ALTERNATIVE RATE STRUCTURES

FOR

LOCAL TELEPHONE SERVICE

IN NORTH AMERICA

FINAL REPORT

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CONTENTS

FOREWORD

This report and the associated reference file contain descriptive material and documentation on local telephone pricing schemes in North America and on related subsidy programs and special assistance pricing programs. Prepared for Mr. Everett King of the Telecommunications Policy Branch of the Department of Communications, the report and the file provide an inventory and description of the rate structures and a comprehensive survey of the extensive literature on pricing issues.

The survey of the literature was intended to provide descriptive material on local telephone pricing structures. In reality the material provides descriptions of generalized models and partial examples of specific situations. In the circumstances, it was necessary to go to the actual tariffs to develop a complete picture of the rate structures. Reviewing sample tariffs, in turn, identified wide variance in applications within the structures and the consequent impact on users. Accordingly, to build up a complete picture, our sample grew to include 41 companies. These included 32 companies in the U.S. and 9 companies in Canada.

Robert Chouinard (Parsec Communications Inc.) led the technical team which undertook this extensive work. The team included Kelvin Bellis (Bellis Associates), Robert Logan and Blair Poetschke. Lucie Belle-Isle translated the report.

This work would not have been possible without the willing assistance of many people in industry and government. We wish to thank all those who have provided information through personnel contacts and access to their facilities. In particular, we are indebted to the staff of Bell Canada's Documentation Resource Centre in Ottawa, and CNCP Telecommunications' Library in Toronto.

Finally, it must be emphasized that the findings, observations and inferences that may be drawn from this report are expressions of the authors and in no way purport to express views or positions of our client, the Department of Communications, Government of Canada.

Leonard E. Poetschke
President

ALTERNATIVE RATE STRUCTURES FOR LOCAL TELEPHONE SERVICE IN NORTH AMERICA

I INTRODUCTION

1.1 OBJECTIVE

In Canada and the United States a wide variety of rate structures for local telephone service has evolved through interaction over the years of market forces and regulatory decisions. In recent years this process has been accelerating and there has been a marked increase in the degree of complexity of these rates. The objective of this study has been to compile an inventory of these rates and to identify some of the issues raised by their impact in the market.

1.2 BACKGROUND

Local telephone service, supplied under monopoly conditions is closely regulated by federal, provincial or state and municipal authorities. Proposed rate levels and pricing mechanisms are generally initiated by the telephone companies. The regulatory process, through the medium of public hearings, offers challenge to these proposals.

Regulatory decisions are expected to reflect, in the name of the public interest, a compromise of interests and requirements. On the one hand the rate must reflect the legitimate needs of the industry to effectively operate, introduce technology, improve productivity and provide a fair return to investors. On the other hand, the authorities must insure that rates are just and reasonable, the concerns of society are met, the

underprivileged are not left out and that telephone service is universally available at affordable rates.

A characteristic of local telephone service across North America is the complexity and subtleness of the various rate structures. These have been brought about by rapidly advancing technology coupled with monopoly forces pressing to optimize their position in a restraining context of politics, public interest and market inertia.

Concern about the impacts of these structures and the rate levels developed within them form the core of the volumes of material outlining the assessments and counter-assessments made by the industry, consumer interests, governments and regulatory bodies.

1.3 APPROACH

The basic task undertaken in this study has been to sift through these volumes of material, attempting to identify and assemble descriptions of local rate systems, issues and arguments that might serve those engaged in and concerned with pricing of local telephone service in Canada. Information on these rates and their impact were found in articles and papers, studies and reports, regulatory documents and current Canada and U.S. tariff schedules. Representative material from the review is identified in the bibliography attached as Appendix 3. Copies of bibliographies collected during this assessment are included in the working papers submitted with this report.

In preparing the inventory and review of rate structures and levels outlined in Section II of this report, the local service rates contained in the tariffs of 32 American and 9 Canadian major telephone companies were examined. Specific rate data was extracted and compiled into a set of 41 comparative rate tables using a format similar to the one used in the annual NARUC

report on Exchange Service Telephone Rates.[1] Sample rate tables are shown in Appendix 2 with the full set of rate tables included as working papers submitted with this report.

A summary of local rates along with other pertinent data was prepared for each tariff. NARUC reports were used to prepare summaries for the 20 states for which the tariffs of the major telephone company were not obtained. These summaries make up Appendix 5 which is bound as a separate 106-page volume of this report. Sample summary pages are included as Appendix 1 to this report.

To supplement this information on rate structures and to identify specific major issues, concerns and basis for regulatory practices, a detailed analysis was developed for each of the primary rate structure categories. The three case studies contained in Section IV below were developed to complement and illustrate the analysis.

1.4 ISSUES

Central to the development of rate structures is the underlying pricing concept. Historically, local telephone service in North America has been mostly priced on a flat rate basis. The origins of flat rate pricing are rooted in the concepts of telephone development and universally available telephone service. The rates for long-distance telephone service on the other hand are based on usage sensitive pricing concepts incorporating charges for frequency, duration, distance and time of day.

Restructuring of the industry in the United States, along with inflation and advancing technology, resulted in efforts during the late 1970's to incorporate elements of the long-distance rate structure into the charge for local telephone service.[2] It is expected that these usage sensitive priced rates for local service will help offset the impact of reduced revenues from long-distance services.

The introduction of local service rates based on usage sensitive pricing has met with varied responses ranging from acceptance to rejection from the regulators. Given the nature of the social and economic issues being debated before the regulators in the United States, it is evident that Canadians will be faced with many of the same concerns if and when the telephone companies decide to open the question of usage sensitive pricing for local telephone service.

The social issues centre mainly on equity, universal availability of affordable service and on the impact of higher charges on specific groups such as senior citizens and others on fixed incomes. The arguments are that telephone usage is not correlated to income and the poor could face higher charges. The counterargument is that measured rates allow customers to control their costs by reducing usage. Two frequent topics in these debates are the elasticity of demand and the correlation between income and having a telephone.

The economic issues relate to the availability and the reliability of supporting cost studies used in rate-making and the estimates of decreases in demand resulting from price change. Generally the assessment of the efficiencies and the benefits claimed for the new rates includes determination of the cost and the benefits. The methodologies and the cost studies are at issue and a number of applications have been accepted or rejected on this basis.

Additional investment in plant is required to implement the measuring and the billing capabilities. This is said to be offset by the deferral of capacity expansion resulting from shifts in peak loads when time of day discounts are provided. Studies to substantiate claims of such peak shifting and reduction in demand due to measured usage are also requested and challenged.

In a number of cases, the regulator has determined that the investment in measuring equipment is cost-effective when limited to modern electronic switching centres. The modification of electro-mechanical switches has been deemed to be too costly.

Because of the uncertainties, the complexities of the rate structures and public opinion, the discernible trend in regulation seems to be cautious acceptance on a limited basis of usage based rates with emphasis on experiments, trials and pilot projects. The immediate objective appears to be a better understanding of the impact of local service rate structure based on usage sensitive pricing.[3]

II RATE STRUCTURES FOR LOCAL TELEPHONE SERVICE

2.1 RATE PRICING CONCEPTS

Flate rate and usage sensitive pricing concepts can be used to develop telephone rate structures and levels to meet many different objectives. Rate can be designed to reflect the cost of specific service offerings, to recover costs for a class of users, or they can be designed to yield specific target revenues while still making a contribution to cost recovery There is disagreement as to whether rates should reflect average total costs, average variable costs, peak and off-peak costs, long-range incremental rates and so on.[4]

Rates design can be used also as a tool to implement development and marketing strategies through rate schedules. Historically the rate design objectives of telephone companies have been stated along lines as follows:

- Produce adequate and stable revenues;
- Provide maximum satisfaction to the public through:
  encouraging maximum practical use with a fair distribution of charges and a uniformly high quality of service;
- Permit economic operation;
- Make for simplicity of administration and easy of understanding by the public.

Within these objectives the principles used to set rate levels have been based on:

- value of service where the price is based on the value to the customer;
- some recognition of the costs of providing the service;

- price averaging within territories and categories of customers;
- service classifications among groups of customers.

More recently, the need to respond to competition and a changing environment has been added to the list of objectives and greater emphasis has been placed on the recognition of costs.[5]

2.2 RATE COMPONENTS OF LOCAL SERVICE

Over the years, the components that are factored into charges for local telephone service have evolved and grown in number, allowing increasing price differentiation reflecting a widening range of situations. The main components identified from pricing practices across North America are described in the following:

Exchange:

The basic element in the hierarchy of factors shaping rate schedules is the telephone exchange. An exchange is a defined geographic area within which all calls are made without long distance charges. It is an administrative area, containing one or more telephone central offices. An exchange area typically covers one community and its immediate hinterland. In larger metropolitan areas, however, an exchange may include smaller areas defined within it as zones, bands or cells which are identified for purposes of setting local rates based on the distance covered by the call.

Rate Group:

The exchanges within the territory of a telephone company are classified into rate groups according to the number of telephone lines in the exchange. A different rate is applied to each group according to the size of the exchanges in the group.

Extended Area Service:

The toll-free calling area of an exchange may be extended to include that of a nearby exchange. The effect is to increase the total number of lines in the new toll-free area and rates go up in the nearby exchange as it moves into the higher rate group. Alternatively, the rates for Extended Area Service can be optional and in either case can be ased on flat rate or usage sensitive pricing.

Service Classification:

Within an exchange, rates are differentiated based on classification of the service. These classifications are as follows:

Purpose	Residential; Business.
Amount of Service	Individual line
	Two party; four party; or multi-party lines
	Multi-line (two or more lilnes, one listing)
	Trunk lines (PBX)
Special Concession	Low-income; churches; clergy; charities.

2.3 RATE STRUCTURES

At the broadest level, rate structures for telephone service in North America have evolved in two broad categories - flate rate structures resulting in fixed monthy charges; and structures based on usage resulting in variable monthly charges. These structures have developed for many classes of service. The following discussion, however, is limited to local business and residential services, leaving out other classifications such as coin telephone service, PBX trunks and feature packages.

A. FLAT RATE STRUCTURES

A flat rate structure provides for a fixed monthly subscription fee per line

with unlimited calling within the local toll-free calling area. No limits are placed on the number of calls, their duration or the time and day. A different fee applies in different jurisdictions, different rate groups and different classes of service.

The rate level depends on the telephone count in the area as defined by the rate group. Business rates are set higher than residential rates and individual rates are set higher than two and multi-party lines. PBX trunks and multi-line service rates are set higher than individual service rates.

Additions to the basic flat rate are made to reflect:

- Lower number of telephones per square mile in some urban areas;
- Extended zone service in large urban areas;
- Extended area service where the additional charge is assessed to customers in the extended area and sometimes to those in the home exchange area.

Inexpensive flat rate pricing for local service has been successful in helping to achieve virtually universal service in North America. Currently 98% of the households in Canada and 95% in the United States have telephone service.[6]

The early entrepreneurs saw that the value of the telephone increased as the network size increased. To promote the use of the service, the value of service concept was used to justify price discrimination between markets having different price elasticities. This demand oriented approach, using the value of service concept, coupled with flat rate pricing resulted in a simple and efficient tool to implement market strategies. Rate schedules were developed to encourage the use of the service by the maximum number of customers and the maximum use by each customer, and in this way help to make telephone service progressively more valuable to all.

During the early development phase, the marketing strategy for development consisted of setting a low flat rate for the target market. As the penetration increased so did the value of the service in both the existing and original target market to the point where prices could be increased to support development of the next target market.

Initially telephone service was used mostly by business customers. To attract residential customers, lower promotional rates had to be used because residence customers would not pay as much as business customers for the same service. Subsequently the strategy was used to develop the rural market and create yet other classes of customers. The strategy was modified to deal with the large post-war expansion of the calling scope in local exchanges where flat rate pricing replaced short-haul (long distance) toll routes in the larger communities.

During the latter stages of development, contributions from the fast growing toll revenues were added to the contribution from some of the other classes of service to keep down residential rates. The strategies for maximum development under flat rate succeeded and by 1975 flat rate was used by virtually all residential customers in North America and by half of the business customers in the United States.

