NRRI 89-18

AN EXAMINATION OF THE APPLICATION OF PEAK METHODS TO ALLOCATE A REVENUE REQUIREMENT FOR INTRASTATE TELEPHONE SERVICES

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May 1990

This report was prepared by The National Regulatory Research Institute (NRRI) with funding provided by participating member commissions of The National Association of Regulatory Utility Commissioners (NARUC). The views and opinions of the authors do not necessarily state or reflect the views, opinions, or policies of the NRRI, the Public Utility Commission of Texas, Southwestern Bell Telephone Company, the NARUC, or NARUC member commissions.

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EXECUTIVE SUMMARY

The research presented in this report concludes that measures of bouncing busy-hour, busy-season traffic have a profound and substantive impact on the allocation of the revenue requirement among service and customer categories. Furthermore, the inclusion of measures of terminating traffic have a substantive impact as well. These conclusions were derived from revenue requirement studies based on data supplied by Southwestern Bell Telephone Company - Texas Division and AT&T of the Southwest.

The impetus for examining busy-hour traffic as a basis for allocations is rooted in economic theory and telephone engineering practices. Economists have long recognized that the conditions of the supply of telephone services meet the assumptions of the peak-load pricing model of economic theory. This insight is further reinforced by the fact that telephone engineers design switching and trunking capacity for the switch network to meet busy-hour traffic volumes with a specified probability of blocking. Integrating these ideas into revenue requirement allocations results in sound cost causation principles guiding the allocations. The research concludes that bouncing busy-hour, busy-season traffic is the correct basis for performing allocations.

The NRRI research team found that the ratio of Centrex to residential revenue requirements per access line was 2.36, while the ratio of business to residential revenue requirements per access line was 1.36. The ratio of 2.36 means that for every dollar per access line attributed to residential, $2.36 per access line was attributed to Centrex. The ratio for business can be interpreted in a similar manner. These ratios provide a benchmark with which to evaluate existing or proposed rates. To evaluate existing rates, the analyst would have to compute the revenues collected from business, Centrex, and residential customer groups and gather information on the number of access lines for each customer group. The ratio of, say, actual Centrex revenues per access line to that of residential would disclose whether existing Centrex rates were congruent with the revenue requirement relative to residential rates per access line. Proposed rates could be evaluated in a similar manner using estimated revenues and access lines.

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FOREWORD

Determining how to allocate revenue requirements is an ongoing problem in telecommunications regulation. We believe this report makes an important contribution by using important economic concepts and tying them to telephone planning practices to allocate revenue requirements by the amount of call volume at peak periods. Moreover, the research team gathered and applied real telephone company data from one state in conducting this new analysis. The results are important information that should improve the ability of commissions and utilities to conduct revenue requirement studies.

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May 1990

ACKNOWLEDGEMENTS

The author would like to thank the commissioners and the commission staff of the telephone division of the Public Utility Commission of Texas for their support (including financial) and encouragement during the course of this project. Southwestern Bell Telephone Company and its Texas Division supplied the accounting, engineering, and traffic data that made this study possible. The company's technical advice was invaluable in summarizing and analyzing the data. The author would like to thank Douglas Jones and Ray Lawton for their helpful comments and encouragement during the course of this project. Discussions with and technical review by Clark Mount-Campbell greatly improved the presentation of the data summary and analysis. The report was measurably improved through the editing of David Wagman. Finally, the cheerful, prompt, and expert typing of Linda Schmidt and the preparation of computer-based graphics by Debra Daugherty and Wendy Windle made the author's life much easier in preparing this final report.

CHAPTER 1

REVENUE REQUIREMENT ALLOCATIONS AND REGULATORY ISSUES

This report presents the culmination of a major investigation into integrating telephone planning concepts and economic theory into fully distributed cost studies. During this study, two reports have been published and a pilot study has been undertaken to apply the concepts and ideas from the first two reports. The first report, *Cost-of-Service Methods for Intrastate Jurisdictional Telephone Services*[1], reviewed the theory applicable to cost-of-service methods, examined existing cost-of-service studies, and proposed peak responsibility as a fully distributed costing method. The second report, *A Peak Responsibility Cost-of-Service Manual for Intrastate Telephone Services: A Review Draft*[2], delineated complete and detailed functional categorization of the Uniform System of Accounts and specified how each cost category might be allocated or assigned to specific customer and service categories. Since the publication of the draft manual, the accounting, engineering, and usage data needed to perform the allocations specified in the manual were collected, verified, and edited by an NRRI research team. The results presented in this report are based upon the allocation concepts specified in the manual and the data that were collected.

[1] William Pollard, *Cost-of-Service Methods for Intrastate Jurisdictional Telephone Services* (Columbus, Ohio: The National Regulatory Research Institute, April 1985).
[2] Idem, *A Peak Responsibility Cost-of-Service Manual for Intrastate Telephone Services: A Review Draft* (Columbus, Ohio: The National Regulatory Research Institute, August 1986).

Problem Statement and Research Questions

The role and purpose of fully distributed cost studies in a regulatory context is to set revenue targets for categories of services and/or customers. The term "fully distributed cost studies" is really a misnomer. What these studies do is allocate the revenue requirement to the services and customer classes for which prices must be set. In this sense, fully distributed cost studies do not find or disclose the costs of providing a service. Instead, the balance sheets and income statements for a telephone company that result from the revenue requirement phase of a rate case are allocated to broad categories of customers and services. The commission may use the allocated revenue requirement to set revenue targets for a bundle of services provided to specific groupings of customers, or use the allocated revenue requirement information to evaluate current or proposed tariffs. In essence, the regulatory constraint (that is, the need to meet the revenue requirement) is being allocated and cost-causative principles are being used to guide the allocations.

A generally accepted principle in cost accounting is to assign or allocate costs to those customers and/or services that cause the cost to be incurred. At the time of divestiture, the standard allocation factor used to allocate booked costs of plant and equipment was the 24-hour use of various pieces of the public switched network. This practice was widely criticized as not properly reflecting cost causation for the public switched network. Economists generally recognize that the physical conditions of supply for telephone services meet the basic assumptions of the peak-load pricing model.[3] The economist's view of the conditions of supply was further reinforced by telephone companies' planning procedures for switching and trunking capacity in the public switched network. Reliability standards or grades of service are stated in terms of the percentage of blocked or

[3] See O.E. Williamson, "Peak-load Pricing and Optimal Capacity Under Indivisibility Constraints," *American Economic Review*, 1966: 810; and J.E. Parker, "A Neoclassical Approach to Peak Load Pricing," *Bell Journal of Economics*, Autumn 1976: 521.

delayed calls during the bouncing busy-hour, busy-season[4] for a piece of equipment. Thus, economic theory and telephone companies' planning practices indicated that cost-causative allocations are based on measures of peak.

At the beginning of this project, the research team had many questions regarding the time pattern of telephone calling and how these patterns would affect the allocations of the revenue requirement among customers and services. The research team knew generally that a typical nonholiday weekday at a typical switch or on a typical trunk group[5] would have the busiest hour of traffic (on average around 11 A.M.) and a secondary peak around 2 or 3 P.M. The research team also knew that, in general, business customers experienced their busiest hours of traffic (on their subscriber loop) between 10 A.M. and 4 P.M., while residential customers generally had their busiest hours of use around 8 or 9 P.M. The scraps of knowledge, however, did not allow the research team to predict what the impact might be if the revenue requirement was allocated according to each service and customer class's contribution to the busy hour (peak).

It is possible that allocations based on measures of peak traffic flows would not be different from the allocations based on 24-hour use. The reasons for this may not be readily apparent. If traffic for all customers and services from one hour to the next was a constant proportion of total traffic, the allocation based on any one of the hours would be identical to the allocation based on the total traffic for all hours. The extent to

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[4] The bouncing busy-hour refers to the busiest hour of traffic regardless of the hour it occurs. The hour may bounce from hour to hour. This bouncing concept of the busy hour was introduced when equipment was developed to measure use regardless of hour. Prior to this time, the busy hour was a fixed hour, say 11 A.M. The busy season refers to the three busiest months of use for a switch, trunk group, or other piece of equipment. Telephone companies typically employ ten-day bouncing busy-hour, busy-season traffic for planning purposes.

[5] Exactly what constitutes a typical switch or trunk group may not be well understood. The idea is a statistical one. If one were to collect data on the hourly traffic at a sample of switches (which the research team did), one would anticipate that the averages for this traffic data to exhibit certain properties with regard to the time profile of use. The typical switch or trunk group in this case refers to hourly traffic that has been averaged over all switches in the sample regardless of the day, month, or year in which the hourly use occurs.

which actual traffic patterns exhibit the proportional behavior was unknown to the NRRI research team. However, the research team thought that this behavior may depend on the level of aggregation of services and customer classes. For instance, if one were to examine interstate interLATA traffic for all customer classes, this traffic may be a constant percentage of total traffic across the hours of a day. Furthermore, the way in which this traffic is summarized may be the determining factor. In other words, what is the definition of the peak that lies behind the allocation and aggregation of services and customers?

This notion of the definition of the peak hour and its impact on the allocation of the revenue requirement to categories of customers and services is the central theme of the research undertaken by the NRRI. Two definitions of peak hour were identified. First, the engineering planning criteria of the bouncing busy-hour, busy-season traffic is one possible candidate and is considered by the NRRI research team to represent the best measure of traffic in terms of cost causation. The second possible measure of peak is the busiest hour, on average, over the measurement period for a sample of switches, trunk groups, and customer subscriber lines. This average busy hour is based on a summary statistic of the traffic and has a variance. That is, traffic during this hour was both larger and smaller during the days over which the measurement was performed. In other words, it has a probability distribution.

This second definition of the peak differs from the first in two ways. First, the bouncing busy-hour, busy-season measure of traffic is not a fixed hour, but may occur at different hours. The busiest hour, on average, is a fixed hour over the measurement period. The second difference is based on the fact that the bouncing busy-hour, busy-season measure of traffic will always exceed the largest hour on average. To see this, suppose that the bouncing busy hour is a fixed hour. It must be the case that this is the busiest hour on average. Given this fact, the busy-hour is measuring the upper tail of the distribution of the busiest hour on average.

Even given these differences in the measure of peak, the impact on the allocation of the revenue requirement is unknown because of the proportionality issue. The effect of the level of aggregation on the probable existence of proportionality is also unknown. Consequently, data were collected and revenue requirement allocations were performed to test the impact of two peak methods relative to allocations based on 24-hour use. Three broad groups of scenarios are outlined in table 1.1.

The first column of table 1.1 delineates the traffic information used as the basis for the revenue requirement allocation performed. The second column indicates the significance of each allocation basis. These three broad groups of allocation bases are used to organize the presentation of the results of the traffic studies and revenue requirement allocations presented in this report. There is, however, an additional dimension to the allocations performed in this report.

TABLE 1.1

THREE BROAD GROUPS OF SCENARIOS EXAMINED

Traffic Information Used in Allocation of Revenue Requirement	Significance of Allocation Basis
24-Hour Traffic Average	Traditional allocation basis for switched network: it assumes every hour has same traffic pattern
Bouncing Busy-Hour Busy-Season Traffic	Follows telephone engineering planning criteria and economic theory: it assigns costs to peak user
Busiest Hour on Average (Average Peak)	Statistical summary of sample usage data from subscriber lines: assigns costs to the busiest hour on average

Source: Authors' compilations.

The first two reports in this investigation into peak methods emphasized the important role that terminating or incoming traffic potentially plays in identifying cost causation on the switched network. Congestion of switching equipment or trunk groups can be attributed to both traffic that is outgoing or originates from the plant and equipment, and traffic that is incoming or terminates (completes) on the plant and equipment. The traditional practice of performing fully distributed cost studies did not recognize congestion (as noted above) and the relative roles of originating and terminating traffic. In order to integrate terminating traffic into revenue requirement allocations, the NRRI research team collected data on originating and terminating traffic. Consequently, the relative impact of introducing terminating traffic into the revenue allocations is tested for each of the three broad groups of scenarios.

The research questions addressed in this report examine the changes in the allocation of the revenue requirement that result from using different measures of peak or busy-hour traffic. These different measures of traffic are summarized in table 1.1. In addition, the impact of the inclusion of terminating traffic in the calculation of allocation factors is examined. To a large extent, the question of impact can be reduced to a question of whether the traffic for a service category and customer class grouping[6] is a constant proportion of total traffic for each hour. If this proportionality holds, 24-hour use is as discriminating as measures of peak from a cost causation perspective. However, the NRRI research team did not expect this proportionality to hold, particularly when examining a large number of service and customer categories including the originating and terminating traffic distinction.

Revenue Requirement Allocations and Regulation

With the divestiture of American Telephone and Telegraph (AT&T) and the continued trend toward allowing fledgling competition to develop, cost studies have become a focal point of rate hearings and a central feature of legislation allowing relaxed regulation or deregulation of demonstrably competitive services. In these contexts, cost studies are used to provide some basis for setting rates for competitive and regulated services. A 1989 survey of state public utility commissions regulating telephone services

[6] Fully distributed cost studies are sometimes referred to as "category cost studies" because the revenue requirement is allocated to categories of services and customers. These categories are not defined at the same level of detail as is needed for setting tariffs. In fact, the categories represent highly aggregated sets of tariff elements.

indicated that fully distributed cost studies were the most frequently preferred type of study by commissions, while marginal-cost studies were the most frequently submitted type of study by telephone companies.[7] The frequency of submission of marginal-cost studies highlights telephone companies' emphasis on the competitive environment in which they operate and provide specific services. The difficulty with using marginal costs as a basis for telephone rate making is that prices set equal to marginal costs only recover approximately one-half of the revenue requirement. The most often recommended method for reconciling marginal-cost estimates to the revenue requirement is Ramsey pricing.[8] Revenue requirement allocations offer state regulatory commissions a way to examine the allocations recommended by the telephone companies.

Fully distributed cost studies have been attacked as being arbitrary and deriving deriving costs that are economically meaningless. The issue of "cost" as opposed to a revenue requirement study has already been addressed above. Consequently, one cannot interpret revenue requirement allocations as costs except in the traditional cost-of-service, rate-base regulation sense as found in legislation, court cases, and the literature on regulation. The issue of arbitrariness, however, is troublesome and worth some comment and analysis.

In economic theory, only the marginal-cost function exists for a company producing multiple products which share common plant and equipment. The average-cost function for any one product or group of products sharing common plant and equipment does not exist. Fully distributed cost studies in some sense are interpreted as trying to estimate these average costs which do not exist even in theory. Consequently, such studies are nonsense to an economist. Note, however, that this criticism is based on the notion that fully distributed cost studies derive costs and are not simply revenue requirement allocations. Whether or not this distinction is a verbal sleight of hand or a real analytical distinction depends largely on the

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[7] William Pollard et al., *The Treatment of Official Telephone Services by Public Utility Commissions in the United States*, (Columbus, Ohio: The National Regulatory Research Institute, March 1989).

[8] W.J. Baumol and D.F. Bradford, "Optimal Departures from Marginal Cost Pricing," *American Economic Review* June 1970: 265; and F. Ramsey, "A Confrontation to the Theory of Taxation," *Economic Journal* March 1927: 47-61.

extent to which social and political goals should interact with economic criteria for an effectively and efficiently functioning telecommunications sector, and the extent to which varying degrees of monopoly power are tolerated by regulators.

Another dimension of arbitrariness of fully distributed cost studies involves the actual practice or undertaking of such studies. Parties to rate hearings have carefully chosen the allocators for costs that best favor their position, or regulatory authorities may have adopted allocators without a thorough investigation of the underlying cost causation. A salient example of fully distributed cost studies in the telephone industry is separations procedures[9] that are used by the FCC to determine the revenue requirement for services subject to federal regulation. The history of separations[10] is replete with examples of political compromise through the Joint Board process to specify allocations on which a majority of states can agree. Often such allocators have little to do with cost causation.

The position of the NRRI research team is that fully distributed cost studies should adhere to principles of cost causation. In doing this, there is a limited number of allocations that are appropriate and these are based on measures of peak or busy-hour use. Furthermore, these studies should be referred to as revenue requirement studies or allocations to avoid confusion with notions of economic costs. In doing this, the public utility commission is emphasizing the fact that it is setting revenue targets for groups of services and customers for which the telephone company must set rates.

Beyond setting revenue targets for groups of services and customers, revenue requirement allocations can be used to evaluate existing or proposed rate relationships for groups of services and customer classes. The results of the revenue requirement studies presented in chapter 5 of this report are summarized in terms of the ratio of revenue requirements per access line for local services. The revenue requirement for local services per access

[9] "Part 67 - Jurisdictional Separations Procedures: Standard Procedures for Separating Telephone Property Costs Revenue, Expenses, Taxes, Reserves," *Federal Register* 19 no. 43, March 1984: 7946.

[10] Richard Gabel, *Development of Separations: Principles in the Telephone Industry*, (East Lansing, Michigan: Institute of Public Utilities, 1967).

line for business and Centrex customers is divided by the revenue requirement for local services per access line for residential customers. In doing this, one learns the revenue requirement for Centrex customers per access line is one-and-one-half that of residential or twice that of residential, and so on. These ratios can be compared to the corresponding ratio of marginal-cost revenues, Ramsey price revenues, existing rates, or proposed rates.

To illustrate the importance of the ratios, an example of allocating a telephone company's revenue requirement between regulated and competitive[11] services is depicted in figure 1-1. The horizontal axis is the locus of all possible revenues per access line that could be charged in the competitive markets. The vertical axis represents the locus of all possible revenues per access line that could be charged in the regulated markets. The vertical line labelled MC_c represents the marginal-cost revenues per access line achievable from the competitive markets. The horizontal line labelled MC_R represents the marginal-cost revenues per access line for the regulated markets. Point M represents maximum profits per access line that are collected from charging P_R^M in the regulated markets and P_C^M in the competitive markets. The ellipse in figure 1-1 is the combination of revenue requirement per access line that just recovers the revenue requirement. The shape of the ellipse is determined by the elasticities of demand in the competitive and regulated markets. The segment of rational pricing on this ellipse is the arc between points A and B. Any other points on the ellipse represent combinations of prices for which one or both of the prices could be decreased and one or both groups of customers made better off and still collect the revenue requirement. The three lines emanating from the origin are the ratio of revenue requirements per access line.

The middle line intersecting the ellipse at point R represents the ratio of Ramsey price revenues per access line. Point R is special to economists because it represents the set of prices for the underlying

[11] The use of the term competitive here is not meant to imply perfect competition. Instead, imperfect competition such as oligopoly or monopolist competition is intended.

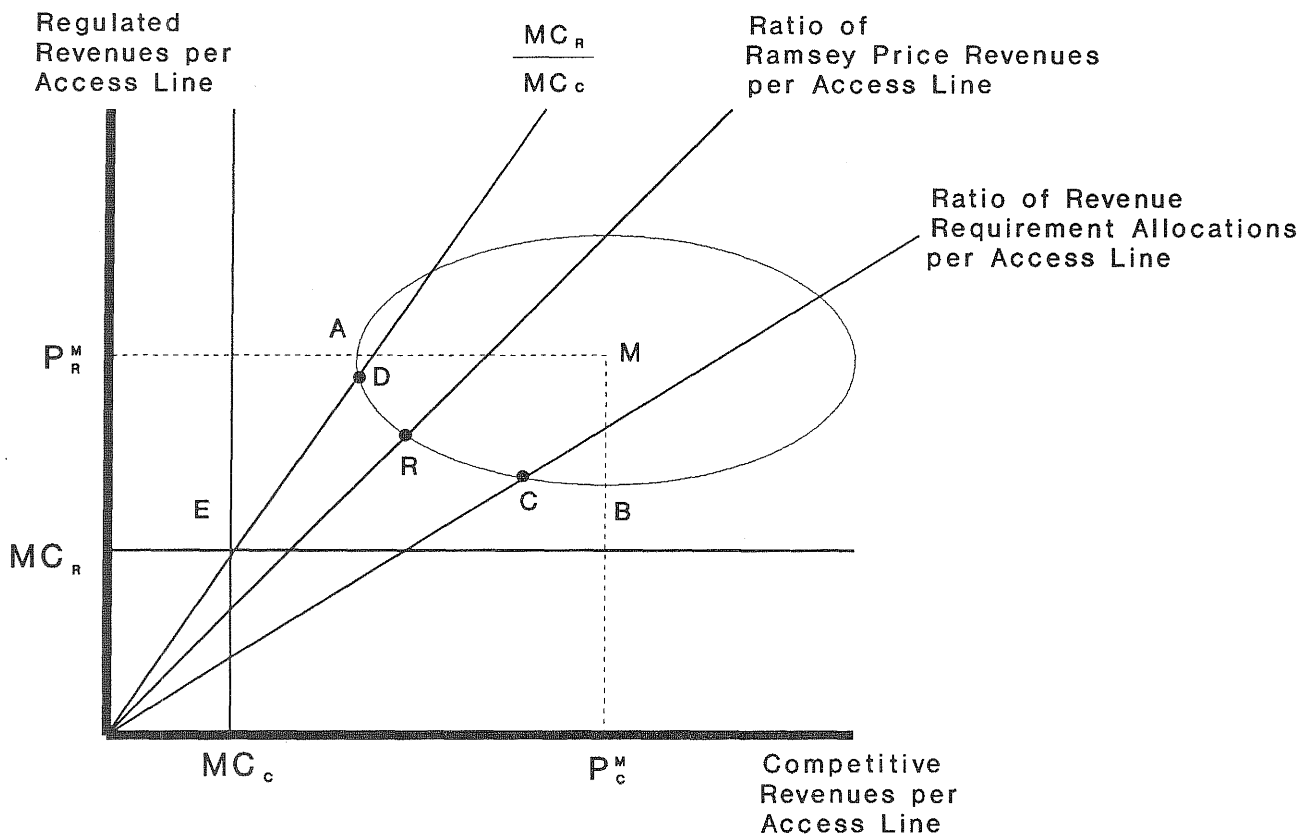

Fig. 1-1. Pricing ellipse for regulated and competitive services and the ratio of revenues per access line.

services that do the least harm to economic efficiency and still recover the revenue requirement. The adjustment to prices is done according to the inverse price elasticity rule. Since regulated markets would tend to have inelastic and competitive markets elastic demands, more of the revenue shortfall from charging prices set at marginal costs would be recovered from the regulated market. Many commissions when confronted with Ramsey pricing reject it on equity grounds or because the elasticities are not known, or both.

The steepest line intersecting the ellipse at point D is the ratio for marginal-cost revenues per access line. Note that this line goes through point E where the marginal-cost revenues in each market intersect. Point E is considered by economists to be the welfare maximizing point that results from charging prices equal to marginal cost in both sets of markets. A point like D might result if the commission adjusted the prices in each market upward by the same proportion over marginal costs in order to cover the revenue requirement because elasticities are not known. Such an adjustment has the potential to set revenues per access line that may not even recover the revenue requirement if the resulting line did not intersect the ellipse. Consequently such adjustments are risky.

The third line intersecting the ellipse at point C represents the ratios of revenue requirement allocations per access line. Previous research at the NRRI[12] has indicated that point C lies to the right of point R for Ramsey pricing. This means that revenue requirement allocations tend to favor the regulated markets with relative lower prices than those resulting from Ramsey pricing. The issue raised by economists in these circumstances is the loss in economic efficiency that results from revenue requirement allocations. Research has suggested this loss in economic efficiency is around 1.25 percent. Regulatory commissions when examining this loss may factor in social and equity goals in assessing rates.

The issue addressed in this report is the positioning of the line passing through point C. Three broad groups of allocation factors are examined in this report: 24-hour use; bouncing busy-hour, busy-season

[12] J. Stephen Henderson and Robert E. Burns, *An Economic and Legal Analysis of Undue Price Discrimination* (Columbus, Ohio: The National Regulatory Research Institute, August 1989).

traffic; and busiest hour on average. The NRRI research team found that revenue requirement allocations based on bouncing busy-hour, busy-season traffic best integrate economic and engineering concepts into the allocations. However, the research team did not know prior to this research whether the traffic of each service used by customers increased proportionately from hour to hour. If traffic is proportional, the line going through point C will not change regardless of the traffic basis for the allocations. If the ratios do change, the line going through C will shift to the left or right as the basis for allocations change. This notion of changes in the ratios of revenue requirements per access line is a benchmark to which the analysis returns in chapters 5 and 6.

A Note on the Allocation of the Subscriber Loop

The traditional approach to allocating the subscriber loop in regional holding companies' embedded cost studies is to allocate the cost to an access category for each customer class. This access category is subsequently assigned to local services for each customer class. The NRRI research team does not follow this method in any of the revenue requirement studies presented in this report. The subscriber loop is allocated in two steps to service categories and customer classes. The first step is to allocate subscriber loop costs to customer classes according to the relative number of subscriber loops for each customer class. This allocation conforms to the notion that cost causation is identified by the act of subscription. In the second step, the costs or revenue requirement for the subscriber loop allocated to each customer class is allocated to the services according to the measure of relative use of the services. While this allocation does not change the costs allocated to any customer class, it does allocate the cost between local, toll, and other services. This is done for both measures of 24-hour and busy-hour traffic. This notion of peak allocations of subscriber loop costs requires some explanation as to why it represents cost causation.

The act of subscription creates an external benefit that must be factored into rate structures approved by commissions. An external benefit is said to exist when the consumption of a good or service cannot be limited to the purchaser. The purchaser in the case of telephone service is the subscriber. Consumption cannot be limited to the subscriber because other subscribers to telephone service worldwide may use the loop to contact him. Now this may not seem to be an undesirable outcome and in fact may be even a desirable outcome of subscription. Everybody subscribes to telephone service both to make and receive calls. This motivation, however, is not the issue; the issue is pricing the subscriber loop according to the principles of cost causation and internalizing the external benefit.

An examination of the motivation underlying the act of subscription for the first and all additional loops discloses that the subscription to telephone service relieves the blocking of calls to and from the subscriber. A rational decision to subscribe would compare the costs of subscription to the costs that congestion is imposing. The costs of subscription are the nonrecurring connection charge and the monthly bills for service. The costs that congestion are imposing are the subscriber's subjective evaluation of the costs of congestion or the profits foregone by a business due to congestion. Since the decision maker is the existing or potential subscriber, cost causation must be evaluated from the subscriber's perspective rather than the telephone company's.

Both originating and terminating use of a subscriber loop to a subscriber's premises cause congestion of the loop. Congestion due to originating use is directly observable by the subscriber. If he is not a subscriber, the costs of congestion are related to the costs imposed in gaining access to a public or other telephone and the costs of placing the call. When at least one loop is present, the costs of congestion are the costs imposed by queuing at the subscriber's premises, whether a residential or business customer. Traditionally, congestion due to terminating use is not always observable by a subscriber and information regarding congestion of incoming calls may be gained only second-hand or indirectly by a subscriber.[13] The ability of the subscriber to evaluate the costs

[13] Call waiting provides a mechanism by which a subscriber may learn about incoming calls that are blocked at his loop. Another is from a redial by the caller at a later time. The popularity of call waiting may possibly be explained by subscribers' desire to obtain information on incoming calls that are blocked. Call waiting is a surrogate for a second loop.

associated with terminating congestion, consequently, is limited and imperfect.

If the role of prices (as economists contend) is to provide information to consumers about both the private and social costs of consumption, the pricing of the loop must reflect the costs imposed by congestion. To an economist, efficient pricing of the subscriber loop must internalize this external benefit by imposing some of the costs of congesting a subscriber loop on the initiator of the call. The subscriber cannot control the timing of incoming calls or who calls him. There are certain times of the day, month, and year during which congestion of a loop is likely. These times vary by class of customer and these periods are defined as "peak periods" during which the probability of getting a busy signal from a loop is high. Consequently, the subscriber who initiates a call should be charged for the cost of congesting his loop and the costs associated with congesting the loop he is calling. This approach to pricing subscriber loop capacity leads to a charge for using a loop to initiate a call and a charge to cover the costs of congesting the loop the subscriber is calling. If the pricing scheme was set just to recover the costs associated with congestion, the resulting revenues may not cover the costs of the subscriber loop or even the marginal costs of the subscriber loop.[14]

Since the purpose of revenue requirement studies is to allocate the revenue requirement to services and/or customer classes for purposes of deriving revenues for bundles of services and/or customers, the subscriber loop should be allocated according to the busy-hour traffic of a customer class's subscriber loop for originating and receiving calls. How these revenues are translated to prices for the underlying services and customer groups is based on the regulatory commission's objectives and practices. In a world of flat charges for local service, this model of cost causation may be impossible to implement in practice because it implies a regimen of measured-rate service. However, such a scheme would be possible for toll calling and could be included in the common-line-charge portion of access

[14] William Pollard, "Externalities, Congestion, and the Subscriber Loop," speech given at the 3rd Annual Conference on State Utility Regulation: New State Regulatory Strategies for Telecommunications Services (Salt Lake City, Utah, February 1-4, 1987).

charges. This allocation is cost causative in that it is based not on the company's view of cost causation, but on that of the decision maker--the subscriber--who decides to subscribe to the first or addition loops.

Readers' Guide and Organization of the Report

The remainder of this report is organized into five chapters. Not every reader may wish to read all of the technical details of the sample design, data summary and analysis, or the calculation of the allocation factors. For such readers, a readers' guide is outlined after the organization of the report is covered.

Chapter 2 contains a discussion of the sample design used to collect the traffic data needed to perform the allocations contained in this report. Chapter 3 presents the methods used to summarize the usage data in order to compute the allocation factors for eight revenue requirement allocations based on measures of 24-hour use and busy-hour use. The fourth chapter contains the algorithms used to compute the allocation factors for local dial switching and subscriber loop plant. The fifth chapter presents the results of the revenue requirement studies and evaluates the impacts of using measures of peak to perform the allocations. The sixth and final chapter contains a concise summary of the result and conclusions regarding the existence or proportionality of busy-hour measure of use, as well as suggestions regarding how future research into busy-hour methods may proceed.

A reader not interested in all of the technical detail or who wants to review the major findings before delving into the technical details should read the section in chapter 4 which defines the scenarios analyzed in chapter 5 and the explanation in chapter 4 of the structure of customer and service categories (see pp. 85-106). Following these sections, the reader should proceed to chapters 5 and 6.

CHAPTER 2

SAMPLE DESIGN FOR USAGE STUDIES

Usage studies were performed by Southwestern Bell of Texas (hereafter Southwestern Bell) to collect the data needed to develop allocation factors for each of the scenarios. The NRRI research team designed the sample with two objectives in mind. First, the research team wanted to perform regressions to estimate usage by customer classes during various times of the day. Second, the research team wanted to hold down the cost of data collection. To accomplish these two objectives a combination of stratified random sampling[1] and cluster sampling[2] was employed. This chapter briefly outlines the sample design and data collection techniques.

The data were collected using two data sources. One data source is referred to as matrix studies and was done at the switch level. The other data source was the automatic message accounting (AMA) equipment and is referred to as AMA studies hereafter. The design of the sample was divided into four distinct steps. They were

1. Stratification of switches in Texas
2. Selection of switches within each strata
3. Stratification of subscriber lines at each switch in the sample
4. Selection of the subscriber line sample for each strata

Each of these steps is explained below.

Stratification of Switches in Texas

The purpose of stratified random sampling is to reduce the overall variance of sample estimates. The research team hypothesized that the mean

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[1] See W.G. Cochrun, *Sampling Techniques*, 3rd ed. (New York: Wiles, 1977).
[2] V. Barnett, *Elements of Sampling Theory* (London: English Universities Press Ltd., 1974).

and variance of use per subscriber line depends on several exogenous factors such as population of local calling area, income of subscriber, size of household or business, and age distribution of household. Data for these exogenous factors in the detailed required were not available. Instead, the research team acquired information regarding the number of subscriber lines in a local calling area and used it as a proxy for population of the local calling area.

The Public Utilities Commission of Texas (hereafter PUCT) divides Southwestern Bell's service territory into eight "rate groups" for rate-making purposes. These rate groups are defined on the basis of the number of local exchange access arrangements (subscriber lines) within the local calling area of an exchange.[3] The definitions of the eight rate groups are shown in table 2.1.

TABLE 2.1
RATE GROUP DEFINITIONS OF SOUTHWESTERN BELL OF TEXAS

RATE GROUP	Total Local Exchange Access Arrangements (Subscriber Lines) in Local Calling Area		
1	1	-	8,000
2	8,001	-	30,000
3	30,001	-	60,000
4	60,001	-	200,000
5	200,001	-	400,000
6	400,001	-	800,000
7	800,001	-	1,500,000
8	1,500,001	-	and over

Source: Southwestern Bell of Texas, Local Exchange Tariff Section 1, Sheet 1, effective March 15, 1985.

[3] The use of rate groups by the PUCT is based on value-of-service concepts. Rate Group 1 consists of the smallest local calling areas in Texas while Rate Groups 7 and 8 are the largest groups. The PUCT set lower rates for local service in Rate Group 1 than in Rate Groups 7 and 8 because the service is less valuable since fewer people can be called on a local basis.

The NRRI used the rate groups as a proxy for the population of the local calling area. The research team obtained data on switching entities for each of the eight strata.

The best definition for a switching entity is the CLLI code (which stands for Common Language Location Identifier). A CLLI code is an eleven-character alphanumeric identifier. The first four characters identify the city, the next two identify the state, the next two identify the building in which the switch is located, and the last three characters provide information about the type of switch. For instance, DLLSTXADCGØ indicates the city is Dallas (DLLS), the state is Texas (TX), the building is AD (in this case Addison), and CGØ (Control Group Ø) indicates this is a electronic analog switch.[4]

With the information on rate groups and CLLI codes, the research team was able to stratify all switches in Texas for sampling purposes. However, not all CLLI codes in Texas could perform the measurements the research team required. The CLLI codes that were candidates for the sample had to have both matrix studies capabilities and Local Automatic Message Accounting (LAMA) resident in the switch.[5] These two requirements limited sampling to 1 ESS and 1A ESS switches in Southwestern Bell's network. Table 2.2 shows the number of 1/1A ESS switches in each rate group. Note that only two candidate switches remain in Rate Group 1. These are digital remote switching arrangements and do not have matrix studies capabilities.

[4] For crossbar switches this last field is Marker Group, MGØ. For remote switching units, this last field indicates that it is a remote switch, RSQ. For digital switches, this last field indicated that the CLLI code designates a digital switch, DSQ. For step-by-step switches, this last field is a series of alphanumeric characters, which usually signify the exchange.

[5] Two kinds of automatic message accounting (AMA) equipment are possible. AMA equipment is used for measuring direct dial toll calls, measured rate local calling, and directory assistance calls, but not operator handled calls. Local AMA (LAMA) is resident at the CLLI code (i.e. part of the switch). The other form of AMA is centralized automatic message accounting (CAMA). With CAMA, the AMA equipment is placed in another switch with CAMA trunk links between the switches. When toll calls or other measured calls are made, the recording is done at the centralized location, usually a tandem switch.

TABLE 2.2
1/1A ESS SWITCHES IN EACH RATE GROUP
FOR SOUTHWESTERN BELL OF TEXAS*

	Rate Group							
	1	2	3	4	5	6	7	8
NUMBER OF 1/1A ESS	2	6	12	46	10	32	25	50

Source: Southwestern Bell of Texas.

* Some of the ESS or electronic switches in Texas are 2B ESS and 3ESS switches and do not have LAMA equipment. Thus, these counts may not account for all electronic switches in a rate group.

Selection of Switches Within Each Strata

The next step is to identify the switches in which to perform the matrix studies. Because of cost considerations, matrix studies were not done in all 183 1/1A ESS switches in the eight rate groups. Instead, cluster sampling[6] was used to select the CLLI codes using a D-optimal[7] experimental design.

The objective of performing the matrix studies is to collect hourly usage data at the switch (CLLI code) level by service categories (i.e. local, toll, operator services, etc.). These data are then used in linear regressions to estimate customer class contributions to each service category on an hourly basis. The form of the linear regression is:

$$U^D_{it\ell} = \sum_c \beta^D_{cit} N_{c\ell}$$

[6] Barnett, *Elements of Sampling Theory*.
[7] V.V. Fedorov, *Theory of Optimal Experiments*, trans. and ed., W.J. Studden and E.M. Klimko (New York: Academic Press, 1972).

where $U^D_{it\ell}$ is the use of service i in hour t at switch ℓ. The superscript D takes on values O for originating and I for terminating (incoming) use. The $N_{c\ell}$ are the number of subscriber lines for customer class c at CLLI code ℓ. The β^D_{cit} are the average and marginal[8] use of originating or terminating (D) service i in hour t by customer class c. Estimates of the β^D_{cit} are used to develop allocation factors for wire and facilities, switching costs, and subscriber loops.

A D-optimal experimental design minimizes the volume of the joint confidence interval for all estimators. It does this by maximizing the determinant of the matrix product N^tN where the matrix N has elements $N_{c\ell}$ that correspond to the number of subscriber lines at CLLI code ℓ for comtomer class c. In order to implement the design, the research team had to stratify subscriber lines at each of the candidate CLLI codes into customer classes.

The research team requested subscriber line counts by customer class for the candidate CLLI codes. A copy of the monthly "R525" report was made available by Southwestern Bell. This report tracks inward and outward migration of customers by USOC.[9] Part of this report records the number of subscriber lines for each USOC at the end of the month.

The research team wrote a computer program to summarize these data into five customer classes for each switch. They were:

1. Flat Rate Residence
2. Single Line Business
3. Multiple Line Business
4. Trunk and Centrex
5. Public and Semi-Public

Multiple line business refers to business customers that have two or more subscriber lines at their premises that are not connected to a PBX or switch. Customers connecting a PBX or their own switch with the network are included in the trunk category. These five classes were selected because

[8] The regression coefficients are both average and marginal because the regression equation has no intercept term.
[9] USOC stands for Universal Service Order Code.

the research team hypothesized they would constitute the majority of use at a CLLI code and that the mean and variance of use for each class would differ significantly among the five.

The data in table 2.3 support this hypothesis. Table 2.3 shows the total lines in service, the ten-day "bouncing" busy-hour usage and its standard deviation for four classes of residential and five classes of business customers. (To get the mean busy-hour usage, divide the ten-day bouncing busy-hour by ten.)

TABLE 2.3
1984 USAGE DATA FOR SELECTED CUSTOMER CLASSES
SOUTHWESTERN BELL OF TEXAS

Class of Service	Total Lines In Service**	10-day Busy-Hour Usage* Per Line	Standard Deviation Over Lines
Residential			
one-party flat rate	3,833,569	24.13	1.19
two-party flat rate	53,619	16.94	.98
four-party flat rate	83,287	15.99	1.79
one-party measured	41,084	11.38	3.63
Business			
one-party flat rate	489,191	31.90	1.80
multiline	584,012	54.16	2.26
PBX/Centrex CU trunks	222,074	113.18	8.56
four-party flat rate	1,528	15.02	.81
one-party measured	23,952	18.64	3.98

* Usage is measured in hundred call seconds (CCS) for ten days.

** Line counts may not agree with the information in the R525 report because of differing time periods for the information.

Source: Southwestern Bell of Texas.

Mitchell's Algorithm[10] was used to choose the CLLI codes for the sample. This algorithm computes the determinant, $|N^tN|$, to disclose which

[10] T.J. Mitchell, "An Algorithm for Construction of D-Optimal Experimental Designs," *Technometrics* 16 (1974): 203-10.

set of CLLI codes yields the maximum value for the determinant. It does not enumerate all possible combinations. The research team tested taking five, six, and seven CLLI codes from each rate group. Five, the minimum number possible with five customer classes, yielded the highest value of the determinant for each of the rate groups.

There was a problem with this strategy for Rate Group 1. Recall that Rate Group 1 has only two possible candidate switches of CLLI codes in which the AMA study is feasible (see table 2.2). Since the D-optimal method requires a minimum of five switches when dealing with five customer classes, Rate Groups 1 and 2 were combined into a single rate group. The resulting CLLI codes identified by Mitchell's algorithm for this combined rate group all came from Rate Group 2. For the sake of completeness and nonstatistical considerations, the two CLLI codes from Rate Group 1 were included only in the AMA study. Thus, the combined rate group contains seven CLLI codes rather than five.

The information on line counts for the five customer classes for each of the thirty-seven CLLI codes is presented in table 2.4 by rate group. Matrix studies cannot be done in the two CLLI codes in Rate Group 1. Thus, matrix studies were performed in thirty-five offices from Rate Groups 2 through 8 with five offices per rate group. These data were used to perform regressions to estimate customer class contributions for each hour of the day by service category, and are subsequently referred to as matrix studies data.

Stratification of Subscriber Lines at Each Switch in the Sample

Once the switches for the matrix studies were determined, the next step was to select the subscriber lines from these switches on which to perform the AMA studies for selected customer classes. Recall the NRRI research team had two objectives in designing the subscriber line usage study. The first was to collect a representative sample of subscriber line usage for selected customer classes. The second was to hold down the overall cost of data collection. The stratification of subscriber lines into the selected customer classes is discussed in this section.

TABLE 2.4
CENTRAL OFFICE SWITCHES IN WHICH THE SUBSCRIBER
LINE USAGE STUDY SHOULD BE LOCATED

RATE GROUP	RES.	PUBLIC	TRUNK	SINGLE BUS.	MULTI-LINE BUS.	BUS.
1	505	5	0	37	9	46
	763	10	0	63	1	64
2	9190	258	257	1481	1069	2807
	10457	250	357	1714	721	2792
	11020	428	432	1813	1184	3429
	14344	361	675	2044	1381	4100
	12457	361	239	1754	1351	3344
3	13932	398	427	3317	35	3779
	22069	882	716	3660	2420	6796
	26120	1025	1137	4272	3581	8990
	18016	527	2624	6229	5921	14774
	23958	656	848	4183	3753	8784
4	16367	1099	2312	7441	6287	16040
	34813	731	683	2578	3707	6968
	14810	1300	2664	7107	5628	15399
	19273	1133	1914	15091	5374	22379
	23449	755	1426	7292	6	8724
5	14282	924	3380	12054	5676	21110
	41415	1085	1477	4106	5642	11225
	34045	1139	2864	6453	8920	19137
	14668	207	299	1666	2165	4130
	24523	433	1691	2880	4200	8771
6	40302	874	1573	5946	6537	14056
	21795	609	1641	9890	3816	15347
	14517	1487	3781	13139	6762	23682
	30432	701	1991	5272	10434	17697
	39737	698	663	3865	5509	10037
7	22698	799	7209	14615	14419	36243
	33467	403	965	3008	5181	9154
	26869	910	2326	5426	7324	15075
	1361	590	4346	17255	3543	25144
	28236	559	3275	15899	7685	26859
8	31446	652	1379	4213	8251	13843
	33878	981	2309	10114	6313	18736
	6591	991	3054	14344	3037	20435
	8819	448	4974	11310	8887	25171
	36989	856	3767	10247	11203	25217

Source: Author's derivation.

In selecting customer classes for the subscriber line sample, the NRRI research team held discussions with the PUCT and Southwestern Bell regarding the information that was desirable and feasible to be collected. Furthermore, the information in table 2.3 was useful to the research team regarding which customer groupings had significantly different means and variances.

The customer classes can be segregated into three: residential, business, and miscellaneous. The customer classes delineated below are intended to encompass and to be exhaustive of all possible subscribers' telephone message service.[11] The breakdown of the broad classification is as follows:

Residential	One-party flat rate Multi-party lines Measured-rate customers Customers
Business	Single-line flat rate Multi-line customers Trunk customers Centrex Measured-rate customers Customer FX Official company use
Miscellaneous	WATS Feature Group A

The customer classes defined above are mutually exclusive and exhaustive of the telephone company's customers subscribing to telephone message service. This set of customer classes was defined because it was thought that the usage characteristics may differ statistically by time of day and in total. The primary basis of the distinction among the customer classes is the conditions or rates under which customers subscribe to service.

[11] Any Universal Service Order Code (USOC) for message service customers will fit into one of these customer classes.

Definitions of the customer classes are as follows:

Residential one-party flat rate: Residential subscribers who have a single dedicated subscriber loop and receive unlimited local area calling for a fixed price each month.

Residential multiparty customers: Residential subscribers who share a single subscriber loop with one or more subscribers and receive unlimited local area calling for a fixed price each month, or who pay on a per-message or measured basis for local area calling.

Residential measured rate customers: Residential subscribers who have a single dedicated subscriber loop and pay on a message or measured basis for local area calling.

Residential customer FX: Residential customers subscribing to foreign exchange private line services.

Business single-line flat rate: Business customers with a single dedicated subscriber line terminating at their business premises who receive unlimited local area calling for a fixed price each month.

Business multiline customers: Business customers with two or more subscriber lines terminating at their business premises, but whose subscriber lines do not terminate at a switch at the business premises (see business trunk). The multiline business customer can either pay a fixed price for unlimited local area calling or on a message or measured basis for local area calling.

Business trunk customers: Business customers with two or more trunks terminating at a switch at their business premises. The trunk business customer can pay a fixed price for unlimited local area calling or on a message or measured basis for local area calling.

Centrex customers: Business customers subscribing to Centrex 1 and 2. Centrex 3 subscribers are excluded from the usage sample because none existed in Texas at the time the sample was taken.[12]

Business measured-rate customers: Business customers with a single dedicated subscriber line terminating at their business premises and who pay on a message or measured basis for local area calling.

Business customer FX: Business customers subscribing to foreign exchange private line services.

Company official: Represents the subscriber lines, trunks, Centrex, and private lines subscribed to by the telephone company which is rendering the service.

WATS: The WATS customer class represents customers subscribing to outWATS and 800 service.

Public telephones, coin, and semipublic coin telephones could not be studied because of technical problems. In particular, placing coin phones on the AMA sample prevented customers from placing dial-"0" local calls. Mobile telephone customers using telephones for calls such as coastal harbor, VHF marine, air-ground, highway, urban mobile radio, and paging services could not be studied either because they did not have loops. In addition to the customer classes defined above, feature group A (FGA) subscriber lines were studied. These lines are used by FGA carriers to complete telephone calls coming into the local calling area from other LATAs. This use is classified as terminating FGA use. With the addition of FGA lines, a total of thirteen customer classes were studied.

[12] Centrex 3, allows the customer to impose software-defined restrictions on lines of the customers' choice.

Selection of the Subscriber Line Sample for Each Strata

In summary, thirty-five 1/1A ESS switches and two remote digital switching units were selected for the usage study. Table 2.4 shows the distribution of these switches among the eight rate groups and their approximate composition of customer classes. The objective now is to select a subscriber line sample to distribute among the thirty-seven switches.

Table 2.3 above gave the ten-day, busy-hour usage and its standard deviation for nine customer classes. This information along with the information on subscriber line counts by rate group for eight of the nine customer classes are used to select samples of subscriber loops. Table 2.5 gives the line counts by rate group for three classes of residential customers and five classes of business customers. Table 2.5 combines the two-party and four-party flat rate customer classes in table 2.4 into a single multiparty flat-rate class.

TABLE 2.5

SUBSCRIBER LINES FOR SELECTED CUSTOMER CLASSES
BY RATE GROUP FOR SOUTHWESTERN BELL OF TEXAS

Class of Service	Rate Group 1	2	3	4	5	6	7	8
Residential								
one-party flat rate	268,386	294,849	263,634	754,994	219,555	716,961	532,133	917,478
multiparty flat rate	53,244	34,799	15,131	16,537	4,265	5,455	1,747	3,094
one-party message	16	345	1,536	10,383	6,580	12,545	12,545	22,929
Business								
one-party flat rate	42,122	40,498	33,432	90,697	29,194	77,958	88,029	125,131
multiline	17,035	26,111	28,218	97,383	37,214	91,791	122,086	180,133
Centrex CO lines	267	73	365	6,651	6,671	16,796	41,035	54,589
PBX/Centrex-CU trunks	3,185	7,249	7,783	29,533	11,971	29,204	53,326	76,338
one-party message	22	126	588	2,611	1,474	4,442	7,217	8,290

Source: Southwestern Bell of Texas.

Usage information was not available for residential and business customer foreign exchange lines and feature group A lines. Consequently, the research team specified sample sizes for these classes based on the number of lines at each CLLI code.

The basic model for determining the sample sizes for each customer class and rate group is a constrained optimization problem where a constraint is placed on the total number of lines to be measured. The objective of collecting the sample is to estimate the total per-line-day use during the peak hour. A sample of n_{cg} lines was selected at random from customer class c in rate group g. The sample average per-line-day use during the peak of customer class c in rate group g is given by $\bar{U}_{cg}$ where

$$\bar{U}_{cg} = \frac{1}{n_{cg}} \sum_{k=1}^{n_{cg}} U_{cgk}$$

and U_{cgk} is the per-day peak use of the k^{th} line selected in customer class c and rate group g. The standard deviation of per-line-day use during the peak for customer class c in rate group g has been estimated to be σ_{cg}. These values are given in table 2.3. If $\bar{U}$ is the weighted-average per-line-day use during the peak taken over all customer classes, then

$$\bar{U} = \frac{1}{N} \sum_{g} \sum_{c} M_{cg} \bar{U}_{cg}$$

where M_{cg} is the total number of lines in customer class c in rate group g and

$$N = \sum_{g} \sum_{c} M_{cg}$$

is the total number of lines.

The accuracy of this estimate of total busy-hour use depends on the accuracy of $\bar{U}$ as an estimate of the true mean.[13] A measure of accuracy of $\bar{U}$ is the variance of $\bar{U}$ which is given by P:

$$P = \frac{1}{N^2} \sum_g \sum_c M_{cg}^2 \frac{\sigma_{cg}^2}{n_{cg}} .$$

For fixed N by selecting values for n_{cg} so as to minimize the variance of $\bar{U}$, the accuracy of the estimate is maximized for a given sample size.

One way to minimize this variance is to sample all subscriber lines forever and $\bar{U}$ becomes the true mean of busy-hour use per line-day. This is, of course, impractical due to limited data collection resources and the costs of handling and processing data. Consequently, it was determined that a sample of three-thousand five-hundred lines would be used. The distribution of these lines among the customer classes and rate groups has to be determined as a constrained optimization problem as follows:

Minimize

$$P = \frac{1}{N^2} \sum_g \sum_c M_{cg}^2 \frac{\sigma_{cg}^2}{n_{cg}}$$

subject to

$$\sum_g \sum_c n_{cg} = 3,500 .$$

The Lagrange Multiplier method was used to solve this problem for an initial set of n_{cg}.

Two adjustments were made to the initial set of sample sizes, n_{cg}. The first adjustment was to make the sample size for each customer class and rate group divisible by five. This was done so the sample for a customer class and rate group could be evenly distributed among the five CLLI codes

[13] This discussion so far has not defined the population because it was assumed to be self-evident. For sake of clarity, the population is the busy-hour use generated by all possible customers on a per-line basis.

in each rate group. Thus, all sample sizes were rounded upward. The second adjustment was to specify the sample sizes for those customer classes for which variance information was unavailable. Again, these sample sizes were divisible by five. The requested sample sizes submitted to Southwestern Bell are presented in table 2.6. The total sample size is 4,145 lines.

TABLE 2.6
REQUESTED SAMPLE SIZES BY RATE GROUP AND CUSTOMER CLASS TO SOUTHWESTERN BELL FOR AMA STUDIES

	Rate Group								
	1	2	3	4	5	6	7	8	Total
One-party res	105	115	105	295	85	280	210	360	1555
Multiparty res	20	15	10	10	10	10	10	10	95
Meas. rate res	10	10	10	15	10	20	15	30	120
Forgn exch res	10	10	10	10	10	10	10	10	80
Single-line bus	25	25	20	55	20	50	55	75	325
Multiline bus	15	20	10	75	30	70	90	135	445
Trunk	10	20	25	85	35	85	150	215	625
Centrex	10	10	10	10	10	15	30	40	135
Meas. rate bus	10	10	10	10	10	10	10	15	85
Forgn exch bus	10	10	10	10	10	10	10	10	80
Official	10	10	10	10	10	10	10	10	80
OutWATS	20	20	20	20	20	20	20	20	160
FGA	10	50	50	50	50	50	50	50	360
Total	265	325	300	655	310	640	670	980	4145

Source: Author's compilations.

Table 2.7 contains the sample sizes for each customer class and rate group that were actually measured over the three-month period of July through September 1987. First, note that the overall sample size has increased by 1,313 lines. Increases occurred in all rate groups except Rate Group 1. These two remote switches did not have many customer classes or enough customers in a class to fulfill the initial sample size specification. The sample size for Foreign Exchange Residential customers was decreased by sixty-five lines spread over all the rate groups. The Centrex customer class decreased by eighteen lines with reductions occurring in Rate Groups 1, 4, 6, 7, and 8. The overall increase in sample size, however, should improve the sample as an estimator of the mean of use per line-day.

TABLE 2.7
ACTUAL SAMPLE SIZES BY RATE GROUP AND CUSTOMER CLASS
MEASURED OVER THREE-MONTH PERIOD

	Rate Group								
	1	2	3	4	5	6	7	8	Total
One-party res	86	163	118	327	91	307	236	388	1716
Multiparty res	14	31	14	16	17	19	15	15	141
Meas. rate res	8	15	12	17	12	20	22	52	158
Forgn exch res	0	2	7	2	0	3	1	0	15
Single-line bus	20	37	21	74	26	58	60	75	371
Multiline bus	9	36	10	92	35	74	101	154	511
Trunk	0	30	36	105	89	175	335	250	1020
Centrex	0	26	18	9	12	11	24	22	122
Meas. rate bus	0	8	15	20	17	11	14	21	106
Forgn exch bus	0	31	13	67	16	12	17	13	169
Official	8	16	13	11	13	12	14	9	96
OutWATS	0	27	17	22	23	18	21	20	148
FGA	0	8	55	85	182	132	364	48	874
Total	145	430	350	847	540	852	1226	1068	5458

Source: Author's compilations.

Summary of Sample Selection

The NRRI research team designed a sample to collect data at thirty-seven CLLI codes in Southwestern Bell's territory in Texas. Matrix studies data were to be collected at thirty-five CLLI codes from Rate Groups 2 through 8 with five CLLI codes from each rate group. The matrix studies capabilities measure originating and terminating holding time for successful and unsuccessful calls for the switch by broad categories of use. The AMA study was performed in the same thirty-five CLLI codes plus two remote switches from Rate Group 1. Data were collected on thirteen customer classes using a CLLI code in thirty-four ways (service categories). The AMA equipment measures originating conversation time for successful calls. Both of these data sets are summarized to provide the basic information from which allocation factors can be derived. This summarization is the topic of the next chapter.

Before turning to the summarization of these data, it should be noted that the sample design presented in this chapter is predicated on an assumed analysis that would be possible or feasible once the data were collected. The optimally allocated sample was based on total use per line-day. In the summarization that follows, the research team is interested in the use of local, toll, and operator services that comprise total use. This may result in some sample size problems for toll use if toll use has a bigger variance on a per line-day basis during the busy hour than total use. Furthermore, the optimally allocated sample is predicated on a single analysis. Several analyses were performed on these data. The NRRI research team assumed the analysis on which the sample is optimally allocated is a reasonable composite of those actually intended.

CHAPTER 3

SUMMARY AND ANALYSIS OF THE USAGE DATA

In this chapter, the algorithms used to summarize and analyze the matrix study and AMA study data are presented. The objective in summarizing and analyzing the sample data is to estimate mean use per line-day of various service categories for each customer class. The approach to two data sets differs because of the way in which the data were collected. The matrix studies data do not have any customer class distinction. Thus, customer class use per line-day of various local and toll services are derived using regression techniques. The AMA study data, on the other hand, have information regarding thirteen customer classes using the switched network in thirty-four different ways.

The stratification scheme for the sample data presented in this chapter differs from the stratification scheme adopted for sampling purposes. The seven strata defined for sampling were based on assumed differences in the mean and variance of use per line-day for each strata. The research team did not have any data to support this assumption, but used rate group as a surrogate for population of the local calling area and an assumed effect of population on use per line-day. With the collection of usage data for each sampled strata, the research team was able to test this assumption. The analysis of the sampled data permitted aggregating the sampled data into two strata: metropolitan (metro) and nonmetropolitan (nonmetro). This aggregation scheme increased the degrees of freedom within each new strata and substantially reduced the computational requirements for the project.

It should be noted at the outset of this chapter that the matrix studies data and AMA data are not directly comparable even though they are measuring the same activity. Matrix studies measure total originating and terminating holding time, which consists of set-up time and conversation time for successful and unsuccessful telephone calls. The AMA studies, on the other hand, measure only originating conversation time for successful telephone calls. Consequently, one should expect that the originating use per line-day for the matrix studies would be more than the use per line-day calculated from the AMA study data. However, the time-of-day patterns of originating use per line for these two data sets should approximate one another.[1] A judgment-based comparison of the analysis results from these two studies was used as one validity check.

The remainder of this chapter describes the algorithms used to summarize and analyze the data. The matrix studies data were analyzed in two ways: a typical-day usage profile and using the three busiest hours for the sample period. The AMA study data were summarized on the basis of a typical-day profile only.

Analysis of the Matrix Studies

In this section, the procedures for summarizing the matrix studies data are presented. The matrix studies data were summarized and analyzed in two ways: (1) a typical-day profile and (2) the three busiest hours during the sample period. The matrix studies data contained information for twenty service fields that were usable. These data for each of the thirty-five CLLI codes were summarized in two ways for eleven service fields for originating use and nine service fields for terminating (incoming) use for each hour. These two summarized data sets were combined with STARS (Sample Traffic Analysis Reporting System) and subscriber-line-count data for regression analyses that derived appropriate estimates of use per line-day of selected categories for each of the customer classes.

Table 3.1 contains a listing of the various usages measured by the matrix studies. An examination of this table discloses that four services are originating only: 800, DA, RASW, and TSPS. The second item to note is the MIX and MIXIL usages for terminating usage. The significance of both of these groups of services is discussed below. In WATS (800), usage can be measured only with matrix studies capabilities at the point of origination.

[1] Differences between the measures of usage would be a function of the actual sample and estimation techniques.

TABLE 3.1

USAGES MEASURED BY MATRIX STUDIES

Service Field[1]	Originating Service	Terminating Service
800	800	-
MIXIL	-	MIXIL[2]
DA	DA	-
RAEX	RAEX	RAEX
FGB	FGB	FGB
MIX	-	MIX
SIL	SIL	SIL
ISIL	ISIL	ISIL
RASW	RASW	-
SL	SL	SL
TSPS	TSPS	-

Source: Author's compilations.

[1] 800 is InWATS, MIXIL is both interstate and intrastate interLATA use, DA is directory assistance, RAEX is local calling between switches, FGB is feature group B use, MIX is local and toll combined, SIL is intrastate interLATA, ISIL is interstate interLATA, RASW is local calling that originates and completes on the same switch, SL is intrastate intraLATA use, and TSPS is dial-"0" use.

[2] Traffic incoming from a tandem only.

An 800 call is translated to a seven- or ten-digit POTS call during setup. When the call arrives at the switch which it completes, it resembles an ordinary toll call to the measurement equipment. Consequently, terminating toll calling contains 800 terminating use.

Directory assistance (DA) calls originate at a switch and are trunked directly to the appropriate DA center. DA calls never terminate at a switch. Intraswitch calls (RASW) originate and terminate on the same switch. To count both originating and terminating intraswitch use would result in double counting of this usage for a CLLI code.

TSPS or dial-0 calling, whether with operator or credit card intervention, is trunked directly to a TSPS center for the call setup. When the call completes on another switch, it resembles an ordinary toll call to the measurement equipment used for matrix studies. Consequently, terminating toll calling contains both direct dial and dial-0 usage, which presents no real problem for the analysis.

The MIX and MIXIL fields refer to both local and toll usage combined for MIX, and interstate and intrastate interLATA toll calling combined for MIXIL. These "mixed" fields occur in calling areas served by tandem switches. Tandem switches connect three or more switches and distribute traffic to the appropriate destination. When traffic is routed through a tandem, the trunk group carrying traffic to the terminating switch may carry a combination of local and toll uses, depending on the function of the tandem and the configuration of the local network. Consequently, some of the CLLI codes in the matrix studies data have MIX and MIXIL usage. The MIXIL is separated with the STARS data. The MIX field, however, requires some assumptions to sort out local and toll. These assumptions are discussed later.

Before turning to the summary and analysis of the matrix studies data, the mathematical notation for a typical record in the matrix studies data is presented. Let $U_{\ell ymdtjD}$ represent a typical matrix studies data record where U denotes usage measured in CCS and the subscripts are defined as in table 3.2. It should be noted that the combination of the subscript j and D accounts for the information provided in table 3.1. Thus, for each entry in table 3.1, there is a record of each CLLI code ($\ell = 1, \ldots, 35$) each month ($m = 7, 8, 9$), each day ($d = 1, \ldots, 31/m = 7$ or 8) and ($d = 1, \ldots, 30/m = 9$), and each hour ($t = 1, \ldots, 24$). In other words there are 231,840 records for each combination of j and D in table 3.1.

The remainder of this section describes the algorithms used to develop a typical-day profile during the sample period and to compute the three busiest hours during the sample period. The typical-day profile is discussed first followed by the three busiest hours.

TABLE 3.2

INDEXING SCHEME FOR MATRIX STUDIES DATA

Subscript	Definition
ℓ	An index of CLLI codes ($\ell = 1, \ldots, 35$)
y	An index of the year in which the matrix-studies data record was recorded (y = 1987). This index is dropped in subsequent references.
m	An index of the month in which the matrix-studies data record was recorded (m = {7, 8, 9}) where 7 = July, 8 = August, and 9 = September.
d	An index of the day of the month in which the matrix-studies data record was recorded. For July and August (d = 1, ..., 30).
t	An index of the hour in which the matrix-studies data record was recorded (t = 1, ..., 24) where t = 1 is the hour ending at 1 am, for instance.
j	An index of service fields as listed in the first column of table 3.1 (j = 1, ..., 11).
D	An index of direction to and from subscribers connected with a CLLI code. D = {O, T} where O stands for usage originated by subscribers connected to CLLI code ℓ and T denotes use that terminates or is incoming to subscribers hooked into CLLI code ℓ.

Source: Author's construct.

Typical-Day Profile

The objective of summarizing and analyzing the matrix studies data is to derive each customer class's hourly per-line-day use of various local and toll service for carefully defined strata. The matrix study data received from Southwestern Bell by the NRRI research team does not have customer class distinctions nor the correct detail for local and toll services. This data set had information on thirty-five CLLI codes in seven of the eight rate groups. The summarization process to derive typical-day profiles consists of four steps. They are:

1. Compute, for each hour, the per-line-day averages for each service fields at each CLLI code.
2. Analyze stratification scheme used for sampling purposes and develop new stratification scheme, if necessary.
3. Apportion the MIX and MIXIL fields to appropriate service categories.
4. Regress usage of service categories for strata on subscriber line counts to derive hourly customer class usages for each service category.

Each of these steps is discussed below.

Develop Average Hourly Use of Service Fields

The first step of summarizing the matrix studies data to develop a typical-day profile for weekdays, was to compute the hourly (t) use of each service field (j) on an originating and terminating basis (D) for each CLLI code (ℓ) for each month. SAS[2] procedure "tabulate" was used to perform the following operation:

$$U_{\ell mtjD} = \sum_{d} U_{\ell mdtjD}$$

where d denotes a weekday[3] and nonholiday day in month m at CLLI code ℓ during hour t. This computation was performed for all twenty combinations of service fields j and direction D.

These summary data were then used to compute per-line-day average use for each service field, each month, and each CLLI code for originating and terminating use. The formula for computing these averages was:

[2] SAS Institute, Inc. *SAS User's Guide: Statistics*, Version 5 Edition. Cary, North Carolina: SAS Institute, Inc., 1985.
[3] July 1987 had 22 weekdays that were nonholidays. August and September 1987 had 21 weekday nonholidays each.

$$\bar{U}_{\ell mtjD} = \frac{U_{\ell mtjD} * 100}{d_{\ell m} * N_{\ell m}} , \qquad (1)$$

where $d_{\ell m}$ is the number of weekdays for each month that were measured at CLLI code ℓ and $N_{\ell m}$ is the total number of active subscriber (access) lines at CLLI code ℓ at the end of month m. The usage data on the tapes provided by Southwestern Bell were stated in terms of CCS (centrum call seconds). Multiplying by one hundred converts these usages to seconds. These per-line-day hourly averages are used to analyze the stratification scheme use for sampling purposes.

Metropolitan and Nonmetropolitan Strata

Recall that the sampling procedure for matrix studies stratified the CLLI codes eligible for sampling into seven groups according to rate groups in Texas with Rate Group 1 excluded from the matrix study data. Each of these sampling strata for matrix studies had five offices in it. The computational requirements for this stratification scheme required 2,460 regression models to be estimated. The research team, wishing to reduce the number of models to be estimated, examined the matrix studies data received from Southwestern Bell to see if strata could be combined in some reasonable way.

The NRRI research team hypothesized several schemes for aggregating the CLLI codes that define sampled data strata. One possibility was to combine all thirty-five CLLI codes into one strata for the entire state. This approach, however, was not judged appropriate because of the noted lack of homogeneity in average use across the CLLI codes. Instead, a grouping of the CLLI codes into two or more strata was pursued.

One strategy for stratifying CLLI codes would entail collecting demographic data about residential and business subscribers connected to each CLLI code in Southwestern Bell territory. By analyzing the sample usage data and the associated demographic data, one could design a model to predict total usage at a CLLI code based on these characteristics. This approach was not pursued in this study, nor is it likely to be practical for cost studies.[4] Instead, more obvious, less costly, and more easily implemented strategies were tried.

The first step in analyzing the data was to compute total use per line-day at each CLLI code in the matrix studies data. The formula is:

$$\bar{U}_{\ell mt..} = \sum_{D} \sum_{j} \bar{U}_{\ell mtjD}. \qquad (2)$$

This is the total of originating and terminating (D) use per line-day for all twenty service fields (j) at CLLI code ℓ for hour t and month m. There were 105 such $\bar{U}_{\ell mt}$ for each hour (t). These data were analyzed to find patterns that might offer a simple method of combining all CLLI codes in Southwestern Bell's territory into groups that exhibit homogeneity in their total use per line-day.

Analysis of the data indicated that Rate Groups 2, 3, 4, and 5 could be included in the nonmetropolitan stratum and Rate Groups 6, 7, and 8 could be included in the metropolitan stratum. Weighted-average total use per line-day were computed for the two strata. The weighted averages were computed as

Metro:

$$\bar{U}^{M}_{.t...} = \frac{\sum_{m} \sum_{\ell \epsilon M} \bar{U}_{\ell mt..} * N_{\ell m}}{\sum_{m} \sum_{\ell \epsilon M} N_{\ell m}} , \qquad (3)$$

Nonmetro:

$$\bar{U}^{N}_{.t...} = \frac{\sum_{m} \sum_{\ell \epsilon N} \bar{U}_{\ell mt..} * N_{\ell m}}{\sum_{m} \sum_{\ell \epsilon N} N_{\ell m}} . \qquad (4)$$

[4] See Clark Mount-Campbell et. al., *A Descriptive Study of Telephone Usage in Ohio* (Columbus, Ohio: Public Utilities Commission of Ohio, 1987).

Figure 3-1 depicts a plot of these hourly averages for these strata. The horizontal axis has the hours of the typical day beginning with the hour ending at 8 A.M. and ending with the hour ending at midnight. The vertical axis has the total per-line-day use measured in seconds. As can be seen from this figure, the per-line-day use for the metro stratum exceeds that of the nonmetro stratum, particularly from 10 A.M. until 5 P.M.

The differences become more distinct when terminating per-line-day use was examined. Figure 3-2 depicts the same plots for terminating use. As can be seen, terminating use for the metro stratum exceeds that of the nonmetro stratum by a greater degree than total per-line-day use.

Another important distinguishing factor involved differences between local and toll calling for the two strata. Toll use per line-day for the nonmetro stratum generally exceeds that for the metro stratum (see figure 3-3).

Local per-line-day use for the metro stratum exceeded that for the nonmetro stratum for every hour (see figure 3-4). The plots of local use for the two strata exhibited similar time profiles.

These distinctive features of per-line-day use for the metro and nonmetro strata were sufficient to adopt the stratification scheme. The CLLI codes in the matrix studies data and line counts for all CLLI codes were stratified according to this scheme. Rate Groups 1, 2, 3, 4, and 5 were designated in the nonmetro stratum and Rate Groups 6, 7, and 8 were designated in the metro stratum.

Apportionment of the MIX and MIXIL Service Fields

The MIX and MIXIL service fields need to be apportioned to the proper service categories before the regressions can be performed. Recall that the MIX service field consists of local and toll services combined, and results from measuring incoming use to a CLLI code from a tandem switch in the local calling area. The MIXIL field, on the other hand, combines intrastate and interstate interLATA toll calling, and results from measuring incoming traffic on a direct trunk link to an interLATA carrier's point of presence. This section presents the algorithms used to apportion these service fields to the appropriate local and toll service categories.

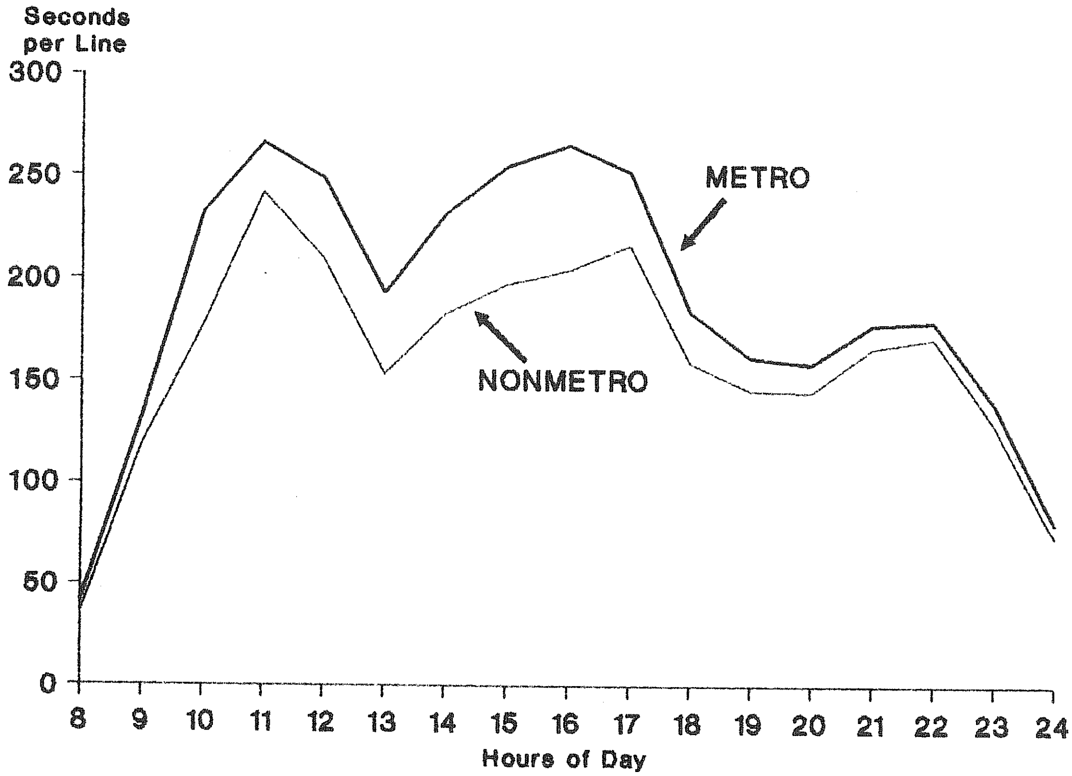


Fig. 3-1. A comparison of total originating and terminating use per line-day for the metro and nonmetro strata.

