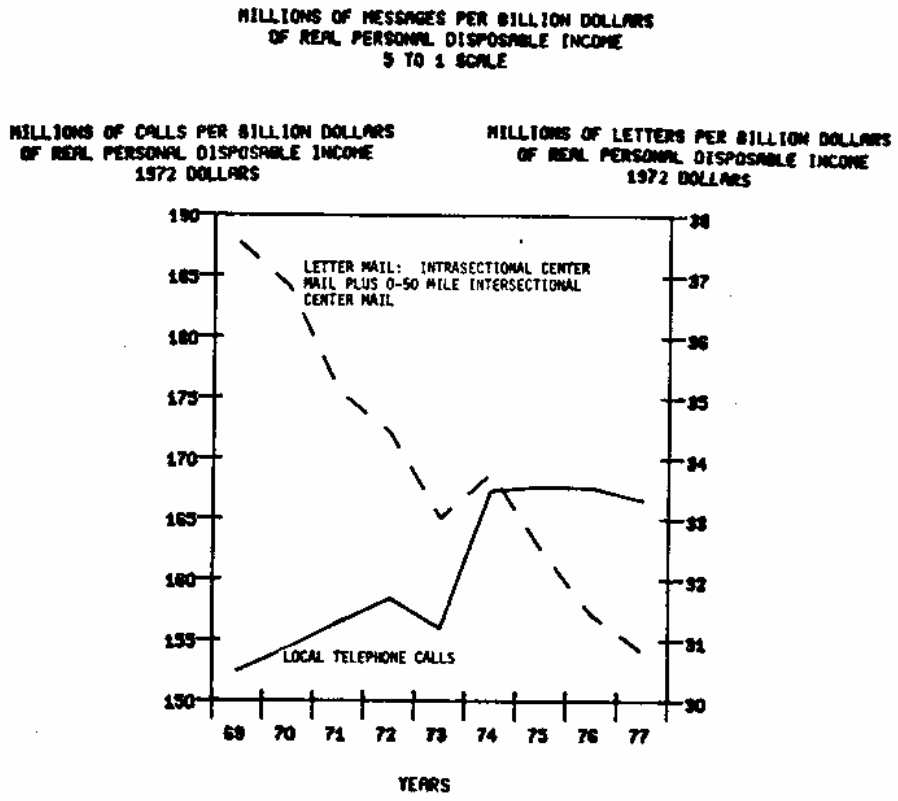
Figure VII - 3

LOCAL TELEPHONE CALLS
LETTER MAIL: INTRASECTIONAL CENTER MAIL PLUS
0-50 MILE INTERSECTIONAL CENTER MAIL
5 TO 1 SCALE



Source: AT&T and U.S. Postal Service

Figure VII - 4



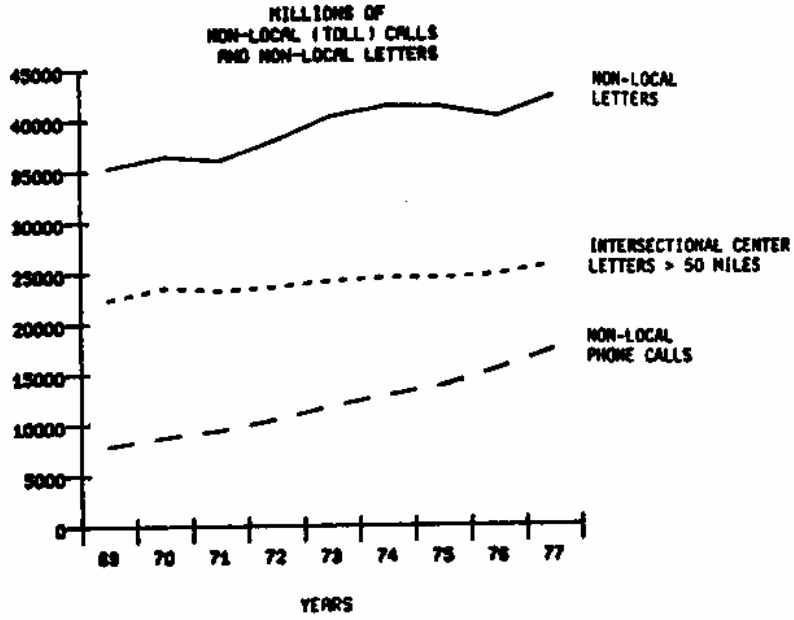
Source: AT&T and U.S. Postal Service

Figures VII-5 and VII-6 illustrate the 1969 - 1977 trend in non-local (or toll) telephone calls and non-local mail volumes using both postal definitions.

Regardless of the definition used for local mail, it would appear obvious that local telephone calls are increasing at a much higher rate than mail usage in absolute terms and an even higher rate relative to economic growth.

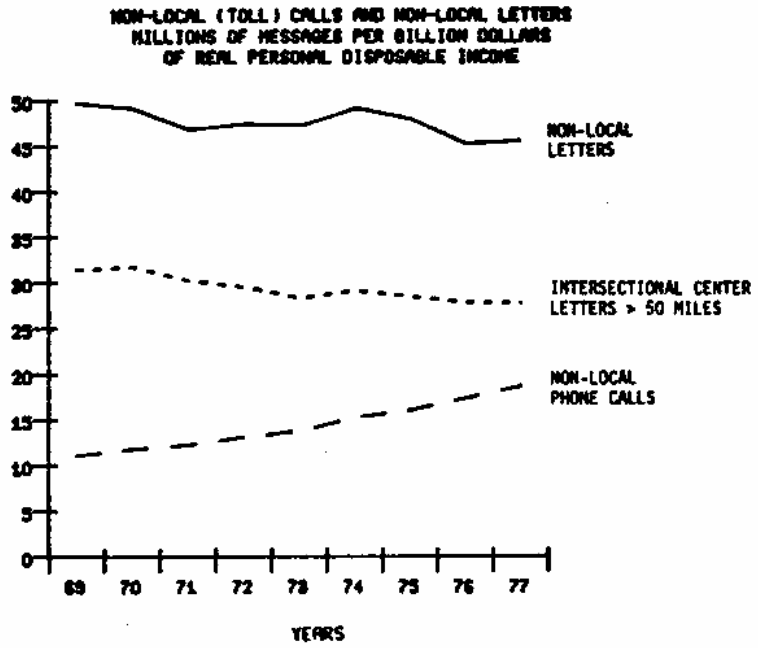
Under either definition of local letters, non-local letters are growing in absolute terms, but at a lesser rate than toll calling. Relative to Disposable Personal Income, non-local letter mail volume is declining and toll calls are increasing.

Figure VII - 5



Source: AT&T and U.S. Postal Service

Figure VII - 6



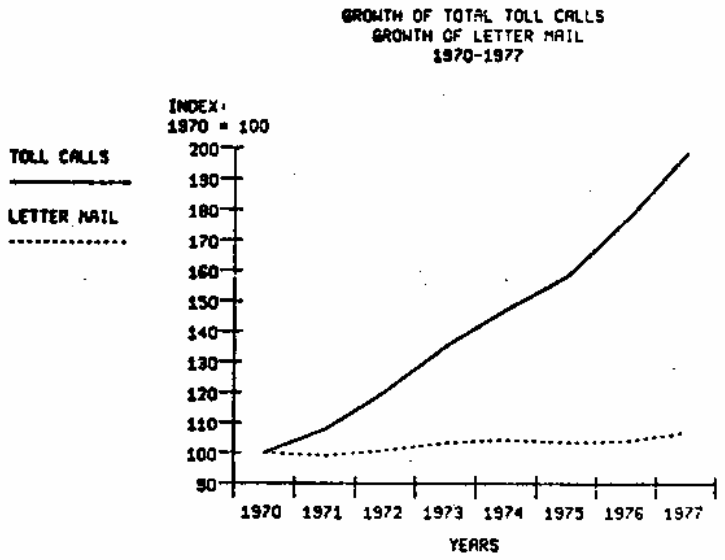
Source: AT&T and U.S. Postal Service

B. Comparative Use of Letter Mail Service and Toll Telephone Service

It might well be inappropriate to compare local telephone calls to letters because of the "free goods" nature of local calls. (It appears likely, for example, that even large businesses operating under Local Measured Service tend to treat local telephone calls as "free goods", both because of the relatively low price per call and the difficulty of controlling local calling behavior.) Since all use of mail entails payment on a per message basis, we also have compared total letter mail use with total toll calling.

Figure VII-7 shows the relative growth of toll calls and all letters (local and non-local) between 1970 and 1977 (Index 1970 = 100). The obvious disparity in rates of growth is explained partially by the small number of toll calls in the base year compared to the large number of letters.