The next logical local growth market for local service is to increase the amount of access and usage, thus continuing to increase the value of the service. The objective could be met by pricing the service to increase the number of lines for business customers and to promote the addition of a second line per household in the vast residential market. Looking ahead to the emerging market for information transfer and add-on services, there is potential for additional access capacity, e.g. more lines or more bandwidth, and for increased usage, e.g. more calls, longer holding time for some computer connections and more call related services such as call waiting and call screening.

In order to further expand usage under flat rate pricing, however, a low rate, representing the modest incremental value to the customers would be required to represent more access and usage. A low rate may not be sufficient to support the expansion of the network increments such as a second line per household or the provision of increased bandwidth.

Similarly a small increase in rate for all customers to represent the marginal value of additonal usage would not generate enough revenues for the expansion. Further classifications are required to target those markets where the price elasticity will support additional charges for increased access and usage.

In the late 1970's AT&T opted for a different pricing philosophy proposing new rate structures with separate charges for access and for usage. The access component was based on flat rate pricing with a fixed monthly subscription fee. Three options were proposed for the usage component - a premium flat rate service, a low use and a standard measured service.[7]

Consequently, current flat (premium) rates for local telephone service in areas where usage sensitive pricing has been introduced, have been split into two components (unbundled). This two-component flat rate introduces greater flexibility in adjusting rate levels to attain rate objectives.

B. USAGE SENSITIVE STRUCTURES (U.S.)

In contrast to flat rate pricing, application of the usage sensitive pricing concept results in individual charges for each customer based on the amount of network usage as represented by selected units of measurement. Historically these usage sensitive rate structures have been widely used for long distance telephone service and to a limited extent for local message service.

Recent advances in technology have made possible the refinement of message rate structures into multi-element (LMS) rate structures that are supported by more detailed and sophisticated usage measurements.

2.3.1 Message Rate Structures

The rate is separated (unbundled) into a fixed monthly subscription fee for access to the network and a second variable charge for usage. The flat rate access component is treated in the same manner as flat rate service so that the components of exchange, rate group and service classification will determine the fixed monthly subscription fee.

The variable usage sensitive charge is assessed either per message (per call) or per unit. The unit adds weighting to the call for distance, duration, time/day or a combination of these. For example, calls between different locations will be set on a scale of 2, 4, and 8 units according to distance. If timing is available, the rate for given distance could be set at 6 units for the first five minutes and 4 units for each additional five minutes.

The message rate structures may also include an allowance for usage in the monthly subscription fee for access. The allowance can be expressed in number of calls or units. Where time/day discounts are available, the allowance is expressed in monetary terms. Variable charges are applied only after the allowance is used up. Historically message rate local service was offered mostly in the largest cities in the United States. Generally, the service was mandatory for business and optional for residence customers. The offerings tended to be of the high value discount variety and included generous allowances of calls that could be made without additional charge.[8] Elsewhere in Canada, as in the United States, message rate was viewed as a minimum price service. It offered an alternative to four party service customers and to low usage business customers.

The view of the industry was that as long as flat rate service could be offered at levels which included a reasonable minimum rate, it offered more advantages than message rate service. In general customers got relatively more service for their money and were therefore prepared to pay more; the use was greater, which gave the service more value; and customer complaints over amounts of bills were eliminated.

Attempts by some telephone companies to withdraw message rate service and implement flat rate service in the large cities were turned down by those regulators who viewed message rate charging for business as a more equitable way of assessing the cost of providing service.[9]

Over the years, improvements were made to the measuring mechanisms to allow charging on the basis of distance, duration, and time. Attempts to introduce the timing of call durations, in particular, met with strong public reaction where optional message rate service was offered to residential customers.[10]

In terms of overall telephone development, the impact of message rate service has been to retain low use customers and to distribute the revenue burden according to usage for business service.

2.3.2 Local Measured Rate Structures (LMS)

Local Measured Service (LMS) is the term widely used to refer to measured rate service based on an access charge and four usage elements -frequency, duration, distance and time/day. the LMS rate structure is similar to that used for long-distance service and, in many areas, the policy of the telephone companies is to offer it as an optional alternative to flat rate service where facilities are available.

The rate is separated (unbundled) into a fixed monthly subscription fee for network access and variable charges based on usage. This access fee is set in the same manner as in flat rate service insofar as it reflects the exchange location, the service classification and, sometimes, the rate group in some tariffs a separate fixed fee is made for both access and for the usage component, before the variable usage charges are applied. The usage elements are:

Duration: the duration of the call in minutes rounded to the next higher value.

Frequency: a call set up charge for each call is included in the rate for the initial minute

Distance: the rate per minute increases for each increment of distance in the local calling area (zone, band).

The rate structure also incorporates modifiers:

a) The flat rate component generally includes an allowance for a pre-determined amount of usage. This is generally expressed as a dollar value.

b) the usage component may include discounts for:

- high usage volume customers (volume discounts)
- off peak period calling (time and day).

Charges are also made if detailed billing is provided and surcharges are made for local telephone operator-assisted calls. Usage charges are assessed only on completed outgoing telephone calls, although measured service for incoming calls is available in some areas.

In 1977, AT&T announced its decision to extend the concept of measured service to local calling and to phase out flat rate service by 1985. The change to cost based rates was considered necessary due to a number of economic and social changes in the 1960's and 1970's that "combined to make flat rate pricing increasingly untenable, particularly if universal service was to remain the primary goal." Another important reason was that technological progress had made such a transformation feasible. The reasons for change were given as:

a) Impact of inflation on rate levels and the possible loss of customers;

b) Inability to increase revenues in relation to increasing network usage;

c) Impact of competition on the traditional contribution from long-distance;

d) Regulators and legislators' increasing awareness that cost-based pricing fosters the efficient use of resources; and

e) Increasingly active consumer groups who would oppose higher rate levels and are troubled about the inherent inequalities in flat rate pricing which forces low users to bear some of the incidence of cost generated by high users.[11]

Around that time it became possible for the electronic switching equipment in the central office to generate a complete billing record for a local call. The four-element billing record for local and long distance calls contains:

- calling number;
- called number;
- connect date and time; and
- call duration (disconnect or lapsed time).

The new switching equipment was also capable of capturing additional call information with additional revenue potential. Examples include: charges for call attempts; charge per call for Speed Calling; separate charges for two calls involved in Call Forwarding; appropriate billing for Three-Way Calling; and for Call Waiting.[12]

The rate structure for the original Bell System proposal at the time was based on an access charge (unbundled) and three usage options. The access charge, at a fixed monthly fee, would provide access from the customer's premises to the local and long-distance network. The fee would cover maintenance and incoming calls.[13]

The customer-dialed usage charge would be priced according to the four elements - frequency, duration, distance and time/day. The inclusion of the distance element would allow the call to increase smoothly from local to long-distance and time/day discounts would be available.[14]

Access and the four usage elements were to reflect the categories of costs incurred by the company in providing service. The three rate options were:

a) Low Use Measured Service: without a usage allowance or a very small one.

b) Standard Measured Services: usage allowance designed for average use.

c) Premium Rate Service: fixed monthly fee, substantially higher than present flat rate, for unlimited local calling.

In contrast to AT&T, General Telephone announced its plan to implement non-optional measured service. A single rate with no allowance was proposed because no need was seen for a multiple option marketing plan to induce customers to change from flat rate service.[15]

Within the existing classifications, developed under flat rate price averaging techniques, the new measured rate structures introduce a further level of price discrimination at the individual customer level. Each customer, in effect becomes a class within a class with unique price elasticity.

The justification for the new level of price discrimination was to bring the rate closer to the cost of providing the service. Under ideal usage sensitive price concepts, the charges for service are related to the variable cost of providing the service and to a pro-rata share of the total return on investment.

For marketing reasons, the AT&T plan grouped customers into three rate groups with a low, standard and premium rate. The effect in each case was to allow each to select the least expensive option.

To retain customers in the high use category, ceilings are placed on the charges. For customers in the standard category, an allowance for calls

was set to preserve revenues and to discourage demand for second lines in households. For the lower user, the usage charges were set to escalate rapidly to prevent migration from the group which selected the standard rate structure.

The new rate structures also provided a mechanism to allow the development of new discretionary services priced in small increments which would be attractive to customers.

The LMS proposals of the telephone companies brought a strong public reaction. The regulators, faced with the complexity of the new rates and the uncertainties related to both the justification and the probable impact had to proceed cautiously. The decisions being made reflect a range of views on the matter. The result has been a slow but steady introduction of a number of variants of the original LMS proposals with widespread experimentation still going on and a number of issues remaining unresolved.

Since 1980, local measured service has been introduced in 35 states. While both message rate service and LMS are available in 47 states they are not widely used and LMS penetration particularly is not yet extensive.[16]

2.4 LIFELINE RATES

The concept of a "lifeline" rate in provision of telephone services, in general, refers to a minimum price offering. In some cases eligibility depends upon certification of low income. More often, "lifeline" is used to denote a budget or economy level rate for limited use.

In Canada there is no strictly mandated lifeline service where eligibility is based on income. In the sample of nine tariffs from the major telephone companies, only Bell Canada and British Columbia Telephone offer a

budget service in the form of a low price two-party line service. This offering arose from decisions of the Canadian Radio-television and Telecommunications Commission in 1979 and 1980 when the carriers were directed to lower the rates for two-party service to the level of four-party service. This was done in response to the concern outlined by interveners and it was consistent with the Commission's continuing desire to ensure accessbility to basic telephone service. (Telecom Decision 79-23, Nov. 1979.)

Comparison of Rates for
Single and Two-Party Residence Service
(Nine Major Telephone Companies - Canada)

	Single Party	Two Party	Percent Below Single Pty
A.G.T. (Alberta)	$12.61	$11.42	9%
B.C. Tel (British Columbia)	12.65	7.45	41
Bell Canada (Quebec, Ont.)	11.60	6.95	40
Island Tel (P.E.I.)	11.25	10.75	4
M.T.&T. (Nova Scotia)	11.65	10.35	11
M.T.S. (Manitoba)	6.75	6.15	9
N.B. Tel (New Brunswick)	12.05	11.20	7
N.T. Co. (Newfoundland)	13.15	11.15	15
Sask Tel (Saskatchewan)	8.30	8.10*	2

* Rate for Multi-Party

In the United Stgates, concerns were voiced that higher rates for local telephone service, resulting largely from decreased contributions from long-distance revenue, would cause low-income customers to forgo telephone service. These concerns have given renewed impetus to consideration of a reduced lifeline rate for the needy.[17]

The concept of widely available telephone service, available at affordable rates is referred to as universal service. It is accepted by regulators and it has been cited in their decisions. The Communications Act of 1934, states this goal (although the language is not specific) and this has been interpreted by most as a mandate for universal service. In both countries the goal has been achieved as 98% of Canadian and 95% of American households have a telephone.[18]

The concept that higher rates will cause disconnects (drop-offs) has been extensively studied. The results of these studies of price elasticity and income elasticity of demand for telephone service is a general agreement that most subscribers will continue service even if prices increase. The focus on these studies has been on some of the components of the customer's bill.[19]

Monthly Items:

1. Basic local service access; sometimes local usage (2) is included.
2. Local service usage, including discounts.
3. Long-distance usage, including discounts.
4. Equipment and services: set, tone dialling, extended area service (sometimes included under 1 above), extensions, etc.
5. Taxes.

One-Time Costs:

6. Initial installation/connection fee.

Studies of elasticity of demand for telephone service have included basic local service prices (1 and 2 above) and sometimes the initial installation price (6). Recent work has found indications that disconnects are strongly related to long distance charges[20]. Some real life factors were not included in the studies, in particular the effect of price barriers to initial entry and to re-entry after drop-off (deposits, credit rules, etc.)

Untargeted Lifeline

The general approach to lifeline rates is to insure that the local service alternatives include a low price rate option. In a flat rate environment, the lower price is related to a lesser grade of service such as a two-party or multi-party service. Where measured service is available, it takes the form of a low use/low price service, available to all customers regardless of income, it is generally a measured rate with a small or no allowance.