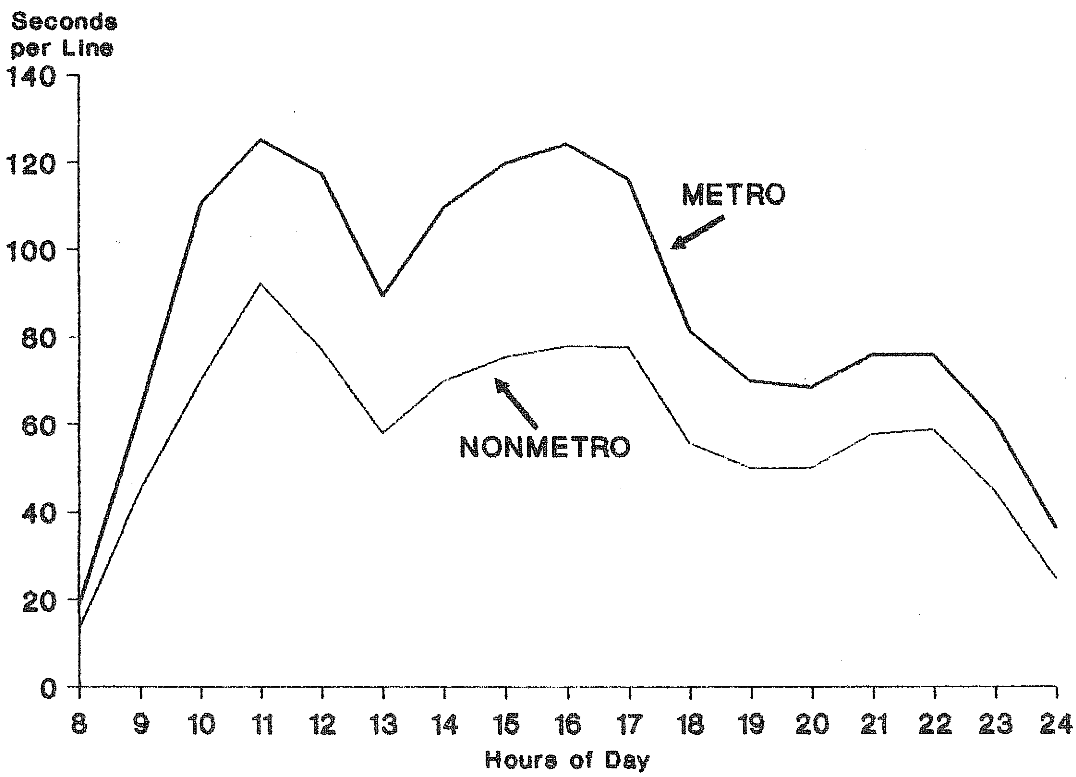


Fig. 3-2. A comparison of terminating use per line-day for the metro and nonmetro strata.

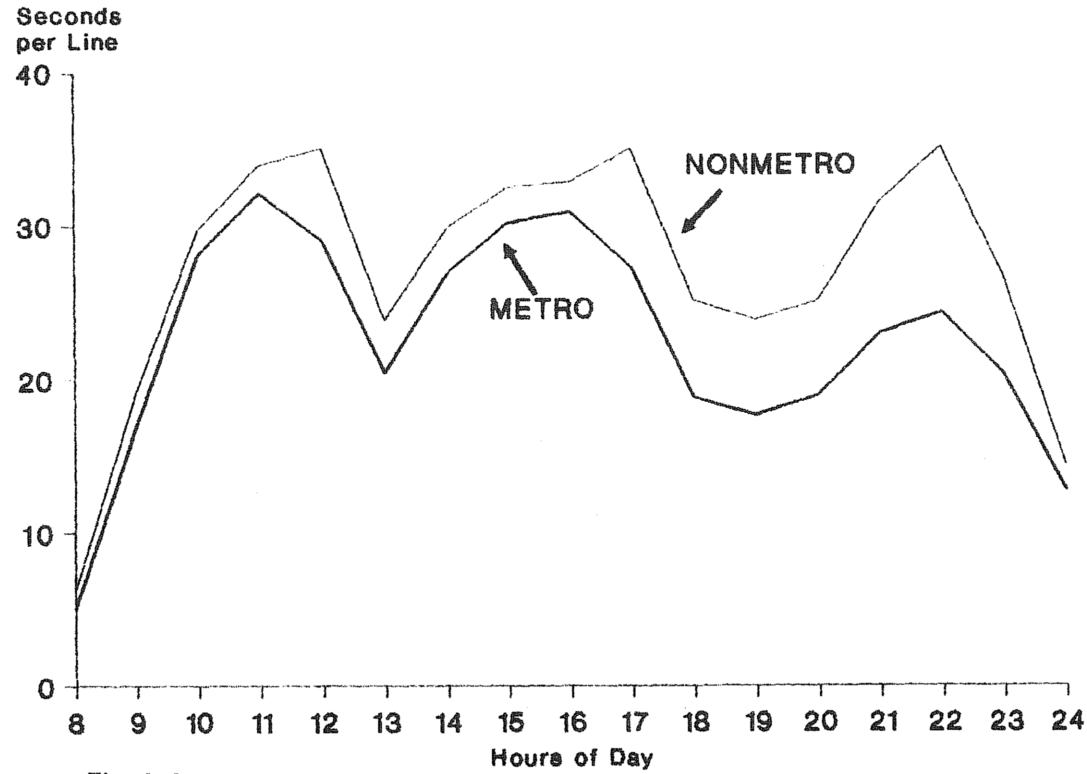


Fig. 3-3. A comparison of originating and terminating toll use per line-day for the metro and nonmetro strata.

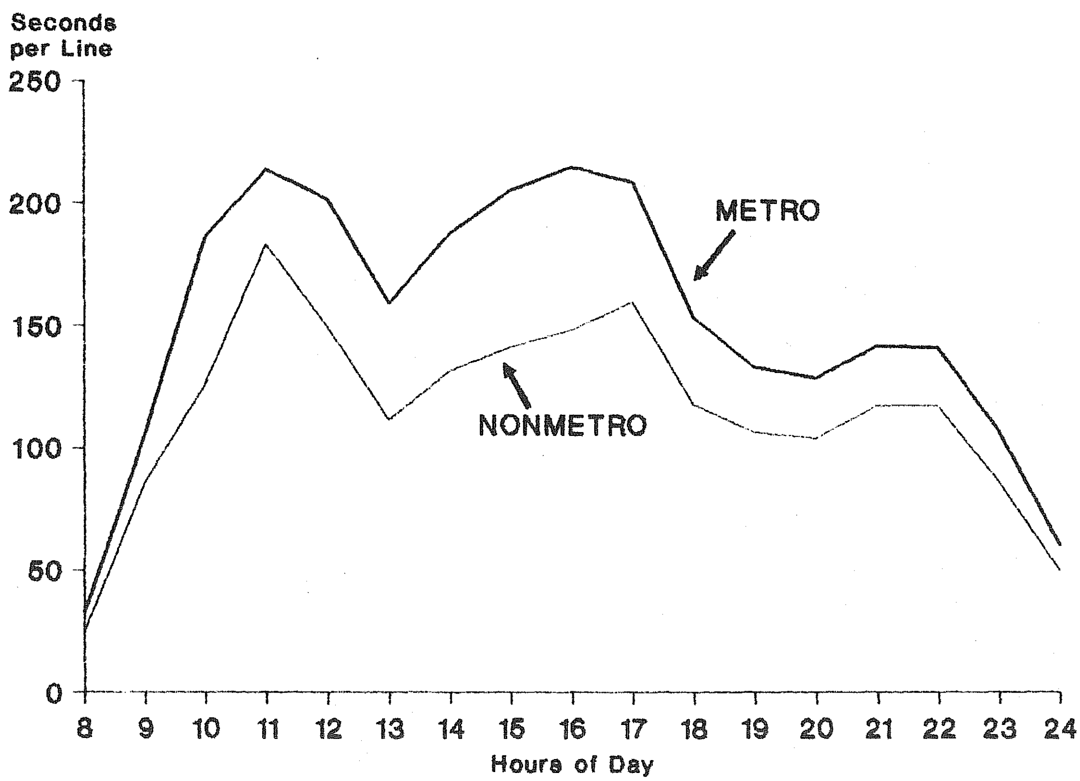


Fig. 3-4. A comparison of originating and terminating local use per line-day for the metro and nonmetro strata.

The first step is to state which service categories should be derived from the MIX and MIXIL service fields. The objective is to categorize all usage into the service categories in table 3.3. These are similar to the service fields presented in table 3.1 except that the MIX and MIXIL fields are eliminated.

TABLE 3.3

SERVICE CATEGORIES DERIVED FROM THE MATRIX STUDY DATA FOR REGRESSION ANALYSIS

Service Category	Originating Use	Terminating Use
RASW	X *	-
RAEX	X	X
ISIL	X	X
ISL	X	X
SIL	X	X
SL	X	X
800	X	-
FGB	X	X
TSPS	X	-
DA	X	-

Source: Author's compilations.

* The "X" in this table signifies the fact that usage either was measured or needs to be estimated for the combination of service category and direction.

The distinction between service fields and service categories is an important and subtle one in the structure of information needed for the subsequent regression analysis and allocations. Service fields have been used to refer to the structure of information provided directly by the matrix studies data and have been denoted by the index j. Service categories, on the other hand, refer to the derived structure of information with the MIX and MIXIL service disentangled into their component parts. Service categories are denoted by the index i.

The MIX and MIXIL fields are terminating use only. The local use in the MIX field is RAEX for terminating use. This fact helps to disentangle these "mixed" service fields.

The MIX service field must be disentangled first. This service field in the matrix studies data occurs only in a few of the CLLI codes in each strata (metro and nonmetro). In the other CLLI codes, the local (RAEX) and toll service fields are separated. This separate usage information on CLLI codes in each strata is used to apportion the MIX service fields. The assumption made by the research team was that for each stratum, the terminating local and toll usage switched through a tandem occurs in roughly the same proportion as terminating usage in CLLI codes without a tandem.

The calculation of the fraction of terminating use that is local or toll for CLLI codes in each stratum is straightforward, but also is notationally awkward. The service fields of interest for terminating use are RAEX, ISIL, SIL, and SL (see table 3.1 for definitions). The general notation for usage in a service field of the matrix studies data is $\bar{U}_{\ell mtjD}$. For each month that is used in this computation the hourly per-line-day usages are for j = RAEX, ISIL, SIL, and SL, and for D = I for terminating use. The monthly averages for all four of these service fields for each hour are added for all CLLI codes not connected to tandems to get the basis for computing the fractions. These totals are then divided into the RAEX terminating usages to estimate the fraction of MIX terminating use that is local. There are seventy-two such fractions for each stratum since t = 1, ..., 24 and m = July, August, September. The portion of terminating use that is toll is found by subtracting these fractions from 1. These fractions are then applied to the MIX fields to separate each CLLI code's MIX service category into terminating RAEX and a general terminating toll use category. This newly created mixed toll service field just derived for switches having tandem connections is a mixture of interstate and intrastate toll calling whether interLATA or intraLATA. The MIXIL service field, on the other hand, consists of only a mix of interstate and intrastate interLATA calling. The difficulty confronted now is the general mixed toll category and the MIXIL service field. These service fields must be separated into ISIL, ISL, SIL, and SL (see table 3.1 for definitions).

STARS data are used to sort out the amount of calling that belongs in each of the service categories ISIL, ISL, SIL, and SL. STARS data are derived from toll billing tapes and contain information on hourly originating and terminating toll use for each CLLI code in the sample for each of the four service categories ISIL, ISL, SIL, and SL. The hourly terminating uses for the four service categories were used to compute the fraction of toll use attributable to each of these four service categories at each CLLI code in the sample.[5]

The fractions were applied to the general toll service field derived from the above MIX service field to apportion this use among the four service categories. The interLATA terminating use in the MIXIL service field was apportioned between interstate and intrastate use using the fraction of interLATA use that was interstate (ISIL) and intrastate (SIL). The outcome was to complete the data matrix described in table 3.3 with sixteen service categories. This table depicts the usage information available on an hourly basis for each CLLI code. In this study, these data are summarized for each month, hence, there are 2,520 (35 CLLI codes x 24 hours x 3 months) tables of these data in the data base. A typical record for the derived matrix study data is now denoted as $\bar{U}_{\ell mtiD}$.

Regress Usage for Each Service Category on Subscriber Line Counts

The matrix studies data are now in a form suitable for the regression analysis. The purpose of performing the regression analysis is to derive the average hourly use of each service category by the customer classes connected to the CLLI code. Up to this point, the hourly use per line-day for sixteen service categories at thirty-five CLLI codes for three months has been derived. Ten of the service categories are for originating use and

[5] The reader at this point may be wondering why STARS data were not used directly in the estimation of toll use. The reason is that STARS data measure only conversation time, while matrix studies measure holding time. This incompatibility was thought to bias toll downward relative to local use if STARS data were used. The use of STARS data, however, implicitly assumes that set-up time for calls is proportional to total use and constant across interstate and intrastate and interLATA and intraLATA calling.

six are for terminating use. The hourly usage for all sixteen service categories for the hours between 1 A.M. and 7 A.M. were dropped from the regression analysis because these usages were essentially zero. Thus, 272 regressions (16 service fields X 17 hours) for each stratum are performed for a total of 544 regressions.

The regression model can be described as follows. As noted, there are 544 regression models. The indices D for direction, i for service categories, t for hour, and s for stratum are model indices. There are ten service categories (i) for direction equal to originating (D = O) and six service categories for direction equal to terminating (D = I, where I stands for incoming). These combinations of D and i account for the sixteen service categories in table 3.3. There are seventeen hours (t). The combination of hours and service fields accounts for 272 regression models. Finally, there are two strata, metro and nonmetro, that are partitioned sets of the CLLI codes, ℓ. This partitioning of CLLI codes is performed according to whether a CLLI code is contained in Rate Groups 6, 7, or 8 for the metro and nonmetro stratum. The index s for stratum can take on the values M for metro and N for nonmetro and is denoted as $\ell \epsilon M$ for metro and $\ell \epsilon N$ for nonmetro. S_s is the set of CLLI codes in stratum s.

The average use per line-day, $\bar{U}_{\ell mtiD}$, for one of the sixteen service categories (i) and one hour (t) at CLLI code ℓ, $\ell \epsilon s$, during month m is an observation for the dependent variable. In general, there were forty-five observations per regression model for the metro stratum and sixty observations per regression model for the nonmetro stratum.

The independent variables for each regression model were derived from information about monthly subscriber line counts for the residential, business, and Centrex customer classes. The subscriber line counts for a customer class at CLLI code ℓ are denoted by $N_{\ell cm}$. For purposes of the regression analysis, this information was converted to the fraction of subscriber lines each month at CLLI code ℓ that were customer class c. This fraction is denoted by $P_{\ell cm}$ which is computed as follows:

$$P_{\ell cm} = \frac{N_{c\ell m}}{\sum_{c} N_{c\ell m}} \quad . \qquad (5)$$

The $P_{\ell cm}$ are the independent variable in each regression model.

The general form of the regressions performed for this analysis was as follows:

$$\bar{U}_{\ell mtiD} = \sum_{c} \beta_{tciDs} P_{\ell cm} \qquad \ell \epsilon S_s \ , \qquad (6)$$

where S_s is the set of CLLI codes in stratum s (s = M, N). The regression coefficients, β_{tciDs}, are the average use per line-day of service category i in direction D by customer class c in stratum s. The β_{tciDs} are constrained to be positive or zero, $\beta_{tciDs} \geq 0$, because negative use of a service makes no sense. The intercept term is suppressed in all models which makes the regression coefficients the average, as well as the marginal use. Several statistical considerations also played an important role in the choice of the precise form of the regressions.

First and foremost, measures of multicollinearity guided the research team in deciding which customer classes would be included in the regressions. Subscriber line counts by CLLI code were available for sixteen customer classes. Inclusion of all sixteen customer classes in the regression equation resulted in a very high degree of multicollinearity. The research team examined the percentage of lines at each CLLI code associated with each of these sixteen customer classes. Some of these customer classes accounted for less than 1 percent of all subscriber lines at a CLLI code. These customer classes were dropped from the regressions. This left one-party residential, single-line business, Centrex, and trunk subscriber lines. The inclusion of both Centrex and trunk-subscriber line counts resulted in high measures of multicollinearity. The trunk customers were subsequently dropped and Centrex retained. Later Centrex use was used as a proxy for PBX.

Dropping the proportion of subscriber lines for thirteen customer classes had an effect on the remaining three customer classes. In particular, it increased the estimates for those remaining. By way of illustration, suppose the research team wishes to include four customer classes in the following hypothetical model:

$$U = \hat{\beta}_R R + \hat{\beta}_B B + \hat{\beta}_c C + \hat{\beta}_o O + E \ ,$$

where U - estimated use per line

β_R - estimated regression coefficient for residential customers

β_B - estimated regression coefficient for business customers

β_c - estimated regression coefficient for Centrex customers

$\hat{\beta}_o$ - estimated regression coefficient for other lines

R - fraction of residential lines

B - fraction of business lines

C - fraction of Centrex lines

O - fraction of other lines

E - error term

Now suppose that this estimation experienced multicollinearity and the collinearity can be expressed as follows:

$$O = \alpha_R R + \alpha_B \beta + \alpha_c C \ .$$

Under these circumstances, the fraction of other lines would be dropped from the model and the estimation would be performed using only R, B, and C. The resulting estimates would be as follows:

$$U = (\hat{\beta}_R + \hat{\alpha}_R)\ R + (\hat{\beta}_B + \hat{\alpha}_B)\ B + (\hat{\beta}_c + \hat{\alpha}_c)\ C + E' \ .$$

As one can see, the regression coefficients for the remaining variables are inflated by the factors α_R, α_B, and α_c for residential, business, and

Centrex customers, respectively. The research team's assumption regarding this effect is that since the fraction of other lines (O) is small, the effects of α_R, α_B, and α_c are also small. Also note that the error term, E', is different from the original model. Typically, E' is smaller than E when multicollinearity is eliminated.

The estimated per-line-day usage of fourteen service categories for business, Centrex, and residential customer classes for the metro and nonmetro strata for the hours ending at 8 A.M. through the hour ending at midnight are contained in appendix A. There are a total of 1,326 estimated coefficients in these tables.

The regression coefficients in tables A.1 to A.6 in appendix A are the basis for four cost-allocation scenarios presented later in this report. These hourly per-line-day usages of service categories by business, Centrex, and residential customers are used to estimate usage profiles for local dial switches, trunk capacity, tandem switches, and subscriber loops. The algorithms used to generate allocation factors using these usage profiles are discussed in the next chapter.

Three Busiest Hours During Sample Period

Capacity for the switched network is planned on the basis of a ten-day bouncing busy-hour. To model switched network planning criteria, the matrix studies data were scanned to find the busiest three hours during the three-month sample period. The NRRI research team had information indicating that 60 percent of the CLLI codes historically had at least one busy-season month during the July, August, and September period. The three largest hours for each CLLI code were selected regardless of the month, day, or hour they occurred. This second approach to summarizing the matrix study data provided the NRRI research team with a measure of peak that models network planning criteria for purposes of cost study analysis.

The summary of this data consisted of four steps. They were:

1. Identify the three busiest hours during the ninety day sample period for each CLLI code.
2. Obtain the usage data for each service field j for the hours and days identified in step 1.

3. Apportion the MIX and MIXIL service fields to the appropriate service categories.

4. Regress the usage of service categories for metro and nonmetro strata on subscriber line counts to derive customer class contributions to the three busiest hours.

The metro and nonmetro strata determined for the typical-day profile were retained for this analysis of the data. The last two steps are similar to the steps for the typical-day profile summary. These four steps are discussed below.

Identify the Three Busiest Hours

The procedures for identifying the three busiest hours during the sample period from the matrix studies data is relatively straightforward. The matrix study data records are denoted by $U_{\ell mdtjD}$ where the subscripts t, d, and m identify a specific hour (t), month (m), and day (d). The summary of the matrix studies data under the busiest-hours scenario differs fundamentally from the summary presented in the previous section for the typical-day profile. The typical-day profile averaged the hourly usage of a service field (j) at a CLLI code for the entire month (see equation 1). The day-by-day variation in hourly usage is lost by this procedure. Under this scenario, the original data supplied by Southwestern Bell is reexamined and the three busiest hours at each CLLI code are identified regardless of month, day, and hour they occur.

The procedure computed the following usage information:

$$U_{\ell mdt..} = \sum_{D} \sum_{j} U_{\ell mdtjD} . \qquad (7)$$

The $U_{\ell mdt..}$ is the total use of the CLLI code ℓ during hour t on day d of month m. The three busiest $U_{\ell mdt..}$ were identified. Denote the hour, day, and month for the busiest by t^1, d^1, m^1, the second busiest by t^2, d^2, m^2, and the third busiest by t^3, d^3, m^3. Table 3.4 contains the month, days, and hours identified in this manner.

An examination of table 3.4 discloses that the hour ending at 11 A.M. was the busiest hour at sixteen out of thirty-five CLLI codes, and was one of the busiest three hours fifty out of 105 times for the three-month sample period. The busiest hour occurred only six times after 5 P.M. The hour ending at 4 P.M. was one of the busiest three hours twenty-five out of 105 times, while 3 P.M. was one of the busiest thirteen times. Thus, the busy hours tended to occur during midmorning or midafternoon business hours. Another tendency disclosed by table 3.4 is that busy hours occurred within the last five or the first five days of the month, in general.

Once the three busiest hours at each CLLI code during the sample period were identified, the usage of each service field (j) for each of the three hours at each CLLI code was obtained from the matrix studies data for purposes of analysis. Referring back to table 3.2, there are sixteen service fields of data for each busy day and each CLLI code. The typical records for these data may be denoted as $U_{\ell d^1 t^1 jD}$ for the busiest hour, $U_{\ell d^3 t^3 jD}$ for the third busiest hour.

Metropolitan and Nonmetropolitan Strata

The stratification scheme adopting the typical-day profile was used for the busiest-three-hours data. The NRRI analyzed this data and determined that the grouping of CLLI codes in Rate Groups 6, 7, and 8 for the metro stratum and the grouping of CLLI codes in Rate Groups 2, 3, 4, and 5 for the nonmetro stratum was still appropriate.

Apportionment of the MIX and MIXIL Service Fields

Recall that the service fields from the matrix studies data contain two service fields for terminating use that consist of incoming use to a CLLI code from a tandem switch in a local calling area. The MIX service field measure local and toll use combined, while the MIXIL service field combines interstate and intrastate interLATA toll calling. Algorithms similar to

TABLE 3.4

MONTH, DAY, AND HOUR OF THREE LARGEST HOURS OF TOTAL USE AT EACH SAMPLED CLLI CODE DURING THE SAMPLE TIME PERIOD*

Switching Node ID Number	Busiest Hour		Second Busiest Hour		Third Busiest Hour	
	Date (m/d)	Hour Ending	Date (m/d)	Hour Ending	Date (m/d)	Hour Ending
1	7/06	11	8/18	11	8/20	11
2	7/13	12	7/13	15	7/13	11
3	7/13	16	7/27	11	7/13	11
4	7/14	20	9/08	21	9/21	22
5	7/15	11	8/10	16	7/20	16
6	7/14	11	9/14	16	8/25	11
7	7/20	11	9/29	16	8/03	15
8	7/21	11	7/22	11	7/28	15
9	8/03	11	7/23	15	7/13	15
10	8/03	15	8/03	14	8/03	13
11	8/10	11	8/10	16	7/20	16
12	8/10	11	8/04	16	8/05	11
13	8/25	16	8/31	16	8/25	11
14	8/27	11	8/31	11	8/31	17
15	8/28	11	9/01	11	8/27	15
16	8/31	11	7/13	15	9/01	11
17	8/31	11	9/01	22	9/01	16
18	8/31	11	8/31	15	8/31	12
19	8/31	11	8/31	16	8/31	15
20	8/31	12	8/31	11	9/01	17
21	8/31	14	9/02	22	8/31	16
22	8/31	15	9/01	16	9/02	16
23	8/31	15	8/31	16	8/31	11
24	8/31	16	8/31	11	8/31	15
25	9/01	11	8/31	15	8/31	16
26	9/01	21	8/18	16	7/29	17
27	9/01	22	8/26	17	8/31	16
28	9/05	12	9/05	16	9/05	11
29	9/10	16	9/14	16	7/22	16
30	9/14	11	7/20	11	9/21	16
31	9/14	21	9/21	21	9/16	21
32	9/14	22	7/08	11	9/15	22
33	9/23	11	8/10	11	7/13	11
34	9/28	17	7/20	11	7/15	11
35	9/28	21	9/08	22	9/10	21

Source: Author's compilations.

* Recall that two of the thirty-seven CLLI codes did not have matrix studies capabilities.

those used for the typical-day profile were used to apportion these service fields to the appropriate local and toll service categories.

The procedure begins by disentangling the MIX service field, which is terminating use only. Consequently, the local use is RAEX terminating use only. Since the MIX and MIXIL service fields only occur in a few of the CLLI codes in each strata, the CLLI codes that had local and toll separated were used to apportion the MIX service field between local and toll use. The assumption was that for each stratum the terminating local and toll usage switched through a tandem occurs in roughly the same proportion as terminating usage in CLLI codes without a tandem in the local calling area. This procedure derives terminating RAEX use for the three busiest hours of each CLLI code hooked into a tandem and a general terminating toll service field for each CLLI code hooked into a tamdem. The task then confronted was to disentangle this general terminating toll category into interstate and intrastate interLATA and intraLATA service categories.

STARS data were used again to sort out the amount of calling that belongs in each of the service categories ISIL, ISL, SIL, and SL. Recall that STARS data are derived from toll billing tapes and contain information on hourly originating and terminating toll use for each CLLI code in the sample for each day during the sample period for each of the four service categories ISIL, ISL, SIL, and SL. The tapes were scanned to obtain the information for each of these four service categories for the three busiest days at each CLLI code identified above. These data were used to compute the fractions of toll use categories at each CLLI code with tandem switches.

These four fractions were applied to the general toll service field derived above from the MIX service field to apportion this use among the four service categories. The interLATA terminating use in the MIXIL service field was apportioned between interstate and intrastate use according to the fraction of interLATA use that was interstate (ISIL) and intrastate (SIL). The outcome of this procedure was to derive the busiest three-hour usage data for the sixteen service fields described in table 3.3. Each service category has 105 observations (35 CLLI codes X 3 hours) on the busiest three hours. With a total of sixteen service categories, there are 1,680 observations.

Regress Three Busiest Hours for Each Service Category on Subscriber Line Counts

The three-busiest-hour data are now in a form suitable for regression analysis. The purpose of the regression analysis is to derive each customer class's use of each service category (i) for each stratum during the three busiest hours during the sample period.

The typical data record in the three-busiest-hours data is denoted as $U_{\ell d^k t^k jD}$ (k = 1, 2, 3). The indices D for direction, j for service category, and s for stratum are indices of regression models. There are ten service categories (i) for direction equal to originating (D = O) and six service categories for direction equal to terminating (D = I where I stands for incoming). There are two strata (s), metro and nonmetro, which partition the set of CLLI codes. Thus, there were thirty-two regression models estimated.

The dependent variable in each regression model was the three-busiest-hour data, $U_{\ell d^k t^k jD}$ (k = 1, 2, 3) for one of the sixteen service categories (j) for the CLLI codes $\ell \epsilon S_s$. In general, there were forty-five observations per regression model for the metro stratum and sixty observations for the nonmetro stratum.

The independent variables for each regression model were derived from information about monthly subscriber line counts for the residential, business, and Centrex customer classes. The subscriber line counts for a customer class at CLLI code ℓ are denoted by $N_{\ell cm}$. For purposes of the regression analysis, this information was converted to the fraction of subscriber lines each month at CLLI code ℓ that were customer class c. Denote this fraction by $P_{\ell cm}$ which is computed as follows:

$$P_{\ell c_m} = \frac{N_{c\ell m}}{\sum_c N_{c\ell m}} . \tag{8}$$

The $P_{\ell c_m}$ are the independent variable in each regression model.

The general form of the regressions performed for the three busiest hours was as follows:

$$U_{\ell d^{k}t^{k}iD} = \sum_{c} \alpha_{ciDs} P_{\ell c_{m}} \qquad \ell \epsilon S_{s} \qquad (9)$$

where S_s is the set of CLLI codes in stratum s. The regression coefficients, α_{ciDs}, are the estimated contribution per line of service category i in direction D by customer class c in stratum s. The α_{ciDs} are constrainted to be positive or zero, $\alpha_{ciDs} \geq 0$, because negative use does not make sense. The intercept term is suppressed in all models which makes the coefficients the average and marginal contribution of each customer class c.

Table 3.5 presents the regression coefficients by strata for each customer class and service category. The significance level of the individual coefficients, as measured by the student's t test, was at least 60 percent with most around the 85-90 percent confidence level. Nine originating and five terminating service categories for each stratum are contained in table 3.5 for business, Centrex, and residential customers. These data are the basis of two allocation scenarios presented later in this report.

Summary of the SLU Data

In this section the algorithms for summarizing the SLU data are presented. The SLU data were measured in thirty-seven CLLI codes using AMA equipment. This data measures the use of thirty service fields by thirteen customer classes hour-by-hour for the same ninety-day period as the matrix studies. Recall that these data measure only originating conversation time rather than originating and terminating holding time for successful and unsuccessful attempts, as did the matrix studies data. The summary of these data involves computing weighted-average uses for each service category, customer class, and hour for the metro and nonmetro strata identified from the matrix studies data. This procedure develops a typical-day profile for each strata.

TABLE 3.5

ESTIMATED PER-LINE-DAY USE DURING THE THREE BUSIEST HOURS FOR THE SAMPLE PERIOD FOR FOURTEEN SERVICE CATEGORIES, AND THREE CUSTOMER CLASSES FOR THE METRO AND NONMETRO STRATA

	Service	Type	Business	Centrex	Residential
METRO	800	ORIG	20.96	4.87	1.92
	DA	ORIG	1.85	0.87	0.12
	FGB	ORIG	0.22.	0.11	0.00
	FGB	TERM	0.00	0.51	0.00
	ISIL	ORIG	44.32	22.37	0.35
	ISIL	TERM	8.76	9.99	1.45
	RAEXEAS	ORIG	318.58	178.53	33.89
	RAEXEAS	TERM	354.14	270.02	16.55
	RASW	ORIG	20.16	20.53	48.24
	SIL	ORIG	16.16	18.42	5.16
	SIL	TERM	69.80	25.53	2.05
	SL	ORIG	6.05	12.31	5.41
	SL	TERM	11.62	11.84	5.30
	TSPS	ORIG	2.29	0.97	0.28
NONMETRO	800	ORIG	23.77	34.39	1.84
	DA	ORIG	0.97	0.00	0.56
	FGB	ORIG	0.05	0.28	0.00
	FGB	TERM	8.87	0.00	0.00
	ISIL	ORIG	24.16	0.00	3.14
	ISIL	TERM	0.00	0.00	2.73
	RAEXEAS	ORIG	52.43	812.23	71.85
	RAEXEAS	TERM	99.67	513.95	69.81
	RASW	ORIG	112.35	0.00	80.50
	SIL	ORIG	43.98	0.00	0.69
	SIL	TERM	26.89	97.66	9.67
	SL	ORIG	1.91	10.01	6.13
	SL	TERM	9.70	35.97	4.77
	TSPS	ORIG	6.14	0.00	0.07

Source: Author's compilations.

Table 3.6 contains the customer classes contained in the SLU data. There are four classes of residential customers and six classes of business customers. In addition, there are official lines which are subscriber lines used by Southwestern Bell for business purposes, OutWATS which are WATS lines for outgoing toll calls, and feature group A lines. All of these customer classes were defined in the previous chapter.

TABLE 3.6

CUSTOMER CLASS DISTINCTIONS FOR THE SLU DATA

Customer Classes
ONE-PARTY RESIDENTIAL
MULTIPARTY RESIDENTIAL
MEASURED RATE RESIDENTIAL
FOREIGN EXCHANGE RESIDENTIAL
SINGLE-LINE BUSINESS
MULTILINE BUSINESS
MEASURED RATE BUSINESS
TRUNK (PBX) BUSINESS
CENTREX
FOREIGN EXCHANGE BUSINESS
OFFICIAL (SOUTHWESTERN BELL LINES)
OUTWATS
FEATURE GROUP A

Source: Author's compilations.

Table 3.7 contains shorthand notation for the thirty service fields and their definitions. There were fifteen directory assistance (DA) service fields. There are seven directory service centers in Texas. Fourteen of the entries are DA, two entries for each center corresponding to intrastate interLATA DA and intrastate intraLATA DA. The fifteenth entry for DA corresponds to interstate directory assistance. When the shorthand notation ends with a 0, it signifies operator-assisted calling either with a credit card or with operator intervention.

TABLE 3.7

SERVICE FIELD DISTINCTIONS FOR THE SLU DATA

Service Field	Description of Service Field
800	Out WATS
DAIS	Intrastate Directory Assistance
DASIL1	Intrastate InterLATA DA Service Center 1
DASIL2	Intrastate InterLATA DA Service Center 2
DASIL3	Intrastate InterLATA DA Service Center 3
DASIL4	Intrastate InterLATA DA Service Center 4
DASIL5	Intrastate InterLATA DA Service Center 5
DASIL6	Intrastate InterLATA DA Service Center 6
DASIL7	Intrastate InterLATA DA Service Center 7
DASL1	Intrastate IntraLATA DA Service Center 1
DASL2	Intrastate IntraLATA DA Service Center 2
DASL3	Intrastate IntraLATA DA Service Center 3
DASL4	Intrastate IntraLATA DA Service Center 4
DASL5	Intrastate IntraLATA DA Service Center 5
DASL6	Intrastate IntraLATA DA Service Center 6
DASL7	Intrastate IntraLATA DA Service Center 7
FGARASW	Feature Group A Intraswitch Incoming Use
FGB	Feature Group B
INTL	International Toll Use
ISIL	Interstate InterLATA Use
INTLO	Interstate Operator Assisted Toll Use (DIAL 0)
ISILO	Interstate InterLATA Operator Assisted Toll Use
SILO	Intrastate IntraLATA Operator Assisted Toll Use
RAEX	Interswitch Local Use
RAEXO	Interswitch Operator Assisted Local Use
RASW	Intraswitch Local Use
RASWO	Intraswitch Operator Assisted Local Use
SIL	Intrastate InterLATA Toll Use
SL	Intrastate IntraLATA Toll Use
SLO	Intrastate IntraLATA Operator Assisted Toll Use

Source: Author's compilation.

The thirteen customer classes and thirty service fields should suggest that this data set is sizeable, a total of 1,298,700 records. The SLU information provided by Southwestern Bell had ninety days of data hour-by-hour for each customer class and service field. The NRRI research team summarized these data into a typical-day profile for each month, customer class, and service field by computing monthly averages across the sample customers and nonholiday weekdays for each hour.

Denote the use of the j^{th} service field by customer class c at CLLI code ℓ during hour t of day d in month m by $U_{jc\ell tdm}$. Let $n_{c\ell m}$ be the sample size for customer class c at CLLI code ℓ during month m. The line-day average use of service field j by customer class c at switch ℓ during hour t of month m is given by

$$\bar{U}_{jc\ell tm} = \frac{\sum_{d} U_{jc\ell tdm}}{W_{m\ell} * n_{c\ell m}} \qquad (10)$$

where $W_{m\ell}$ is the set of days that are nonholiday weekdays for month m for CLLI code ℓ. With thirty service fields, thirteen customers classes, thirty-seven CLLI codes, and three months, there were 43,290 possible averages for each hour of a typical weekday. However, because each sampled CLLI did not have all of the customer classes present or did not have all service fields, only 23,649 averages were calculated.

Note that these line-day averages were calculated for each CLLI code. In order to get from these sample averages $\bar{U}_{jc\ell tm}$ to the line-day averages for the metro and nonmetro strata, a weighted average using the population count of subscriber lines for each customer class at a CLLI code must be adopted. The weighted average is necessary because the customer classes do not occur in the same proportion in the sample as they do in the population.

Let $N_{c\ell m}$ be the population of customer class c at CLLI code ℓ during month m. The weighted-average line-day use of service field j by customer class c during hour t for stratum s is given by:

$$\bar{U}_{jcts} = \frac{\sum_{m} \sum_{\ell \epsilon s} N_{c\ell m} \bar{U}_{jc\ell tm}}{\sum_{m} \sum_{\ell \epsilon s} N_{c\ell m}} . \qquad (11)$$

Seven hours were dropped from the analysis at this point. All the hours between 1 A.M. and 7 A.M. had essentially zero usage and contributed little information to the analysis. (Recall that the same hours were dropped from the regression analysis.) At this point there are 780 averages for each hour, 390 per stratum, and 13,260 (13 X 30 X 2 X 17) in total.

The hourly weighted average per-line-day use of fifteen service categories for eleven customer classes in the metro and nonmetro strata are contained in appendix B in tables B.14 to B.34. The OutWATS and official service categories are not contained in these tables. The SLU data for official customer class were unusable as a result of a too-small sample size. The OutWATS data were fine, but were not published for proprietary reasons. The directory assistance data were not published in these tables to make them more readable. Tables B.14 through B.23 contain the metro data while tables B.24 through B.34 contain nonmetro data. Comments concerning these data are reserved for the analysis in the next section. These per-line-day weighted averages from the SLU data provide the basis for two allocation scenarios presented later in this report.

Comparisons of SLU Averages and Regression Coefficients

The NRRI research team compared the SLU averages to the regression coefficients for the typical-day profile to confirm further the validity of the coefficients estimated by these regression analyses. It was not expected that the SLU averages would equal the corresponding regression coefficients. Recall that the matrix studies data measured holding time for both successful and unsuccessful telephone calls. The SLU data only measures conversation times for successful attempts. Thus, the regression coefficients would be expected to exceed the corresponding SLU averages because the SLU data does not measure the setup times of successful and unsuccessful attempts. The research team did not have sufficient information to adjust either data set for these discrepancies. Instead, the data were analyzed for similarities in the time-of-day pattern, the relative magnitudes of peaks and valleys, and whether or not the regression coefficients exceeded the SLU averages. Any detailed statistical analysis of these data was precluded by the sheer size of the data sets involved. Consequently, the research team plotted the SLU averages against the regression coefficients to answer the questions posed above. While some of the comparisons faired better than others, the research team concluded these data acceptable.

The data were graphed and a scoring system was based on these expected relationships between the regression coefficients for the typical-day profile and the SLU averages. First, one point was scored when the time-of-pattern of use for regression coefficients and SLU averages tracked or corresponded to each other. One-half point was scored when the regression coefficients tracked the SLU averages during peak periods. No points were scored if the two graphs did not correspond. The second test examined the relative magnitude of the peaks and valleys of the time-of-day profiles. If the relative magnitude of peaks and valleys was preserved, one point was scored. If the relative magnitude of peaks was preserved during the peak, one-half point was scored. No points were scored if the relative magnitude of peaks and valleys was not preserved. The third and final test examined the graphs to see if the regression coefficients exceeded the SLU averages. One point was scored if the regression coefficient exceeded the SLU averages for all seventeen hours. One-half point was scored if the regression coefficients exceeded the SLU averages during the peak. Finally, no points were scored if the regression coefficients failed to exceed the SLU averages. The results of applying this scoring system to the data are presented after a discussion of the comparisons.

The detail on service fields and customer classes in the SLU data greatly exceeds the number of service categories for the regression coefficients. Table 3.8 shows the service fields for the SLU averages that are contained in the service categories for the regression coefficient data only when multiple fields exist. Consequently, four service categories were chosen for the analysis. They are the local intraswitch usage (RASW), the local interswitch usage (RAEX), the intrastate interLATA usage (SIL), and the intrastate intraLATA usage (SL).

The customer class information in the SLU data is also much richer in detail than that of the regression analysis. The line counts used in the regression analysis were one-party residential, single-line business, and Centrex lines. Consequently, the per-line-day averages for these SLU data are used in this analysis.

As noted previously, the SLU data is only originating use. Thus, only originating regression coefficients are plotted against the SLU data. The research team did not have data with which to evaluate the terminating data, which is accepted as it is. However, the research team asserts that the insights gained from evaluating the originating data would transfer to the terminating data.

TABLE 3.8

RELATIONSHIPS BETWEEN SERVICE CATEGORIES FOR SLU AVERAGE AND REGRESSION COEFFICIENTS

Service Category for Regression Coefficient	Corresponding Service Fields for SLU Averages
TSPS	INTLØ ISILØ SILØ SLØ RAEXØ RASW
DA	DAIS DASILI...DASIL7 DASLI...DASLI7
ISIL	INTL & ISIL
RASW	RASW FGARASW

Source: Author's compilations.

The plots of the regression coefficients and SLU averages (figures 3-5 through 3-28) are organized according to the structure of the regression performed. There are three figures (business, Centrex, and residential) for each service category (RASW, RAEX, SIL, SL) for each stratum (metro and nonmetro). The discussion of these figures, therefore, is organized by service category and stratum.

The metro intraswitch-use data are compared in figures 3-5 through 3-7. The most striking feature of these three figures is the graph for business (figure 3-5). The per-line-day SLU averages exceed the corresponding regression coefficients for every hour. The implications of this are discussed later. The regression coefficients do mirror the peaks but at only half of the magnitude indicated by the SLU data. Centrex (figure 3-6) and residential (figure 3-7) uses behave as expected with the regression coefficients exceeding the SLU average during every hour. The tracking of the time-of-day profile and the relative magnitude of peaks and valleys is acceptable as well.

The nonmetro intraswitch-use data are plotted in figures 3-8 through 3.10. The plot for the residential class (figure 3-10) does not indicate any peculiar problems. Again, the intraswitch regression coefficients for the business class are less than the per-line-day SLU averages. The tracking of the busy-hours is not as good as for the metro strata. The regression coefficients predict a 10 A.M. peak for business intraswitch use, while the SLU averages indicate 11 A.M.

The plot for nonmetro Centrex use indicates some problems with the imaging of the time-of-day profile (see figure 3-9). First is the obvious divergence after 6 P.M. (hour 18) where the regression coefficients indicate a marked increase in use while SLU is near zero. Second, the SLU data indicates a gradual increase in use per line-day with a busy hour around 5 P.M. (hour 17). The regression coefficients, on the other hand, indicate a spike at 3 P.M. (hour 15). The potential problems indicated by these figures are discussed below.

The metro interswitch-local (RAEX) plots are figures 3-11 through 3-13. These plots are generally acceptable with the exception of residential (figure 3-13). In this case, the regression coefficients are less than the SLU averages until after 6 P.M. (hour 18). After these hours, the behavior of the regression coefficients is as expected. In general, the business (figure 3-11) and Centrex (figure 3-12) plots behave as expected by mirroring the time-of-day profile and the relative magnitudes of the peaks and valleys.

The nonmetro interswitch local comparisons are contained in figures 3-14 to 3-16. The plot for business interswitch local use is generally acceptable. However, note that the regression coefficients exceed the SLU averages by a factor of at least six during the busiest hours of the day. The plot for Centrex (figure 3-15) is less acceptable. The peak is shifted from 11 A.M. to 4 P.M. and the evening hours after 7 P.M. (hour 19) indicating an increase, whereas SLU averages are essentially zero. The nonmetro interswitch local plot for residential (figure 3-16) has some problems similar to the plot for metro. The regression coefficients are below the SLU averages until 8 P.M. (hour 20). The coefficients for this plot predict the busy hour, but perform poorly off-peak.

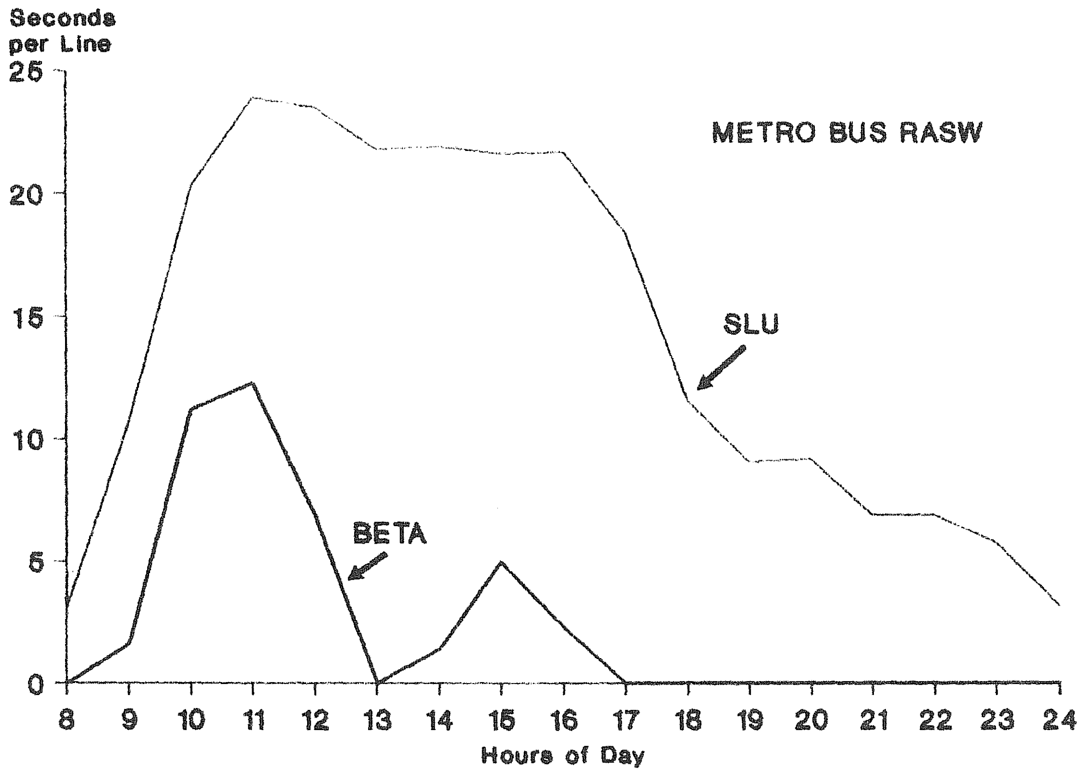


Fig. 3-5. Comparison of SLU averages and regression coefficients (BETA) for metropolitan business customers' intraswitch use.

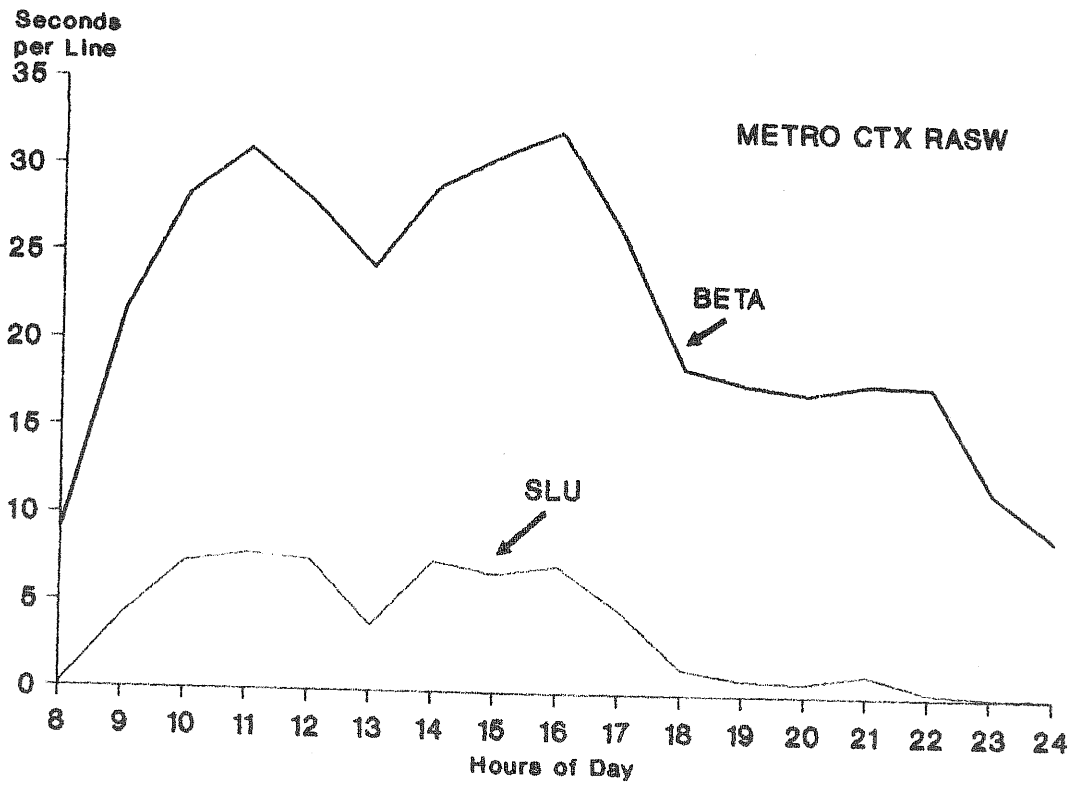


Fig. 3-6. Comparison of SLU averages and regression coefficients (BETA) for metropolitan centrex customers' intraswitch use.

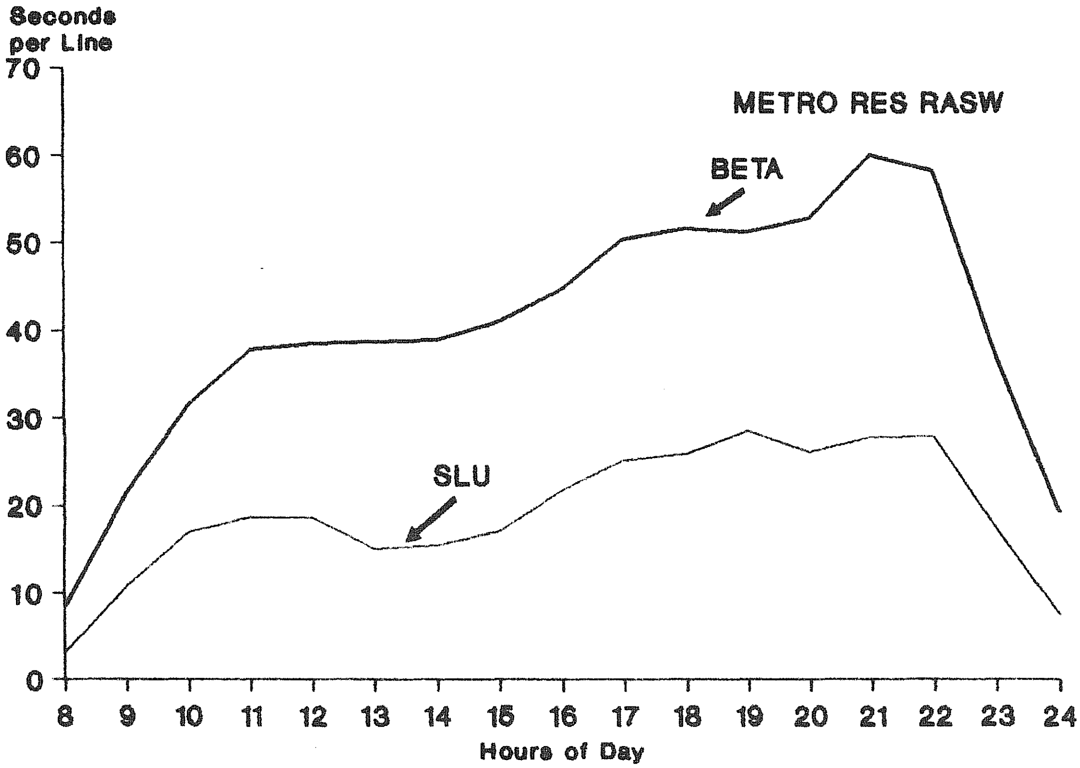


Fig. 3-7. Comparison of SLU averages and regression coefficients (BETA) for metropolitan residential customers' intraswitch use.

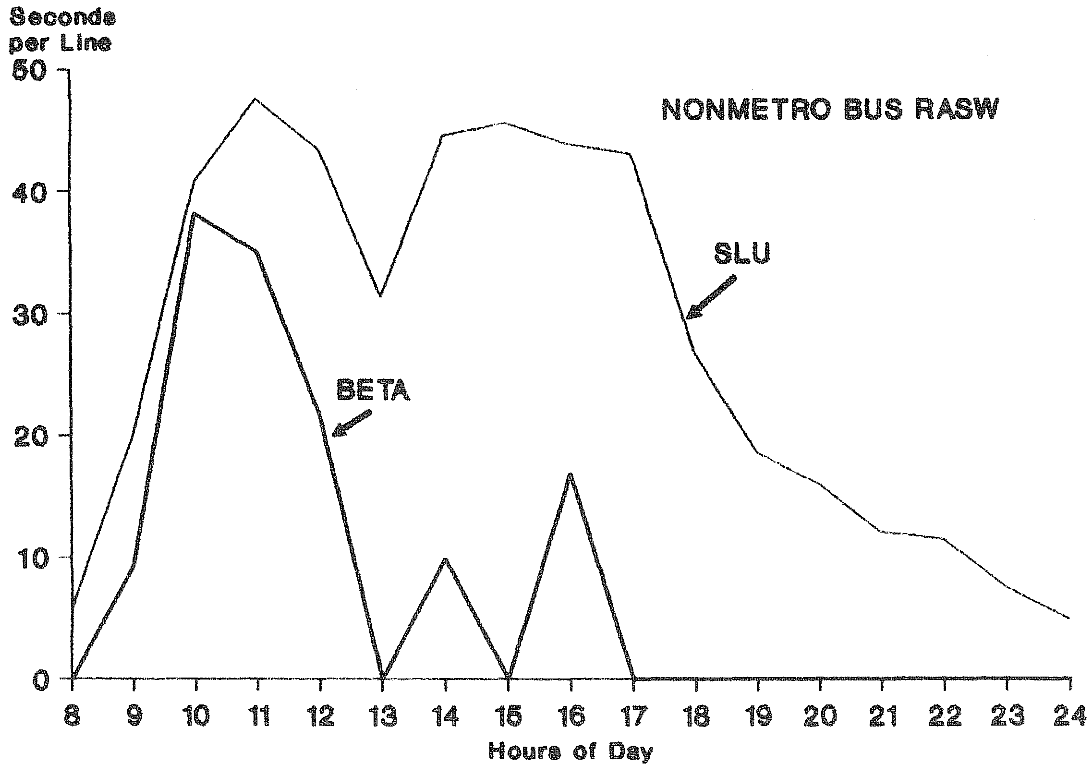


Fig. 3-8. Comparison of SLU averages and regression coefficients (BETA) for nonmetropolitan business customers' intraswitch use.

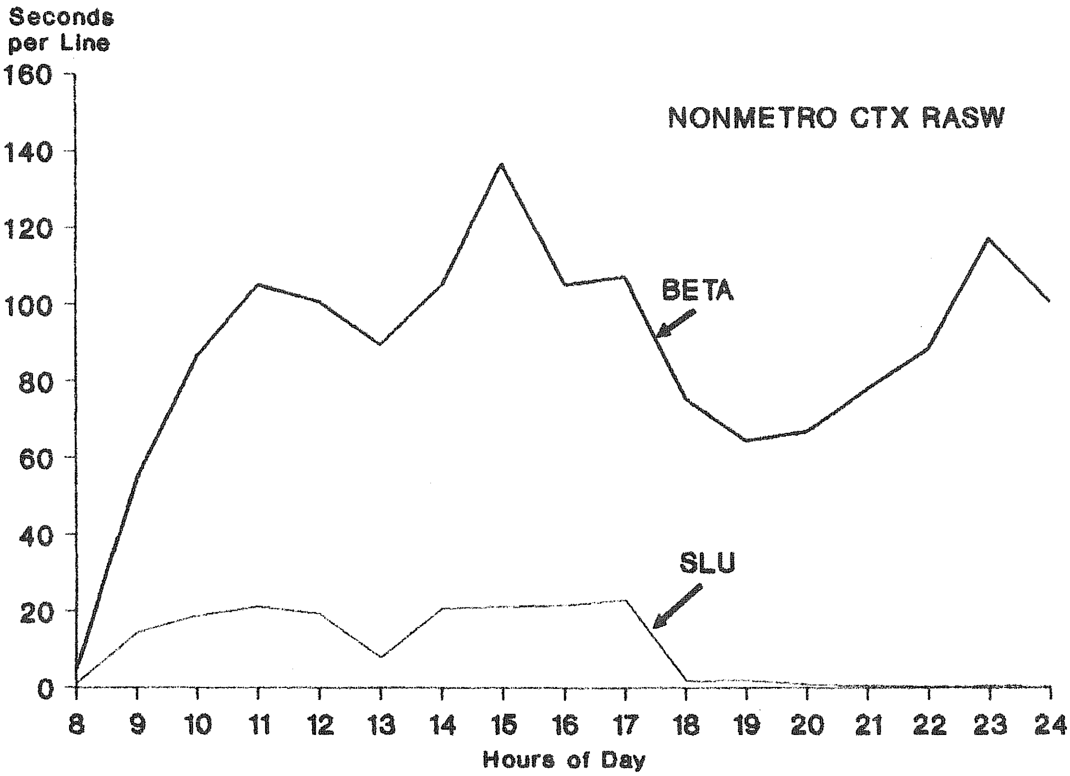


Fig. 3-9. Comparison of SLU averages and regression coefficients (BETA) for nonmetropolitan centrex customers' intraswitch use.

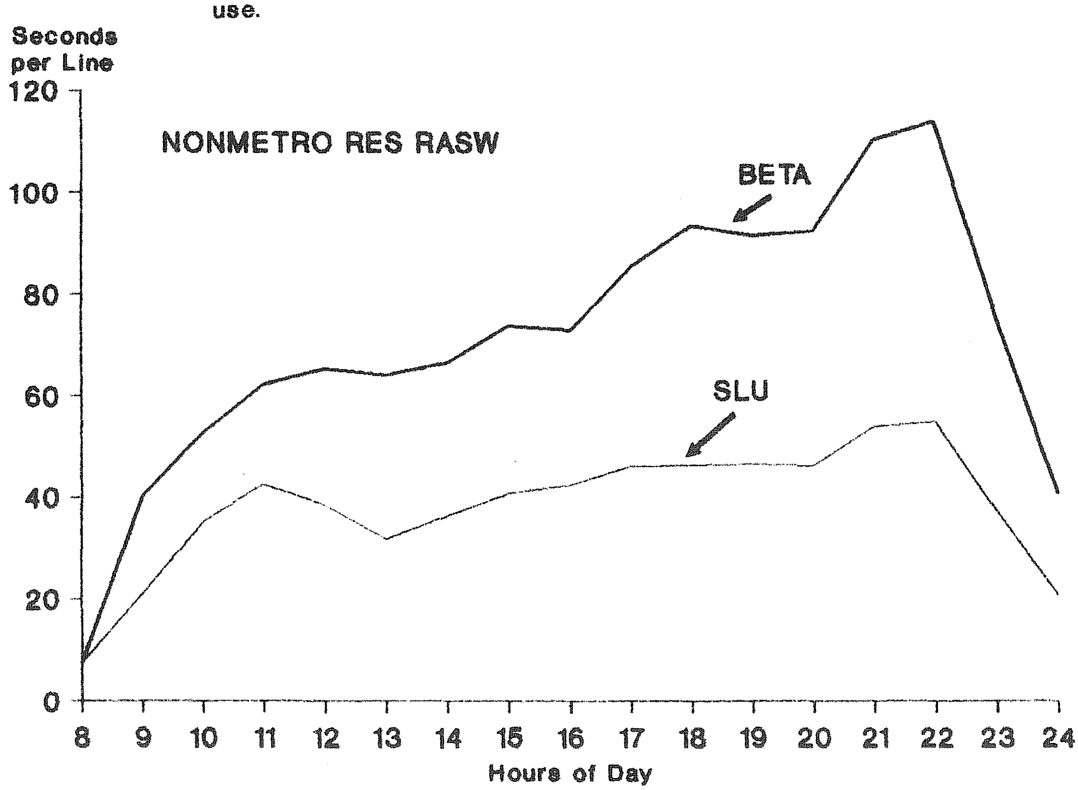


Fig. 3-10. Comparison of SLU averages and regression coefficients (BETA) for nonmetropolitan residential customers' intraswitch use.

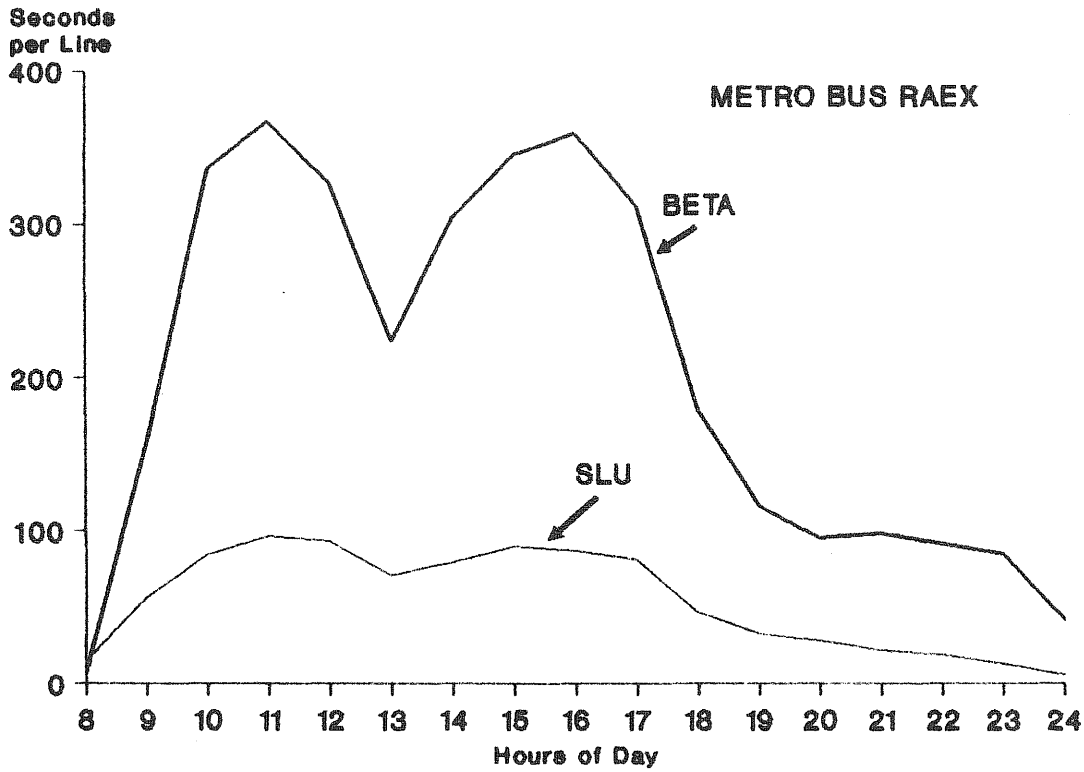


Fig. 3-11. Comparison of SLU averages and regression coefficients (BETA) for metropolitan business customers' intraexchange use.

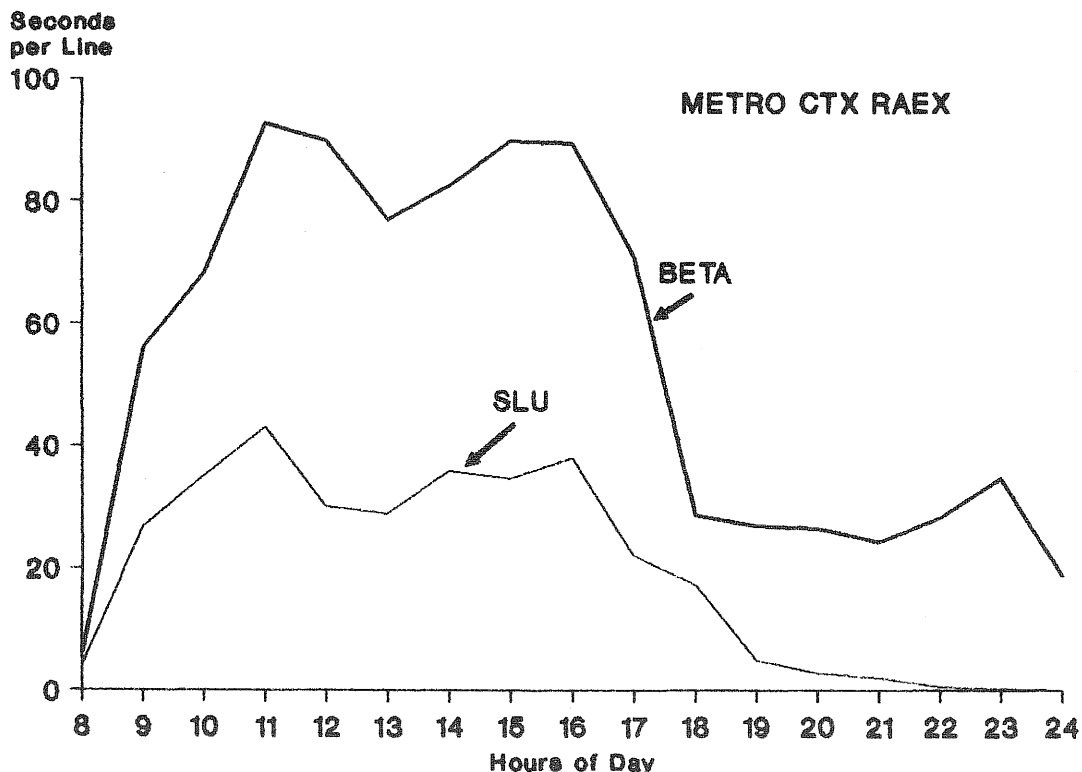


Fig. 3-12. Comparison of SLU averages and regression coefficients (BETA) for metropolitan centrex customers' intraexchange use.

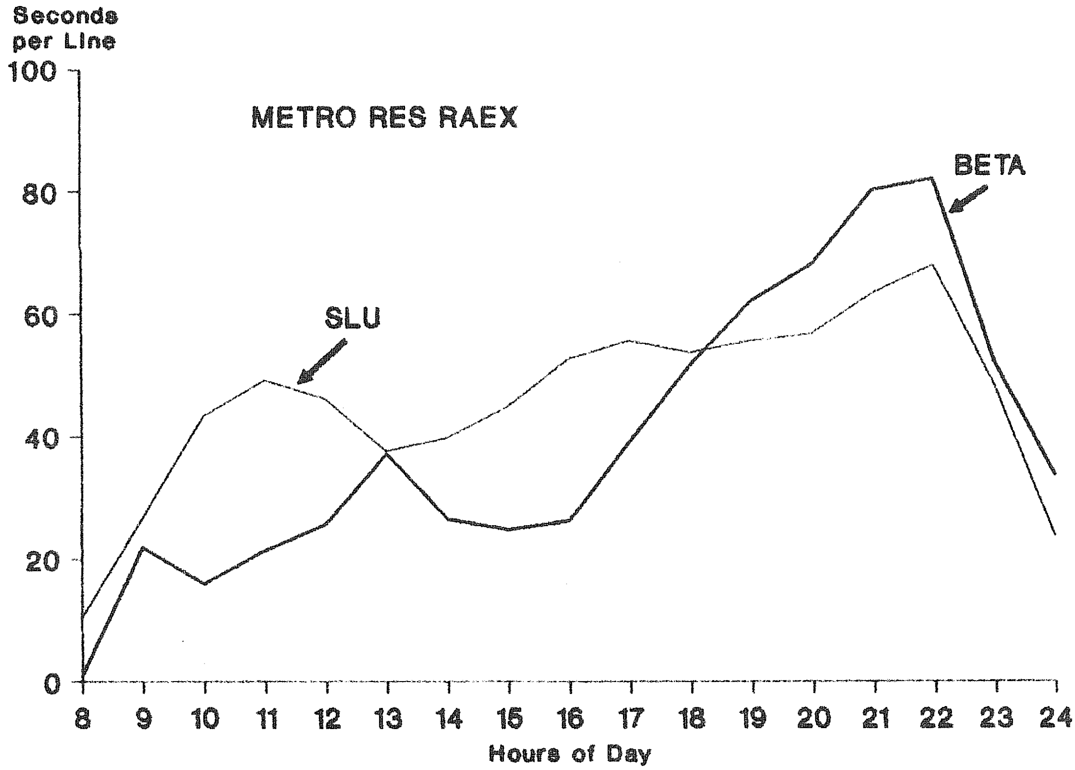


Fig. 3-13. Comparison of SLU averages and regression coefficients (BETA) for metropolitan residential customers' intraexchange use.

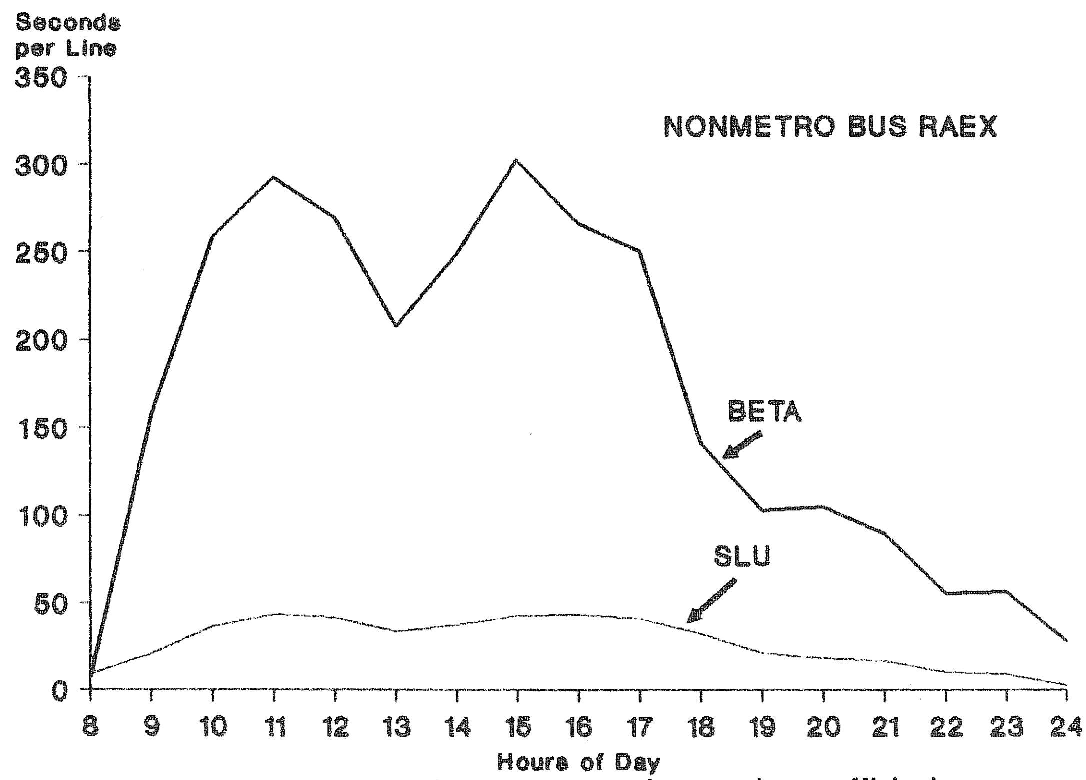


Fig. 3-14. Comparison of SLU averages and regression coefficients (BETA) for nonmetropolitan business customers' intraexchange use.