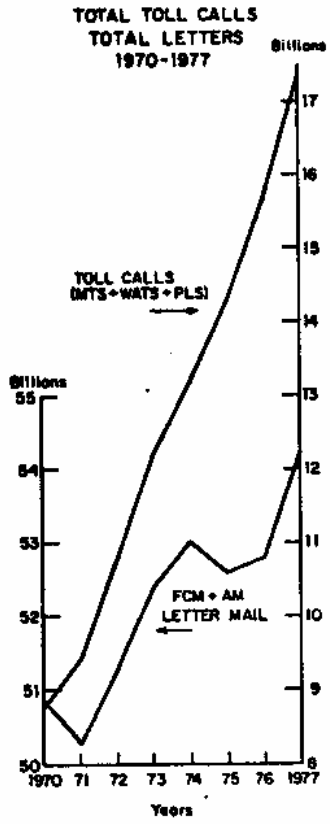
Figure VII - 7



Source: AT&T and U.S. Postal Service

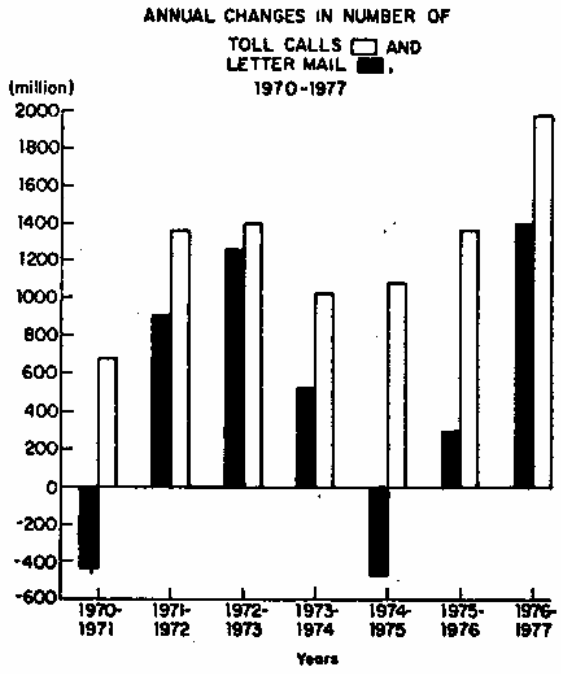
As shown in Figure VII-8, however, the growth in toll calls (+8.6 billion) substantially exceeded the growth in letters (3.5 billion) in absolute terms during the 1970 - 1977 period. Figure VII-9 portrays the absolute change in annual letter mail volumes and toll calls for the 1970 - 1977 period. The shifts portrayed in Figure VII-9 do not suggest an obvious one-for-one substitution from letter mail to toll telephone services.

Figure VII - 8



Source: AT&T and U.S. Postal Service

Figure VII - 9

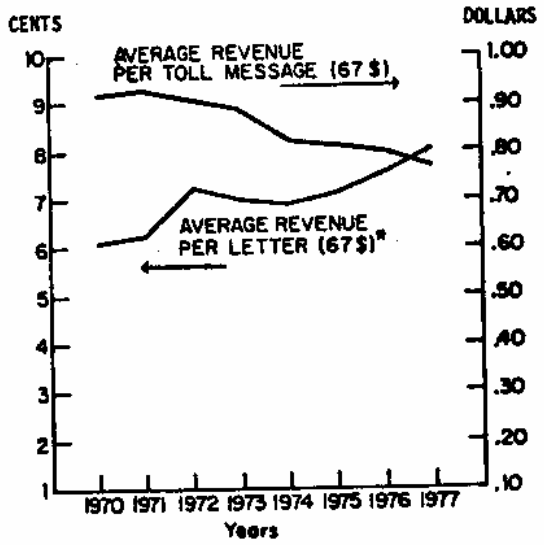


Source: AT&T and U.S. Postal Service

Part of the difference in growth trends of letter mail and toll telephone services may be attributable to the trend of pricing for each service. Using average revenue per message as a surrogate for price, Figure VII-10 illustrates that during the 1970 - 1977 period, the real price per toll telephone call was dropping while the real cost per letter climbed. Viewed in terms of relative prices, the average MTS toll call in 1970 was approximately 15 times more expensive than the average letter; by 1977, the cost of the average toll call was less than ten times as costly as the average letter (Figure VII-11).

Figure VII - 10

TOLL TELEPHONE AND LETTER MAIL COST TRENDS



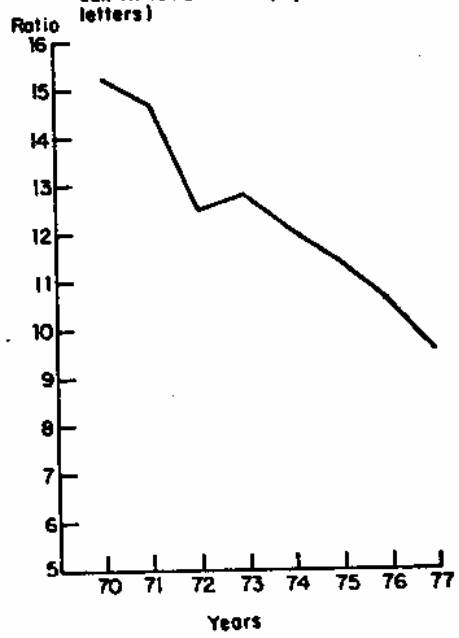
* Fiscal Years

Source: AT&T and U.S. Postal Service

Figure VII - 11

TOLL CALL COSTS RELATIVE TO LETTER MAIL COSTS

(The average revenue per MTS toll call in 1970 would pay for 15 letters)

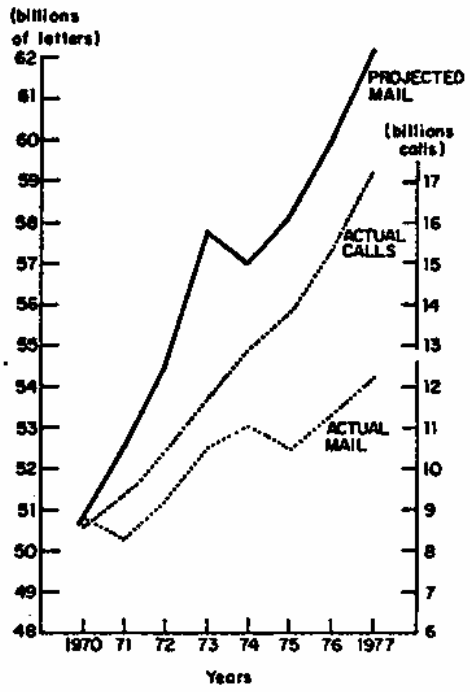


Source: AT&T and U.S. Postal Service

As discussed in Chapter V, the growth of letter mail volume between 1970 and 1977 fell far short of projections made during the late 1960's. Figure VII-12 compares the actual growth of toll telephone calls (MTS+WATS+PLS) and letter mail between 1970 and 1977 to a projection of letter mail volumes (based upon the 1960-1969 relationship between growth of letter mail volume and growth of Real DPI). The absolute growth in the number of toll telephone calls during the 1970 - 1977 period is of sufficient magnitude as to possibly account for a substantial portion of the shortfall in letter mail volume growth.

Figure VII - 12

ACTUAL TOLL CALLS AND
LETTER MAIL 1970-1977
COMPARED TO PROJECTED MAIL VOLUME



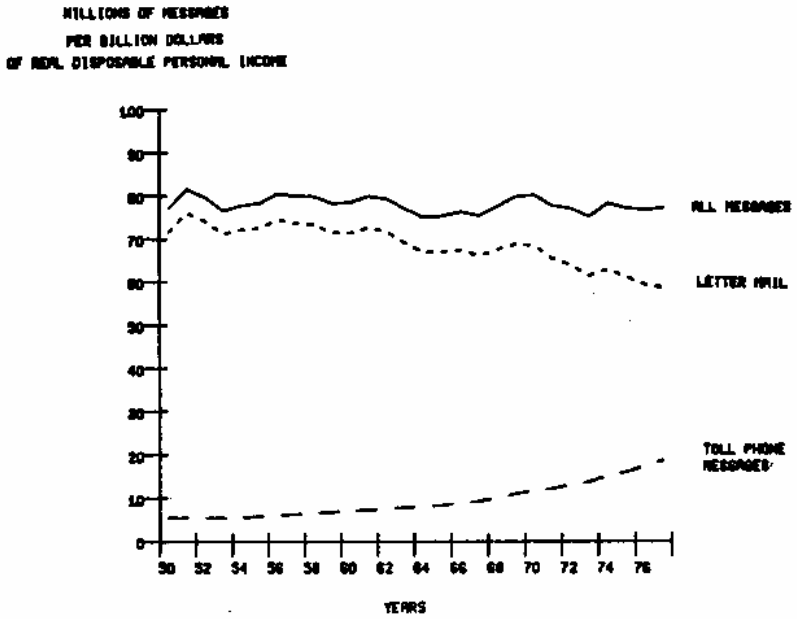
Source: AT&T and U.S. Postal Service

C. Toll Telephone and Letter Mail Services Viewed as a Single Market

Figure VII-13 illustrates letter mail and toll telephone volumes as a function of Real DPI between 1950 and 1977. This figure invites particular attention because of the constant relationship of total messages (letters plus toll calls) to Real DPI. The time series indicates a mean level of 78.0 million messages for each one billion dollars of DPI (1972 dollars). Deviations from the mean ranged between a high of 81.5 million messages per billion, or 4.6% above the mean (1951) to a low of 75.0 million messages per billion (-3.9%) in 1964.

Figure VII - 13

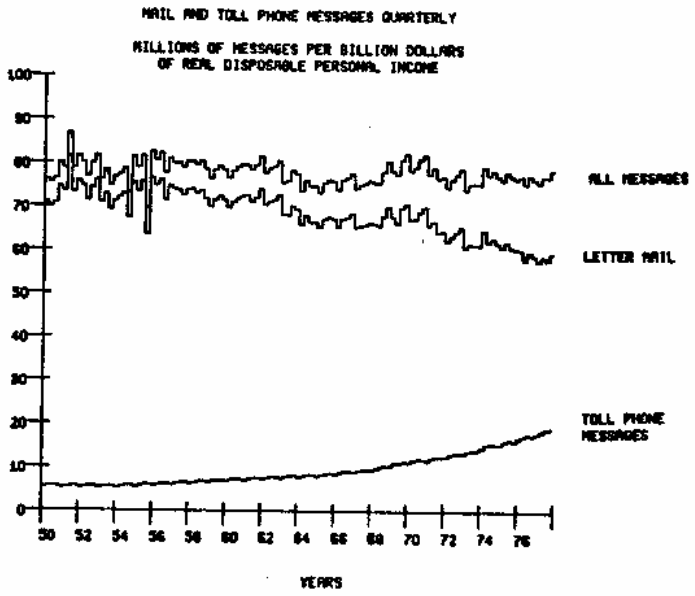
MAIL AND TOLL PHONE MESSAGES ANNUALLY



Source: AT&T and U.S. Postal Service

The constancy of this relationship led us to examine it in more detail. Figure VII-14 shows similar data on a quarterly basis for the 1950 - 1977 period. Again, variations from the mean were slight (+11% to -11%).