Although income is not related to telephone usage, the low use/low price option is viewed as a lifeline for those needy customers who require only little usage and those who reduce their level of consumption. In cases where the low use/low price measured rate structure has a higher price per call than the standard measured service, increases or occasional surges in the level of consumption will cause the customer to consider changing to standard service to keep the price down.[21]

Targeted Lifeline

In specific situations, subsidized rates for low-income telephone customers have been mandated by legislation or the regulators. Consideration has been given to funding the subsidies from a number of sources including government, long-distance revenues, directory revenues or local service revenues.

The administration of subsidy programs is a difficult and costly undertaking and generates much debate. Suggestions have been made for a lifeline "class of service". It is argued that telephone service is sufficiently widespread to be used to raise the equivalent of a head tax to subsidize target groups. Administering such a subsidy would be simple and would conform to economic theory insofar as the retained customer would add to the externalities of the local calling area.[22]

Application of the subsidy affects different parts of the customer's bill: it is generally applied to the access component only or to both access and

usage. Some jurisdictions extend the subsidy to the initial installation charge and the telephone set. No subsidy is applied to long-distance calling or to the overall billed amount.

Six states in the United States have strictly mandated lifeline residence service where the eligibility is based on income - Arkansas, California, Maryland, New York, Vermont and Wisconsin. Utah is expecting a ruling in April or May 1986 from the regulator and Nevada will be considering a new application from Nevada Bell in May (Docket 85-1009). A description of the program for each of the six states with mandated lifeline service is included below along with a comparison to the standard rate.[23]

1. ARKANSAS (Southwestern Bell)

Qualification:	requires eligibility for the State Food Stamp Program administered by the State Department of Human Service.
Administration:	Southwestern Bell is responsible for annual review of eligibility.
Authority:	mandated by the Arkansas Public Service Commission.
Funding:	from Southwestern Bell overall revenues. The cost of the program is estimated at $8.25 per month per lifeline customer.
Availability:	only where LMS is available. At the end of 1984, 1,144 customers used the service.

2. CALIFORNIA (All telephone companies)

Qualification:	houshold income less than $11,500 (under review).

Administration: telephone company administers a self-certification program with annual reviews.

Authority: State legislature, Moore Universal Telephone Act.

Funding: tax on intrastate, interlata carriers.

Rate: 50% of residence service charges and monthly charges plus an allowance for the telephone set.
Based on flat rate where measured service is available.

Availability: Statewide, at the end of 1984 about 500,000 customers used the service.

3. MARYLAND (C&P Telephone of Maryland)

Qualification: eligibility to be determined by the State Department of Human Resources using Federal welfare standards for the disabled, special hardship cases and low income people aged 65 or over.

Administration: State Department.

Authority: State Legislature, 1985 telephone Lifeline Service Act.

Funding: State credit on C&P Telephone's gross receipts tax (estimated program cost $2.7 million in the first year).

NOTE: Tariff to be implemented in mid-1986.

Rate: measured rate, $4.05 per month, 50% of residence service, allowance 30 calls per month, additional calls 9 cents.

Availability: where measured service is available. Estimated 65,000 will be served by the program.

4. NEW YORK (New York Telephone)

Qualification:	those eligible to receive New York State financial assistance.
Administration:	New York Telephone provides the application forms for self-certification.
Authority:	New York Department of Public Service.
Funding:	from overall New York Telephone revenues.
Rate:	a reduction of 50 cents per month on the access charge for Basic Budget rates or for regular flat rate residence service.
Availability:	Statewide.

5. VERMONT (New England Tel & Tel)

Qualification:	eligible to receive social welfare assistance from State welfare agencies. The agencies provide lists to the telephone company.
Administration:	customer must apply and fill out a waiver form provided by the telephone company.
Authority:	State Legislature.
Funding:	reduction in contributions to the intrastate carrier settlement pool and a 3 cent per month charge on all customers.
Rate:	$1.00 per month reduction in access charge. Applicable to flat rate or measured service.
Availability:	4,500 customers on lifeline out of 25,000 eligible, 5,000 of which do not have telephone service.

6. WISCONSIN (Wisconsin Bell)

Qualification:	no qualifications needed to subscribe; however, the initial installation fee is waived for those who meet the Low Income Energy Assistance Guidelines of the State Department of Health and Social Services.
Administration:	The telephone company administers the waivers provided by the State Department.
Authority:	Public Service Commission of Wisconsin.
Funding:	From general revenues.
Rate:	$3.50 for access plus 24 cents per call.
Availability:	where measured service is available. In 1984, 2,589 waivers were granted and there were 13,027 customers on the service.

Mandated Lifeline Rates Compared to Standard Rates - Individual Residence Service -

	Flat Rate		Local Measured Service		
	Standard	Lifeline	Standard	Economy/ Budget	Lifeline
Arkansas	$15.38	-	$8.45	-	$5.05
Allowance	-	-	none	-	20 calls
Cost/call[1]	-	-	-	-	8¢
California	8.25	4.13[2]	4.45	-	2.23
Allowance	-	-	3.00	-	30 calls[3]
Cost/call[1]	-	-	8¢	-	10¢, 15¢[3]
Maryland	17.19	-	9.90	6.10	4.05
Allowance	-	-	5.85	none	30 calls
Cost/call[1]	-	-	8.6¢	8.6¢	9¢
Vermont[4]	11.00	10.00	6.15	-	5.15
Allowance	-	-	4.50	-	30 calls
Cost/call[3]	-	-	n/a	-	11¢

			Message Rate Service		
			Standard	Economy/ Budget	Lifeline
New York	13.90	13.40	6.28	-	5.78
Allowance	-	-	4.00[5]	-	4.00[5]
Cost/call[1]	-	-	12¢[5]	-	12¢[5]
Wisconsin	17.50	-	11.90	9.00	3.50
Allowance	-	-	60 calls	20 calls	none
Cost/call	-	-	9¢	17¢	24¢

NOTES:

1. Based on 5-minute call in the shortest distance band.
2. Where measured not available.
3. Under review.
4. Lifeline applied to rates at December 31, 1983.
5. Timed service.

IV FINDINGS

Local telephone service in North America is available to residence and business customers on a flat rate and/or a measured basis. The availability for each state and the District of Columbia is shown on Table 1 for residence and Table 4 for business. Flat rate service is available in all jurisdictions for residence and business service with the exception of seven states and D.C. where measured service is mandatory for business. In five of the states, business service is mandatory in parts of the state.

In Canada flat-rate service is available in all jurisdictions and a limited form of measured service is available to business customers in four jurisdictions.

Tables 2 and 4, based on our sample of 32 tariffs, show the availability of the various classes of flat rate service. We note that two-party and four-party service are widely available. We also note that measured service is available in all the U.S. jurisdictions in the sample.

A close examination of the tariffs revealed the existence of a wide variety of measured rates, ranging from simple per call charge to multi-element usage charges.

Our study focused on the four-element usage sensitive rate structures that were introduced during the last five years in the United States as the measuring technology became available. These are generally called LMS rates. Should usage sensitive pricing be allowed in Canada, we expect that this type of rate structure would be proposed.[24]

Tables 3 and 6 summarize the twenty-four LMS rate structures found in the sample. These rates include a flat-rate component, which is sometimes unbundled into an access and a usage charge. Variable charges for usage are

TABLE 1
SUMMARY OF U.S. RATE STRUCTURES
FOR LOCAL TELEPHONE SERVICE
INDIVIDUAL RESIDENCE[1]

State	Flat Rate[2]	Usage Sensitive Rates: Message Rate	Opt[3]	Measured: Freq	Dur	Dist	Allow	T/Day
Alabama		-		x	x	x	x	x
*Alaska		-		-	-	-	-	
Arizona		x		x	x	x	-	x
Arkansas		-		x	x	x	-	x
California		x		x	x	x	x	x
Colorado		-		x	x	-	-	x
Connecticut		x		x	x	x	-	x
District of Columbia		x		-	-	-	-	-
Delaware		x		x	x	x	x	x
Florida		-		x	x	x	x	x
Georgia		x		x	x	x	x	x
*Hawaii		-		-	-	-	-	-
*Idaho		-		x	x	x	-	x
Illinois		x		x	x	x	x	x
Indiana		x		-	-	-	-	-
Iowa		-		x	x	x	x	x
*Kansas		-		x	x	x	x	x
Kentucky		x		x	x	x	x	x
Louisiana		x		x	x	x	x	x
*Maine		x		-	-	-	-	-
Maryland		x		x	x	-	x	-
Massachusetts		-		x	x	x	x	-
Michigan		x		x	x	x	-	x
Minnesota		-		x	x	x	x	x
Mississippi		-		x	x	x	x	x
*Missouri		-		x	-	-	-	x
*Montana		-		x	x	x	x	x
*Nebraska		-		x	x	x	x	x
*Nevada		-		x	x	x	x	x
*New Hampshire		-		x	x	x	x	x
*New Jersey		x		-	-	-	-	-
*New Mexico		-		x	x	x	x	x
New York		x		x	x	x	x	x
North Carolina		x		x	x	-	x	x
*North Dakota		-		x	x	x	x	x
Ohio		x		x	x	x	-	x
*Oklahoma		-		-	-	-	-	-
Oregon		-		x	x	x	x	x
Pennsylvania		x		x	x	x	x	x
*Rhode Island		x		-	-	-	-	-
*South Carolina		-		x	x	x	x	x
*South Dakota		-		x	x	x	-	x
Tennessee		x		x	x	x	x	x
Texas		x		-	-	-	-	-
Utah		x		-	-	-	-	-
*Vermont		-		x	x	x	-	x
Virginia		x		x	x	x	x	x
Washington		-		x	x	x	x	x
*West Virginia		x		x	x	x	x	x
Wisconsin		x		-	-	-	-	-
*Wyoming		x		-	-	-	-	-

*at June 1984, NRRI, State Public Service Commission Experience with Local Measured Rate Service: Survey Results June 1984.

[1]Based on tariffs in effect at October 1985 for the major telephone companies, except those marked with an asterisk.
[2]Available in all states.
[3]LMS is optional in all states where it is offered.

TABLE 2
FLAT RATE SERVICE - RESIDENCE[1]
AVAILABILITY BY CLASS OF SERVICE

STATE/PROV.	1 PTY	2 PTY	4 PTY	MULTI/ 8 PTY	Measured Rate Also Offered
Alabama	x	x			x
Arizona	x	x	x	x	x
Arkansas	x	x	x		x
California	x	x	x		x
L.A.	x				x
Colorado	x	x	x	x	x
Connecticut	x	x			x
Delaware	x	x	x		x
D.C.	x				x
Florida	x	x	x		x
Georgia	x	x	x		x
Illinois	x				x
Chicago	x				x
Indiana	x	x	x		x
Iowa	x	x			x
Kentucky	x	x			x
Louisiana	x	x	x		x
Maryland	x	x			x
Massachusetts	x	x	x		x
Michigan	x	x			x
Minnesota	x	x			x
Mississippi	x	x	x		x
New York	x	x	x		x
New York City	x	x			x
North Carolina	x	x			x
Ohio	x	x			x
Oregon	x	x	x		x
Pennsylvania	x	x	x		x
Tennessee	x	x	x		x
Texas	x	x	x	x	x
Utah	x	x	x	x	x
Virginia	x	x	x		x
Washington	x	x	x		x
Wisconsin	x				x
Alberta	x			x	
B.C.	x	x	x	x	
Manitoba	x			x	
New Brunswick	x	x	x		
Newfoundland	x	x			
Nova Scotia	x	x	x		
Ontario	x	x	x		
Quebec	x	x	x		
P.E.I.	x	x	x		
Saskatchewan	x	x		x	

[1]Based on tariffs in effect at October 1985 for a sample of the major telephone companies.