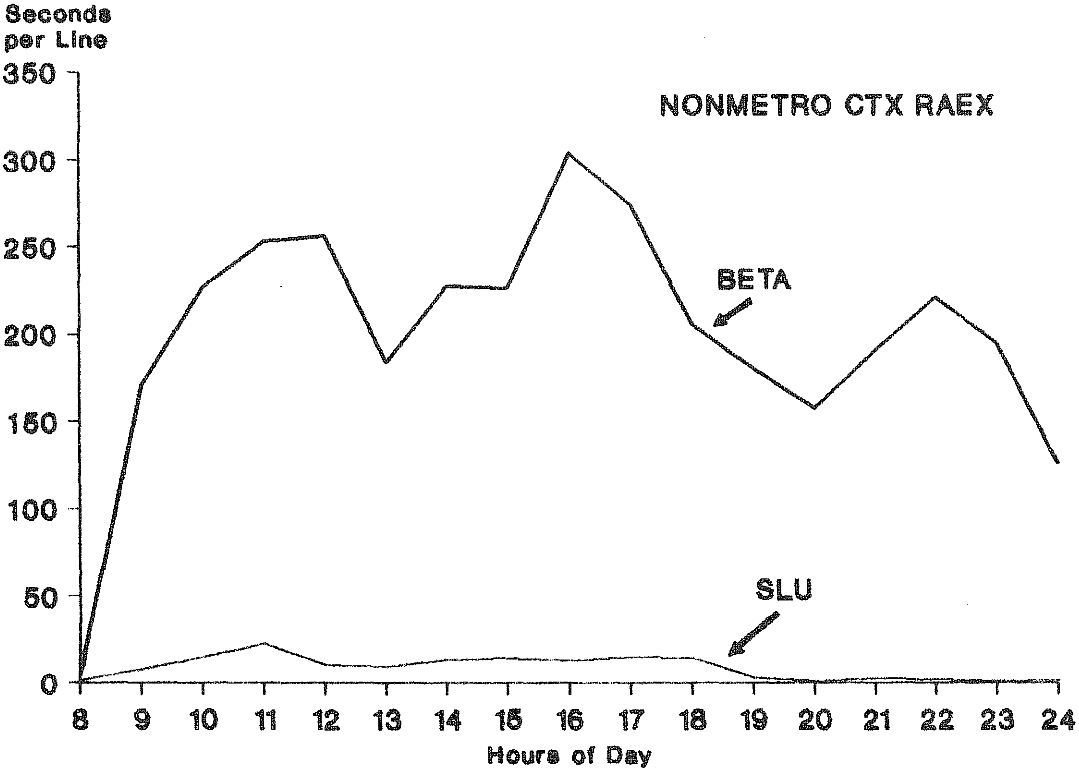


Fig. 3-15. Comparison of SLU averages and regression coefficients (BETA) for nonmetropolitan centrex customers' intraexchange use.

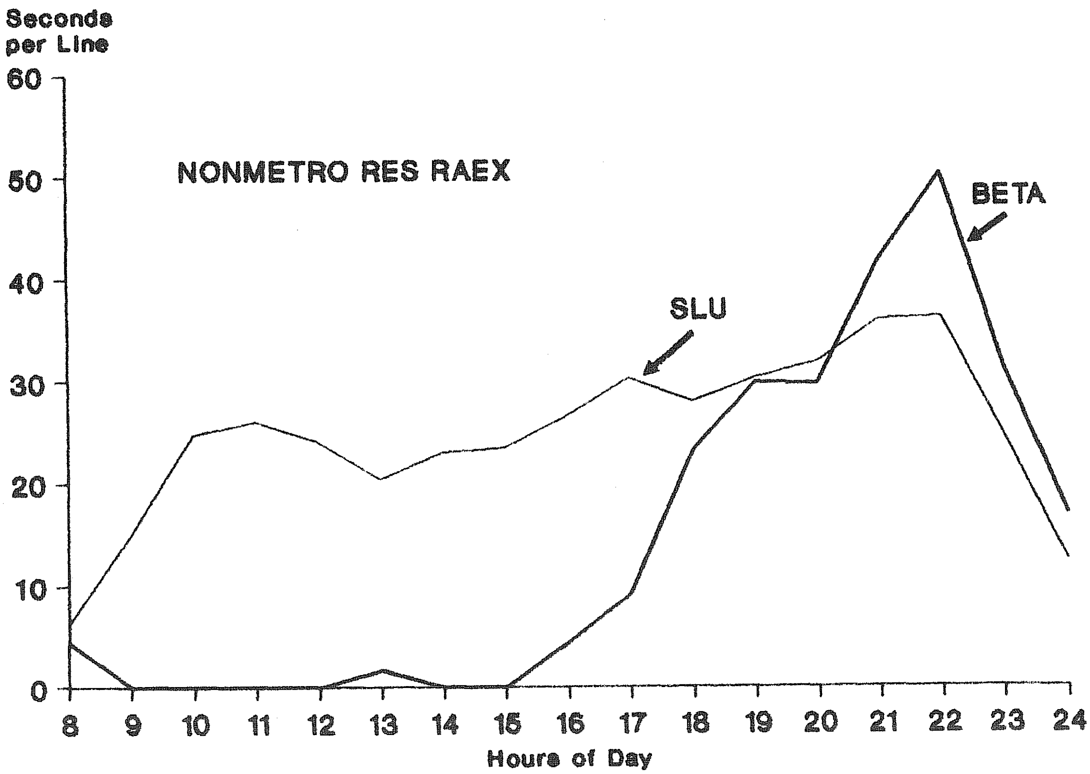


Fig. 3-16. Comparison of SLU averages and regression coefficients (BETA) for nonmetropolitan residential customers' intraexchange use.

The metro intrastate interLATA comparisons are contained in figures 3-17 through 3-19. The plot for the business class is generally fine. Note that SLU averages indicate five seconds per line-day, while the regression coefficients indicate twenty-seven to twenty-eight seconds on peak. Also note the behavior of the regression coefficients after 8 P.M. for business. The plot for Centrex (figure 3-18) is less acceptable. The SLU averages indicate busy-hour per-line-day use of around three seconds. The busy hour occurs during the hour ending at noon according to SLU. The regression coefficients indicate a peak hour at 11 P.M. (hour 23) of around ten seconds per line-day. The obvious and unexplained increase in Centrex usage after 7 P.M. diverges significantly from the SLU data. Before 7 P.M. the regression coefficients demonstrate a mixed performance in mirroring the time-of-day profile and the relative magnitude of peaks and valleys. The SLU averages for Centrex exceed the corresponding regression coefficients during two hours (hour 12 and hour 17).

The comparisons for residential intrastate interLATA use for the metro strata exhibit some problems. The SLU average for residential exceeds the regression coefficients during every hour. The two data sets predict the same hour as the peak: 10 P.M. (hour 22). The busy-hour use for residential for SLU is around six seconds per line-day. The problems experienced with residential and the other classes for metro intrastate interLATA (SIL) use are taken up later in this chapter.

The comparisons for nonmetro intrastate interLATA (SIL) are generally more favorable than those for the metro strata. The plots are figures 3-20 through 3.22. The regression coefficients for residential behaved as expected. The comparisons for nonmetro intrastate interLATA for the business class (figure 3-20) are acceptable up to 5 P.M. (hour 17) after which the SLU averages exceed the regression coefficients. Also, hour 13 (the hour ending at 1 P.M.) has regression coefficients that dip slightly below the SLU averages. The imaging of the time-of-day profile is fairly good, but the peaks and valleys are exaggerated. The busy hour for the regression coefficients is twice SLU, while the off-peak regression coefficient is as low as zero while SLU is one or two seconds per line-day.

The performance of the Centrex regression coefficients for nonmetro intrastate interLATA use (figure 3-21) is somewhat erratic. The regression coefficients, with the exception of one hour (hour 20) are less than the SLU averages. The imaging is not good. During the busy hour indicated by the SLU averages, the regression coefficient is zero. The peaks and valleys for the regression coefficients bear little resemblance to the SLU averages. This is probably the worst performing regression and raises the issue of sample size for both the matrix studies and the AMA study. This important issue is addressed later in this chapter.

The comparisons for intrastate intraLATA toll for the metro strata are figures 3-23 through 3-25. These comparisons are favorable for the business, Centrex, and residential classes. The regression coefficients generally track the time-of-day profile with adequate comparisons in the magnitude of peaks and valleys.

The plots of the comparisons for nonmetro intrastate intraLATA toll are figures 3-26 through 3-28. The regression coefficients for business (figure 3-26) exceed the SLU averages except for four hours in the evening (hours 19, 20, 21, and 22). The mirroring of the time-of-day profile by the regression coefficients is fair. The regression coefficients experience a spike at 3 P.M. (hour 15) that does not occur with the SLU averages. This shifts the peak from 11 A.M. (SLU) to 3 P.M. Another spike at 11 P.M. for the regression coefficients does not show up with SLU averages.

The behavior of the Centrex averages is erratic (see figure 3-27). The SLU averages for nonmetro intrastate intraLATA toll use exceed the regression coefficients for eight of the seventeen hours. The imaging of the time-of-day profile is not good and the relative magnitude of peaks and valleys is fair. These results again raise the issue of sample size which is discussed later in this report.

The residential comparisons (figure 3-28) for nonmetro intrastate intraLATA toll are barely acceptable for two out of the three tests. First, the regression coefficients exceed the SLU averages for all hours. Second, the regression coefficients only roughly approximate the SLU average time-of-day pattern. The regression coefficients are anywhere from three to seven times larger than the SLU averages. The evening peak at 10 P.M. (hour 22) for SLU averages is shifted to 9 P.M. (hour 21) for regression coefficients, with 10 P.M. the second largest. Finally, the relative magnitude of peaks and valleys is preserved with the regression coefficients.

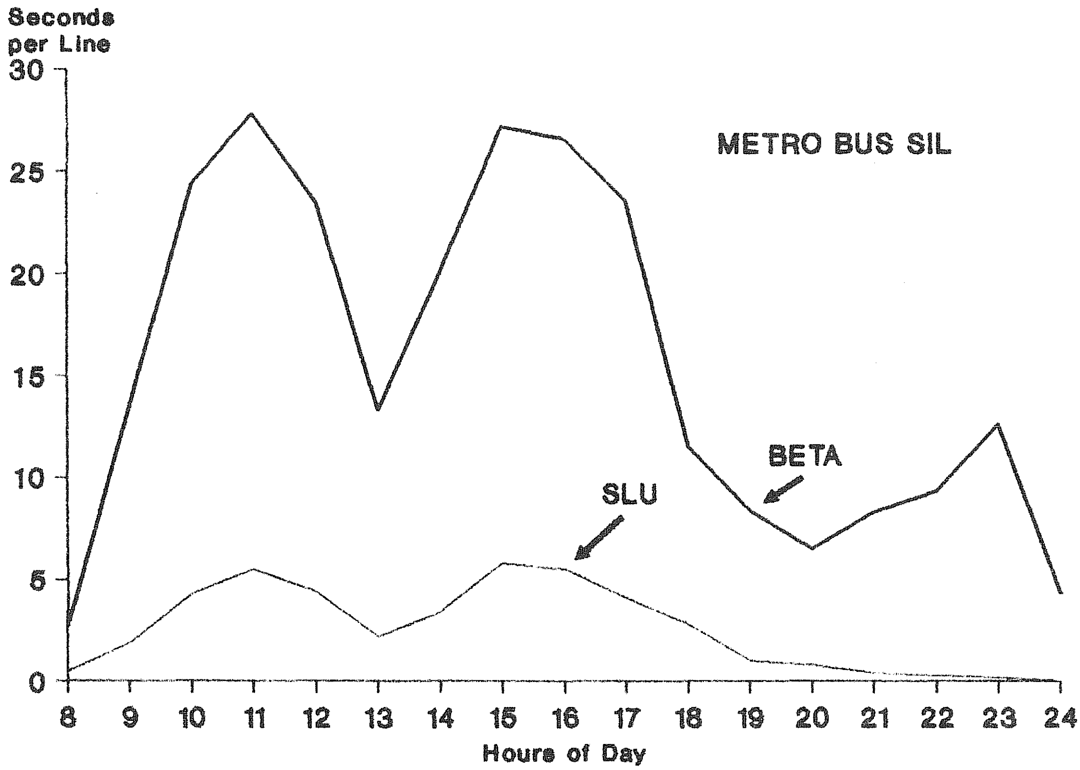


Fig. 3-17. Comparison of SLU averages and regression coefficients (BETA) for metropolitan business customers' intrastate interLATA use.

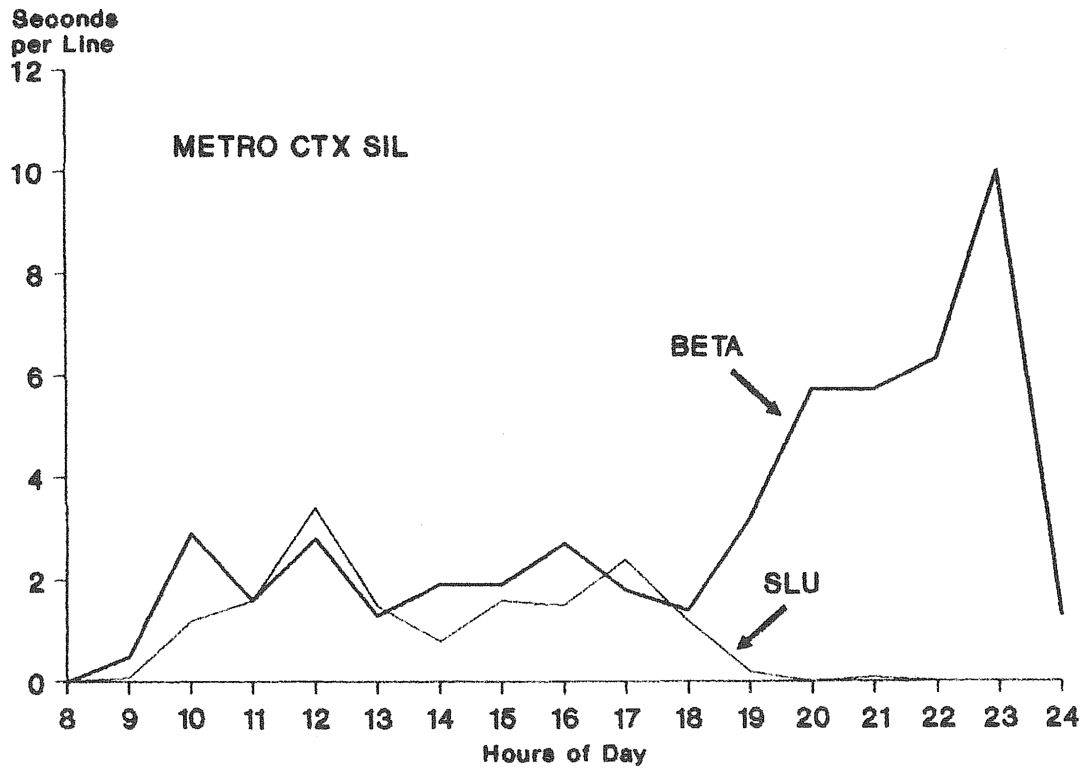


Fig. 3-18. Comparison of SLU averages and regression coefficients (BETA) for metropolitan centrex customers' intrastate interLATA use.

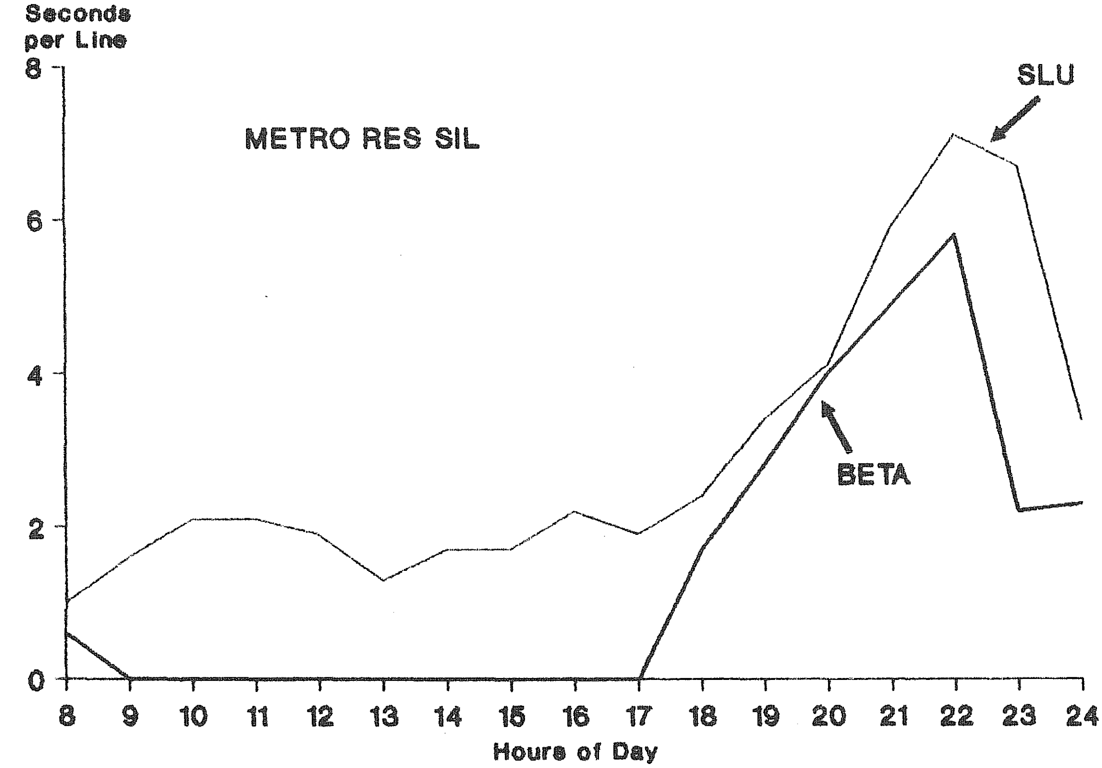


Fig. 3-19. Comparison of SLU averages and regression coefficients (BETA) for metropolitan residential customers' intrastate interLATA use.

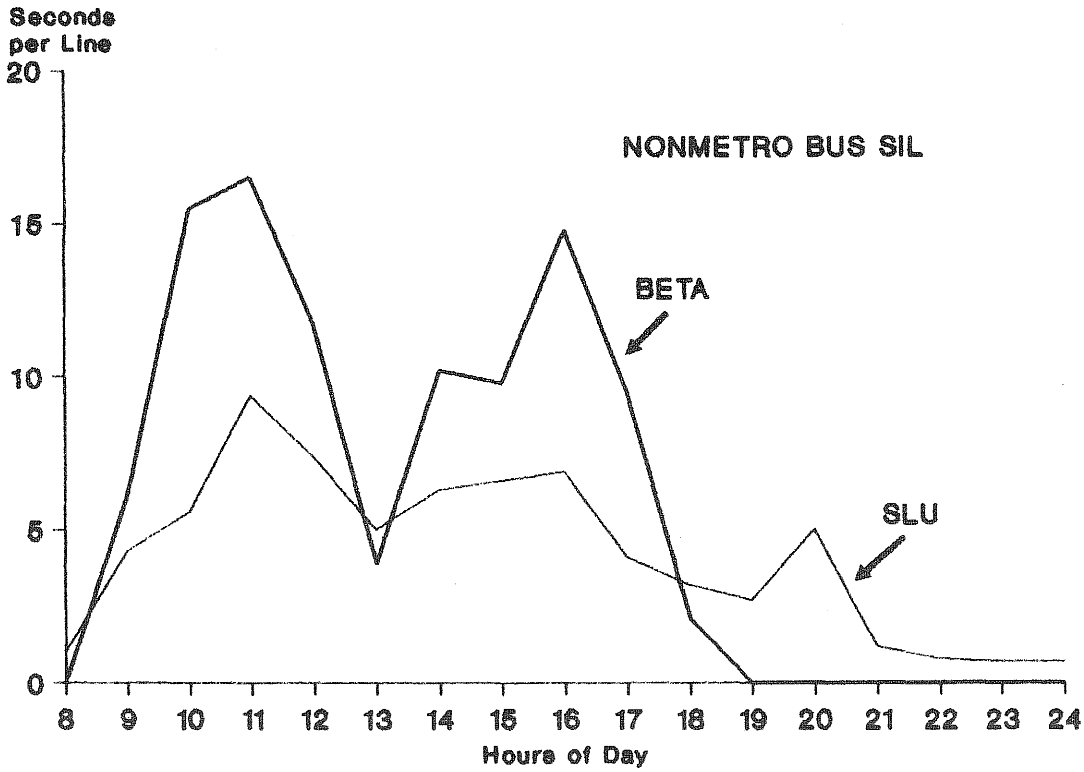


Fig. 3-20. Comparison of SLU averages and regression coefficients (BETA) for nonmetropolitan business customers' intrastate interLATA use.

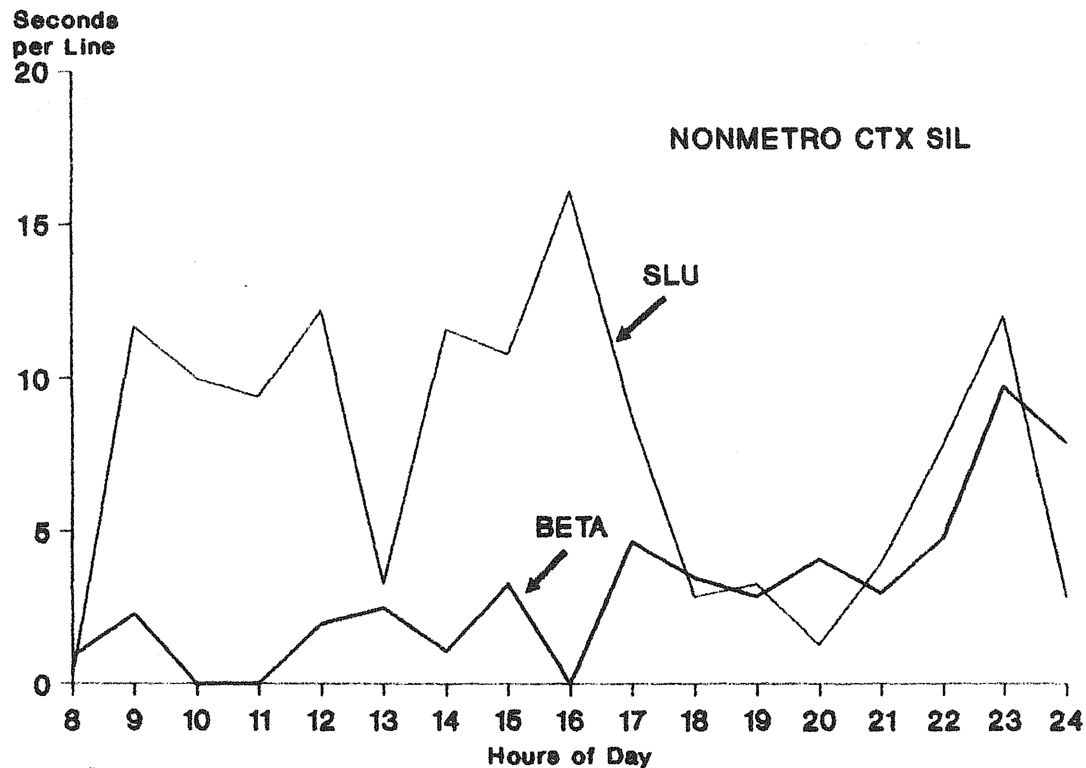


Fig. 3-21. Comparison of SLU averages and regression coefficients (BETA) for nonmetropolitan centrex customers' intrastate interLATA use.

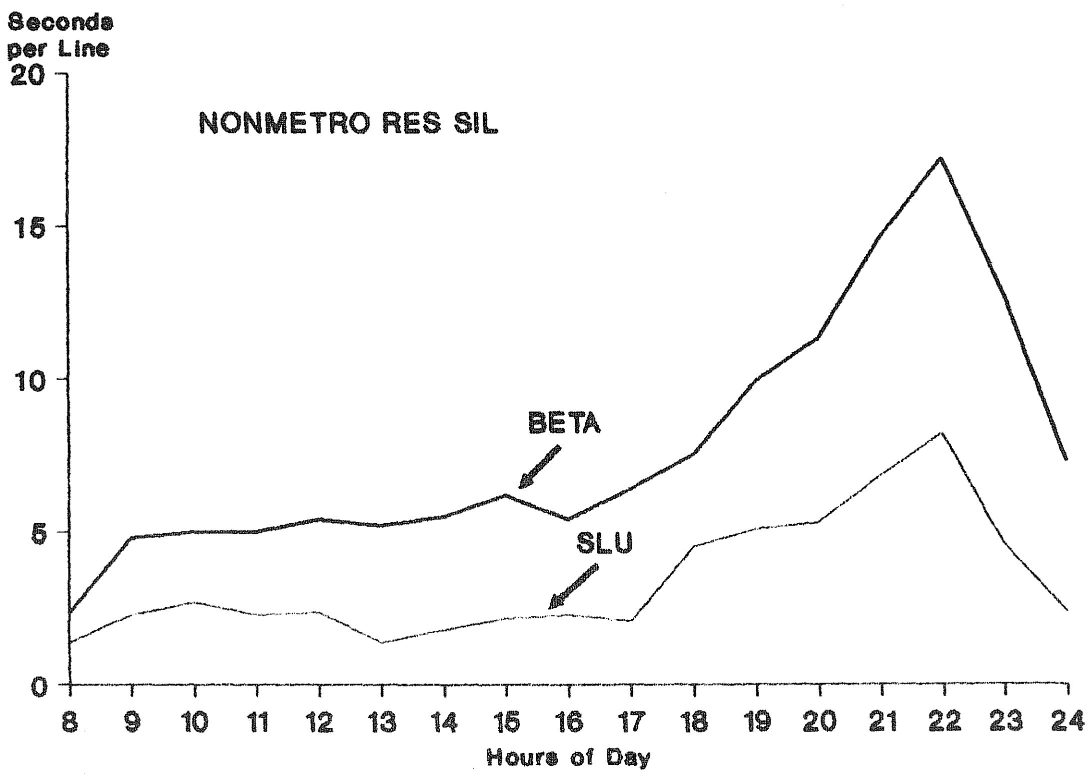


Fig. 3-22. Comparison of SLU averages and regression coefficients (BETA) for nonmetropolitan residential customers' intrastate interLATA use.

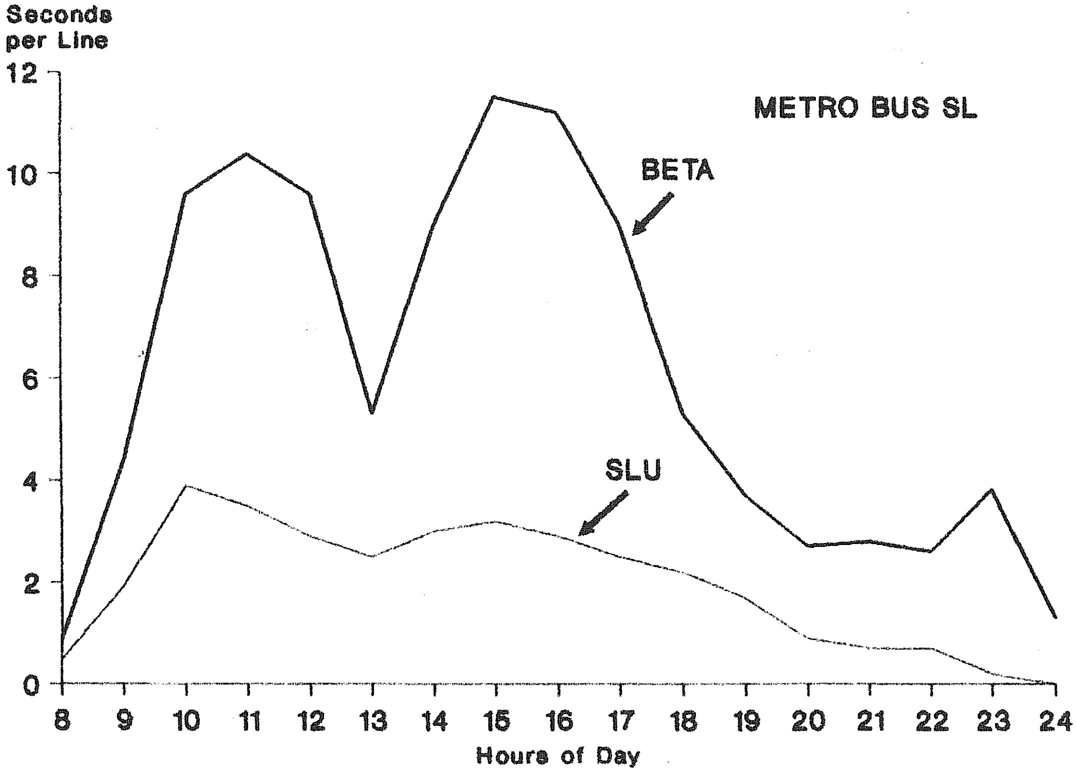


Fig. 3-23. Comparison of SLU averages and regression coefficients (BETA) for metropolitan business customers' intrastate intraLATA use.

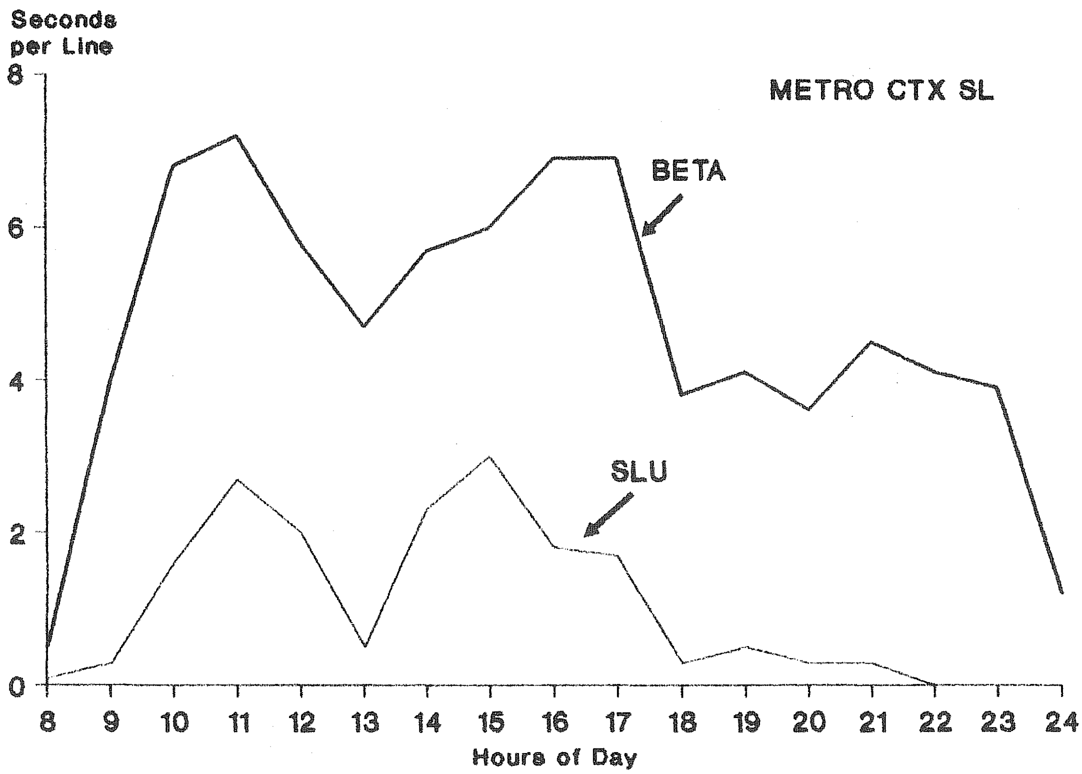


Fig. 3-24. Comparison of SLU averages and regression coefficients (BETA) for metropolitan centrex customers' intrastate intraLATA use.

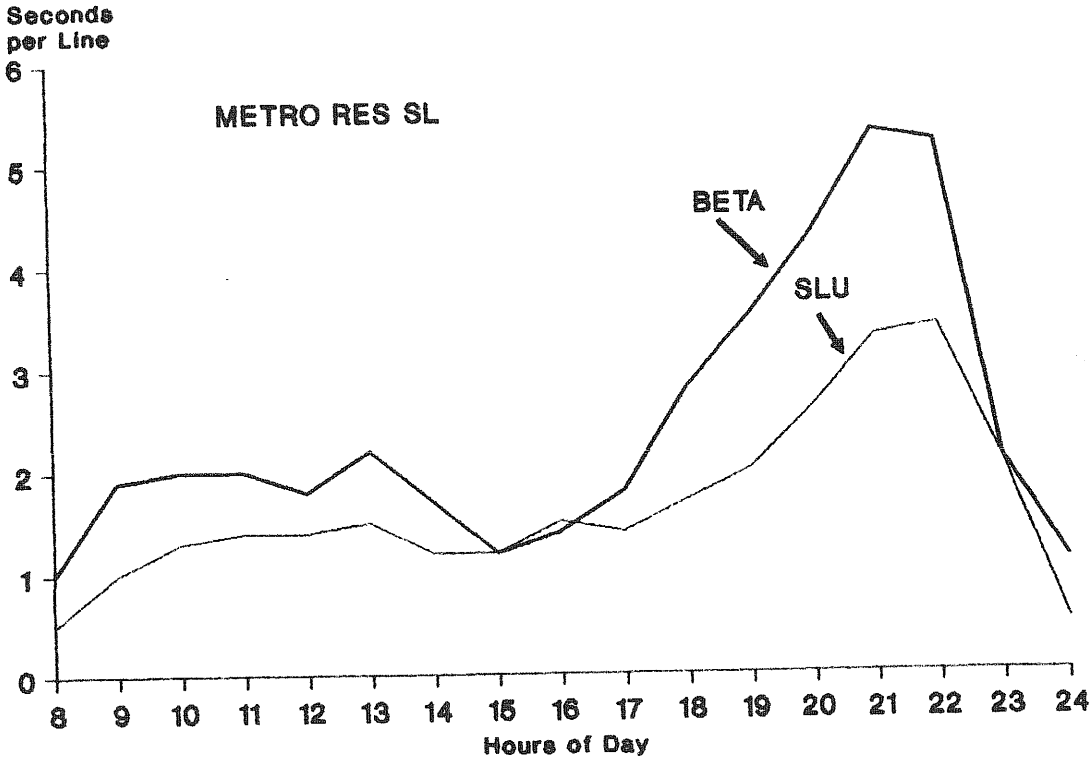


Fig. 3-25. Comparison of SLU averages and regression coefficients (BETA) for metropolitan residential customers' intrastate intraLATA use.

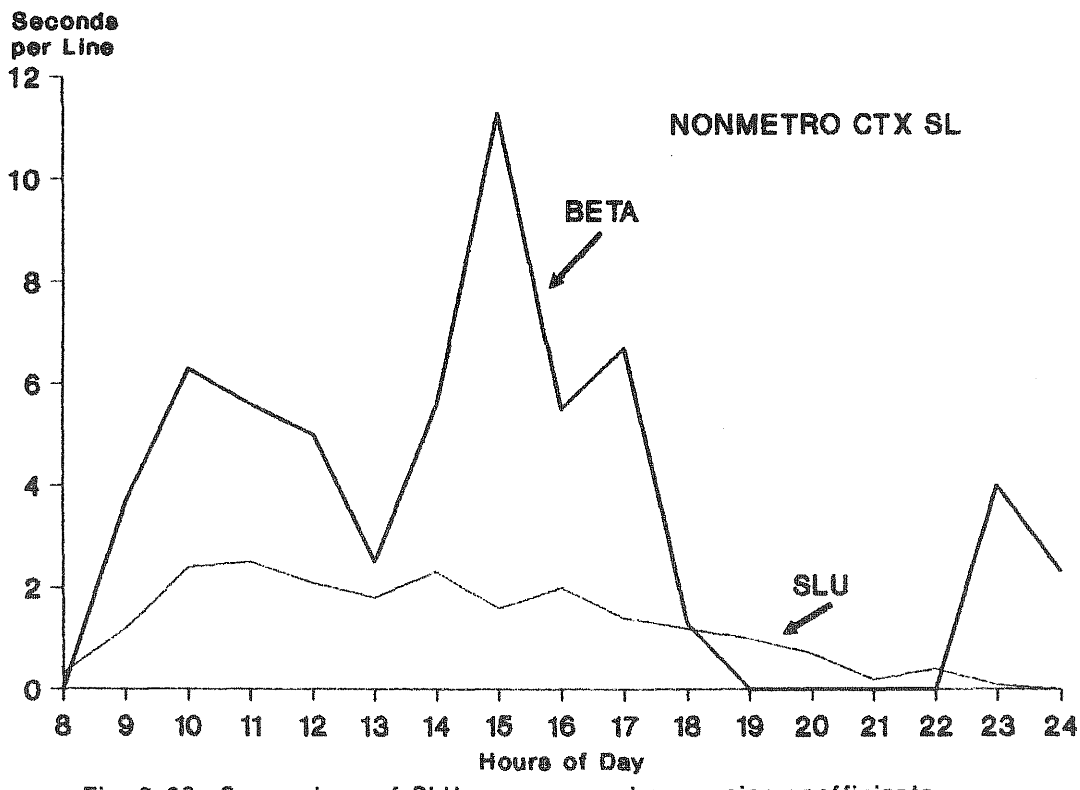


Fig. 3-26. Comparison of SLU averages and regression coefficients (BETA) for nonmetropolitan business customers' intrastate intraLATA use.

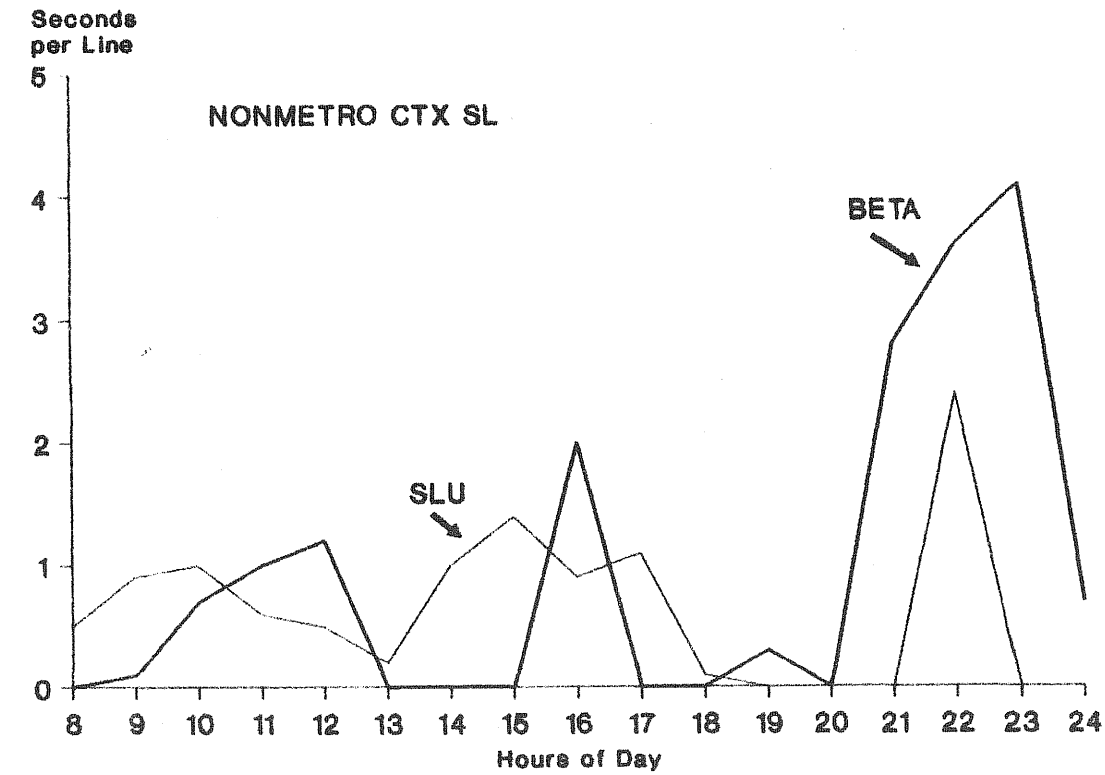


Fig. 3-27. Comparison of SLU averages and regression coefficients (BETA) for nonmetropolitan centrex customers' intrastate intraLATA use.

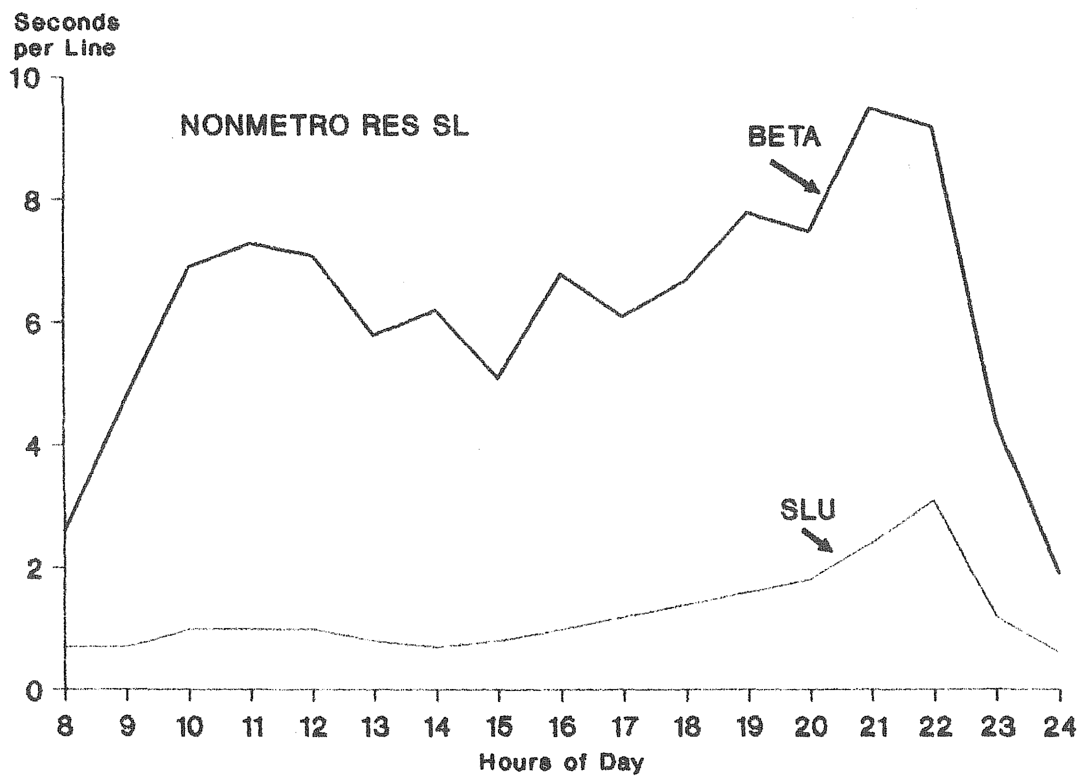


Fig. 3-28. Comparison of SLU averages and regression coefficients (BETA) for nonmetropolitan residential customers' intrastate intraLATA use.

This comparison of the regression coefficients and the SLU averages has raised two main issues. First and foremost is the issue of sample size in terms of the number of switches for the matrix studies and number of subscriber lines for the AMA study on which the SLU averages are based. The second issue is the performance of the regression analysis when use-per-line-day or subscriber line counts are low.

Table 3.9 summarizes the comparison of regression coefficients and SLU averages for each customer class, service category, and strata. Scores from 0 to 3 were assigned to a cell in this table based on whether none, one, two, or three of the tests were met. Recall the tests for the regression coefficient and SLU average comparisons were whether the regression coefficients exceed the SLU averages for all hours, whether the time-of-day pattern for the regression coefficient mirrors that of the SLU averages, and whether the peaks and valleys are of similar magnitude. A score of 0 indicates that none of the tests was met, a score of 1 that one was met, and so on. A score of .5 indicates that a test was met for some of the hours or that it performed on peak. The summation of a row of scores is for a particular set

TABLE 3.9

SUMMARY OF SCORING FOR COMPARISONS OF REGRESSION COEFFICIENTS AND SLU AVERAGES FOR EACH CUSTOMER CLASS, SERVICE CATEGORY, AND STRATA

		Business	Centrex	Residential	Row Total
RASW	Metro	0.5	3	3	6.5
	Nonmetro	0	1	3	4
RAEX	Metro	3	2.5	1.5	7
	Nonmetro	3	1	1.5	5.5
SIL	Metro	2.5	0	1	3.5
	Nonmetro	1.5	0	3	4.5
SL	Metro	2	2	2.5	6.5
	Nonmetro	1	0.5	2	3.5
Column Total		13.5	10	17.5	41

Source: Author's compilations.

of regressions for a strata and service category. The maximum possible row-score is 9. The summation of a column of scores is for the comparison of a customer class regardless of strata or service category. The maximum score for a column is 24.

In seven of the table entries, the metro stratum scored better than the nonmetro stratum, while the nonmetro stratum scored better in only one entry. The residential customer class scored best overall followed by business and Centrex. The problem areas are business intraswitch local use regardless of strata, Centrex intrastate interLATA toll regardless of strata, intrastate intraLATA for business, and Centrex in the nonmetro strata. The overall unweighed score for this table was 41 out of a possible 72.

One difficulty with the comparisons made in this section is that sample data for two samples are being compared. Which sample best fits the population parameters, if either? One problem is probably sample size. For the matrix studies data on which the regressions were based, only fifteen CLLI codes are included in the metro stratum, while nineteen are in the nonmetro stratum. However, the F-test values for the regressions were significant in all cases as were the t-tests for the individual coefficients.

The other sample size involved in these comparisons is the subscriber line sample for the AMA studies. The erratic behavior of some of the Centrex SLU data for the toll service categories suggests the sample size may not be sufficiently large when use per line-day is low for a service category in a stratum. Examine figures 3-18 and 3-21 for intrastate interLATA toll use and 3.24 and 3.27 for intrastate intraLATA toll use. Note the erratic up and down behavior of SLU averages. The research team questioned whether this is representative of the calling behavior of the population or a problem of insufficient sample size.

The general consensus of the NRRI research team is that this is the result of insufficient sample size. As for the issue of sample size, the research team could not make any firm conclusions, but made some observations regarding calling behavior and the sample plan. The distribution of originating use on each subscriber line in a sample is peculiar. It is bimodal with respect to whether a call is made or not made during a given hour. The line is either busy or not. If it is busy, the subscriber may be making a local or toll call. Since local calls are made more frequently than toll calls, its mode at zero usage is much smaller than that for toll calls. This leads to much less line-to-line variability in minutes of use during a given hour than would occur for toll calls. For instance, if the sample contains a customer with particularly erratic calling behavior including the occasional high use of a service category, that customer has a significant impact on group average. Of course, a larger sample size would improve all estimates of average use. It is the opinion of the research team that this would correct most, if not all, the problems encountered.

The second issue involves the performance of the regression analysis when use per line-day or subscriber line counts were small for a stratum. Recall from table 3.9 that the regression coefficients for the nonmetro stratum performed worse on average than those for the metro stratum, toll service categories had lower scores than local, and the customer classes scored according to their relative size (with Centrex the lowest).

The metro and nonmetro strata were determined on the basis of use-per-line-day profiles and magnitudes. The metro stratum had a higher measured total per line-day use than the nonmetro stratum (see figure 3-1). Also, the local and toll characteristics differed. These differences are reflected in the scores for row totals.

The second point to note is that toll use in general scored worse than local. Toll use per line-day is considerably lower than local use per line-day. The nonmetro stratum had higher toll use per line-day than the metro stratum (see figure 3-3), while metro had higher local use per line-day. There is a weak correlation for these relationships reflected in the scores for metro and nonmetro in table 3.9.

The third point involves examining the scores and relative sizes of the customer classes. The residential customer class scored highest with 17.5 out of 24. The metro stratum scored 8 out of 12 for residence, while the nonmetro stratum scored 9.5 out of 12 for residence. The residential customer class accounted for 68 percent of the subscriber lines used in the metro regressions and 53 percent of total lines. The similar statistic for the nonmetro class are 71 percent of lines used in the regression and 58 percent of total lines.

The Centrex class, on the other hand, was small by comparison and performed worse. The score for the Centrex class was 10 out of 24 (see table 3.9). The metro Centrex scored 7.5 out of 12, while the nonmetro scored 2.5 out of 12. The Centrex class accounted for 3.25 percent of the total lines for metro used in the regressions and 2.5 percent of all lines. The same statistics for the nonmetro stratum are 4.15 percent of lines used in the regressions and 3.4 percent of total lines. The combinations of lower use per line-day and the smaller percentage of lines may account for nonmetro Centrex's poor scoring in table 3.9.

All of these weak correlations are, of course, only circumstantial evidence that does not fully explain the performance of the estimates for intraswitch usage by the business class regardless of strata. In this circumstance, the coefficients for several hours were constrained to zero because they became negative when unrestricted. The same was true of metro intrastate interLATA for residential and nonmetro intrastate intraLATA for Centrex. This negative coefficient problem also led the research team to exclude certain customer classes from the analysis altogether because of multicollinearity.

In summary, the NRRI research team has completed many calculations on the matrix studies data and the AMA studies SLU data. A total of 544 regressions were run to develop the time-of-day profiles for three customer classes for thirteen service categories of originating and terminating use. The AMA studies data entailed the computation of over 26,000 averages that were summarized to around 13,260 weighted averages for metro and nonmetro strata. These SLU averages were based on a sample as well. This fact makes definitive conclusions regarding the comparisons of the regression coefficients and SLU averages difficult to draw. Statistical inference is further complicated by the fact that the matrix studies and AMA studies do not measure the identical usages. AMA measures only conversation time for successful calls, which is a subset of the holding time for successful and unsuccessful calls that is measured by matrix studies. The sheer size of the data sets coupled with budget and time limitations precluded further analysis of the data. The regression coefficients and SLU averages are used to develop allocation factors for cost studies in the scenario analysis presented in this report.

CHAPTER FOUR

ALGORITHMS FOR COMPUTING ALLOCATION FACTORS FOR EIGHT COST ALLOCATION SCENARIOS

Eight cost studies are performed to assess the impact of peak methods on the allocation of the revenue requirement to services and customer classes. Each of the cost studies uses the same basic accounting input data. The studies differ only in the allocation factors for local dial switching and subscriber loop investments. These cost studies are fully distributed cost studies, which are sometimes referred to as category cost studies. For category cost studies, the costs are allocated by direct assignment or allocation factors to categories of services and/or customer classes. In this chapter, the network of service and customer categories used in the cost studies and the algorithms for computing the allocation factors are presented.

This chapter consists of five parts. In the first section, the eight allocation scenarios are described. Each cost study is based on different allocation factors for switching and subscriber loop plant. In the second section, the network of service and customer categories is presented and the interrelationships among them are discussed. In the third section, some additional data that were collected are discussed. The fourth section contains a discussion of the algorithms for computing the allocation factors for each of the eight scenarios and presents the results of these computations. In the final section, the allocation factors from the eight scenarios for selected investments are compared and analyzed to form some expectation about the results of the cost studies. This analysis also examines the relationships between the allocation factors based on SLU averages and those based on the regression coefficients in light of the comparisons performed in the previous chapter.

The Eight Scenarios

The eight cost-allocation scenarios presented in this report allow the effect of several measures of use of telephone services on the allocation of the revenue requirement to be analyzed. One primary effect analyzed is the inclusion of measures of peak use instead of average use. Another effect examined is the impact of including estimates of terminating use in the allocations. Finally, the effect of using the SLU averages versus the regression coefficients is analyzed. The eight scenarios defined in this section are divided into three groups. The first group of scenarios is based on the SLU averages developed in the previous chapter. There are two scenarios in this group. The second group of scenarios is based on the regression coefficients for originating use only for both the typical day profile and the busiest three days. There are three scenarios in this group. The third group of scenarios is based on the regression coefficients for originating and terminating use for both the typical-day profile and the three busiest days. There are three scenarios in this group.

The Base Case: use24

The base case is the "use24" scenario which utilizes the SLU per-line-day averages and allocates the revenue requirement on the basis of average use of plant and equipment over a typical nonholiday weekday during the sample period. This approach to allocations best depicts the standard industry practice used during the past decade and a half for allocations of traffic-sensitive investment. This scenario extends the practice to nontraffic-sensitive (NTS) costs and performs an SLU allocation of NTS costs. This scenario is labelled "use24" for purposes of presentation.

The Typical Day SLU Peak: usepeak

The "usepeak" scenario utilizes the typical-day profile developed from the hourly SLU per-line-day averages. The busiest hour of a typical day, on average, over the sample period for each piece of equipment is estimated and identified. The contribution of services and/or customer classes to this peak hour is identified and is the allocator for traffic-sensitive costs. NTS costs are assigned to customer classes according to relative loop counts for each class and allocated to the services based on the busiest hour on average for each customer class. This scenario is labelled "usepeak" for purposes of presentation.

Average Originating Use Based on Regression Coefficients: betaaveo

The "betaaveo" scenario utilizes the average originating use per line-day derived from the regression coefficients. This scenario is similar to the base case (use24). It allows the effect of the regression approach to be compared directly to the allocation factors based on the SLU data. This scenario is called "betaaveo" for purposes of presentation. (The last letter "o" stands for originating use only.)

The Typical-Day Originating Regression Peak: avepeako

The "avepeako" scenario utilizes the typical-day profile developed using the regression coefficients that estimate hourly per-line-day originating use. The busiest hour for a typical day, on average, is estimated for each piece of equipment. The contribution of services and/or customer classes to this hour is used to compute allocation factors. This scenario allows two effects to be examined. One effect is a further analysis of the impact of the regression data when compared to the SLU data. This analysis entails comparing this scenario to the usepeak scenario. The other effect analyzed is the impact of this measure of peak use on the allocation of the revenue requirement when compared to the betaaveo scenario. This scenario is labelled "avepeako" for presentation. (Again the "o" at the end of the scenario name indicates originating use only.)

The Busiest Three Hours of Originating Use: daypeako

The "daypeako" scenario utilizes the busiest three hours identified from matrix study data. Recall these data were developed using regression analysis and were believed by the research team to best reflect network planning criteria. These regression coefficients are used to estimate the three busiest hours for each piece of equipment and identify service and/or customer class contributions to these peaks. This scenario does not have any counterpart for the SLU data. It is compared to the betaaveo and avepeako scenarios to evaluate the impact of this measure of busy-hour on the allocation of the revenue requirement. This scenario is labelled "daypeako" for purposes of presentation. (Again, the "o" at the end of the name signifies originating use only.)

Average Use Based on Regression Coefficients: betaave

The "betaave" scenario utilizes the average use per line-day derived from the regression coefficients. This scenario differs from betaaveo in that terminating as well as originating use is included in the computations of these allocation factors. A comparison of this scenario with the betaaveo scenario permits an analysis of the impact on the base case of including terminating use on the allocation of the revenue requirement. This scenario is called "betaave" for presentation. (Note that the trailing "o" is deleted from the name signifying both originating and terminating use.)

The Typical-Day Regression Peak: avepeak

The "avepeak" scenario utilizes the typical-day profile developed using the regression coefficients that estimated hourly per-line-day originating and terminating use. The busiest hour for a typical day, on average and when considering both originating and terminating use, is estimated and identified for each piece of equipment. The contribution of services and/or customer class to this hour is used to compute allocation factors. This scenario allows two effects to be analyzed: the effect of including terminating use in the peak allocation when this scenario is compared with the avepeako scenario, and the effect of the originating and terminating peak relative to their average by comparing this scenario to the betaave scenario. This scenario is labelled "avepeak" for presentation.

The Three Busiest Hours of Use: daypeak

The "daypeak" scenario is based on the three busiest hours of originating and terminating use over the sample period as identified from the matrix studies data. The purpose of this scenario is to discern the effect of terminating use on the allocations when compared to the daypeako scenario. Also, the impact of this measure of peak as opposed to the avepeak and betaave scenarios may be analyzed. This scenario is labelled "daypeak" for presentation.

Structure of Service and Customer Categories

As noted, fully distributed cost studies have a network of customer and/or service categories to which costs are assigned or allocated. This network can be depicted as an inverted tree diagram in which the "root" is the total for all customer classes and services. As one moves away from the root toward the branches, the customer classes and services become increasingly disaggregated. The network for the eight scenarios analyzed in this report consists of eighty-two categories. The structure for this network is depicted in figure 4-1 and suggests the usage data needed to compute allocation factors as well as guides in preparing data for the scenarios. The structure suggests the data needed for the scenarios by pointing to specific services and/or customer class categories for which allocation factors are computed. An analysis of this structure also helps to understand some of the results obtained from the eight scenarios.

The categories in figure 4-1 may be divided conceptually into two sets. For one set of categories, the allocation of the revenue requirement does not change with the eight scenarios. The other set of categories has

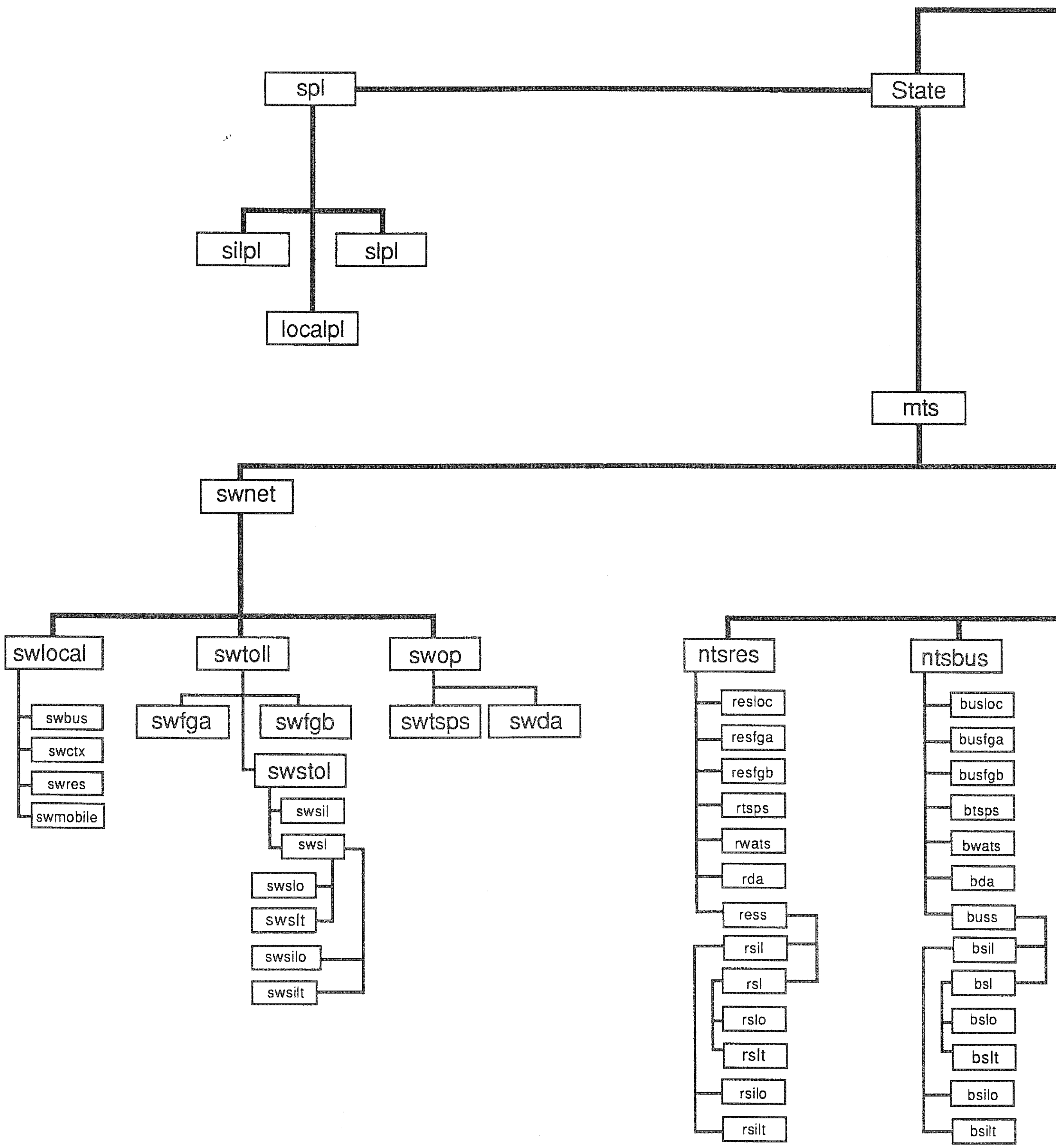
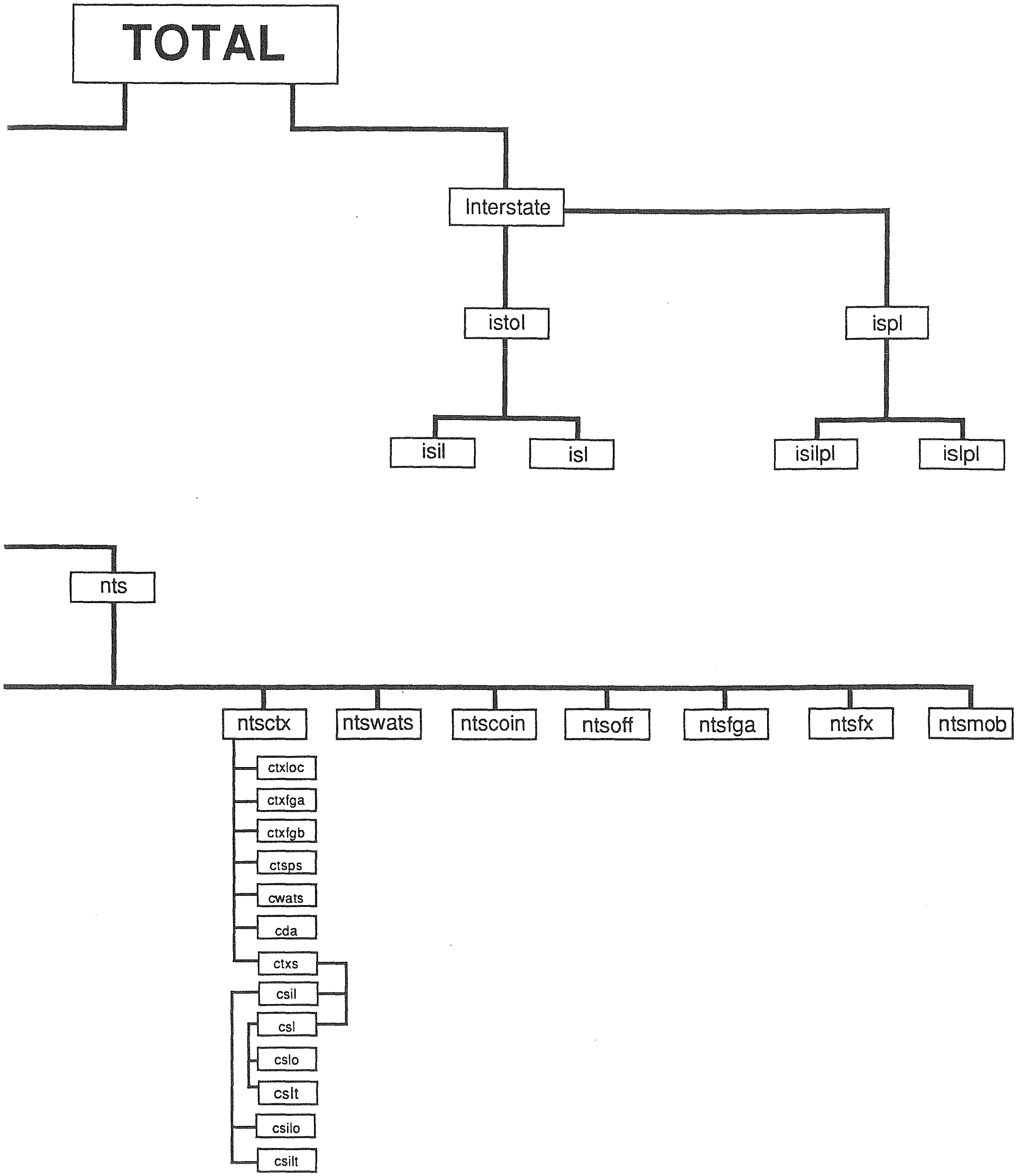


Figure 4.1 Structure of service and customer class categories.


TOTAL
Interstate
istol
ispl
isil
isl
isilpl
islpl
nts
ntsctx
ntswats
ntscoin
ntsoff
ntsfga
ntsfx
ntsmob
ctxloc
ctxfga
ctxfgb
ctsps
cwats
cda
ctxs
csil
csl
cslo
cslt
csilo
csilt

allocations that change with each of the scenarios. These two sets of categories are discussed below.

Figure 4-2 depicts the set of categories for which allocations do not change with each of the scenarios. Table 4.1 contains the definitions for each of the category names contained in the cells of figure 4-2. This set of cells is from the top half or "root" part of the inverted tree diagram in figure 4-1. The allocations to these cells are fixed either institutionally or technically. The first division of costs between the state and interstate jurisdictions is fixed by separations procedures. The same is true for any breakdown of costs within the interstate branch of the tree diagram. The research team assumed the results of separations acted as an institutional constraint on the revenue requirement for the state jurisdiction. Consequently, these allocations were accepted without question or alteration.

The division of the state category between state private line (SPL) and message telephone service (MTS) is also fixed for the eight scenarios. The assignments of plant and equipment to the private line categories for the interstate jurisdiction are determined by accounting records with the exception of the subscriber loop portion, which is allocated by loop counts to the intrastate private line categories. The allocation of expenses to the intrastate private line categories is also fixed with respect to the eight scenarios because their allocation procedures are fixed. Consequently, the intrastate private line category is assigned 3.2749 percent of the revenue requirement for the intrastate jurisdiction.

The message telephone service (MTS) category is divided between the switched network (swnet) and the nontraffic-sensitive (NTS) categories. One may think of the switch network category as analogous to traffic-sensitive cost categories. The assignment of the cost of plant and equipment to either the switched network or NTS category is largely a technical matter. Nontraffic-sensitive costs are generally correlated to subscriber loop or customer-related investments. The costs of plant and equipment assigned to the switched network category are correlated with the traffic carried either in terms of calls or holding time. Since the network configuration is fixed for the eight scenarios, 41.3227 percent of the intrastate jurisdictional revenue requirement is allocated to the "swnet" category, while 55.0697 percent is assigned to the "NTS" category.

TABLE 4.1

DEFINITIONS OF CUSTOMER AND/OR SERVICE CATEGORIES DEPICTED IN FIGURE 4.2

CATEGORY NAME	DESCRIPTION	INPUT CATEGORY
TOTAL	Total Amount	
INTERSTATE	Total Interstate Jurisdictional Category	total
STATE	Total Intrastate Jurisdictional Category	total
MTS	Message Telephone Service	state
SPL	Intrastate Private Line Services	state
NTS	Nontraffic-Sensitive Category	mts
SWNET	Switched Network Category	mts
NTSBUS	Business NTS Costs Line-Related Costs for Business	nts
NTSRES	Residential NTS Costs Line-Related Costs for Residential	nts
NTSCTX	Centrex NTS Costs Line-Related Costs for Centrex and Trunk	nts
NTSCOIN	Nontraffic-Sensitive Cost Category for Coin	nts
NTSFGA	NTS Costs for Feature Group A	nts
NTSFX	NTS Costs for Foreign Exchange	nts
NTSMOB	NTS Costs for Mobile	nts
NTSOFF	NTS Costs for Official Services	nts
NTSWATS	NTS Costs for WATS Both out WATS and 800	nts
LOCALPL	Local Private Line Services	spl
SILPL	Intrastate InterLATA Private Line	spl
SLPL	Intrastate IntraLATA Private Line	spl
ISIL	Interstate InterLATA Use of the Switched Network -- Access	istol
ISILPL	Interstate InterLATA Private Line	ispl
ISL	Interstate IntraLATA Use of the Switched Network -- Access	istol
ISLPL	Interstate IntraLATA Private Line	ispl
ISPL	Interstate Private Line Service	interstate
ISTOL	Interstate Toll Use of the Switched Network	interstate

Source: Author's compilations.

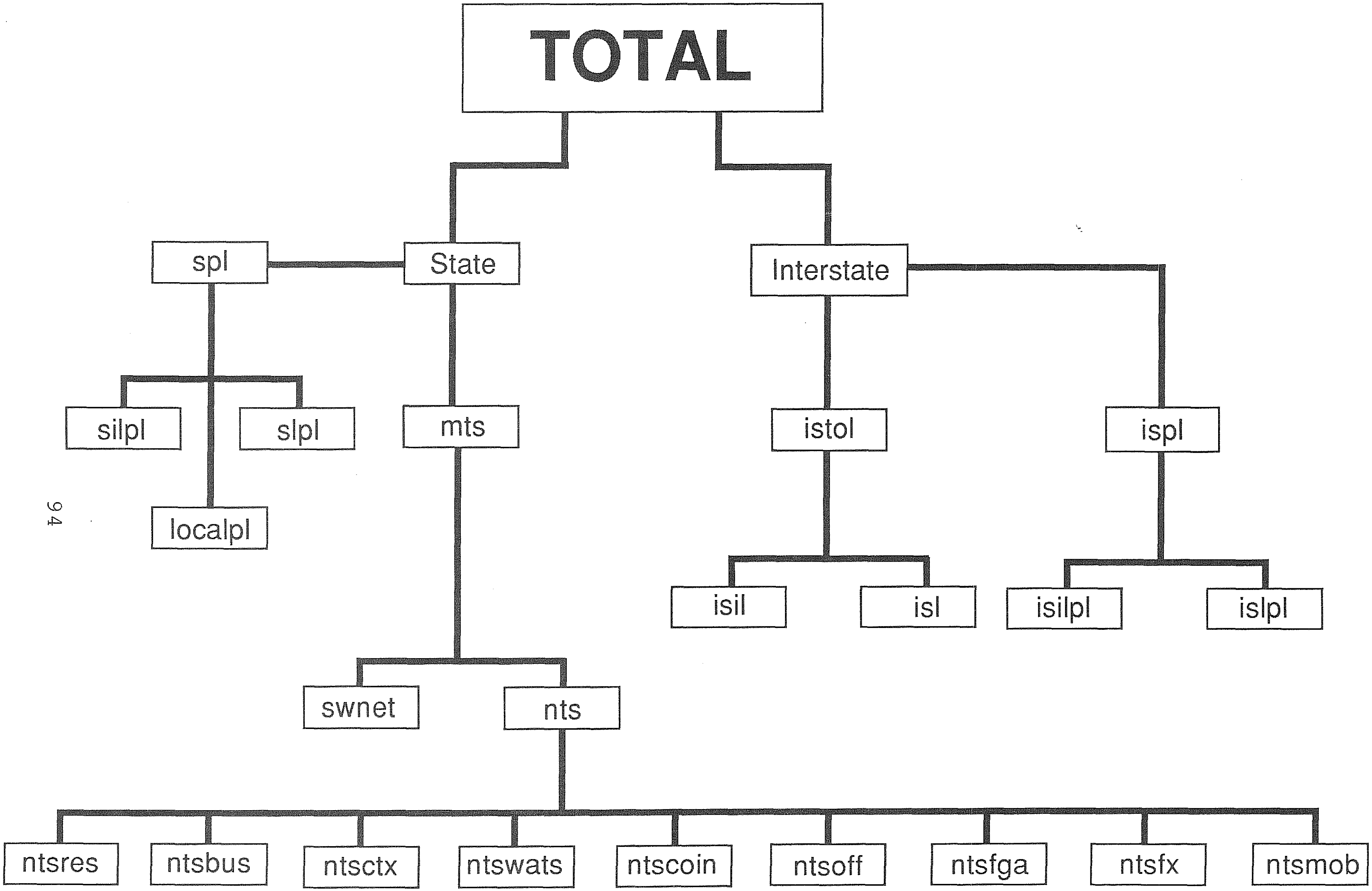


Figure 4.2 Service and customer class categories for which allocations are fixed in the eight scenarios.

Finally, the costs assigned to the NTS category are distributed among the customer classes on the basis of the relative loop counts for each of the nine classes used in the eight scenarios. Table 4.2 contains the loop counts for each of the customer class categories under the NTS category. As depicted in figure 4-2, the data in this table are segregated by loop counts for the four technologies of local dial switching and in total for the wire and facilities costs. Since the customer classes are fixed in number and in size, the allocation of costs to the nine customer categories under the NTS category does not change with the eight scenarios. Consequently, 32 percent of the intrastate revenue requirement is assigned to the residential NTS (ntsres) category, 9 percent to the business NTS (ntsbus) category, and 4 percent to the Centrex NTS (ntsctx) category. These three customer categories for the NTS category account for 45 percent of the intrastate revenue requirement and 82 percent of the costs assigned to NTS.