Figure VII - 14



Source: AT&T and U.S. Postal Service

These series suggest that letter mail and toll telephone use constitute a single market that varies directly with economic activity. Using this construct, the total growth in toll telephone use between 1950 and 1977 can be explained by (a) economic growth as measured by DPI, and (b) message volume diverted from the letter mail stream. Within this context, the Postal Service and the telephone industry appear to be competing in a zero-sum game (after allowing for economic growth).[31]

Figure VII-15 portrays the decline in postal share of this total message market.

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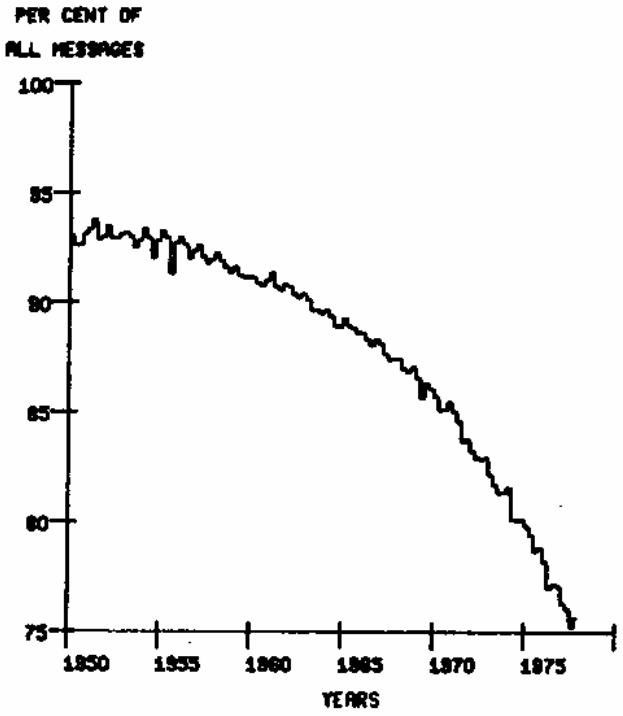
[31] Obviously there are other message services competing in this "message market", but the volume of messages handled by TWX, Telex, Telegram, Mailgram, etc., is infinitesimal compared to the 18 billion toll calls and 54 billion letters handled in 1977.

Likewise, including estimates of messages based upon the revenues of Specialized Common Carriers and Value Added Networks would not appreciably alter the size of the total market. As discussed in Chapter V, other physical delivery systems (particularly intracompany services) may represent an important component of this market.

Figure VII - 15

LETTER MAIL SHARE OF TOTAL PAID MESSAGES



Source: AT&T and U.S. Postal Service

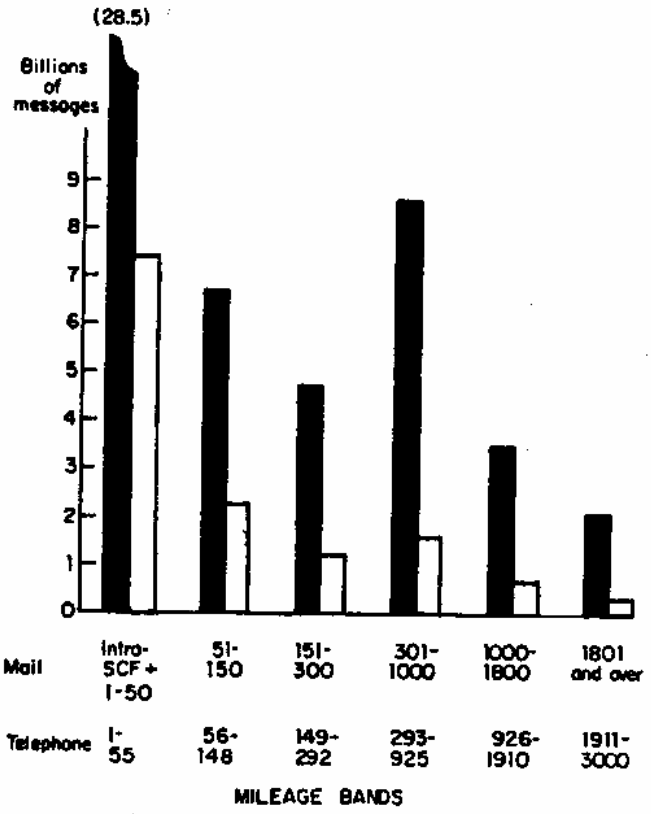
D. Trends in Comparative Usage by Distance

Because overall usage trends suggest the possibility that telephone calls are being substituted for letters, this section reviews telephone and letter mail usage within mileage bands in order to identify likely types of substitution.

Figure VII-16 illustrates the distribution of 1977 MTS Interstate and Intrastate toll calls by mileage band compared to 1977 letter mail volumes. While adding WATS and PLS calls (on which we lack detailed mileage data) would increase the telephone volumes shown in Figure VII-16 by perhaps a third, letter mail volumes still would dominate usage in all mileage bands.

Figure VII - 16

DISTRIBUTION OF MESSAGES BY MILEAGE BANDS-1977
INTER AND INTRA MTS CALLS □
TOTAL LETTER MAIL ■

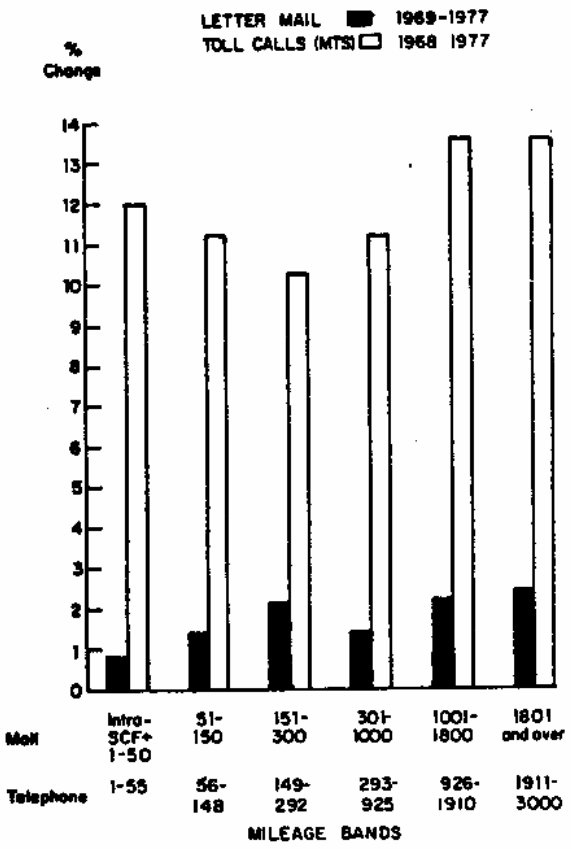


Source: AT&T sample, annualized; U.S. Postal Service

As shown in Figure VII-17, however, MTS calling has been increasing at a far greater rate than letter mail use for every mileage band. This difference in growth rates would be even more dramatic if WATS and PLS calls were known by mileage band, because total message volumes for these services have been increasing at a greater rate than total MTS volumes during the same period.

Figure VII - 17

COMPOUND ANNUAL GROWTH RATES
BY MILEAGE BANDS



Source: AT&T sample, annualized; U.S. Postal Service

While the differences in growth rates shown in Figure VII-17 suggest that substitution of telephone calls for letter mail use could be occurring in all mileage bands, the results present possible contradictions. Both telephone calling and letter mail use have increased most significantly over longer distances. This may suggest the importance of prices in absolute terms; thus while the real price of a three-thousand mile Interstate MTS call has declined substantially in recent years, and the real price of sending a letter has climbed significantly, postage for a First Class letter is only 15 cents while a three-minute call may range from $.52 (nights and weekends) to $1.30 (daytime).

VIII. POTENTIAL FOR FUTURE DIVERSION OF LETTER MAIL TO TELEPHONE

While the trends noted and discussed in Chapter VII suggest that users are substituting telephone calls for letters, there are structural constraints upon this process as noted in Chapter III. This chapter reviews the current known use of letter mail for purposes of identifying letter mail volumes subject to future substitution.[32]

Table VIII-1 summarizes the 1977 flow of First Class Mail. For that portion of First Class Mail that flows to and from households (67% of the total) it details the nature of the mail in terms of primary content.

Not surprisingly, more than half of the household mailstream (20 billion pieces) consists of bills, payments and financial statements. Of this, 11.5 billion pieces contain bills and financial statements which do not appear to be particularly amenable to telephone substitution. Conceivably, some portion of the 8.5 billion payments could be diverted to telephone bill paying schemes, but these have not proven to be economically successful to date.

The 9.7 billion pieces of First Class Mail described as correspondence would appear to be the sector of mail most vulnerable to telephone substitution. Review of the Michigan study provides the following information on this correspondence:

1 - 67% of the correspondence going to households -- or 6.5 billion letters -- was originated by other households. It is estimated that household to household

[32] Data on letter mail cited throughout this chapter are drawn from M. Kallick, W. Rodgers, et al, Household Mailstream Study, Final Report, University of Michigan, Ann Arbor, prepared for the Mail Classification Research Division, U.S. Postal Service, 1978.

Table VIII-1. Composition of First-Class Mail in 1977

(billions of pieces)

	Total	Correspondence & Greeting Cards	Payments	Bills	Financial Statements	Advertising	Other (incl. merchandise)
Total First Class Mail	57.7	(			?		)
Non-Household to Non-Household	19.2	(			?		)
To and From Households	38.5	9.7	8.5	8.9	2.6	1.0	7.8
Between Households	6.8	6.5	0.1	---	---	--	0.2
Households to Non-Households	9.2	1.4	6.5	---	---	--	1.3
Non-Households to Households	22.5	1.8	1.9	8.9	2.6	1.0	6.3

Source: University of Michigan, Household Mailstream Study, Vol. II.

correspondence declined by two billion pieces between 1972 and 1977. Given the increase in the number of households during this period, this means that the average household cut its correspondence to other households by 32% over the same period.