TABLE 3
LOCAL MEASURED RATE SERVICE ELEMENTS
INDIVIDUAL RESIDENCE SERVICE[1]

STATE	TELCO	FREQ	DUR	DIST	ALLOW	T/DAY
Alabama	S. Central Bell	x	x	x	x	x
Arizona	Mountain St. T&T	x	x	x		x
Arkansas	SW Bell	x	x	x		x
California	Pacific Bell	x	x	x	x	x
Colorado	Mountain St. T&T	x	x			x
Connecticut	S. New England Tel	x	x	x		x
Delaware	Diamond St. Tel	x	x	x	x	x
Florida	S. Bell T&T	x	x	x	x	x
Georgia	S. Bell T&T	x	x	x	x	x
Illinois	Illinois Bell	x	x	x	x	
Iowa	NW Bell	x	x	x	x	x
Kentucky	S. Central Bell	x	x	x	x	x
Louisana	S. Central Bell	x	x	x	x	x
Maryland	C&P Tel	x	x			
Massachusetts	New England T&T	x	x	x	x	x
Minnesota	NW Bell	x	x	x	x	x
Mississippi	S. Central Bell	x	x	x	x	x
N. Carolina	S. Bell T&T	x	x	x	x	x
Ohio	Ohio Bell	x	x	x		x
	Cincinnati Bell	x	x	x	x	x
Oregon	Pacific NW Bell	x	x	x	x	x
Pennsylvania	Bell of Penn.	x	x	x	x	x
Tennessee	S. Central Bell	x	x		x	x
Virginia	C&P Tel	x	x	x	x	x
		x			x	
Washington	Pacific NW Bell	x	x	x	x	x

[1]Based on tariffs in effect at October 1985 for a sample of the major telephone companies.

TABLE 4
SUMMARY OF U.S. RATE STRUCTURES FOR LOCAL TELEPHONE SERVICE INDIVIDUAL BUSINESS[1]

State	Flat Rate[2]	Usage Sensitive Rates: Message Rate	Measured Opt	Measured Freq	Measured Dur	Measured Dist	Measured Allow	Measured T/Day
Alabama		x	x	x	x	x	x	x
*Alaska		-	-	-	-	-	-	-
Arizona		x	x	x	x	x	-	x
Arkansas		-	x	x	x	x	-	x
California	No	-	-	x	x	x	-	x
Colorado		x	-	-	-	-	-	-
Connecticut		x	x	x	x	x	-	x
District of Columbia	No	x	-	-	-	-	-	-
Delaware		x	x	x	x	x	x	x
Florida		x	x	x	x	x	x	x
Georgia		x	x	x	x	x	x	x
*Hawaii		-	-	-	-	-	-	-
*Idaho		-	x	x	x	-	-	x
Illinois	Some	x	x	x	x	x	-	x
Indiana		x	-	-	-	-	-	-
Iowa		-	x	x	x	x	x	x
*Kansas		x	-	-	-	-	-	-
Kentucky		x	x	x	x	x	x	x
Louisiana		-	x	x	x	x	x	x
*Maine		x	-	-	-	-	-	-
Maryland	No	x	-	x	x	-	-	-
Massachusetts	Some	-	x	x	x	x	x	-
Michigan	No	x	x	x	x	x	-	x
Minnesota		x	x	x	x	x	-	x
Mississippi		-	x	x	x	x	x	x
*Missouri		x	x	x	x	x	-	x
*Montana		x	x	x	x	x	-	x
*Nebraska		x	x	x	x	x	-	x
*Nevada		-	x	x	x	x	x	x
*New Hampshire		x	x	x	x	x	-	x
*New Jersey		x	-	-	-	-	-	-
*New Mexico		-	x	x	x	-	-	-
New York	No	x	x	x	x	x	-	x
North Carolina		x	x	x	x	-	x	x
*North Dakota		-	x	x	x	x	-	x
Ohio	Some	x	x	x	x	x	-	x
*Oklahoma		-	-	-	-	-	-	-
Oregon	No	-	x	x	x	x	-	x
Pennsylvania	Some	x	x	x	x	x	x	x
*Rhode Island	No	x	-	-	-	-	-	-
*South Carolina		x	x	x	x	x	-	x
*South Dakota		-	x	x	x	x	x	x
Tennessee		x	x	x	x	-	x	x
Texas		x	-	-	-	-	-	-
Utah		x	-	-	-	-	-	-
*Vermont		x	x	x	x	x	-	x
Virginia	Some	x	x	x	x	x	-	x
Washington		-	x	x	x	x	-	x
*West Virginia		x	x	x	x	x	-	x
Wisconsin	No	x	-	-	-	-	-	-
*Wyoming		x	-	-	-	-	-	-

* at June 1984, NRRI, State Public Service Commission Experience with Local Measured Service: Survey Results June 1984

[1]Based on tariffs in effect at October 1985 for the major telephone companies, except those marked with an asterisk.

[2]Available in most states, except as shown.

TABLE 5
FLAT RATE SERVICE - BUSINESS[1]
AVAILABILITY BY CLASS OF SERVICE

STATE/PROV.	1 PTY	2 PTY	4 PTY	MULTI/ 8 PTY	Measured Rate Also Offered
Alabama	x	x			x
Arizona	x		x	x	x
Arkansas	x		x		x
California	x	x	x		x
L.A.					x
Colorado	x	x	x	x	x
Connecticut	x	x			x
Delaware	x	x			x
D.C.					x
Florida	x	x	x		x
Georgia	x	x	x		x
Illinois	x				
Chicago					x
Indiana	x		x		x
Iowa	x				x
Kentucky	x	x			x
Louisiana	x	x	x		x
Maryland					x
Massachusetts	x				x
Michigan	x				x
Minnesota	x				x
Mississippi	x	x	x		x
New York	x	x			
New York City					x
North Carolina	x	x			x
Ohio					x
Oregon	x	x	x		x
Pennsylvania	x				x
Tennessee	x	x	x		x
Texas	x		x	x	x
Utah	x		x	x	x
Virginia	x	x			x
Washington	x	x			x
Wisconsin					x
Alberta	x			x	
B.C.	x		x	x	x
Manitoba	x			x	
New Brunswick	x	x	x		x
Newfoundland	x	x			
Nova Scotia	x	x	x		x
Ontario	x	x	x		x
Quebec	x	x	x		x
P.E.I.	x	x	x		
Saskatchewan	x	x		x	

[1]Based on tariffs in effect at October 1985 for a sample of the major telephone companies.

TABLE 6
LOCAL MEASURED RATE SERVICE ELEMENTS
INDIVIDUAL BUSINESS SERVICE[1]

STATE	TELCO	FREQ	DUR	DIST	ALLOW	T/DAY
Alabama	S. Central Bell	x	x	x	x	x
Arizona	Mountain St. T&T	x	x	x		x
Arkansas	SW Bell	x	x	x		x
California	Pacific Bell	x	x	x		x
Connecticut	S. New England Tel	x	x	x		x
Delaware	Diamond St. Tel	x	x	x	x	x
Florida	S. Bell T&T	x	x	x	x	x
Georgia	S. Bell T&T	x	x	x	x	x
Illinois	Illinois Bell	x	x	x		x
Iowa	NW Bell	x	x	x	x	x
Kentucky	S. Central Bell	x	x	x	x	x
Louisiana	S. Central Bell	x	x	x	x	x
Maryland	C&P Tel	x	x			
Massachusetts	New England Tel	x	x	x	x	x
Minnesota	N.W. Bell	x	x	x		x
Mississippi	S. Central Bell	x	x	x	x	x
N. Carolina	S. Bell T&T	x	x	x	x	x
Ohio	Ohio Bell	x	x	x		x
	Cincinnati Bell	x	x	x	x	
Oregon	Pacific NW Bell	x	x	x		x
Pennsylvania	Bell of Penn.	x	x	x	x	x
Tennessee	S. Central Bell	x	x		x	x
Virginia	C&P Tel	x	x	x		x
		x				
Washington	Pacific NW Bell	x	x	x		x
Wisconsin	Wis. Bell	x			x	

[1]Based on tariffs in effect of October 1985 for a sample of the major telephone companies.

TABLE 7
NUMBER OF CALLS REQUIRED FOR LMS CHARGES TO EQUAL FLAT RATE[1]

STATE	CITY	Residence Individual[2]	Business[3] Individual
Alabama	Birmingham	83	338
Arizona	Phoenix	72	218
Arkansas	Little Rock	87	219
California	L.A.	85	-
Colorado	Boulder	44	206
Connecticut	Hartford	88	352
Delaware	Wilmington	128	229
D.C.	Washington	148	-
Florida	(trial)	90	184
Georgia	Atlanta	92	298
Indiana	Indianapolis	79	221
Iowa	Des Moines	119	228
Kentucky	Louisville	81	263
Louisiana	New Orleans	76	238
Maryland	Baltimore	153	-
Massachusetts	Boston	109	-
Michigan	Detroit	114	-
Minnesota	Minneapolis	91	216
Mississippi	Biloxi	104	280
New York	NYC	97	-
N.C.	Raleigh (trial)	77	162
Ohio	state-wide	103	-
Oregon	state-wide	59	129
Pennsylvania	Philadelphia	150	-
Tennessee	Nashville	95	275
Texas	Austin	83	199
Utah	state-wide	33	60
Virginia	Arlington	118	562
Washington	Seattle	88	280
Wisconsin	Milwaukee	122	-
B.C.	Vancouver	-	240
Manitoba	Winnipeg	-	-
N.B.	St. John	-	180
N.S.	Halifax	-	155
Ontario/Quebec	Toronto	-	323

[1] Based on tariffs in effect at October 1985 for a sample of the major telephone companies.

[2] 5 minutes - billing, same wire centre

[3] 3 minutes - billing, same wire centre

based on frequency, duration, distance and time and day. An allowance expressed in dollars is generally used. This structure is based on the prototype designed by AT&T for optional measured service. The tables show that not all usage elements are used in all jurisdictions. In particular, not all use an allowance and where it is used, it is sometimes limited to residence customers. An unbundled flat rate component for usage has been introduced in Delawware, Maryland, Pennsylvania and Virginia.

The use of LMS rates is not as extensive as the traditional measured rates based on messages or units. The twenty-four LMS tariffs refer to the availability in specific exchanges where electronic equipment is installed. Eight of these tariffs apply to trials or pilot projects with a specified scope and time frame.

A number of issues have been debated before the regulators in the United States when the LMS tariffs were proposed. The issues center mostly on the cost of implementation, the impact of the rates on customers, and the cost/benefit of usage sensitive pricing. Uncertainty remains, particularly in the area of the impact of the LMS rates and for this reason, some jurisdictions have decided on a gradual, experimental approach.

The impact of a particular LMS rate is usually predicted or calculated with the aid of computer models. These all supply too many variables to be considered. It is possibly however to gain some insight by examining some of the characteristics of particular tariffs.[25]

The LMS tariff used by the Diamond State Telephone Company in Delaware contains all the components and elements used in LMS rates and provides a good illustration of a complex rate structure. Our analysis compares the current rates with two previous rates shown in the NARUC annual listing of local exchange rates.

In January 1980, a residence customer in Wilmington (rate group 6), was charged $8.95 for individual service or $5.80 for two-party service. Changes in both the

level and the structures of the rates for non-measured service in Wilmington resulted in the rates shown below:

	1980	1983	1985
Individual	$8.95 mo.	$9.55 mo.	$12.40 mo.
Two-Party	5.80	6.75	11.70

This was accomplished by unbundling, changing the rate groups and de-averaging. The rate was unbundled into an access and a usage component. The access component, called Dial Tone Line, was based on "density cells" and was applied to three rate groups with no difference in the changes in 1983.

Dial Tone Line	1983 Line Rate Group*			1985 Line Rate Group*		
	1	2	3	1	2	3
Individual	$4.20	$4.20	$4.20	$4.90	$5.15	$5.40
Two-Party	4.20	4.20	4.20	4.20	4.50	4.50

*Based upon Central Office density: lines per square mile.

The usage component was also based on three rate groups.

Usage Packages	1983 Usage Rate Group*			1985 Usage Rate Group*		
	X	Y	Z	X	Y	Z
Unlimited 1 pty	$4.35	$4.85	$5.35	$6.50	$7.00	$7.50
Unlimited 2 pty	2.15	2.35	2.55	6.50	7.00	7.50
Measured Valu-Pak 2	N/A	N/A	N/A	4.00	4.00	4.00
Measured Valu-Pak 1	1.50	1.50	1.50	1.50	1.50	1.50

*Based on weighted number of lines in the exchange.

Wilmington is in Line Rate Group 1 and Usage Rate Group Z. Thus the sum of the charges for Dial Tone Line and Unlimited usage package apply. It should be noted that two-party service was limited to existing customers at their present location when measured service was available at the serving Central Office.