TABLE 4.2

SUBSCRIBER LOOP COUNTS FOR NINE CUSTOMER CLASSES
BY SWITCHING TECHNOLOGY AND IN TOTAL

Category	No. 5 Crossbar	Step-by Step	Electronic Analog	Electronic Digital	Total
NTS	256,039	643,145	4,590,964	570,065	6,237,347
NTSBUS	41,407	102,194	951,966	96,394	1,224,671
NTSRES	200,579	510,491	2,992,557	439,325	4,274,152
NTSCTX	4,741	7,252	369,800	17,745	404,911
CTSCOIN	4,831	11,869	86,078	9,833	115,940
NTSWATS	1,290	2,250	59,330	3,368	67,761
NTSOFF	1,772	6,659	98,776	1,732	110,510
NTSFGA	299	286	19,880	433	21,410
NTSFX	893	1,422	8,197	1,216	12,644
NTSMOB	227	722	4,380	19	5,348

Source: Author's computations.

There are twenty-five customer and/or service categories that are fixed with regard to the eight scenarios. The remaining fifty-seven categories have allocation factors associated with them which may shift costs among services and/or customer classes. These categories may be conceptualized as four sets of categories. One set is associated with the switch network (swnet) category, while the remaining three are associated with the customer/service categories for ntsres, ntsbus, and ntsctx. Each of these sets of categories is discussed below.

The switch network (swnet) portion of the inverted tree diagram consists of eighteen customer and/or service categories. This portion of the structure of the categories is depicted in figure 4-3. Each of the category names appearing in this diagram is defined in table 4.3. The switched network (swnet) category is divided into three categories for local use (swlocal), toll use (swtoll), and use of operator services (swop) on the basis of the relative use of the services by customers, as defined by each scenario. The local category is further divided into local use categories for business, Centrex, residential, and mobile customers. The allocations among these local service categories for the switched network depend on each class's relative use of local services. Consequently, the usage measures used to develop allocation factors for the eight scenarios could result in shifts in the revenue requirement among the customer classes in this portion of the allocation network.

The remaining categories for the switched network categories deal with toll use or operator services. None of the detailed categories in these branches has customer class distinctions. All of these services are measured-rate services. As such, the time of day at which these services are used is more important in driving costs than the customer class using them. In fact, if local services were all measured-rate services, the customer class distinction would not be needed for the switched network (swnet).

The toll (swtoll) category consists of features group A (swfga), features group B (swfgb), and dial-"1" intrastate toll services (swstol). The dial-"1" toll service category is divided between interLATA (swsil) and intraLATA (swsl) calling, and each of these is further split between originating and terminating use when applicable.

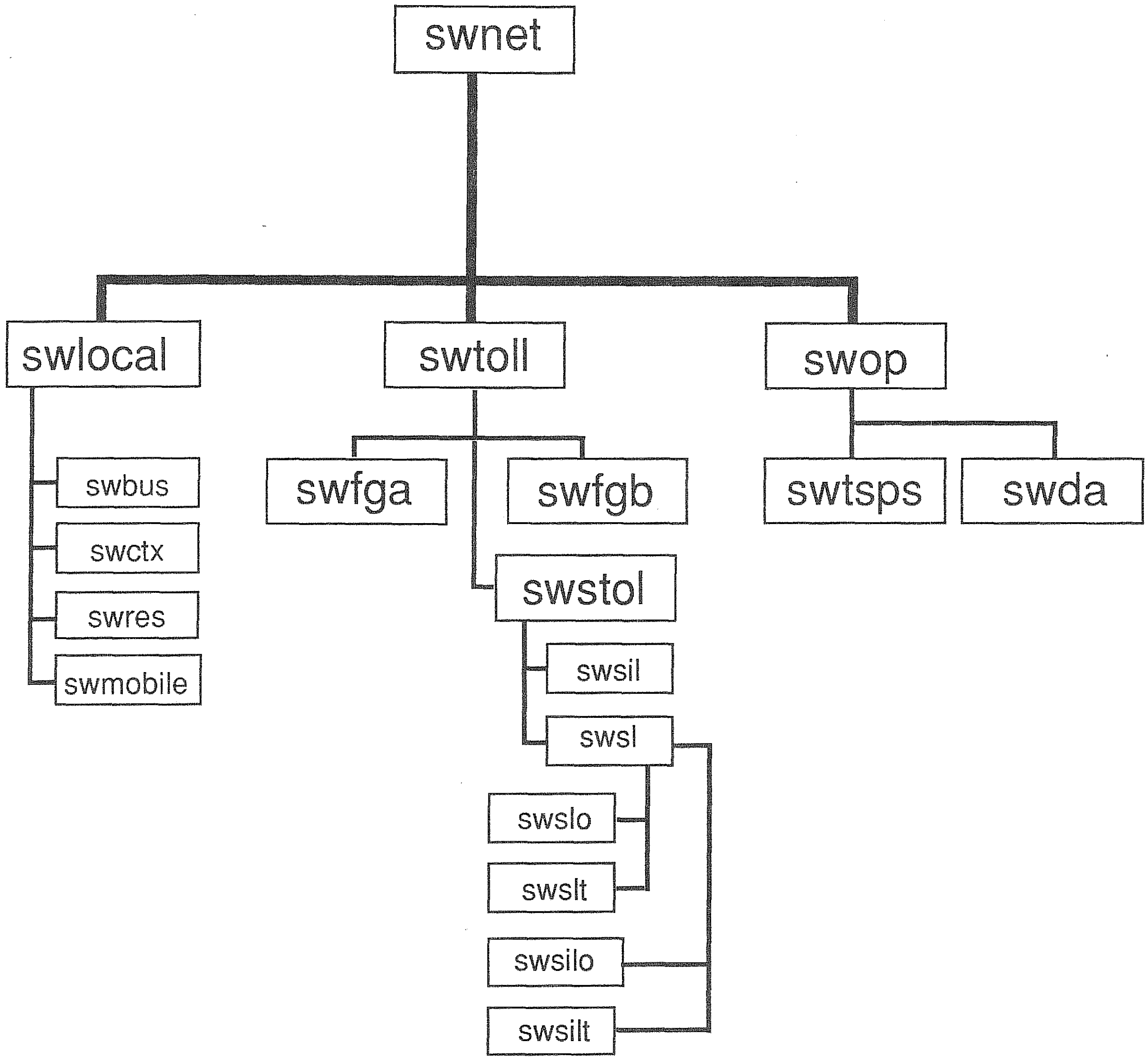


Figure 4.3 Structure of service and customer class categories for the switched network.

TABLE 4.3

DEFINITIONS OF CUSTOMER AND/OR SERVICE CATEGORIES DEPICTED IN FIGURE 4.3

CATEGORY NAME	DESCRIPTION	INPUT CATEGORY
SWNET	Switched Network Category	mts
SWBUS	Local Switched Network Costs for Business Customers	swlocal
SWCTX	Local Switched Network Costs for Centrex and Trunk Customers	swlocal
SWLOCAL	Local Switched Network	swnet
SWMOBILE	Usage of the Switched Network by Mobile	swlocal
SWRES	Local Switched Network Costs for Residential Customers	swlocal
SWFGA	Feature Group A Use of the Switched Network	swtoll
SWFGB	Feature Group B Use of the Switched Network	swtoll
SWSIL	Intrastate InterLATA Use of the Switched Network -- Access	swstol
SWSILO	Intrastate InterLATA Originating Use of the Switched Network -- Access	swsil
SWSILT	Intrastate InterLATA Terminating Use of the Switched Network -- Access	swsil
SWSL	Intrastate IntraLATA Use of the Switched Network -- Access	swstol
SWSLO	Intrastate IntraLATA Originating Use of the Switched Network -- Access	swsl
SWSLT	Intrastate IntraLATA Terminating Use of the Switched Network -- Access	swsl
SWSTOL	Intrastate Toll Use of the Switched Network	swtoll
SWTOLL	Toll Services for the Switched Network	swnet
SWDA	Directory Assistance -- Use of the Switched Network and DA Centers	swop
SWOP	Operator Services for Switched Network Both TSPS and DA	swnet
SWTSPS	Dial 0 Operator Services -- Use of the Switched Network and TSPS Centers	swop

Source: Author's compilations.

The operators services category (swop) is split between dial-"0" toll calling (swtsps) and directory assistance (swda). Both of these services are originating use only.

The NTS categories of ntsres, ntsbus, and ntsctx are allocated to local and toll services by usage-based allocation factors. The structure of service categories for residential NTS (ntsres) costs is depicted in figure 4-3. Table 4.4 contains the definition for each of the categories in figure 4-3. The structure for business NTS (ntsbus) costs is depicted in figure 4-4 and the definitions are in table 4.5. The structure for Centrex NTS (ntsctx) costs is depicted in figure 4-5 and the definitions are in table 4.6. On studying these diagrams and tables, note that the structure is identical for all three categories of customers. The residential class structure is discussed here. Of course, the same comments apply to the other two customer categories.

The residential NTS (ntsres) category is divided among local, toll, and operator services. This division may not be as apparent as it was with the switched network when examining figure 4-3. The local use category is resloc. The main divisions of toll use are residential features group A (resfga), residential features group B (resfgb), residential use of 800 WATS services (rwats), and residential intrastate dial-"1" toll use (ress). The dial-"1" toll services are further split between intraLATA (rsl) and interLATA (rsil) toll use. Each of these categories is then allocated between originating and terminating use when applicable. This structure of dial-"1" toll services allows the common line charge portion of the access charges for residential customers to be computed. Finally, the operator services are found in dial-"0" toll use (rtsps) and directory assistance use (rda). As noted, this structure is duplicated for both business and Centrex customers.

Having described the structure of customer and/or service categories for the eight scenarios, the impact of shifts in the magnitude of a customer class's use and relative use of toll and local services can be examined for possible tendencies. First, recall that the switched network is assigned 41 percent of the intrastate revenue requirement while the NTS categories are assigned 55 percent. Recall further that the NTS costs are assigned to the NTS customer categories by subscriber loop counts. All of these assignments are fixed for the eight scenarios. Consequently, the shift of revenue

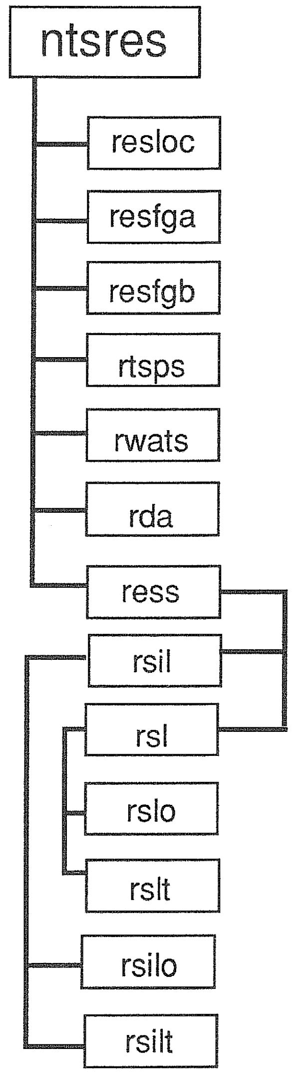


Figure 4.4 Structure of service categories for the residential NTS category.

TABLE 4.4

DEFINITIONS OF CUSTOMER AND/OR SERVICE CATEGORIES DEPICTED IN FIGURE 4.4

CATEGORY NAME	DESCRIPTION	INPUT CATEGORY
NTSRES	Residential NTS Costs Line-Related Costs for Residential	nts
RDA	Residential Use of Directory Assistance	ntsres
RESFGA	Feature Group A Use of Line-Related Cost for Residential Customers -- Access	ntsres
RESFGB	Feature Group B Use of Line-Related Cost for Residential Customers -- Access	ntsres
RESLOC	Local Use of the Line-Related Costs for Residential Customers -- Access	ntsres
RESS	Intrastate Toll Use of Line-Related Cost for Residential Customers -- Access	ntsres
RSIL	Intrastate InterLATA Access for Residential Line-Related Costs	ress
RSILO	Intrastate InterLATA Originating Access for Residential Line-Related Costs	rsil
RSILT	Intrastate InterLATA Terminating Access for Residential Line-Related Costs	rsil
RSL	Intrastate IntraLATA Access for Residential Line-Related Costs	ress
RSLO	Intrastate IntraLATA Originating Access for Residential Line-Related Costs	rsl
RSLT	Intrastate IntraLATA Terminating Access for Residential Line-Related Costs	rsl
RTSPS	Residential Use of Operator Services	ntsres
RWATS	Residential Use of 1-800 Dial in WATS Service	ntsres

Source: Author's compilations.

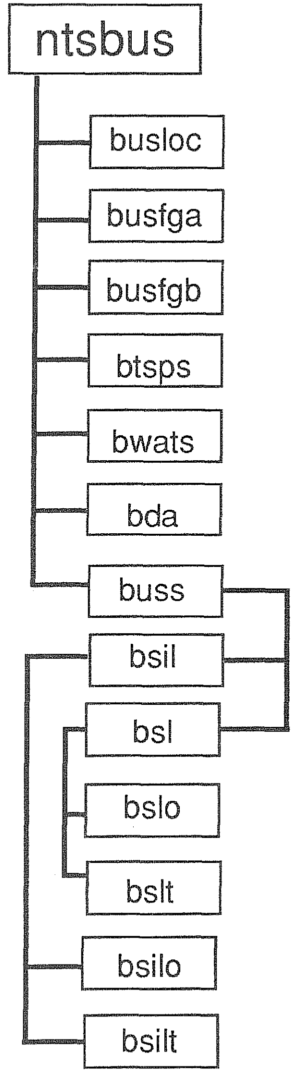


Figure 4.5 Structure of service categories for the business NTS category.

TABLE 4.5

DEFINITIONS OF CUSTOMER AND/OR SERVICE CATEGORIES DEPICTED IN FIGURE 4.5

CATEGORY NAME	DESCRIPTION	INPUT CATEGORY
NTSBUS	Business NTS Costs Line-Related Costs for Business	nts
BDA	Business Use of Directory Assistance	ntsbus
BSIL	Intrastate InterLATA Access for Business Line-Related Costs	buss
BSILO	Intrastate InterLATA Originating Access for Business Line-Related Costs	bsil
BSILT	Intrastate InterLATA Terminating Access for Business Line-Related Costs	bsil
BSL	Intrastate IntraLATA Access for Business Line-Related Costs	buss
BSLO	Intrastate IntraLATA Originating Access for Business Line-Related Costs	bsl
BSLT	Intrastate IntraLATA Terminating Access for Business Line-Related Costs	bsl
BTSPS	Business Use of Operator Services	ntsbus
BUSFGA	Feature Group A Use of Line-Related Cost for Business Customers -- Access	ntsctx
BUSFGB	Feature Group B Use of Line-Related Cost for Business Customers -- Access	ntsbus
BUSLOC	Local Use of Line-Related Costs for Business Customers	ntsbus
BUSS	Intrastate Toll Use of Line-Related Cost for Business Customers -- Access	ntsbus
BWATS	Business Use of 1-800 Dial in WATS Services	ntsbus

Source: Author's compilations.

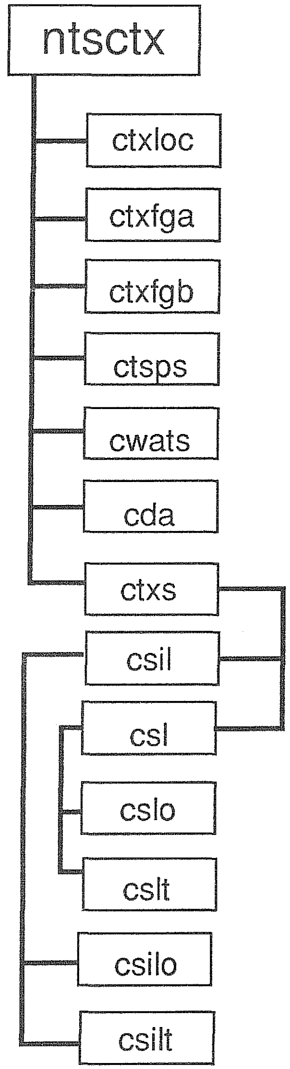


Figure 4.6 Structure of service categories for the Centrex NTS category.

TABLE 4.6

DEFINITIONS OF CUSTOMER AND/OR SERVICE CATEGORIES DEPICTED IN FIGURE 4.6

CATEGORY NAME	DESCRIPTION	INPUT CATEGORY
NTSCTX	Centrex NTS Cost Line-Related Costs for Centrex and Trunk	nts
CDA	Centrex Use of Directory Assistance	ntsctx
CSIL	Intrastate InterLATA Access for Centrex Line-Related Costs	ctxs
CSILO	Intrastate InterLATA Originating Access for Centrex Line-Related Costs	csil
CSILT	Intrastate InterLATA Terminating Access for Centrex Line-Related Costs	csil
CSL	Intrastate IntraLATA Access for Centrex Line-Related Costs	ctxs
CSLO	Intrastate IntraLATA Originating Access for Centrex Line-Related Costs	csl
CSLT	Intrastate IntraLATA Terminating Access for Centrex Line-Related Costs	csl
CTSPS	Centrex Use of Operator Services	ntsctx
CTXFGA	Feature Group A Use of Line-Related Cost for Centrex Customers -- Access	ntsctx
CTXFGB	Feature Group B Usage by Centrex Customers. Related to NTS Costs	ntsctx
CTXLOC	Local Use of the Line-Related Costs for Centrex Customers	ntsctx
CTXS	Intrastate Toll Use of Line-Related Cost for Centrex Customers -- Access	ntsctx
CWATS	CENTREX Usage of 1-800 Dial in WATS Service	ntsctx

Source: Author's compilation.

requirements among the customer classes is dampened. For example, suppose business use in total increases 10 percent relative to Centrex and residential use by changing the measure of usage. The impact of this change shifts some portion of the revenue requirement allocated to the switch network to business for local services away from residential and Centrex. The maximum possible shift to business is 4.1 percent (10% X 41%) if one assumes all use of the switched network is local. More realistically, however, local use of the switched network may receive around 25 percent of the revenue requirement. In this case, the maximum expected shift would be 2.5 percent (10% X 25%).

The NTS allocations to business would not change. However, shift in the revenue requirements to local or toll services can shift on the NTS side as well as the switched network side. Consequently, one should expect to see larger shifts in revenue requirements among service categories than among customer categories. This is solely the result of the structure of costs outlined in this section.

Additional Network Information

Several pieces of information about the Southwestern Bell network in Texas were needed to compute allocation factors for local dial switching trunk capacity and subscriber loops. These data are described in this section.

The accounting information for local dial switching equipment in separations procedures segregates the investment costs into cost categories according to switching technology. For purposes of the eight scenarios, step-by-step, crossbar, electronic analog, and electronic digital technologies were sufficient characterizations for the Southwestern Bell network. Consequently, all CLLI codes in Southwestern Bell's network were classified into one of these four technology categories. The superscript "T" denotes this stratification. All CLLI codes in Southwestern Bell's territory also were stratified by the metro and nonmetro strata denoted by superscript "S." Recall that this stratification is tied to rate groups. CLLI codes also were characterized according to whether a switch resided in single-switch (local calling area) or multiple-switch exchanges. If the exchange was a single switch, interswitch local calling (RAEX) was excluded from the usage calculations for equipment and outside plant associated with that CLLI code.

The research team acquired R525 reports for each of the three sampled months for all CLLI codes in Southwestern Bell's territory. This report provides information on the number of lines in service at the end of each month by USOC. As done previously with the sampled CLLI codes, this information was transformed into the thirteen customer classes identified for purposes of this study. These subscriber line counts are partitioned by the technology of CLLI code, metro or nonmetro strata, and multiple-switch or single-switch exchanges.

Algorithms for Computing Allocation Factors

In this section, the algorithms for computing allocation factors for local dial switching and subscriber loop capacity are presented for each of the eight scenarios. This section is organized into subsections by switching and loop capacity, respectively.

Local Dial Switching

The investment costs of local dial switching equipment are segregated by technology of the switch. The costs associated with each technology are divided between traffic-sensitive and nontraffic-sensitive components for purposes of allocation. Factors for the traffic-sensitive portion, as noted earlier, allocate costs to the switch network (swnet) portion of categories, while the NTS portion allocates the costs assigned to NTS for residential customers (ntsres), business customers (ntsbus), and Centrex customers (ntsctx). The algorithms for computing the traffic-sensitive allocation factors are presented first, followed by the NTS algorithms.

Traffic-Sensitive Costs

For purposes of presenting the algorithms for computing the allocation factors for the traffic-sensitive costs, the eight allocation scenarios can be segregated into three sets. The first is the three scenarios based on measures of average use or twenty-four-hour use over a typical day. These three scenarios are use24, betaaveo, and betaave. The second set of three scenarios consists of usepeak, avepeako, and avepeak. These are based on the busy hour for a typical day during the sample period. The last set of scenarios consists of daypeako and daypeak, which are based on the three busiest hours during the ninety-day sample period. This grouping of scenarios is the basis for the discussion below.

Average-Use Scenarios

The first step in computing allocation factors for each of the three average-use scenarios is to compute the number of lines at technology T for customer class c. The formula is:

$$N_{csT} = \sum_{\ell \epsilon T \; S_s} N_{c\ell} \qquad (12)$$

where $N_{c\ell}$ denotes the population of subscriber lines for customer class c at CLLI code ℓ and the summation denoted that the sum is restricted to CLLI codes of technology T in stratum s. This subscriber line count is used in all three of the average-use scenarios.

The second step is to compute the allocation factor for each of the three average-use or twenty-four-hour-use scenarios. The computational formula for the base case scenario, use24, is given by:

$$F_{icT} = \frac{\sum_{t} \bar{U}_{icts} N_{csT}}{\sum_{i} \sum_{c} \sum_{t} \bar{U}_{icts} N_{csT}} \qquad (13)$$

where F_{icT} is the allocation factor for service i used by customer class c at CLLI codes of technology T. As noted previously, the customer class distinction for the switched network toll use is not used. Consequently, the F_{icT} are summed over all customer classes (c) for toll and operator services. The allocation factors for the use24 scenario are presented in table 4.7 as percentages. The columns of this table add to more than 100 percent. Recall, however, the relationships among categories in the switched network. First, swlocal, swtoll, and swop categories add to 100 percent for swnet category. Second, swlocal (78.415% in Table 4.7 for No. 5 Crossbar) is the sum of swbus (12.733%), swctx (2.805%), and swres (62.876%). Third, swtoll (11.026%) is the sum of swstol (7.912%), swfga (.691%), swfgb (.398%), and swwats (2.025%). Finally, swstol (7.912%) is the sum of swsil (4.57%) and swsl (3.342%).

TABLE 4.7

ALLOCATION FACTORS FOR LOCAL DIAL SWITCHING
TRAFFIC-SENSITIVE COSTS: SCENARIO USE24

Category	No. 5 Crossbar	Step-by-Step	Electronic Analog	Electronic Digital
SWBUS	12.733%	12.800%	17.131%	13.467%
SWCTX	2.805	1.829	6.667	3.883
SWRES	62.876	65.216	51.630	60.583
SWLOCAL	78.415	79.845	75.428	77.933
SWSIL	4.570	4.648	4.020	4.317
SWSL	3.342	3.014	5.723	4.219
SWSTOL	7.912	7.662	9.743	8.537
SWFGA	0.691	0.624	0.760	0.715
SWFGB	0.398	0.312	0.452	0.411
SWWATS	2.025	1.854	2.772	2.284
SWTOLL	11.026	10.452	13.728	11.946
SWDA	0.040	0.035	0.044	0.043
SWTSPS	10.519	9.668	10.801	10.078
SWOP	10.560	9.703	10.845	10.121
SWNET	100.000	100.000	100.000	100.000

Source: Authors' compilations.

The allocation factors for the betaaveo and betaave scenarios are based on the regression coefficient data derived from the matrix studies data. The allocation factors for the betaaveo scenario only uses the originating (D = 0) regression coefficients in the computation. The formula is:

$$F_{icT} = \frac{\sum_{t} \hat{\beta}_{tciDs} N_{csT}}{\sum_{i} \sum_{c} \sum_{t} \hat{\beta}_{tciDs} N_{csT}} \qquad \text{where } D = 0. \qquad (14)$$

This set of allocation factors for the betaaveo scenario is reported in table 4.8.

TABLE 4.8

ALLOCATION FACTORS FOR LOCAL DIAL SWITCHING
TRAFFIC-SENSITIVE COSTS: SCENARIO BETAAVEO

Category	No. 5 Crossbar	Step-by-Step	Electronic Analog	Electronic Digital
SWBUS	20.176%	24.347%	25.143%	19.977%
SWCTX	0.141	0.029	5.650	0.458
SWRES	78.691	74.757	68.170	78.594
SWLOCAL	84.449	83.887	88.378	86.481
SWSIL	5.936	6.041	4.410	5.254
SWSILO	5.936	6.041	4.410	5.254
SWSL	4.761	4.769	3.654	4.321
SWSLO	4.761	4.769	3.654	4.321
SWSTOL	10.697	10.810	8.064	9.575
SWFGA	0.809	0.601	0.985	0.789
SWFGB	1.286	1.330	0.613	0.998
SWTOLL	12.792	12.741	9.662	11.362
SWDA	0.436	0.538	0.394	0.373
SWTSPS	2.323	2.835	1.567	1.783
SWOP	2.759	3.372	1.960	2.156
SWNET	100.000	100.000	100.000	100.000

Source: Authors' compilations.

The allocation factors for traffic-sensitive costs for the betaave scenario use the same formula as betaaveo with the exception that the direction (D) can be both originating and terminating. These factors are reported in table 4.9.

TABLE 4.9

ALLOCATION FACTORS FOR LOCAL DIAL SWITCHING
TRAFFIC-SENSITIVE COSTS: SCENARIO BETAAVE

Category	No. 5 Crossbar	Step-by-Step	Electronic Analog	Electronic Digital
SWBUS	25.557%	30.078%	30.202%	25.222%
SWCTX	0.122	0.026	5.161	0.429
SWRES	52.338	47.595	47.385	54.541
SWLOCAL	78.252	77.951	82.894	80.444
SWSIL	9.513	9.826	7.776	8.600
SWSILO	4.175	4.170	2.849	3.616
SWSILT	5.338	5.657	4.927	4.984
SWSL	7.855	7.670	5.638	7.088
SWSLO	3.349	3.292	2.361	2.973
SWSLT	4.506	4.378	3.277	4.115
SWSTOL	17.367	17.496	13.415	15.688
SWFGA	0.750	0.558	0.924	0.733
SWFGB	1.690	1.667	1.502	1.651
SWTOLL	19.807	19.721	15.840	18.073
SWDA	0.306	0.371	0.254	0.257
SWTSPS	1.634	1.956	1.012	1.227
SWOP	1.940	2.328	1.267	1.484
SWNET	100.000	100.000	100.000	100.000

Source: Authors' compilations.

Average-Peak Scenarios

To compute traffic-sensitive allocation factors for the average-peak scenarios (usepeak, avepeako, and avepeak) a time-of-day profile for all CLLI codes in Southwestern Bell's territory must be estimated and the busiest hour, on average, for each CLLI code identified. Once this estimated busy hour at each and every CLLI code is identified, the contribution of each service and customer class to the busy hours is computed. The usepeak scenario is covered first, followed by avepeako and avepeak scenarios, respectively.

The usepeak scenario, as noted, uses the SLU per-line-day hourly averages. The first step is to compute the hourly use of all services by all customer classes at each CLLI code in Southwestern Bell's territory. The formula is:

$$\hat{U}_{t\ell} = \sum_i \sum_c \bar{U}_{tics} N_{c\ell}, \text{ where } \ell \epsilon S_s. \qquad (15)$$

These hourly average usages for each hour and CLLI code are ordered from largest to smallest hourly use for each CLLI code. Denote the hour for the busiest usage on average at each CLLI code by t'_ℓ. With this information, the allocation factors are computed as:

$$F_{icT} = \frac{\sum_{\ell \epsilon T} \hat{U}_{t'_\ell\, ic\ell}}{\sum_i \sum_c \sum_{\ell \epsilon T} \hat{U}_{t'_\ell\, ic\ell}}. \qquad (16)$$

F_{icT} is the fraction of total use during hour t'_ℓ attributable to customer class c and service i that are using technology T. The results of these computations are presented in table 4.10 as percentages.

The allocation factors for the avepeako scenario are computed in a similar manner, but using the regression coefficient data for originating use only (D = 0). The first step is to estimate the traffic for service category i that is originated by customer class c at CLLI code ℓ during hour t using the regression coefficients for the typical-day profile. The formula is:

$$\hat{\beta}_{\ell ticD} = \hat{\beta}_{ticDs} N_{c\ell}, \text{ where } \ell \epsilon S_s \text{ and } D = 0. \qquad (17)$$

TABLE 4.10

ALLOCATION FACTORS FOR LOCAL DIAL SWITCHING
TRAFFIC-SENSITIVE COSTS: SCENARIO USEPEAK

Category	No. 5 Crossbar	Step-by-Step	Electronic Analog	Electronic Digital
SWBUS	14.186%	8.895%	20.881%	12.976%
SWCTX	4.248	1.820	9.352	4.763
SWRES	59.808	69.038	44.279	59.921
SWLOCAL	78.242	79.752	74.513	77.660
SWSIL	5.244	6.208	4.243	5.339
SWSL	3.690	3.511	6.653	4.709
SWSTOL	8.934	9.719	10.896	10.048
SWFGA	0.750	0.571	0.830	0.708
SWFGB	0.555	0.378	0.523	0.497
SWWATS	2.269	1.183	3.559	2.128
SWTOLL	12.508	11.851	15.808	13.381
SWDA	0.039	0.029	0.051	0.038
SWTSPS	9.211	8.368	9.628	8.921
SWOP	9.250	8.397	9.679	8.959
SWNET	100.000	100.000	100.000	100.000

Source: Authors' compilations.

In essence, the average hourly estimated use-per-line-day of service i by customer class c is multiplied by the population of customers in class c at CLLI code ℓ. Note that the estimated average hourly use-per-line-day and line counts are matched according to the metropolitan and nonmetropolitan strata. The next step is to compute the total estimated traffic at CLLI code ℓ during hour t using the traffic information computed in step 1. The formula is:

$$\hat{\beta}_{\ell t..D} = \sum_{c} \sum_{i} \hat{\beta}_{\ell ticD}, \text{ where } D = 0. \qquad (18)$$

As with the SLU data, this total originating traffic information is rank ordered for each CLLI code from the busiest to the least busy hour. Again denote the ranking of the busiest hour by t'_ℓ. With the busiest-hour on average at each CLLI code identified, the allocation factors are:

$$F_{icT} = \frac{\sum_{\ell \epsilon T} \hat{\beta}_{\ell t'_\ell icD}}{\sum_c \sum_i \sum_{\ell \epsilon T} \hat{\beta}_{\ell t'_\ell icD}} \ . \qquad (19)$$

F_{icT} is the fraction of total originating use during hour t'_ℓ attributable to customer class c and service category i on technology T. The results of the computations are presented in table 4.11 for each technology T. The results are directly comparable with those from the usepeak scenario.

TABLE 4.11

ALLOCATION FACTORS FOR LOCAL DIAL SWITCHING TRAFFIC-SENSITIVE COSTS: SCENARIO AVEPEAKO

Category	No. 5 Crossbar	Step-by-Step	Electronic Analog	Electronic Digital
SWBUS	5.910%	8.442%	18.065%	6.629%
SWCTX	0.100	0.020	5.359	0.351
SWRES	93.298	90.860	75.695	92.341
SWLOCAL	83.523	83.076	87.346	85.346
SWSIL	7.637	7.674	5.578	6.850
SWSILO	7.637	7.674	5.578	6.850
SWSL	4.283	4.323	3.665	4.066
SWSLO	4.283	4.323	3.665	4.066
SWSTOL	11.919	11.996	9.243	10.916
SWFGA	0.800	0.595	0.973	0.778
SWFGB	1.141	1.191	0.578	0.883
SWTOLL	13.861	13.782	10.794	12.578
SWDA	0.151	0.224	0.229	0.134
SWTSPS	2.465	2.918	1.631	1.942
SWOP	2.616	3.142	1.860	2.076
SWNET	100.000	100.000	100.000	100.000

Source: Authors' compilations.

The allocation factors for the avepeak scenario are developed in the same way as the avepeako allocation factors with one exception. The avepeak scenario considers both originating and terminating traffic in the ranking of hours of the day, and subsequent calculations of the allocation factors F_{icT}. The results are presented in table 4.12.

TABLE 4.12

ALLOCATION FACTORS FOR LOCAL DIAL SWITCHING
TRAFFIC-SENSITIVE COSTS: SCENARIO AVEPEAK

Category	No. 5 Crossbar	Step-by-Step	Electronic Analog	Electronic Digital
SWBUS	25.557%	30.078%	30.202%	25.222%
SWCTX	0.122	0.026	5.161	0.429
SWRES	52.338	47.595	47.385	54.541
SWLOCAL	78.252	77.951	82.894	80.444
SWSIL	9.513	9.826	7.776	8.600
SWSILO	4.175	4.170	2.849	3.616
SWSILT	5.338	5.657	4.927	4.984
SWSL	7.855	7.670	5.638	7.088
SWSLO	3.349	3.292	2.361	2.973
SWSLT	4.506	4.378	3.277	4.115
SWSTOL	17.367	17.496	13.415	15.688
SWFGA	0.750	0.558	0.924	0.733
SWFGB	1.690	1.667	1.502	1.651
SWTOLL	19.807	19.721	15.840	18.073
SWDA	0.306	0.371	0.254	0.257
SWTSPS	1.634	1.956	1.012	1.227
SWOP	1.940	2.328	1.267	1.484
SWNET	100.000	100.000	100.000	100.000

Source: Authors' compilations.

The Three-Busiest-Hours Scenarios

The computations of allocation factors for the daypeako and daypeak scenarios are much simpler than the previous six. The basic algorithm estimates the composition of traffic during the three busiest hours for each technology (T) and stratum (s). The regression coefficients, α_{ciDs}, are the per-line-day use of each originating and terminating (D) service i by customer class c during the three busiest hours of the same period in stratum s. The allocation factors for these two scenarios involve constructing weighted averages of these regression coefficients.

The first step is to construct the weights which are based on subscriber line counts for all CLLI codes in Southwestern Bell's service territory. These line counts are the $N_{c\ell}$ used previously where the CLLI codes, ℓ, are grouped according to stratum and technology. The goal of these calculations is to have an allocation factor for each service i and/or customer class c for each technology, T. In general, the weight is given by:

$$W_{csT} = \sum_{\ell \epsilon S_s \, T} N_{c\ell} \quad . \qquad (20)$$

In words, the weight is the fraction of subscriber lines for customer class c that is in stratums s and is hooked into a CLLI code of technology T out of all subscriber lines that are hooked into technology T.

The per-line-day originating use of service i during the three busiest hours by customer class c hooked into a CLLI code of technology C is given by:

$$\hat{\alpha}_{icDT} = \sum_{s} W_{csT} \, \hat{\alpha}_{cids} \text{ where } D = 0. \qquad (21)$$

The allocation factors are computed as:

$$F_{icT} = \frac{\hat{\alpha}_{icDT}}{\sum_i \sum_c \hat{\alpha}_{icDT}} \text{ where } D = 0. \qquad (22)$$

The results of these computations for the daypeako scenario are presented in table 4.13. Note that the F_{icT} have been aggregated over customer class for toll and operator assisted services.

TABLE 4.13

ALLOCATION FACTORS FOR LOCAL DIAL SWITCHING
TRAFFIC-SENSITIVE COSTS: SCENARIO DAYPEAKO

Category	No. 5 Crossbar	Step-by-Step	Electronic Analog	Electronic Digital
SWBUS	17.938%	16.745%	32.700%	23.835%
SWCTX	8.283	4.986	16.292	8.774
SWRES	64.270	68.856	40.774	57.569
SWLOCAL	90.526	90.668	89.937	90.373
SWSIL	4.547	4.561	4.956	4.623
SWSILO	4.547	4.561	4.956	4.623
SWSL	3.146	3.175	3.238	3.312
SWSLO	3.146	3.175	3.238	3.312
SWSTOL	7.694	7.736	8.194	7.935
SWFGA	0.868	0.649	1.002	0.824
SWFGB	0.001	0.000	0.008	0.003
SWTOLL	8.562	8.386	9.204	8.762
SWDA	0.328	0.345	0.324	0.325
SWTSPS	0.584	0.601	0.535	0.541
SWOP	0.912	0.947	0.858	0.866
SWNET	100.000	100.000	100.000	100.000

Source: Authors' compilations.

The allocation factors for the daypeak scenario use the same weights W_{csT} and are computed using the same formulas. The only difference is that both originating and terminating uses (D = O and I) are included when computing the factors. Table 4.14 contains the allocation factors for traffic-sensitive local dial switching costs for the daypeak scenario.

Nontraffic-Sensitive Costs

The purposes of computing allocation factors for the NTS portion of a local dial switch is to allocate the revenue requirement for each customer class (c) and technology (T) to the services (i). This NTS portion of the revenue requirement for local dial switching has already been allocated to the customer classes by the relative number of subscriber loops for each customer class. The presentation of the algorithms in this section draws on a pattern established in the previous section. The algorithms in the previous section were segregated into three groups: average use, average peak, and the three-busiest-hours scenarios. Within each of these groupings of scenarios, their differences were the usages per-line-day for a service and/or customer class. In this section, the algorithm for computing allocation factors for the first scenario in a grouping is presented in detail. However, the algorithms for the remaining scenarios in a grouping are discussed only briefly and the results are presented. In all cases for NTS costs, the algorithms develop a usage profile by service category for a typical subscriber line from customer class c at a switch of technology T.

TABLE 4.14

ALLOCATION FACTORS FOR LOCAL DIAL SWITCHING
TRAFFIC-SENSITIVE COSTS: SCENARIO DAYPEAK

Category	No. 5 Crossbar	Step-by-Step	Electronic Analog	Electronic Digital
SWBUS	19.560%	17.851%	36.375%	27.258%
SWCTX	8.633	5.269	17.915	9.668
SWRES	58.041	63.432	30.993	48.876
SWLOCAL	86.319	86.652	85.565	86.089
SWSIL	7.958	7.847	8.792	8.194
SWSILO	2.873	2.912	2.812	2.823
SWSILT	5.084	4.936	5.979	5.371
SWSL	4.263	4.241	4.139	4.356
SWSLO	1.988	2.026	1.837	2.023
SWSLT	2.275	2.215	2.302	2.334
SWSTOL	12.221	12.089	12.931	12.551
SWFGA	0.827	0.621	0.953	0.785
SWFGB	0.057	0.034	0.064	0.047
SWTOLL	13.105	12.744	13.948	13.382
SWDA	0.207	0.220	0.184	0.198
SWTSPS	0.369	0.384	0.303	0.330
SWOP	0.576	0.604	0.487	0.529
SWNET	100.000	100.000	100.000	100.000

Source: Authors' compilations.

This typical line is a weighted average of metro and nonmetro strata for each customer class and technology.

The Average-Use Scenarios

The algorithms for NTS allocation factors based on average or twenty-four-hour use are developed in three basic steps. The algorithm for the use24 scenario, which is based on the SLU data, is presented in detail. The algorithms for the betaaveo and betaave scenarios are presented as extensions of the use24 algorithm.

The first step in developing the NTS allocation factors for the use24 scenario is to construct a set of subscriber line weights for each customer class (c), stratum (s), and technology (T). These weights are the fraction of subscriber lines in customer class c connected to technology T that are in stratum s. The formula is:

$$W_{csT} = \frac{\sum\limits_{\ell \epsilon S_s \, T} N_{c\ell}}{\sum\limits_{c} \sum\limits_{\ell \epsilon S_s \, T} N_{c\ell}} . \qquad (23)$$

For each customer class c, eight weights are computed (4 technologies x 2 strata).

The second step is to compute the per-line-day use of each service i over the entire day by each customer class. The computational formula is:

$$\hat{U}_{icT} = \sum_{s} W_{csT} \sum_{t} \bar{U}^{S}_{icts} . \qquad (24)$$

The third and final step in computing the allocation factors of the NTS costs for the use24 scenario is:

$$F_{icT} = \frac{\hat{U}_{icT}}{\sum\limits_{i} \hat{U}_{icT}} . \qquad (25)$$

The results of these calculations are presented in tables 4.15 through 4.17 for the business and residential Centrex classes, respectively.

For each customer class there are four sets of NTS allocation factors--one for each technology. These four sets form the last four columns of each of the tables. The rows of these three tables are the service categories for business, Centrex, and residential customers, respectively. There are ten rows or service categories. There is double counting in these tables and all subsequent tables in that the "sil" (intrastate interLATA) and "sl" (intrastate intraLATA) categories for each customer class always sum to the "s" (intrastate toll) categories. Each of these categories in the tables has the appropriate customer class qualification as the first letter or letters. For instance, for business customers in table 4.15, bsil + bsl = buss.

The NTS allocation factors for the betaaveo scenario are presented in tables 4.18 through 4.20 for the business, Centrex, and residential customer classes, respectively. These allocation factors were derived by replacing the SLU averages $\hat{U}^{S}_{icts}$, in formula 24 for the use24 scenario with the regression coefficients for the typical day profile, $\hat{\beta}_{ictsD}$, where the direction D is limited to originating use. Comparison of these allocation

TABLE 4.15

ALLOCATION FACTORS FOR LOCAL DIAL
SWITCHING NONTRAFFIC-SENSITIVE COSTS:
BUSINESS CUSTOMERS FOR SCENARIO USE24

Category	No. 5 Crossbar	Step-by-Step	Electronic Analog	Electronic Digital
BDA	0.000%	0.000%	0.000%	0.000%
BSIL1	18.186	18.306	14.085	16.019
BSL	5.306	4.847	8.974	7.160
BTSPS	6.975	8.141	4.877	5.704
BUSFGA	4.108	3.341	4.370	4.328
BUSFGB	1.027	0.988	1.249	1.173
BUSLOC	52.717	53.741	52.595	52.670
BUSS	23.492	23.153	23.059	23.180
BWATS	11.682	10.635	13.851	12.945
NTSBUS	100.000	100.000	100.000	100.000

Source: Authors' compilations.

TABLE 4.16

ALLOCATION FACTORS FOR LOCAL DIAL SWITCHING NONTRAFFIC-SENSITIVE COSTS: CENTREX CUSTOMERS FOR SCENARIO USE24

Category	No. 5 Crossbar	Step-by-Step	Electronic Analog	Electronic Digital
CDA	0.000%	0.000%	0.000%	0.000%
CSIL	3.428	3.429	3.635	3.500
CSL	15.171	15.415	22.504	20.075
CTSPS	33.702	33.402	24.987	27.465
CTXFGA	1.447	1.438	1.024	1.261
CTXFGB	7.961	7.825	3.047	5.045
CTXLOC	29.496	29.642	33.692	32.688
CTXS	18.599	18.844	26.139	23.574
CWATS	8.794	8.848	11.111	9.966
NTSCTX	100.000	100.000	100.000	100.000

Source: Authors' compilations.

TABLE 4.17

ALLOCATION FACTORS FOR LOCAL DIAL SWITCHING NONTRAFFIC-SENSITIVE COSTS: RESIDENTIAL CUSTOMERS FOR SCENARIO USE24

Category	No. 5 Crossbar	Step-by-Step	Electronic Analog	Electronic Digital
NTSRES	100.000%	100.000%	100.000%	100.000%
RDA	0.000	0.000	0.000	0.000
RESFGA	1.645	1.630	1.582	1.638
RESFGB	0.609	0.502	0.973	0.789
RESLOC	69.043	69.467	68.674	68.750
RESS	18.282	18.119	18.187	18.265
RSIL	14.199	14.169	13.382	13.835
RSL	4.083	3.950	4.805	4.430
RTSPS	5.972	6.019	5.657	5.825
RWATS	4.449	4.263	4.927	4.733

Source: Authors' compilations.

TABLE 4.18

ALLOCATION FACTORS FOR LOCAL DIAL
SWITCHING NONTRAFFIC-SENSITIVE COSTS:
BUSINESS CUSTOMERS FOR SCENARIO BETAAVEO

Category	No. 5 Crossbar	Step-by-Step	Electronic Analog	Electronic Digital
BDA	1.911%	2.084%	1.037%	1.401%
BSIL	3.465	3.081	5.420	4.601
BSILO	3.465	3.081	5.420	4.601
BSL	1.841	1.747	2.318	2.117
BSLO	1.841	1.747	2.318	2.117
BTSPS	8.116	8.999	3.594	5.488
BUSFGA	2.213	1.462	2.286	2.296
BUSFGB	0.155	0.161	0.117	0.133
BUSLOC	82.299	82.466	85.228	83.964
BUSS	5.301	4.827	7.738	6.718
NTSBUS	100.000	100.000	100.000	100.000

Source: Authors' compilations.

TABLE 4.19

ALLOCATION FACTORS FOR LOCAL DIAL
SWITCHING NONTRAFFIC-SENSITIVE COSTS:
CENTREX CUSTOMERS FOR SCENARIO BETAAVEO

Category	No. 5 Crossbar	Step-by-Step	Electronic Analog	Electronic Digital
CDA	0.019%	0.073%	0.197%	0.146%
CSIL	1.185	1.483	2.207	1.927
CSILO	1.185	1.483	2.207	1.927
CSL	0.593	1.212	2.748	2.156
CSLO	0.593	1.212	2.748	2.156
CTSPS	0.112	0.378	1.030	0.782
CTXFGA	0.635	0.640	0.570	0.629
CTXFGB	0.004	0.010	0.029	0.025
CTXLOC	97.453	96.205	93.219	94.335
CTXS	1.778	2.695	4.947	4.082
NTSCTX	100.000	100.000	100.000	100.000

Source: Authors' compilations.

TABLE 4.20

ALLOCATION FACTORS FOR LOCAL DIAL
SWITCHING NONTRAFFIC-SENSITIVE COSTS:
RESIDENTIAL CUSTOMERS FOR SCENARIO BETAAVEO

Category	No. 5 Crossbar	Step-by-Step	Electronic Analog	Electronic Digital
NTSRES	100.000%	100.000%	100.000%	100.000%
RDA	0.051	0.030	0.164	0.105
RESFGA	0.486	0.489	0.427	0.463
RESFGB	1.580	1.717	0.844	1.232
RESLOC	84.939	84.182	89.259	87.026
RESS	12.124	12.784	8.450	10.352
RSIL	6.594	7.016	4.209	5.444
RSILO	6.594	7.016	4.209	5.444
RSL	5.530	5.768	4.231	4.907
RSLO	5.530	5.768	4.231	4.907
RTSPS	0.810	0.808	0.844	0.832

Source: Authors' compilations.

factors to those computed for the use24 scenario should disclose the impact on these allocations of using the regression coefficients instead of the SLU averages.

The NTS allocation factors for the betaave scenario are presented in tables 4.21 through 4.23 for the business, Centrex, and residential classes, respectively. These NTS allocation factors are computed by replacing the SLU averages, $\hat{U}_{icts}$ in formula 24, with the regression coefficients, $\hat{\beta}_{ictsD}$, where the direction D is both originating (O) and terminating (I) use. A comparison of these allocation factors to the betaaveo scenario discloses the impact of including terminating use in the allocations.

The Average-Peak Scenarios

The NTS algorithms for the average-peak scenarios are computationally more complex than those for the average-use scenarios. There are five basic steps in computing the NTS allocation factors for average-peak scenarios. The algorithms for the usepeak scenario are covered in detail in this

TABLE 4.21

ALLOCATION FACTORS FOR LOCAL DIAL
SWITCHING NONTRAFFIC-SENSITIVE COSTS:
BUSINESS CUSTOMERS FOR SCENARIO BETAAVE

Category	No. 5 Crossbar	Step-by-Step	Electronic Analog	Electronic Digital
BDA	0.879%	0.960%	0.473%	0.641%
BSIL	9.502	9.406	9.992	9.786
BSILO	1.593	1.419	2.470	2.105
BSILT	7.909	7.986	7.522	7.682
BSL	1.910	1.754	2.698	2.369
BSLO	0.847	0.805	1.056	0.968
BSLT	1.063	0.949	1.642	1.401
BTSPS	3.733	4.146	1.638	2.510
BUSFGA	2.167	1.437	2.215	2.235
BUSFGB	1.145	1.275	0.491	0.762
BUSLOC	80.664	81.023	82.497	81.694
BUSS	11.412	11.159	12.689	12.158
NTSBUS	100.000	100.000	100.000	100.000

Source: Authors' compilations.

TABLE 4.22

ALLOCATION FACTORS FOR LOCAL DIAL
SWITCHING NONTRAFFIC-SENSITIVE COSTS:
CENTREX CUSTOMERS FOR SCENARIO BETAAVE

Category	No. 5 Crossbar	Step-by-Step	Electronic Analog	Electronic Digital
CDA	0.014%	0.051%	0.127%	0.097%
CSIL	8.017	7.096	5.080	5.820
CSILO	0.854	1.032	1.415	1.274
CSILT	7.160	6.067	3.665	4.546
CSL	0.860	1.258	2.137	1.817
CSLO	0.427	0.843	1.762	1.426
CSLT	0.433	0.415	0.380	0.391
CTSPS	0.080	0.263	0.661	0.517
CTXFGA	0.571	0.587	0.553	0.593
CTXFGB	2.632	2.226	1.336	1.661
CTXLOC	87.827	88.520	90.107	89.500
CTXS	8.876	8.357	7.217	7.632
NTSCTX	100.000	100.000	100.000	100.000

Source: Authors' compilations.

TABLE 4.23

ALLOCATION FACTORS FOR LOCAL DIAL SWITCHING NONTRAFFIC-SENSITIVE COSTS: RESIDENTIAL CUSTOMERS FOR SCENARIO BETAAVE

Category	No. 5 Crossbar	Step-by-Step	Electronic Analog	Electronic Digital
NTSRES	100.000%	100.000%	100.000%	100.000%
RDA	0.041	0.025	0.126	0.083
RESFGA	0.438	0.437	0.395	0.425
RESFGB	1.943	1.896	2.162	2.052
RESLOC	76.763	75.729	82.174	79.450
RESS	20.152	21.246	14.495	17.331
RSIL	9.518	10.079	6.638	8.082
RSILO	5.383	5.794	3.230	4.312
RSILT	4.143	4.277	3.407	3.770
RSL	10.634	11.167	7.849	9.249
RSLO	4.515	4.763	3.247	3.887
RSLT	6.111	6.403	4.602	5.363
RTSPS	0.662	0.668	0.648	0.659

Source: Authors' compilations.

subsection. The NTS allocation factors for the avepeako and avepeak scenarios are presented as extensions of the usepeak algorithm.

The first step in computing the NTS allocation factors for the usepeak scenario is to compute the subscriber line weights for each customer class. Fortunately, these are the same weights computed in equation 24 for the average-use scenarios in the previous subsection.

The second step is to compute the total use of a typical subscriber line for each customer class (c) and stratum (s). The formula for the usepeak scenario is:

$$\bar{U}_{cts} = \sum_{i} \bar{U}_{icts}. \tag{26}$$

Once the totals have been derived, the hours of the day for each customer class and stratum are ordered from busiest to smallest according to the total use of a typical subscriber loop. This identifies the busiest hour, on average, for a typical subscriber loop in customer class c and stratum s. Denote this hour as t_{cs}.

In the fourth step, the weighted average per-line-day use of service i by customer class c during the busiest hour on average is computed as:

$$\hat{U}_{ict_cT} = \sum_s W_{csT} \; \bar{U}^S_{ict_{cs}s} . \qquad (27)$$

The weighting properly considers the fraction of subscriber lines for a class in each stratum connected to technology T and the difference in per-line-day use of service i by customer class c for each stratum.

Finally, the NTS allocation factors are computed as follows:

$$F_{icT} = \frac{\hat{U}_{ict_cT}}{\sum_i \hat{U}_{ict_cT}} . \qquad (28)$$

Tables 4.24 through 4.26 contain the allocation factors for business, Centrex, and residential customers, respectively, for the usepeak scenario.

The avepeako and avepeak allocation factors are derived using these formulas by substituting the appropriate measures of use per line-day. The NTS allocation factors for local dial switching for these scenarios are derived by substituting the regression coefficients for the typical day profile, $\hat{\beta}_{ictsD}$, for the SLU averages $\bar{U}^S_{ict}$. For the avepeako scenario, only the regression coefficients associated with originating use (D = 0) for each customer class were used. The NTS allocation factors for this scenario are reported in tables 4.27 through 4.29 for the business, Centrex, and residential customer classes, respectively. For the avepeak scenario, the regression coefficients for combined originating and terminating use were included. The NTS allocation factors for local dial switching for the avepeak scenario are reported in tables 4.30 through 4.32 for the business, Centrex, and residential classes, respectively.

The Busiest Three Hours

The NTS allocation factors for local dial switching for the daypeako and daypeak scenarios are based on weighted averages of the regression coefficients that estimate each customer class and service contribution to the busiest three hours. The weighting scheme used to compute these allocation factors is identical to that used in the two previous groupings of scenarios. The subscriber line weights, W_{csT}, are applied to the regression coefficients for these two scenarios. Three steps are required to compute the allocation factors. Computation of the subscriber line weights is the first step. The second step is the computation of the per-line-day busy-hour use of each service by a customer class connected to technology T; that is:

$$\hat{\alpha}_{icDT} = \sum_{S} W_{csT} \bar{\alpha}_{icsD} \quad \text{where } D = 0. \qquad (29)$$

Finally, the NTS allocation factors for local dial switch costs for the daypeako scenario are

$$F_{icT} = \frac{\hat{\alpha}_{icDT}}{\sum_{i} \hat{\alpha}_{icDT}} \,. \qquad (30)$$

The results of these computations for the daypeako scenario are reported in tables 4.33 through 4.35 for the business, Centrex, and residential classes.

The NTS allocation factors for the daypeak scenario are computed in the same manner except both originating and terminating uses are used in the computations. Tables 4.36 through 4.38 report the NTS allocation factors for the daypeak scenario for business, Centrex, and residential customers.

An Analysis of Allocation Factors for Subscriber Loop Costs

The algorithms for computing the allocation factors for subscriber loop costs are similar to those for the NTS portion of the local dial switch. The algorithms for the NTS portion of the local dial switch recognized the technology of the switch to which customers were connected. With the subscriber loop, partitioning according to the technology is irrelevant. Consequently, the difference lies in the computation of the subscriber loop

TABLE 4.24

ALLOCATION FACTORS FOR LOCAL DIAL
SWITCHING NONTRAFFIC-SENSITIVE COSTS:
BUSINESS CUSTOMERS FOR SCENARIO USEPEAK

Category	No. 5 Crossbar	Step-by-Step	Electronic Analog	Electronic Digital
BDA	0.021%	0.000%	0.016%	0.022%
BSIL	21.631	20.955	15.259	17.697
BSL	4.478	3.774	8.973	7.146
BTSPS	3.549	4.657	3.567	3.786
BUSFGA	4.943	3.613	4.734	4.906
BUSFGB	0.929	0.763	1.344	1.075
BUSLOC	51.563	55.279	50.544	51.098
BUSS	26.109	24.729	24.232	24.843
BWATS	12.970	10.959	15.563	14.270
NTSBUS	100.000	100.000	100.000	100.000

Source: Authors' compilations.

TABLE 4.25

ALLOCATION FACTORS FOR LOCAL DIAL
SWITCHING NONTRAFFIC-SENSITIVE COSTS:
CENTREX CUSTOMERS FOR SCENARIO USEPEAK

Category	No. 5 Crossbar	Step-by-Step	Electronic Analog	Electronic Digital
CDA	0.000%	0.000%	0.010%	0.008%
CSIL	4.577	4.080	4.197	4.101
CSL	14.389	15.286	22.418	20.310
CTSPS	31.867	36.358	19.889	25.686
CTXFGA	0.800	0.734	0.891	0.885
CTXFGB	9.081	8.444	3.368	5.408
CTXLOC	30.626	27.712	36.350	33.369
CTXS	18.967	19.365	26.615	24.411
CWATS	8.660	7.388	12.877	10.232
NTSCTX	100.000	100.000	100.000	100.000

Source: Authors' compilations.

TABLE 4.26

ALLOCATION FACTORS FOR LOCAL DIAL
SWITCHING NONTRAFFIC-SENSITIVE COSTS:
RESIDENTIAL CUSTOMERS FOR SCENARIO USEPEAK

Category	No. 5 Crossbar	Step-by-Step	Electronic Analog	Electronic Digital
NTSRES	100.000%	100.000%	100.000%	100.000%
RDA	0.000	0.000	0.000	0.000
RESFGA	1.546	1.494	1.333	1.415
RESFGB	0.755	0.779	0.926	1.020
RESLOC	68.860	66.060	68.937	67.117
RESS	20.065	24.488	18.549	22.383
RSIL	15.534	19.487	13.439	17.413
RSL	4.531	5.002	5.109	4.970
RTSPS	4.387	5.002	4.739	4.806
RWATS	4.387	2.176	5.516	3.259

Source: Authors' compilations.

TABLE 4.27

ALLOCATION FACTORS FOR LOCAL DIAL
SWITCHING NONTRAFFIC-SENSITIVE COSTS:
BUSINESS CUSTOMERS FOR SCENARIO AVEPEAKO

Category	No. 5 Crossbar	Step-by-Step	Electronic Analog	Electronic Digital
BDA	1.405%	1.517%	0.726%	1.028%
BSIL	4.046	3.818	5.417	4.808
BSILO	4.046	3.818	5.417	4.808
BSL	2.866	2.879	2.786	2.821
BSLO	2.866	2.879	2.786	2.821
BTSPS	4.553	5.010	1.809	3.029
BUSFGA	2.280	1.512	2.334	2.352
BUSFGB	0.004	0.002	0.018	0.012
BUSLOC	84.849	85.264	86.908	85.951
BUSS	6.909	6.695	8.204	7.629
NTSBUS	100.000	100.000	100.000	100.000

Source: Authors' compilations.

TABLE 4.28

ALLOCATION FACTORS FOR LOCAL DIAL
SWITCHING NONTRAFFIC-SENSITIVE COSTS:
CENTREX CUSTOMERS FOR SCENARIO AVEPEAKO

Category	No. 5 Crossbar	Step-by-Step	Electronic Analog	Electronic Digital
CDA	0.016%	0.021%	0.188%	0.123%
CSIL	3.480	3.444	2.308	2.750
CSILO	3.480	3.444	2.308	2.750
CSL	0.790	0.855	2.925	2.121
CSLO	0.790	0.855	2.925	2.121
CTSPS	0.039	0.051	0.490	0.320
CTXFGA	0.619	0.631	0.572	0.625
CTXFGB	0.007	0.007	0.075	0.048
CTXLOC	95.052	94.992	93.441	94.013
CTXS	4.269	4.297	5.233	4.871
NTSCTX	100.000	100.000	100.000	100.000

Source: Authors' compilations.

TABLE 4.29

ALLOCATION FACTORS FOR LOCAL DIAL
SWITCHING NONTRAFFIC-SENSITIVE COSTS:
RESIDENTIAL CUSTOMERS FOR SCENARIO AVEPEAKO

Category	No. 5 Crossbar	Step-by-Step	Electronic Analog	Electronic Digital
NTSRES	100.000%	100.000%	100.000%	100.000%
RDA	0.015	0.007	0.041	0.026
RESFGA	0.493	0.501	0.427	0.468
RESFGB	0.606	0.667	0.311	0.464
RESLOC	86.427	86.002	88.602	87.479
RESS	11.310	11.616	9.789	10.572
RSIL	7.229	7.457	6.094	6.678
RSILO	7.229	7.457	6.094	6.678
RSL	4.081	4.156	3.695	3.894
RSLO	4.081	4.156	3.695	3.894
RTSPS	1.146	1.211	0.827	0.991

Source: Authors' compilations.

TABLE 4.30

ALLOCATION FACTORS FOR LOCAL DIAL SWITCHING NONTRAFFIC-SENSITIVE COSTS: BUSINESS CUSTOMERS FOR SCENARIO AVEPEAK

Category	No. 5 Crossbar	Step-by-Step	Electronic Analog	Electronic Digital
BDA	0.879%	0.960%	0.473%	0.641%
BSIL	9.502	9.406	9.992	9.786
BSILO	1.593	1.419	2.470	2.105
BSILT	7.909	7.986	7.522	7.682
BSL	1.910	1.754	2.698	2.369
BSLO	0.847	0.805	1.056	0.968
BSLT	1.063	0.949	1.642	1.401
BTSPS	3.733	4.146	1.638	2.510
BUSFGA	2.167	1.437	2.215	2.235
BUSFGB	1.145	1.275	0.491	0.762
BUSLOC	80.664	81.023	82.497	81.694
BUSS	11.412	11.159	12.689	12.158
NTSBUS	100.000	100.000	100.000	100.000

Source: Authors' compilations.

TABLE 4.31

ALLOCATION FACTORS FOR LOCAL DIAL SWITCHING NONTRAFFIC-SENSITIVE COSTS: CENTREX CUSTOMERS FOR SCENARIO AVEPEAK

Category	No. 5 Crossbar	Step-by-Step	Electronic Analog	Electronic Digital
CDA	0.014%	0.051%	0.127%	0.097%
CSIL	8.017	7.096	5.080	5.820
CSILO	0.854	1.032	1.415	1.274
CSILT	7.160	6.067	3.665	4.546
CSL	0.860	1.258	2.137	1.817
CSLO	0.427	0.843	1.762	1.426
CSLT	0.433	0.415	0.380	0.391
CTSPS	0.080	0.263	0.661	0.517
CTXFGA	0.571	0.587	0.553	0.593
CTXFGB	2.632	2.226	1.336	1.661
CTXLOC	87.827	88.520	90.107	89.500
CTXS	8.876	8.357	7.217	7.632
NTSCTX	100.000	100.000	100.000	100.000

Source: Authors' compilations.

TABLE 4.32

ALLOCATION FACTORS FOR LOCAL DIAL
SWITCHING NONTRAFFIC-SENSITIVE COSTS:
RESIDENTIAL CUSTOMERS FOR SCENARIO AVEPEAK

Category	No. 5 Crossbar	Step-by-Step	Electronic Analog	Electronic Digital
NTSRES	100.000%	100.000%	100.000%	100.000%
RDA	0.041	0.025	0.126	0.083
RESFGA	0.438	0.437	0.395	0.425
RESFGB	1.943	1.896	2.162	2.052
RESLOC	76.763	75.729	82.174	79.450
RESS	20.152	21.246	14.495	17.331
RSIL	9.518	10.079	6.638	8.082
RSILO	5.383	5.794	3.230	4.312
RSILT	4.143	4.277	3.407	3.770
RSL	10.634	11.167	7.849	9.249
RSLO	4.515	4.763	3.247	3.887
RSLT	6.111	6.403	4.602	5.363
RTSPS	0.662	0.668	0.648	0.659

Source: Authors' compilations.

TABLE 4.33

ALLOCATION FACTORS FOR LOCAL DIAL
SWITCHING NONTRAFFIC-SENSITIVE COSTS:
BUSINESS CUSTOMERS FOR SCENARIO DAYPEAKO

Category	No. 5 Crossbar	Step-by-Step	Electronic Analog	Electronic Digital
BDA	0.421%	0.411%	0.461%	0.445%
BSIL	15.024	16.537	7.493	10.545
BSILO	15.024	16.537	7.493	10.545
BSL	0.966	0.882	1.383	1.215
BSLO	0.966	0.882	1.383	1.215
BTSPS	2.103	2.310	1.052	1.479
BUSFGA	1.902	1.230	2.173	2.101
BUSLOC	70.747	69.310	80.967	76.789
BUSS	15.990	17.420	8.877	11.760
BWATS	8.842	9.315	6.471	7.430
NTSBUS	100.000	100.000	100.000	100.000

Source: Authors' compilations.

TABLE 4.34

ALLOCATION FACTORS FOR LOCAL DIAL
SWITCHING NONTRAFFIC-SENSITIVE COSTS:
CENTREX CUSTOMERS FOR SCENARIO DAYPEAKO

Category	No. 5 Crossbar	Step-by-Step	Electronic Analog	Electronic Digital
CDA	0.010%	0.013%	0.166%	0.096%
CSIL	0.203	0.277	3.509	2.020
CSILO	0.203	0.277	3.509	2.020
CSL	1.273	1.312	2.987	2.216
CSLO	1.273	1.312	2.987	2.216
CTSPS	0.011	0.014	0.186	0.106
CTXFGA	0.611	0.621	0.548	0.608
CTXLOC	93.929	93.816	89.469	91.447
CTXS	1.477	1.589	6.497	4.236
CWATS	3.963	3.945	3.132	3.507
NTSCTX	100.000	100.000	100.000	100.000

Source: Authors' compilations.

TABLE 4.35

ALLOCATION FACTORS FOR LOCAL DIAL
SWITCHING NONTRAFFIC-SENSITIVE COSTS:
RESIDENTIAL CUSTOMERS FOR SCENARIO DAYPEAKO

Category	No. 5 Crossbar	Step-by-Step	Electronic Analog	Electronic Digital
NTSRES	100.000%	100.000%	100.000%	100.000%
RDA	0.322	0.330	0.240	0.282
RESFGA	0.531	0.543	0.431	0.489
RESLOC	92.767	93.215	90.039	91.560
RESS	5.064	4.659	7.566	6.165
RSIL	1.041	0.743	2.851	1.838
RSILO	1.041	0.743	2.851	1.838
RSL	4.023	3.916	4.715	4.327
RSLO	4.023	3.916	4.715	4.327
RTSPS	0.074	0.058	0.166	0.111
RWATS	1.242	1.195	1.566	1.386

Source: Authors' compilations.

TABLE 4.36

ALLOCATION FACTORS FOR LOCAL DIAL
SWITCHING NONTRAFFIC-SENSITIVE COSTS:
BUSINESS CUSTOMERS FOR SCENARIO DAYPEAK

Category	No. 5 Crossbar	Step-by-Step	Electronic Analog	Electronic Digital
BDA	0.248%	0.252%	0.241%	0.237%
BSIL	16.389	17.470	12.497	13.606
BSILO	8.879	10.138	3.912	5.632
BSILT	7.511	7.333	8.584	7.975
BSL	2.810	2.929	2.418	2.499
BSLO	0.571	0.541	0.722	0.649
BSLT	2.239	2.388	1.696	1.850
BTSPS	1.242	1.416	0.549	0.790
BUSFGA	1.939	1.258	2.224	2.102
BUSLOC	72.146	70.963	82.859	76.798
BUSS	19.199	20.400	14.916	16.106
BWATS	5.225	5.710	3.378	3.968
NTSBUS	100.000	100.000	100.000	100.000

Source: Authors' compilations.

TABLE 4.37

ALLOCATION FACTORS FOR LOCAL DIAL
SWITCHING NONTRAFFIC-SENSITIVE COSTS:
CENTREX CUSTOMERS FOR SCENARIO DAYPEAK

Category	No. 5 Crossbar	Step-by-Step	Electronic Analog	Electronic Digital
CDA	0.006%	0.007%	0.083%	0.051%
CSIL	6.546	6.565	7.314	6.991
CSILO	0.115	0.156	1.754	1.065
CSILT	6.431	6.409	5.561	5.926
CSL	3.104	3.120	3.774	3.492
CSLO	0.719	0.739	1.493	1.168
CSLT	2.384	2.381	2.279	2.323
CTSPS	0.006	0.008	0.093	0.056
CTXFGA	0.570	0.580	0.531	0.578
CTXLOC	87.529	87.497	86.640	86.984
CTXS	9.650	9.686	11.088	10.483
CWATS	2.239	2.222	1.565	1.849
NTSCTX	100.000	100.000	100.000	100.000

Source: Authors' compilations.

TABLE 4.38

ALLOCATION FACTORS FOR LOCAL DIAL
SWITCHING NONTRAFFIC-SENSITIVE COSTS:
RESIDENTIAL CUSTOMERS FOR SCENARIO DAYPEAK

Category	No. 5 Crossbar	Step-by-Step	Electronic Analog	Electronic Digital
NTSRES	100.000%	100.000%	100.000%	100.000%
RDA	0.217	0.219	0.173	0.195
RESFGA	0.510	0.520	0.417	0.472
RESLOC	89.080	89.440	86.718	88.079
RESS	9.309	8.988	11.447	10.218
RSIL	4.404	4.309	5.017	4.666
RSILO	0.699	0.494	2.050	1.272
RSILT	3.705	3.815	2.967	3.394
RSL	4.905	4.679	6.430	5.553
RSLO	2.703	2.604	3.391	2.994
RSLT	2.197	2.075	3.039	2.558
RTSPS	0.050	0.039	0.119	0.077
RWATS	0.835	0.795	1.126	0.959

Source: Authors' compilations.

weights, W_c, that were computed in equation 24; otherwise the algorithms are identical.

This section is organized according to the three groupings of scenarios used in the previous section and draws heavily on the reader's familiarity with the algorithms for the NTS portion of local dial switching. The approach to computing the new subscriber line weights is presented. Once the new weights are derived, the same computational formulas that were used for the NTS portion of the local dial switch are employed for the subscriber loop. In undertaking this manner of presentation, the main goal is to present the results of computing the allocation factors for subscriber loop costs.

Before beginning this presentation, it is worthwhile to review briefly the overall treatment of subscriber loop costs in the cost allocations. The total investment in subscriber loop plant is first split between the interstate and intrastate jurisdiction according to separations procedures. The intrastate portion is split between message telephone service (MTS category) and private line (SPL) according to the information provided by

Southwestern Bell. The subscriber loop investment assigned to MTS is assigned to the nontraffic-sensitive category (NTS). The NTS category is then assigned to the customer classes according to the relative loop count for each class. All of these assignments are fixed with regard to the eight cost-allocation scenarios examined in this report. The eight scenarios only affect the allocation of the subscriber loop costs for business, Centrex, and residential customers, and only impact the allocation among local, toll, and operator assisted services for each class separately. Consequently, the allocations do not shift costs among customer classes but among local, toll, and operator assisted services for each class.

The subscriber line weights for the subscriber loop allocation factors weight the per-line-day use information for a customer class and service category by the relative number of subscriber loops in the metro and nonmetro strata. The formula is:

$$W_{cs} = \frac{\sum_{\ell \epsilon S_s} N_{c\ell}}{\sum_{\ell} N_{c\ell s}} . \qquad (31)$$

This yields the fraction of subscriber lines for customer class c that is in stratum s. These weights are fixed for all eight scenarios. This computation differs from that in equation 24 in that technology T is not present; that is, the calculation is done regardless of technology T.

The Average-Use Scenarios

The subscriber loop allocation factors for the average-use scenarios use24, betaaveo, and betaave are presented in tables 4.39 through 4.41, respectively. Each of these tables consists of three sets of two columns. The first column in each set contains the service category for residential, business, or Centrex customers, respectively. The second column has the corresponding percent of use per-line-day for each service category.

These allocation factors for the average-use scenarios merit some comparison and evaluation. The first thing to note is that the use24 allocation factors tell a different story than the betaaveo allocation factors. In table 4.39, the percentage of total use that is local is approximately 69 percent for residential, 53 percent for business, and 33 percent for Centrex. When the betaaveo or betaave scenarios are compared to the use24 scenario, these percentages and the decline in percentage from residential to Centrex are not repeated. In tables 4.40 and 4.41, the percentages of total use that are local are higher and increase as one goes from residential to Centrex. In table 4.40 the local use is 88 percent for residential, 85 percent for business, and 96 percent for Centrex. The use24 and betaaveo scenario are considered directly comparable and are included here to demonstrate the impact of regression estimates versus direct measurement with SLU. This brief comparison discloses a substantial shift in the estimated percentages accounted for by local, toll, and operator assisted services for all customer classes. Part of this shift is due to the operator assisted services category, the TSPS categories. In the use24 scenario, dial-0 operator services account for around 5.5 percent of total use for the residential and business class and a surprising 25 percent for Centrex. With the betaaveo scenario, the percentages decline to less than 1 percent for residence and Centrex. In addition, the toll allocation factor for the betaveo scenario is substantially less than that for the use24 scenario. These shifts account for the changes in the percentage of use that is local. Consequently, the remaining two sets of scenarios are examined in this manner for similar patterns.