2 - Of the 6.5 billion pieces of household-to-household correspondence, 3.1 billion pieces (48%) are greeting cards. Of these, 1.7 billion are seasonal holiday cards mailed in December and 1.4 billion are "other" greeting cards mailed throughout the year. Of the two billion-piece decline of household-to-household correspondence between 1972 and 1977, approximately half appears to be attributable to a decline in seasonal greeting cards. Intuitively it would seem that telephone usage is not substituted for seasonal greeting cards, but may serve to substitute for some of the 1.4 billion "other" cards.

3 - 45% (2.9 billion pieces) of household-to-household correspondence is "local" mail and 60% travels less than 150 miles. Given the "free" nature of local telephone pricing, it would appear that this mail is price-insensitive at current postage prices.

4 - 11% of household-to-household correspondence included some form of enclosure with the correspondence and 2% of household-to-household letters exceeded two ounces. Depending upon the overlap between these categories,

700 to 800 million pieces of correspondence probably cannot be transferred to telephone use because of the need to transmit enclosures or lengthy materials.

5 - Of the 1.8 billion pieces of correspondence sent by non-households to households, 720 million pieces included enclosures with correspondence.

6 - Table VIII-2 analyzes the 7.9 billion pieces of correspondence generated by households in terms of the age of the head of the household. Households headed by persons between 40 and 64 generate correspondence roughly in proportion to their numbers in the household population. Households with heads of 65 years or older generate a disproportionately large share of the correspondence originated by households, and households headed by individuals under 40 years of age generate a disproportionately small share.

This skewed distribution may reflect a different pattern of communications requirements. The over-representation of persons 65 and over among letter writers may reflect the economic constraints of retirement incomes and greater leisure time. The overall pattern does suggest the likelihood that younger people are less inclined to communicate by mail than their elders. The fact that 50% of all household correspondence is generated by households where the head is 50 years of age or older also raises the possibility that these people choose to use mail more

either by lifelong habit or based upon earlier impressions as to the relative prices of postal and telephone services.

Table VIII - 2

Percent of Total Correspondence Generated by Households According to Age of Household Head

Age of Household Head	% of Total Households	% of Correspondence
under 30	16.1	11.5
30 - 39	22.0	16.5
40 - 49	19.4	21.7
50 - 64	26.6	28.2
64 and over	16.9	22.0

Source: University of Michigan, Household Mailstream Study, Vol. II, Table 14.15.

Given this information, we can make some guesses concerning potential telephone substitution for the 9.7 billion pieces of correspondence sent to or from households:

1 - A minimum of 1.5 billion pieces appears to be "protected" from telephone substitution because of enclosures or extra weight.

2 - 2.9 billion pieces of household-to-household correspondence (45%) is local and thus unlikely to be diverted to toll telephone usage. If correspondence between households and non-households follows the same local distribution pattern (something which we do not know) another 1.4 billion pieces of correspondence would be local.

3 - .3 billion pieces of correspondence are announcements, invitations and other items which might not be subject to telephone substitution because of social conventions.

4 - 1.7 billion pieces are seasonal greeting cards for which wide-spread telephone substitution does not appear to be practical.

If all of these categories were mutually exclusive, 7.8 billion pieces would be unlikely candidates for diversion, leaving 1.9 billion pieces as a target. There are, however, unknown overlaps among these categories. If the categories were mutually inclusive (i.e., all seasonal greeting cards and all letters with enclosures also were for local delivery) a minimum of 2.9 billion pieces would be protected from telephone substitution, leaving 6.8 billion pieces as candidates for diversion.

If we reject the extremes of total overlapping and no overlapping of categories, it appears that of the 9.7 billion pieces of correspondence sent to or from households, somewhere between two billion and seven billion pieces could be switched from mail to telephone usage.

As shown in Figure VIII-1, there were 19.2 billion pieces of First Class Mail sent between non-households in 1977. At this time we do not know the composition of this number in terms of correspondence, bills, payments, etc. Completion of the USPS non-household mailstream study will allow similar analysis of the potential for substitution.

It should be noted, incidentally, that our focus in this chapter has been upon the potential for letter mail to be diverted to telephone calls, not on the potential for letter mail volumes to decline. In the case of seasonal greeting cards, for example, it is not unreasonable to assume that people might reduce their mailing without compensating increases in telephone calling. Thus the potential for reductions in letter mail volume would appear to exceed the potential for telephone substitution.

Appendices E and F provide additional information on the structural use of the mail and MTS calling during 1977.

APPENDICES

Appendix A

Summary of Telephone and Letter Mail Use, 1950-1977, with Economic-Demographic Indicators

(See Appendix H for 1978 and 1979 data.)

	1950	1951	1952	1953	1954	1955	1956	1957	1958	1959	1960	1961	1962	1963
MILLIONS OF LOCAL CALLS [1] (BELL SYSTEM ONLY).....	44,463	45,957	47,456	48,685	50,554	53,444	56,503	59,487	62,155	65,675	69,371	71,285	76,517	79,157
PER CENT CHANGE.....	NA	3.4	3.3	2.6	3.8	5.7	5.7	5.3	4.5	5.7	5.6	2.8	7.3	3.5
MILLIONS OF [1] MTS MESSAGES.....	1,949	1,986	2,031	2,085	2,165	2,361	2,558	2,706	2,827	3,033	3,205	3,340	3,550	3,764
PER CENT CHANGE.....	NA	1.9	2.3	2.7	3.8	9.1	8.4	5.8	4.5	7.3	5.7	4.2	6.3	6.0
MILLIONS OF [1] MTS INTERSTATE MESSAGES...	533	587	584	666	683	760	823	874	903	983	1,055	1,110	1,193	1,295
PER CENT CHANGE.....	NA	10.0	-0.6	14.1	2.5	11.3	8.2	6.2	3.4	8.8	7.4	5.2	7.5	8.5
MILLIONS OF [1] MTS INTRASTATE MESSAGES...	1,416	1,399	1,393	1,419	1,482	1,601	1,735	1,833	1,924	2,050	2,149	2,230	2,356	2,469
PER CENT CHANGE.....	NA	-1.2	-0.4	1.9	4.4	8.0	8.4	5.6	5.0	6.5	4.8	3.7	5.7	4.8
MILLIONS OF [2] WATS CALLS (ESTIMATED)....	0	0	0	0	0	0	0	0	0	0	0	25	85	146
PER CENT CHANGE.....	NA	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	243.5	71.6
MILLIONS OF PRIVATE [2] LINE CALLS (ESTIMATED)....	47	58	70	81	91	110	135	159	188	227	268	302	330	359
PER CENT CHANGE.....	NA	22.9	21.5	14.7	12.8	20.7	23.3	17.7	17.7	21.0	18.4	12.4	9.3	8.9
MILLIONS OF FIRST CLASS [3] AND AIR MAIL LETTERS.....	25,910	28,250	28,345	28,286	29,008	30,863	33,114	33,411	33,620	34,101	34,780	36,342	37,361	37,231
PER CENT CHANGE.....	NA	9.0	0.3	-0.2	2.6	6.4	7.3	0.9	0.6	1.4	2.0	4.5	2.8	-0.3
DISPOSABLE PERSONAL INCOME [4] (BILLIONS OF 1972 DOLLARS)	362	372	382	398	402	426	445	454	459	477	487	501	522	539
PER CENT CHANGE.....	7.7	2.7	2.8	4.0	1.2	5.9	4.5	2.0	1.1	4.0	2.1	2.7	4.2	3.4
POPULATION (MILLIONS) [5].....	152	154	157	160	162	165	168	171	174	177	181	184	187	189
PER CENT CHANGE.....	1.7	1.7	1.7	1.7	1.8	1.8	1.8	1.8	1.7	1.7	2.0	1.7	1.5	1.4
MILLIONS OF HOUSEHOLDS [6]....	44	45	46	46	47	48	49	50	50	51	53	54	55	55
PER CENT CHANGE.....	3.3	2.6	1.9	1.9	1.2	1.9	2.1	1.6	1.6	1.9	2.7	1.4	2.3	0.9

Appendix A (cont'd)