The first change to the rate schedule was to de-average the rates for Dial Tone Line in order to reflect the difference in cost to provide service in offices having different number of lines per square mile.

The second change was to reflect the difference between individual and two-party residence in the Dial Tone Line rather than in the usage packages.

The residence customers in Wilmington who chose measured service were billed according to the Valu-Pak 1 usage option, priced at $1.50 per month and an allowace of $3.00. Valu-Pak 2 was introduced during the period with a charge of $4.00 per month and an allowance of $8.00. The effect was to make LMS attractive to customers having higher usage than those subscribing to Valu-Pak 1.

The variable charges are based on duration, distance, time and day. To illustrate the effect of the usage rate and the allowance, one can assume that a customer makes 30 and 100 five-minute calls in the nearest distance band and that no time and day discounts apply.

Using the current tariff, the following calculation of charges in Wilmington will result:

	Valu-Pak 1	**Valu-Pak 2**
Dial Tone Line (Group 1)	$ 4.90 mo.	$ 4.90 mo.
Usage Package (Group Z)	1.50	4.00
120 Calls at 7¢	8.40	8.40
Allowance	(3.00)	(8.00)
Total	$ 11.80	$ 9.30
At 30 calls the allowances are not used up and the total becomes	$ 6.40 mo.	$ 8.90 mo.

The effect of the change in rate and allowance is to make Valu-Pak 2 attractive to customers with a higher calling rate.

The sensitivity of the per minute charges can also be illustrated with the aid of simplified assumptions. In order to assign values for the calculation of distance charges, all the exchanges were averaged into three distance clusters: Bands 1, 2 and 3 and the rates were set as follows:

	Peak Rate Period	
Exchange Band	**Initial Period** (3 minutes)	**Additional Period** (1 minute)
1	5¢	1¢
2	7.5¢	1.5¢
3	10¢	2¢

Discounts of 50% and 70% are used to encourage off peak calling.

Our calculations of $9.30 for Valu-Pak 2 with 120 calls of 5-minute duration would change as follows:

- 25% of the calls placed off-peak would reduce the charges by $1.05.
- An increase of 1/2¢ per additional minute would add $1.20.
- 50% of the calls in Band 2 would add $2.10.

A comparison of the various LMS tariffs brought out a number of notable variances for similar elements:

Rate Groups:

We found variances in the basic access charge for local measured service (LMS): Tennessee has a different basic access charge for each of the five rate groups, while Oregon uses one basic access charge for all rate groups.

Delaware and Pennsylvania do not use rate group for the basic access charge (Dial Tone Line) in their LMS structure. Rather, they use "density cells" based on the number of access lines per square mile to reflect the lower unit cost of dense areas.

Service Classifications:

We also found a variance in the present differential between individual business and residence service; this differential is not changed when LMS is introduced but it only applies to the non-variable charges.:

	Residence	**Business**
Arkansas	100%	209%
Delaware	100%	202%
Iowa	100%	254%
Massachusetts	100%	349%

The differential applies to both flat and measured rate structures.

The per minute charges for usage elements vary between tariffs, the sensitive components of the rate provide a flexible tool for rate adjustments.

a) First Distance Band:

	1st Minute	**Add'l. Minute**
Arizona	.03	.01
Arkansas	.04	.01
Delaware (1st 3 minutes)	.05	.01
Kentucky	.04	.02
Massachusetts (New Bedford)	.04	.03
Minnesota	.06	.012

b) The initial minute for each distance band:

	Distance		
	Shortest	**Medium**	**Longer**
Arizona	.03	.05	.06
Arkansas	.04	.05	.06
Kentucky	.04	.06	-
Minnesota	.06	.10	.13
North Carolina	.05	.10	-

c) The off-peak hours and discount percentage vary.

d) The usage allowances vary.

The tariffs also include other service offerings related to local measured services. Some of the services are mentioned at times in LMS debates:

a) Rates for operator-assisted local calls:

	Station	**Person**
Alabama	1.00	2.00
Arizona	0.20	0.30
Colorado	0.32	0.32
Delaware	0.80	2.00
North Carolina	0.70	1.10
Pennsylvania	1.10	3.00
Washington	0.30	0.65

b) Illinois Bell offers Family service, consisting of two residence lines arranged for sequential hunting and for directory listing if required. With the measured option, the message allowance is pooled. The rates in the Chicago exchange are:

Allowance (units)	Single Line	Allowance (units)	Family (two lines)
0	-	-	-
30	$1.10	-	-
80	2.90	80	$2.90/line
110	4.00	110	4.00
140	5.10	140	5.10
170	6.20	170	6.20
200	7.30	200	7.30

In this case, a family placing 160 calls per month will pay very little for the second line if they choose the Family rate.

c) New York Telephone offers a Special Incoming Report Telephone Service in New York City, for customers who required 10 lines or more for measured incoming service.

In the next section of this report, three case studies are developed to illustrate the regulatory and pricing considerations that enter into the decision to change rates or set new rates in both a flat rate and a usage sensitive pricing environment.

CASE STUDY I: Local Measured Service

In 1968 a lifeline rate was authorized to provide low cost telephone service in parts of California. In 1984 a new lifeline rate, targeted to low income groups was mandated. The new rate extended coverage to the entire state and was set at 50% of the standard rate. This case study relates the chronology of events during the period and highlights the arguments used during the debates.

4.1 California - Lifeline Service

1968 Lifeline rates for local residence service were introduced in California in 1968. At the time both flat rate and message rate service were offered. In the large metropolitan areas, message rate was optional for residence service and mandatory for business service where available. Message rate service was offered on a charge per call basis.

In its Decision 74917 of November 13, 1968[26], the California Public Utilities Commission (PUC) ordered the dominant carrier, Pacific Telephone and Telegraph (PTT) to offer lifeline measured residence service. The standard residential flat rate at the time was $3.85 per month and the new lifeline rate was set at $2.25 per month with an allowance of 30 messages for either single or two party in areas where message rate facilities were available. The only restriction was that no more than one such service be established for each dwelling unit.

The need for a lifeline service was identified during the general rate case in the testimony of eight representatives of a number of major organizations of senior citizens during a day where some 300 attended the hearing. The decision states:
"their plea is for special rates for the elderly poor, the infirm, and the shut-ins to whom telephone service is essential. A "telephone pal" or "buddy" system is widely used by these people as a means of checking once

Decision 74917 (Public Utilities Reports, Inc., Washington, D.C., Volume 77 Third Series 1969. (77 PUR 3d)

daily to see if the aged person can answer the telephone. Victims of accidents, strokes, heart attacks and falls have been prevented from lying for days unattended by reason of this telephone check. The telephone to these people is a lifeline. To many of them the present minimum monthly telephone bill represents almost three days' food allowance. They are unable to pay more. A call a day is their minimum need."

The intent of the Commission in this decision was to make available a low cost, low use lifeline service at minimum price.

1969 In July 1969[27] in a general rate case, the Commission directed the General Telephone Company of California (GTC), the second largest telephone company inthe state, to expand its message service coverage and introduce lifeline service. At the time GTC had introduced message rate service in a few exchanges in Los Angeles and had requested its replacement by flat rate service. The Commission ruled that message rate service was more equitable and it ordered GTC to provide non-optional business message rate service and optional lifeline message rate service in Los Angeles. The lifeline rate was set at $2.30 per month with an allowance of 30 messages.

1971 In June 1971, the Pacific Telephone and Telegraph Company, in a general rate case, proposed that the basic charge for lifeline service be increased to $2.95 per month and that the 30 message allowance be reduced to zero. Individuals and groups objected strenuously to this proposal and the Commission decided to increase the basic charge to $2.95 per month (from $2.25) and reduce the message allowance to 20.[28]

Decision 75873 (80 PUR 3d)
Decision 78851 (90 PUR 3d)

1972 In June 1972 the supreme court of California, in dealing with a tax expense issue, annulled the PUC Decision of June 1971 and directed that all the rates be restored to the 1971 level. In the process the lifeline rate was restored to the $2.25 level with a 30 message allowance[29]. By that time the flat rate residence service in Los Angeles reached $4.70 per month.

1974 The lifeline rate attracted low volume users regardless of income and in August 1974 the Commission mandated a $7,500 per year income limitation. This was abolished two months later because it was an "administrative headache"[30]. During those two months, 94,000 customers left lifeline service.

In 1974, single message rate timing was introduced whereby local calls were timed at five minute intervals. Thus a long call would be equivalent to two or more five minute calls and charged accordingly.

1976 Due to public reaction to the new timing system, the Commission, after public hearings ordered an end to timed measured rates for residential service its Order of November 1976[31].

Consumer groups, including senior citizens, argued that they would incur a higher monthly bill and that some calls to hospitals, doctor's offices, Social Security Administrations and other government agencies lasted more than 5 minutes because the caller is frequently placed on hold. The consumer groups also argued that it was not fair to time calls on message rate while flat rate call durations remained unlimited.

Decision 80347 (95 PUR 3d)
Decision 86594 (16 PUR 4th)

The Commission agreed with the consumer parties that many persons for whom lifeline was intended would be unable to retain the service without paying surcharges every month. The Commission also questionned the reasonableness of timing calls for one service classification and not for another (flat rate).

In this proceeding the company, PTT argued three points:

a) customer's fears were unfounded,

b) without timing, the growing number of customers on message rate would increase the deficit for residential services,

c) it would be too costly to measure all residential customers.

The company's opinion was that fears on the part of some consumer witnesses of a pronounced increase in billing were unwarranted. As for the small minority experiencing a heavy increase in additional billings as a result of timing, these customers were not those for whom the lifeline service was intended. PTT showed billing results of a sample of customers before and after the introduction of timing:

Billing Comparison - Lifeline Customers 1976

	Before Timing	After Timing		
	(Feb, Mar, Apr)	May	June	July
No Additional Billing	64.8%	51.6%	51.5%	53.4%
$1.00 or less	19.4	19.5	20.7	20.9
$1.01 to $1.50	5.1	7.4	6.8	4.5
$1.51 to $2.00	3.6	4.2	6.6	3.8
$2.01 to $3.00	3.7	7.4	6.0	7.3
$3.01 to $4.00	1.7	3.4	2.6	3.0
$4.01 to $5.00	0.6	2.5	1.7	2.4
$5.01 and over	1.1	4.0	4.1	4.7

b) The company pointed out that while the Commission had designed lifeline for low income persons, the fact that there were no restrictions other than one such service per residence, the lifeline service had "spread over all kinds of customer, rich and poor and young and old".

One of the commissioners explained that lifeline was intended to "furnish residential service at the lowest possible monthly bill, to those who are of limited means and who need limited service for minimum usage. Lifeline is not designed for the purpose of simply furnishing low cost residential service to persons with a highly subsidized service regardless of how much they use their phones."

In 1976, the number of lifeline customers was growing at 3% per year. In the metropolitan area served by PTT where message rate was available to 3.9 million residence customers, the distribution was as follows:

Lifeline 30 message	$2.50 per month	10% of customers
Residence 60 message	$3.75 per month	10% of customers
Residence Flat Rate	$5.70 per month	80% of customers

The commissioner calculated that if the level was reached where 20% of customers are on lifeline and 20% are on residence message rate, the revenue impact would be a negative $25 million.

It was recognized that residence rates in California were subsidized. PTT estimates of the monthly fixed cost per telephone was $11.59. The monthly net deficit for residential services was: $7.41 per month for lifeline, $6.14 for residential measured and $5.83 for flat rate service.

In this case PTT stated that as in the past it did not seek to make residential service compensatory in the belief that the value of service concepts weighted heavily in setting the rates at the lowest reasonable level.

c) PTT did not offer an alternative which would eliminate all flat rate residence service because of the high capital costs involved. In all, the company served about 1.5 million business lines and over 6 million residential lines of which 20% were measured. The estimated cost of installing timing and metering equipment was $200 to $300 million.

In this proceeding the staff of the Commission proposed retaining the timing feature and create a new class of lifeline service, untimed for subscribers of age sixty-five and over (one third of lifeline customers). A certification-by-mail program administered by PTT would be used. In the future, the classification could be broadened to include handicapped persons or those under sixty-five who receive social security pensions.