Average-Peak Scenarios

The subscriber loop allocation factors for the average-peak scenarios usepeak, avepeako, and avepeak are presented in tables 4.42 through 4.44, respectively. These tables are organized in the same manner as those for the average-use scenarios. Beyond just reporting the allocation factors in this subsection, the subscriber loop allocation factors for these three scenarios are compared with each other and to those for the average-use scenarios.

An examination of the subscriber loop allocation factors for the usepeak scenario discloses the percentage that is local declines as one goes from residential (68 percent), to business (51 percent), to Centrex (36

TABLE 4.39

ALLOCATION FACTORS FOR SUBSCRIBER
LOOP COSTS: SCENARIO USE24

Residential Category	Percent Use per Line-day	Business Category	Percent Use per Line-day	Centrex Category	Percent Use per Line-day
RDA	0.000%	BDA	0.000%	CDA	0.000%
RSIL	13.545	BSIL	14.713	CSIL	3.609
RSL	4.637	BSL	8.413	CSL	21.921
RTSPS	5.735	BTSPS	5.263	CTSPS	25.652
RESFGA	1.586	BUSFGA	4.266	CTXFGA	1.073
RESFGB	0.915	BUSFGB	1.196	CTXFGB	3.463
RESLOC	68.761	BUSLOC	52.671	CTXLOC	33.382
RESS	18.182	BUSS	23.126	CTXS	25.530
RWATS	4.820	BWATS	13.477	CWATS	10.900
NTSRES	100.000	NTSBUS	100.000	NTSCTX	100.000

Source: Authors' compilations.

TABLE 4.40

ALLOCATION FACTORS FOR SUBSCRIBER
LOOP COSTS: SCENARIO BETAAVEO

Residential Category	Percent Use per Line-day	Business Category	Percent Use per Line-day	Centrex Category	Percent Use per Line-day
RDA	0.134%	BDA	1.275%	CDA	0.095%
RSIL	4.922	BSIL	4.887	CSIL	1.615
RSILO	4.922	BSILO	4.887	CSILO	1.615
RSL	4.622	BSL	2.188	CSL	1.498
RSLO	4.622	BSLO	2.188	CSLO	1.498
RTSPS	0.836	BTSPS	4.826	CTSPS	0.499
RESFGA	0.445	BUSFGA	2.238	CTXFGA	0.591
RESFGB	1.066	BUSFGB	0.128	CTXFGB	0.000
RESLOC	87.976	BUSLOC	84.458	CTXLOC	95.686
RESS	9.544	BUSS	7.075	CTXS	3.113
NTSRES	100.000	NTSBUS	100.000	NTSCTX	100.000

Source: Authors' compilations.

TABLE 4.41

ALLOCATION FACTORS FOR SUBSCRIBER
LOOP COSTS: SCENARIO BETAAVE

Residential Category	Percent Use per Line-day	Business Category	Percent Use per Line-day	Centrex Category	Percent Use per Line-day
RDA	0.105%	BDA	0.583%	CDA	0.065%
RSIL	7.463	BSIL	9.859	CSIL	6.696
RSILO	3.847	BSILO	2.232	CSILO	1.106
RSILT	3.616	BSILT	7.626	CSILT	5.589
RSL	8.648	BSL	2.485	CSL	1.433
RSLO	3.612	BSLO	1.000	CSLO	1.026
RSLT	5.035	BSLT	1.485	CSLT	0.407
RTSPS	0.653	BTSPS	2.204	CTSPS	0.342
RESFGA	0.406	BUSFGA	2.173	CTXFGA	0.549
RESFGB	2.097	BUSFGB	0.667	CTXFGB	0.000
RESLOC	80.629	BUSLOC	82.030	CTXLOC	88.865
RESS	16.111	BUSS	12.343	CTXS	8.131
NTSRES	100.000	NTSBUS	100.000	NTSCTX	100.000

Source: Authors' compilations.

TABLE 4.42

ALLOCATION FACTORS FOR SUBSCRIBER
LOOP COSTS: SCENARIO USEPEAK

Residential Category	Percent Use per Line-day	Business Category	Percent Use per Line-day	Centrex Category	Percent Use per Line-day
RDA	0.000%	BDA	0.017%	CDA	0.010%
RSIL	14.829	BSIL	15.834	CSIL	4.206
RSL	5.027	BSL	8.546	CSL	21.910
RTSPS	4.776	BTSPS	3.618	CTSPS	20.958
RESFGA	1.364	BUSFGA	4.719	CTXFGA	0.883
RESFGB	0.898	BUSFGB	1.293	CTXFGB	3.759
RESLOC	68.366	BUSLOC	50.717	CTXLOC	35.806
RESS	19.856	BUSS	24.380	CTXS	26.116
RWATS	4.740	BWATS	15.257	CWATS	12.468
NTSRES	100.000	NTSBUS	100.000	NTSCTX	100.000

Source: Authors' compilations.

TABLE 4.43

ALLOCATION FACTORS FOR SUBSCRIBER
LOOP COSTS: SCENARIO AVEPEAKO

Residential Category	Percent Use per Line-day	Business Category	Percent Use per Line-day	Centrex Category	Percent Use per Line-day
RDA	0.054%	BDA	1.206%	CDA	0.136%
RSIL	6.086	BSIL	4.811	CSIL	0.289
RSILO	6.086	BSILO	4.811	CSILO	0.289
RSL	4.378	BSL	2.960	CSL	1.699
RSLO	4.378	BSLO	2.960	CSLO	1.699
RTSPS	1.475	BTSPS	3.423	CTSPS	0.350
RESFGA	0.439	BUSFGA	2.260	CTXFGA	0.597
RESFGB	0.633	BUSFGB	0.017	CTXFGB	0.000
RESLOC	86.937	BUSLOC	85.324	CTXLOC	96.878
RESS	10.461	BUSS	7.770	CTXS	1.987
NTSRES	100.000	NTSBUS	100.000	NTSCTX	100.000

Source: Authors' compilations.

TABLE 4.44

ALLOCATION FACTORS FOR SUBSCRIBER
LOOP COSTS: SCENARIO AVEPEAK

Residential Category	Percent Use per Line-day	Business Category	Percent Use per Line-day	Centrex Category	Percent Use per Line-day
RDA	0.105%	BDA	0.583%	CDA	0.065%
RSIL	7.463	BSIL	9.859	CSIL	6.696
RSILO	3.847	BSILO	2.232	CSILO	1.106
RSILT	3.616	BSILT	7.626	CSILT	5.589
RSL	8.648	BSL	2.485	CSL	1.433
RSLO	3.612	BSLO	1.000	CSLO	1.026
RSLT	5.035	BSLT	1.485	CSLT	0.407
RTSPS	0.653	BTSPS	2.204	CTSPS	0.342
RESFGA	0.406	BUSFGA	2.173	CTXFGA	0.549
RESFGB	2.097	BUSFGB	0.667	CTXFGB	0.000
RESLOC	80.629	BUSLOC	82.030	CTXLOC	88.865
RESS	16.111	BUSS	2.343	CTXS	8.131
NTSRES	100.000	NTSBUS	100.000	NTSCTX	100.000

Source: Authors' compilations.

percent). This pattern is similar to the factors for the use24 scenario both in magnitude and pattern. This result suggests that the use of an average peak measure and average use may make little difference in the allocation of costs between local and toll services.

An examination of the avepeako and avepeak scenarios would seem to confirm this result. The allocation factor for local use of a residential subscriber loop is approximately 87 percent for the avepeako scenario and 88 percent for betaaveo scenario. The same local percentages for business are 85.3 percent and 84.5 percent for the avepeako and betaaveo scenarios, respectively. The percentage for Centrex are 96.8 percent and 95.7 percent. These similarities are striking and are further reinforced by an examination of the avepeak and betaave scenarios. From these data, it would appear that local use increases proportionately from the average to the peak hour during a typical day for all three customer classes.

It is worth noting that the disparate results between the SLU and regression estimates continue with the average-peak scenarios. The factor for allocating to the local service category declines from residential, to business, to Centrex with the usepeak scenario, but increases with the scenarios using the regression estimates. Reasons for this behavior have been advanced and are examined in more detail after the three-busiest-hours scenarios are examined.

The Three Busiest Hours

The subscriber loop allocation factors for the daypeako and daypeak scenarios are reported in tables 4.45 and 4.46, respectively. These tables are organized in the same fashion as previous tables reporting subscriber loop allocation factors. The most salient feature of the data in these tables is the fact that local use continues to be a high percentage of total use. This behavior is consistent with previous regression estimates for the betaaveo, betaave, avepeako, and avepeak scenarios. Unfortunately, there are no SLU averages with which to compare the estimated allocation factors for these scenarios. However, the consistency of the behavior of the regression estimates is remarkable and reassuring.

TABLE 4.45

ALLOCATION FACTORS FOR SUBSCRIBER LOOP COSTS: SCENARIO DAYPEAKO

Residential Category	Percent Use per Line-day	Business Category	Percent Use per Line-day	Centrex Category	Percent Use per Line-day
RDA	0.258%	BDA	0.455%	CDA	0.154%
RSIL	2.317	BSIL	8.538	CSIL	3.238
RSILO	2.317	BSILO	8.538	CSILO	3.238
RSL	4.517	BSL	1.327	CSL	2.848
RSLO	4.517	BSLO	1.327	CSLO	2.848
RTSPS	0.141	BTSPS	1.198	CTSPS	0.171
RESFGA	0.454	BUSFGA	2.107	CTXFGA	0.554
RESLOC	90.841	BUSLOC	79.576	CTXLOC	89.837
RESS	6.834	BUSS	9.862	CTXS	6.086
RWATS	1.472	BWATS	6.800	CWATS	3.201
NTSRES	100.000	NTSBUS	100.000	NTSCTX	100.000

Source: Authors' compilations.

TABLE 4.46

ALLOCATION FACTORS FOR SUBSCRIBER LOOP COSTS: SCENARIO DAYPEAK

Residential Category	Percent Use per Line-day	Business Category	Percent Use per Line-day	Centrex Category	Percent Use per Line-day
RDA	0.182%	BDA	0.233%	CDA	0.078%
RSIL	4.832	BSIL	12.525	CSIL	7.259
RSILO	1.633	BSILO	4.372	CSILO	1.634
RSILT	3.193	BSILT	8.154	CSILT	5.625
RSL	5.962	BSL	2.379	CSL	3.724
RSLO	3.182	BSLO	0.679	CSLO	1.437
RSLT	2.780	BSLT	1.701	CSLT	2.287
RTSPS	0.099	BTSPS	0.613	CTSPS	0.086
RESFGA	0.441	BUSFGA	2.084	CTXFGA	0.534
RESLOC	87.447	BUSLOC	78.684	CTXLOC	86.704
RESS	10.794	BUSS	14.904	CTXS	10.983
RWATS	1.037	BWATS	3.482	CWATS	1.615
NTSRES	100.000	NTSBUS	100.000	NTSCTX	100.000

Source: Authors' compilations.

Comments on SLU Versus Regression Coefficients

Differences between the allocation factors based on the SLU data and regression coefficients arise from two sources. First, the percentage of total use that is toll is larger in the SLU data. Second, the TSPS data in the SLU data are from a different measurement period than the TSPS data from the matrix study data. Each of these sources is discussed below.

Recall from chapter 3 that comparisons between the SLU averages and regression coefficients were made for each customer class for each of the local and toll services, separately. The overall rating for this comparison was 41 out of 72. The ranking was based on three criteria. One point was awarded if the time-of-day profile was mirrored, another point was earned if the relative magnitudes of peaks and valleys were the same, and another point was awarded if the regression coefficients exceeded the SLU averages. In this section, the ranking is repeated for this last criterion alone. In addition, the relative magnitude of the ratio of regression coefficients to SLU averages is approximated and recorded.

Table 4.47 reports the results of this exercise. Examining the row total scores for the comparisons, local use scored slightly better than toll. Examining the column totals one can see that residential with a score of 6 fared the best, followed by Centrex with a score of 5.2 and business with a score of 5. The interesting data, however, are the approximate ratio of the regression coefficients to the SLU averages.

Beginning with the business class in column (2), one can see the intraswitch regression coefficients did not exceed the SLU averages for either the metro or nonmetro strata. However, for local interswitch usage, the regression coefficients exceed the SLU averages as expected. These regression coefficients were approximately five times larger than the SLU averages. Examining the toll categories, on the other hand, the ratio appears to be about three times larger. If the intraswitch usage (RASW) is a small percentage of total use, one would expect some shift from toll to

TABLE 4.47

SUMMARY OF SCORING FOR COMPARISONS OF
REGRESSION COEFFICIENTS AND SLU AVERAGES FOR
EACH CUSTOMER CLASS, SERVICE CATEGORY, AND STRATA

Service Category	Stratum	Business		Centrex		Residential		
		Pts (1)	Ratio (2)	Pts (3)	Ratio (4)	Pts (5)	Ratio (6)	Row Total (7)
RASW	Metro	0	X*	1	4	1	2.5	2
	Nonmetro	0	X	1	7.5	1	2.1	2
RAEX	Metro	1	3.5	1	2.5	0.5	1.1	2.5
	Nonmetro	1	6	1	15	0.5	1.8	2.5
SIL	Metro	1	4	0	X	0	X	1
	Nonmetro	0.5	2	0	X	1	2	1.5
SL	Metro	1	3	1	2	1	1.8	3
	Nonmetro	0.5	5	0.2	2	1	3	1.7
Total		5		5.2		6		16.2

Source: Authors' computations.

* An X denotes the fact that the regression coefficients did not exceed the SLU averages.

the local categories when comparing allocations based on SLU data versus these regression coefficients.

With the Centrex class, local use for the regression coefficients is estimated to be roughly four to five times that of the SLU averages. For intrastate interLATA toll, however, the regression coefficients for both strata failed this simple test of exceeding the SLU averages. With the marginal performance of the intrastate intraLATA use for nonmetro, the shifts in allocation, from toll to local is not unexpected when comparing allocations based on matrix data rather than SLU data.

When examining the residential class, it is difficult to expect much of a shift from this chart alone. The relative magnitude of the ratios is virtually the same for toll and local and may not fully account for the shift of 20 percent to local actually observed. However, note that the metro intrastata interLATA regression coefficients fail the test to be as large as the SLU averages and that those for local interswitch use for residential passed only marginally. Consequently, the shift in allocations from toll to local may be expected but substantially less for the residential class than the other two classes.

In summary, it appears from the information in table 4.47 that one could reasonably expect the use of the regression coefficients to shift revenue requirement allocations from toll to local services. This shift is remarkably consistent regardless of the scenario examined. The other remarkable consistency in the data is the stability of the percentage that is local for the average-use and average-peak scenarios. If the SLU data are examined, the percent of use that is local is fairly constant for all customer classes in the use24 and usepeak scenarios. The same pattern occurs in the betaaveo and avepeako scenarios and in the betaave and avepeak scenarios. These similarities between the SLU averages and regression coefficients provide some confidence in the comparison made among the allocations based on average use and various measures of peak use.

The TSPS data, however, is another matter. The SLU data as previously noted were collected during July, August, and September 1987. This three-month period was not the data collection period initially anticipated, which was October, November, and December 1986. Due to data collection problems with both the matrix and AMA studies, this period was extended to July to September 1987. These same problems, however, were not experienced with the TSPS data which were provided by AT&T. The data provided on TSPS was from November and December 1986 and January 1987. Because of the expense and time involved in acquiring new TSPS data for the July to September period to include with the SLU data, the NRRI research team did not recollect these data. The TSPS data in the SLU sample for residential and particularly Centrex seem to be much larger than the corresponding TSPS data from the matrix studies.

CHAPTER FIVE

ANALYSIS OF RESULTS

In this chapter the results of six of the eight cost studies are presented and analyzed.[1] The previous three chapters have presented the sampling plan to collect usage data, the summary of the data, and the development of allocation factors for use in the eight cost studies. Some of the results of the cost studies have been anticipated with respect to shifts in the revenue requirement among customer classes, and shifts due to using the regression coefficients rather than the SLU data. The results presented in this chapter are stated as the revenue requirement per access line per month. This form was chosen because of its similarity to monthly bills. These results, however, should not be construed to represent monthly bills for reasons discussed below. The results presented here are sensitive to the definition of peak that is used in the allocations. Consequently, the choice of peak used in cost allocations should adhere to engineering criteria as closely as possible in order to have theoretical support based in telephone engineering practices.

The cost studies were performed using the Interactive Cost Allocation System (ICAS). The ICAS model for one scenario is in appendices C to I. Some brief explanatory comments are included in the appendices to give the reader some idea about ICAS.

The results from two of the scenarios, the avepeako and avepeak scenarios, are not presented in the report because the comparisons of these scenarios lead to results similar to those from the use24 and usepeak scenarios. The usepeak, avepeako, and avepeak scenarios do not have a

[1] The results from two of the scenarios, the avepeako and avepeak scenarios, are not presented in the report because the comparisons of these scenarios lead to results similar to those from the use24 and usepeak scenarios.

definition of peak that is compatable with that used by network planning engineers in telephone companies. Recall that these scenarios use the busiest hour on average over the 90-day sample period. Network engineers typically use the 10-day bouncing busy-hour, busy-season traffic to plan network switching and trunking capacity. The daypeako and daypeak scenarios best model these planning criteria given the available data. Consequently, the results of the use24 and usepeak scenarios are compared to one another and the results of the betaaveo, betaave, daypeako, and daypeak scenarios are compared.

The goal of these comparisons is threefold. One is to examine the impact on the allocation of the revenue requirement of peak methods versus allocation schemes based on average or 24-hour usage. The second goal is to learn the effects on the allocation of the revenue requirement from using different measures of peak. The third goal is to learn the impact of including measures of terminating use on the allocation of the revenue requirement. In each of these three cases, proportionality of the allocations is the key issue.

The role of terminating use in revenue requirement allocations is both substantive and conceptual. It is substantive in that its inclusion may change the allocation of the revenue requirement among local, toll, and other services. The conceptual role of terminating use can be seen in the way the revenue requirement allocated to services is recovered in prices. Its explicit use in revenue requirement allocations develops information needed to properly integrate terminating use in the pricing function. This conceptual role is worth some comment.

Peak methods are appropriate in cost studies of the telephone network because the network is subject to congestion at various times as are subscriber loops. Both originating and terminating calls lead to congestion, which in turn can lead to capacity additions when congestion persists and exceeds network planning criteria. If the role of cost allocations and pricing is to recover revenue requirements from the cost causer, the allocation method and pricing mechanism must recognize the role of congestion and the contribution of originating and terminating use of telephone plant and equipment. Including terminating use in a cost allocation scheme may have little impact on the results of the revenue requirement allocation and yet may have an important role in formulating a rational pricing scheme that imposes costs on the cost causer. In particular, the originator of a call should bear the costs of the plant, equipment, and associated expenses for all plant and equipment during periods likely to experience congestion. This includes paying for the costs of the loop on which the originator's call is incoming. The peak-load pricing model suggests that an on-peak and off-peak pricing scheme is appropriate, while the recognition of terminating use suggests a method for recovering the revenue requirement within each of the peak and off-peak periods. In practice this means the toll call that comes into a local calling area should bear some of the costs of plant and equipment in that area, including the subscriber loop. The same would be true of local calls within an area if measured-rate pricing schemes were adopted. In a world in which flat-rate local service is the norm, integrating the conceptual importance of terminating calls into pricing schemes may be difficult and would involve properly discounting the price charged for the subscriber loop for local calling.

The remainder of this chapter is organized into four sections. First, the computation of the revenue requirement per access line is discussed. In the second section, the reasons why these revenue requirement calculations per access line should not be interpreted as bills for the respective services are presented. In the third section, the results of the six scenarios and an interpretation and analysis of the results are presented. The final section offers some concluding remarks.

The Computation of the Revenue Requirement per Access Line

The results of the six scenarios are presented in terms of a revenue requirement per access line per month for various service categories and customer classes. This form of presentation suggests a bill per access line and allows the reader to interpret the results in familiar terms. The calculation of the revenue requirement per access line per month for local services is performed on a customer-class basis. The costs for both the switched network and nontraffic-sensitive categories are combined to simulate the idea of flat-rate pricing for local services.

The revenue requirement for dial-"1" toll services is reported as three line items. One line item is the revenue requirement per line-month for the switched network. This is not the typical way to present the revenue requirement for use of the switched network. The prices for these services are stated as a price per minute of use. The next two items are the revenue requirement per line-month for the NTS portion of dial-"1" toll services. This revenue requirement represents those costs intended to be recovered by the common line charge portion of access charges. The allocations for the switched network were stated without a customer class distinction, while the allocations of the NTS portion were stated on a customer-class basis.

Allocations to operator services are made for the switched network and NTS portions of the revenue requirement. Operator services are dial-"0" calling whether toll or local and directory services. These revenue requirements are summarized under the miscellaneous category in the analysis in this chapter. As noted in the previous chapter, the TSPS data used for the SLU sample did not match the sample period for the rest of the sample. Consequently, one would expect to see revenue requirements shift when comparing the use24 and usepeak scenarios to those utilizing the regression coefficients. The results of the calculations outlined in this subsection confirm these shifts as expected. Operator services are originating only as the distinction between originating and terminating use is not introduced.

Miscellaneous services are the revenue requirements for features group A, features group B, and WATS. Features groups A and B are found both in the switched network and NTS portion of the allocation network, while WATS is only found in the NTS portion of the allocation network. As noted in the previous chapter, WATS was excluded from the switched network because the matrix study data only allowed the research team to identify 800 calling while OUTWATS was included in toll. Consequently, WATS calling was included in toll calling. This was done to make the SLU data scenarios comparable to those based on the matrix studies data.

Revenue Requirement per Line-Month Are Not Prices

The reader may be tempted to interpret the revenue requirement per line-month as representing bills. This temptation should be avoided for several reasons. The most salient is that the costs included in these results do not separately identify the costs of many special services or features used by customers wanting custom services. Another reason is that the expense associated with inward and outward migration is averaged in the NTS portion of the revenue requirements. These two factors result in the revenue requirement per line-month overstating the actual bill for the services they represent. On average, however, the tendencies represented in the allocation of the revenue requirement by using peak methods rather than average or 24-hour use are preserved. Thus, no harm is done to the analysis presented in this report, but the reader should not construe the results as representing prices.

An Analysis of the Results

In this section, the results of the six cost studies are presented and described. The six studies are compared to one another to analyze the changes in the allocation of the revenue requirements that are observed by using different allocation factors for switching and subscriber loop investments. The examination of the results consists of reporting the revenue requirements per line-month and the percentage changes that result from changing the basis for allocating local dial switching and subscriber loop plant. The data set does not lend itself to rigorous statistical analysis because it consists of one observation at a moment in time that is manipulated in different ways. Consequently, tests for significance are not appropriate.

The results from the SLU data set are examined first, followed by the results for the regression data. In both cases, allocations based on average use serve as a base case for evaluating the impact that measures of peak have on revenue requirements per line-month. The research team considers percentage change and absolute change in the revenue requirement per line-month used here as adequate measures of substantive impact. The reader is invited to fashion other definitions of substantive impact on the revenue requirement allocation.

One method of reporting the results of a scenario is to compute the ratio of the revenue requirement for the local service category for Centrex or businesses to that of residential. This ratio would tell one that the revenue requirement for local Centrex service is, for instance, twice that of residential while business is one-and-one-half times that of residential. One can use this information for a direct comparison to the ratio of revenues collected from these customer classes, the ratio of local bills paid by a typical customer for these customer classes, or the ratio of estimated marginal-cost revenues for local service for a typical customer in these customer classes. In this chapter, only ratios are reported. In chapter 6, some thoughts on possible analyses are suggested based on these ratios.

The results of the six cost studies or revenue requirement allocations are presented in pairs to facilitate examination of the results. First, the SLU-based allocations, use24 and usepeak, are presented and examined. Next, the use24 scenario and the betaaveo scenario are compared and contrasted to learn the impact that the regression coefficients have on the allocations relative to the SLU data. Attention is then turned to the analysis of the scenarios based on engineering definitions of peak. The betaaveo and daypeako scenarios are compared and contrasted to understand the revenue requirement shifts that are due to the contribution of services and customer classes to the three busiest hours over the sample period. The betaave and daypeak scenarios introduce terminating (incoming) traffic into the analysis.

This analysis of the impact of terminating use requires three comparisons. First, the betaaveo and betaave scenarios are compared to learn the impact of terminating use on allocations based on 24-hour or average use. Second, the daypeako and daypeak scenarios are compared to examine the impact of terminating use on allocation based on engineering definitions of peak use. Finally, the betaave and daypeak scenarios are compared directly to understand the impact on allocations of including both originating and terminating use in the allocation factors.

Use24 and Usepeak Scenarios

Table 5.1 presents the average revenue requirement per line-month for broad categories of services without any customer class distinction. The first thing to note in this table is the twin bottom line total of around \$45 per access line per month. Note that these two totals differ by ten cents. This difference is due to small discrepancies in the allocations reported by ICAS. The error is two-tenths of one percent. Such discrepancies appear in every table reporting this total. The percentage changes calculated in the table are normalized for this difference in the total revenue requirement per line-month.

The shift of sixteen cents in the local revenue requirement from using peak instead of average use in the allocation is a minuscule three-tenths of one percent. In fact, the largest shift reported in table 5.1 is forty cents per line-month for the miscellaneous services that are features groups A and B, WATS, and operator services. In general, the shifts in the revenue

TABLE 5.1

COMPARISON OF THE RESULTS FOR THE USE24 AND USEPEAK SCENARIOS

	use24 \$/line-month	usepeak \$/line-month	Percentage Change Differences
Local	\$29.87	\$29.71	-0.32%
InterLATA	3.24	3.55	9.64
IntraLATA	1.89	1.95	3.43
Toll Use	1.75	1.85	5.93
Total less Misc.	36.75	37.05	1.05
Total Misc.	8.71	8.31	-4.42
Total	45.46	45.36	

Source: Authors' compilations.

requirement are from local and miscellaneous services to intrastate toll. One may think of the $3.24 and $3.55 as measures of the common line charge portion of access charges on average for interLATA toll services. The 9.64 percent increase, while large in a relative sense, is $0.31 per line-month. The revenue requirement per line-month for the NTS portion of intraLATA toll increases six cents or 3.43 percent. The toll use of the switched network increases from $1.75 to $1.85 per line-month, or by 5.93 percent. In all cases, the changes are modest both in percentage and absolute terms.

When customer class distinctions are introduced into the analysis, some modest shifts among classes are disclosed. Table 5.2 contains the results for local services and the NTS portion of intrastate interLATA and intraLATA toll services for the residential, business, and Centrex customer classes. It is interesting to note that the revenue requirement per line-month

TABLE 5.2
CUSTOMER CLASS RESULTS FOR THE
USE24 AND USEPEAK SCENARIOS

	use24 $/line-month	usepeak $/line-month	Percentage Change Differences
Local			
Residential	$29.75	$29.08	-2.24%
Business	26.50	26.75	0.94
Centrex	41.33	45.25	9.48
InterLATA			
Residential	3.33	3.67	10.00
Business	3.58	3.83	6.98
Centrex	1.25	1.42	13.33
IntraLATA			
Residential	1.08	1.17	7.69
Business	2.67	2.67	0.00
Centrex	8.00	8.00	0.00

Source: Authors' compilations.

for single-line business customers is below that for residential customers under both scenarios. The most striking result in this table is the $3.92 change in the Centrex local revenue requirement per line-month, or a 9.48

percent increase, and the corresponding decline in the residential figure. Recall from table 5.1 that local service overall experienced a 0.32 percent decrease. The increase in toll use is also evident in this table with interLATA toll experiencing increases from using the average peak rather than 24-hour use. The results for intraLATA toll show the residential class absorbing the entire increase. With the exception of the Centrex local revenue requirement per line-month, the shifts are modest.

The usepeak scenario is based on the busiest hour on average over the sample period. These shifts in the revenue requirement per line-month are modest and may not be worth the time, money, and effort to incorporate this definition of peak into cost allocations. This measure of the busy-hour is not in harmony with the planning criteria for network capacity. As noted earlier, planning engineers use a ten-day bouncing busy-hour during the busy season. The daypeako and daypeak scenarios are designed to emulate this planning measure of peak and the NRRI research team considers these scenarios the best test of the impact of peak methods. As noted, the avepeak and avepeako scenarios are not presented in this report because the results of these scenarios were very similar to those for the usepeak scenario. The conclusions drawn from this analysis of the use24 and usepeak scenarios hold without exception for comparisons of the betaaveo and avepeako scenarios and the betaave and avepeak scenarios.

Comparison of the Use24 and Betaaveo Scenarios

The comparison of the use24 scenario to the betaaveo scenario allows the impact of using regression coefficients instead of SLU averages to be examined. Some expectations regarding shifts in the revenue requirement per line-month from toll and dial-"0" services to local services have already been formed in the previous chapter. The analysis of the results of the allocations confirm these expected shifts. Table 5.3 reports the results for these two scenarios and the percentage change for broad categories of services.

The first thing to note in table 5.3 is the increase in the revenue requirement per line-month for local service of $7.68, or 24.97 percent. This increase comes from dial-"1" toll services and the miscellaneous service category which contains dial-"0" services. The bottom line total between these two scenarios differs by only twenty-seven cents. Again this difference is due to minor discrepancies in the allocations reported by ICAS for these two scenarios. The shifts in the miscellaneous category cut the total for that category in half and drove up the revenue requirement for

TABLE 5.3
A COMPARISON OF THE
USE24 AND BETAAVEO SCENARIOS

	use24 $/line-month	betaaveo $/line-month	Percentage Change Differences
Local	$29.87	$37.55	24.97%
InterLATA	3.24	1.27	-61.04
IntraLATA	1.89	1.13	-40.47
Toll Use	1.75	1.69	-4.19
Total less Misc.	36.75	41.63	12.63
Miscellaneous	8.71	4.10	-53.27
Total	45.46	45.73	

Source: Authors' compilations.

local and dial-"1" toll by 12.63 percent. Finally, the shifts in dial-"1" toll services tend to equalize the revenue requirement per line-month. In the analysis that follows, the betaaveo is used as the basis for comparing the changes in the revenue requirement per line-month when busy-hour measures of peak are used and terminating use is included in the allocations.

Comparison of the Betaaveo and Daypeako Scenarios

The comparison of the betaaveo and daypeako scenarios demonstrates the impact of incorporating engineering concepts of the peak use in the allocations. Table 5.4 reports the revenue requirement per line-month for broad categories of services and the percentage change resulting from using the three busiest hours of the sample period.

The first thing to note in table 5.4 is that the daypeako scenario increases local revenue requirements per line-day by fifty-five cents on average, or 1.42 percent. This increase comes from both dial-"1" services and the miscellaneous category. The drop in the miscellaneous category comes from features group B and operator services. The drop in dial-"1" toll services comes from the revenue requirement reported in the form of

TABLE 5.4
COMPARISON OF THE RESULTS FOR
BETAAVEO AND DAYPEAKO SCENARIOS

	betaaveo $/line-month	daypeako $/line-month	Percentage Change Differences
Local	$37.55	$38.10	1.42%
InterLATA	1.27	0.98	-22.74
IntraLATA	1.13	1.11	-2.11
Toll Use	1.69	1.56	-7.37
Total less Misc.	41.63	41.75	0.23
Miscellaneous	4.10	4.00	-2.33
Total	45.73	45.75	

Source: Authors' compilations.

interLATA common line charge for all customers on average. This decline is computed as a 22.74 percent decline, or twenty-nine cents. Smaller declines were witnessed in the intraLATA NTS portion and portions associated with the switched network. The bottom-line totals for the two scenarios differ by only two cents in this case.

Table 5.5 reports the breakdown of the revenue requirement shifts for local service and the NTS portion of intrastate dial-"1" toll services. An examination of the results discloses a shift in revenue requirement per-line-month away from residential customers toward business and Centrex customers. This is particularly noticeable for local services. The per line-month revenue requirement for residential customers declines by $3.67 or 9.73 percent, while business increases by $10 or 32.52 percent. Centrex experiences the largest absolute increase of $16.50, which translates to a 29.03 percent increase.

The ratio of residence to business and Centrex revenue requirements per line-month is another measure of relative shifts in allocations and can be tied to rates. For the betaaveo scenario, the ratio for business is 0.82 and 1.51 for Centrex. The ratios for the daypeako scenario are 1.2 for business and 2.16 for Centrex. These ratios could be compared to rates for local services for these customer classes given the appropriate weighting scheme for various rate elements.

The results for the NTS portion of dial-"1" interLATA toll services demonstrate the same direction of shifts in revenue requirements per line-month. The revenue requirement per line-month for residential customers declines by $0.68 or 51.31 percent. While small in absolute terms the

TABLE 5.5
CUSTOMER CLASS RESULTS FOR THE
BETAAVEO AND DAYPEAKO SCENARIOS

	betaaveo $/line-month	daypeako $/line-month	Percentage Change Differences
Local			
Residential	$37.67	$34.00	-9.73%
Business	30.75	40.75	32.52
Centrex	56.83	73.33	29.03
InterLATA			
Residential	1.33	0.65	-51.31
Business	1.25	2.08	66.67
Centrex	0.67	1.17	74.13
IntraLATA			
Residential	1.08	1.08	0.00
Business	1.25	1.00	-20.00
Centrex	1.25	1.67	33.33

Source: Authors' compilations.

percentage decline is large. The business revenue requirement per line-month increases by 66.67 percent or $0.83. Finally, the Centrex share increases by 74.13 percent or $0.50. In all cases, the dollar amount of the shifts on a per-line-month basis are relatively small, but the percentages are large.

The results for the NTS portion of dial-"1" intraLATA toll services show a slightly different pattern than local and interLATA dial-"1" toll. The revenue requirement per line-month for the residential customers is unchanged, while business declines by 20 percent and Centrex increases by 33.33 percent. Again, the dollar amounts of the shifts are small.

Recall from a previous chapter that 55 percent of the allocation of the revenue requirement was fixed with regard to the customer classes. The NTS costs are allocated to customer classes by subscriber line counts which are fixed for all of the scenarios. The shifts in revenue requirements per line-month for local and NTS portions of dial-"1" toll services are the sole outcome of shifts in the relative use of the switched network for local services. The implication is that business and Centrex customers are heavy users of local services during the busiest hours of the sample period. From conversations with Southwestern Bell employees, the bouncing busy-hours typically occur during business hours, as was found in the sample data.

Comparison of Betaave and Daypeak Scenarios

The comparison of the betaave and daypeak scenarios introduces terminating usage into the allocations for both scenarios. To disentangle the effects of introducing terminating usage, the impact of going from originating use only in the average-use scenario (betaaveo) to both originating and terminating use in the average-use scenario (betaave) must be examined. This analysis sheds light on the shifts in the revenue requirement per line-month observed when the betaave and daypeak scenarios are compared. Thus, the betaaveo and betaave scenarios are examined first in the section to understand the impacts of introducing terminating use. Following that, the revenue requirement shifts due to using the three busiest hours when both originating and terminating use during the sample period are examined. Finally, the daypeako and daypeak scenarios are compared to analyze the impact of introducing terminating use during the three busiest hours during the sample period.

The results for the betaaveo and betaave scenarios are compared in table 5.6. The first finding to note in this table is the decrease in local revenue requirement per line-month and the increases in the dial-"1" toll and miscellaneous categories. The increase in the miscellaneous category is due to introducing features group A and B terminating usage into the allocations. Most of this increase is attributable to features group B carriers terminating toll calls in the local calling areas. The operator services contained in the miscellaneous category are originating only. The changes result in the total of local and dial-"1" toll services declining slightly by 0.09 percent.

The revenue requirement per line-month for local services decreases by \$2.41 or 5.33 percent, while that for dial-"1" toll services increases. The increase in dial-"1" toll services occurs in both the switched network and NTS portions of the revenue requirement per line-month. The switched network portion increases \$0.40 per line-month or by 25.18 percent. The impact on the NTS portion for interLATA dial-"1" toll is an increase of \$0.78 per line-month or 63.11 percent. The intraLATA part of NTS increases by \$0.72 per line-month or by 65.47 percent. Consequently, the introduction of terminating use increases the toll share of the revenue requirement per

TABLE 5.6
COMPARISON OF THE RESULTS FOR
THE BETAAVEO AND BETAAVE SCENARIOS

	betaaveo \$/line-month	betaave \$/line-month	Percentage Change Differences
Local	\$37.55	\$35.14	-5.33%
InterLATA	1.27	2.05	63.11
IntraLATA	1.13	1.85	65.47
Toll Use	1.69	2.09	25.18
Total less Misc.	41.63	41.13	-0.09
Miscellaneous	4.10	4.09	0.88
Total	45.73	45.21	

Source: Authors' compilations.

line-month relative to the local and the miscellaneous categories. Features groups A, B, C, and D all experienced increases.

The shifts in the revenue requirements per line-month for customer classes for local services and the NTS portion of dial-"1" toll services show an interesting distribution of the impact of terminating use on customer classes. Table 5.7 presents the customer class results. The first

TABLE 5.7
CUSTOMER CLASS RESULTS FOR THE
BETAAVEO AND BETAAVE SCENARIOS

	betaaveo $/line-month	betaave $/line-month	Percentage Change Differences
Local			
Residential	$37.67	$31.42	-16.59%
Business	30.75	41.83	36.04
Centrex	56.83	54.25	-4.55
InterLATA			
Residential	1.33	1.92	43.75
Business	1.25	2.42	93.33
Centrex	0.67	2.33	248.26
IntraLATA			
Residential	1.08	2.08	92.31
Business	1.25	1.25	0.00
Centrex	1.25	1.17	-6.67

Source: Authors' compilations.

thing to note is the distribution of the shifts in the revenue requirement per line-month for local services. The addition of terminating use to the allocations resulted in a decline in the residential and Centrex shares of local services' revenue requirement, while that of the business class increased. In the betaaveo scenario the ratio of the business class revenue requirement per line-month to that of the residential class was 0.82. With the introduction of terminating use this ratio increased to 1.33 or one-third larger than residential. The Centrex ratio increased from 1.51 to 1.73 due to the fact that the residential share decreased more than that of

Centrex. As noted above, local declined 5.33 percent overall, but this drop is not shared by all customer classes.

The results for the NTS portion of intraLATA dial-"1" toll services discloses that all customer classes experience an increase in the revenue requirement per line-month with Centrex experiencing the largest increase. This suggests that Centrex has a larger proportion of interLATA incoming calls than outgoing. The increase is $1.66 per line-month or 248.26 percent. The increase for the business class is 93.33 percent or $1.17 per line-month. The increase in the residential revenue requirement per line-month is $0.59 or 43.75 percent. This suggests that residential customers originate more interLATA calls than they have on an incoming basis on average. Indeed, the regression coefficient usage data confirm this suggestion.

The results for the NTS portion of intraLATA dial-"1" services show considerably different impacts on the customer classes. The business classes experience no change in their revenue requirement per line-month and Centrex shows a decrease. The residential revenue requirement per line-month shows an increase of $1.00 or 92.31 percent. This suggests that residential customers have relatively more incoming intraLATA calls relative to originating than business or Centrex classes.

This analysis of the effect of introducing terminating calls into the allocations was done to better understand the results for the betaave and daypeak scenarios. The results of these two scenarios are presented in table 5.8. The first finding to note is the shift in revenue requirement per line-month from dial-"1" toll and the miscellaneous categories to the local category. The daypeak scenario results in an increase of $1.66 per line-month or 4.61 percent of the revenue requirement per line-month for local services. The revenue requirement per line-month for the switched network portion of dial-"1" toll services declines by $0.34 per line-month or 15.99 percent. The NTS portion of dial-"1" toll services also declines by $0.43 or 16.33 percent for interLATA toll and by $0.34 or 15.99 percent for intraLATA toll. Thus, some of the shifts in the revenue requirement per line-month that resulted from introducing terminating usage are reversed when the three busiest hours of the sample period are the basis for allocations with terminating use included.

TABLE 5.8
COMPARISON OF THE RESULTS FOR THE
BETAAVE AND DAYPEAK SCENARIOS

	betaave $/line-month	daypeak $/line-month	Percentage Change Differences
Local	$35.14	$36.80	4.61%
InterLATA	2.05	1.72	-16.33
IntraLATA	1.85	1.42	-23.42
Toll Use	2.09	1.75	-15.99
Total less Misc.	41.13	41.69	1.26
Miscellaneous	4.09	3.57	-12.68
Total	45.21	45.26	

Source: Authors' compilations.

The interesting results of this scenario are found in examining the customer class results for local services and the NTS portion of dial "1" toll services. Table 5.9 presents these results. One notable finding is that all customer classes experience an increase in local revenue requirements when the peak rather than average use is considered as a basis for allocation. The Centrex customer classes experience an increase of $20.25 or 37.33 percent. This increases the ratio of Centrex to residential revenue requirement per line-month from 1.73 for the betaave scenario to 2.37 for the daypeak scenario. This is a modest increase from the 2.16 ratio recorded for the daypeako scenario. The residential revenue requirement per line-month for local services increases by a modest $0.08 or 0.27 percent over the betaave scenario. The business revenue requirement per line-month increases modestly by $1.00 or 2.39 percent. The Centrex class experiences the brunt of the increase in the local revenue requirement per line-month.

Turning to the NTS portion of dial-"1" interLATA toll services, the residential class experiences a decline of $0.67 per line-month or 34.78 percent. The corresponding impact on business customers is a $0.66 or 27.59 percent increase in the revenue requirement per line-month. Centrex experiences a modest increase of $0.17 or 7.14 percent. Consequently the 16.33 percent decline in the revenue requirement per line-month for the NTS portion of dial-"1" interLATA toll services accrues to the residential

TABLE 5.9
CUSTOMER CLASS RESULTS FOR THE
BETAAVE AND DAYPEAK SCENARIOS

	betaave $/line-month	daypeak $/line-month	Percentage Change Differences
Local			
Residential	$31.42	$31.50	0.27%
Business	41.83	42.83	2.39
Centrex	54.25	74.50	37.33
InterLATA			
Residential	1.92	1.25	-34.78
Business	2.42	3.08	27.59
Centrex	2.33	2.50	7.14
IntraLATA			
Residential	2.08	1.42	-32.00
Business	1.25	1.25	0.00
Centrex	1.17	1.92	64.29

Source: Authors' compilations.

class. This implies that the residential class uses dial-"1" interLATA toll services relatively less during the busy hour than on average when compared to other customer classes.

The results for the NTS portion of dial-"1" interLATA toll services show a similar result. The revenue requirement for the residential class falls while that for business is unchanged and Centrex increases. The Centrex revenue requirement per line-month increases by $0.75 or 64.29 percent, while the corresponding figure for the residential class falls by $0.66 or 32 percent. Again, these results demonstrate that the 23.42 percent decline in the revenue requirement per line-month accrues to the residential class, while the Centrex class uses more intraLATA services relative to the other customer classes.

To wrap up the analysis of the impact of engineering definitions of peak on the allocation of the revenue requirement per line-month the daypeako and daypeak scenarios are compared to examine the effect of including terminating use at the peak. Table 5.10 presents the results of this comparison for broad categories of services. The results show that dial-"1" toll experiences an increase in the revenue requirement per line-

TABLE 5.10
COMPARISON OF RESULTS FOR THE
DAYPEAKO AND DAYPEAK SCENARIOS

	daypeako $/line-month	daypeak $/line-month	Percentage Change Differences
Local	$38.10	$36.80	-2.30%
InterLATA	0.98	1.72	76.72
IntraLATA	1.11	1.42	29.52
Toll Use	1.56	1.75	13.58
Total less Misc.	41.75	41.69	0.99
Miscellaneous	4.00	3.57	-9.76
Total	45.75	45.26	

Source: Authors' compilations.

TABLE 5.11
CUSTOMER CLASS RESULTS FOR THE
DAYPEAKO AND DAYPEAK SCENARIOS

	daypeako $/line-month	daypeak $/line-month	Percentage Change Differences
Local			
Residential	$34.00	$31.50	-7.35%
Business	40.75	42.83	5.11
Centrex	73.33	74.50	1.59
InterLATA			
Residential	0.65	1.25	92.55
Business	2.08	3.08	48.00
Centrex	1.17	2.50	114.29
IntraLATA			
Residential	1.08	1.42	30.77
Business	1.00	1.25	25.00
Centrex	1.67	1.92	15.00

Source: Authors' compilations.

month, while local and miscellaneous services decline when terminating use is factored into the allocations based on peak. The revenue requirement per line-month for the switched network portion of dial-"1" toll services increases by $0.19 or 13.58 percent. The NTS portion of interLATA dial-"1" toll services increases by $0.74 or 76.72 percent, while the same increase for intraLATA toll services is $0.31 or 29.52 percent. The analysis of the customer class results disclose the distribution of the shifts in the revenue requirements per line-month among the customer classes. Table 5.11 presents the results of this comparison.

These results show that the increase in the revenue requirement per line-month for the NTS portion of dial-"1" toll services is shared by all customer classes, while the decline in local services accrues solely to residential customers. Thus, one can conclude that business and Centrex customers use relatively more local service on peak when both originating and terminating calls are included in the definition of peak rather than originating calls alone. All customer classes experience an increase in the revenue requirement per line-month for the NTS portion of dial-"1" toll services when terminating use is included in the allocation factors.

Conclusions

The results of the six cost studies have demonstrated that a peak defined using engineering concepts has a substantive impact on the allocation of the revenue requirement among local and toll services and among customer classes when compared to traditional practices that use 24-hour use as a basis for allocations. Furthermore, the inclusion of terminating use in the allocations also has a substantive impact on the allocations under an engineering definition of the peak. If the peak is defined as the busiest hour on average for a typical day over the measurement period, the impact on the allocations is inconsequential and not worth the time and expense of collecting the data and performing the allocations. The analyst is better served focusing on the bouncing busy-hour, busy-season measurements and estimating the contribution of each customer class and service.

The conclusion drawn from the analysis in this chapter is that the allocations based on 24-hour use tend to underestimate the revenue requirement for dial-"1" toll services and for business and Centrex classes. Operator services and the residential class tend to be allocated too much of the revenue requirement by 24-hour use. If the purpose of the revenue requirement allocation is to assign the responsibility for cost causation to customer classes and services driving the underlying investments in plant and equipment and expenses, then engineering concepts of peak use better serve this goal as a basis for allocations.

The role of terminating use in the allocations is primarily conceptual, but also is substantive. Factoring in terminating use in the design of rates is the conceptual role. This is particularly true when designing access charges for toll services. In a world of flat-rate prices for local services, using terminating use in allocations results in shifts in the revenue requirement per line-month for local services among the customer classes. If flat rates were not the norm, then the information regarding the revenue requirement associated with terminating use could be used in designing usage prices for local services. Since business and Centrex customers receive relatively more calls on peak than residential customers or more than they originate, some rate realignment would occur. As it stands, however, the information on terminating use largely benefits the design of dial-"1" toll services directly, while only causing shifts in the revenue requirement for local services among customer classes.

CHAPTER SIX

SUMMARY OF FINDINGS AND SUGGESTIONS FOR FUTURE RESEARCH

The purpose of this chapter is to summarize the major findings of this report with regard to revenue requirement allocations for local services and to suggest a direction for future research in the application of bouncing busy-hour, busy-season concepts to revenue requirement allocations. The presentation of major results returns to the notion of the ratio of revenue requirements per access line developed in the first chapter and reported in the fifth chapter. The suggestion for further research outlines an improved method of collecting bouncing busy-hour, busy-season traffic information.

Summary of Major Findings for Local Services

In the first chapter, it was speculated that usage of services by customer classes does not change proportionally from hour to hour. If this were the case, allocations of the revenue requirement based on 24-hour measures of traffic would yield the same results as allocations based on measures of peak. The information to answer this question for local services is presented in this section.

Table 6.1 reports the ratios of business and Centrex to residential revenue requirements per access line for the six scenarios presented in chapter 5. The first column of this table identifies the scenario by its name. The second column reports the ratio of the business revenue requirement per access line to the residential revenue requirement per access line. In the third column, the ratio of the Centrex revenue requirement per access line to that of the residential customer category is reported. This table discloses some interesting results with regard to measures of busy-hour and the inclusion of terminating use in the allocations.

TABLE 6.1

RATIOS OF REVENUE REQUIREMENT PER ACCESS LINE

Scenario Name	Ratio of Business to Residential Local Revenue Requirement	Ratio of Centrex to Residential Local Revenue Requirement
use24	89.08%	138.92%
usepeak	91.99	155.61
betaaveo	81.63	150.86
daypeako	119.85	215.68
betaave	133.13	172.66
daypeak	135.97	236.51

Source: Author's compilations.

The first thing to note in table 6.1 is the ratio of business to residential requirements per access line. The ratios for the use24, usepeak, and betaaveo scenarios are similar which suggests proportionality. Furthermore, the business revenue requirement for these first three scenarios is uniformly less than that for the residential class. All of these scenarios are based on originating use only. The usepeak scenario is based on the busiest hour on average over the sample period. This definition results primarily from a method of summarizing AMA[1] data for inclusion in a revenue requirement study based on a measure of peak. This average notion of peak is not a planning engineer's definition of busy-hour use, but is a statistical artifact of summarizing AMA data prior to designing the revenue requirement allocation scheme.

The results for the daypeako scenario tell a different story, however. The daypeako scenario is based on originating use and a bouncing busy-hour, busy-season concept of peak use. Note the lack of proportionality when compared to the betaaveo scenario (daypeako's data counterpart). The ratios

1. AMA is an acronym for Automatic Message Accounting Equipment used for customer billing.

increase from 81.63 percent to 119.85 percent. This is a significant change and highlights the fact that bouncing busy-hour, busy-season originating use does not exhibit proportionality. Instead, significantly more revenue requirement per access line is allocated to the business class.

An examination of the ratio of business to residential revenue requirements per access line for the betaave and daypeak scenarios discloses the impact of introducing terminating use into the allocations. Note that these results demonstrate proportionality in the allocations. However, also note that terminating use has significantly increased the ratio for these two scenarios when compared to the betaaveo and daypeako scenarios, respectively. The ratio for the betaave scenario increases fifty percentage points over the betaaveo scenario. Both of the scenarios are based on measures of 24-hour use. The ratio for the daypeak scenario increases fifteen percentage points over the daypeako scenario. From this information, one can conclude that terminating use has a significant impact on the results of a revenue requirement allocation for business customers relative to residential customers.

The ratios of the Centrex revenue requirement per access line to that of residential customers tells a slightly different story. The comparisons of the use24 and usepeak scenarios don't exhibit the same degree of proportionality as they did for the business comparison. The ratio of the Centrex revenue requirement to the residential for the usepeak scenario increases 16 percent over that of the use24 scenario. The same result, however, is witnessed for the betaaveo scenario which should be directly comparable to the use24 scenario. The NRRI research team attributes this change to data problems with the use24 scenario as discussed in chapter 4.

When the betaaveo and daypeako scenarios are compared, the ratio of the Centrex revenue requirement per access line to that of residential for the daypeako scenario increases 65 percent over that of the betaaveo scenario. Clearly again, the bouncing busy-hour, busy-season measures of peak do not exhibit proportionality when compared to allocations based on 24-hour use. The ratio for the daypeako scenario is 215.68 percent, while the ratio for the betaaveo scenario is 150.86 percent.

The introduction of terminating use into the allocations has a significant impact. The ratio of the Centrex revenue requirement per access line to that of residential for the betaave and daypeak scenarios increases significantly over those for the betaaveo and daypeako scenarios. Furthermore, the results for the betaave and daypeak scenarios do not exhibit proportional behavior as they did for the ratio of business to residential. These results reinforce the conclusion that bouncing busy-hour, busy-season traffic measures have a substantial and profound impact on the allocation of the revenue requirement, and the traffic measures should include terminating use.

To conclude this analysis, the measure of the busiest hour on average appears to be nearly proportional enough to 24-hour use so as to not warrant the time and effort to become a basis for allocating the revenue requirement. Measures of bouncing busy-hour, busy-season traffic, on the other hand, appear to have a significant impact on the allocations. Furthermore, terminating use should be included in the allocations. The NRRI research team concludes that this bouncing busy-hour concept of peak is in accordance with engineering practices and best reflects cost causation.

Suggestion for Future Research

If bouncing busy-hour, busy-season traffic best reflects cost causation, analysts performing revenue requirement allocations must look to planning engineers and network administrators for data to perform the allocations. Two possible ways may exist to integrate planning concepts directly. The first method is based on AMA studies supplemented with planning data regarding the bouncing busy-hour, busy-season. The second method is based directly on planning data and uses regression analysis, supplemented STARS, and other data to estimate customer class and service category contributions to peak.

The first approach involves carefully timing AMA (SLU) studies at switches. The SLU study should be activated during months which have historically been identified as busy-season. During these collection periods, the ten or twenty busiest hours and the dates they occurred can be identified by network administrators. The AMA tapes can be scanned for usage on sampled lines during the bouncing busy-hours identified during the busy season. This information may then be used to approximate customer class and service contributions to the bouncing busy-hour during the busy season. While this approach requires gathering more data, the alternative, if feasible, requires more data analysis.

The alternative is to use the planning engineer's measures of bouncing busy-hour, busy-season traffic directly. Regression analysis can be performed on the data once the traffic data are separated into suitable service categories. This segregation of the planning engineers' bouncing busy-hour, busy-season traffic into service categories may require STARS or other data as appropriate. If it is feasible to segregate this traffic information into service categories, this approach has the promise of substantial savings in time and resources devoted to data collection.

While the focus of this study has been upon the allocation of the revenue requirement, the peak responsibility concept can be used in any telecommunications context where cost causation cannot otherwise be directly identified. Since marginal costs are only half of the revenue requirement, peak allocations can be used to allocate this shortfall in an economically correct fashion. If a commission needed to divide assets between competitive and noncompetitive services, the peak approach offers a reliable and equitable way of doing this according to the demand each type of service places upon the peak.

The use of peak load costing concepts has been successfully accomplished in the electric utility industry because of the congruence of economic theory with electric utility engineering practices and because of the desirability of the outcomes achieved. There is no reason to suspect that the peak concept will be any less successful in the telecommunications industry.

APPENDIX A

Regression Coefficient Data: Hourly Use per Line-day by Customer Class, Service Category, and Strata

TABLE A.1

REGRESSION COEFFICIENTS: ESTIMATED HOURLY PER-LINE-DAY USAGE FOR THIRTEEN SERVICE CATEGORIES FOR METROPOLITAN BUSINESS CUSTOMERS

Service Category (i)	Type D	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
		Hours of Day																
FGB	ORIG	0.0	0.0	0.0	0.1	0.3	0.2	0.4	0.1	0.1	0.3	0.1	0.3	0.4	0.4	0.3	0.3	0.2
DA	ORIG	0.1	0.5	3.2	1.8	1.2	1.1	1.3	1.8	1.8	1.4	0.5	0.4	0.4	0.3	0.2	0.3	0.3
ISIL	ORIG	7.0	22.5	42.7	48.5	40.7	27.4	37.4	49.7	48.1	33.3	21.2	14.3	11.0	12.8	14.1	14.0	9.1
RAEXEAS	ORIG	8.1	159.3	336.1	367.2	326.4	223.9	304.3	345.2	358.9	311.5	177.8	115.7	95.0	98.0	90.6	84.6	41.9
SL	ORIG	0.9	4.4	9.6	10.4	9.6	5.3	9.0	11.5	11.2	9.0	5.3	3.7	2.7	2.8	2.6	3.8	1.3
RASW	ORIG	0.0	1.6	11.2	12.3	6.9	0.0	1.4	5.0	2.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
SIL	ORIG	2.7	13.6	24.4	27.8	23.5	13.3	20.2	27.2	26.6	23.6	11.5	8.4	6.5	8.3	9.3	12.6	4.3
RAEXEAS	TERM	43.3	187.0	354.5	264.9	363.3	433.1	347.2	379.6	385.2	372.5	211.1	129.8	106.6	100.9	99.4	73.9	50.6
FGB	TERM	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
ISIL	TERM	1.1	7.6	17.0	16.8	14.9	42.1	12.3	14.9	15.0	10.5	3.5	1.8	0.2	1.9	1.3	1.7	0.0
SIL	TERM	9.1	33.3	89.3	68.2	61.6	44.1	52.7	58.2	59.2	49.1	26.2	13.1	13.5	13.4	14.6	13.7	3.9
SL	TERM	1.4	3.2	18.5	25.8	23.1	12.9	18.0	21.3	22.7	18.6	6.7	0.7	0.0	0.0	0.0	0.8	1.3
TSPS	ORIG	0.3	0.6	2.8	1.7	0.9	1.0	1.3	1.2	1.5	1.3	0.9	0.0	0.3	1.0	1.0	1.3	0.2

Source: Author's compilation.

TABLE A.2

REGRESSION COEFFICIENTS: ESTIMATED HOURLY PER-LINE-DAY USAGE FOR THIRTEEN SERVICE CATEGORIES FOR METROPOLITAN CENTREX CUSTOMERS

Service Category (i)	Type D	Hours of Day 8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
FGB	ORIG	0.0	0.1	0.1	0.3	0.0	0.2	0.0	0.0	0.2	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0
DA	ORIG	0.1	1.1	0.0	0.7	1.2	0.6	0.7	0.3	0.4	0.6	0.2	0.1	0.1	0.0	0.1	0.0	0.0
ISIL	ORIG	0.5	0.0	0.0	0.0	0.0	0.0	2.5	0.0	0.0	1.8	0.0	1.4	1.0	2.1	0.8	0.6	2.0
RAEXEAS	ORIG	6.2	56.2	68.3	92.8	90.0	77.0	82.6	90.0	89.5	71.1	28.8	27.0	26.7	24.5	28.4	34.9	19.0
SL	ORIG	0.5	4.0	6.8	7.2	5.8	4.7	5.7	6.0	6.9	6.9	3.8	4.1	3.6	4.5	4.1	3.9	1.2
RASW	ORIG	9.1	21.6	28.4	31.0	28.0	24.3	28.9	30.7	32.2	26.4	18.7	17.8	17.3	17.9	17.8	11.8	9.1
SIL	ORIG	0.0	0.5	2.9	1.6	2.8	1.3	1.9	1.9	2.7	1.8	1.4	3.2	5.7	5.7	6.3	10.0	1.3
RAEXEAS	TERM	18.7	82.5	123.5	158.5	103.2	0.0	97.0	117.0	114.8	76.2	26.7	32.8	34.8	38.6	39.4	44.2	7.9
FGB	TERM	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.3	0.0	0.0	0.0	0.0	0.0	0.0
ISIL	TERM	1.0	0.0	0.0	1.8	0.8	0.0	0.3	0.0	0.0	0.5	0.7	0.8	2.1	1.7	2.7	0.3	0.0
SIL	TERM	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.4	0.2	1.7	0.1	0.0	1.8
SL	TERM	0.6	0.0	0.0	0.9	0.4	2.3	0.0	0.0	0.0	0.0	0.0	2.5	0.0	0.0	0.0	0.1	1.7
TSPS	ORIG	0.7	1.6	0.7	1.9	2.4	1.9	1.2	2.1	1.4	1.9	1.4	3.1	2.7	2.2	2.5	3.0	1.2

Source: Author's compilation.

TABLE A.3

REGRESSION COEFFICIENTS: ESTIMATED HOURLY PER-LINE-DAY USAGE FOR THIRTEEN SERVICE CATEGORIES FOR METROPOLITAN RESIDENTIAL CUSTOMERS

Service Category (i)	Type D	Hours of Day																
		8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
FGB	ORIG	0.0	0.2	0.2	0.2	0.1	0.0	0.0	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.1	0.0	0.0
DA	ORIG	0.1	0.3	0.0	0.2	0.7	0.3	0.2	0.3	0.2	0.3	0.4	0.4	0.3	0.2	0.2	0.1	0.0
ISIL	ORIG	0.7	0.0	0.0	0.0	0.0	0.4	0.0	0.0	0.0	0.4	3.7	6.4	9.2	11.5	11.9	9.0	5.3
RAEXEAS	ORIG	0.9	22.0	16.0	21.4	25.7	37.3	26.7	24.9	26.3	39.2	51.8	62.1	68.1	80.3	82.3	52.4	33.8
SL	ORIG	1.0	1.9	2.0	2.0	1.8	2.2	1.7	1.2	1.4	1.8	2.8	3.5	4.3	5.3	5.2	2.1	1.1
RASW	ORIG	8.5	21.5	31.6	37.7	38.5	38.7	38.9	41.0	44.7	50.3	51.6	51.2	52.7	59.9	58.1	37.0	19.4
SIL	ORIG	0.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.7	2.8	4.0	4.9	5.8	2.2	2.3
RAEXEAS	TERM	5.3	1.0	0.0	92.1	0.0	0.0	0.0	0.0	0.0	1.1	25.6	41.9	47.0	57.4	57.2	40.9	19.9
FGB	TERM	2.9	2.8	2.9	2.8	3.6	2.5	2.2	2.6	2.4	2.7	2.1	2.1	2.3	3.3	3.1	3.4	2.4
ISIL	TERM	0.5	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4	1.5	1.9	2.8	3.0	3.3	2.8	1.9
SIL	TERM	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.0	7.1	7.8	10.4	11.1	7.9	6.4
SL	TERM	1.2	5.2	2.4	2.4	2.8	3.0	2.5	2.2	1.9	2.6	4.0	5.8	6.7	8.2	8.4	2.1	2.2
TSPS	ORIG	0.1	0.3	0.4	0.5	0.8	0.6	0.6	0.6	0.7	0.7	0.7	1.1	1.0	1.1	1.4	1.3	0.9

Source: Author's compilation.

TABLE A.4

REGRESSION COEFFICIENTS: ESTIMATED HOURLY PER-LINE-DAY USAGE FOR THIRTEEN SERVICE CATEGORIES FOR NON METROPOLITAN BUSINESS CUSTOMERS

Service Category (i)	Type D	Hours of Day																
		8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
FGB	ORIG	5.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
DA	ORIG	1.2	3.9	6.2	6.6	7.4	5.3	6.7	7.3	6.9	7.3	3.9	4.0	3.2	3.2	2.4	2.0	1.0
ISIL	ORIG	0.9	4.7	23.5	27.8	23.5	14.7	19.4	27.3	21.9	21.1	13.7	10.2	8.3	6.8	9.5	8.2	5.7
RAEXEAS	ORIG	7.7	158.3	258.8	292.2	269.4	207.8	249.0	302.8	266.7	250.7	141.6	103.0	105.1	89.5	55.7	56.4	28.9
SL	ORIG	0.0	3.7	6.3	5.6	5.0	2.5	5.6	11.3	5.5	6.7	1.3	0.0	0.0	0.0	0.0	4.0	2.3
RASW	ORIG	0.0	9.3	38.2	35.1	21.8	0.0	9.9	0.0	16.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
SIL	ORIG	0.0	6.1	15.5	16.5	11.7	3.9	10.2	9.8	14.8	9.5	2.1	0.0	0.0	0.0	0.0	0.0	0.0
RAEXEAS	TERM	3.5	142.6	316.8	321.3	295.6	219.3	297.9	376.3	342.9	314.2	167.7	116.3	105.0	94.5	143.3	65.7	48.8
FGB	TERM	3.5	4.8	10.0	10.0	9.3	7.7	5.6	7.8	15.6	2.3	6.9	3.9	2.5	1.8	3.1	3.4	1.2
ISIL	TERM	2.3	5.7	10.0	12.9	12.3	8.1	10.0	12.4	10.1	9.1	5.7	3.8	4.9	4.9	4.1	4.0	2.5
SIL	TERM	5.2	16.8	64.9	86.0	76.5	55.7	67.8	76.8	52.2	59.2	20.9	7.9	11.5	4.1	12.1	3.2	0.0
SL	TERM	0.3	4.0	7.6	14.5	13.1	7.1	5.8	4.4	4.4	5.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TSPS	ORIG	10.0	14.8	21.5	23.3	25.3	21.3	20.0	24.5	24.3	16.1	16.9	20.7	15.2	22.4	24.6	27.0	14.4

Source: Author's compilation.

TABLE A.5

REGRESSION COEFFICIENTS: ESTIMATED HOURLY PER-LINE-DAY USAGE FOR THIRTEEN SERVICE CATEGORIES FOR NON METROPOLITAN CENTREX CUSTOMERS

Service Category (i)	Type D	Hours of Day																
		8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
FGB	ORIG	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
DA	ORIG	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
ISIL	ORIG	2.2	7.6	7.5	4.2	6.4	4.5	6.9	8.9	14.8	8.2	5.9	5.0	6.1	3.2	3.0	6.5	6.7
RAEXEAS	ORIG	4.7	170.7	227.0	253.5	256.3	183.7	227.6	226.4	303.5	274.7	205.3	180.0	157.3	190.5	220.7	194.7	125.6
SL	ORIG	0.0	0.1	0.7	1.0	1.2	0.0	0.0	0.0	2.0	0.0	0.0	0.3	0.0	2.8	3.6	4.1	0.7
RASW	ORIG	5.1	54.9	86.8	105.1	100.6	89.6	104.9	136.8	105.0	107.1	75.3	64.5	66.7	77.9	88.3	117.1	100.8
SIL	ORIG	0.9	2.3	0.0	0.0	2.0	2.5	1.1	3.3	0.0	4.7	3.5	2.9	4.1	3.0	4.8	9.7	7.9
RAEXEAS	TERM	0.4	183.4	48.5	74.3	76.2	45.1	41.6	3.8	67.5	57.4	43.8	48.3	53.6	67.4	127.9	85.3	55.4
FGB	TERM	1.9	17.7	14.4	4.4	15.6	11.9	8.3	13.6	12.1	45.9	11.4	6.1	3.8	5.0	5.0	7.7	5.8
ISIL	TERM	0.0	13.6	0.0	0.0	0.0	0.0	0.0	0.0	9.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
SIL	TERM	1.1	113.8	34.6	26.9	27.8	10.1	4.2	23.4	145.5	27.1	9.0	9.1	4.5	11.2	23.4	26.9	19.2
SL	TERM	0.2	1.2	0.0	0.0	0.0	0.0	0.0	0.0	9.9	0.0	0.0	0.2	0.0	0.4	4.7	5.2	8.0
TSPS	ORIG	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Source: Author's compilation.

TABLE A.6

REGRESSION COEFFICIENTS: ESTIMATED HOURLY PER-LINE-DAY USAGE FOR THIRTEEN SERVICE CATEGORIES FOR NON METROPOLITAN RESIDENTIAL CUSTOMERS

Service Category (i)	Type D	Hours of Day 8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
FGB	ORIG	0.0	2.3	3.0	1.8	2.0	1.4	2.4	1.7	1.4	1.9	2.1	1.6	2.1	2.1	2.8	2.5	2.0
DA	ORIG	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
ISIL	ORIG	2.3	5.1	1.5	1.7	2.1	2.8	2.9	0.8	2.9	2.4	4.2	5.9	7.4	9.9	9.9	7.9	4.5
RAEXEAS	ORIG	4.5	0.0	0.0	0.0	0.0	1.7	0.0	0.0	4.5	9.2	23.2	29.8	29.7	41.8	50.2	31.4	16.9
SL	ORIG	2.6	4.8	6.9	7.3	7.1	5.8	6.2	5.1	6.8	6.1	6.7	7.8	7.5	9.5	9.2	4.4	1.9
RASW	ORIG	7.5	40.4	52.7	62.3	65.4	64.2	66.6	73.9	73.1	85.7	93.6	91.8	92.6	110.4	114.0	75.4	41.1
SIL	ORIG	2.4	4.8	5.0	5.0	5.4	5.2	5.5	6.2	5.4	6.4	7.5	9.9	11.3	14.6	17.2	12.8	7.3
RAEXEAS	TERM	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.5	13.6	16.0	25.4	10.8	20.1	5.5
FGB	TERM	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.7	0.0	0.0	0.6	0.6	0.5	1.0	1.7
ISIL	TERM	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	0.3	0.6	1.3	0.5	0.3
SIL	TERM	0.4	5.0	0.0	0.0	0.0	0.0	0.0	0.0	1.4	0.0	7.1	11.0	12.3	17.2	16.1	14.3	7.8
SL	TERM	2.1	6.9	10.0	9.4	8.9	6.9	9.9	11.1	10.8	9.7	8.3	8.3	8.1	9.6	10.0	7.6	3.4
TSPS	ORIG	0.0	0.0	0.0	0.0	0.0	0.0	1.5	0.0	0.0	1.7	1.1	0.0	1.7	3.6	2.6	0.0	1.6

Source: Authors' compilations.

APPENDIX B

SLU DATA: Hourly Use per Line-day by Customer Class, Service Category, and Strata

TABLE B.1

SLU DATA: HOURLY WEIGHTED-AVERAGE PER-LINE-DAY USE OF FIFTEEN SERVICE CATEGORIES BY CENTREX CUSTOMERS IN THE METROPOLITAN STRATUM

Service Category	Type D	Hours of Day															
	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	24
800	1.8	3.2	4.3	6.0	6.7	2.5	5.2	9.3	10.7	1.9	0.7	0.0	0.2	0.0	0.0	0.0	0.0
FGARASW	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
FGB	0.0	0.0	0.1	0.1	1.4	0.5	0.1	0.0	0.0	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.0
INTL	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
ISLO	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
OCINTLO	0.0	1.7	1.2	1.0	5.5	10.0	0.3	42.3	1.3	1.5	1.3	0.1	0.3	0.3	0.3	0.2	0.0
OCISILO	0.0	0.0	1.2	11.3	17.9	49.3	3.7	11.6	0.5	1.7	1.0	0.0	0.0	0.0	0.0	0.0	0.0
OCSILO	14.5	19.4	26.6	26.1	39.6	54.2	20.7	29.7	32.6	39.1	11.2	8.6	2.7	0.0	16.0	14.9	0.0
RAEX	4.3	26.8	35.1	43.2	30.1	29.0	35.9	34.8	38.1	22.3	17.3	5.0	2.8	2.1	0.6	0.3	0.1
RAEXO	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
RASW	0.2	4.2	7.3	7.8	7.5	3.8	7.5	6.8	7.3	4.8	1.5	0.9	0.8	1.3	0.3	0.1	0.1
RASWO	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
SIL	0.0	0.1	1.2	1.6	3.4	1.5	0.8	1.6	1.5	2.4	1.2	0.2	0.0	0.1	0.0	0.0	0.0
SL	0.1	0.3	1.6	2.7	2.0	0.5	2.3	3.0	1.8	1.7	0.3	0.5	0.3	0.3	0.0	0.0	0.0
SLO	0.0	4.0	2.2	9.4	10.8	8.0	15.1	6.2	17.5	11.5	12.1	8.1	0.3	2.7	5.5	4.9	3.6

Source: Author's compilations.

TABLE B.2

SLU DATA: HOURLY WEIGHTED-AVERAGE PER-LINE-DAY USE OF FIFTEEN SERVICE CATEGORIES BY FEATURE GROUP A CUSTOMERS IN THE METROPOLITAN STRATUM

Service Category	Type D 9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	24
	Hours of Day																
800	0.0	0.0	0.0	0.1	0.2	0.1	0.1	0.1	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
FGARASW	0.2	0.4	0.7	0.9	0.7	0.2	0.6	0.8	1.0	0.5	0.1	0.1	0.1	0.0	0.1	0.1	0.0
FGB	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
INTL	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
ISLO	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
OCINTLO	0.0	0.0	0.0	0.4	0.0	0.0	0.3	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
OCISILO	0.0	0.0	0.0	0.5	0.0	0.0	0.1	0.8	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
OCSILO	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.0	0.0	0.0	0.0
RAEX	51.2	146.2	148.2	164.5	169.8	137.0	153.2	152.1	148.5	146.3	120.8	149.4	141.1	117.5	102.3	130.7	73.4
RAEXO	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
RASW	3.0	12.1	22.4	28.2	24.5	15.1	20.7	25.1	23.9	18.8	7.7	4.4	3.0	2.6	3.2	2.6	1.8
RASWO	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
SIL	0.0	0.1	0.2	0.1	0.2	0.1	0.3	0.3	0.4	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
SL	0.0	0.1	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.1	0.0
SLO	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Source: Author's compilations.