	1964	1965	1966	1967	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977
MILLIONS OF LOCAL CALLS (BELL SYSTEM ONLY).....	82,740	87,915	92,577	95,848	100,571	108,567	114,461	120,315	126,962	133,275	140,924	144,178	149,156	154,289
PER CENT CHANGE.....	4.5	6.3	5.3	3.5	4.9	8.0	5.4	5.1	5.5	5.0	5.7	2.3	3.5	3.4
MILLIONS OF MTS MESSAGES.....	4,085	4,465	4,933	5,319	5,883	6,561	7,219	7,761	8,577	9,500	10,198	10,725	11,684	12,844
PER CENT CHANGE.....	8.5	9.3	10.5	7.8	10.6	11.5	10.0	7.5	10.5	10.8	7.3	5.2	8.9	9.9
MILLIONS OF MTS INTERSTATE MESSAGES...	1,426	1,607	1,825	1,994	2,239	2,539	2,789	2,988	3,308	3,665	3,937	4,104	4,385	4,832
PER CENT CHANGE.....	10.2	12.6	13.6	9.2	12.3	13.4	9.8	7.2	10.7	10.8	7.4	4.2	6.9	10.2
MILLIONS OF MTS INTRASTATE MESSAGES...	2,659	2,858	3,107	3,325	3,644	4,023	4,431	4,773	5,268	5,836	6,261	6,621	7,299	8,012
PER CENT CHANGE.....	7.7	7.5	8.7	7.0	9.6	10.4	10.1	7.7	10.4	10.8	7.3	5.8	10.2	9.8
MILLIONS OF WATS CALLS (ESTIMATED)....	206	264	325	390	477	585	638	746	951	1,215	1,496	1,800	2,359	2,946
PER CENT CHANGE.....	40.9	28.3	23.2	20.0	22.2	22.7	9.2	16.9	27.4	27.7	23.1	20.3	31.0	24.9
MILLIONS OF PRIVATE LINE CALLS (ESTIMATED)....	383	402	485	542	622	737	860	894	970	1,081	1,164	1,274	1,406	1,515
PER CENT CHANGE.....	6.7	5.0	20.6	11.7	14.8	18.5	16.7	4.0	8.5	11.4	7.7	9.4	10.4	7.8
MILLIONS OF FIRST CLASS AND AIR MAIL LETTERS.....	38,594	41,014	43,345	44,230	46,955	48,969	50,755	50,321	51,211	52,469	52,996	52,529	52,824	54,232
PER CENT CHANGE.....	3.7	6.3	5.7	2.0	6.2	4.3	3.6	-0.9	1.8	2.5	1.0	-0.9	0.6	2.7
DISPOSABLE PERSONAL INCOME (BILLIONS OF 1972 DOLLARS)	577	612	644	670	695	712	742	769	801	855	842	860	890	926
PER CENT CHANGE.....	7.1	6.1	5.1	4.1	3.8	2.5	4.1	3.7	4.2	6.7	-1.5	2.1	3.5	4.1
POPULATION (MILLIONS).....	192	194	197	199	201	203	205	207	209	210	212	214	215	217
PER CENT CHANGE.....	1.4	1.3	1.2	1.1	1.0	1.0	1.1	1.1	0.9	0.7	0.7	0.8	0.7	0.8
MILLIONS OF HOUSEHOLDS....	56	57	58	59	61	62	63	65	67	68	70	71	73	74
PER CENT CHANGE.....	1.6	2.3	1.7	1.4	2.7	2.3	1.9	2.2	2.9	2.4	2.4	1.8	2.5	1.7

[1] AT&T

[2] PIRP estimates (see Chapter II).

[3] USPS

[4] Seasonally adjusted at annual rates. U.S. Department of Commerce, Bureau of Economic Analysis, National Income and Product Accounts of the United States, Table 2.1.

[5] U.S. Department of Commerce, Bureau of Economic Analysis, National Income and Product accounts of the United States, Table 2.1.

[6] March data except 1951-1955 which are April. U.S. Department of Commerce, Bureau of the Census. Current Population Reports, Series P-20. (Alaska and Hawaii are included beginning 1960.)

Appendix B

Third Class Mail Volume and Rates
(Average Revenue per Piece)[1]
1961 - 1977

Postal Fiscal Year	Single Piece Rate		Bulk-Rate Regular		Bulk-Rate Non-Profit	
	Volume (bils. of pcs.)	Avg. Revenue per Piece (cents)	Volume (bils. of pcs.)	Avg. Revenue per Piece (cents)	Volume (bils. of pcs.)	Avg. Revenue per Piece (cents)
1961	3.7	4.1	11.5	2.7	2.3	1.3
1962	3.7	4.2	11.7	2.7	2.5	1.3
1963	3.8	4.8	12.5	2.8	2.2	1.3
1964	3.4	5.9	13.0	2.9	2.3	1.3
1965	3.4	6.0	13.4	3.0	2.7	1.3
1966	3.3	6.0	14.1	3.1	2.9	1.3
1967	3.3	6.0	14.6	3.1	3.0	1.3
1968	3.0	6.5	14.3	3.5	3.4	1.4
1969	1.0	11.8	14.9	4.0	3.7	1.5
1970	1.0	12.2	15.1	4.2	4.0	1.7
1971	0.9	12.6	15.2	4.2	4.4	1.6
1972	0.9	15.0	16.5	4.7	4.5	1.8
1973	0.8	19.4	16.7	5.4	5.2	1.8
1974	0.7	20.7	16.4	5.8	5.4	1.8
1975	0.7	22.4	15.7	6.8	5.4	1.8
1976	0.7	27.3	15.9	7.6	6.0	1.8
1977	0.6	34.6	16.9	8.1	6.6	2.0

[1] There are a number of postage rates for each subclass of Third Class Mail. For brevity and simplicity we have used average revenue per piece as a surrogate for rates.

Source: USPS

Appendix C

MTS Interstate Rates and Changes, 1971-1977
Daytime, Monday-Friday, 8:00 am - 5:00 pm (RP1)
Customer-Dialed Three-Minute Call

% Change shown only for changes exceeding ± 5%

Mileage Band	1/26/71	% Change 71 - 73	1/22/73	% Change 73 - 75	3/9/75	% Change 75 - 76	2/29/76	% Change 76 - 77	9/13/77	% Change 71 - 77
1 - 10	.17		.17	+65	.28	+25	.35	+6	.37	+118
10 - 16	.23		.23	+70	.39	+15	.45		.47	+104
17 - 22	.30		.30	+57	.47	+13	.53		.55	+83
23 - 30	.35		.35	+63	.57	+14	.65		.67	+91
31 - 40	.40		.40	+73	.69	+9	.75		.77	+92
41 - 55	.45	+11	.50	+62	.81	+7	.87		.89	+98
56 - 70	.50	+10	.55	+58	.87	+7	.93		.95	+90
71 - 85	.55	+9	.60	+50	.90		.93		.95	+73
86 -100	.60	+8	.65	+43	.93	+6	.99		1.01	+68
101-124	.65	+8	.70	+37	.96		.99		1.01	+55
125-148	.70	+7	.75	+32	.99		1.02		1.04	+49
149-196	.75	+7	.80	+28	1.02		1.02		1.04	+39
197-244	.80		.80	+31	1.05		1.08		1.10	+38
245-292	.85		.85	+27	1.08		1.08		1.10	+29
293-354	.90		.90	+23	1.11		1.14		1.16	+29
355-430	.95		.95	+20	1.14		1.14		1.16	+22
431-675	1.00		1.05	+11	1.17		1.18		1.18	+12
676-925	1.05		1.15		1.20		1.18		1.18	+12
926-1360	1.15		1.25		1.24		1.24		1.24	+8
1361-1910	1.25		1.35		1.30		1.24		1.24	
1911-3000	1.35		1.45	-6	1.36		1.30		1.30	

Source: National Association of Regulatory Utility Commissioners. Long-Distance Telephone Rates, Washington, D.C., December 1977, Table 51, and June 1971, Table 52.

Appendix C (cont'd)

Interstate MTS Calls, 1975 - 1977

Percent Changes in Number of Messages and Conversation Minutes

Daytime, Monday - Friday, 8:00 am - 5:00 pm (RP1)

Mileage Band	% Change Messages			% Change Conversation Minutes		
	75 - 76	76 - 77	75 - 77	75 - 76	76 - 77	75 - 77
1 - 10	-6.3	+7.9	+1.1	-8.8	+6.5	-2.9
11 - 16	-6.1	+8.7	+2.1	-7.8	+6.9	-1.5
17 - 22	-3.8	+10.0	+5.8	-5.8	+8.0	+1.7
23 - 30	-3.7	+9.5	+5.4	-5.8	+7.6	+1.4
31 - 40	-1.6	+10.9	+9.2	-3.7	+9.4	+5.3
41 - 55	-2.7	+10.3	+7.9	-3.6	+9.2	+5.2
56 - 70	-2.2	+9.5	+7.1	-3.4	+7.1	+3.4
71 - 124	-4.5	+10.0	+5.1	-5.9	+8.3	+1.9
125 - 196	-2.8	+12.5	+9.3	-4.2	+9.9	+5.3
197 - 292	-1.0	+12.1	+11.0	-3.0	+8.9	+5.7
293 - 430	-1.5	+13.8	+12.0	-3.1	+10.0	+6.6
431 - 925	0	+14.3	+14.3	-1.3	+10.8	+9.3
926 - 1910	+2.4	+15.7	+18.5	+0.8	+13.1	+14.0
1911 - 3000	+3.0	+16.1	+19.6	+1.8	+12.9	+14.7
TOTAL	-1.7	+12.4	+10.6	-2.9	+10.0	+6.8

Source: AT&T sample

Appendix C (cont'd)

MTS Interstate Rates and Changes, 1971-1977
Evenings, Sunday-Friday, 5:00 - 11:00 pm (RP2)
Customer-Dialed Three-Minute Call

% Change shown only for changes exceeding ± 5%

Mileage Band	1/26/71	% Change 71 - 73	1/22/73	% Change 73 - 75	3/9/75	% Change 75 - 76	2/29/76	% Change 76 - 77	9/13/77	% Change 71 - 77
1 - 10	.13		.13	+38	.18	+22	.22	+9	.24	+85
11 - 16	.17		.17	+47	.25	+16	.29		.30	+76
17 - 22	.24		.24	+25	.30	+13	.34		.35	+46
23 - 30	.28		.28	+32	.37	+14	.42		.43	+54
31 - 40	.32		.32	+38	.44	+9	.48		.50	+56
41 - 55	.36		.36	+44	.52	+8	.56		.57	+58
56 - 70	.40		.40	+40	.56	+7	.60		.61	+53
71 - 85	.40		.40	+45	.58		.60		.61	+53
86 -100	.40		.40	+50	.60	+7	.64		.65	+63
101-124	.45		.45	+38	.62		.64		.65	+44
125-148	.50		.50	+28	.64		.66		.67	+34
149-196	.55		.55	+20	.66		.66		.67	+22
197-244	.55		.55	+24	.68		.70		.71	+29
245-292	.55		.55	+27	.70		.70		.71	+29
293-354	.55		.55	+31	.72		.74		.75	+36
355-430	.60		.60	+23	.74		.74		.75	+25
431-675	.60		.60	+27	.76		.76		.76	+27
676-925	.65		.65	+20	.78		.76		.76	+17
926-1360	.70		.70	+14	.80		.80		.80	+14
1361-1910	.75		.75	+13	.85	-6	.80		.80	+7
1911-3000	.85		.85		.88	-5	.84		.84	-7

Source: National Association of Regulatory Utility Commissioners. Long-Distance Telephone Rates, Washington, D.C., December 1977, Table 51, and June 1971, Table 52.