The order of the commission was to end timing residential measured service and to restore the untimed message service.

1979 In 1979, the Commission in Order 90642 allowed an increase in the message rate for lifeline service. The new rates were still $2.50 per month with a 30 message allowance (untimed), but the rate of 5 cents for additional calls was changed to 10 cents for calls between 30 or 40 per month and 15 cents for calls over 40.

The consumer groups' objections to the higher costs were not accepted by the commission. The Order reiterated the original objectives of minimum cost for minimum service and its concerns about making lifeline attractive to all residential customers regardless of income and level of usage.

1983 During an investigation into the restructuring of the telecommunications industry the commission asked the participants to comment on a number of issues including universality and residential lifeline service.

Means tests were suggested for targeted lifeline groups but this was generally resisted by local operating telephone companies as it would raise administrative costs and be impossible to enforce. In addition, most of the comments favored a rate structure with a low access charge with a small allowance and higher charges for usage beyond the allowance.[32]

1984 A targeted lifeline residential service was introduced in July 1984 pursuant to the mandate of the Moore Universal Telephone Service Act. The lifeline services formerly offered by Pacific Tel and General Tel were replaced with the new rates. These also applied to all the other telephone utilities in the state.[33]

The funding was from a 3% tax on intrastate inter-LATA long distance service providers.

1985 About 20 to 25% of those who qualify (about 500,000), were using lifeline in 1985 and the commission estimates that the annual cost of managing the program was $32,000,000.

Lifeline was limited to those customers with household incomes under $11,000 per year. This was increased to $11,500 in 1985 and it is currently being reviewed based on Federal Poverty Guidelines and the CPI.

New applicants are required to return a signed self-certification form within 30 days or the service will be changed to the regular tariff rate.[34]

Recertification is required annually or whenever the qualifying criteria for recipients change. The utility mails recertification forms annually to each recipent which must be returned within 30 days.

(54 PUR 4th)
NARUC Survey on State Lifeline Telephone Service. Revised July 1, 1985.
Pacific Bell Tariff. CAL.P.U.C. No. A5 Sheet 346.

The usual deposit and establishment of credit procedures are waived for lifeline customers.

The rates for lifeline service are set at one half of the basic rate for residential service. The service and labour charges are also billed at one half and a $0.75 allowance on the telephone set is included.

The 1985 residential rates in Los Angeles were as follows:

		Standard	**Lifeline**	
Flat Rate		$8.25	$4.13	
Measured	Access	$4.45	$2.23	
	Allowance	$3.00	30 calls	
	Usage	Time/Day Distance Duration	31 to 40 calls	10¢
			41 and over	15¢

The allowance for lifeline service has been increased to 60 calls and in the current rate proceeding, (February 1986), possibility of increasing the allowance to 130 calls or to an unlimited amount of calls is being studied.

ASSESSMENT

Environment

The availability of metering equipment in the metropolitan areas made it possible to offer the optional minimum cost/minimum use residence service in 1969.

The widespread concerns in 1983 that large increases in local telephone rates would threaten universal service gave rise to a renewed interest in lifeline rates for low income customers.

In 1982, a settlement in the U.S. Department of Justice in its antitrust suit of AT&T and Western Electric resulted in what became known as the modified final judgement (MFJ). Under the MFJ, AT&T divested its local operating companies. California was divided into 10 local access and transport area (LATAs) beyond which with the local operating telephone company is prohibited from transporting a call. Long distance carriers must be used for inter-LATA calls (interstate or intrastate). Thus much of the traffic, and the revenues of Pacific Tel would be reduced.

The MFJ also required the replacement of toll settlement agreements between telephone companies by a system of access charges. This further reduced the funds available for the support of local costs. The FCC, after its access charge investigation imposed a method of interstate regulations which mandated the recovery of a substantial portion of fixed exchange plant costs through flat monthly access charges upon the local customer. Thus the combination of decreased toll revenues and the local access charge was added to the existing pressures to increase rates for local telephone service.

Objectives of the Rate Structure

The objective of the original rate structure was to offer a minimum cost/minimum use service as a lifeline for low income customers in areas where message rate service was available.

The objectives of the lifeline rates resulting from the Moore Act were to make the service available state wide and shelter low income customers from the expected increases in local rates. Another objective which is now emerging is the removal of the limitations on usage.

Strengths and Weaknesses

The strengths of the current lifeline rate structure are: simplicity and easy to understand from a customer's view point (50% discount), it covers the one-time installation charges and a telephone set allowance and lastly it achieves its objectives of wide availability, sheltering the target group and removing restrictions.

The weaknesses lie in the problems of having the telephone company administer an income based certification program. Fraud and complexity remain problem areas since efficient verification of income while retaining privacy is difficult. Self-certification is the responsibility of the recipient, consequently errors or delays in this process can trigger the automatic price change and the ensuing problems.

Costs and Benefits

The social benefits are obvious and the low income customers are sheltered from having to make a full contribution towards costs. By targeting income rather than low use, the rate reduces the customer base thus reducing the total amount of subsidy required. It allows the use of cost-based rates for low-use customers. To the extent that local residence service is priced below cost, lifeline service, like residence service is subsidized.

In addition the cost of managing the program for the half million lifeline customers is $32 million per year, over $5.00 per month per customer. Furthermore, the 50% discount represents a revenue loss in the order of $3.00 to $4.00 per lifeline customer, based on the average charges of $8.25 to $9.25 per month for standard residence service.[35]

[35] NARUC Lifeline Survey. Op. Cit., p.7

CASE STUDY I: Local Measured Service

Oregon, Non-Optional Business Measured Service

(A case study of a proposed mandatory measured service for business customers in Oregon. The Commissioner ordered the proposal to be in effect in 1984. The State legislature stopped the implementation.)

Overview

Optional local measured service has been available to most business and residential telephone customers for many years in Oregon. In 1982, the regulator initiated a study of the potential effects of introducing mandatory business measured service for the customers of Pacific Northwest Bell Telephone Co. (PNB), the major telephone company.

In July 1983, PNB filed with the Public Utility Commissioners of Oregon for a change of all existing flat rate business customers to business measured service to be in effect in January 1984.

There followed an investigation into the applicability and economic feasibility of mandatory business measured service (BMS) under docket UT9. At the conclusion of the investigation, the Commissioner ordered mandatory BMS to be effective in 1984. He also initiated new proceedings under Docket UT 17 for the development of an appropriate cost based rate structure. The resulting rates were approved in June 1984 and the implementation was scheduled for July 1985.

In response to public reaction, the state legislature stopped the implementation of the mandatory BMS tariff and the rates were never put into effect. Alternatives such as unbundled rates with a fixed monthly fee for access and a fixed monthly fee for unlimited usage are now being studied.

Cost Based Rates

The applicability and feasibility of mandatory local business measured service (BMS) was investigated under Docket UT9. The cost-benefits and the impact of BMS were examined against a background of acceptance of the need to move towards cost based rates.

In Order 83-835, December 1983, the Commissioner concluded that cost-based rates must replace value of service pricing in the new communications environment for the following reasons:[36]

- With the break-up of the Bell system, the local telephone companies will be solely responsible for raising revenues to meet their costs.
- With the advent of competition and advances in technology. The local companies must compete in some areas while long distance revenues available to offset local costs are decreasing.
- Cost-based rates are necessary to allow the customer to make informed economic decisions and to avoid anti-competitive predatory pricing.
- The existing rates were based on system-wide averages and on value of service. This made it easy to justify placing more cost recovery on one service in order to keep the rates low on another.
- The demographics have changed and no longer is it accurate to say that telephone service is more valuable in some areas or rate groups. The value of service concept should be abandoned in today's cost-based environment.

Cost and Benefits Analysis

PNB prepared a cost/benefit analysis that contained those elements that it could quantify, that is the billing and the measurement, less the cost savings resulting from a 5% decrease in the number of calls after the introduction of measured service.

Order, page 7

b) The analysis is attached as Appendix 4 and the resulting cost estimates were as follows:

c) Pacific Northwest Bell (October 1983)[37]

estimated cost of measurement and billing	$ 232,379	/mo.	(.57¢/call)
estimated savings due to 5% reduction in the number of calls	$ 102,797	/mo	(.25¢/call)
estimated net cost of measured service	$ 129,582		(.32¢/call)

Dr. L. Selwyn, witness for intervenor TRACER, using the company's data calculated that a level of 11% repression would be required before the costs and the savings were equal.[38] He noted that the specific costs identified fell short of accurately reflecting the total costs. He concluded that the Company's study confirms that the cost of LMS are higher than the benefits which PNB had been able to quantify. The other benefits claimed were based on an unsupported analysis.

Dr. J.T. Wenders, witness for PNB described an economist's narrow and broad benefit/cost test for LMS.[39]

The narrow test looks at the benefit and costs of lowering access prices and raising usage prices in the local exchange market and it identifies two benefits and three cost areas:

Usage:	Benefit No. 1	cost saving of repressed usage
	Cost No. 1	value to customers of lost usage
	Cost No. 2	cost of measurement and billing

Appendix 4
Wenders testimony, p. 24

Access:	Benefit No. 2	value of access to those who would drop off
	Cost No. 3	cost of having these who would drop off.

In his evidence, Dr. Wenders refers to the benefits and costs as B1 for benefit No. 1 and C1 for Cost No. 1, etc.

In Dr. Wenders' view, LMS is beneficial if the sum of the benefits exceeds that sum of the costs. "In the future I do not think that there is any question that looking strictly at the access market that B2 exceeds C3. And, when electronic central offices are used, I believe B1 exceeds C1 and C2 as well. Thus, I do not think there is any question that LMS will pass even the economist's narrow test, and the degree of this passing will be even higher in the future when flat rate prices would have to be higher, local usage is higher due to imminent increased computer use of the network, and the sensitivity of demand to price is likely to be higher."

The economist's broad benefit/cost test adds to the narrow test the further benefits of allowing distortions to be eliminated in the various toll markets -- ". . . to the extent the presence of LMS makes it easier to eliminate these distortions without completely losing the market to competitors the benefits therefrom are properly attributable to LMS."

In rebuttal testimony Dr. Selwyn[40] stated his view that the narrow and the broad benefit/cost test explained by Dr. Wender were not supported by quantitative data. ". . . their success or failure is solely dependent upon the individual responsible for making the assumptions. As a result, they are nothing more than an exercise in imagination and should be ignored."

In this proceeding, no further attempts were made to quantify some of the benefits and costs discussed above. However in 1984 LMS study prepared by Economics and Technology, Inc. (ETI) for the Washington Utilities and

Selwyn testimony, page 18

Transportation Commission, an attempt was made to quantify the value to customers of usage which is foregone when LMS is implemented (C1 in Dr. Wenders narrow test).[41]

When evaluating the costs and benefits of a mandatory local service measuring plan, one must take into account the economic loss to customers associated with the decrease in the number of calls after introduction of the plan. This social loss is calculated by multiplying the cost of each call by the number of lost calls.

Economics and Technology Inc.
Washington - October 1984
Estimated Value of Foregone Business Customer Usage in a Change to Mandatory LMS

Business Service, using PNB data

number of calls per month	59,790,658 calls
percentage of decrease in the number of calls	0.05%
monthly decrease in the number of calls	2,989,533 calls
PNB price per call	$ 0.091275
monthly social costs	$ 136,435
annual social costs	$1,637,218

In this case, the introduction of mandatory measured service was expected to result in almost 3 million less calls per month at a loss to society valued at over $1.6 million.

Economics and Technology Inc. A multi-part study of local measured service prepared for the Washington Utilities and Transportation Commission, October 1984, page 18.

Other Benefits:

In addition to the quantified benefits, other benefits claimed for BMS were evaluated and accepted by the commission.

1. Customers are not required to pay for the usage of others.
2. Customers can control their telephone costs.
3. Measured rates provide proper economic signals resulting in efficient resource allocation.
4. The costs of providing usage are recovered through usage rates.
5. The company saves investment capital from deferred construction.
6. Lower basic access rate promotes universality.