TABLE B.3

SLU DATA: HOURLY WEIGHTED-AVERAGE PER-LINE-DAY USE OF FIFTEEN SERVICE CATEGORIES BY FOREIGN EXCHANGE BUSINESS CUSTOMERS IN THE METROPOLITAN STRATUM

Service Category	Type D							Hours of Day									
	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	24
800	0.2	2.8	5.8	4.5	2.8	3.1	5.6	3.4	3.8	4.2	2.1	2.0	0.8	0.1	0.0	0.0	0.0
FGARASW	2.4	5.8	9.4	6.4	6.3	3.9	8.3	5.9	21.2	6.7	0.6	0.0	0.0	0.0	0.2	0.0	0.0
FGB	0.0	0.0	0.0	0.1	0.0	0.3	0.0	0.1	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0
INTL	0.4	0.0	0.6	0.3	0.2	0.2	0.0	0.2	0.0	0.2	0.0	0.3	0.0	0.0	0.0	0.2	0.0
ISLO	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
OCINTLO	0.0	0.0	0.0	9.8	1.7	3.4	5.1	0.0	8.5	4.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
OCISILO	0.0	3.2	2.0	2.5	6.6	0.0	0.0	11.5	1.8	3.7	0.9	0.0	3.7	4.2	0.0	0.0	0.0
OCSILO	0.0	2.8	0.0	0.2	2.1	2.3	1.8	8.1	2.1	4.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0
RAEX	32.8	158.0	220.0	242.5	206.6	165.4	201.2	212.7	210.6	206.2	64.3	28.4	21.5	27.5	13.1	14.3	4.3
RAEXO	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
RASW	5.5	47.7	59.2	49.7	50.2	41.8	58.1	39.3	49.3	48.0	18.3	5.9	6.6	10.9	10.8	8.7	5.0
RASWO	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
SIL	1.5	5.4	18.2	7.5	5.0	1.8	7.7	8.1	4.2	7.0	3.9	0.5	0.1	0.4	1.4	0.1	0.0
SL	0.6	1.5	1.8	1.3	1.3	0.8	2.7	1.0	0.8	2.4	0.9	0.7	1.1	1.2	1.7	1.0	0.0
SLO	0.0	2.1	16.9	0.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0	1.8	0.0	0.0	0.0	0.0	0.0

Source: Author's compilations.

TABLE B.4

SLU DATA: HOURLY WEIGHTED-AVERAGE PER-LINE-DAY USE OF FIFTEEN SERVICE CATEGORIES BY FOREIGN EXCHANGE RESIDENTIAL CUSTOMERS IN THE METROPOLITAN STRATUM

Service Category	Type D	Hours of Day															
	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	24
800	0.0	0.8	1.4	2.3	2.1	0.0	1.4	0.8	1.1	1.7	0.0	0.6	0.7	0.7	1.0	0.6	0.0
FGARASW	0.1	0.0	0.9	0.1	0.1	0.1	0.0	0.0	0.2	0.9	0.6	0.0	0.0	0.5	0.0	0.0	0.0
FGB	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
INTL	0.0	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
ISLO	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
OCINTLO	0.0	0.0	16.1	3.3	3.8	9.5	0.0	4.2	0.6	0.0	7.4	26.6	4.8	0.0	0.0	0.3	0.0
OCISILO	0.0	0.0	0.0	14.4	34.7	6.4	32.3	0.8	0.0	5.5	0.0	0.0	0.0	0.0	0.0	64.0	38.6
OCSILO	0.0	0.0	4.9	0.0	0.0	0.0	0.0	4.2	0.0	0.0	2.0	2.3	18.9	5.5	0.0	0.8	0.9
RAEX	73.7	70.9	113.4	101.4	89.9	67.0	72.7	66.6	66.9	79.5	94.7	77.4	39.7	71.6	96.1	72.4	16.4
RAEXO	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
RASW	0.9	4.9	7.3	9.7	8.2	11.1	11.4	9.1	5.0	12.5	4.9	5.5	2.2	1.4	8.6	2.3	0.5
RASWO	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
SIL	0.7	5.0	28.5	28.1	11.9	4.6	8.2	12.3	16.8	23.4	18.0	2.7	3.4	2.4	8.4	0.6	0.0
SL	1.2	4.1	16.0	14.1	10.4	5.7	7.5	11.9	9.9	10.1	6.5	4.4	8.2	9.1	9.2	19.1	16.1
SLO	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	5.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Source: Author's compilations.

TABLE B.5

SLU DATA: HOURLY WEIGHTED-AVERAGE PER-LINE-DAY USE OF FIFTEEN SERVICE CATEGORIES BY MEASURED RATE BUSINESS CUSTOMERS IN THE METROPOLITAN STRATUM

Service Category	Type D	Hours of Day															
	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	24
800	0.0	1.0	3.5	3.8	2.8	3.4	2.8	4.5	5.0	1.5	1.0	0.1	0.2	0.2	0.0	0.7	0.0
FGARASW	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
FGB	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
INTL	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
ISLO	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
OCINTLO	0.0	0.0	4.1	0.0	0.0	0.0	4.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.1	0.0
OCISILO	0.0	0.0	24.0	11.4	16.5	3.8	8.7	2.6	9.8	0.0	1.7	6.6	0.0	0.0	0.0	0.0	0.0
OCSILO	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.9	0.0	0.0	0.0
RAEX	0.5	6.2	28.1	29.4	27.1	25.2	27.8	22.1	37.6	25.5	7.5	4.5	1.3	0.8	0.4	0.2	4.4
RAEXO	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
RASW	0.0	1.0	11.7	16.6	8.9	9.1	14.7	28.9	28.9	11.3	2.2	0.2	0.1	0.0	0.0	0.0	0.0
RASWO	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
SIL	0.0	0.3	0.9	2.1	2.2	2.0	0.8	2.0	1.5	1.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0
SL	0.0	0.1	2.5	2.7	1.3	2.7	5.4	2.3	0.8	1.6	0.4	0.3	0.0	2.6	1.2	0.0	0.0
SLO	0.0	0.0	0.0	0.0	0.0	4.9	0.0	0.0	0.0	0.0	0.0	0.0	9.2	0.0	0.0	0.0	0.0

Source: Author's compilations.

TABLE B.6

SLU DATA: HOURLY WEIGHTED-AVERAGE PER-LINE-DAY USE OF FIFTEEN SERVICE CATEGORIES BY MEASURED RATE RESIDENTIAL CUSTOMERS IN THE METROPOLITAN STRATUM

Service Category	Type D	Hours of Day															
	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	24
800	0.1	0.2	1.8	0.4	0.8	0.8	0.6	0.6	0.4	0.1	0.0	0.1	0.4	0.0	0.2	0.0	0.0
FGARASW	0.0	0.1	0.6	0.9	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0
FGB	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
INTL	0.0	0.0	0.0	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.4	0.0	0.0	0.0	0.0
ISLO	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
OCINTLO	0.0	5.1	0.0	0.0	1.4	0.0	0.0	0.1	0.0	0.0	0.0	0.0	4.7	0.3	13.9	8.9	0.0
OCISILO	0.0	1.3	5.6	2.4	0.0	6.2	0.0	11.6	12.8	7.3	6.9	7.9	10.4	4.9	0.4	7.3	0.0
OCSILO	0.0	0.0	0.2	1.5	1.8	0.0	0.0	0.0	5.5	0.4	0.0	2.6	4.5	1.4	0.6	29.4	8.2
RAEX	0.6	2.3	10.8	14.5	7.0	5.8	4.6	8.1	8.5	16.6	6.7	14.7	19.6	16.5	12.9	9.3	2.3
RAEXO	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
RASW	0.4	4.1	0.9	1.1	2.0	3.0	2.5	1.8	2.2	1.5	2.2	3.8	2.6	1.2	5.9	0.9	0.6
RASWO	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
SIL	0.0	0.1	0.2	0.3	0.4	0.2	0.2	0.3	0.6	0.2	0.4	1.0	3.0	0.8	3.5	2.5	0.3
SL	0.3	0.6	0.4	0.8	1.1	1.9	0.7	1.2	2.6	2.6	1.8	0.9	0.8	1.9	3.5	1.9	0.6
SLO	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.7	0.0	0.0	0.0	0.0	9.2	0.0

Source: Author's compilations.

TABLE B.7

SLU DATA: HOURLY WEIGHTED-AVERAGE PER-LINE-DAY USE OF FIFTEEN SERVICE CATEGORIES BY MULTI LINE BUSINESS CUSTOMERS IN THE METROPOLITAN STRATUM

Service Category	Type D	Hours of Day															
	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	24
800	1.5	9.9	15.0	17.8	12.6	9.1	14.6	16.0	15.3	10.2	3.4	1.3	0.2	0.1	0.1	0.1	0.0
FGARASW	0.1	2.2	5.7	6.0	6.6	4.5	4.7	5.1	5.9	4.9	1.6	0.5	0.2	0.1	0.0	0.2	0.0
FGB	0.0	0.4	0.6	0.8	0.8	0.9	0.8	1.4	1.1	0.6	0.1	0.2	0.1	0.0	0.0	0.0	0.0
INTL	0.0	0.6	0.6	1.1	0.6	0.8	1.1	1.4	1.1	1.2	0.5	0.4	0.0	0.0	0.0	0.0	0.0
ISLO	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
OCINTLO	5.9	3.5	1.9	4.0	5.8	6.7	8.4	7.3	4.2	6.5	1.4	0.4	0.6	0.6	0.7	0.0	0.0
OCISILO	2.1	7.4	12.7	9.9	9.2	6.6	10.9	13.9	8.5	6.5	4.0	0.3	1.9	0.3	1.3	3.3	0.0
OCSILO	0.0	3.5	10.1	8.2	13.4	4.7	4.3	6.1	9.2	6.5	5.1	2.6	4.9	1.1	0.4	0.3	0.0
RAEX	8.1	52.1	101.4	116.9	101.1	72.2	89.4	105.2	112.0	100.5	44.9	20.1	13.5	12.3	9.6	5.8	3.1
RASW	1.9	11.6	22.9	28.9	24.7	16.3	20.3	25.7	26.4	22.0	11.8	5.7	3.1	2.0	1.1	0.5	0.3
RASWO	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
SIL	0.5	5.1	13.0	12.8	11.5	5.1	10.4	13.2	11.8	13.2	4.1	1.6	0.7	0.2	0.2	0.1	0.0
SL	2.1	12.0	24.6	23.8	21.1	15.1	18.3	24.0	24.5	20.9	10.3	4.8	3.4	2.6	1.2	0.8	0.2
SLO	0.1	1.4	1.3	3.9	1.6	0.8	1.5	0.1	0.8	0.9	0.0	0.1	2.0	0.0	0.0	0.0	0.0

Source: Author's compilations.

TABLE B.8

SLU DATA: HOURLY WEIGHTED-AVERAGE PER-LINE-DAY USE OF FIFTEEN
SERVICE CATEGORIES BY MULTI PARTY RESIDENTIAL CUSTOMERS IN THE METROPOLITAN STRATUM

Service Category	Type D							Hours of Day									
	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	24
800	0.0	0.1	2.0	0.8	1.4	1.1	1.0	0.6	1.1	0.3	0.2	0.0	0.1	0.0	0.0	0.2	0.0
FGARASW	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0
FGB	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
INTL	0.0	0.0	0.1	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.0
ISLO	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
OCINTLO	0.0	2.9	0.0	2.3	0.1	0.0	0.1	0.0	1.0	2.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0
OCISILO	8.8	0.0	26.1	20.4	0.0	14.2	10.6	7.0	38.6	3.9	20.2	0.0	0.0	0.0	0.0	0.0	18.6
OCSILO	0.0	0.0	0.2	1.0	3.0	0.0	23.1	0.0	0.0	0.0	2.7	0.0	0.0	0.0	0.0	72.2	0.0
RAEX	7.5	14.7	22.3	24.0	19.1	17.6	14.9	16.4	11.1	10.1	7.6	5.9	9.6	14.9	8.5	4.0	1.4
RASW	3.4	16.3	30.5	28.9	18.2	19.3	19.8	19.4	19.0	28.2	27.4	20.4	32.7	38.7	23.0	9.7	2.8
RASWO	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
SIL	0.5	0.0	0.9	2.1	0.5	0.1	0.0	1.3	2.1	1.0	0.4	1.3	1.3	1.1	1.6	6.1	5.7
SL	2.7	0.5	1.0	2.0	3.5	6.2	4.2	1.8	1.6	3.3	8.3	6.2	3.2	3.9	2.6	5.4	1.6
SLO	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Source: Author's compilations.

TABLE B.9

SLU DATA: HOURLY WEIGHTED-AVERAGE PER-LINE-DAY USE OF FIFTEEN SERVICE CATEGORIES BY ONE PARTY RESIDENTIAL CUSTOMERS IN THE METROPOLITAN STRATUM

Service Category	Type D	Hours of Day															
	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	24
800	0.3	1.7	2.2	2.2	1.9	1.5	1.8	1.9	1.9	1.8	0.9	1.0	0.6	0.6	0.5	0.3	0.1
FGARASW	0.4	0.3	0.3	0.3	0.2	0.2	0.3	0.3	0.2	0.2	0.7	0.7	0.5	0.5	0.4	0.5	0.2
FGB	0.0	0.2	0.2	0.3	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.4	0.5	0.6	0.7	0.8	0.3
INTL	0.1	0.1	0.2	0.2	0.1	0.3	0.3	0.1	0.1	0.3	0.2	0.2	0.2	0.2	0.1	0.2	0.2
ISLO	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
OCINTLO	0.3	2.2	2.1	2.7	1.0	1.1	1.6	2.7	4.1	3.7	4.0	2.4	2.6	0.9	1.8	1.7	0.9
OCISILO	2.1	7.0	3.8	5.5	5.8	4.7	1.1	4.2	4.5	5.6	5.4	6.6	3.4	5.9	6.7	4.2	3.3
OCSILO	1.5	6.4	4.2	3.6	1.0	1.2	0.6	2.5	3.7	4.2	5.1	2.9	6.5	3.7	6.8	5.7	7.2
RAEX	10.5	26.8	43.4	49.3	46.2	37.6	39.9	44.9	52.8	55.6	53.8	55.7	56.8	63.4	68.0	48.6	23.9
RAEXO	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
RASW	3.2	10.8	17.0	18.6	18.6	15.1	15.5	17.1	21.7	25.1	25.9	28.5	26.1	27.8	27.9	17.4	7.6
RASWO	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
SIL	1.0	1.6	2.1	2.1	1.9	1.3	1.7	1.7	2.2	1.9	2.4	3.4	4.1	5.9	7.1	6.7	3.4
SL	0.5	1.0	1.3	1.4	1.4	1.5	1.2	1.2	1.5	1.4	1.7	2.0	2.6	3.3	3.4	2.1	0.5
SLO	0.3	2.3	0.3	1.2	1.5	0.6	0.2	0.9	1.6	1.3	1.1	1.4	1.0	0.2	0.4	0.1	0.7

Source: Author's compilations.

TABLE B.10

SLU DATA: HOURLY WEIGHTED-AVERAGE PER-LINE-DAY USE OF FIFTEEN SERVICE CATEGORIES BY SINGLE LINE BUSINESS CUSTOMERS IN THE METROPOLITAN STRATUM

Service Category	Type D							Hours of Day									
	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	24
800	0.5	3.8	6.1	7.9	7.2	5.2	6.6	7.6	5.1	5.6	2.6	1.0	0.3	0.3	0.2	0.2	0.1
FGARASW	0.0	0.4	0.4	0.5	0.7	0.4	1.0	0.2	0.1	0.4	0.2	0.1	0.1	0.0	0.0	0.0	0.0
FGB	0.0	0.4	0.7	1.4	1.8	0.5	0.8	1.7	1.8	0.9	0.3	0.1	0.0	0.0	0.0	0.0	0.0
INTL	0.2	1.4	0.9	0.6	1.3	0.5	0.5	1.0	2.0	4.4	5.0	1.9	0.4	0.1	0.0	0.1	0.0
ISLO	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
OCINTLO	0.8	0.2	15.3	2.1	1.6	1.2	1.5	1.2	8.7	3.6	1.1	4.0	3.5	0.5	0.9	1.0	0.5
OCISILO	1.5	0.5	2.7	7.6	6.9	3.2	4.7	5.9	14.6	9.8	10.6	16.1	4.9	5.8	6.3	3.4	0.0
OCSILO	0.0	1.7	9.6	7.6	4.8	3.4	2.3	8.9	3.8	6.9	2.5	7.1	0.1	0.1	1.5	0.3	0.0
RAEX	15.2	56.5	84.4	96.8	92.9	70.9	79.4	89.4	87.0	80.7	46.7	33.0	28.1	21.9	19.0	12.8	6.0
RAEXO	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0
RASW	3.1	10.7	20.3	23.9	23.5	21.8	21.9	21.6	21.7	18.4	11.6	9.1	9.2	6.9	6.9	5.8	3.2
RASWO	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
SIL	0.5	1.9	4.3	5.5	4.4	2.2	3.4	5.8	5.5	4.1	2.8	1.0	0.8	0.4	0.3	0.2	0.0
SL	0.5	1.9	3.9	3.5	2.9	2.5	3.0	3.2	2.9	2.5	2.2	1.7	0.9	0.7	0.7	0.2	0.0
SLO	0.0	0.2	1.2	0.7	1.2	3.4	0.1	1.4	0.1	0.5	2.0	0.1	0.2	0.0	0.5	0.0	0.0

Source: Author's compilations.

TABLE B.11

SLU DATA: HOURLY WEIGHTED-AVERAGE PER-LINE-DAY USE OF FIFTEEN SERVICE CATEGORIES BY TRUNK CUSTOMERS IN THE METROPOLITAN STRATUM

Service Category	Type D	Hours of Day															
	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	24
800	1.6	6.9	14.2	16.5	13.5	10.1	16.2	14.5	15.2	9.1	2.8	1.1	0.8	0.4	0.2	0.3	0.0
FGARASW	0.1	1.0	1.1	1.3	1.2	0.7	1.1	1.4	1.4	0.8	0.3	0.1	0.1	0.1	0.0	0.0	0.0
FGB	0.0	0.2	0.4	0.5	0.4	0.2	0.4	0.5	0.6	0.6	0.3	0.2	0.3	0.3	0.4	0.4	0.1
INTL	0.0	0.3	1.3	0.8	0.8	0.5	0.5	1.1	0.9	1.1	0.4	0.1	0.1	0.1	0.0	0.0	0.0
ISLO	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
OCINTLO	4.7	7.3	6.2	12.2	10.1	5.5	8.3	4.2	4.7	11.9	2.9	3.8	3.6	5.0	7.4	4.1	4.8
OCISILO	17.2	34.6	46.3	49.7	45.7	34.0	32.8	41.2	34.1	30.6	34.7	42.2	53.5	56.7	77.8	70.2	36.1
OCSILO	11.1	24.3	39.0	37.2	26.6	17.8	19.9	20.9	29.3	31.7	33.0	52.0	46.3	53.3	66.5	64.1	19.9
RAEX	21.2	85.9	147.6	157.6	135.1	95.4	128.1	149.3	148.3	116.4	43.1	25.6	19.1	18.1	17.2	14.1	5.8
RAEXO	0.0	0.1	0.4	0.0	0.1	0.0	0.1	0.0	0.1	0.0	0.0	0.1	0.0	0.0	0.2	0.0	0.0
RASW	5.9	20.5	31.2	33.0	27.4	19.8	25.8	28.9	27.9	23.7	9.7	5.7	4.4	4.1	2.1	1.5	0.8
RASWO	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
SIL	0.3	2.2	4.5	4.4	4.0	1.6	3.1	4.7	4.9	3.2	1.3	0.5	0.5	0.5	0.3	0.3	0.4
SL	7.4	30.1	54.3	57.4	48.5	35.4	46.5	48.3	48.0	40.0	19.6	11.3	6.9	5.8	5.9	4.5	1.9
SLO	6.4	8.2	9.3	11.5	12.2	5.8	7.8	7.2	9.2	7.3	4.1	7.5	5.5	6.1	4.4	2.2	1.7

Source: Author's compilations.

TABLE B.12

SLU DATA: HOURLY WEIGHTED-AVERAGE PER-LINE-DAY USE OF FIFTEEN SERVICE CATEGORIES BY CENTREX CUSTOMERS IN THE NON METROPOLITAN STRATUM

Service Category	Type D							Hours of Day								
	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	24
800	0.4	0.6	1.3	1.6	0.7	1.2	2.1	1.0	3.4	2.4	1.3	3.4	1.0	4.8	6.3	0.4	0.4
FGARASW	0.0	0.0	0.1	0.2	0.0	0.0	0.0	0.0	0.0	0.7	0.0	0.0	0.0	1.4	0.0	0.0	0.0
FGB	0.0	0.1	0.2	0.1	2.6	0.2	0.1	0.2	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
INTL	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
ISLO	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
OCINTLO	0.1	0.7	9.9	15.6	29.2	21.7	22.5	7.7	5.8	0.3	1.9	0.3	0.2	0.1	0.6	0.0	0.0
OCISILO	10.4	5.6	5.8	23.5	0.4	0.2	5.1	26.7	7.7	0.1	0.0	9.3	16.4	11.6	34.4	26.7	3.9
OCSILO	0.0	0.0	0.0	4.2	0.0	2.7	0.0	0.0	0.0	0.0	2.5	0.0	0.0	0.0	0.0	0.0	0.0
RAEX	1.6	7.8	15.0	22.7	10.6	9.5	13.5	14.7	12.9	14.9	14.4	3.5	1.1	2.7	2.4	1.3	1.9
RAEXO	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
RASW	1.3	14.4	18.8	21.2	19.3	7.9	20.7	21.3	21.7	23.0	1.9	2.1	1.1	0.8	0.3	0.7	0.6
RASWO	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
SIL	0.2	11.7	10.0	9.4	12.2	3.3	11.6	10.8	16.1	8.8	2.9	3.3	1.3	4.0	7.8	12.0	2.9
SL	0.5	0.9	1.0	0.6	0.5	0.2	1.0	1.4	0.9	1.1	0.1	0.0	0.0	0.0	2.4	0.0	0.0
SLO	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Source: Author's compilations.

TABLE B.13

SLU DATA: HOURLY WEIGHTED-AVERAGE PER-LINE-DAY USE OF FIFTEEN SERVICE CATEGORIES BY FEATURE GROUP A CUSTOMERS IN THE NON METROPOLITAN STRATUM

Service Category	Type D	Hours of Day															
	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	24
800	0.1	0.5	0.9	1.0	0.8	0.4	0.6	0.9	0.8	0.7	0.2	0.1	0.0	0.0	0.0	0.0	0.0
FGARASW	0.2	0.4	0.3	0.5	0.3	0.3	0.3	0.3	0.3	0.3	0.1	0.0	0.0	0.0	0.0	0.0	0.0
FGB	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
INTL	0.2	1.8	2.2	2.1	0.6	1.2	1.7	1.9	1.6	0.7	0.1	0.1	0.0	0.0	0.0	0.0	0.0
ISLO	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
OCINTLO	0.0	0.0	0.0	8.0	0.5	5.9	2.7	1.9	3.3	0.2	1.5	2.4	0.0	0.0	0.0	0.0	0.0
OCISILO	0.1	0.7	9.6	12.0	13.5	6.4	18.4	28.1	27.6	20.7	19.6	28.2	51.1	62.3	74.1	40.0	17.1
OCSILO	0.0	1.0	0.0	0.0	0.0	0.1	0.0	0.2	0.8	0.0	0.0	0.0	0.8	0.3	0.0	0.0	0.0
RAEX	45.6	132.4	203.5	204.2	186.1	120.9	165.3	188.8	188.6	169.2	110.2	96.9	105.4	122.9	128.7	92.2	47.3
RAEXO	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
RASW	6.4	30.2	42.6	46.9	38.2	22.7	41.0	49.2	43.7	31.1	15.8	10.4	9.0	8.2	7.6	7.5	5.1
RASWO	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
SIL	0.2	1.0	1.4	2.2	1.5	0.8	1.4	2.5	2.5	1.7	0.2	0.1	0.1	0.0	0.0	0.0	0.0
SL	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
SLO	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Source: Author's compilations.

TABLE B.14

SLU DATA: HOURLY WEIGHTED-AVERAGE PER-LINE-DAY USE OF FIFTEEN
SERVICE CATEGORIES BY FOREIGN EXCHANGE BUSINESS CUSTOMERS IN THE NON METROPOLITAN STRATUM

Service Category	Type D	Hours of Day															
	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	24
800	0.8	1.4	3.4	1.5	1.8	2.1	0.9	1.8	2.3	1.3	1.6	0.8	0.5	0.3	0.8	0.1	0.3
FGARASW	0.0	2.6	1.7	6.1	6.7	2.7	2.8	3.7	4.1	2.8	0.9	0.0	0.2	0.7	0.0	0.0	0.0
FGB	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
INTL	0.0	0.0	0.3	0.3	0.7	0.1	1.0	0.9	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
ISLO	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
OCINTILO	2.7	42.9	0.0	10.9	3.3	16.8	2.1	38.3	51.5	27.3	5.3	77.9	42.7	9.0	15.0	3.7	0.0
OCISILO	1.0	0.4	11.8	0.0	0.9	0.0	1.9	3.2	0.7	12.0	0.3	1.2	2.6	17.0	3.9	0.0	0.0
OCSILO	0.0	3.8	4.8	1.2	8.3	22.7	0.8	7.8	0.1	0.0	0.8	0.5	0.0	4.9	0.0	0.3	0.0
RAEX	9.5	47.2	73.2	68.8	65.7	39.5	56.6	67.0	68.2	57.4	40.1	23.6	24.2	24.9	27.0	28.1	12.0
RAEXO	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
RASW	34.4	76.9	101.6	94.9	86.9	45.5	73.1	97.3	86.1	64.7	28.5	16.2	13.1	15.8	24.8	25.5	10.8
RASWO	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
SIL	0.4	1.3	0.7	1.2	0.9	0.7	0.5	0.5	0.8	0.6	0.8	0.0	1.1	0.9	2.5	2.4	2.0
SL	0.7	0.5	1.6	1.2	2.4	2.0	1.5	1.6	1.6	1.1	1.3	0.4	1.2	3.1	0.4	0.1	0.1
SLO	0.0	0.1	0.4	0.0	0.0	1.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Source: Author's compilations.

TABLE B.15

SLU DATA: HOURLY WEIGHTED-AVERAGE PER-LINE-DAY USE OF FIFTEEN SERVICE CATEGORIES BY FOREIGN EXCHANGE RESIDENTIAL CUSTOMERS IN THE NON METROPOLITAN STRATUM

Service Category	Type D	Hours of Day															
	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	24
800	0.0	0.0	0.0	0.0	0.3	0.0	0.0	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
FGARASW	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
FGB	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
INTL	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
ISLO	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
OCINTLO	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	12.3	11.0	5.7	0.0	0.0	0.0	0.0	0.0	0.0
OCISILO	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
OCSILO	0.0	0.0	0.0	0.0	0.0	0.0	0.0	140.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
RAEX	0.0	1.7	0.3	7.0	8.0	9.1	4.9	9.9	5.4	2.0	10.0	7.1	6.2	0.0	0.0	0.0	0.0
RAEXO	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
RASW	2.8	33.8	43.4	26.6	34.2	1.2	42.0	19.5	24.9	38.8	11.2	6.2	10.8	1.8	2.2	0.6	0.5
RASWO	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
SIL	0.0	9.7	10.7	2.0	1.9	0.0	1.1	0.0	15.7	0.3	4.7	2.6	0.6	0.0	3.8	0.0	0.0
SL	0.0	3.9	3.7	0.0	0.0	0.0	0.0	0.1	0.0	0.4	3.1	0.5	1.0	0.0	0.0	0.0	0.0
SLO	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Source: Author's compilations.

TABLE B.16

SLU DATA: HOURLY WEIGHTED-AVERAGE PER-LINE-DAY USE OF FIFTEEN SERVICE CATEGORIES BY MEASURED RATE BUSINESS CUSTOMERS IN THE NON METROPOLITAN STRATUM

Service Category	Type D							Hours of Day									
	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	24
800	0.0	1.6	6.5	8.7	8.6	3.3	7.0	8.8	8.3	4.5	0.7	0.1	0.0	0.0	0.1	0.0	0.0
FGARASW	0.0	0.4	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
FGB	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
INTL	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
ISLO	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
OCINTLO	0.0	0.0	0.0	46.0	8.4	0.0	0.0	0.0	0.0	2.3	0.0	0.0	0.0	0.0	29.5	0.0	0.0
OCISILO	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	60.3	0.0	33.3	0.0	33.8	0.0	0.0
OCSILO	0.0	7.1	20.8	0.0	0.0	0.0	3.9	12.5	0.5	0.0	0.0	24.6	27.9	9.1	39.6	0.0	0.0
RAEX	0.5	2.2	8.7	12.7	11.5	6.9	6.3	10.0	9.9	11.3	10.4	3.4	2.1	7.0	3.2	0.2	0.2
RAEXO	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
RASW	1.1	0.9	6.3	4.8	5.3	7.7	9.6	4.7	3.5	4.3	3.8	2.6	1.6	1.3	3.6	1.5	0.1
RASWO	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
SIL	1.2	3.6	5.8	5.8	5.2	4.5	3.8	4.2	5.0	4.8	4.0	1.2	0.5	0.7	0.3	0.2	0.1
SL	0.0	0.1	0.3	0.1	0.1	0.2	0.2	0.3	0.1	0.2	0.1	0.0	0.1	0.1	0.3	0.0	0.0
SLO	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	7.4	36.5	0.0	0.0	0.0	0.0

Source: Author's compilations.

TABLE B.17

SLU DATA: HOURLY WEIGHTED-AVERAGE PER-LINE-DAY USE OF FIFTEEN SERVICE CATEGORIES BY MEASURED RATE RESIDENTIAL CUSTOMERS IN THE NON METROPOLITAN STRATUM

Service Category	Type D / Hours of Day 9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	24
800	0.4	0.5	1.5	2.3	1.1	1.2	1.1	1.4	0.6	2.6	5.4	4.2	0.7	0.4	0.4	0.5	0.0
FGARASW	0.4	1.1	1.7	0.2	0.1	0.6	0.2	0.0	0.0	0.2	0.3	0.3	0.1	0.0	0.0	0.0	0.0
FGB	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
INTL	0.0	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.3	0.2	0.5	0.0
ISLO	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
OCINTLO	0.0	6.1	11.5	5.6	0.7	2.7	2.0	39.9	1.3	0.1	0.0	0.2	1.2	0.0	5.1	3.7	4.0
OCISILO	0.0	0.0	4.2	0.0	3.6	43.2	14.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.3	0.0	0.0
OCSILO	0.4	0.0	24.6	2.9	8.1	3.2	16.2	17.0	0.6	0.3	0.1	0.1	0.0	10.5	0.0	0.0	0.0
RAEX	1.1	5.2	7.1	9.2	7.9	6.1	8.7	7.5	7.6	13.2	9.0	9.4	9.7	19.5	9.5	6.4	0.3
RAEXO	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
RASW	0.3	0.8	2.8	4.4	4.6	3.4	2.3	3.2	6.8	6.4	7.5	13.9	4.7	8.2	8.0	5.8	4.5
RASWO	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
SIL	0.1	0.3	0.8	0.3	0.6	0.7	0.8	0.6	0.2	0.5	1.6	1.0	5.9	6.2	4.1	0.2	0.0
SL	0.1	0.5	0.5	0.8	0.7	0.6	0.4	0.6	0.3	0.4	0.2	0.5	0.8	0.5	0.6	0.1	0.0
SLO	0.0	0.0	0.0	0.6	2.5	0.0	0.0	0.1	0.7	0.0	0.0	0.8	0.0	0.0	0.0	0.0	0.0

Source: Author's compilations.

TABLE B.18

SLU DATA: HOURLY WEIGHTED-AVERAGE PER-LINE-DAY USE OF FIFTEEN SERVICE CATEGORIES BY MULTI LINE BUSINESS CUSTOMERS IN THE NON METROPOLITAN STRATUM

Service Category	Type D 9	Hours of Day 10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	24
800	0.4	6.8	12.0	13.0	12.2	8.0	12.1	11.6	11.2	6.2	2.2	0.3	0.1	0.3	0.0	0.0	0.0
FGARASW	0.5	2.7	5.2	6.5	6.0	3.5	4.3	5.5	5.4	4.4	1.9	0.8	0.3	0.0	0.0	0.0	0.0
FGB	0.3	0.3	0.8	0.8	0.5	0.9	0.8	0.6	0.4	0.7	0.2	0.1	0.2	0.0	0.1	0.0	0.0
INTL	0.1	0.3	0.8	0.7	0.9	0.3	0.5	0.6	0.4	0.4	0.1	0.0	0.0	0.0	0.0	0.0	0.0
ISLO	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
OCINTLO	2.4	8.6	18.5	26.8	13.1	11.4	23.3	16.7	9.0	8.0	11.2	3.7	1.2	3.5	4.4	5.9	0.0
OCISILO	0.3	0.7	3.1	11.6	12.8	6.7	4.8	7.2	9.9	3.7	1.8	0.0	0.0	1.8	1.7	0.0	0.0
OCSILO	1.9	1.0	15.0	9.4	10.2	6.3	10.8	7.7	5.5	21.0	6.5	0.7	2.4	0.0	0.4	0.0	11.9
RAEX	3.8	40.8	78.0	78.9	75.1	47.7	72.1	79.6	82.7	68.6	29.9	11.9	5.0	3.6	2.8	2.6	1.5
RASW	3.1	27.4	51.5	57.1	54.1	27.6	42.4	48.4	51.8	42.0	22.3	7.7	5.6	4.3	3.0	2.6	1.5
RASWO	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0
SIL	0.2	8.3	20.4	20.6	17.7	5.7	14.4	23.6	19.0	16.4	5.4	1.4	0.4	0.4	0.5	0.2	0.2
SL	0.4	3.8	5.9	6.3	6.3	4.8	5.3	5.5	6.3	7.0	2.6	1.8	0.8	0.4	0.7	0.4	0.3
SLO	0.0	0.1	0.2	0.3	0.0	0.0	0.2	0.4	0.8	0.1	0.0	0.0	0.2	0.2	0.3	0.1	0.0

Source: Author's compilations.

TABLE B.19

SLU DATA: HOURLY WEIGHTED-AVERAGE PER-LINE-DAY USE OF FIFTEEN SERVICE CATEGORIES BY MULTI PARTY RESIDENTIAL CUSTOMERS IN THE NON METROPOLITAN STRATUM

Service Category	Type D	Hours of Day															
	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	24
800	0.0	0.1	0.6	0.6	0.6	0.0	0.1	0.6	0.3	0.3	0.2	0.0	0.0	0.0	0.0	0.0	0.0
FGARASW	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0
FGB	0.1	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.1	0.0	0.1	0.1	0.1	0.4	0.0	0.0	0.3
INTL	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
ISLO	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
OCINTLO	0.0	0.2	0.2	1.1	0.3	2.1	0.5	0.4	0.0	6.3	0.2	2.0	0.1	0.1	1.3	129.3	5.4
OCISILO	0.0	0.0	3.9	5.8	9.5	0.0	0.0	6.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
OCSILO	0.0	0.4	0.0	1.5	0.6	4.6	1.9	1.5	0.0	0.0	0.0	0.0	3.8	0.0	4.1	0.0	2.6
RAEX	0.7	2.9	5.3	5.9	3.0	3.6	3.2	5.3	4.3	6.1	4.6	5.4	7.9	6.6	6.8	3.3	3.4
RASW	20.1	15.5	16.7	19.0	24.6	14.2	19.5	18.4	25.9	27.9	23.6	20.4	25.6	32.2	24.3	8.7	5.3
RASWO	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
SIL	0.7	0.4	0.5	2.0	0.5	0.5	1.2	0.5	0.6	1.0	0.9	1.2	1.8	1.3	3.1	1.4	0.0
SL	0.3	0.7	0.9	0.4	0.4	0.9	1.0	1.0	0.8	1.2	1.3	1.4	1.7	3.8	3.9	0.7	0.0
SLO	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Source: Author's compilations.

TABLE B.20

SLU DATA: HOURLY WEIGHTED-AVERAGE PER-LINE-DAY USE OF FIFTEEN SERVICE CATEGORIES BY ONE PARTY RESIDENTIAL CUSTOMERS IN THE NON METROPOLITAN STRATUM

Service Category	Type D	Hours of Day															
	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	24
800	0.7	1.1	1.8	1.8	1.5	1.3	1.8	1.4	1.4	1.8	0.6	0.4	0.4	0.3	0.2	0.3	0.3
FGARASW	0.4	0.4	0.4	0.4	0.3	0.2	0.3	0.5	0.3	0.3	0.5	0.5	0.7	0.8	0.6	0.3	0.0
FGB	0.0	0.0	0.1	0.1	0.0	0.0	0.1	0.1	0.1	0.0	0.1	0.1	0.2	0.2	0.3	0.1	0.0
INTL	0.1	0.2	0.2	0.4	0.3	0.8	0.5	0.5	0.2	0.5	0.6	0.4	0.4	0.5	0.8	0.5	0.5
ISLO	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
OCINTLO	0.7	2.5	2.4	7.4	15.8	4.3	1.8	3.0	9.0	3.9	5.8	6.0	3.1	4.9	10.7	8.9	5.4
OCISILO	0.7	3.0	3.2	1.3	1.6	2.1	1.2	2.1	0.7	1.8	1.5	2.9	3.6	2.3	11.6	3.2	4.0
OCSILO	0.7	3.4	5.2	2.3	4.9	1.6	5.2	6.6	2.6	3.9	6.3	7.5	9.3	7.3	7.2	5.6	7.4
RAEX	6.2	14.9	24.8	26.1	24.1	20.4	23.0	23.5	26.6	30.3	28.0	30.3	31.8	35.9	36.2	24.8	12.5
RAEXO	0.0	0.0	0.0	0.1	0.7	0.0	0.0	0.0	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0
RASW	7.5	21.1	35.3	42.6	38.5	32.0	36.4	40.9	42.6	46.3	46.5	46.8	46.5	54.1	55.1	37.6	20.8
RASWO	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0
SIL	1.4	2.3	2.7	2.3	2.4	1.4	1.8	2.2	2.3	2.1	4.5	5.1	5.3	6.8	8.2	4.6	2.4
SL	0.7	0.7	1.0	1.0	1.0	0.8	0.7	0.8	1.0	1.2	1.4	1.6	1.8	2.4	3.1	1.2	0.6
SLO	0.0	0.3	1.2	0.7	0.2	0.1	0.2	0.4	0.0	0.5	0.3	1.0	1.2	1.7	0.5	0.0	0.0

Source: Author's compilations.

TABLE B.21

SLU DATA: HOURLY WEIGHTED-AVERAGE PER-LINE-DAY USE OF FIFTEEN SERVICE CATEGORIES BY SINGLE LINE BUSINESS CUSTOMERS IN THE NON METROPOLITAN STRATUM

Service Category	Type D	Hours of Day															
	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	24
800	0.3	2.0	3.3	3.9	3.5	2.4	4.2	3.9	4.2	2.3	0.9	0.3	0.6	0.3	0.4	0.2	0.1
FGARASW	0.0	0.4	0.5	0.4	0.5	0.2	0.4	0.4	0.5	0.4	0.1	0.2	0.2	0.2	0.0	0.0	0.0
FGB	0.0	0.1	0.2	0.3	0.1	0.3	0.3	0.6	0.3	0.4	0.0	0.2	0.3	0.0	0.0	0.3	0.1
INTL	0.0	0.1	0.8	1.2	0.5	0.3	0.5	0.2	0.5	0.4	0.4	0.1	0.1	0.2	0.1	0.2	0.0
ISLO	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
OCINTLO	0.1	3.9	13.1	37.6	17.4	4.3	10.7	6.7	13.1	8.9	3.1	5.3	2.3	0.0	1.1	0.0	0.0
OCISILO	0.0	1.3	0.9	1.9	7.6	23.3	27.5	0.9	2.2	1.1	20.4	4.2	16.5	23.7	15.2	0.0	0.0
OCSILO	1.2	8.0	14.6	5.2	19.0	7.6	8.5	17.7	14.2	9.8	8.8	28.5	4.9	4.0	2.0	3.2	0.2
RAEX	9.5	21.0	37.0	43.4	41.8	34.0	37.6	42.7	43.5	41.5	32.9	21.7	18.7	17.0	10.6	9.4	2.9
RAEXO	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
RASW	5.7	20.0	40.9	47.6	43.5	31.4	44.6	45.6	43.9	43.1	26.8	18.6	16.0	12.1	11.5	7.5	5.0
RASWO	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.7	0.0	0.0
SIL	1.0	4.3	5.6	9.4	7.4	5.0	6.3	6.6	6.9	4.1	3.2	2.7	5.0	1.2	0.8	0.7	0.7
SL	0.3	1.2	2.4	2.5	2.1	1.8	2.3	1.6	2.0	1.4	1.2	1.0	0.7	0.2	0.4	0.1	0.0
SLO	0.1	0.5	0.7	0.3	1.1	0.7	1.2	1.9	3.2	0.9	1.6	0.8	0.3	0.0	0.0	0.0	1.0

Source: Author's compilations.

TABLE B.22

SLU DATA: HOURLY WEIGHTED-AVERAGE PER-LINE-DAY USE OF FIFTEEN SERVICE CATEGORIES BY TRUNK CUSTOMERS IN THE NON METROPOLITAN STRATUM

Service Category	Type D	Hours of Day															
	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	24
800	2.1	16.0	18.5	18.7	14.7	12.7	15.5	18.3	19.3	14.4	3.2	1.0	0.8	0.5	0.6	0.9	0.2
FGARASW	0.2	1.3	2.1	1.7	2.5	1.8	2.7	2.8	2.7	4.8	2.0	0.6	0.6	0.5	0.3	0.2	0.1
FGB	0.8	9.3	16.9	20.9	16.3	7.9	15.7	19.9	17.2	14.9	5.0	2.1	1.3	1.7	1.3	1.6	0.5
INTL	0.1	0.4	0.8	0.9	1.1	0.6	0.7	0.7	0.7	0.6	0.6	0.1	0.0	0.0	0.0	0.0	0.0
ISLO	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
OCINTLO	31.0	67.9	150.3	143.5	134.1	80.5	122.4	125.8	145.5	95.8	16.8	11.3	17.0	24.2	13.5	16.0	5.0
OCISILO	21.7	78.2	89.0	104.4	102.4	57.4	70.2	91.6	91.1	52.6	46.6	57.5	83.2	74.1	46.8	34.4	9.4
OCSILO	35.0	115.1	196.0	230.1	167.6	122.3	195.8	191.0	184.8	124.3	70.2	67.7	92.9	95.8	92.8	57.7	12.8
RAEX	10.7	72.9	155.9	172.8	150.4	85.2	132.4	151.3	149.7	130.0	55.6	21.9	14.9	13.5	12.7	7.7	3.9
RAEXO	0.0	0.1	0.1	0.0	0.2	1.0	0.4	0.0	0.0	0.1	0.0	0.0	0.2	0.0	0.0	0.0	0.0
RASW	8.4	43.5	87.4	93.2	89.6	46.3	68.4	80.9	81.5	71.8	31.0	15.7	11.7	11.8	11.8	7.6	4.5
RASWO	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.2	0.0	0.3	0.0	0.2	0.4
SIL	0.9	4.4	7.0	10.2	5.7	2.1	6.4	8.9	7.8	5.2	1.0	0.6	0.4	0.6	0.5	0.3	0.3
SL	1.7	6.7	9.8	11.0	7.5	4.4	7.0	7.5	7.7	6.7	2.6	1.4	1.4	1.7	0.6	0.6	0.3
SLO	6.7	27.3	39.9	47.5	38.5	33.1	28.9	29.8	34.8	27.3	14.3	21.0	30.8	21.0	25.5	18.8	3.3

Source: Author's compilations.

APPENDIX C

List of Accounts for Basic Cost Allocation Model

Accounts

There are 354 accounts defined in the ICAS model for each of the eight scenarios. The account definitions follow the draft manual (with a few exceptions). When exceptions occurred the accounting data were more aggregated than the manual specified. In such cases the accounts were defined as the sum of the desired subaccounts or functional accounting groups. The account numbers differ from the manual in that the ICAS model cannot handle alphabetic data. Consequently, the alphabetic information was converted to numeric codes with A being 1 or 01, B being 2 or 02, and so on.

A convention was adopted to deal with the information entered into the accounts. When the data provided by Southwestern Bell corresponded to an exact account number or a separations cost category, the account number or account number and separations subaccount designation was used to define the account in the ICAS model.

In some circumstances, the data requested did not conform to a separations category and had to be reconciled to separations. In such cases, the account began with 8000. For instance, the depreciation reserve account 171 was requested on a functional basis that did not conform with separations categories. These data were defined for account 8171 with the appropriate extension such as 8171.21 for the depreciation reserve for central office equipment. Thus, when the manual specifies that an account or allocation must be reconciled to separations, an 8000-series account was created in addition to the account specified by separations to accomplish the reconciliation.

Dummy accounts were also created in the ICAS model to hold usage data on which allocation factors could be based. These accounts are the 9000 series of accounts. Where feasible a correspondence between the 9000 account number and that of the account to be allocated has been established. For instance, account 9221.6222 contains usage data to allocate the traffic-sensitive portion of no. 5 crossbar switches in account 221.622 (which is account 221.6B2 in the draft manual). Where there is no correspondence, the reader must rely on the account description.

LIST OF ACCOUNTS FOR MODEL: use24

ACCOUNT NO.	ID NO.	DESCRIPTION
100.1000000	1	Telephone Plant In Service
100.2000000	2	Telephone Plant Under Construction
100.3000000	3	Property Held for Future Telephone Use
171.0000000	4	Depreciation Reserve
171.9000000	5	Depreciation Reserve- Investment not in service
176.0000000	6	Accumulated Deferred Income Taxes - Accelerated Tax Depreciation - Operating
176.1000000	7	Accumulated Deffered Income Taxes- Operating
176.2000000	8	Accumulated Deferred Income Taxes - Other
212.0100000	9	Operating Room and Central Office Equipment Space
212.0200000	10	Operators' Quarters
212.0300000	11	General Traffic Supervision Space
212.0400000	12	Commercial Office Space
212.0600000	13	Revenue Accounting Space
212.0700000	14	Garages, Storerooms, Warehouses, and Pole Yards
212.0900000	15	General Office Space
212.1000000	16	Antenna Supporting Structures
221.1141000	17	The Service Evaluation Board/System or (SES) Signal Converter/Allotter (SC/A)
221.1160000	18	Separate DA Boards/Systems Including No. 5 Used for DA Service and Joint Aux.
221.1170000	19	Separate Intercepting Boards/Systems or No. 5 ACD Used for Intercept Service
221.2200000	20	Short Haul Dial Tandem Switching Equipment
221.2300000	21	Common Switching/Control Equipment Used for Switched Message Exchange Traffic

ACCOUNT NO.	ID NO.	DESCRIPTION
221.2500000	22	Common Switching/Control Equip. Used for Through Switched OCC-C InterLATA Traffic
221.3022000	23	Intertoll Dial Switching for Intrastate Toll Message or Private Line Traffic
221.3030000	24	Common Switching/Control Equip. for Toll Type& Plus Terminal Private Line Traffic
221.3080000	25	Common Switching/Control Equip. for No. 1/1A Electronic Switching System (ESS)
221.4210000	26	Automatic Message Recording Equip. for Interstate/Intrastate Message Service
221.4220000	27	Automatic Message Recording Equip. for Inter/Intrastate Switched Private Line
221.6220000	28	Local Dial Switching Equipment: No. 5 Crossbar
221.6320000	29	Local Dial Switching Equipment: Step-by-Step (Over 5000 working lines)
221.6500000	30	Local Dial Switching Equip.: Electronic --analog (Over 2500 working lines)
221.6600000	31	Local Dial Switching Equipment: Electronic--Digital
221.7500000	32	Control Units for Electronic Switching System Located in Central Offices
221.8051100	33	Broadband Circuit Equipment for Access to Interstate Private Line Services
221.8051200	34	Broadband Circuit Equip. for Telephone Co.'s Interstate Private Line Services
221.8052200	35	Broadband Circuit Equip. for Telephone Co.'s Intrastate Private Line Services
221.8061100	36	Wideband Circuit Equip. for Interstate Private Line Services by Other Carrier
221.8062100	37	Wideband Circuit Equip. for Intrastate Private Line Services by Other Carrier
221.8062200	38	Wideband Circuit Equip. for Telephone Co.'s Intrastate Private Line Services

ACCOUNT NO.	ID NO.	DESCRIPTION
221.8066100	39	Private Line Interstate Circuit Equip. for DATAPHONE/High Speed Digital Service
221.8066200	40	PL Interstate Circuit Equip. for DDS/ HSSDS Offered by the Bell Operating Co.
221.8067100	41	PL Intrastate Circuit Equipment Used for DDS and HSSDS for Other Carrier Access
221.8067200	42	PL Intrastate Circuit Equip. for DDS and HSSDS Offered by the Bell Operating Co.
221.8070100	43	Basic Circuit Equipment for Other Carrier Access for Interstate MTS
221.8070200	44	Basic Circuit Equip. Used for Interstate (IS) MTS & The Telephone Co.'s IS MTS
221.8070600	45	Combined Allocation of Cost Categories 8g-6, 8g-7 and 8g-8
221.8071100	46	Basic Circuit Equipment for MT Central Office Connecting Facilities (COCF)
221.8071200	47	Basic Circuit Equipment for Interstate/ Intrastate MTS & the Telephone Co.'s MTS
221.8071300	48	Basic Circuit Equipment Used for Private Line Teletypewriter Service
221.8071400	49	Basic Circuit Equipment Used for Other Private Line Service
221.8071500	50	Basic Circuit Equip. Used for the Tele- phone Co.'s PL Teletypewriter Service
221.8071600	51	Basic Circuit Equip. Used for the Tele- phone Co.'s Other Private Line Services
221.8071910	52	Special Circuit Equipment for Interstate InterLATA PL Teletypewriter Service
221.8071920	53	Special Circuit Equip. for the Telephone Co.'s IS PL Teletypewriter Service
221.8071930	54	Special Circuit Equip. Used for Intra- state PL Teletypewriter Service
221.8072010	55	Special Circuit Equip. for Other Carrier Access for Other IS InterLATA PL Service
221.8072020	56	Special Circuit Equip. for The Telephone

ACCOUNT NO.	ID NO.	DESCRIPTION
		Co.'s Other Interstate PL Services
221.8072030	57	Special Circuit Equip. for Intrastate PL Serv. for Access Carriers & Telephone Co
221.8080000	58	Circuit Equipment Used for Host/Remote Circuit Facilities
221.8091000	59	Interexchange Circuit Equipment Used for Mobile Radio Services Under FCC Tariffs
221.8111100	60	Broadband Circuit Equipment Used on Local Channels for Other Carrier Access
221.8111200	61	Broadband Circuit Equip. Used on Local Channels For The Telephone Co.'s IS PL
221.8113101	62	Basic Circuit Equip. w/Subscriber Loops for Message Telephone Service Incl. WATS
221.8113106	63	Subscriber Loop Basic Circuit Equip. for Other Carrier Access for IS PL Services
221.8113107	64	Subscriber Loop Basic Circuit Equip. for Carr. Acc. for Intrastate PL Service
221.8113109	65	Subscriber Loop Basic Circuit Equip. for Intrastate PL Serv. by Tele. Company
221.8113110	66	Subscriber Loop Basic Circuit Equip. for Intrastate PL for Intraexchange Service
221.8113210	67	Combined Allocation of Cost Categories 8KCT1 and 8KCT2a
221.8113220	68	Circuit Equipment w/Message Exchange Trunks for Toll and Exchange COCF FGB
221.8113241	69	Circuit Equip. w/Message Exchange Trunk of Outside Plant for IS PL Local Channel
221.8113242	70	Circuit Equip. w/Message Exchange Trunk of Outside Plant for IS Switched Access
221.8113251	71	Circuit Equip. w/Message Exchange Trunk Portion for Intrastate PL Local Channels
221.8113252	72	Circuit Equip. w/ Message Exchange Trunk Portion for Intrastate Switched Access
221.8113260	73	Circuit Equip. w/Message Exchange Trunk Portion for Tele. Co.'s Intraexchange PL

ACCOUNT NO.	ID NO.	DESCRIPTION
221.8119000	74	Circuit Equip. for Urban Mobile, Bell Boy, VHF Maritime Radio Serv., & Others
231.0000000	75	Station Apparatus
232.1000000	76	Station Connections - Inside Wire: Teletypewriter Installations
232.2000000	77	Station Connections - Inside Wire: Official Company
232.3000000	78	Station Connections: Complex Inside Wire
232.4000000	79	Station Connections - Inside Wire: Public Telephone
234.0000000	80	Large Private Branch Exchanges
235.0000000	81	Public Telephone Equipment
240.1020000	82	Broadband Local Channels for Telephone Co.'s Interstate PL Broadband Services
240.1131010	83	Outside Plant w/Subscriber Loops for MTS Including WATS
240.1131070	84	Outside Plant w/Subscriber Loops Used for Other Carr. Access for IS PL DDS
240.1131090	85	Outside Plant w/Subscriber Loops for Other Carr. Acc. for Intrastate PL DDS
240.1131100	86	Outside Plant w/Subscriber Loops for Intrastate PL DDS by The Telephone Co.
240.1131110	87	Outside Plant w/Subscriber Loops for Intrastate PL DDS for Intraexchange Ser.
240.1132120	88	Combined Allocation of Cost Categories kct-1 and kct-2a
240.1132200	89	Outside Plant w/Message Exchange Trunks for Toll & Exchange COCF Traffic
240.1132420	90	Exchange Trunk Portion of Outside Plant for IS Switched Access for Private Line
240.1132520	91	Exchange Trunk Portion of Outside Plant for Intrastate Switched Access for PL
240.1190000	92	Out. Plant Providing Urban Mobile, Bell

ACCOUNT NO.	ID NO.	DESCRIPTION
		Boy, VHF Maritime Radio Serv., & Others
240.5120000	93	Outside Plant Used for The Telephone Co.'s Interstate Private Line Services
240.6110000	94	Outside Plant for Wideband Channels for IS PL Services Offered by Other Carrier
240.6210000	95	Outside Plant for Wideband Channels for Intrastate PL Services by Other Carrier
240.6610000	96	Outside Plant To Provide IS PL Circuits for DDS and HSSDS for Other Carr. Access
240.6620000	97	Outside Plant To Provide IS PL Circuits for DDS/HSSDS by The Bell Operating Co.
240.6710000	98	Outside Plant for Intrastate PL Circuits for DDS & HSSDS for Other Carrier Access
240.6720000	99	Outside Plant for Intrastate PL Circuits for DDS/HSSDS by The Bell Operating Co.
240.7010000	100	Outside Plant for Other Carr. Access for Interstate Message Telephone Services
240.7020000	101	Outside Plant for Other Carr. Access for IS MTS and The Telephone Co.'s IS MTS
240.7050000	102	Combined Allocation of Cost Categories g=5, g-6, and g-7
240.7080000	103	Outside Plant for Intrastate WATS MTS for Other Carr. Access & Telephone Co.
240.7090000	104	Outside Plant Used for Message Telephone Central Office Connecting Facilities
240.7100000	105	Outside Plant Providing IS & Intrastate MTS for Other Carr. Acc. & The Tele. Co.
240.7110000	106	Outside Plant for Other Carrier Access for Interstate Private Line Service
240.7120000	107	Outside Plant for the Telephone Co.'s Interstate Private Line Services
240.7140000	108	Outside Plant for The Telephone Co.'s Intrastate Private Line Services
240.8000000	109	Outside Plant Used for Host/Remote Facilities

ACCOUNT NO.	ID NO.	DESCRIPTION
240.9100000	110	Interexchange Outside Plant Used for Mobile Radio Services Under FCC Tariffs
261.1000000	111	Storeroom Furniture and Office Equipment
261.2000000	112	Other Furniture and Office Equipment
261.3000000	113	Furniture and Office Equipment - Computer and AMA Systems
261.4000000	114	Artworks
261.5000000	115	Items of Small Value
262.0000000	116	Other Communications Equipment
264.0800000	117	Small Value Items
264.1234560	118	Vechicles and Other Work Equipment -- Categories 1 - 6 Combined Separations
304.0000000	119	Tax Accounts: Investment Credits - Net
307.0000000	120	Other Operating Taxes
308.0000000	121	Operating Federal Income Taxes Deferred
309.0000000	122	Income Credits & Charges Resulting From Prior Deferrals of Federal Income Taxes
500.0100000	123	Subscribers' Station Revenues: Telephone Exchange Services
500.0200000	124	Subscribers' Station Revenues: Mobile Telephone Service
500.0300000	125	Subscribers' Station Revenues: Other Exchange Services
501.0000000	126	Operating Revenue Accounts: Public Telephone Revenues
503.0000000	127	Operating Revenue Accounts: Service Stations
504.0000000	128	Operating Revenue Accounts: Local Private Line Services
506.0000000	129	Other Local Service Revenues
508.1000000	130	Interstate Access Revenues: End User

ACCOUNT NO.	ID NO.	DESCRIPTION
		Revenues
508.2000000	131	Interstate Access Revenues: Carrier's Carrier Facilities Revenues
508.3000000	132	Interstate Access Revenues: Special Access Revenues
509.0200000	133	Intrastate Access Revenues: End User Revenues
509.0400000	134	Intrastate Access Revenues: Carrier's Carrier Facilities Revenues
509.0600000	135	Intrastate Access Revenues: Special Access Revenues
510.0000000	136	Operating Revenue Accounts: Message Tolls
511.0000000	137	Operating Revenue Accounts: Wide Area Toll Service
512.0000000	138	Operating Revenue Accounts: Toll Private Line Service
516.0000000	139	Operating Revenue Accounts: Other Toll Service Revenues
521.0000000	140	Telegraph Commission(nonjurisductional)-
523.0000000	141	Operating Revenue Accounts: Directory Advertising and Sales
524.0000000	142	Rent Revenues - Land, Buildings, Conduit Space, Right-of-way, Taxes
524.0500000	143	Rent Revenues-MFJ-related
524.0900000	144	Rent Revenues - Other
525.0000000	145	Operating Revenue Accounts: Revenues from General Services and Licenses
526.0000000	146	Operating Revenue Accounts: Other Operating Revenues
527.0000000	147	Operating Revenue Accounts: Interstate Billing and Collection Revenues
528.0000000	148	Operating Revenue Accounts: Intrastate Billing and Collection Revenues

ACCOUNT NO.	ID NO.	DESCRIPTION
530.0000000	149	Operating Revenue Accounts: Uncollectible Operating Revenues - Debit
602.1000000	150	Repairs to Pole Lines
602.2000000	151	Repairs to Aerial Cable
602.3000000	152	Repairs of Underground Cable
602.4000000	153	Repairs of Buried Cable
602.5000000	154	Repairs of Submarine Cable
602.6000000	155	Repairs of Aerial Wire
602.7000000	156	Repairs of Underground Conduit
602.8000000	157	Shop Repairs and Salvage Adjustment
603.1000000	158	Test Desk Work: Subscriber Line Testing
603.2000000	159	Test Desk Work: Inward Service Order
603.4000000	160	Test Desk Work: Message Trunk Testing
604.1000000	161	Ordinary Repairs to Central Office Equipment
604.4000000	162	Shop Repairs and Salvage Adjustments Expense for Central Office Equipment
604.6000000	163	House Service
604.7000000	164	Rearrangements and Changes Expense for Central Office Equipment
604.8000000	165	Interoffice Facility Assignment and Circuit Layout
605.1100000	166	Ordinary Repairs to Telephone and Misc. Station Apparatus Repair Parts
605.1200000	167	Ordinary Repairs to Large Private Branch Exchanges
605.4000000	168	Shop Repairs and Salvage Adjustments to Station Equipment
605.7200000	169	Rearrangements and Changes for Station Apparatus and Inside Wire

ACCOUNT NO.	ID NO.	DESCRIPTION
605.7400000	170	Rearrangements and Changes to Large Private Br. Ex. Station App. & Inside Wire
605.8000000	171	Plant Assignment and Related Clerical Work
606.0000000	172	Repairs to Building and Grounds
607.0000000	173	Repairs to Public Telephone Equipment
608.0000000	174	Depreciation Expenses
610.0000000	175	Maintaining Transmission Power
612.0000000	176	Other Maintenance Expense
620.0000000	177	
632.0000000	178	Public Telephone Expense
633.0000000	179	Other Traffic Expense
634.0000000	180	Joint Traffic Expenses - Debit
635.0000000	181	Joint Traffic Expenses - Credit
640.0000000	182	General Commercial Administration
642.0000000	183	Advertising
643.0000000	184	Sales Expense
644.1000000	185	Connecting Company Relations Expense for Private Line Service
644.3000000	186	Connecting Company Relations Expense for Message Toll Service
645.1000000	187	Local Commercial Operations Expense for Business Customers
645.2000000	188	Local Commerical Operations Expense for Residential Customers
645.3000000	189	Local Commercial Operations Expense for Public Telephone
645.4000000	190	Local Commercial Operations Expense for Interexchange Customers
645.5000000	191	The Remaining Local Commercial Operations Expense

ACCOUNT NO.	ID NO.	DESCRIPTION
648.0000000	192	Public Telephone Commissions
649.0000000	193	Directory Expenses
650.0000000	194	Other Commercial Expenses - Three Categories Combined
661.0000000	195	General Office Salaries and Expenses: Executive Department
662.0000000	196	Accounting Department -- All Cost Categories
663.0000000	197	Treasury Department
664.0000000	198	Law Department
665.0000000	199	Other General Office Salaries and Expenses
668.0000000	200	Insurance
669.0000000	201	Accidents and Damages
671.0000000	202	Operating Rents -- All Categories
672.0000000	203	Relief and Pensions
673.0000000	204	Telephone Franchise Requirements
675.0000000	205	Other Expenses
676.0000000	206	Telephone Franchise Requirements - Credit
677.0000000	207	Expenses Charged Construction - Credit
8171.1200000	208	Depreciation Reserve: Buildings
8171.2100000	209	Depreciation Reserve: Central Office Equipment
8171.3100000	210	Depreciation Reserve: Station Apparatus
8171.3200000	211	Depreciation Reserve: Station Connections
8171.3400000	212	Depreciation Reserve: Large Private Branch Exchanges
8171.3500000	213	Depreciation Reserve: Public Telephone

ACCOUNT NO.	ID NO.	DESCRIPTION
		Equipment
8171.4000000	214	Depreciation Reserve: Outside Plant
8171.6100000	215	Depreciation Reserve: Furniture and Office Equipment
8171.6200000	216	Depreciation Reserve: Other Communications Equipment
8171.6400000	217	Depreciation Reserve: Vehicles and Other Work Equipment
8171.8000000	218	Depreciation Reserve: Equal Access and Network Reconfiguration
8261.3010000	219	Computers and AMA Systems: Support and Administration of Local Plant
8261.3020000	220	Computers/AMA Systems: Support & Admin- istration of Local Dial Switching Equip.
8261.3030000	221	Computers/AMA Systems: Support & Admin- istration of Toll Dial Switching Equip.
8261.3040000	222	Computers/AMA Systems: Support & Admin- istration of Total Dial Switching Equip.
8261.3050000	223	Computers and AMA Systems: Message Trunk Testing
8261.3060000	224	Computers and AMA Systems: Private Line Circuit Equipment
8261.3070000	225	Computers and AMA Systems: Support and Administration of Circuit Equipment
8261.3080000	226	Computers and AMA Systems: Overall Support of Telecommunication Equipment
8261.3090000	227	Computers and AMA Systems: Support and Administration of Manual Switchboards
8261.3100000	228	Computers and AMA Systems: Directory Assistance
8261.3110000	229	Computers and AMA Systems: Non-Coe Applications
8261.3120000	230	Computers and AMA Systems: Non-Interstate

ACCOUNT NO.	ID NO.	DESCRIPTION
8620.1207000	231	Operator Service Centers: Directory Assistance Records
8620.1208000	232	Operator Services - General Supervision
8620.1209000	233	Operator Services - Equal Access
8620.2108000	234	Operation Service Centers: Customer Name and Address Service Center
8620.2109000	235	Operator Service Centers: IntraLATA Toll and Assistance Network
8620.2113000	236	Operator Services - Other Network
8620.2115000	237	Operator Service Centers: Directory Assistance Network Service Center
8620.2117000	238	Intercept Operator Service Center
8620.2118000	239	Operation Service Center: Directory Assistance Record Maintenance
8620.2119000	240	Operation Service Center: Data Base Administration Center
8620.2120000	241	Operation Service Center: Service Evaluation Center
8620.2121000	242	Operation Service Center: Message Investigation Center
8620.2700000	243	Network Administration - Data
8620.2701000	244	Network Administration - Switching
8620.2702000	245	Network Administration - Trunks
8620.2703000	246	Network Administration - Transition
8620.2704000	247	Network Administration - Line, Number and Central Office
8620.2705000	248	Network Administration - Translation
8620.2722000	249	Network Administration Support - Customer
8620.2760000	250	Network Administration Support - General Administration
8620.2761000	251	Network Administration Support -

ACCOUNT NO.	ID NO.	DESCRIPTION
		Supervisory
8620.2762000	252	Network Administration Support - Education and Training
8620.2900000	253	Operation Service Center: Force Management Center
8620.2902000	254	Operation Service Center: Facilities Administration
8640.1000000	255	General Commercial Administration Expense for Business
8640.2000000	256	General Commercial Administration Expense for Residence
8640.3000000	257	General Commercial Administration Expense for Public Telephone
8640.4000000	258	Gen. Commercial Administration Expenses for Interexchange Customer Serv. Center
8640.5000000	259	All Other General Commercial Administration Expense
8642.1000000	260	Advertising Expense for Corporate
8642.2000000	261	Advertising Expense for Informational Purposes
8642.3100000	262	Advertising Expenses for Sales: Business Customers
8642.3200000	263	Advertising Expenses for Sales: Residential Customers
8642.3300000	264	Advertising Expenses for Sales: Public Telephone
8642.4100000	265	Advertising Expense for Long Distance: Business Customers
8642.4200000	266	Advertising Expense for Long Distance: Residential Customers
8642.4300000	267	Advertising Expense for Long Distance: Public Telephone
8642.5000000	268	Other Advertising Expense for Long Distance

ACCOUNT NO.	ID NO.	DESCRIPTION
8643.1000000	269	Sales Expense for Business Customers MTS and Private Line Combined
8643.2000000	270	Sales Expense for Residential Customers
8643.3000000	271	Sales Expense for Public Telephone Service
8643.5000000	272	Sales Expense -- Other
8649.2000000	273	Directory Expense for Alphabetical and Street Address Directory - All Category
8649.3200000	274	Directory Expense for Delivery of Alphabetical Directories
8649.4100000	275	All Other Directory Expenses: Mechanization of Directory Operations
8649.4200000	276	Address Telephone Directories, Special Number Services, & Foreign Directories
8649.4300000	277	Other Directory Expenses: Admin. or Supportive Personnel in Dir. Operations
8662.0110000	278	Customer Accounting Department Expenses: Toll Message Operations
8662.0120000	279	Customer Accounting Department Expenses: Local Message Operations
8662.0130000	280	Customer Accounting Department Expenses: Service and Equipment Operations
8662.0140000	281	Customer Accounting Department Expenses: Remittance Operations
8662.0150000	282	Customer Accounting Department Expenses: Accounts Operations
8662.0160000	283	Customer Accounting Department Expenses: Customer Output
8662.0170000	284	Customer Accounting Department Expenses: Access Charges Operations
8662.0180000	285	Customer Accounting Operations - Executive
8662.0210000	286	Corporate Accounting Operations: Payroll Operations

ACCOUNT NO.	ID NO.	DESCRIPTION
8662.0220000	287	Corporate Accounting Operations: Investment and Cost Operations
8662.0230000	288	Corporate Accounting Operations: Accounts Payable Operations
8662.0240000	289	Corporate Accounting Operations: Corporate Reports Operations
8662.0250000	290	Corporate Functional Accounting System Processing Operations
8662.0300000	291	General Accounting
8671.1010000	292	Operating Rents: Manual Switching Equipment Space
8671.1020000	293	Operating Rents: Dial Switching Equipment Space
8671.1030000	294	Operating Rents: Circuit Equipment Space
8671.1040000	295	Operating Rents: Operators' Quarters
8671.1050000	296	Operating Rents: Genral Traffic Supervision Space
8671.1060000	297	Operating Rents: Commercial Office Space
8671.1070000	298	Operating Rents: Revenue Accounting Space
8671.1080000	299	Operating Rents: Garages, Storerooms, Warehouses, and Pole Yards
8671.1100000	300	Operating Rents: General Office Space
8671.2000000	301	Operating Rents: Outside Plant Rents
8671.3000000	302	Operating Rents: Circuit Rents
8671.4000000	303	Operating Rents: Equipment Rents
8671.5100000	304	Operating Rents: Switching Equipment
8671.5200000	305	Operating Rents: Cable Transmission Facilities and Structures
8671.5300000	306	Operating Rents: Central Office Circuit and Radio Transmission Equipment

ACCOUNT NO.	ID NO.	DESCRIPTION
8671.5400000	307	Operating Rents: Operator Services
8671.5500000	308	Operating Rents: Land and Buildings
8671.5600000	309	Operating Rents: Operations Center and Support Systems
8671.5700000	310	Operating Rents: Power and Distributing Frames
8671.6000000	311	Operating Rents: Antitrust and Other Rents
8671.9000000	312	Operating Rents -- Intra-Company
9221.0000000	313	24-Hour Usage for the Switched Network
9221.1160000	314	Usage of Directory Assistance Facilites
9221.2200000	315	Usage of Short Haul Tandems: Local and Intrastate IntraLATA Tandems
9221.2500000	316	Usage of Local Dial Switches for Tandem Switching of Intrastate InterLATA Usage
9221.3000000	317	Usage to Long Haul Tandems Function for Local Dial Switches: IS and SIL and SL
9221.3022000	318	Usage of Intrastate IntraLATA Toll by Originating and Terminating for SWNET
9221.4210000	319	Usage of AMA Equipment for All Services That are Measured
9221.6212000	320	Usage of the Traffic Sensitive Portion of no. 1 Crossbar Switches
9221.6222000	321	Usage of the Traffic Sensitive Portion of no. 5 Crossbar Switches
9221.6223000	322	Loop Count for no. 5 Crossbar Switches
9221.6224000	323	Usage of no. 5 Crossbar Switches by Residential Customers
9221.6225000	324	Usage of no. 5 Crossbar Switches by Business Customers
9221.6226000	325	Usage of no. 5 Crossbar Switches by CENTREX Customers

ACCOUNT NO.	ID NO.	DESCRIPTION
9221.6322000	326	Usage of Step-by-step Swtiches Over 5000
9221.6323000	327	Loop Counts for Step-by-Step Switches Over 5000
9221.6324000	328	Usage of Step-by-step Switches by Residential
9221.6325000	329	Usage of Step-by-Step Switches by Business
9221.6326000	330	Usage of Step-by-Step Switches for CENTREX
9221.6430000	331	Loop Counts for ESS Analog Switches
9221.6440000	332	Usage of ESS Analog Switches by Residential
9221.6450000	333	Usage of ESS Analog Switches for Business
9221.6460000	334	Usage of ESS Analog Switches by CENTREX
9221.6520000	335	Usage of ESS Analog Switches Over 2500
9221.6620000	336	Usage of Ditital Switches
9221.6630000	337	Loop Count for Digital Switches
9221.6640000	338	Usage of Digital ESS Switches for Residential
9221.6650000	339	Usage of Digital ESS Switches by Busines
9221.6660000	340	Usage of Digital Switches by CENTREX
9221.7500000	341	Switched Network Usage by Customers in Cost Category 7E of Account 221 Centrex
9221.8113252	342	Usage of Intrastate InterLATA Toll Serv. Originating and Terminating Use
9240.1131011	343	Loop Counts by Customer Class for Allocating NTS Costs
9240.1131012	344	Usage of Residential Subscriber Loops
9240.1131013	345	Usage of Business Subscriber Loops

ACCOUNT NO.	ID NO.	DESCRIPTION
9240.1131014	346	Usage of CENTREX Subscriber Loops
9240.1131100	347	Subscriber Loop Counts for Allocating Certain Investment or Expense to swlocal
9240.1132120	348	Usage of Trunk Capacity Cost Categories KCT-1, KCT-2A, All Interswitch Usage
9240.7050000	349	Interoffice Usage of Interstate and Intrastate MTS
9240.8000000	350	Usage of Host/Remote Facilities for Intrastate and Interstate Usage
9261.3110000	351	Use of Switched Network for Measured Customers
9662.0120000	352	Use by Measured Rate Customers
9800.0000000	353	Big 4 Wage Allocator Data
9801.0000000	354	Inward Migration of Customers

No. of Accounts = 354

APPENDIX D

List of Customer and Service Categories for Cost Allocation Basic Model

Categories

There are eighty-two categories specified in the ICAS model for each of the eight scenarios corresponding to the categories depicted in figure 4.1. The information in appendix D names the category, describes it, and indicates its input category. This information describes the interrelationships of service and customer categories for purposes of allocations and diagnostics in the ICAS model.