Appendix C (cont'd)

Interstate MTS Calls, 1975 - 1977

Percent Changes in Number of Messages and Conversation Minutes

(RP2)

Mileage Band	% Change Messages			% Change Conversation Minutes		
	75 - 76	76 - 77	75 - 77	75 - 76	76 - 77	75 - 77
1 - 10	-2.3	+7.9	+5.4	-4.6	+6.8	+1.8
11 - 16	-1.7	+8.6	+6.8	-2.4	+8.4	+5.8
17 - 22	-0.7	+10.6	+9.8	-2.1	+10.7	+8.4
23 - 30	-0.3	+9.1	+8.7	-1.0	+9.3	+8.3
31 - 40	-0.2	+10.0	+11.5	-1.0	+10.3	+9.2
41 - 55	+0.4	+11.0	+10.6	+0.3	+11.8	+12.2
56 - 70	-0.3	+10.9	+10.6	+0.8	+11.1	+12.0
71 - 124	+0.2	+10.4	+10.6	+0.9	+11.6	+12.6
125 - 196	+2.1	+11.6	+13.9	+3.2	+12.9	+16.5
197 - 292	+3.4	+10.6	+14.4	+5.3	+11.1	+17.0
293 - 430	+4.6	+12.7	+17.9	+6.7	+13.1	+20.7
431 - 925	+6.9	+13.9	+21.7	+9.1	+14.1	+24.5
926 - 1910	+7.4	+14.3	+22.8	+10.6	+14.1	+26.1
1911 - 3000	+9.8	+16.5	+27.8	+12.3	+15.5	+29.7
TOTAL	+3.6	+12.1	+16.2	+6.0	+12.8	+19.6

Source: AT&T sample

Appendix C (cont'd)

MTS Interstate Rates and Changes, 1971-1977
Nights and Weekends (RP3 & 4)
Customer-Dialed Three-Minute Call

% Change shown only for changes exceeding ± 5%

Mileage Band	1/26/71	% Change 71 - 73	1/22/73	% Change 73 - 75	3/9/75	% Change 75 - 76	2/29/76	% Change 76 - 77	9/13/77	% Change 71 - 77
1 - 10	.10		.10	+10	.11	+27	.14		.14	+40
11 - 16	.14		.14	+7	.15	+20	.18		.18	+29
17 - 22	.20		.20	-10	.18	+17	.21		.22	+10
23 - 30	.20		.20	+10	.22	+18	.26		.26	+30
31 - 40	.26		.26		.27	+11	.30		.30	+15
41 - 55	.30		.30	+7	.32	+6	.34		.35	+17
56 - 70	.33		.33		.34	+9	.37		.38	+15
71 - 85	.35		.35		.36		.37		.38	+9
86 -100	.35		.35	+5	.37	+5	.39		.40	+14
101-124	.35		.35	+9	.38		.39		.40	+14
125-148	.46		.46	-15	.39		.40		.41	-11
149-196	.48		.48	-17	.40		.40		.41	-15
197-244	.48		.48	-12	.42		.43		.44	-8
245-292	.50		.50	-14	.43		.43		.44	-12
293-354	.50		.50	-12	.44		.45		.46	-8
355-430	.50		.50	-10	.45		.45		.46	-8
431-675	.50		.50	-8	.46		.47		.47	-6
676-925	.50		.50		.48		.47		.47	-6
926-1360	.65		.65	-26	.49		.49		.49	-25
1361-1910	.65		.65	-20	.52	-6	.49		.49	-25
1911-3000	.75		.75	-28	.54		.52		.52	-31

Source: National Association of Regulatory Utility Commissioners. Long-Distance Telephone Rates, Washington, D.C., December 1977, Table 51, and June 1971, Table 52.

Appendix C (cont'd)

Interstate MTS Calls, 1975 - 1977

Percent Changes in Number of Messages and Conversation Minutes

(RP3 & 4)

Mileage Band	% Change Messages			% Change Conversation Minutes		
	75 - 76	76 - 77	75 - 77	75 - 76	76 - 77	75 - 77
1 - 10	+22.8	+7.8	+32.4	+22.5	+5.2	+28.9
11 - 16	+24.7	+8.6	+35.4	+24.8	+8.1	+34.9
17 - 22	+25.9	+10.1	+38.5	+26.3	+9.4	+38.2
23 - 30	+27.0	+9.9	+39.6	+28.7	+8.6	+39.7
31 - 40	+27.6	+9.4	+39.5	+28.9	+9.8	+41.6
41 - 55	+27.8	+10.9	+41.7	+31.5	+10.4	+45.3
56 - 70	+26.0	+12.9	+42.2	+27.9	+14.2	+46.0
71 - 124	+27.2	+11.4	+41.7	+29.9	+12.5	+46.2
125 - 196	+29.3	+13.4	+46.5	+33.4	+15.5	+54.0
197 - 292	+30.4	+13.9	+48.5	+34.4	+15.9	+55.8
293 - 430	+31.3	+15.1	+51.0	+34.6	+16.9	+57.4
431 - 925	+33.0	+16.8	+55.5	+37.0	+35.0	+85.0
926 - 1910	+36.8	+17.3	+60.4	+42.2	+19.6	+70.1
1911 - 3000	+32.6	+18.0	+56.5	+38.6	+21.5	+68.4
TOTAL	+30.8	+14.3	+49.6	+35.8	+16.9	+58.7

Source: AT&T sample

Appendix D

First Class and Airmail Volumes by Distance
(Billions of Pieces by Year)

	1969	1970	1971	1972	1973	1974	1975	1976	1977
TOTAL VOLUME.....	49.114	50.820	50.201	51.211	52.409	52.927	52.464	52.754	54.220
PER CENT CHANGE.....	4.3	3.5	-1.2	2.0	2.3	1.0	-0.9	0.6	2.8
LOCAL VOLUME.....	13.750	14.405	14.158	13.200	12.019	11.552	11.124	12.432	11.957
PER CENT CHANGE.....	NA	4.8	-1.7	-6.8	-8.9	-3.9	-3.7	11.8	-3.8
PER CENT OF TOTAL VOLUME	28.0	28.3	28.2	25.8	22.9	21.8	21.2	23.6	22.1
TOTAL INTRA-SECTIONAL FACILITY VOLUME.....	21.407	21.542	21.052	21.394	22.070	22.041	20.185	19.720	19.997
PER CENT CHANGE.....	NA	0.6	-2.3	1.6	3.2	-0.1	-8.4	-2.3	1.4
PER CENT OF TOTAL VOLUME	43.6	42.4	41.9	41.8	42.1	41.6	38.5	37.4	36.9
INTRASECTIONAL FACILITY VOLUME + 1-50 MILES INTERSECTIONAL FACILITY VOLUME.....	26.738	27.298	26.979	27.583	28.220	28.424	27.938	27.971	28.541
PER CENT CHANGE.....	NA	2.1	-1.2	2.2	2.3	0.7	-1.7	0.1	2.0
PER CENT OF TOTAL VOLUME	54.4	53.7	53.7	53.9	53.8	53.7	53.3	53.0	52.6
INTERSECTIONAL FACILITY VOLUME BY DISTANCE TRAVELLED									
TOTAL INTER-SECTIONAL FACILITY VOLUME.....	27.707	29.278	29.149	29.817	30.339	30.886	32.172	33.001	34.215
PER CENT CHANGE.....	NA	5.7	-0.4	2.3	1.7	1.8	4.2	2.6	3.7
PER CENT OF TOTAL VOLUME	56.4	57.6	58.1	58.2	57.9	58.4	61.3	62.6	63.1
1-50 MILES.....	5.331	5.756	5.928	6.190	6.151	6.383	7.753	8.251	8.544
PER CENT CHANGE.....	NA	8.0	3.0	4.4	-0.6	3.8	21.5	6.4	3.5
PER CENT OF TOTAL VOLUME	10.9	11.3	11.8	12.1	11.7	12.1	14.8	15.6	15.8
51-150 MILES.....	6.025	6.296	5.912	5.987	6.172	6.333	6.342	6.443	6.732
PER CENT CHANGE.....	NA	4.5	-6.1	1.3	3.1	2.6	0.1	1.6	4.5
PER CENT OF TOTAL VOLUME	12.3	12.4	11.8	11.7	11.8	12.0	12.1	12.2	12.4
151-300 MILES.....	3.933	4.361	4.327	4.331	4.442	4.503	4.474	4.525	4.672
PER CENT CHANGE.....	NA	10.9	-0.8	0.1	2.6	1.4	-0.7	1.1	3.2
PER CENT OF TOTAL VOLUME	8.0	8.6	8.6	8.5	8.5	8.5	8.5	8.6	8.6
301-600 MILES.....	4.211	4.249	4.277	4.364	4.456	4.495	4.494	4.498	4.619
PER CENT CHANGE.....	NA	0.9	0.7	2.0	2.1	0.9	0.0	0.1	2.7
PER CENT OF TOTAL VOLUME	8.6	8.4	8.5	8.5	8.5	8.5	8.6	8.5	8.5
601-1000 MILES.....	3.541	3.655	3.638	3.713	3.808	3.827	3.772	3.809	4.010
PER CENT CHANGE.....	NA	3.2	-0.5	2.1	2.6	0.5	-1.4	1.0	5.3
PER CENT OF TOTAL VOLUME	7.2	7.2	7.2	7.3	7.3	7.2	7.2	7.2	7.4
1001-1400 MILES.....	1.864	1.850	1.905	1.967	2.061	2.070	2.029	2.070	2.168
PER CENT CHANGE.....	NA	-0.7	3.0	3.2	4.8	0.4	-2.0	2.0	4.8
PER CENT OF TOTAL VOLUME	3.8	3.6	3.8	3.8	3.9	3.9	3.9	3.9	4.0
1401-1800 MILES.....	1.065	1.189	1.179	1.247	1.233	1.240	1.262	1.279	1.330
PER CENT CHANGE.....	NA	11.7	-0.9	5.8	-1.2	0.6	1.8	1.4	4.0
PER CENT OF TOTAL VOLUME	2.2	2.3	2.3	2.4	2.4	2.3	2.4	2.4	2.5
1801-2200 MILES.....	0.667	0.724	0.713	0.751	0.745	0.762	0.764	0.775	0.801
PER CENT CHANGE.....	NA	8.5	-1.5	5.3	-0.9	2.3	0.4	1.5	3.3
PER CENT OF TOTAL VOLUME	1.4	1.4	1.4	1.5	1.4	1.4	1.5	1.5	1.5
2201-2600 MILES.....	0.928	1.082	1.091	1.105	1.102	1.116	1.073	1.142	1.138
PER CENT CHANGE.....	NA	16.6	0.8	1.2	-0.3	1.3	-3.9	6.4	-0.3
PER CENT OF TOTAL VOLUME	1.9	2.1	2.2	2.2	2.1	2.1	2.0	2.2	2.1
GREATER THAN 2600 MILES.	0.175	0.143	0.147	0.151	0.157	0.159	0.182	0.211	0.192
PER CENT CHANGE.....	NA	-18.4	3.3	2.6	4.3	1.0	14.7	15.6	-8.8
PER CENT OF TOTAL VOLUME	0.4	0.3	0.3	0.3	0.3	0.3	0.3	0.4	0.4