Other areas of the investigation were the methods used to measure repression and costs. The commission found that the 5% repression estimate was useful only as a benchmark or point of beginning to estimate possible benefits. The commission also directed PNB to develop verifiable cost studies for all services related to peak and non-peak traffic sensitive costs; non-traffic sensitive costs; and for common overhead costs and the allocation thereof to the various services.

ASSESSMENT

Environment

Optional measured business service was available in Oregon, the proposed change to non-optional service was made at a time when long distance revenues were decreasing and competition was increasing. Local service rates were expected to increase.

Objective of Mandatory Rate Structure

The mandatory structure would be more equitable insofar as high use customers would pay more and it would lead to more efficient use of the network by confronting customers with the marginal cost for each call made.

Strengths

With non-optional measured service, conservation and efficient allocation of resources can be attained to a greater degree than with optional measured service.

Weaknesses

Public reaction to non-optional business service because of the anticipated high charge for high use customers. Price level setting required further cost studies to price closer to marginal costs.

Cost/Benefits

The result of the new rates would be a net additional cost of measurement to be recovered by pricing the new rates for a zero-effect within this service classification.

The quantified costs and benefits were not relatively significant amounts in the overall cost/revenue situation. Most of the other cost and benefits were not or could not be quantified. The decision therefore was primarily a policy decision based on expected benefits in terms of equity, efficient allocation of resources and universality.

CASE STUDY II: Local Flat Rate Service

4.2. Bell Canada - Rate Relationships

Flat rates have traditionally been designed using company-wide averaging and value of service principles. Consequently, any change in rate is based largely on judgement and care is taken to maintain the existing relationships between the existing service classifications. The three following examples illustrate the approach used to justify rate changes.

a) Business/Residence Rate Relationships:

In February 1980, Bell Canada filed an application with the Canadian Radio-television and Telecommunications Commission for a general increase in rates which included a request for an increase of 23% for primary residence service and 35% for most primary business services.[42]

The rationale for the different percentage increase was recognition that traditionally business rates had been significantly higher than residence rates. In addition the value of service to business customers was increasing as telephone usage became more universal and technological innovations increased its usefulness. The Company reiterated its basic objective "... to provide low-cost service on as wide a base as possible." The Company also stated that its proposal for a wider gap was to comply with the Commission's wishes in a previous decision, as perceived by the Company.

Interveners presented differing views:

The Canadian Industrial Communications Assembly (CICA et al.), representing business customers examined in detail the justification for the wider spread, presented evidence showing that the business/residence ratio in the Bell territory was higher than in comparable cities in other parts of Canada. CICA argued that while the evidence supported a reduction in the ratio, they were only requesting that the same percentage increase should apply to both classifications.

See Telecom Decision CRTC 80-14 p.98

The Consumer Association of Canada argued that the increase for residence service should be less than for business to maintain universality of service and to reflect the greater ability of business customers to bear increases. The National Anti-Poverty Organization argued that the proposed differential was not sufficiently large. The testimony referred to the externalities in local telephone service and the need to maintain local service slightly below cost.

Having considered the evidence, the Commission concluded that the current relationship should be maintained at this time. The Commission approved a 13% increase in each classification based on the revised revenue requirements.

b) Two-Party and Four-Party Rate Relationships:

In November 1979 the Commission approved a decrease in the rate for two-party residence service in order to provide a "budget" alternative.[43] In considering the amount of rate reduction, the Commission noted that a low-price service was already available in the form of four-party service in non-urban areas.

The Commission did not consider it desirable to reduce Bell Canada's rates for two-party service to levels lower than those charged for four-party service. Nor did it consider that present four-party rates should be altered. The two-party rate was reduced to the same level as four-party rate for both urban and non-urban areas. Non-urban customers would continue to pay mileage charges for two-party service. The Commission noted that the differential between individual line service and two-party service increased from 28% to 35%.

See Telecom Decision CRTC 79-23

c) Extended Area Service:

On November 11, 1985, Bell Canada requested approval for revisions to the criteria employed by the Company to determine which location qualify for Extended Area Service (EAS). The approval of these criteria would add 130 exchanges qualifying for EAS.[44]

When an exchange is added to the local toll-free calling area, the loss of long-distance revenue and the cost of the additional facilities are recovered through an increase in local rates. The increase results from the recalculation of the rate group size to reflect the increased telephone count using special weighting factors reflecting distance. The traditional approach is to increase the weighted group size both in the original calling area and in the new extended area.

In Telecom Decision 85-5, March 1985, the Commission reaffirmed its concern that much of the EAS cost is not recovered from the customers who reap the benefits and the general body of subscribers subsidize EAS expansion into new areas.

In response to this concern, Bell Canada proposes to recover the costs of providing EAS in new areas by rate group adjustments in those areas only. Full implementation of the proposed criteria would result in a pro-tax net revenue loss of $19 million from the 160 exchanges. In these exchanges local monthly rates would rise from $0.30 to $1.45 for residence customers, and from $2.00 to $4.55 for business customers.

CRTC Notices 1985-81 and 1984-1, Telecom Decision 85-5.

ASSESSMENT

Environment

Competition allowed in the terminal equipment market, not in message toll market - value of service and price averaging widely used.

Objective of Rate Changes

Stimulate consumption and development. Distribute the revenue requirement over large groups and broad classes. In addition, the EAS rate change proposes a greater role for market forces in the determination of EAS expansion.

Strengths

Simple rate structures, changes easy to justify and rate schedules simple to administer.

Weaknesses

Rates are not cost-based, wrong pricing signals are received by customer resulting in inefficient allocation of resources. Some correction in the existing price signals would result from the new proposal for Extended Area Service.

Cost/Benefits

The increase in revenue requirements due to the residence/business and two-party decisions were offset by value of service, fairness and universality.

In the EAS example, the customers, collectively will decide if the benefits exceed the cost. This will be achieved by a simle majority vote process.

CASE STUDY 3 - Advanced Services

4.3. Bell Canada, Advanced Services

Advanced services refer to local services based on new applications of the public switched telephone network such as custom calling features and electronic shopping/banking.

Some services such as customer calling features (speed call, forwarding, etc.) are viewed by customers as a premium or luxury service. In these instances the rate is set to reflect the market place. The rate design insures that costs are recovered and the price is set according to marketing information (trials, etc.).

The proposed 976 service to provide customer-dialed access to message announcement also falls in this category the price is set above cost according to marketing information.[45]

The supporting studies for these rate designs are mostly confidential and are provided to the regulator only.

A different approach is taken for services such as Data Grade Access Line which is a central office line terminating on a data jack and engineered to provide data transmission over the public switched telephone network.[46]

In a simple case like this one, the rate is set as a flat rate surcharge on the basic access, service (individual business line). The surcharge is based on the causal costs as calculated in supporting resource cost study and on the value of service. Given an accepted cost methodology, the estimates and calculations are relatively simple to evaluate from a regulator's viewpoint.

See Bell Application, CRCT Notice 1986-4
See Bell Application, CRTC Notice 1985-74

The following example of rate design for the provision of telephone numbers with outpulsing contrasts the earlier pricing philosophy used by Bell Canada with the current approach.

Customers use telephone numbers with outpulsing to received direct dialed calls from the public switched telephone network. When an outside caller dials the assigned number, the incoming line does not ring in the usual fashion. Rather the central office equipment will transmit tones or pulses representing the last four digits of the called telephone number. The terminal equipment at the customer's premises decodes the last four digits and directs the call to the desired terminal or extension. Applications of these services include radio systems and private branch exchanges (PBX) arranged for direct inward dialling.

In 1981 Bell Canada filed a tariff with the CRTC to modify its rates for direct inward dialling to PBX extensions.[47] The change proposed was to separate the rate into two components: a Central Office component; and a PBX trunk termination component. In instances where the customer rather than Bell provided the telephone system, the PBX trunk charge would not apply.

The rate was changed as follows (for SL-1 PBX):

	Each Extension Line	Each Trunk
Old (Bundled)	$7.10 per mo.	included
New (Unbundled)	6.90 per mo.	$3.00

CRTC Notice 1982-8 and attached application.

The rate design consisted of identifying the incremental cost to Bell for each trunk termination on its PBX systems. This cost was reflected in a $3.00 rate for each trunk. Since each trunk served an average of 14 extension lines, 20¢ was subtracted from the $7.10 rate for extension lines to arrive at the new rate. Thus Bell customers would pay $6.90 per month per telephone number with outpulsing (extension line) and $3.00 per trunk (serving 14 lines). Their monthly bill would not change. Customers with their own PBX would only pay the $6.90 per telephone number with outpulsing and provide their own trunk terminations.

In November 1985 Bell Canada filed tariff revisions providing for rate changes for telephone numbers with outpulsing for the use of cellular and mobile radio systems[48]. Some of the offerings are quite similar to the inward dialling service for PBX.

The approach to the rate changes in 1985, however, was different than those in 1981. In this case Bell provided two cost studies to support the rate calculation. The first study was a determination of the annual cost of the provisioning of a telephone number: $2.25 per number (Annual Equivalent Cost). The second study was a determination of the annual cost of the usage of a telephone number with outpulsing: $9.88 per number (Annual Equivalent Cost). The monthly rate was designed to cover these specific costs and include a contribution. The former rate was increased from $0.82 to $1.25 per telephone number with outpulsing.

The substantial difference in the rate level for service offerings that are largely similar reflects the different approach to rate design used at different times.

CRTC Notice 1986-22 and attached application.

NOTES

1. National Association of Regulatory Commissioners, Washington, D.C.

2. Garfinkel, Linhart 1979, ref. A20, 2 of 2 page 18.

3. 1980-1984 Decisions:
   Accepted: Del, NH, Vt.
   Rejected/stopped: DC, Md, Mc, ND, Wis.
   Limited, trial, pilot, phase in: Ala., Fla., Ga., Ky, Mass., Miss., NJ, NC, Ohio.

4. Galligan 1976, ref. A15, p.30.

5. Bell Canada, "Framework for the Future". A submission to the Department of Communications Telecommunications Policy Review, Ottawa, May 1984., p. 27.

6. Of Canada's 8,857,000 households in May 1984, 8,727,000 households or 98.5% had one or more telephones - Telephone Statistics 1984, Statistics Canada. Catalogue 56-203.

   See also discussion by Perl 1983, ref. S15 pp. 37, 63 and CBO report Appendix B-1 ref. S26.

7. Garfinkel, Linhart, Ref. A20, p.20, Mitchell, B.M., ref. S10, p.12.

8. Zielinski, C.A., 1979, ref. C2, p.12.

9. See Case Study, California, Section IV, i.e. 1969, p.35.

10. See Case Study, California, Section IV, i.e. 1976, p.36.

11. Garfinkel, Linhart 1979, p. 28, ref. A20.

12. Poynter, J.J. 1980, ref. C3, p.7.

13. Mitchell, B.M. 1976,, 1980, ref. S9 and S12.

14. Garfinkel, Linhart 1979, ref. A20, p.20.

15. Mitchell, B.M. 1980, ref. S10, p.13.

16. Davis, Pope (NRRI) 1984, Survey results on penetration of all forms of local measured service.

17. See Lifeline legislative proposals, Congressional Budget Office Report, ref. S26, p.31, Committee Report, House of Representatives, ref. S28, p.18.

18. Canadian Dept. of Communications, "...ensuring that the public's right to basic telecommunications services at reasonable rates is not eroded". Ref. C5, p.73.

    See also S25 and S27.

19. During 1983 the average residential bill in the U.S. totalled about $38.00, ref. S26, p.27. Demand Studies are summarized in ref. S28, Exhibits F1, F2. For Usage Studies see S14 for summaries.

20. The average bill for all disconnects was $26.00, only 8.8% had not used toll, ref. S17.

21. Income and Usage, see ref. S9, p.13, see also S3 and S16.

22. Reinking, R.D., ref. A7.

23. NARUC Lifeline survey, ref. S23.

24. Bell Canada Suggested Structure, ref. C2.

25. Garkinfel, Linhart 1980, ref. A20.

26-48 Supporting details provided in the PUC Order listed at the bottom of the page where the comment is made.