LIST OF CATEGORIES FOR MODEL: use24

SEQ. #	CATEGORY NAME	ID.	GROUP	DESCRIPTION
0	total	82	0	Total Amount
1	interstate	27	1	Total Interstate Jurisdictional Category Input Category: 1) total
1	state	62	1	Total Intrastate Jurisdictional Category Input Category: 1) total
2	mts	35	3	Message Telephone Service Input Category: 1) state
2	spl	61	3	Intrastate Private Line Services Input Category: 1) state
3	nts	36	7	Non-Traffic Sensitive Category Input Category: 1) mts
3	swnet	70	7	Switched Network Category Input Category: 1) mts
4	bda	1	10	Business Use of Directory Assistance Input Category: 1) ntsbus
4	bsil	2	13	Intrastate InterLATA Access for Business Line-Related Costs Input Category: 1) buss
4	bsilo	3	15	Intrastate InterLATA Originating Access for Business Line-Related Costs Input Category: 1) bsil
4	bsilt	4	15	Intrastate InterLATA Terminating Access for Business Line-Related Costs Input Category: 1) bsil
4	bsl	5	13	Intrastate IntraLATA Access for Business Line-Related Costs Input Category: 1) buss
4	bslo	6	14	Intrastate IntraLATA Originating Access for Business Line-Related Costs Input Category: 1) bsl
4	bslt	7	14	Intrastate IntraLATA Terminating Access for Business Line-Related Costs Input Category: 1) bsl
4	btsps	8	10	Business Use of Operator Services Input Category: 1) ntsbus
4	busfga	9	10	Feature Group A Use of Line Related Cost for Business Customers -- Access

SEQ. #	CATEGORY NAME	ID.	GROUP	DESCRIPTION
				Input Category: 1) ntsbus
4	busfgb	10	10	Feature Group B Use of Line Related Cost for Business Customers -- Access Input Category: 1) ntsbus
4	busloc	11	10	Local Use of the Line Related Costs for Business Customers Input Category: 1) ntsbus
4	buss	12	10	Intrastate Toll Use of Line Related Cost for Business Customers -- Access Input Category: 1) ntsbus
4	bwats	13	0	Business Use of 1-800 Dial In WATS Services Input Category: 1) ntsbus
4	ntsbus	37	8	Business NTS Costs Line Related Costs for Business Input Category: 1) nts
5	ntsres	44	8	Residential NTS Costs Line Related Costs for Residential Input Category: 1) nts
5	rda	46	11	Residential Use of Directory Assistance Input Category: 1) ntsres
5	resfga	47	11	Feature Group A Use of Line Related Cost for Residential Customers -- Access Input Category: 1) ntsres
5	resfgb	48	11	Feature Group B Use of Line Related Cost for Residential Customers -- Access Input Category: 1) ntsres
5	resloc	49	11	Local Use of the Line Related Costs for Residential Customers Input Category: 1) ntsres
5	ress	50	11	Intrastate Toll Use of Line Related Cost for Residential Customers -- Access Input Category: 1) ntsres
5	rsil	51	16	Intrastate InterLATA Access for Residential Line-Related Costs Input Category: 1) ress
5	rsilo	52	18	Intrastate InterLATA Originating Access for Residential Line-Related Costs Input Category: 1) rsil

SEQ. #	CATEGORY NAME	ID.	GROUP	DESCRIPTION
5	rsilt	53	18	Intrastate InterLATA Terminating Access for Residential Line-Related Costs Input Category: 1) rsil
5	rsl	54	16	Intrastate IntraLATA Access for Residential Line-Related Costs Input Category: 1) ress
5	rslo	55	17	Intrastate IntraLATA Originating Access for Residential Line-Related Costs Input Category: 1) rsl
5	rslt	56	17	Intrastate IntraLATA Terminating Access for Residential Line-Related Costs Input Category: 1) rsl
5	rtsps	57	11	Residential Use of Operator Services Input Category: 1) ntsres
5	rwats	58	0	Residential Use of 1-800 Dial In WATS Service Input Category: 1) ntsres
6	cda	14	12	Centrex Use of Directory Assistance Input Category: 1) ntsctx
6	csil	15	20	Intrastate InterLATA Access for Centrex Line-Related Costs Input Category: 1) ctxs
6	csilo	16	22	Intrastate InterLATA Originating Access for Centrex Line-Related Costs Input Category: 1) csil
6	csilt	17	22	Intrastate InterLATA Terminating Access for Centrex Line-Related Costs Input Category: 1) csil
6	csl	18	20	Intrastate IntraLATA Access for Centrex Line-Related Costs Input Category: 1) ctxs
6	cslo	19	21	Intrastate IntraLATA Originating Access for Centrex Line-Related Costs Input Category: 1) csl
6	cslt	20	21	Intrastate IntraLATA Terminating Access for Centrex Line-Related Costs Input Category: 1) csl
6	ctsps	21	12	Centrex Use of Operator Services

SEQ. #	CATEGORY NAME	ID.	GROUP	DESCRIPTION
				Input Category: 1) ntsctx
6	ctxfga	22	12	Feature Group A Use of Line Related Cost for Centrex Customers -- Access Input Category: 1) ntsctx
6	ctxfgb	23	12	Feature Group B Usage by Centrex Custom. Related to NTS Costs Input Category: 1) ntsctx
6	ctxloc	24	12	Local Use of the Line Related Costs for Centrex Customers Input Category: 1) ntsctx
6	ctxs	25	12	Intrastate Toll Use of Line Related Cost for Centrex Customers -- Access Input Category: 1) ntsctx
6	cwats	26	0	CENTREX Usage of 1-800 Dial In WATS Service Input Category: 1) ntsctx
6	ntsctx	39	8	Centrex NTS Costs Line Related Costs for Centrex and Trunk Input Category: 1) nts
7	ntscoin	38	8	Non Traffic Sensitive Cost Category for Coin Input Category: 1) nts
7	ntsfga	40	8	NTS Costs for Feature Group A Input Category: 1) nts
7	ntsfx	41	8	NTS Costs for Foreign Exchange Input Category: 1) nts
7	ntsmob	42	8	NTS Costs for Mobil Input Category: 1) nts
7	ntsoff	43	8	NTS Costs for Official Services Input Category: 1) nts
7	ntswats	45	8	NTS Costs for WATS Both In WATS and 800 Input Category: 1) nts
8	swbus	63	26	Local Switched Network Costs for Business Customers Input Category: 1) swlocal
8	swctx	64	26	Local Switched Network Costs for CENTREX and Trunk Customers Input Category: 1) swlocal

SEQ. #	CATEGORY NAME	ID.	GROUP	DESCRIPTION
8	swlocal	68	25	Local Switched Network Input Category: 1) swnet
8	swmobile	69	26	Usage of the Switched Network by Mobile Input Category: 1) swlocal
8	swres	72	26	Local Switched Network Costs for Residential Customers Input Category: 1) swlocal
9	swfga	66	27	Feature Group A Use of the Switched Network Input Category: 1) swtoll
9	swfgb	67	27	Feature Group B Use of the Switched Network Input Category: 1) swtoll
9	swsil	73	29	Intrastate InterLATA Use of the Switched Network -- Access Input Category: 1) swstol
9	swsilo	74	31	Intrastate InterLATA Originating Use of the Switched Network -- Access Input Category: 1) swsil
9	swsilt	75	31	Intrastate InterLATA Terminating Use of the Switched Network -- Access Input Category: 1) swsil
9	swsl	76	29	Intrastate IntraLATA Use of the Switched Network -- Access Input Category: 1) swstol
9	swslo	77	30	Intrastate IntraLATA Originating Use of the Switched Network -- Access Input Category: 1) swsl
9	swslt	78	30	Intrastate IntraLATA Terminating Use of the Switched Network -- Access Input Category: 1) swsl
9	swstol	79	27	Intrastate Toll Use of the Switched Network Input Category: 1) swtoll
9	swtoll	80	25	Toll Services for the Switched Network Input Category: 1) swnet
10	swda	65	28	Directory Assistance -- Use of the Switched Network and DA Centers

SEQ. #	CATEGORY NAME	ID.	GROUP	DESCRIPTION
				Input Category: 1) swop
10	swop	71	25	Operator Services for Switched Network Both TSPS and DA Input Category: 1) swnet
10	swtsps	81	28	Dial 0 Operator Services -- Use of the Switched Network and TSPS Centers Input Category: 1) swop
11	localpl	34	6	Local Private Line Services Input Category: 1) spl
11	silpl	59	6	Intrastate InterLATA Private Line Input Category: 1) spl
11	slpl	60	6	Intrastate IntraLATA Private Line Input Category: 1) spl
12	isil	28	5	Interstate InterLATA Use of the Switched Network -- Access Input Category: 1) istol
12	isilpl	29	4	Interstate InterLATA Private Line Input Category: 1) ispl
12	isl	30	5	Interstate IntraLATA Use of the Switched Network -- Access Input Category: 1) istol
12	islpl	31	4	Interstate IntraLATA Private Line Input Category: 1) ispl
12	ispl	32	2	Interstate Private Line Services Input Category: 1) interstate
12	istol	33	2	Interstate Toll Use of the Switched Network Input Category: 1) interstate

No. of Categories = 82

APPENDIX E

List of Initial Values for Use24 Scenario

Initial Values

The initial values provide the starting point for the allocations that are performed. These data may be investment cost or expense information, or usage data derived from the usage samples. The data are organized by account number and category in accordance with the account and category modules. The cost or revenue requirement information was collected from separations output or the functional accounting system used by Southwestern Bell. In all cases there is an amount entered for the total category. When these data were derived from separations data, the amounts for interstate toll and private line are also entered. In most cases, the data for intrastate private line is also contained in the initial values file. The initial values for the usage data in the 9000 series of accounts are entered by categories needed to compute specific allocation factors. The organization of these data and inexact data provided along with the account and category structure determined the structure of the allocation procedures to be specified.

ACCOUNT NO.	ID NO.	DESCRIPTION	
100.1000000	1	Telephone Plant In Service	
		isil	2,151,640,593.00
		isilpl	589,864,357.00
		isl	2,132,860.00
		islpl	9,561,649.00
		silpl	198,553,573.00
		slpl	213,474,830.00
		total	11,566,641,561.00
100.2000000	2	Telephone Plant Under Construction	
		isil	45,623,609.00
		isilpl	10,632,371.00
		isl	51,290.00
		islpl	137,070.00
		silpl	3,872,493.00
		slpl	4,750,922.00
		total	282,273,404.00
100.3000000	3	Property Held for Future Telephone Use	
		isil	154,036.00
		isilpl	42,413.00
		isl	173.00
		islpl	454.00
		silpl	15,322.00
		slpl	17,690.00
		total	910,602.00
171.0000000	4	Depreciation Reserve	
		isil	492,901,341.00
		isilpl	127,098,414.00
		isl	483,994.00
		islpl	2,070,357.00
		silpl	43,495,771.00
		slpl	48,364,207.00
		total	1,203,129,613.00
171.9000000	5	Depreciation Reserve- Investment not in service	
		istol	2,143,046.00
		total	7,771,432.00
176.0000000	6	Accumulated Deferred Income Taxes - Accelerated Tax Depreciation - Operating	
		isil	296,173,792.00
		isilpl	79,076,330.00
		isl	315,223.00
		islpl	1,102,605.00
		silpl	30,414,610.00
		slpl	35,155,812.00
		total	736,837,892.00
212.0100000	9	Operating Room and Central Office	

ACCOUNT NO.	ID NO.	DESCRIPTION	
		Equipment Space	
		isil	79,349,597.00
		isilpl	28,415,819.00
		isl	128,774.00
		islpl	296,439.00
		silpl	10,619,208.00
		slpl	13,381,312.00
		total	507,304,588.00
212.0200000	10	Operators' Quarters	
		isil	225,480.00
		isl	276.00
		total	2,781,581.00
212.0300000	11	General Traffic Supervision Space	
		isil	1,469,795.00
		isilpl	0.00
		isl	1,655.00
		islpl	0.00
		silpl	82.00
		slpl	0.00
		total	16,364,169.00
212.0400000	12	Commercial Office Space	
		isil	9,096,860.00
		isilpl	268,781.00
		isl	20,332.00
		islpl	1,351.00
		silpl	110,917.00
		slpl	295,463.00
		total	67,549,768.00
212.0600000	13	Revenue Accounting Space	
		isil	7,020,631.00
		isilpl	0.00
		isl	3,944.00
		islpl	406.00
		silpl	0.00
		slpl	57,964.00
		total	28,996,375.00
212.0700000	14	Garages, Storerooms, Warehouses, and Pole Yards	
		isil	17,480,392.00
		isilpl	3,495,200.00
		isl	10,425.00
		islpl	79,468.00
		silpl	1,068,573.00
		slpl	887,567.00
		total	83,567,635.00
212.0900000	15	General Office Space	

ACCOUNT NO.	ID NO.	DESCRIPTION	
		isil	168,993,582.00
		isilpl	45,626,163.00
		isl	223,281.00
		islpl	570,893.00
		silpl	16,866,603.00
		slpl	20,660,033.00
		total	311,157,576.00
212.1000000	16	Antenna Supporting Structures	
		total	110,486.00
221.1141000	17	The Service Evaluation Board/System or (SES) Signal Converter/Allotter (SC/A)	
		isil	145,212.00
		isl	64.00
		total	235,139.00
221.1160000	18	Separate DA Boards/Systems Including No. 5 Used for DA Service and Joint Aux.	
		isil	1,780,222.00
		isl	3,240.00
		total	7,013,255.00
221.1170000	19	Separate Intercepting Boards/Systems or No. 5 ACD Used for Intercept Service	
		isil	762,462.00
		isl	341.00
		total	1,576,903.00
221.2200000	20	Short Haul Dial Tandem Switching Equipment	
		total	8,556,585.00
221.2300000	21	Common Switching/Control Equipment Used for Switched Message Exchange Traffic	
		total	1,370,356.00
221.2500000	22	Common Switching/Control Equip. Used for Through Switched OCC-C InterLATA Traffic	
		isil	1,251,059.00
		total	1,871,368.00
221.3022000	23	Intertoll Dial Switching for Intrastate Toll Message or Private Line Traffic	
		isil	0.00
		total	344,819.00
221.3030000	24	Common Switching/Control Equip. for Toll Type& Plus Terminal Private Line Traffic	
		isil	1,711,244.00
		isilpl	0.00
		isl	101,462.00

ACCOUNT NO.	ID NO.	DESCRIPTION	
		silpl	0.00
		total	10,525,283.00
221.3080000	25	Common Switching/Control Equip. for No. 1/1A Electronic Switching System (ESS)	
		isil	79,473.00
		isl	0.00
		total	6,265,590.00
221.4210000	26	Automatic Message Recording Equip. for Interstate/Intrastate Message Service	
		isil	6,739,292.00
		isl	9,587.00
		total	22,986,278.00
221.4220000	27	Automatic Message Recording Equip. for Inter/Intrastate Switched Private Line	
		total	80,734.00
221.6220000	28	Local Dial Switching Equipment: No. 5 Crossbar	
		isil	34,748,446.00
		isl	57,125.00
		total	229,635,881.00
221.6320000	29	Local Dial Switching Equipment: Step-by-Step (Over 5000 working lines)	
		isil	19,645,915.00
		isl	6,790.00
		total	143,866,099.00
221.6500000	30	Local Dial Switching Equip.: Electronic --analog (Over 2500 working lines)	
		isil	226,863,785.00
		isl	61,043.00
		total	1,583,922,715.00
221.6600000	31	Local Dial Switching Equipment: Electronic--Digital	
		isil	281,258,146.00
		isl	124,958.00
		total	1,957,424,695.00
221.7500000	32	Control Units for Electronic Switching System Located in Central Offices	
		isil	196,588.00
		isl	88.00
		total	837,816.00
221.8051100	33	Broadband Circuit Equipment for Access to Interstate Private Line Services	
		total	40,352.00

ACCOUNT NO.	ID NO.	DESCRIPTION	
221.8051200	34	Broadband Circuit Equip. for Telephone Co.'s Interstate Private Line Services	
		total	130,138.00
221.8052200	35	Broadband Circuit Equip. for Telephone Co.'s Intrastate Private Line Services	
		total	385,909.00
221.8061100	36	Wideband Circuit Equip. for Interstate Private Line Services by Other Carrier	
		total	5,906,775.00
221.8062100	37	Wideband Circuit Equip. for Intrastate Private Line Services by Other Carrier	
		isilpl	0.00
		isl	0.00
		islpl	0.00
		silpl	523,251.00
		slpl	0.00
221.8062200	38	Wideband Circuit Equip. for Telephone Co.'s Intrastate Private Line Services	
		isil	0.00
		isilpl	0.00
		isl	0.00
		islpl	0.00
		silpl	0.00
		slpl	1,212,135.00
		total	1,212,135.00
221.8066100	39	Private Line Interstate Circuit Equip. for DATAPHONE/High Speed Digital Service	
		isilpl	16,204,856.00
		islpl	0.00
		total	16,204,856.00
221.8066200	40	PL Interstate Circuit Equip. for DDS/ HSSDS Offered by the Bell Operating Co.	
		total	0.00
221.8067100	41	PL Intrastate Circuit Equipment Used for DDS and HSSDS for Other Carrier Access	
		total	6,911,047.00
221.8067200	42	PL Intrastate Circuit Equip. for DDS and HSSDS Offered by the Bell Operating Co.	
		total	23,063,911.00
221.8070100	43	Basic Circuit Equipment for Other Carrier Access for Interstate MTS	
		total	15,029,000.00

ACCOUNT NO.	ID NO.	DESCRIPTION	
221.8070200	44	Basic Circuit Equip. Used for Interstate (IS) MTS & The Telephone Co.'s IS MTS	
		isil	8,917,910.00
		isl	0.00
		total	8,917,910.00
221.8070600	45	Combined Allocation of Cost Categories 8g-6, 8g-7 and 8g-8	
		total	24,545,793.00
221.8071100	46	Basic Circuit Equipment for MT Central Office Connecting Facilities (COCF)	
		isil	1,238,733.00
		isl	0.00
		total	2,327,911.00
221.8071200	47	Basic Circuit Equipment for Interstate/ Intrastate MTS & the Telephone Co.'s MTS	
		isil	82,883,439.00
		isl	520,487.00
		total	278,782,526.00
221.8071300	48	Basic Circuit Equipment Used for Private Line Teletypewriter Service	
		isilpl	366,001.00
		islpl	0.00
		silpl	582,396.00
		slpl	0.00
		total	948,397.00
221.8071400	49	Basic Circuit Equipment Used for Other Private Line Service	
		isilpl	57,214,508.00
		islpl	0.00
		silpl	41,708,345.00
		slpl	0.00
		total	98,922,853.00
221.8071500	50	Basic Circuit Equip. Used for the Telephone Co.'s PL Teletypewriter Service	
		isil	0.00
		isilpl	0.00
		isl	0.00
		islpl	33,128.00
		silpl	0.00
		slpl	428,078.00
		total	461,206.00
221.8071600	51	Basic Circuit Equip. Used for the Telephone Co.'s Other Private Line Services	
		islpl	1,790,420.00

ACCOUNT NO.	ID NO.	DESCRIPTION	
		slpl	66,473,701.00
		total	68,264,121.00
221.8071910	52	Special Circuit Equipment for Interstate InterLATA PL Teletypewriter Service	
		total	1,358,370.00
221.8071920	53	Special Circuit Equip. for the Telephone Co.'s IS PL Teletypewriter Service	
		total	122,949.00
221.8071930	54	Special Circuit Equip. Used for Intra-state PL Teletypewriter Service	
		isilpl	0.00
		islpl	0.00
		silpl	2,161,493.00
		slpl	1,588,761.00
		total	3,750,254.00
221.8072010	55	Special Circuit Equip. for Other Carrier Access for Other IS InterLATA PL Service	
		total	1,267,116.00
221.8072020	56	Special Circuit Equip. for The Telephone Co.'s Other Interstate PL Services	
		isilpl	0.00
		islpl	39,652.00
		silpl	0.00
		slpl	0.00
		total	39,652.00
221.8072030	57	Special Circuit Equip. for Intrastate PL Serv. for Access Carriers & Telephone Co	
		silpl	923,706.00
		slpl	1,472,181.00
		total	2,395,887.00
221.8080000	58	Circuit Equipment Used for Host/Remote Circuit Facilities	
		isil	628,909.00
		isl	0.00
		total	3,673,769.00
221.8091000	59	Interexchange Circuit Equipment Used for Mobile Radio Services Under FCC Tariffs	
		total	210,668.00
221.8111100	60	Broadband Circuit Equipment Used on Local Channels for Other Carrier Access	
		isilpl	3,197,878.00
		islpl	0.00
		total	3,197,878.00

ACCOUNT NO.	ID NO.	DESCRIPTION	
221.8111200	61	Broadband Circuit Equip. Used on Local Channels For The Telephone Co.'s IS PL	
		total	408,473.00
221.8113101	62	Basic Circuit Equip. w/Subscriber Loops for Message Telephone Service Incl. WATS	
		isil	97,075,694.00
		isl	43,090.00
		total	410,381,289.00
221.8113106	63	Subscriber Loop Basic Circuit Equip. for Other Carrier Access for IS PL Services	
		total	16,925,151.00
221.8113107	64	Subscriber Loop Basic Circuit Equip. for Carr. Acc. for Intrastate PL Service	
		total	4,441,131.00
221.8113109	65	Subscriber Loop Basic Circuit Equip. for Intrastate PL Serv. by Tele. Company	
		total	2,288,322.00
221.8113110	66	Subscriber Loop Basic Circuit Equip. for Intrastate PL for Intraexchange Service	
		total	18,671,756.00
221.8113210	67	Combined Allocation of Cost Categories 8KCT1 and 8KCT2a	
		isil	100,542,273.00
		isl	0.00
		total	519,595,407.00
221.8113220	68	Circuit Equipment w/Message Exchange Trunks for Toll and Exchange COCF FGB	
		isil	7,866,548.00
		isl	0.00
		total	14,783,355.00
221.8113241	69	Circuit Equip. w/Message Exchange Trunk of Outside Plant for IS PL Local Channel	
		isilpl	139,535,352.00
		islpl	0.00
		total	139,535,352.00
221.8113242	70	Circuit Equip. w/Message Exchange Trunk of Outside Plant for IS Switched Access	
		isil	1,005,777.00
		isl	32,642.00
		total	1,038,419.00
221.8113251	71	Circuit Equip. w/Message Exchange Trunk	

ACCOUNT NO.	ID NO.	DESCRIPTION	
		Portion for Intrastate PL Local Channels	
		silpl	17,054,987.00
		slpl	33,100,008.00
		total	50,154,995.00
221.8113252	72	Circuit Equip. w/ Message Exchange Trunk Portion for Intrastate Switched Access	
		total	242,039.00
221.8113260	73	Circuit Equip. w/Message Exchange Trunk Portion for Tele. Co.'s Intraexchange PL	
		total	46,754,650.00
221.8119000	74	Circuit Equip. for Urban Mobile, Bell Boy, VHF Maritime Radio Serv., & Others	
		total	14,010,357.00
231.0000000	75	Station Apparatus	
		isil	1,237,891.00
		isilpl	160,112.00
		isl	549.00
		islpl	0.00
		silpl	42,013.00
		slpl	21,649.00
		total	5,456,880.00
232.1000000	76	Station Connections - Inside Wire: Teletypewriter Installations	
		isil	231,393.00
		isilpl	231,975.00
		isl	103.00
		islpl	0.00
		silpl	60,871.00
		slpl	31,364.00
		total	6,204,682.00
232.2000000	77	Station Connections - Inside Wire: Official Company	
		isil	25,161,239.00
		isilpl	25,224,665.00
		isl	11,168.00
		islpl	0.00
		silpl	6,618,966.00
		slpl	3,410,467.00
		total	674,737,653.00
232.3000000	78	Station Connections: Complex Inside Wire	
		isil	0.00
		isilpl	0.00
		isl	0.00
		islpl	0.00
		silpl	0.00

ACCOUNT NO.	ID NO.	DESCRIPTION	
		slpl	0.00
		total	1,216,750.00
232.4000000	79	Station Connections - Inside Wire: Public Telephone	
		isil	25,392,632.00
		isilpl	4,427,206.00
		isl	11,271.00
		islpl	0.00
		silpl	1,161,691.00
		slpl	598,569.00
		total	118,417,270.00
234.0000000	80	Large Private Branch Exchanges	
		isil	16,139,378.00
		isilpl	7,220,195.00
		isl	7,164.00
		islpl	739,350.00
		silpl	2,210,791.00
		slpl	5,898,710.00
		total	170,908,901.00
235.0000000	81	Public Telephone Equipment	
		isil	19,809,907.00
		isilpl	0.00
		isl	8,793.00
		islpl	0.00
		silpl	0.00
		slpl	0.00
		total	83,745,116.00
240.1020000	82	Broadband Local Channels for Telephone Co.'s Interstate PL Broadband Services	
		total	4,554,132.00
240.1131010	83	Outside Plant w/Subscriber Loops for MTS Including WATS	
		isil	976,175,774.00
		isl	433,306.00
		total	4,126,720,666.00
240.1131070	84	Outside Plant w/Subscriber Loops Used for Other Carr. Access for IS PL DDS	
		total	6,118,902.00
240.1131090	85	Outside Plant w/Subscriber Loops for Other Carr. Acc. for Intrastate PL DDS	
		total	1,750,103.00
240.1131100	86	Outside Plant w/Subscriber Loops for Intrastate PL DDS by The Telephone Co.	
		total	1,656,311.00

ACCOUNT NO.	ID NO.	DESCRIPTION	
240.1131110	87	Outside Plant w/Subscriber Loops for Intrastate PL DDS for Intraexchange Ser.	
		total	4,187,333.00
240.1132120	88	Combined Allocation of Cost Categories kct-1 and kct-2a	
		isil	11,978,867.00
		isl	0.00
		total	16,778,867.00
240.1132200	89	Outside Plant w/Message Exchange Trunks for Toll & Exchange COCF Traffic	
		isil	287,510.00
		isl	0.00
		total	540,309.00
240.1132420	90	Exchange Trunk Portion of Outside Plant for IS Switched Access for Private Line	
		isil	18,595.00
		isl	604.00
		total	19,199.00
240.1132520	91	Exchange Trunk Portion of Outside Plant for Intrastate Switched Access for PL	
		total	58,598.00
240.1190000	92	Out. Plant Providing Urban Mobile, Bell Boy, VHF Maritime Radio Serv., & Others	
		total	959,042.00
240.5120000	93	Outside Plant Used for The Telephone Co.'s Interstate Private Line Services	
		total	3,887.00
240.6110000	94	Outside Plant for Wideband Channels for IS PL Services Offered by Other Carrier	
		total	3,944,995.00
240.6210000	95	Outside Plant for Wideband Channels for Intrastate PL Services by Other Carrier	
		total	329,468.00
240.6220000	0		
		total	875,152.00
240.6610000	96	Outside Plant To Provide IS PL Circuits for DDS and HSSDS for Other Carr. Access	
		total	740,442.00
240.6710000	98	Outside Plant for Intrastate PL Circuits for DDS & HSSDS for Other Carrier Access	

ACCOUNT NO.	ID NO.	DESCRIPTION	
		total	261,596.00
240.6720000	99	Outside Plant for Intrastate PL Circuits for DDS/HSSDS by The Bell Operating Co.	
		total	876,098.00
240.7010000	100	Outside Plant for Other Carr. Access for Interstate Message Telephone Services	
		total	6,245,290.00
240.7020000	101	Outside Plant for Other Carr. Access for IS MTS and The Telephone Co.'s IS MTS	
		total	3,705,831.00
240.7050000	102	Combined Allocation of Cost Categories g=5, g-6, and g-7	
		total	6,664,276.00
240.7080000	103	Outside Plant for Intrastate WATS MTS for Other Carr. Access & Telephone Co.	
		total	3,535,711.00
240.7090000	104	Outside Plant Used for Message Telephone Central Office Connecting Facilities	
		isil	514,755.00
		isl	0.00
		total	967,362.00
240.7100000	105	Outside Plant Providing IS & Intrastate MTS for Other Carr. Acc. & The Tele. Co.	
		isil	34,442,153.00
		isl	216,288.00
		total	115,847,878.00
240.7110000	106	Outside Plant for Other Carrier Access for Interstate Private Line Service	
		total	23,927,539.00
240.7120000	107	Outside Plant for the Telephone Co.'s Interstate Private Line Services	
		total	757,774.00
240.7140000	108	Outside Plant for The Telephone Co.'s Intrastate Private Line Services	
		total	27,801,027.00
240.8000000	109	Outside Plant Used for Host/Remote Facilities	
		isil	329,124.00
		isl	0.00
		total	1,922,581.00

ACCOUNT NO.	ID NO.	DESCRIPTION	
240.9100000	110	Interexchange Outside Plant Used for Mobile Radio Services Under FCC Tariffs	
		total	12,700.00
261.1000000	111	Storeroom Furniture and Office Equipment	
		isil	32,131.00
		isilpl	7,166.00
		isl	37.00
		islpl	94.00
		silpl	2,860.00
		slpl	3,491.00
		total	175,799.00
261.2000000	112	Other Furniture and Office Equipment	
		isil	12,293,227.00
		isilpl	2,955,014.00
		isl	13,774.00
		islpl	38,567.00
		silpl	1,179,265.00
		slpl	1,439,520.00
		total	72,494,334.00
261.3000000	113	Furniture and Office Equipment - Computer and AMA Systems	
		isil	36,975,681.00
		isilpl	9,187,117.00
		isl	40,288.00
		islpl	105,155.00
		silpl	3,520,384.00
		slpl	4,417,909.00
		total	228,545,863.00
261.4000000	114	Artworks	
		isil	149,910.00
		isilpl	36,035.00
		isl	163.00
		islpl	470.00
		silpl	14,381.00
		slpl	17,554.00
		total	884,036.00
261.5000000	115	Items of Small Value	
		isil	384,771.00
		isilpl	92,490.00
		isl	431.00
		islpl	1,207.00
		silpl	36,910.00
		slpl	45,056.00
		total	2,269,033.00
262.0000000	116	Other Communications Equipment	
		isil	27,858,439.00

ACCOUNT NO.	ID NO.	DESCRIPTION	
		isilpl	6,696,540.00
		isl	31,214.00
		islpl	87,399.00
		silpl	2,672,406.00
		slpl	3,262,406.00
		total	164,283,880.00
264.0800000	117	Small Value Items	
		isil	390,330.00
		isilpl	78,046.00
		isl	233.00
		islpl	1,774.00
		silpl	23,861.00
		slpl	19,819.00
		total	1,866,321.00
264.1234560	118	Vechicles and Other Work Equipment -- Categories 1 - 6 Combined Separations	
		isil	38,770,040.00
		isilpl	7,752,054.00
		isl	23,014.00
		islpl	176,252.00
		silpl	2,370,055.00
		slpl	1,968,525.00
		total	185,375,583.00
304.0000000	119	Tax Accounts: Investment Credits - Net	
		istol	36,342,672.00
		total	150,783,529.00
307.0000000	120	Other Operating Taxes	
		istol	45,480,476.00
		total	300,710,956.00
308.0000000	121	Operating Federal Income Taxes Deferred	
		istol	56,705,370.00
		total	249,954,088.00
309.0000000	122	Income Credits & Charges Resulting From Prior Deferrals of Federal Income Taxes	
		istol	14,697,040.00
		total	65,612,382.00
500.0100000	123	Subscribers' Station Revenues: Telephone Exchange Services	
		ntsbus	713,518,601.00
		ntscoin	13,486,643.00
		ntsres	804,989,771.00
		total	1,531,995,015.00
500.0200000	124	Subscribers' Station Revenues: Mobile Telephone Service	

ACCOUNT NO.	ID NO.	DESCRIPTION	
		total	5,735,256.00
500.0300000	125	Subscribers' Station Revenues: Other Exchange Services	
		ntsbus	4,258,778.00
		ntsres	0.00
		total	4,258,778.00
501.0000000	126	Operating Revenue Accounts: Public Telephone Revenues	
		ntscoin	98,756,912.00
		total	98,756,912.00
503.0000000	127	Operating Revenue Accounts: Service Stations	
		total	6,035.00
504.0000000	128	Operating Revenue Accounts: Local Private Line Services	
		localpl	92,026,700.00
		total	92,026,700.00
506.0000000	129	Other Local Service Revenues	
		ntsbus	22,068,291.00
		ntsres	23,258,811.00
		swda	45,170,617.00
		total	43,069,846.00
508.1000000	130	Interstate Access Revenues: End User Revenues	
		isil	133,760,951.00
		istol	133,760,951.00
		total	133,760,951.00
508.2000000	131	Interstate Access Revenues: Carrier's Carrier Facilities Revenues	
		isil	628,943,075.00
		istol	628,943,075.00
		total	628,943,075.00
508.3000000	132	Interstate Access Revenues: Special Access Revenues	
		isil	186,626,161.00
		isilpl	0.00
		istol	186,626,161.00
		total	186,626,161.00
509.0200000	133	Intrastate Access Revenues: End User Revenues	
		swsil	287,791.00
		swstol	287,791.00
		total	287,791.00

ACCOUNT NO.	ID NO.	DESCRIPTION	
509.0400000	134	Intrastate Access Revenues: Carrier's Carrier Facilities Revenues	
		swda	6,871,263.00
		swsil	637,394,376.00
		swsl	2,579.00
		total	644,268,218.00
509.0600000	135	Intrastate Access Revenues: Special Access Revenues	
		total	46,956,323.00
510.0000000	136	Operating Revenue Accounts: Message Tolls	
		istol	846,035.00
		total	263,970,628.00
511.0000000	137	Operating Revenue Accounts: Wide Area Toll Service	
		istol	- 44,461.00
		silpl	0.00
		slpl	0.00
		total	41,221,552.00
512.0000000	138	Operating Revenue Accounts: Toll Private Line Service	
		ispl	110,098.00
		silpl	0.00
		slpl	0.00
		total	69,222,162.00
516.0000000	139	Operating Revenue Accounts: Other Toll Service Revenues	
		istol	- 1,831,501.00
		silpl	0.00
		slpl	0.00
		total	- 2,625,539.00
521.0000000	140	Telegraph Commission(nonjurisductional)-	
		istol	0.00
		silpl	0.00
		slpl	0.00
		total	94,093.00
523.0000000	141	Operating Revenue Accounts: Directory Advertising and Sales	
		istol	0.00
		silpl	0.00
		slpl	0.00
		total	54,309,120.00
524.0000000	142	Rent Revenues - Land, Buildings, Conduit	

ACCOUNT NO.	ID NO.	DESCRIPTION	
		Space, Right-of-way, Taxes	
		istol	0.00
		silpl	0.00
		slpl	0.00
		total	47,930,889.00
524.0500000	143	Rent Revenues-MFJ-related	
		istol	0.00
		silpl	0.00
		slpl	0.00
		total	39,465,237.00
524.0900000	144	Rent Revenues - Other	
		istol	0.00
		silpl	0.00
		slpl	0.00
		total	936,484.00
525.0000000	145	Operating Revenue Accounts: Revenues from General Services and Licenses	
		istol	0.00
		silpl	0.00
		slpl	0.00
		total	500.00
526.0000000	146	Operating Revenue Accounts: Other Operating Revenues	
		istol	0.00
		silpl	0.00
		slpl	0.00
		total	33,622,546.00
527.0000000	147	Operating Revenue Accounts: Interstate Billing and Collection Revenues	
		istol	49,031,984.00
		silpl	0.00
		slpl	0.00
		total	49,031,984.00
528.0000000	148	Operating Revenue Accounts: Intrastate Billing and Collection Revenues	
		istol	0.00
		silpl	0.00
		slpl	0.00
		total	70,997,923.00
530.0000000	149	Operating Revenue Accounts: Uncollectible Operating Revenues - Debit	
		istol	6,000,000.00
		silpl	0.00
		slpl	0.00
		total	31,271,653.00

ACCOUNT NO.	ID NO.	DESCRIPTION	
602.1000000	150	Repairs to Pole Lines	
		istol	715,280.00
		total	2,618,054.00
602.2000000	151	Repairs to Aerial Cable	
		istol	31,093,325.00
		total	117,578,722.00
602.3000000	152	Repairs of Underground Cable	
		istol	6,923,834.00
		total	28,632,751.00
602.4000000	153	Repairs of Buried Cable	
		istol	51,340,032.00
		total	207,306,940.00
602.5000000	154	Repairs of Submarine Cable	
		istol	4,259.00
		total	13,355.00
602.6000000	155	Repairs of Aerial Wire	
		istol	199,431.00
		total	661,296.00
602.7000000	156	Repairs of Underground Conduit	
		istol	1,325,537.00
		total	5,008,937.00
602.8000000	157	Shop Repairs and Salvage Adjustment	
		istol	- 3,793.00
		total	- 14,313.00
603.1000000	158	Test Desk Work: Subscriber Line Testing	
		istol	19,694,662.00
		silpl	809,718.00
		slpl	431,514.00
		total	78,416,735.00
603.2000000	159	Test Desk Work: Inward Service Order	
		istol	242,050.00
		silpl	9,952.00
		slpl	5,303.00
		total	963,794.00
603.4000000	160	Test Desk Work: Message Trunk Testing	
		istol	27,384,533.00
		total	65,385,354.00
604.1000000	161	Ordinary Repairs to Central Office Equipment	
		istol	14,356,352.00

ACCOUNT NO.	ID NO.	DESCRIPTION	
		total	70,311,915.00
604.4000000	162	Shop Repairs and Salvage Adjustments Expense for Central Office Equipment	
		istol	669,415.00
		total	3,278,596.00
604.6000000	163	House Service	
		istol	3,968,483.00
		total	19,436,185.00
604.7000000	164	Rearrangements and Changes Expense for Central Office Equipment	
		istol	21,608,740.00
		total	105,831,400.00
604.8000000	165	Interoffice Facility Assignment and Circuit Layout	
		istol	5,604,169.00
		total	27,447,045.00
605.1100000	166	Ordinary Repairs to Telephone and Misc. Station Apparatus Repair Parts	
		istol	8,453,643.00
		total	33,689,626.00
605.1200000	167	Ordinary Repairs to Large Private Branch Exchanges	
		istol	246,989.00
		total	894,107.00
605.4000000	168	Shop Repairs and Salvage Adjustments to Station Equipment	
		istol	19,621.00
		total	75,276.00
605.7200000	169	Rearrangements and Changes for Station Apparatus and Inside Wire	
		istol	4,716,179.00
		total	18,545,165.00
605.7400000	170	Rearrangements and Changes to Large Private Br. Ex. Station App. & Inside Wire	
		istol	66,837.00
		total	243,066.00
605.8000000	171	Plant Assignment and Related Clerical Work	
		istol	6,075,829.00
		total	25,865,176.00
606.0000000	172	Repairs to Building and Grounds	

ACCOUNT NO.	ID NO.	DESCRIPTION	
		istol	4,903,041.00
		total	24,512,417.00
607.0000000	173	Repairs to Public Telephone Equipment	
		istol	3,162,637.00
		total	13,422,319.00
608.0000000	174	Depreciation Expenses	
		istol	187,409,089.00
		total	821,195,364.00
610.0000000	175	Maintaining Transmission Power	
		istol	3,094,418.00
		total	15,253,681.00
612.0000000	176	Other Maintenance Expense	
		isil	2,705,798.00
		isilpl	903,192.00
		isl	2,837.00
		islpl	15,452.00
		total	15,037,736.00
620.0000000	177		
		istol	10,892,526.00
		total	115,116,919.00
632.0000000	178	Public Telephone Expense	
		istol	9,686.00
		total	111,077.00
633.0000000	179	Other Traffic Expense	
		istol	6,163.00
		total	75,806.00
634.0000000	180	Joint Traffic Expenses - Debit	
		istol	298,889.00
		total	41,646,701.00
635.0000000	181	Joint Traffic Expenses - Credit	
		istol	142,346.00
		total	1,049,001.00
640.0000000	182	General Commercial Administration	
		istol	9,171,397.00
		total	61,594,374.00
642.0000000	183	Advertising	
		istol	5,740,736.00
		total	23,096,305.00
643.0000000	184	Sales Expense	
		istol	4,231,845.00

ACCOUNT NO.	ID NO.	DESCRIPTION	
		total	17,251,983.00
644.1000000	185	Connecting Company Relations Expense for Private Line Service	
		total	2,630,668.00
644.3000000	186	Connecting Company Relations Expense for Message Toll Service	
		istol	0.00
		total	171,975.00
645.1000000	187	Local Commercial Operations Expense for Business Customers	
		istol	22,971,115.00
		total	47,337,748.00
645.2000000	188	Local Commerical Operations Expense for Residential Customers	
		istol	0.00
		total	93,245,609.00
645.3000000	189	Local Commercial Operations Expense for Public Telephone	
		istol	10,139.00
		silpl	0.00
		slpl	502,119.00
		total	7,718,393.00
645.4000000	190	Local Commercial Operations Expense for Interexchange Customers	
		istol	0.00
		total	11,269,808.00
645.5000000	191	The Remaining Local Commercial Operations Expense	
		istol	0.00
		total	1,292,178.00
648.0000000	192	Public Telephone Commissions	
		istol	9,794.00
		total	8,858,315.00
649.0000000	193	Directory Expenses	
		istol	3,185,897.00
		total	9,354,202.00
650.0000000	194	Other Commercial Expenses - Three Categories Combined	
		istol	92,869.00
		total	679,453.00
661.0000000	195	General Office Salaries and Expenses:	

ACCOUNT NO.	ID NO.	DESCRIPTION	
		Executive Department	
		istol	680,171.00
		total	3,240,720.00
662.0000000	196	Accounting Department -- All Cost Categories	
		istol	23,591,470.00
		total	135,913,965.00
663.0000000	197	Treasury Department	
		istol	2,014,904.00
		total	9,622,455.00
664.0000000	198	Law Department	
		istol	2,671,961.00
		total	12,724,047.00
665.0000000	199	Other General Office Salaries and Expenses	
		istol	32,408,001.00
		total	146,819,637.00
668.0000000	200	Insurance	
		istol	562,635.00
		total	2,423,244.00
669.0000000	201	Accidents and Damages	
		istol	4,689,547.00
		total	20,512,476.00
671.0000000	202	Operating Rents -- All Categories	
		isil	11,126,592.00
		isilpl	3,484,664.00
		isl	284,763.00
		islpl	106,763.00
		total	92,935,576.00
672.0000000	203	Relief and Pensions	
		istol	41,298,766.00
		total	196,222,580.00
673.0000000	204	Telephone Franchise Requirements	
		istol	3,978.00
		total	14,611.00
675.0000000	205	Other Expenses	
		istol	4,419,865.00
		total	20,327,154.00
676.0000000	206	Telephone Franchise Requirements - Credit	
		istol	3,857.00

ACCOUNT NO.	ID NO.	DESCRIPTION	
		total	14,616.00
677.0000000	207	Expenses Charged Construction - Credit	
		istol	3,645,921.00
		total	17,379,837.00
8171.1200000	208	Depreciation Reserve: Buildings	
		total	167,146,547.00
8171.2100000	209	Depreciation Reserve: Central Office Equipment	
		total	765,380,889.00
8171.3100000	210	Depreciation Reserve: Station Apparatus	
		total	996,828.00
8171.3200000	211	Depreciation Reserve: Station Connections	
		total	374,475,565.00
8171.3400000	212	Depreciation Reserve: Large Private Branch Exchanges	
		total	47,169,773.00
8171.3500000	213	Depreciation Reserve: Public Telephone Equipment	
		total	19,667,231.00
8171.4000000	214	Depreciation Reserve: Outside Plant	
		total	963,273,592.00
8171.6100000	215	Depreciation Reserve: Furniture and Office Equipment	
		total	81,293,640.00
8171.6200000	216	Depreciation Reserve: Other Communications Equipment	
		total	78,615,404.00
8171.6400000	217	Depreciation Reserve: Vehicles and Other Work Equipment	
		total	67,745,543.00
8171.8000000	218	Depreciation Reserve: Equal Access and Network Reconfiguration	
		total	6,107,249.00
8171.9000000	0		
		total	7,771,432.00
8261.3010000	219	Computers and AMA Systems: Support and Administration of Local Plant	

ACCOUNT NO.	ID NO.	DESCRIPTION	
		total	19,695,379.00
8261.3020000	220	Computers/AMA Systems: Support & Administration of Local Dial Switching Equip.	
		total	765,517.00
8261.3030000	221	Computers/AMA Systems: Support & Administration of Toll Dial Switching Equip.	
		total	1,120,018.00
8261.3040000	222	Computers/AMA Systems: Support & Administration of Total Dial Switching Equip.	
		total	20,417,552.00
8261.3050000	223	Computers and AMA Systems: Message Trunk Testing	
		total	1,592,064.00
8261.3060000	224	Computers and AMA Systems: Private Line Circuit Equipment	
		total	6,979,830.00
8261.3070000	225	Computers and AMA Systems: Support and Administration of Circuit Equipment	
		total	5,865,231.00
8261.3080000	226	Computers and AMA Systems: Overall Support of Telecommunication Equipment	
		total	27,072,485.00
8261.3090000	227	Computers and AMA Systems: Support and Administration of Manual Switchboards	
		total	1,296,094.00
8261.3100000	228	Computers and AMA Systems: Directory Assistance	
		total	38,182,371.00
8261.3110000	229	Computers and AMA Systems: Non-Coe Applications	
		total	27,616,100.00
8261.3120000	230	Computers and AMA Systems: Non-Interstate	
		total	354,925.00
8620.1207000	231	Operator Service Centers: Directory Assistance Records	
		total	1,070,125.00
8620.1208000	232	Operator Services - General Supervision	
		total	8,998,831.00

ACCOUNT NO.	ID NO.	DESCRIPTION	
8620.1209000	233	Operator Services - Equal Access	
		total	6,883.00
8620.2108000	234	Operation Service Centers: Customer Name and Address Service Center	
		total	795,413.00
8620.2109000	235	Operator Service Centers: IntraLATA Toll and Assistance Network	
		total	936.00
8620.2113000	236	Operator Services - Other Network	
		total	12,919.00
8620.2115000	237	Operator Service Centers: Directory Assistance Network Service Center	
		total	65,154,597.00
8620.2117000	238	Intercept Operator Service Center	
		total	2,263,596.00
8620.2118000	239	Operation Service Center: Directory Assistance Record Maintenance	
		total	3,448,524.00
8620.2119000	240	Operation Service Center: Data Base Administration Center	
		total	941,155.00
8620.2120000	241	Operation Service Center: Service Evaluation Center	
		total	220,743.00
8620.2121000	242	Operation Service Center: Message Investigation Center	
		total	2,686,486.00
8620.2700000	243	Network Administration - Data	
		total	5,582,616.00
8620.2701000	244	Network Administration - Switching	
		total	5,854,254.00
8620.2702000	245	Network Administration - Trunks	
		total	1,235,376.00
8620.2703000	246	Network Administration - Transition	
		total	393,793.00
8620.2704000	247	Network Administration - Line, Number and Central Office	

ACCOUNT NO.	ID NO.	DESCRIPTION	
		total	3,696,972.00
8620.2705000	248	Network Administration - Translation	
		total	2,526,032.00
8620.2722000	249	Network Administration Support - Customer	
		total	20,414.00
8620.2760000	250	Network Administration Support - General Administration	
		total	2,684,147.00
8620.2761000	251	Network Administration Support - Supervisory	
		total	4,375,835.00
8620.2762000	252	Network Administration Support - Education and Training	
		total	190,481.00
8620.2900000	253	Operation Service Center: Force Management Center	
		total	2,378,427.00
8620.2902000	254	Operation Service Center: Facilities Administration	
		total	1,404,720.00
8640.1000000	255	General Commercial Administration Expense for Business	
		total	26,540,644.00
8640.2000000	256	General Commercial Administration Expense for Residence	
		total	22,387,617.00
8640.3000000	257	General Commercial Administration Expense for Public Telephone	
		total	2,742,253.00
8640.4000000	258	Gen. Commercial Administration Expenses for Interexchange Customer Serv. Center	
		total	4,350,808.00
8640.5000000	259	All Other General Commercial Administration Expense	
		total	5,643,951.00
8642.1000000	260	Advertising Expense for Corporate	
		total	3,797,445.00

ACCOUNT NO.	ID NO.	DESCRIPTION	
8642.2000000	261	Advertising Expense for Informational Purposes total	9,875,122.00
8642.3100000	262	Advertising Expenses for Sales: Business Customers total	4,482,181.00
8642.3200000	263	Advertising Expenses for Sales: Residential Customers total	4,192,602.00
8642.3300000	264	Advertising Expenses for Sales: Public Telephone total	398,457.00
8642.4100000	265	Advertising Expense for Long Distance: Business Customers total	337,574.00
8642.4200000	266	Advertising Expense for Long Distance: Residential Customers total	10,942.00
8642.4300000	267	Advertising Expense for Long Distance: Public Telephone total	104,368.00
8642.5000000	268	Other Advertising Expense for Long Distance total	593,535.00
8643.1000000	269	Sales Expense for Business Customers MTS and Private Line Combined total	13,113,960.00
8643.2000000	270	Sales Expense for Residential Customers total	35,223.00
8643.3000000	271	Sales Expense for Public Telephone Service total	1,512,901.00
8643.5000000	272	Sales Expense -- Other total	2,542,734.00
8649.2000000	273	Directory Expense for Alphabetical and Street Address Directory - All Category total	31,800,795.00
8649.3200000	274	Directory Expense for Delivery of Alphabetical Directories	

ACCOUNT NO.	ID NO.	DESCRIPTION	
		total	4,709,625.00
8649.4100000	275	All Other Directory Expenses: Mechanization of Directory Operations	
		total	1,104,269.00
8649.4200000	276	Address Telephone Directories, Special Number Services, & Foreign Directories	
		total	7,989,367.00
8649.4300000	277	Other Directory Expenses: Admin. or Supportive Personnel in Dir. Operations	
		total	6,198,875.00
8662.0110000	278	Customer Accounting Department Expenses: Toll Message Operations	
		total	12,535,859.00
8662.0120000	279	Customer Accounting Department Expenses: Local Message Operations	
		total	2,938,474.00
8662.0130000	280	Customer Accounting Department Expenses: Service and Equipment Operations	
		total	7,264,273.00
8662.0140000	281	Customer Accounting Department Expenses: Remittance Operations	
		total	7,732,650.00
8662.0150000	282	Customer Accounting Department Expenses: Accounts Operations	
		total	11,634,342.00
8662.0160000	283	Customer Accounting Department Expenses: Customer Output	
		silpl	833,583.00
		slpl	1,172,307.00
		total	43,035,180.00
8662.0170000	284	Customer Accounting Department Expenses: Access Charges Operations	
		total	10,813,324.00
8662.0180000	285	Customer Accounting Operations - Executive	
		total	3,218,807.00
8662.0210000	286	Corporate Accounting Operations: Payroll Operations	
		total	7,439,508.00

ACCOUNT NO.	ID NO.	DESCRIPTION	
8662.0220000	287	Corporate Accounting Operations: Investment and Cost Operations total	12,325,857.00
8662.0230000	288	Corporate Accounting Operations: Accounts Payable Operations total	4,257,819.00
8662.0240000	289	Corporate Accounting Operations: Corporate Reports Operations total	3,387,347.00
8662.0250000	290	Corporate Functional Accounting System Processing Operations total	11,519.00
8662.0300000	291	General Accounting total	9,312,526.00
8671.1010000	292	Operating Rents: Manual Switching Equipment Space total	8,434.00
8671.1020000	293	Operating Rents: Dial Switching Equipment Space total	12,655.00
8671.1030000	294	Operating Rents: Circuit Equipment Space total	518,833.00
8671.1040000	295	Operating Rents: Operators' Quarters total	2,814.00
8671.1050000	296	Operating Rents: Genral Traffic Supervision Space total	53,781.00
8671.1060000	297	Operating Rents: Commercial Office Space total	1,209,910.00
8671.1070000	298	Operating Rents: Revenue Accounting Space total	138,496.00
8671.1080000	299	Operating Rents: Garages, Storerooms, Warehouses, and Pole Yards total	23,903.00
8671.1100000	300	Operating Rents: General Office Space total	1,546,307.00

ACCOUNT NO.	ID NO.	DESCRIPTION	
8671.2000000	301	Operating Rents: Outside Plant Rents	
		total	2,817,976.00
8671.3000000	302	Operating Rents: Circuit Rents	
		total	418,050.00
8671.4000000	303	Operating Rents: Equipment Rents	
		total	5,817.00
8671.5100000	304	Operating Rents: Switching Equipment	
		total	6,378,670.00
8671.5200000	305	Operating Rents: Cable Transmission Facilities and Structures	
		total	701,876.00
8671.5300000	306	Operating Rents: Central Office Circuit and Radio Transmission Equipment	
		total	7,195,318.00
8671.5400000	307	Operating Rents: Operator Services	
		total	26,825,735.00
8671.5500000	308	Operating Rents: Land and Buildings	
		total	1,695,091.00
8671.5600000	309	Operating Rents: Operations Center and Support Systems	
		total	459,091.00
8671.5700000	310	Operating Rents: Power and Distributing Frames	
		total	887,275.00
8671.6000000	311	Operating Rents: Antitrust and Other Rents	
		total	1,526,052.00
8671.9000000	312	Operating Rents -- Intra-Company	
		total	40,509,489.00
9221.0000000	313	24-Hour Usage for the Switched Network	
		swbus	4,056.15
		swctx	524.30
		swda	36.86
		swfga	118.14
		swfgb	211.33
		swlocal	11,247.39
		swnet	13,718.53
		swop	194.80
		swres	6,640.96

ACCOUNT NO.	ID NO.	DESCRIPTION	
		swsil	1,114.52
		swsilo	425.80
		swsilt	688.72
		swsl	832.35
		swslo	349.77
		swslt	482.58
		swstol	1,946.87
		swtoll	2,276.33
		swtsps	157.94
9221.2200000	315	Usage of Short Haul Tandems: Local and Intrastate IntraLATA Tandems	
		swbus	221,311,364.67
		swctx	36,392,415.81
		swda	0.00
		swfga	3,907,640.04
		swfgb	0.00
		swlocal	372,022,173.96
		swnet	396,380,512.00
		swop	0.00
		swres	111,577,758.63
		swsil	0.00
		swsilo	0.00
		swsilt	0.00
		swsl	20,450,698.00
		swslo	7,476,558.00
		swslt	12,974,140.00
		swstol	20,450,698.00
		swtoll	24,358,338.04
		swtsps	0.00
9221.2500000	316	Usage of Local Dial Switches for Tandem Switching of Intrastate InterLATA Usage	
		swbus	0.00
		swctx	0.00
		swda	0.00
		swfga	0.00
		swfgb	0.00
		swlocal	0.00
		swnet	105,009,437.00
		swop	0.00
		swres	0.00
		swsil	105,009,437.00
		swsilo	33,786,790.00
		swsilt	71,222,647.00
		swsl	0.00
		swslo	0.00
		swslt	0.00
		swstol	105,009,437.00
		swtoll	105,009,437.00
		swtsps	0.00

ACCOUNT NO.	ID NO.	DESCRIPTION	
9221.3000000	317	Usage to Long Haul Tandems Function for Local Dial Switches: IS and SIL and SL	
		swbus	0.00
		swctx	0.00
		swda	0.00
		swfga	0.00
		swfgb	0.00
		swlocal	0.00
		swnet	105,009,437.00
		swop	0.00
		swres	0.00
		swsil	105,009,437.00
		swsilo	33,786,790.00
		swsilt	71,222,647.00
		swsl	0.00
		swslo	0.00
		swslt	0.00
		swstol	105,009,437.00
		swtoll	105,009,437.00
		swtsps	0.00
9221.3022000	318	Usage of Intrastate IntraLATA Toll by Originating and Terminating for SWNET	
		swsl	60.59
		swslo	24.42
		swslt	36.17
9221.4210000	319	Usage of AMA Equipment for All Services That are Measured	
		mts	33,417,288.00
		state	33,417,288.00
		swbus	320,183.00
		swda	1,845,774.00
		swfgb	1,520,281.00
		swlocal	1,414,698.00
		swnet	33,417,288.00
		swop	1,845,774.00
		swres	1,094,515.00
		swsil	15,542,736.00
		swsilo	3,171,348.00
		swsilt	12,371,388.00
		swsl	13,093,799.00
		swslo	5,277,283.00
		swslt	7,816,516.00
		swstol	28,636,535.00
		swtoll	30,156,816.00
		total	33,417,288.00
9221.6222000	321	Usage of the Traffic Sensitive Portion of no. 5 Crossbar Switches	
		swbus	2,567,671.96
		swctx	565,702.37

ACCOUNT NO.	ID NO.	DESCRIPTION	
		swda	8,083.23
		swfga	139,311.12
		swfgb	80,294.08
		swlocal	15,812,653.00
		swnet	20,165,435.50
		swop	2,129,378.24
		swres	12,679,278.67
		swsil	921,595.31
		swsl	673,875.68
		swstol	1,595,470.99
		swtoll	2,223,404.27
		swtsps	2,121,295.00
		swwats	408,328.07
9221.6223000	322	Loop Count for no. 5 Crossbar Switches	
		nts	256,039.00
		ntsbus	41,407.00
		ntscoin	4,831.00
		ntsctx	4,741.00
		ntsfga	299.00
		ntsfx	893.00
		ntsmob	227.00
		ntsoff	1,772.00
		ntsres	200,579.00
		ntswats	1,290.00
9221.6224000	323	Usage of no. 5 Crossbar Switches by Residential Customers	
		ntsres	16.41
		rda	0.00
		resfga	0.27
		resfgb	0.10
		resloc	11.33
		ress	3.00
		rsil	2.33
		rsl	0.67
		rtsps	0.98
		rwats	0.73
9221.6225000	324	Usage of no. 5 Crossbar Switches by Business Customers	
		bda	0.00
		bsil	4.25
		bsl	1.24
		btsps	1.63
		busfga	0.96
		busfgb	0.24
		busloc	12.32
		buss	5.49
		bwats	2.73
		ntsbus	23.37

ACCOUNT NO.	ID NO.	DESCRIPTION	
9221.6226000	325	Usage of no. 5 Crossbar Switches by CENTREX Customers	
		cda	0.00
		csil	2.51
		csl	11.11
		ctsps	24.68
		ctxfga	1.06
		ctxfgb	5.83
		ctxloc	21.60
		ctxs	13.62
		cwats	6.44
		ntsctx	73.23
9221.6322000	326	Usage of Step-by-step Swtiches Over 5000	
		swbus	6,104,687.26
		swctx	872,147.64
		swda	16,573.17
		swfga	297,419.28
		swfgb	148,874.11
		swlocal	38,079,619.47
		swnet	47,691,871.72
		swop	4,627,356.97
		swres	31,102,784.57
		swsil	2,216,777.70
		swsl	1,437,542.01
		swstol	3,654,319.71
		swtoll	4,984,895.28
		swtsps	4,610,783.80
		swwats	884,282.18
9221.6323000	327	Loop Counts for Step-by-Step Switches Over 5000	
		nts	643,145.00
		ntsbus	102,194.00
		ntscoin	11,869.00
		ntsctx	7,252.00
		ntsfga	286.00
		ntsfx	1,422.00
		ntsmob	722.00
		ntsoff	6,659.00
		ntsres	510,491.00
		ntswats	2,250.00
9221.6324000	328	Usage of Step-by-step Switches by Residential	
		ntsres	15.95
		rda	0.00
		resfga	0.26
		resfgb	0.08
		resloc	11.08
		ress	2.89

ACCOUNT NO.	ID NO.	DESCRIPTION	
		rsil	2.26
		rsl	0.63
		rtsps	0.96
		rwats	0.68
9221.6325000	329	Usage of Step-by-Step Switches by Business	
		bda	0.00
		bsil	3.89
		bsl	1.03
		btsps	1.73
		busfga	0.71
		busfgb	0.21
		busloc	11.42
		buss	4.92
		bwats	2.26
		ntsbus	21.25
9221.6326000	330	Usage of Step-by-Step Switches for CENTREX	
		cda	0.00
		csil	2.48
		csl	11.15
		ctsps	24.16
		ctxfga	1.04
		ctxfgb	5.66
		ctxloc	21.44
		ctxs	13.63
		cwats	6.40
		ntsctx	72.33
9221.6430000	331	Loop Counts for ESS Analog Switches	
		nts	4,590,964.00
		ntsbus	951,966.00
		ntscoin	86,078.00
		ntsctx	369,800.00
		ntsfga	19,880.00
		ntsfx	8,197.00
		ntsmob	4,380.00
		ntsoff	98,776.00
		ntsres	2,992,557.00
		ntswats	59,330.00
9221.6440000	332	Usage of ESS Analog Switches by Residential	
		ntsres	16.44
		rda	0.00
		resfga	0.26
		resfgb	0.16
		resloc	11.29
		ress	2.99
		rsil	2.20

ACCOUNT NO.	ID NO.	DESCRIPTION	
		rsl	0.79
		rtsps	0.93
		rwats	0.81
9221.6450000	333	Usage of ESS Analog Switches for Business	
		bda	0.00
		bsil	3.61
		bsl	2.30
		btsps	1.25
		busfga	1.12
		busfgb	0.32
		busloc	13.48
		buss	5.91
		bwats	3.55
		ntsbus	25.63
9221.6460000	334	Usage of ESS Analog Switches by CENTREX	
		cda	0.00
		csil	1.42
		csl	8.79
		ctsps	9.76
		ctxfga	0.40
		ctxfgb	1.19
		ctxloc	13.16
		ctxs	10.21
		cwats	4.34
		ntsctx	39.06
9221.6520000	335	Usage of ESS Analog Switches Over 2500	
		swbus	63,129,115.83
		swctx	24,568,578.82
		swda	160,900.21
		swfga	2,801,499.67
		swfgb	1,666,676.62
		swlocal	277,959,593.18
		swnet	368,512,141.67
		swop	39,963,626.24
		swres	190,261,898.53
		swsil	14,813,085.53
		swsl	21,091,673.12
		swstol	35,904,758.65
		swtoll	50,588,922.25
		swtsps	39,802,726.03
		swwats	10,215,987.31
9221.6620000	336	Usage of Ditital Switches	
		swbus	6,217,185.47
		swctx	1,792,580.98
		swda	19,744.69
		swfga	329,890.19

ACCOUNT NO.	ID NO.	DESCRIPTION	
		swfgb	189,688.93
		swlocal	35,979,261.89
		swnet	46,166,880.26
		swop	4,672,550.92
		swres	27,969,495.44
		swsil	1,993,034.63
		swsl	1,948,010.26
		swstol	3,941,044.88
		swtoll	5,515,067.45
		swtsps	4,652,806.23
		swwats	1,054,443.44
9221.6630000	337	Loop Count for Digital Switches	
		nts	570,065.00
		ntsbus	96,394.00
		ntscoin	9,833.00
		ntsctx	17,745.00
		ntsfga	433.00
		ntsfx	1,216.00
		ntsmob	19.00
		ntsoff	1,732.00
		ntsres	439,325.00
		ntswats	3,368.00
9221.6640000	338	Usage of Digital ESS Switches for Residential	
		ntsres	16.48
		rda	0.00
		resfga	0.27
		resfgb	0.13
		resloc	11.33
		ress	3.01
		rsil	2.28
		rsl	0.73
		rtsps	0.96
		rwats	0.78
9221.6650000	339	Usage of Digital ESS Switches by Busines	
		bda	0.00
		bsil	3.96
		bsl	1.77
		btsps	1.41
		busfga	1.07
		busfgb	0.29
		busloc	13.02
		buss	5.73
		bwats	3.20
		ntsbus	24.72
9221.6660000	340	Usage of Digital Switches by CENTREX	
		cda	0.00
		csil	1.97

ACCOUNT NO.	ID NO.	DESCRIPTION	
		csl	11.30
		ctsps	15.46
		ctxfga	0.71
		ctxfgb	2.84
		ctxloc	18.40
		ctxs	13.27
		cwats	5.61
		ntsctx	56.29
9221.7500000	341	Switched Network Usage by Customers in Cost Category 7E of Account 221 Centrex	
		swbus	0.00
		swctx	376.29
		swda	0.84
		swfga	2.30
		swlocal	376.29
		swnet	444.41
		swop	3.04
		swres	0.00
		swsil	51.85
		swsilo	9.90
		swsilt	41.95
		swsl	10.93
		swslo	6.37
		swslt	4.56
		swstol	62.78
		swtoll	65.08
		swtsps	2.20
9221.8113252	342	Usage of Intrastate InterLATA Toll Serv. Originating and Terminating Use	
		swsil	213.35
		swsilo	43.53
		swsilt	169.81
9240.1131011	343	Loop Counts by Customer Class for Allocating NTS Costs	
		nts	6,237,347.00
		ntsbus	1,224,671.00
		ntscoin	115,940.00
		ntsctx	404,911.00
		ntsfga	21,410.00
		ntsfx	12,644.00
		ntsmob	5,348.00
		ntsoff	110,510.00
		ntsres	4,274,152.00
		ntswats	67,761.00
9240.1131012	344	Usage of Residential Subscriber Loops	
		ntsres	16.39
		rda	0.00
		resfga	0.26

ACCOUNT NO.	ID NO.	DESCRIPTION	
		resfgb	0.15
		resloc	11.27
		ress	2.98
		rsil	2.22
		rsl	0.76
		rtsps	0.94
		rwats	0.79
9240.1131013	345	Usage of Business Subscriber Loops	
		bda	0.00
		bsil	3.69
		bsl	2.11
		btsps	1.32
		busfga	1.07
		busfgb	0.30
		busloc	13.21
		buss	5.80
		bwats	3.38
		ntsbus	25.08
9240.1131014	346	Usage of CENTREX Subscriber Loops	
		cda	0.00
		csil	1.48
		csl	8.99
		ctsps	10.52
		ctxfga	0.44
		ctxfgb	1.42
		ctxloc	13.69
		ctxs	10.47
		cwats	4.47
		ntsctx	41.01
9240.1131100	347	Subscriber Loop Counts for Allocating Certain Investment or Expense to swlocal	
		swbus	1,451,121.00
		swctx	4,274,152.00
		swfga	21,410.00
		swlocal	6,203,293.00
		swmobile	5,348.00
		swnet	6,224,703.00
		swres	472,672.00
		swtoll	21,410.00
9240.1132120	348	Usage of Trunk Capacity Cost Categories KCT-1, KCT-2A, All Interswitch Usage	
		swbus	201,613,476.23
		swctx	48,730,763.97
		swda	1,628,857.00
		swfga	9,831,643.30
		swfgb	13,889,505.00
		swlocal	936,009,783.70
		swnet	1,154,375,427.00

ACCOUNT NO.	ID NO.	DESCRIPTION	
		swop	15,760,801.00
		swres	686,399,987.27
		swsil	112,537,921.00
		swsilo	46,068,085.00
		swsilt	66,469,836.00
		swsl	66,345,773.00
		swslo	28,980,011.00
		swslt	37,365,762.00
		swstol	178,883,694.00
		swtoll	202,604,842.30
		swtsps	14,131,944.00
9240.7050000	349	Interoffice Usage of Interstate and Intrastate MTS	
		swsil	213.35
		swsilo	43.53
		swsilt	169.81
		swsl	60.59
		swslo	24.42
		swslt	36.17
		swstol	273.94
9240.8000000	350	Usage of Host/Remote Facilities for Intrastate and Interstate Usage	
		swbus	0.00
		swctx	0.00
		swda	977.00
		swfga	0.00
		swfgb	0.00
		swlocal	0.00
		swnet	113,335.00
		swop	9,268.00
		swres	0.00
		swsil	66,511.00
		swsilo	33,515.00
		swsilt	32,996.00
		swsl	37,556.00
		swslo	18,004.00
		swslt	19,552.00
		swstol	104,067.00
		swtoll	104,067.00
		swtsps	8,291.00
9261.3110000	351	Use of Switched Network for Measured Customers	
		swbus	3,703.00
		swctx	192,009.00
		swlocal	222,477.00
		swres	26,765.00
9662.0120000	352	Use by Measured Rate Customers	
		nts	222,477.00

ACCOUNT NO.	ID NO.	DESCRIPTION	
		ntsbus	3,703.00
		ntsctx	192,009.00
		ntsres	26,765.00
9800.0000000	353	Big 4 Wage Allocator Data	
		interstate	0.21
		mts	0.75
		silpl	0.02
		slpl	0.02
		spl	0.04
		state	0.79
		swlocal	0.56
		swnet	0.75
		swsil	0.11
		swsl	0.08
		swstol	0.19
		swtoll	0.19
		total	1.00
9801.0000000	354	Inward Migration of Customers	
		nts	192,022.00
		ntsbus	51,475.00
		ntscoin	3,704.00
		ntsctx	30,290.00
		ntsfga	2,440.00
		ntsfx	430.00
		ntsmob	142.00
		ntsoff	6,641.00
		ntsres	92,517.00
		ntswats	4,383.00

No. of Accounts 351

APPENDIX F

List of Formulas for Basic Cost Allocation Model

Formulas

There are 217 formulas specified in the ICAS model for each of the eight scenarios. These consist of a formula name, description of function, and equation. Formulas use information in accounts, other formulas, and/or numbers directly entered into the formula to compute a ratio, number, or allocation factor used in the allocation procedures. The formula name is usually tied to the function it performs. The formula description briefly states the formula's purpose. The equation is written in a language developed specifically for ICAS, but is not unlike the formula languages found in many spreadsheet programs. Describing this formula language goes beyond the purpose of this appendix, however. The formulas are used by name in the allocation procedures to perform specific allocations. The final report that ICAS creates gives the values of the formulas for each category for which the formula was computed.