Source: PIRP estimates based upon USPS quarterly volumes (Revenue and Cost Analysis Reports) and USPS quarterly estimates of volumes by mileage bands (National Service Index).

Appendix E

Mail To and From Households

HOUSEHOLDS SEND 17.5% OF ALL MAIL (16.1 BILLION PIECES)*

Businesses receive 49.2% of all mail from Households (7.9 billion pieces)

payments	=	74.5%	(5.9 billion pieces)
correspondence	=	13.5%	(1.1 billion pieces)
other	=	11.2%	(0.9 billion pieces)
merchandise	=	0.8%	(0.1 billion pieces)

Households receive 42.4% of all mail from Households (6.8 billion pieces)

correspondence	=	96.1%	(6.5 billion pieces)
merchandise	=	2.0%	(0.1 billion pieces)
other	=	1.2%	(0.1 billion pieces)
payments	=	0.8%	(0.1 billion pieces)

Non-Profit Institutions receive 3.5% of all mail from Households (0.6 billion pieces)

payments	=	51.2%	(0.3 billion pieces)
correspondence	=	31.3%	(0.2 billion pieces)
other	=	17.4%	(0.1 billion pieces)

Federal Government receives 1.4% of all mail from Households (0.2 billion pieces)

other	=	44.4%	(0.1 billion pieces)
payments	=	33.4%	(0.1 billion pieces)

State Governments receive 1.3% of all mail from Households (0.2 billion pieces)

other	=	40.3%	(0.1 billion pieces)
payments	=	40.0%	(0.1 billion pieces)

Local Governments receive 1.2% of all mail from Households (0.2 billion pieces)

payments	=	65.8%	(0.1 billion pieces)

Other Sources receive 1.1% of all mail from Households (0.2 billion pieces)

correspondence	=	45.4%	(0.1 billion pieces)
payments	=	42.6%	(0.1 billion pieces)

* Over 95% of all mail from Households is sent first-class; the remainder consists mostly of fourth-class merchandise sent to other households.

Source: University of Michigan, Household Mailstream Study, Final Report, Appendix A, Volume II, Ann Arbor, 1978.

Appendix E (cont'd)

HOUSEHOLDS RECEIVE 60.9% OF ALL MAIL (56.8 BILLION PIECES)

First-Class Mail

Households receive 51.6% of all FCM (29.3 billion pieces)

Businesses send 59.5% of the FCM received by Households (17.4 billion pieces)

bills	=	47.3%	(8.2 billion pieces)
miscellaneous	=	18.8%	(3.3 billion pieces)
financial statements	=	14.1%	(2.5 billion pieces)
correspondence	=	6.1%	(1.1 billion pieces)
negotiable instruments	=	5.8%	(1.0 billion pieces)
advertising	=	5.3%	(0.9 billion pieces)
other	=	1.7%	(0.3 billion pieces)
merchandise	=	0.9%	(0.2 billion pieces)

Households send 22.3% of the FCM received by Households (6.5 billion pieces)

correspondence	=	97.1%	(6.4 billion pieces)
negotiable instruments	=	1.5%	(0.1 billion pieces)

Non-Profit Institutions send 6.2% of the FCM received by Households (1.8 billion pieces)

miscellaneous	=	65.2%	(1.2 billion pieces)
correspondence	=	20.9%	(0.4 billion pieces)
other	=	4.1%	(0.1 billion pieces)
bills	=	3.2%	(0.1 billion pieces)

Federal Government sends 5.6% of all FCM received by Households (1.6 billion pieces)

negotiable instruments	=	47.1%	(0.8 billion pieces)
miscellaneous	=	34.5%	(0.6 billion pieces)
correspondence	=	8.1%	(0.1 billion pieces)
financial statements	=	3.3%	(0.1 billion pieces)

State Governments send 2.4% of the FCM received by Households (0.7 billion pieces)

miscellaneous	=	50.3%	(0.4 billion pieces)
negotiable instruments	=	28.2%	(0.2 billion pieces)
bills	=	8.9%	(0.1 billion pieces)
correspondence	=	7.3%	(0.1 billion pieces)

Local Governments send 2.4% of the FCM received by Households (0.7 billion pieces)

bills	=	42.7%	(0.3 billion pieces)
miscellaneous	=	36.5%	(0.3 billion pieces)
correspondence	=	11.4%	(0.1 billion pieces)

Other Sources send 1.6% of the FCM received by Households (0.5 billion pieces)

miscellaneous	=	51.0%	(0.2 billion pieces)
bills	=	23.6%	(0.1 billion pieces)

Appendix F

Toll Telephone Use by Type of Caller
1972-1977

(BILLIONS OF INTERSTATE AND INTRASTATE CALLS)

	1972	1973	1974	1975	1976	1977
TOTAL BUSINESS VOLUME...	3.311	3.801	4.038	4.184	4.219	4.698
PER CENT CHANGE.....	NA	14.8	6.2	3.6	0.8	11.4
REVENUE PER ..... BUSINESS MESSAGE	1.123	1.164	1.176	1.242	1.273	1.259
PER CENT CHANGE.....	NA	3.7	1.0	5.6	2.5	-1.1
WATS VOLUME.....	0.951	1.215	1.496	1.800	2.359	2.946
PER CENT CHANGE.....	27.4	27.7	23.1	20.3	31.0	24.9
PRIVATE LINE VOLUME.....	0.970	1.081	1.164	1.274	1.406	1.515
PER CENT CHANGE.....	8.5	11.4	7.7	9.4	10.4	7.8
TOTAL: WATS, PRIVATE LINE AND BUSINESS VOLUME	5.232	6.097	6.698	7.258	7.983	9.159
PER CENT CHANGE.....	NA	16.5	9.9	8.3	10.0	14.7
TOTAL RESIDENTIAL VOLUME	3.477	3.723	4.022	4.311	4.715	5.266
PER CENT CHANGE.....	NA	7.1	8.0	7.2	9.4	11.7
REVENUE PER..... RESIDENTIAL PHONE CALL	1.241	1.276	1.316	1.414	1.474	1.512
PER CENT CHANGE.....	NA	2.8	3.2	7.4	4.3	2.6
TOTAL INDEPENDENT ..... COMPANY VOLUME	1.802	2.115	2.230	2.484	2.746	2.991
PER CENT CHANGE.....	NA	17.3	5.4	11.4	10.6	8.9
REVENUE PER..... INDEPENDENT COMPANY CALL	0.948	0.968	1.001	1.070	1.111	1.128
PER CENT CHANGE.....	NA	2.1	3.4	6.9	3.9	1.5
PAY PHONE VOLUME.....	0.242	0.228	0.233	0.195	0.167	0.164
PER CENT CHANGE.....	NA	-5.7	2.5	-16.4	-14.6	-1.6
REVENUE PER..... PUBLIC TELEPHONE CALL	0.701	0.727	0.766	0.904	1.046	1.030
PER CENT CHANGE.....	NA	3.7	5.4	18.0	15.7	-1.6
TOTAL VOLUME, EXCLUDING WATS AND PRIVATE LINE...	8.833	9.868	10.524	11.174	11.847	13.120
PER CENT CHANGE.....	NA	11.7	6.6	6.2	6.0	10.7
REVENUE PER MESSAGE.....	1.122	1.154	1.184	1.264	1.312	1.328
PER CENT CHANGE.....	NA	2.8	2.6	6.8	3.8	1.2
GRAND TOTAL VOLUME.....	10.754	12.163	13.184	14.248	15.611	17.580
PER CENT CHANGE.....	NA	13.1	8.4	8.1	9.6	12.6

Source: AT&T sample, annualized

Appendix F (cont'd)

(BILLIONS OF INTERSTATE CALLS)