APPENDICES

Province: Ontario, Quebec

Utility: Bell Canada

Regulator: Canadian Radio-television and Telecommunications Commission

At January 1981

Number of Telephone Companies in Province	48
Number of Telephones in Province	11,492,393
Number of Telephones in Bell Canada	10,907,663

Rates November 1985

a) Residence

1. Flat Rate
   - available in all exchanges
   - rates vary from $5.60 to $18.35 per month (Toronto $11.60) for single party service

2. Measured Service
   - not offered for local service
   - there is one Optional Calling Plan plan offered as option to EAS; a 33 1/2% discount is applied to toll calls for a subscription fee based on distance in the calling area

b) Business

1. Flat Rate
   - available in all exchanges
   - rates vary from $12.35 to $62.40 per month (Toronto $41.40) for single party service

2. Measured Service
   - available only in the larger exchanges for single party service
   - basic charge: - $14.35 to $34.45
   - allowance: - 75 to 195 messages
   - usage charges: - 9.2¢ per message
   - discounts: - N/A

Sources: Bell Canada tariffs
Telephone Engineer & Management Directory 1985/86.

State: Delaware

Utility: The Diamond State Telephone Company

Regulator: P.S.C. Delaware
The Commission sets rates based on an original cost historic or partial test year.

At January 1981

Number of Telephone Companies in State	1
Number of Telephones in State	534,188
Number of Telephones in Diamond State Tel	534,188

Rates March 1985: There are two components to monthly rates: a dial tone line plus usage charges (unlimited or measured)

a) Residence
- dial tone line rates vary from $4.90 to $5.40 per month (Wilmington $4.90)

1. Flat Rate
- available in all exchanges
- rates vary from $6.50 to $7.50 per month (Wilmington $7.50) for single party service

2. Measured Service
- 3 options; for single party service only, where facilities permit

	per call	Valu-Pak 1	Valu-Pak 2
- basic charge:	- nil	$1.50	$4.00
- allowance:	- nil	3.00	8.00
- usage charges:	- first minute 5¢ to 10¢ based on distance		
	- add'l minute 1¢ to 2¢ based on distance		
- discounts:	- 50% and 70% outside business hours		

3. Lifeline Service
- not offered

b) Business
- dial tone line rates vary from $12.00 to $14.00 (Wilmington $12.00)

1. Flat Rate
- available in all exchanges
- rates vary from $9.00 to $13.00 per month (Wilmington $13.00) for single party service

2. Measured Service
- for single party service only, where facilities permit
- basic charge: - $3.00
- allowance: - $6.00
- usage charges: - same as residence
- discounts: - same as residence

Sources: Diamond State Tel tariffs
Telephone Engineer & Management Directory 1985/86.
United States Telephone Association - Telephone Statistics, 1985
National Association of Regulatory Utility Commissioners 1983 Annual Report on Utility and Carrier Regulation

PROVINCE: Ontario & Quebec
TELCO: Bell Canada

DATE: Nov. 1985

Rate Group	Total Tel. No. Count /1	Business						Residence		
		Flat Rate Service				Message Rate		Flat Rate Service		
		Individual	2 Party /3	4 Party /3	PBX Trunk	Individual	Allowance /4 (messages)	Individual	2 Party /3	4 Party /3
3	1,500	12.35	9.80	7.30	22.45	-		5.60	3.50	3.50
3A /5	1,500	10.80	8.50	7.30	20.00	-		5.00	3.30	3.50
4	3,500	14.35	11.35	8.00	25.65	-		6.10	3.80	3.80
5	7,500	16.45	12.75	8.75	29.05	-		6.40	4.00	4.00
6	15,000	19.00	14.35	9.40	33.05	-		7.10	4.15	4.15
7	35,000	22.00	-	10.00	38.25	14.35	75	7.40	4.25	4.25
8	75,000	25.55	-	11.30	44.15	15.55	85	8.00	4.85	4.85
9	175,000	29.10	-	12.25	49.85	16.85	95	8.75	5.10	5.10
10	500,000	32.10	-	13.45	54.45	18.65	105	9.15	5.35	5.35
11	1,100,000	34.95	-	14.40	59.05	20.25	115	9.60	5.75	5.75
12	1,700,000	38.25	-	15.90	64.30	22.15	125	10.65	6.35	6.35
13	2,300,000	41.40	-	17.45	69.50	24.10	135	11.60	6.95	6.95
14	2,900,000	44.70	-	19.00	75.00	25.95	145	12.60	7.70	7.70
15	3,500,000	48.00	-	20.55	80.50	28.05	155	13.70	8.35	8.35
16	4,100,000	51.30	-	22.00	85.95	29.95	165	14.75	9.05	9.05
17	4,700,000	54.50	-	23.55	91.40	32.00	175	15.85	9.80	9.80
18	5,300,000	57.85	-	25.05	96.80	32.90	185	16.90	10.55	10.55
19	5,900,000	62.40	-	27.10	104.25	34.45	195	18.35	11.50	11.50

Notes:
1. Sum of telephone numbers as follows: actual tel. nos. in the serving exchange, plus for each of the other exchanges in the local service area, the total tel. nos. multiplied by a weighting factor based on rate distance between the serving exchange and other exchange.
2. Primary exchange service does not include a telephone set.
3. This rate is reduced by 1.00 for business and 0.20 for residence until the customer is permitted to own his own telephone.
4. Additional messages are 9.2 cents each.
5. Northern exchanges only.

DATE: March 1985

	Business Dial Tone Line			Residence Dial Tone Line		
Rate Group /1	Individual	2 Party /2	4 Party	Individual	2 Party /2	4 Party/3
1	12.00	12.00	-	4.90	4.20	-
2	13.00	13.00	-	5.15	4.50	-
3	14.00	14.00	-	5.40	4.50	4.50

Notes: 1. Based on dial tone lines and equivalents per CO district square mile.
2. Where measured services are available, only provided to existing subscribers at their current locations.
3. Only available in one exchange to existing subscribers at their current locations.

Usage	Business Rates				Residence Rates				
Rate Group /1	Unlimited-Trunks	Unlimited-Lines	Valu-Pak/Allowance		Unlimited	Valu-Pak 2 Allowance		Valu-Pak 1 Allowance	
X	16.00	9.00	3.00	6.00	6.50	4.00	8.00	1.50	3.00
Y	22.00	11.00	3.00	6.00	7.00	4.00	8.00	1.50	3.00
Z	25.00	13.00	3.00	6.00	7.50	4.00	8.00	1.50	3.00

Notes: 1. Usage rates apply in addition to rates for a dial tone line. Usage rate groups are based on weighted lines in each Local Calling Area (quantities not stated).
2. There is also a "per-call" usage option available in certain COs, subject to facilities being available. With this option there is no basic usage charge and no allowance.
3. Frequency and distances charges:

exchange band	1st 3 minutes	each add'l minute
1	.05	.01
2	.075	.015
3	.10	.02

4. Discounts (time of day): 50% - 21:00 to 23:59 every day
70% - 00:00 to 06:59 every day
50% - 07:00 to 08:59 every day
50% - 09:00 to 20:59 Sat., Sun.
50% - on 5 (specified) holidays

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PACIFIC NORTHWEST BELL

COST/BENEFIT PAPER

It is fair to pay on the basis of cost and on individual usage. In every jurisdiction where measured service has been introduced, many subscribers have benefitted in terms of reductions in their telephone bills. Those subscribers who use the network a lot, pay more. This elimination of the cross subsidization is inherently fair to both the users and the company.

In addressing the "cost/benefit" test, the costs for measuring local calls and the attendant savings from a reduction in local usage can be identified. Given today's electronic switching capabilities, no physical equipment is added in order to record directly dialed local or long distance calls. All that is required is to dedicate a portion of the software capacity of the call store module which assists in directing the operation of the switching machine, and associated AMA equipment. The costs for using a portion of this software capacity are $.0095 to 'set-up' the call and $.0009 for each minute the call is in process during the busy hour.

In addition to Central Office costs, there are other usage related billing costs that arise as a result of billing local usage. These are data systems costs for processing calls through the mechanized billed system. These average $.0031/call. (In addition, there are line related costs for such things as preparation of an additional bill page, that are not usage sensitive. When allocated on a per call basis, this adds $0.0016 to each message.)

Both the computer software and the physical components of a local switching office are engineered to handle certain volumes during each individual offices 'peak' or busy hour. To the extent that calls during the busy hour are repressed or shifted to other hours, then office replacements, equipment additions, etc., can be delayed or eliminated if everything else remains equal (e.g., the forecasted growth in main stations, etc.), and as long as a new busy hour in a different time period is not created. The cost savings in terms of reduced switching and trunking requirements during the busy hours for each call is $.1760 to set up the call and $.1129 each minute the call is in process.

It should be clearly understood that usage sensitive rates recover these costs and are not subsidized from other sources. The ratepayer, when evaluating the value of placing a call at a known rate, who then makes the call, pays the incremental cost to measure and bill that call.

Given this data, a partial cost/benefit test, using business services, can be completed; one that does not attempt to quantify and include the other factors and benefits outlined above. The following information is also required:

Class of Service	# of[1] Access Lines	Avg. Calls[2] Per Line/Month	Total Calls-Mo.
IFB	47,328	206	9,749,568
IFBKT	69,701	262	18,261,662
PBX	18,701	434	8,116,234
Centrex	51,716	90	4,654,440
			40,781,904

1 May 1983 data.
2 4/24/83-5/12/83 SLUS data - CTX is 5/23/83-6/1/83 - SLUS data adjusted against 1.10.

The costs of billing and measurement are therefore calculated as follows:

— Cost of measurement during the busy hour, based on an average 2.5 minute call; $40,781,904 * .95^4 * .11^1 * \$.0118^2 = \$50,288$ per month.

-- Cost of Billing; $40,781,904 * .95^4 * \$.0047^3 = \$182,091$ per month.

1 % of calls in the busy hour.
2 Busy hour measurement costs.
3 Billing cost per message.
4 Less 5% repressed messages.

Repression of local calling has been experienced in other jurisdictions when usage sensitive pricing has been instituted. Assuming 5% repression of calls in the busy hour, i.e., calls that are foregone or are shifted to non-busy hour periods via incentive pricing options, -- the potential cost savings are:

$40,781,904 * .11^1 * .05^2 * \$.4583^3 = \$102,797$

1 % of calls in the busy hour.
2 5% repression.
3 Busy hour switching and trunking costs for an average 2.5 minute call.

As one can see, using the cost/benefit measure as outlined above, the cost savings recover the cost of measurement, and partially offset the cost of billing.

The result of these calculations indicate that there is a 'cost' [$102,797 - ($50,288 + $182,091) = $129,582, or $.0032 per message] as a move to measured service. (Note: These expenses are fully recovered by usage rates.)

Table 4

PACIFIC NORTHWEST BELL - OREGON

LMS COST/BENEFIT ANALYSIS AT VARYING LEVELS OF REPRESSION

Total messages	40,781,904
BH measurement cost	$0.0118
BH cost/msg.	$0.4583
Non-peak measurement cost	$0.0047
Repression	0.05
Proportion of calls in BH	0.11
BH Messages	4,486,009

Repression	Total message costs	Total flat-rate costs	Measurement costs	Measurement cost/ Total cost	Cost of LMS
0.00	$2,300,548	$2,055,938	$244,610	10.63%	$244,610
0.01	$2,277,543	$2,055,938	$242,164	10.63%	$221,604
0.02	$2,254,537	$2,055,938	$239,718	10.63%	$198,599
0.03	$2,231,532	$2,055,938	$237,272	10.63%	$175,593
0.04	$2,208,526	$2,055,938	$234,825	10.63%	$152,588
0.05	$2,185,521	$2,055,938	$232,379	10.63%	$129,582
0.06	$2,162,515	$2,055,938	$229,933	10.63%	$106,577
0.07	$2,139,510	$2,055,938	$227,487	10.63%	$83,572
0.08	$2,116,504	$2,055,938	$225,041	10.63%	$60,566
0.09	$2,093,499	$2,055,938	$222,595	10.63%	$37,561
0.10	$2,070,493	$2,055,938	$220,149	10.63%	$14,555
0.11	$2,047,488	$2,055,938	$217,703	10.63%	($8,450)
0.12	$2,024,482	$2,055,938	$215,257	10.63%	($31,456)
0.13	$2,001,477	$2,055,938	$212,811	10.63%	($54,461)