	1972	1973	1974	1975	1976	1977
TOTAL BUSINESS VOLUME...	1.388	1.616	1.673	1.707	1.664	1.843
PER CENT CHANGE.....	NA	16.4	3.5	2.1	-2.5	10.8
REVENUE PER.....	1.616	1.673	1.681	1.774	1.817	1.772
BUSINESS MESSAGE						
PER CENT CHANGE.....	NA	3.5	0.4	5.6	2.4	-2.5
WATS VOLUME.....	0.626	0.801	0.974	1.186	1.531	1.936
PER CENT CHANGE.....	28.0	28.0	21.5	21.8	29.1	26.4
PRIVATE LINE VOLUME.....	0.643	0.700	0.731	0.790	0.844	0.884
PER CENT CHANGE.....	4.4	8.9	4.4	8.2	6.8	4.7
TOTAL: WATS, PRIVATE						
LINE AND BUSINESS VOLUME	2.657	3.117	3.377	3.683	4.039	4.663
PER CENT CHANGE.....	NA	17.3	8.4	9.1	9.7	15.4
TOTAL RESIDENTIAL VOLUME	1.364	1.451	1.548	1.650	1.807	2.025
PER CENT CHANGE.....	NA	6.4	6.7	6.6	9.6	12.0
REVENUE PER.....	1.853	1.903	1.945	2.098	2.175	2.222
RESIDENTIAL PHONE CALL						
PER CENT CHANGE.....	NA	2.7	2.3	7.8	3.7	2.1
TOTAL INDEPENDENT	0.392	0.465	0.496	0.548	0.584	0.644
COMPANY VOLUME						
PER CENT CHANGE.....	NA	18.5	6.8	10.5	6.4	10.3
REVENUE PER.....	1.837	1.864	1.896	2.023	2.111	2.107
INDEPENDENT COMPANY CALL						
PER CENT CHANGE.....	NA	1.5	1.7	6.7	4.4	-0.2
PAY PHONE VOLUME.....	0.084	0.080	0.082	0.057	0.044	0.042
PER CENT CHANGE.....	NA	-4.4	2.6	-31.2	-21.7	-5.7
REVENUE PER.....	1.032	1.028	1.090	1.458	1.840	1.846
PUBLIC TELEPHONE CALL						
PER CENT CHANGE.....	NA	-0.5	6.1	33.7	26.2	0.4
TOTAL VOLUME, EXCLUDING						
WATS AND PRIVATE LINE...	3.228	3.611	3.799	3.962	4.099	4.553
PER CENT CHANGE.....	NA	11.9	5.2	4.3	3.5	11.1
REVENUE PER.....	1.728	1.776	1.804	1.939	2.017	2.020
INTERSTATE MESSAGE						
PER CENT CHANGE.....	NA	4.150	1.808	3.054	1.866	2.469
GRAND TOTAL VOLUME.....	4.496	5.112	5.503	5.938	6.474	7.373
PER CENT CHANGE.....	NA	13.7	7.6	7.9	9.0	13.9

Appendix F (cont'd)

(BILLIONS OF INTRASTATE CALLS)

	1972	1973	1974	1975	1976	1977
TOTAL BUSINESS VOLUME...	1.923	2.186	2.366	2.477	2.555	2.855
PER CENT CHANGE.....	NA	13.6	8.2	4.7	3.2	11.7
REVENUE PER ..... BUSINESS MESSAGE	0.767	0.788	0.819	0.875	0.918	0.928
PER CENT CHANGE.....	NA	2.7	4.0	6.8	4.9	1.1
WATS VOLUME.....	0.325	0.414	0.522	0.614	0.827	1.009
PER CENT CHANGE.....	26.4	27.3	26.3	17.6	34.7	22.0
PRIVATE LINE VOLUME.....	0.327	0.381	0.434	0.483	0.562	0.631
PER CENT CHANGE.....	17.4	16.3	13.8	11.5	16.2	12.4
TOTAL: WATS, PRIVATE LINE AND BUSINESS VOLUME	2.576	2.980	3.321	3.575	3.944	4.496
PER CENT CHANGE.....	NA	15.7	11.5	7.6	10.3	14.0
TOTAL RESIDENTIAL VOLUME	2.113	2.273	2.474	2.661	2.908	3.241
PER CENT CHANGE.....	NA	7.5	8.9	7.6	9.3	11.5
REVENUE PER..... RESIDENTIAL PHONE CALL	0.847	0.875	0.923	0.989	1.038	1.069
PER CENT CHANGE.....	NA	3.4	5.4	7.2	4.9	2.9
TOTAL INDEPENDENT ..... COMPANY, VOLUME	1.410	1.650	1.734	1.935	2.162	2.348
PER CENT CHANGE.....	NA	17.0	5.0	11.6	11.7	8.6
REVENUE PER..... INDEPENDENT COMPANY CALL	0.701	0.716	0.744	0.799	0.841	0.859
PER CENT CHANGE.....	NA	2.2	4.0	7.4	5.2	2.2
PAY PHONE VOLUME.....	0.158	0.148	0.151	0.139	0.122	0.122
PER CENT CHANGE.....	NA	-6.4	2.4	-8.4	-11.7	-0.1
REVENUE PER..... PUBLIC TELEPHONE CALL	0.525	0.564	0.590	0.678	0.759	0.751
PER CENT CHANGE.....	NA	7.4	4.6	15.0	11.9	-1.1
TOTAL VOLUME, EXCLUDING WATS AND PRIVATE LINE...	5.605	6.256	6.725	7.212	7.747	8.566
PER CENT CHANGE.....	NA	11.6	7.5	7.3	7.4	10.6
REVENUE PER..... INTRASTATE MESSAGE	0.774	0.795	0.833	0.893	0.939	0.960
PER CENT CHANGE.....	NA	2.8	4.7	7.2	5.1	2.2
GRAND TOTAL VOLUME.....	6.257	7.051	7.681	8.310	9.136	10.207
PER CENT CHANGE.....	NA	12.7	8.9	8.2	9.9	11.7

Appendix G

Composition of Message Telecommunication Service (MTS)

1977

	messages (millions)	% total MTS calls	conversation minutes (millions)	% total conversation minutes	revenue (millions)	% total revenue
I. INTRASTATE	713.7	65.3	3510.2	53.9	685.1	47.1
A. Customer dialed	624.5	57.1	3082.5	47.3	537.5	36.9
1. Business	207.0	18.9	774.5	11.9	166.5	11.5
a. day	173.1	15.8	626.0	9.6	144.7	10.0
b. evening	19.1	1.7	86.7	1.3	13.9	1.0
c. nights & weekends	14.8	1.4	61.8	1.0	7.9	.5
2. Residential	241.8	22.1	1468.2	22.6	233.7	16.1
a. day	89.0	8.1	419.0	6.4	81.0	5.6
b. evening	86.6	7.9	622.1	9.6	97.9	6.7
c. nights & weekends	66.2	6.1	427.1	6.6	54.8	3.8
3. Independent Cos.	175.7	16.1	839.8	12.8	137.3	9.3
a. day	93.9	8.6	371.9	5.7	73.2	5.0
b. evening	40.5	3.7	256.5	3.9	38.2	2.6
c. nights	38.5	3.5	195.4	3.0	23.9	1.6
d. weekends	2.8	.3	16.0	.2	2.0	.1
B. Operator-Assisted, Public, etc.	89.2	8.2	427.7	6.6	147.6	10.2
a. day	63.8	5.8	285.3	4.4	105.3	7.3
b. evenings	16.0	1.5	98.3	1.5	29.2	2.0
c. nights & weekends	9.4	.9	44.1	.7	13.1	.9

Appendix G (cont'd)

II.	INTERSTATE	380.4	34.9	2992.2	46.1	766.5	52.8
	A. Customer dialed	313.6	28.7	2464.8	38.0	557.1	38.3
	1. Business	125.9	11.5	604.5	9.4	185.8	12.8
	a. day	109.6	10.0	493.2	7.6	166.1	11.4
	b. evening	9.1	.8	62.2	1.0	13.1	.9
	c. nights & weekends	7.2	.7	49.1	.8	6.6	.5
	2. Residential	143.5	13.1	1501.3	23.1	289.1	19.9
	a. day	34.9	3.2	226.9	3.5	69.5	4.8
	b. evening	58.0	5.3	664.4	10.2	138.4	9.5
	c. nights & weekends	50.6	4.6	610.0	9.4	81.2	5.6
	3. Independent Cos.	44.2	4.1	359.0	5.5	82.2	5.6
	a. day	21.6	2.0	114.3	1.8	37.2	2.6
	b. evening	11.9	1.1	130.1	2.0	28.3	1.9
	c. nights	10.5	1.0	112.4	1.7	16.4	1.1
	d. weekends	.2	.0	2.2	.0	.3	.0
	B. Operator-Assisted, Public, etc.	66.8	6.2	527.4	8.1	209.4	14.5
	a. day	31.2	2.9	184.5	2.8	96.7	6.7
	b. evening	20.7	1.9	200.3	3.1	72.2	5.0
	c. nights & weekends	14.9	1.4	142.6	2.2	40.5	2.8
TOTAL		1094.1	100.0	6502.4	100.0	1451.6	100.0

Source: AT&T sample, annualized

APPENDIX H

Summary of Telephone and Letter Mail Use, 1978 and 1979, with Economic-Demographic Indicators

(See Appendix A for data from 1950-1977.)

	1978	1979
MILLIONS OF LOCAL CALLS (BELL SYSTEM ONLY)	165,583	169,185
PER CENT CHANGE	7.3	2.2
MILLIONS OF MTS MESSAGES	14,639	16,193
PER CENT CHANGE	14.0	10.6
MILLIONS OF MTS INTERSTATE MESSAGES	5,456	6,083
PER CENT CHANGE	12.9	11.5
MILLIONS OF MTS INTRASTATE MESSAGES	9,183	10,110
PER CENT CHANGE	14.6	10.1
MILLIONS OF WATS CALLS (ESTIMATED)	3,631	4,244
PER CENT CHANGE	23.3	16.9
MILLIONS OF PRIVATE LINE CALLS (ESTIMATED)	1,671	1,852
PER CENT CHANGE	10.3	10.8
MILLIONS OF FIRST CLASS AND AIR MAIL LETTERS	56,188	58,522
PER CENT CHANGE	3.5	4.2
DISPOSABLE PERSONAL INCOME (BILLIONS OF 1972 DOLLARS)	973	995
PER CENT CHANGE	4.6	2.3
POPULATION (MILLIONS)	219	221
PER CENT CHANGE	0.8	0.9
MILLIONS OF HOUSEHOLDS	76	77
PER CENT CHANGE	2.5	1.7