FORMULA NAME	ID NO.	DESCRIPTION/EQUATION
212.01#	355	Allocation of Land and Building for Operating Room and COE -- ACT 212 cat 01 #212.01/state212.01
212.01tot#	356	Allocation of Operating Room and COE Space with Total as Basis #212.01/total212.01
212.02tot#	357	Allocation of Operator's Quarters with Total as Basis #212.02/total212.02
212.03tot#	358	Allocation of General Traffic Supervisio Space with Total as Basis #212.03/total212.03
212.04tot#	359	Allocation of Commercial Office Space with Total as Basis #212.04/total212.04
212.06tot#	360	Allocation of Revenue Accounting Space with Total as Basis #212.06/total212.06
212.07tot#	361	Allocation of Garages, Storerooms, Wareh ouses, and Pole Yards with Total as Basi #212.07/total212.07
212.09tot#	362	Allocation of General Office Space with Total as Basis #212.09/total212.09
221.116#	363	Allocation of DA Boards #221.116/total221.116
221.117#	364	Allocation of Intercept Boards with Total as Basis #221.117/total221.117
240.221.8#	365	Summation of Outside Plant and Associated Circuit Equipment act240# + act221.8#
261.3tot#	366	Allocation of Computers and AMA Equip. with Total as Basis #261.3/total261.3
264.123456#	367	Based on Allocation of Account 264 -- All Cost Categories Combined #264.123456/state264.123456
5xbbusloop#	368	Usage of 5 Crossbar Switches by

FORMULA NAME	ID NO.	DESCRIPTION/EQUATION
		Business: See Account 9221.6225 #9221.6225/ntsbus9221.6225
5xbctxloop#	369	Usage of 5 Crossbar Switches for CENTREX Customers: See Account 9221.6226 #9221.6226/ntsctx9221.6226
5xbloopcnt#	370	Loop Count for 5 Crossbar Switches See Account 9221.6223 #9221.6223/nts9221.6223
5xbnts#	371	NTS Factor of 5 Crossbar Switches .25
5xbpwu#	372	Usage of # Crossbar Switches See Account 9221.6222 #9221.6222/swnet9221.6222
5xbresloop#	373	Usage of 5 Crossbar Switches for Residential: See Account 9221.6224 #9221.6224/ntsres9221.6224
632.635.sum#	374	Summation of Public, Other, and Joint Traffic Expenses with Total as Basis sum<#632,#635.9999>
643.649.sum#	375	Summation of Commercial Expenses exclude Accounts 643 to 649 sum<#643,#649.999>
645.4bus#	376	work Number for Allocation Factor for Account 645.4: Business Loop Usage busloc9240.1131013+bda9240.1131013+btsps 9240.1131013+bs19240.1131013
645.4ctx#	377	Work Number for Allocation Factor for Account 645.4: CENTREX Loop Usage ctxloc9240.1131014+cda9240.1131014+ctsps 9240.1131014+cs19240.1131014
645.4res#	378	Work Number for Allocation Factor for Account 645.4: Residential Loop Usage resloc9240.1131012+rda9240.1131012+rtsps 9240.1131012+rs19240.1131012
645.sum#	379	Summation of the Allocation of Account 645, Local Commercial Operations sum<#645,#645.9999>
645tot#	380	Allocation of Local Commericial Operations with Total as Basis 645.sum#/645.sum:total

FORMULA NAME	ID NO.	DESCRIPTION/EQUATION
8171.12#	381	Allocation of Account 212 with Total as the Basis sum<#212.01,#212.1>/sum<total212.01,tota l212.1>
8171.21#	382	Allocation of COE with Total as Basis sum<#221.1141,#221.8119>/sum<total221.11 41,total221.8119>
8171.31#	383	Allocation of Station Apparatus with Total as Basis #231/total231
8171.32#	384	Allocation of Station Connections with Total as Basis sum<#232.1,#232.4>/sum<total232.1,total2 32.4>
8171.43#	385	Allocation of Large Private Branch Exch. with Total as Basis #234/total234
8171.61#	386	Allocation of Furniture and Equipment with Total as Basis sum<#261.1,#261.5>/sum<total261.1,total2 61.5>
8171.62#	387	Allocation of Other Communications Equip with Total as Basis #262/total262
8261.309#	388	Allocation of COE less DA Boards with Total as Basis (coetot#-#221.116)/(coetot:total-total22 1.116)
8261.311#	389	Factor for Allocating Switched Network Local Usage by Measured Use #9261.311/swlocal9261.311
8620.1206#	390	Combined Allocation of FSUB 1206 of Traffic Expenses -- Operation Service Ce sum<#8620.2108,#8620.2117>/sum<total8620 .2108,total8620.2117>
8620.1208#	391	Allocation for Operation Service Centers with Total as Basis (#8620.1207+632.635.sum#)/(total8620.120 7+632.635.sum:total)
8620.2113#	392	Allocation of Operation Service Centers

FORMULA NAME	ID NO.	DESCRIPTION/EQUATION
		With Total as Basis sum<#8620.2108,#8620.2117>/sum<total8620.2108,total8620.2117>
8620.2121#	393	Allocation of Toll Revenues Accounts 510 Through 516 sum<#510,#516>/sum<total510,total516>
8620.2702#	394	Allocation of Outside Plant and Coe less Subscriber Loop and Associated Circuit (osptot#+coetot#-kcs8kcs.sum#)/(osptot:total+coetot:total-kcs8kcs.sum:total)
8620.2704#	395	Allocation of Subscriber Loop and Assoc. Circuit Equip. with Total as Basis kcs8kcs.sum#/kcs8kcs.sum:total
8620.2722#	396	Allocation of Switching, Trunks, and Transition with Total as Basis 8620.272sum#/8620.272sum:total
8620.272sum#	397	Summation of Network Adminstration Exp. Switching, Trunks, and Transition #8620.2701+#8620.2702+#8620.2704
8620.276#	398	Allocation of Network Administration with Total as Basis sum<#8620.27,#8620.2722>/sum<total8620.27,total8620.2722>
8642.sum#	399	Summation of the Allocation of Account 8642, Detail of Advertising Expense sum<#8642,#8642.9999>
8642.toll#	400	Allocation Basis for Long Distance Toll Advertising 8642.sum#-8642.sum:swlocal-8642.sum:resloc-8642.sum:busloc-8642.sumctxloc
8643.sum#	401	Summation of the Allocation of Account 8643, Detail of Sales Expense sum<#8643,#8643.3>
8671.56#	402	Allocation of COE and Computers and AMA with Total as Basis (coetot#+#261.3)/(coetot:total+total261.3)
8kcs.sum#	403	Summation of Circuit Equipment Cost Categories sum<#221.8113101,#221.8113114>

FORMULA NAME	ID NO.	DESCRIPTION/EQUATION
act221.8#	404	Summation of the Allocation for Circuit Equipment sum<#221.8,#221.8999>
act231#	405	Based on Allocation of Accout 231 for MTS Service Category #231/mts231
act235#	406	Allocation of Account 235 Relative to State Category #235/state235
act240#	407	Summation of the Allocation for Outside Plant: The 240 Series of Accounts sum<#240,#240.9999>
act262#	408	Summation of the Allocation of Other Communication Equipment Account 262 sum<#262,#262.9999>
act264#	409	Summation of the Allocation of Account 264.123456 and 264.08 sum<#264.08,#264.123456>
act300#	410	Allocation Factor for Deferred Income Taxes -- Accounts 306 through 307 sum<#306,#307.9999>/sum<mts306, mts307.9999>
act640#	411	Summation of Account 640 Categories sum<#640,#640.9999>
act643.645#	412	Summation of 643, 644, and 645 for All Cost Categories sum<#643,#645.9999>
act645#	413	Allocation of Local Commericial Operatn Expenses -- Account 645 sum<#645.1,#645.499>/sum<state645.1, state645.499>
act650#	414	Allocation of All Commercial Expenses Except Account 642 (#640+643.649.sum#)/(state640+ 643.649.sum:state)
act8261#	415	Based on Allocation of Account 8261 Which Has Detailed Cost Categories 261 sum<#8261.3,#8261.39>/sum<mts8261.3, mts8261.39>
act8620#	416	Allocation of Traffic Expenses

FORMULA NAME	ID NO.	DESCRIPTION/EQUATION
		sum<#8620,#8620.9999>/sum<state8620, state8620.9999>
act8640#	417	Allocation of General Commercial Admin. Account 640 sum<#8640.1,#8640.5>/sum<state8640.1, state8640.5>
act8640tot#	418	Allocation of General Commercial Expense Detail Accounts with Total as Basis sum<#8640.1,#8640.4>/sum<total8640.1,total8640.4>
act8642#	419	Allocation of Advertising Expenses -- Account 642 sum<#8642.1,#8642.5>/sum<state8632.1, state8642.5>
act8642.tol#	420	Allocation Factor for Long Distance Advertising Account 8642.5 8642.toll#/8642.toll:total
act8642tot#	421	Allocation of Advertising Expense Detail Accounts with Total as Basis 8642.sum#/8642.sum:total
act8643#	422	Allocation of Sales Expenses -- Account 643 sum<#8643.1,#8643.3>/sum<state8643.1, state8643.3>
act8643tot#	423	Allocation of Sales Expense Detail with Total as Basis 8643.sum#/8643.sum:total
act8649#	424	Allocation of Directory Expenses -- Account 649 sum<#8649,#8649.999>/sum<state8649, state8649.999>
act8662#	425	Allocation of Accounting Department Exp. Account 662 sum<#8662,#8662.99>/sum<state8662, state8662.99>
act8662.018#	426	Allocation of Customer Accounting Oper. with Total as Basis sum<#8662.01,#8662.01799>/sum<total8662.01,total8662.01799>
act8662.02#	427	Allocation of Corporate Accounting Detail with Total as Basis

FORMULA NAME	ID NO.	DESCRIPTION/EQUATION
		sum<#8662.01,#8662.02499>/sum<total8662. 01,total8662.02499>
act8671#	428	Allocation of Operating Rents -- Account 671 sum<#8671,#8671.999>/sum<mts8671, mts8671.999>
amause#	429	Usage of AMA Equipment for All Services That are Measured #9221.421/swnet9221.421
amausetot#	430	Usage of AMA equipment for All Services That are Measured: Total as Basis #9221.421/total9221.421
bldg#	431	Allocation Factor According To The Allocation of Accounts 211 and 212 sum<#212,#212.9999>/sum<mts212,mts212.99 99>
bldgtot#	432	Allocation of Land and Buildings with Total as Basis sum<#212,#212.9999>/sum<total212,total21 2.9999>
busbill	433	Revenue Requirement for Business per Access Line per Business (revreq:busloc+revreq:swbus)/ntsbus9240. 1131011
busloop#	434	Usage of Business Subscriber Loops -- #9240.1131013/ntsbus9240.1131013
busloop.ix#	435	Allocation of Business Subscriber Loops for InterLATA Usage #9240.1131013/(ntsbus9240.1131013-645.4b us:ntsbus)
buslooptoll#	436	Allocation Factor for Usage of Business Loops for Toll Purposes #9240.1131013/bustoll:ntsbus
bussil.line	437	Revenue Requirement for Business Intrastate InterLATA Toll / Access Line revreq:bsil/ntsbus9240.1131011
bussilo.line	438	Revenue Requirement for Business ORIG Intrastate IntraLATA Toll / Access Line revreq:bsilo/ntsbus9240.1131011
bussilt.use	439	Revenue Requirement for Business TERM

FORMULA NAME	ID NO.	DESCRIPTION/EQUATION
		Intrastate InterLATA Toll / CCS revreq:bsilt/(ntsbus9240.1131011*36.59)
bussl.line	440	Revenue Requirement for Business Intrastate IntraLATA Toll / Access Line revreq:bsl/ntsbus9240.1131011
busslo.line	441	Revenue Requirement for Business ORIG Intrastate IntraLATA Toll / Access Line revreq:bslo/ntsbus9240.1131011
busslt.use	442	Revenue Requirement for Business TERM Intrastate IntraLATA Toll / CCS revreq:bslt/(ntsbus9240.1131011*7.38)
bustoll#	443	Usage of Business Loops for IntraLATA and InterLATA Purposes ntsbus9240.1131013-busloc9240.1131013-bu sfga9240.1131013-busfgb9240.1131013
circuit#	444	Allocation of Circuit Equipment with TOTAL as Basis act221.8#/act221.8:total
circuittot#	445	Allocation of Circuit Equip. with Total as Basis act221.8#/act221.8:total
coelds#	446	Summation of Local Dial Switching Investment sum<#221.6000,#221.6999>
coeldstot#	447	Allocation of Local Dial Switching Equip with Total as Basis coelds#/coelds:total
coemts#	448	Allocation Factor for Same As Central Office Equipment for MTS sum<#221,#221.89999>/sum<mts221, mts221.89999>
coenocrt#	449	Allocation of COE without Circuit Equip with Total as Basis sum<#221.2,#221.7999>/sum<total221.2,tot al221.7999>
coest#	450	Allocation of Central Office Equipment Relative to the State Category sum<#221,#221.8999>/sum<state221, state221.8999>
coetolltot#	451	Allocation of Toll Switching Equip. with

FORMULA NAME	ID NO.	DESCRIPTION/EQUATION
		Total as Basis sum<#221.21,#221.301>/sum<total221.21,to tal221.301>
coetot#	452	Allocation of Central Office Equip. 221 with Total as Basis sum<#221,#221.9999>/sum<total221,total22 1.9999>
commercbus#	453	Total of Commercial Expenses EXCLUDING Business Allocation: Basis Total commerctot#-8642.sum:ntsbus-8643.sum:nts bus-645.sum:ntsbus
commercctx#	454	Total of Commercial Expenses EXCLUDING Business and CENTREX Allocations commercbus#-8642.sum:ntsctx-8643.sum:nts ctx-645.sum:ntsctx
commercial#	455	Allocation Factor for Commercial Expense Accounts 640, 643, 644, and 645 (act640# + act643.645#)/(act640:mts + act643.645:mts)
commercials#	456	Commercial Expenses for the Test Year June 1986 to May 1987: Summary sum<#640,#650>
commercres#	457	Total of Commercial Expenses EXCLUDING Residential Allocations: Basis Total commerctot#-8642.sum:ntsres-8643.sum:nts res-645.sum:ntsres
commerctot#	458	Total of Commercial Expenses with Total as Basis 8642.sum:total+8643.sum:total+645.sum:to tal
commxbus#	459	Allocation of Commercial Expenses Exclud Business Customers: Basis Total commercctx#/commercctx:ntsres
commxres#	460	Allocation of Commercial Expenses Exclud Residential Customers: Basis Total commercres#/(commercres:ntsbus+commercre s:ntsctx)
ctx221.75#	461	Allocates Switched Network Usage by Centrex to Service Categories #9221.75/swnet9221.75
ctxbill	462	Revenue Requirement for Centrex per

FORMULA NAME	ID NO.	DESCRIPTION/EQUATION
		Access Line for Centrex (revreq:ctxloc+revreq:swctx)/ntsctx9240.1131011
ctxloop#	463	Usage of Centrex Subscriber Loops -- #9240.1131014/ntsctx9240.1131014
ctxloop.ix#	464	Allocation of CENTREX Subscriber Loops for InterLATA Usage #9240.1131014/(ntsctx9240.1131014-645.4ctx:ntsctx)
ctxlooptoll#	465	Allocation of CENTREX Loops for IntraLATA and InterLATA Usage #9240.1131014/ctxtoll:ntsctx
ctxsil.line	466	Revenue Requirement for Centrex Intrastate IntraLATA Toll / Access Line revreq:csil/ntsctx9240.1131011
ctxsilo.line	467	Revenue Requirement for Centrex ORIG Intrastate IntraLATA Toll / Access Line revreq:csilo/ntsctx9240.1131011
ctxsilt.use	468	Revenue Requirement for Centrex TERM Intrastate IntraLATA Toll / CCS revreq:csilt/(ntsctx9240.1131011*7.82)
ctxsl.line	469	Revenue Requirement for Centrex Intrastate IntraLATA Toll / Access Line revreq:csl/ntsctx9240.1131011
ctxslo.line	470	Revenue Requirement for Centrex ORIG Intrastate IntraLATA Toll / Access Line revreq:cslo/ntsctx9240.1131011
ctxslt.use	471	Revenue Requirement for Centrex TERM Intrastate IntraLATA Toll / CCS revreq:cslt/(ntsctx9240.1131011*.81)
ctxtoll#	472	Toll Usage of Bussiness Loops for Inter and IntraLATA Toll ntsctx9240.1131014-ctxloc9240.1131014-ctxfga9240.1131014-ctxfgb9240.1131014
dause#	473	Usage of Directory Assistance Facilites Account 9221.116 #9221.116/swda9221.116
dep#	474	Depreciation Reserve for Test Year June 1986 to May 1987 sum<#170,#179>

FORMULA NAME	ID NO.	DESCRIPTION/EQUATION
dep171#	475	Depreciation Reserve Reconciliation Account Formula sum<#8171.0,#8171.89999>/sum<mts8171, mts8171.89999>
depreciatn#	476	Depreciation Expense for the Test Year June 1986 to May 1987: Summary sum<#608,#609.99>
dgtbusloop#	477	Usage of Digital ESS Switches by Business: See Account 9221.665 #9221.665/ntsbus9221.665
dgtctxloop#	478	Usage of Digital ESS Switches by CENTREX: See Account 9221.666 #9221.666/ntsctx9221.666
dgtlloopcnt#	479	Loop Count for Digital Switches See Account 9221.663 #9221.663/nts9221.663
dgtlnts#	480	NTS Factor for Digital ESS Switches 0.0
dgtlpwu#	481	Usage of Digital Switches See Account 9221.662 #9221.662/swnet9221.662
dgtresloop#	482	Usage of Digital ESS Switches for Residential: See 9221.664 #9221.664/ntsres9221.664
essbusloop#	483	Usage of ESS Analog Switches for Business: See Account 9221.645 #9221.645/ntsbus9221.645
essctxloop#	484	Usage of ESS Analog Switches by CENTREX: See Account 9221.646 #9221.646/ntsctx9221.646
essfactloc#	485	Usage of ESS Local Dial Switches for Local Tandem Purposes sum<#221.64,#221.66>/sum<swlocal221.64, swlocal221.66>
essfactsil#	486	Usage of Local Dial Switches for Tandem Switching of Intrastate InterLATA Usage #9221.25/swsil9221.25
essloopcnt#	487	Loop Counts for ESS Analog Switches See Account 9221.643

FORMULA NAME	ID NO.	DESCRIPTION/EQUATION
		#9221.643/nts9221.643
essnts#	488	NTS Factor for ESS Analog Switches Over 2500 .25
esspwu#	489	Usage of ESS Analog Switches Over 2500 See Account 9221.652 #9221.652/swnet9221.652
essresloop#	490	Usage of ESS Analog Switches by Residential: See Account 9221.644 #9221.644/ntsres9221.644
expense#	491	Expenses for the Test Year: June 1986 to May 1987 sum<#600,#699>
fractrr#	492	Fraction of Revenue Requirement to Each Category with Total as Basis revreq#/revreq:total
fractrrst#	493	Fraction of the Revenue Requirement to Each Category with State as Basis revreq#/revreq:state
general#	494	General Office Expenses for Test Year June 1986 to May 1987: Summary sum<#661,#665>
goslexp#	495	Allocation of General Office and Sales Expenxes: Accounts 661 through 665 sum<#661,#665.9999>/sum<mts661,mts665.99 99>
host#	496	Usage of Host/Remote Facilities for Intrastate and Interstate Usage #9240.8/swnet9240.8
interoffice#	497	Allocation of InterOffice Outside Plant and Associated Circuit Equipment (240.221.8# - kcs8kcs.sum#)/(240.221.8:state - kcs8kcs.sum:state)
inward#	498	Inward Migration of Customers #9801/nts9801
inward.res#	499	Inward and Outward Migration of Business and Centrex Customers #9801/(nts9801-ntsres9801)
kcs#	500	Based on Allocation of All Subscriber

FORMULA NAME	ID NO.	DESCRIPTION/EQUATION
		Loop Capacity sum<#240.1131101,#240.113111>/ sum<nts240.1131101,nts240.113111>
kcs.sum#	501	Summation of Loop Costs for All of KCS sum<#240.113101,#240.113111>
kcs1#	502	Based on Allocation of the Subscriber Loop for MTS Service Category #240.113101/mts240.113101
kcs8kcs.sum#	503	Summation of KCS and 8KCS, Loop and Associated Circuit Equipment kcs.sum# + 8kcs.sum#
loop.nts#	504	Allocation of All Loop Costs Relative to the NTS Category kcs.sum#/kcs.sum:nts
loop.ntsctx#	505	Usage of Subscriber Loops EXCLUDING Centrex Customer's Loops kcs.sum#/(kcs.sum:nts-kcs.sum:ntsctx)
loop.tot#	506	Allocation of Subscriber Loop Investmt with Total as Basis kcs.sum#/kcs.sum:total
loopbus	507	Allocator for NTS Business Loops Relativ to Centrex and Business act 8640.1 ntsbus9240.1131011/(ntsbus9240.1131011+ ntsctx9240.1131011)
loopcnt#	508	Loop Counts by Customer Class for Allocating NTS Costs #9240.1131011/nts9240.1131011
loopcntres#	509	Loop Counts EXCLUDING Residential Customer's Loops #9240.1131011/(nts9240.1131011-ntsres924 0.1131011-ntscoin9240.1131011)
loopst#	510	Allocation of Loop Costs Relative to the State Category kcs.sum#/kcs.sum:state
looptot#	511	Allocation of Loop Investment with Total as Basis kcs.sum#/kcs.sum:total
measured#	512	Use by Measured Service Customers #9662.012/nts9662.012

FORMULA NAME	ID NO.	DESCRIPTION/EQUATION
nts.alloc#	513	Allocation of Loop Plant and Associated Circuit Equipment (#221.8113101 + #240.113101)/(nts221.8113101 + nts240.113101)
operatexp#	514	Allocation of Accounts 602.1 through 610 operating#/operating:state
operating#	515	Operating Expense for the Test Year June 1986 to May 1987: Summary sum<#602,#607.99>+sum<#610,#612>
opertr#	516	Land and Building for Operator Services Account 221 through 211.19999 sum<#221.1,#221.19999>/sum<mts221.1 ,mts221.19999>
origcost#	517	Original Cost of Plant Used and Useful Test Year June 1986 to May 1987 sum<#200,#299>
osp#	518	Allocation of Outside Plant, Accounts 240, 240.99 sum<#240,#240.99>/sum<state240,state240.99>
ospcrt#	519	Allocation of Outside Plant and Circuit Equipment Combined (act240# + act221.8#)/(act240:state + act221.8:state)
ospmts#	520	Allocation of Outside Plant, accounts 240,240.99 with mts as Basis sum<#240,#240.99>/sum<mts240,mts240.99>
osptot#	521	Allocation of Outside Plant with Total as Basis act240#/act240:total
other#	522	Other Expenses for the Test Year June 1986 to May 1987: Summary sum<#668,#677>
othrplt#	523	Allocation of Other Plant and Equipment Accounts 240 Series, 262, and 264 (act240# + act262# + act264#)/(act240:state + act262:state + act264:state)
percent	524	Allowed Rate of Return for Southwestern Bell During the Test Year .1203

FORMULA NAME	ID NO.	DESCRIPTION/EQUATION
plant#	525	Allocation of Total Plant Investment Account 100.1 Relative to Total #100.1/total100.1
plantmts#	526	Total Plant Investmetn for Accounts 211 Through 277 for Category mts and Below sum<#211,#277.9999>/sum<mts211,mts277.99 99>
plantst#	527	Total Plant Investment Accounts 211 through 277 for State Category & Below sum <#211,#277.9999>/sum<state211, state277.9999>
plcircuit#	528	Allocation of Circuit Equipment with Private Line for State Jurisdiction (act221.8#/act221.8:spl)+(act221.8#/act2 21.8:ispl)/(act221.8:spl+act221.8:ispl)
plt2#	529	Allocation of Plant Accounts EXCEPT 276 and 277 sum<#211,#275.99>/sum<state211,state275. 99>
ratebase#	530	Rate Base for the Test Year origcost#-dep#
repairs#	531	Allocation of Account 605.1 sum<#605.1,#605.1999>/sum<state605.1, state605.1999>
resbill	532	Revenue Requirement for Residential per Access Line for Residential (revreq:resloc+revreq:swres)/ntsres9240. 1131011
resloop#	533	Usage of Residential Subscriber Loop -- #9240.1131012/ntsres9240.1131012
resloop.ix#	534	Allocation of Residential Subscriber Loops of InterLATA Usage #9240.1131012/(ntsres9240.1131012-645.4r es:ntsres)
reslooptoll#	535	Allocation Factor for Residential Loops for InterLATA and IntraLATA Purposes #9240.1131012/restoll:ntsres
ressil.line	536	Revenue Requirement for Residential Intrastate InterLATA Toll / Access Line revreq:rsil/ntsres9240.1131011

FORMULA NAME	ID NO.	DESCRIPTION/EQUATION
ressilo.line	537	Revenue Requirement for Residential Intrastate InterLATA Toll / Access Line revreq:rslo/ntsres9240.1131011
ressilt.use	538	Revenue Requirement for Residential Intrastate InterLATA Toll / CCS revreq:rsilt/(ntsres9240.1131011*4.26)
ressl.line	539	Revenue Requirement for Residential Intrastate IntraLATA Toll / Access Line revreq:rsl/ntsres9240.1131011
resslo.line	540	Revenue Requirement for Residential Orig Intrastate IntraLATA Toll / Access Line revreq:rslo/ntsres9240.1131011
resslt.use	541	Revenue Requirement for Residential TERM Intrastate IntraLATA Toll / CCS revreq:rslt/(ntsres9240.1131011*5.89)
restoll#	542	Usage of Residential Loops for Inter and IntraLATA Purposes ntsres9240.1131012-resloc9240.1131012-resfga9240.1131012-resfgb9240.1131012
revactg#	543	Allocation Factor Based on Allocation of Account 8662.012 through 8662.018 sum<#8662.01,#8662.019999>/ sum<mts8662.01,mts8662.019999>
revenues#	544	Revenues Collected During the Test Year June 1986 to May 1987 sum<#500,#599>
revreq#	545	Revenue Requirement for the Test Year: expense#+tax#+ratebase#*percent
rr.swsil	546	Revenue Requirement for Intrastate Inter LATA Toll per CCS revreq:swsil/(swsil9221*1000000)
rr.swsilo	547	Revenue Requirement for Intrastate Inter LATA Toll per Originating CCS revreq:swsilo/(swsilo9221*1000000)
rr.swsilt	548	Revenue Requirement for Intrastate Inter LATA Toll per Terminating CCS revreq:swsilt/(swsilt9221*1000000)
rr.swsl	549	Revenue Requirement for Intrastate Intra LATA Toll per CCS revreq:swsl/(swsl9221*1000000)

FORMULA NAME	ID NO.	DESCRIPTION/EQUATION
rr.swslo	550	Revenue Requirement for Intrastate Intra LATA Toll per Originating CCS revreq:swslo/(swslo9221*1000000)
rr.swslt	551	Revenue Requirement for Intrastate Intra LATA Toll per Terminating CCS revreq:swslt/(swslt9221*1000000)
silotfact#	552	Usage of Intrastate InterLata Toll Serv. Originating and Terminating Use #9221.8113252/swsil9221.8113252
slotfact#	553	Usage of Intrastate IntraLATA Toll Serv. Originating and Terminating Usage #9221.3022/swsl9221.3022
swloop#	554	Allocation on the Basis of Loop Counts to swlocal #9240.11311/swlocal9240.11311
sxsbusloop#	555	Usage of Step-by-Step Switches by Business: See Account 9221.6325 #9221.6325/ntsbus9221.6325
sxsctxloop#	556	Usage of Step-by-Step Switches for CENTREX: See Account 9221.6326 #9221.6326/ntsctx9221.6326
sxsloopcnt#	557	Loop Counts for Step-by-Step Switches Over 5000: See Account 9221.6323 #9221.6323/nts9221.6323
sxsnts#	558	NTS Factor of Step-by-Step Switches Over 5000 .25
sxspwu#	559	Usage of Step-by-Step Switches Over 5000 : See Account 9221.6322 #9221.6322/swnet9221.6322
sxsresloop#	560	Usage of Step-by-Step Switches by Residential: See Accont 9221.6324 #9221.6324/ntsres9221.6324
tanduse#	561	Usage of Short Haul Tandems: Local and Intrastate IntraLATA Tandems #9221.22/swnet9221.22
tax#	562	Taxes Paid During Test Year June 1986 to May 1987 sum<#300,#399>

FORMULA NAME	ID NO.	DESCRIPTION/EQUATION
tdmtolluse#	563	Usage to Long Haul Tandems Function for Local Dial Switches: IS and SIL and SL #9221.3/swtoll9221.3
tolluse#	564	InterOffice Usage of Interstate and Intrastate MTS #9240.705/swstol9240.705
trafexp#	565	Allocation Factor for Traffic Expense Category 620.1208 for mts #8620.1208/mts8620.1208
traffic#	566	Traffic Expenses for the Test Year June 1986 to May 1987: Summary sum<#620,#635.99>
trkuse#	567	Usage of Trunk Capacity Cost Categories KCT-1, KCT-2A, All Interswitch Usage #9240.113212/swnet9240.113212
use24#	568	24-Hour Usage for the Switched Network #9221/swnet9221
wages#	569	Allocation to Categories with All Local in One Category by Big 4 Wages #9800/mts9800
wagesst#	570	Allocation of Big Four Wages with Total as Basis #9800/state9800
wagestot#	571	Allocation of Big Four Wages with Total as Basis #9800/total9800

No. of Formulas *****

APPENDIX G

Allocation Procedures for Basic Cost Allocation Model

Allocation Procedures

The allocation procedures specify exactly how each account is allocated to the categories either by direct assignment or with a formula. The allocation procedures are organized in the same order as the accounts in the draft manual. Each account is defined in the procedures, described according to the draft manual. The allocation procedure for that account is then specified. The procedures for an account are written in an allocation language developed for ICAS. While describing this language goes beyond the scope of this report, one procedure is to "set" a category equal to another category or sum of categories. Usually, these statements will directly correspond to computations on the initial values in the initial values file. A "set" statement could be construed as a direct assignment of costs. An "alloc" statement allocates costs in a category to other categories by a formula specified by its formula name. The allocation procedures are designed to perform the allocations that the analyst has as a goal.

```
parm model to use24
parm total to total
parm maxiter to 100
parm converge to 0.00000000001

begin iteration

calc formulas

define account 100.100000
*    Account 100-1
*    Telephone Plant In Service
*    allocated as all other plant accounts
*    including MTS and PL but excluding accounts
*    201, 202, and 203
set istol equal to isil@+isl@
set ispl equal to isilpl@+islpl@
set interstate equal to istol@+ispl@
set spl equal to silpl@+slpl@
set state equal to total@-interstate@
set mts equal to state@-spl@
alloc mts to categories by plantmts#
* same as accounts 211-277.99
end

define account 100.200000
*    Account 100-2
*    201, 202, and 203
*    Telephone Plant Under Construction
*    allocated as all other plant accounts
*    including MTS and PL but excluding accounts
*    201, 202, and 203
set istol equal to isil@+isl@
set ispl equal to isilpl@+islpl@
set interstate equal to istol@+ispl@
set spl equal to silpl@+slpl@
set state equal to total@-interstate@
set mts equal to state@-spl@
alloc mts to categories by plantmts#
* same as accounts 211-277.99
end

define account 100.300000
*    Account 100-3
*    Property Held for Future Telephone Use
*    allocated as all other plant accounts
*    including MTS and PL but excluding accounts
*    201, 202, and 203
set istol equal to isil@+isl@
set ispl equal to isilpl@+islpl@
set interstate equal to istol@+ispl@
set spl equal to silpl@+slpl@
set state equal to total@-interstate@
set mts equal to state@-spl@
alloc mts to categories by plantmts#
```

```
* same as accounts 211-277.99
end

define account 171.000000
*     Depreciation Reserve
*     The Detailed Subaccount Information is Contained
*     in Accounts 8171.12 through 8171.8 above
set istol equal to isil@+isl@
set ispl equal to isilpl@+islpl@
set interstate equal to istol@+ispl@
set spl equal to silpl@+slpl@
set state equal to total@-interstate@
set mts equal to state@-spl@
alloc mts to categories by dep171#
end


define account 171.900000
*    Depreciation Reserve
*    Investment NOT IN Service
*    Initial Values have Separation Amounts
*    Allocate Remainder as Account 100.1
set istol equal to isil@+isl@
set ispl equal to isilpl@+islpl@
set interstate equal to istol@+ispl@
set spl equal to silpl@+slpl@
set state equal to total@-interstate@
set mts equal to state@-spl@
alloc mts to categories by plantmts#
end

define account 8171.120000
*    Account 171-1t6
*    Depreciation Reserve: Buildings
*    Results of this allocation need reconciled to
*    Separations Procedures.  See Account 171.00 below
*    for the Interstate Amount for the following 171 series
*    of accounts 171.12 to 171.64.  The Amounts Allocated to
*    Interstate by the Plant Account Proportionality Factors
*    should yield the Separations Results for 171 as a whole.
* same as account 212.01-212.1
alloc total to categories by 8171.12#
end

define account 8171.210000
*    Depreciation Reserve: Central Office
*    Equipment
*    Results of this allocation need reconciled to
*    Separations Procedures.  See Account 171.00
* same as account 221.1141-221.8119
alloc total to categories by 8171.21#
end

define account 8171.310000
*    Depreciation Reserve: Station Apparatus
*    Results of this allocation need reconciled to
```

```
*    Separations Procedures.  See Account 171.00
* same as account 231
alloc total to categories by 8171.31#
end

define account 8171.320000
*    Depreciation Reserve:
*    Station Connections
*    Results of this allocation need reconciled to
*    Separations Procedures.  See Account 171.00
* same as account 232.1-232.4
alloc total to categories by 8171.32#
end

define account 8171.340000
*    Depreciation Reserve: Large Private
*    Branch Exchanges
*    Results of this allocation need reconciled to
*    Separations Procedures.  See Account 171.00
* same as account 234
alloc total to categories by 8171.34#
end

define account 8171.350000
*    Depreciation Reserve: Public Telephone
*    Equipment
*    Results of this allocation need reconciled to
*    Separations Procedures.  See Account 171.00
set interstate equal to istol@
set spl equal to silpl@+slpl@
set state equal to total@-interstate@
set mts equal to state@-spl@
alloc state to mts
alloc mts to nts
alloc nts to ntscoin
* same as account 235
end

define account 8171.400000
*    Depreciation Reserve: Outside Plant
*    Results of this allocation need reconciled to
*    Separations Procedures.  See Account 171.00
* same as account 240.102-240.91
alloc total to categories by osptot#
end

define account 8171.610000
*    Depreciation Reserve: Furniture and
*    Office Equipment
*    Results of this allocation need reconciled to
*    Separations Procedures.  See Account 171.00
* same as account 261.1-261.5
alloc total to categories by 8171.61#
end

define account 8171.620000
```

```
*    Depreciation Reserve: Other
*    Communications Equipment
*    Results of this allocation need reconciled to
*    Separations Procedures.  See Account 171.00
* same as account 262
alloc total to categories by osptot#
end

define account 8171.640000
*    Depreciation Reserve: Vehicles and Other
*    Work Equipment
*    Results of this allocation need reconciled to
*    Separations Procedures.  See Account 171.00
* same as account 264.08-264.123456
alloc total to categories by 8171.64#
end

define account 8171.800000
*    Depreciation Reserve:  Equal Access
*    and Network Reconfiguration Costs
*    Allocated to Interstate and Intrastate InterLATA
*    MTS and PL in accordance with allocation of Investment 100.1
*    for these service categories
* same as account 100.1
set interstate equal to istol@
set state equal to total@-interstate@
alloc state to categories by plantst#
end

* define account 8171.900000
*    Depreciation Reserve
*    Investment NOT IN Service
*    Initial Values have Separation Amounts
*    Allocate Remainder as Account 100.1
* same as account 100.1
* end
* set interstate equal to istol@
* set state equal to total@-interstate@
* alloc state to categories by plantst#
* end

define account 176.000000
*    Account 176
*    Accumulated Deferred Income Taxes
*    Separations Results are Incorporated in this Allocation
*    The Remainder is Allocated as the Corresponding Tax Account
set istol equal to isil@+isl@
set ispl equal to isilpl@+islpl@
set interstate equal to istol@+ispl@
set spl equal to silpl@+slpl@
set state equal to total@-interstate@
set mts equal to state@-spl@
alloc mts to categories by plantmts#
* same as account 308.1 which is allocated by 100.1
end
```

```
define account 212.010000
*    Account 211 & 212, Category 1
*    Operating Room and Central Office
*    Equipment Space
*    Separations Results are Incorporated in this Allocation
*    The Remainder is Allocated by:
*       the Allocation of Account 221 for MTS Services
set istol equal to isil@+isl@
set ispl equal to isilpl@+islpl@
set interstate equal to istol@+ispl@
set spl equal to silpl@+slpl@
set state equal to total@-interstate@
set mts equal to state@-spl@
alloc mts to categories by coemts#
* same as account 221-221.8999 for category state
end

define account 212.020000
*    Account 211 & 212, Category 2
*    Operators' Quarters
*    Separations Results are Incorporated in this Allocation
*    The Remainder is Allocated by:
*       the Allocation of Manual Switching Equipment, Category 1 of Account 221
set istol equal to isil@+isl@

set interstate equal to istol@
set state equal to total@-interstate@
set mts equal to state@
alloc mts to categories by opertr#
* same as account 221.1-221.1999 for category state
end

define account 212.030000
*    Account 211 & 212, Category 3
*    General Traffic Supervision Space
*    Separations Results are Incorporated in this Allocation
*    The Remainder is Allocated by:
*       the Allocation of Traffic Expenses, Account 620.1208,
*       General Traffic Supervision Expenses
set istol equal to isil@+isl@

set ispl equal to isilpl@+islpl@
set interstate equal to istol@+ispl@
set spl equal to silpl@+slpl@
set state equal to total@-interstate@
set mts equal to state@-spl@
alloc mts to categories by trafexp#
* same as account 620.1208 for state
end

define account 212.040000
*    Account 211 & 212, Category 4
*    Commercial Office Space
*    Separations Results are Incorporated in this Allocation
*    The Remainder is Allocated by:
*       the Allocation of Accounts 640, 643, 644, and 645 Combined
```

```
set istol equal to isil@+isl@

set ispl equal to isilpl@+islpl@
set interstate equal to istol@+ispl@
set spl equal to silpl@+slpl@
set state equal to total@-interstate@
set mts equal to state@-spl@
alloc mts to categories by commercial#
* same as account 640-640.9999, 643-643.9999, 644-644.9999, 645-645.9999
* for state
end

define account 212.060000
*    Account 211 & 212, Category 6
*    Revenue Accounting Space
*    Separations Results are Incorporated in this Allocation
*    The Remainder is Allocated by:
*       the Allocation of Accounts 662.011 through 662.018 Combined
*       or 662.01 if breakdown of 662 is unavailable
set istol equal to isil@+isl@

set ispl equal to isilpl@+islpl@
set interstate equal to istol@+ispl@
set spl equal to silpl@+slpl@
set state equal to total@-interstate@
set mts equal to state@-spl@
alloc mts to categories by revactg#
* same as account 662.01-662.01999 for state
end

define account 212.070000
*    Account 211 & 212, Category 7
*    Garages, Storerooms, Warehouses, and
*    Pole Yards
*    Separations Results are Incorporated in this Allocation
*    The Remainder is Allocated by:
*       the Allocation of the 240 Series of Accounts, Account 262, and
*       Account 264, Combined
set istol equal to isil@+isl@

set ispl equal to isilpl@+islpl@
set interstate equal to istol@+ispl@
set spl equal to silpl@+slpl@
set state equal to total@-interstate@
set mts equal to state@-spl@
alloc mts to categories by othrplt#
* same as account 240-240.9999, 262-262.9999, 264-264.9999 for state
end

define account 212.090000
*    Account 211 & 212, Category 9
*    General Office Space
*    Separations Results are Incorporated in this Allocation
*    The Remainder is Allocated by:
*       the Allocation of General Expenses, Accounts 661 through 665, Combined
set istol equal to isil@+isl@
```

```
set ispl equal to isilpl@+islpl@
set interstate equal to istol@+ispl@
set spl equal to silpl@+slpl@
set state equal to total@-interstate@
set mts equal to state@-spl@
alloc mts to categories by goslexp#
* same as account 661-665.9999 for state
end

define account 212.100000
*    Account 211 & 212, Category 10
*    Antenna Supporting Structures
*    Separations Results are Incorporated in this Allocation
*    The Remainder is Allocated by:
*       Direct Assignment to Intrastate IntraLATA Private Line
*       for the Pilot Study
alloc total to state
alloc state to spl
alloc spl to slpl
end

define account 221.114100
*    Account 221, Category 1N1
*    The Service Evaluation Board/System or
*    (SES) Signal Converter/Allotter (SC/A)
*    Separations Results are Incorporated in this Allocation
*    The Remainder is Allocated by:
*       Relative Total Usage for 24-hour Period
*       for Service Categories with
*       Local Usage Brokendown into Customer Classes
set istol equal to isil@+isl@
set interstate equal to istol@
set state equal to total@-interstate@
alloc state to mts
alloc mts to swnet
alloc swnet to categories by use24#
end

define account 221.116000
*    Account 221, Category 1P
*    Separate DA Boards/Systems Including
*    No. 5 Used for DA Service and Joint Aux.
*    Separations Results are Incorporated in this Allocation
*    The Remainder is Allocated by:
*       Relative Peak Use of the Directory Assistance Centers
*       Brokendown by Service Category
set istol equal to isil@+isl@
set interstate equal to istol@
set state equal to total@-interstate@
alloc state to mts
alloc mts to swnet
alloc swnet to swop
alloc swop to swda
* alloc swda to categories by dause#
end
```

```
define account 221.117000
*    Account 221, Category 1Q
*    Separate Intercepting Boards/Systems or
*    No. 5 ACD Used for Intercept Service
*    Separations Results are Incorporated in this Allocation
*    The Remainder is Allocated by:
*       Relative Total Minutes of Use for Each Service Category
*       with Local Use Brokendown by Customer Classes
*       Allocation Assumes that the Intercept of Calls is Randomly Distributed
set istol equal to isil@+isl@

set state equal to total@-interstate@
alloc state to mts
alloc mts to swnet
alloc swnet to categories by use24#
end

define account 221.220000
*    Account 221, Category 2B
*    Short Haul Dial Tandem Switching
*    Equipment
*    Separations Results are Incorporated in this Allocation
*    The Remainder is Allocated by:
*       Peak Usage of This Equipment
*       This Equipment Carries Only Local and Intrastate IntraLATA Traffic??
alloc total to state
alloc state to mts
alloc mts to swnet
alloc swnet to categories by tanduse#
end

define account 221.230000
*    Account 221, Category 2C
*    Common Switching/Control Equipment Used
*    for Switched Message Exchange Traffic
*    Separations Results are Incorporated in this Allocation
*    The Remainder is Allocated by:
*       The Allocation of Accounts 221.64, 221.65, and 221.66 for
*       the Local Service Category.  These Accounts are the Local Dial
*       Switch for Electronic Analog and Digital Technologies
* same as account 221.64-221.66 for swlocal
alloc total to state
alloc state to mts
alloc mts to swnet
alloc swnet to swlocal
alloc swlocal to categories by essfactloc#
end

define account 221.250000
*    Account 221, Category 2E
*    Common Switching/Control Equip. Used for
*    Through Switched OCC-C InterLATA Traffic
*    Separations Results are Incorporated in this Allocation
*    The Remainder is Allocated by:
*       The Allocation of Accounts 221.64, 221.65, and 221.66
```

```
*       for the InterLATA Service Categories
* same as account 221.64-221.66
set istol equal to isil@
set interstate equal to istol@
set state equal to total@-istol@
alloc state to mts
alloc mts to swnet
alloc swnet to swtoll
alloc swtoll to swstol
alloc swstol to swsil
alloc swsil to categories by essfactsil#
end

define account     221.30220000
*    Account 221, Category 3B2
*    Intertoll Dial Switching for Intrastate
*    Toll Message or Private Line Traffic
alloc total to state
alloc state to mts
alloc mts to swnet
alloc swnet to swtoll
alloc swtoll to swstol
alloc swstol to swsl
alloc swsl to categories by slotfact#
end

define account     221.30300000
*    Account 221, Category 3C
*    Common Switching/Control Equip. for Toll
*    Type Plus Terminal Private Line Traffic
*       The Relative Peak Usage of this Equipment
set istol equal to isil@+isl@
set ispl equal to isilpl@+islpl@
set interstate equal to istol@+ispl@
set state equal to total@-interstate@
set mts equal to state@
alloc mts to swnet
alloc swnet to swtoll
alloc swtoll to categories by tdmtolluse#
end

define account     221.30800000
*    Account 221, Category 3H
*    Common Switching/Control Equip. for No.
*    1/1A Electronic Switching System (ESS)
*    Separations Results are Incorporated in this Allocation
*    The Remainder is Allocated by:
*       The Relative Usage of Interstate and Intrastate Toll Use
*       of InterLATA and IntraLATA Services for this Equipment
set istol equal to isil@+isl@
set interstate equal to istol@
set state equal to total@-interstate@
alloc state to mts
alloc mts to swnet
alloc swnet to swtoll
alloc swtoll to categories by tdmtolluse#
```

```
end

define account      221.42100000
*    Account 221, Category 4B1
*    Automatic Message Recording Equip. for
*    Interstate/Intrastate Message Service
*    Separations Results are Incorporated in this Allocation
*    The Remainder is Allocated by:
*       The Relative Use of Intersate InterLATA, Interstate IntraLATA
*       Intrastate InterLATA, Intrastate IntraLATA Direct Dial Toll
*       Calling and Local Measured Calling Delineated By Customer Class,
set istol equal to isil@+isl@
set interstate equal to istol@
set state equal to total@-interstate@
alloc state to mts
alloc mts to swnet
alloc swnet to categories by amause#
end

define account      221.42200000
*    Account 221, Category 4B2
*    Automatic Message Recording Equip. for
*    Inter/Intrastate Switched Private Line
alloc total to state
alloc state to spl
alloc spl to silpl
end

define account      221.62200000
*    Account 221, Category 6B2
*    Local Dial Switching Equipment:
*    No. 5 Crossbar
set istol equal to isil@+isl@

set interstate equal to istol@
set state equal to total@-interstate@
alloc state to mts
alloc mts to nts by 5xbnts#
alloc mts to swnet by 1-5xbnts#
alloc swnet to categories by 5xbpwu#
alloc nts to categories by 5xbloopcnt#
alloc ntsres to categories by 5xbresloop#
alloc ntsbus to categories by 5xbbusloop#
alloc ntsctx to categories by 5xbctxloop#
end

define account      221.63200000
*    Account 221, Category 6C2
*    Local Dial Switching Equipment:
*    Step-by-Step (Over 5000 working lines)
set istol equal to isil@+isl@

set interstate equal to istol@
set state equal to total@-interstate@
alloc state to mts
alloc mts to nts by sxsnts#
```

```
alloc mts to swnet by 1-sxsnts#
alloc swnet to categories by sxspwu#
alloc nts to categories by sxsloopcnt#
alloc ntsres to categories by sxsresloop#
alloc ntsbus to categories by sxsbusloop#
alloc ntsctx to categories by sxsctxloop#

end

define account     221.65000000
*    Account 221, Category 6E
*    Local Dial Switching Equip.: Electronic
*    --analog (Over 2500 working lines)
set istol equal to isil@+isl@
set interstate equal to istol@
set state equal to total@-interstate@
alloc state to mts
alloc mts to nts by essnts#
alloc mts to swnet by 1-essnts#
alloc swnet to categories by esspwu#
alloc nts to categories by essloopcnt#
alloc ntsres to categories by essresloop#
alloc ntsbus to categories by essbusloop#
alloc ntsctx to categories by essctxloop#

end

define account     221.66000000
*    Account 221, Category 6F
*    Local Dial Switching Equipment:
*    Electronic--Digital
set istol equal to isil@+isl@

set interstate equal to istol@
set state equal to total@-interstate@
alloc state to mts
alloc mts to nts by dgtlnts#
alloc mts to swnet by 1-dgtlnts#
alloc swnet to categories by dgtlpwu#
alloc nts to categories by dgtlloopcnt#
alloc ntsres to categories by dgtresloop#
alloc ntsbus to categories by dgtbusloop#
alloc ntsctx to categories by dgtctxloop#
end

define account     221.75000000
*    Account 221, Category 7E
*    Control Units for Electronic Switching
*    System Located in Central Offices
*       The Relative Peak Use of This Equipment
set istol equal to isil@+isl@
set interstate equal to istol@
set state equal to total@-interstate@
alloc state to mts
alloc mts to swnet
alloc swnet to categories by ctx221.75#
```

```
* Use of swnet by Centrex
end

define account     221.80511000
*    Account 221, Category 8EA1
*    Broadband Circuit Equipment for Access
*    to Interstate Private Line Services
*    Separations Results are Incorporated in this Allocation
*    The Remainder, if any, is Assigned to Intrastate Private Line Services
alloc total to interstate
alloc interstate to ispl
alloc ispl to isilpl
end

define account     221.80512000
*    Account 221, Category 8EA2
*    Broadband Circuit Equip. for Telephone
*    Co.'s Interstate Private Line Services
*    Separations Results are Incorporated in this Allocation
*    The Remainder, if any, is Assigned to Intrastate Private Line Services
alloc total to interstate
alloc interstate to ispl
alloc ispl to islpl
end

define account     221.80522000
*    Account 221, Category 8EB2
*    Broadband Circuit Equip. for Telephone
*    Co.'s Intrastate Private Line Services
*    Separations Results are Incorporated in this Allocation
*    The Remainder, if any, is Assigned to Intrastate Private Line Services
alloc total to state
alloc state to spl
alloc spl to slpl
end

define account     221.80611000
*    Account 221, Category 8FA1
*    Wideband Circuit Equip. for Interstate
*    Private Line Services by Other Carrier
*    Separations Results are Incorporated in this Allocation
*    The Remainder, if any, is Assigned to Intrastate Private Line Services
alloc total to interstate
alloc interstate to ispl
alloc ispl to isilpl
end

define account     221.80621000
*    Account 221, Category 8FB1
*    Wideband Circuit Equip. for Intrastate
*    Private Line Services by Other Carrier
*    Separations Results are Incorporated in this Allocation
*    The Remainder, if any, is Assigned to Intrastate Private Line Services
set ispl equal to isilpl@+islpl@
set spl equal to silpl@+slpl@
set state equal to spl@
```

```
set interstate equal to ispl@
set total to interstate@+state@
end

define account     221.80622000
*    Account 221, Category 8FB2
*    Wideband Circuit Equip. for Telephone
*    Co.'s Intrastate Private Line Services
*    Separations Results are Incorporated in this Allocation
*    The Remainder, if any, is Assigned to Intrastate Private Line Services
alloc total to state
set spl equal to silpl@+slpl@
end

define account     221.80661000
*    Account 221, Category 8FF1
*    Private Line Interstate Circuit Equip.
*    for DATAPHONE/High Speed Digital Service
*    Separations Results are Incorporated in this Allocation
*    The Remainder, if any, is Assigned to Intrastate Private Line Services
alloc total to interstate
set ispl equal to isilpl@+islpl@
end

define account     221.80662000
*    Account 221, Category 8FF2
*    PL Interstate Circuit Equip. for DDS/
*    HSSDS Offered by the Bell Operating Co.
*    Separations Results are Incorporated in this Allocation
*    The Remainder, if any, is Assigned to Intrastate Private Line Services
alloc total to interstate
alloc interstate to ispl
alloc ispl to islpl
end

define account     221.80671000
*    Account 221, Category 8FG1
*    PL Intrastate Circuit Equipment Used for
*    DDS and HSSDS for Other Carrier Access
*    Separations Results are Incorporated in this Allocation
*    The Remainder, if any, is Assigned to Intrastate Private Line Services
alloc total to state
alloc state to spl
alloc spl to silpl
end

define account     221.80672000
*    Account 221, Category 8FG2
*    PL Intrastate Circuit Equip. for DDS and
*    HSSDS Offered by the Bell Operating Co.
*    Separations Results are Incorporated in this Allocation
*    The Remainder, if any, is Assigned to Intrastate Private Line Services
alloc total to state
alloc state to spl
alloc spl to slpl
end
```

```
define account     221.80701000
*    Account 221, Category 8G1
*    Basic Circuit Equipment for Other
*    Carrier Access for Interstate MTS
* define account 221.8g1 & 221.8g4
alloc total to interstate
alloc interstate to istol
alloc istol to isil
end

define account     221.80702000
*    Account 221, Category 8G2
*    Basic Circuit Equip. Used for Interstate
*    (IS) MTS & The Telephone Co.'s IS MTS
*    Separations Results are Incorporated in this Allocation
set istol equal to isil@+isl@
set interstate equal to istol@
end

define account     221.80706000
*    Account 221, Category 8G6,7,8
*    Combined Allocation of Cost Categories
*    8g-6, 8g-7 and 8g-8
*    Intrastate Toll Circuit Equipment -- No Interstate Allocation
alloc total to state
alloc state to mts
alloc mts to swnet
alloc swnet to swtoll
alloc swtoll to categories by tolluse#
* same as account 240.705
end

define account     221.80711000
*    Account 221, Category 8G11
*    Basic Circuit Equipment for MT Central
*    Office Connecting Facilities (COCF)
*       Allocated as the Corresponding Outside Plant
*       Feature Group B Facilities
set istol equal to isil@+isl@
set interstate equal to istol@
set state equal to total@-interstate@
alloc state to mts
alloc mts to swnet
alloc swnet to swtoll
alloc swtoll to swfgb
* same as account 240.0709 for category state
end

define account     221.80712000
*    Account 221, Category 8G12
*    Basic Circuit Equipment for Interstate/
*    Intrastate MTS & the Telephone Co.'s MTS
*       Allocated as the Corresponding Outside Plant
set istol equal to isil@+isl@
set interstate equal to istol@
```

```
set state equal to total@-interstate@
alloc state to mts
alloc mts to swnet
alloc swnet to swtoll
alloc swtoll to categories by tolluse#
end

define account     221.80713000
*    Account 221, Category 8G13
*    Basic Circuit Equipment Used for Private
*    Line Teletypewriter Service
*    Separations Results are Incorporated in this Allocation
*    The Remainder is Allocated by:
set ispl equal to isilpl@+islpl@
set spl equal to silpl@+slpl@
set interstate equal to ispl@
set state equal to spl@
end

define account     221.80714000
*    Account 221, Category 8G14
*    Basic Circuit Equipment Used for Other
*    Private Line Service
*    Separations Results are Incorporated in this Allocation
set ispl equal to isilpl@+islpl@
set spl equal to silpl@+slpl@
set interstate equal to ispl@
set state equal to spl@
end

define account     221.80715000
*    Account 221, Category 8G15
*    Basic Circuit Equip. Used for the Tele-
*    phone Co.'s PL Teletypewriter Service
*    Separations Results are Incorporated in this Allocation
set ispl equal to islpl@
set spl equal to slpl@
set interstate equal to ispl@
set state equal to spl@
end

define account     221.80716000
*    Account 221, Category 8G16
*    Basic Circuit Equip. Used for the Tele-
*    phone Co.'s Other Private Line Services
*    Separations Results are Incorporated in this Allocation
set ispl equal to islpl@
set spl equal to slpl@
set interstate equal to ispl@
set state equal to spl@
end

define account     221.80719100
*    Account 221, Category 8G19A
*    Special Circuit Equipment for Interstate
*    InterLATA PL Teletypewriter Service
```

```
alloc total to interstate
alloc interstate to ispl
alloc ispl to isilpl
end

define account     221.80719200
*    Account 221, Category 8G19B
*    Special Circuit Equip. for the Telephone
*    Co.'s IS PL Teletypewriter Service
alloc total to interstate
alloc interstate to ispl
alloc ispl to islpl
end

define account     221.80719300
*    Account 221, Category 8G19C
*    Special Circuit Equip. Used for Intra-
*    state PL Teletypewriter Service
set ispl equal to isilpl@+islpl@
set spl equal to silpl@+slpl@
set interstate equal to ispl@
set state equal to spl@
end

define account     221.80720100
*    Account 221, Category 8G20A
*    Special Circuit Equip. for Other Carrier
*    Access for Other IS InterLATA PL Service
alloc total to interstate
alloc interstate to ispl
alloc ispl to isilpl
end

define account     221.80720200
*    Account 221, Category 8G20B
*    Special Circuit Equip. for The Telephone
*    Co.'s Other Interstate PL Services
set ispl equal to isilpl@+islpl@
set spl equal to silpl@+slpl@
set interstate equal to ispl@
set state equal to spl@
end

define account     221.80720300
*    Account 221, Category 8G20C
*    Special Circuit Equip. for Intrastate PL
*    Serv. for Access Carriers & Telephone Co
set spl equal to silpl@+slpl@
set state equal to spl@
end

define account     221.80800000
*    Account 221, Category 8H
*    Circuit Equipment Used for Host/Remote
*    Circuit Facilities
*       Allocated According to the Corresponding Outside Plant
```

```
*       Account, See Account 240.8
set istol equal to isil@+isl@
set interstate equal to istol@
set state equal to total@-interstate@
alloc state to mts
alloc mts to swnet
alloc swnet to categories by host#
* same as account 240.8 for state
end

define account     221.80910000
*    Account 221, Category 8JA
*    Interexchange Circuit Equipment Used for
*    Mobile Radio Services Under FCC Tariffs
alloc total to interstate
alloc interstate to istol
alloc istol to isl
end

define account     221.81111000
*    Account 221, Category 8KA1
*    Broadband Circuit Equipment Used on
*    Local Channels for Other Carrier Access
set ispl equal to isilpl@+islpl@
set interstate equal to ispl@
end

define account     221.81112000
*    Account 221, Category 8KA2
*    Broadband Circuit Equip. Used on Local
*    Channels For The Telephone Co.'s IS PL
alloc total to interstate
alloc interstate to ispl
alloc ispl to islpl
end

define account     221.81131010
*    Account 221, Category 8KCS1
*    Basic Circuit Equip. w/Subscriber Loops
*    for Message Telephone Service Incl. WATS
*    Separations Results are Incorporated in this Allocation
*    The Remainder is Allocated
*       According to the Corresponding Outside Plant
*       Account, See Account 240.113101
set istol equal to isil@+isl@

set interstate equal to istol@
set state equal to total@-interstate@
alloc state to mts
alloc mts to nts
alloc nts to categories by loopcnt#
alloc ntsres to categories by resloop#
alloc ntsbus to categories by busloop#
alloc ntsctx to categories by ctxloop#
* same as account 240.113101 for state
end
```

```
define account      221.81131060
*    Account 221, Category 8KCS6
*    Subscriber Loop Basic Circuit Equip. for
*    Other Carrier Access for IS PL Services
alloc total to interstate
alloc interstate to ispl
alloc ispl to isilpl
end

define account      221.81131070
*    Account 221, Category 3KCS7
*    Subscriber Loop Basic Circuit Equip.
*    for Carr. Acc. for Intrastate PL Service
alloc total to state
alloc state to spl
alloc spl to silpl
end


define account      221.81131090
*    Account 221, Category 8KCS9
*    Subscriber Loop Basic Circuit Equip.
*    for Intrastate PL Serv. by Tele. Company
alloc total to state
alloc state to spl
alloc spl to slpl
end

define account      221.81131100
*    Account 221, Category 8KCS10
*    Subscriber Loop Basic Circuit Equip. for
*    Intrastate PL for Intraexchange Service
alloc total to state
alloc state to spl
alloc spl to localpl
end

define account      221.81132100
*    Account 221, Category 8KCT1 & 8KCT2A
*    Combined Allocation of Cost Categories
*    8KCT1 and 8KCT2a
*    Separations Results are Incorporated in this Allocation
*    The Remainder is Allocated
*       According to the Corresponding Outside Plant
*       Account, See Account 240.113212
set istol equal to isil@+isl@
set interstate equal to istol@
set state equal to total@-interstate@
alloc state to mts
alloc mts to categories by trkuse#
* same as account 240.113212 for state
end

define account      221.81132200
*    Account 221, Category 8KCT2B
```

```
*    Circuit Equipment w/Message Exchange
*    Trunks for Toll and Exchange COCF
*    Separations Results are Incorporated in this Allocation
*    The Remainder is Allocated
*       According to the Corresponding Outside Plant
*       Account, See Account 240.11322
*       These are FGB Costs
set istol equal to isil@+isl@
set interstate equal to istol@
set state equal to total@-interstate@
set mts equal to state@
alloc state to mts
alloc mts to swnet
alloc swnet to swtoll
alloc swtoll to swfgb
end

define account     221.81132410
*    Account 221, Category 8KCT4A
*    Circuit Equip. w/Message Exchange Trunk
*    of Outside Plant for IS PL Local Channel
alloc total to interstate
set ispl equal to isilpl@+islpl@
end

define account     221.81132420
*    Account 221, Category 8KCT4B
*    Circuit Equip. w/Message Exchange Trunk
*    of Outside Plant for IS Switched Access
*    Separations Results are Incorporated in this Allocation
set istol equal to isil@+isl@
set interstate equal to istol@
end

define account     221.81132510
*    Account 221, Category 8KCT5A
*    Circuit Equip. w/Message Exchange Trunk
*    Portion for Intrastate PL Local Channels
*       See Account 8221.8113251 (silpl, slpl)
set spl equal to silpl@+slpl@
set state equal to spl@
end

define account     221.81132520
*    Account 221, Category 8KCT5B
*    Circuit Equip. w/ Message Exchange Trunk
*    Portion for Intrastate Switched Access
*    Separations Results are Incorporated in this Allocation
*    The Remainder is Allocated
*       According to the Corresponding Outside Plant
*       Account, See Account 240.113252
alloc total to state
alloc state to mts
alloc mts to swnet
alloc swnet to swtoll
alloc swtoll to swstol
```

```
alloc swstol to categories by silotfact#
* same as account 240.113252 for swstol
end

define account     221.81132600
*    Account 221, Category 8KCT6
*    Circuit Equip. w/Message Exchange Trunk
*    Portion for Tele. Co.'s Intraexchange PL
alloc total to state
alloc state to spl
alloc spl to localpl
end

define account     221.81190000
*    Account 221, Category 8KJ
*    Circuit Equip. for Urban Mobile, Bell
*    Boy, VHF Maritime Radio Serv., & Others
alloc total to state
alloc state to mts
alloc mts to swnet
alloc swnet to swlocal
alloc swlocal to swmobile
end

define account     231.00000000
*    Station Apparatus
*    Separations Results are Incorporated in this Allocation
*    The Remainder is Allocated by:
set istol equal to isil@+isl@

set ispl equal to isilpl@+islpl@
set interstate equal to istol@+ispl@
set spl equal to silpl@+slpl@
set state equal to total@-interstate@
set mts equal to state@-spl@
alloc mts to categories by kcsl#
* same as account 240.113101
end

define account     232.10000000
*    Station Connections-Inside Wire:
*    Teletypewriter Installations
set istol equal to isil@+isl@
set ispl equal to isilpl@+islpl@
set interstate equal to istol@+ispl@
set spl equal to silpl@+slpl@
set state equal to total@-interstate@
set mts equal to state@-spl@
alloc mts to categories by act231#
* same as 231-231.9999 for state
end

define account     232.20000000
*    Station Connections-Inside Wire:
*    Official Company
set istol equal to isil@+isl@
```

```
set ispl equal to isilpl@+islpl@
set interstate equal to istol@+ispl@
set spl equal to silpl@+slpl@
set state equal to total@-interstate@
set mts equal to state@-spl@
alloc mts to nts
alloc nts to ntscoin
end

define account     232.30000000
*    Station Connections: Complex Inside Wire
* same as account 240.1131101-240.113111 for state
set istol equal to isil@+isl@
set ispl equal to isilpl@+islpl@
set interstate equal to istol@+ispl@
set spl equal to silpl@+slpl@
set state equal to total@-interstate@
set mts equal to state@-spl@
alloc mts to nts
alloc nts to ntsctx
alloc ntsctx to categories by ctxloop#
end

define account     232.40000000
*    Station Connections-Inside Wire:
*    Public Telephone
set istol equal to isil@+isl@
set ispl equal to isilpl@+islpl@
set interstate equal to istol@+ispl@
set spl equal to silpl@+slpl@
set state equal to total@-interstate@
set mts equal to state@-spl@
alloc mts to nts
alloc nts to ntscoin
end

define account     234.00000000
*    Large Private Branch Exchanges
set istol equal to isil@+isl@

set ispl equal to isilpl@+islpl@
set interstate equal to istol@+ispl@
set spl equal to silpl@+slpl@
set state equal to total@-interstate@
set mts equal to state@-spl@
alloc state to mts
alloc mts to nts
alloc nts to ntsctx
alloc ntsctx to categories by ctxloop#
end

define account     235.00000000
*    Public Telephone Equipment
set istol equal to isil@+isl@

set ispl equal to isilpl@+islpl@
```

```
set interstate equal to istol@+ispl@
set spl equal to silpl@+slpl@
set state equal to total@-interstate@
set mts equal to state@-spl@
alloc mts to nts
alloc nts to ntscoin
end

define account      240.51200000
*    Account 240 series, Category EA2
*    Outside Plant Used for The Telephone
*    Co.'s Interstate Private Line Services
alloc total to interstate
alloc interstate to ispl
alloc ispl to islpl
end

define account      240.61100000
*    Account 240 series, Category FA1
*    Outside Plant for Wideband Channels for
*    IS PL Services Offered by Other Carrier
alloc total to interstate
alloc interstate to ispl
alloc ispl to isilpl
end

define account      240.62100000
*    Account 240 series, Category FB1
*    Outside Plant for Wideband Channels for
*    Intrastate PL Services by Other Carrier
alloc total to state
alloc state to spl
alloc spl to silpl
end

* define account      240.62200000
*    Account 240 series, Category FB2
*    Outside Plant for Wideband Channels for
*    Telephone Co.'s Intrastate PL Services
* alloc total to state
* alloc state to spl
* alloc spl to slpl
* end

define account      240.66100000
*    Account 240 series, Category FF1
*    Outside Plant To Provide IS PL Circuits
*    for DDS and HSSDS for Other Carr. Access
alloc total to interstate
alloc interstate to ispl
alloc ispl to isilpl
end

define account      240.67100000
*    Account 240 series, Category FG1
*    Outside Plant for Intrastate PL Circuits
```

```
*    for DDS & HSSDS for Other Carrier Access
alloc total to state
alloc state to spl
alloc spl to silpl
end

define account     240.67200000
*    Account 240 series, Category FG2
*    Outside Plant for Intrastate PL Circuits
*    for DDS/HSSDS by The Bell Operating Co.
alloc total to state
alloc state to spl
alloc spl to slpl
end

define account     240.70100000
*    Account 240 series, Category G-1
*    Outside Plant for Other Carr. Access for
*    Interstate Message Telephone Services
* define account 240.gl & 240.g3
alloc total to interstate
alloc interstate to istol
alloc istol to isil
end

define account     240.70200000
*    Account 240 series, Category G-2
*    Outside Plant for Other Carr. Access for
*    IS MTS and The Telephone Co.'s IS MTS
alloc total to interstate
alloc interstate to istol
alloc istol to isil
end

define account     240.70500000
*    Account 240 series, Category G-5, G-6, G-7
*    Combined Allocation of Cost Categories
*       The Costs Contained in This Cost Category
*       are Allocated to Feature Group A, Feature Group B, and
*       Intrastate InterLATA and IntraLATA Toll
alloc total to state
alloc state to mts
alloc mts to swnet
alloc swnet to swtoll
alloc swtoll to categories by tolluse#
* Toll Use computes breakdown for intrastate toll use
end

define account     240.70800000
*    Account 240 series, Category G-8
*    Outside Plant for Intrastate WATS MTS
*    for Other Carr. Access & Telephone Co.
*       The Costs Contained in This Cost Category are
*       Allocated to Intrastate InterLATA and IntraLATA
*       WATS Service
alloc total to state
```

```
alloc state to mts
alloc mts to swnet
alloc swnet to swtoll
alloc swtoll to categories by tolluse#
* If WATS Costs are Identified, An Appropriate Allocation
* Factor must be Computed
end

define account     240.70900000
*    Account 240 series, Category G-9
*    Outside Plant Used for Message Telephone
*    Central Office Connecting Facilities
*       The Costs Contained in This Cost Category are
*       Allocated to Feature Group B for Interstate and
*       Intrastate InterLATA Services
set istol equal to isil@+isl@

set interstate equal to istol@
set state equal to total@-interstate@
alloc state to mts
alloc mts to swnet
alloc swnet to swtoll
alloc swtoll to swfgb
end

define account     240.71000000
*    Account 240 series, Category G-10
*    Outside Plant Providing IS & Intrastate
*    MTS for Other Carr. Acc. & The Tele. Co.
*    Separations Results are Incorporated in this Allocation
*    The Remainder is Allocated by:
*       The Relative Peak Use of This Equipment
set istol equal to isil@+isl@
set interstate equal to istol@
set state equal to total@-interstate@
alloc state to mts
alloc mts to swnet
alloc swnet to swtoll
alloc swtoll to categories by tolluse#
end

define account     240.71100000
*    Account 240 series, Category G-11
*    Outside Plant for Other Carrier Access
*    for Interstate Private Line Service
alloc total to interstate
alloc interstate to ispl
alloc ispl to isilpl
end

define account     240.71200000
*    Account 240 series, Category G-12
*    Outside Plant for the Telephone Co.'s
*    Interstate Private Line Services
alloc total to interstate
alloc interstate to ispl
```

```
alloc ispl to isilpl
end

define account     240.71400000
*    Account 240 series, Category G-14
*    Outside Plant for The Telephone Co.'s
*    Intrastate Private Line Services
alloc total to state
alloc state to spl
alloc spl to slpl
end

define account     240.80000000
*    Account 240 series, Category H
*    Outside Plant Used for Host/Remote
*    Facilities,  The Costs Assigned to This Cost Category
*       are Allocated to Interstate InterLATA and IntraLATA Services
*       and Intrastate InterLATA and IntraLATA Services
set istol equal to isil@+isl@

set interstate equal to istol@
set state equal to total@-interstate@
alloc state to mts
alloc mts to swnet
alloc swnet to categories by host#
* Host factor has Host function usage from tanduse
end

define account     240.91000000
*    Account 240 series, Category JA
*    Interexchange Outside Plant Used for
*    Mobile Radio Services Under FCC Tariffs
alloc total to interstate
alloc interstate to istol

alloc istol to isl
end

define account     240.10200000
*    Account 240 series, Category KA2
*    Broadband Local Channels for Telephone
*    Co.'s Interstate PL Broadband Services
alloc total to interstate
alloc interstate to ispl
alloc ispl to islpl
end

define account     240.11310100
*    Account 240 series, Category KCS1
*    Outside Plant w/Subscriber Loops for
*    MTS Including WATS
*    Separations Results are Incorporated in this Allocation
*    The Remainder is Allocated by:
*       The Relative Peak Use of This Equipment
set istol equal to isil@+isl@
set interstate equal to istol@
```

```
set state equal to total@-interstate@
alloc state to mts
alloc mts to nts
alloc nts to categories by loopcnt#
alloc ntsres to categories by resloop#
alloc ntsbus to categories by busloop#
alloc ntsctx to categories by ctxloop#
end

define account     240.11310700
*    Account 240 series, Category KCS7
*    Outside Plant w/Subscriber Loops Used
*    for Other Carr. Access for IS PL DDS
alloc total to interstate
alloc interstate to ispl
alloc ispl to isilpl
end

define account     240.11310900
*    Account 240 series, Category KCS9
*    Outside Plant w/Subscriber Loops for
*    Other Carr. Acc. for Intrastate PL DDS
alloc total to state
alloc state to spl
alloc spl to silpl
end

define account     240.11311000
*    Account 240 series, Category KCS10
*    Outside Plant w/Subscriber Loops for
*    Intrastate PL DDS by The Telephone Co.
alloc total to state
alloc state to spl
alloc spl to silpl
end

define account     240.11311100
*    Account 240 series, Category KCS11
*    Outside Plant w/Subscriber Loops for
*    Intrastate PL DDS for Intraexchange Ser.
alloc total to state
alloc state to spl
alloc spl to localpl
end

define account     240.11321200
*    Account 240 series, Category KCT-1 & KCT-2A
*    Combined Allocation of Cost Categories
*    kct-1 and kct-2a
*    Separations Results are Incorporated in this Allocation
*    The Remainder is Allocated by:
*       The Relative Peak Use of This Equipment
set istol equal to isil@+isl@
set interstate equal to istol@
set state equal to total@-interstate@
alloc state to mts
```

```
alloc mts to swnet
alloc swnet to categories by trkuse#
* trkuse is a formula that summarizes the interswitch
* usage of trunks for intrastate interLATA and IntraLATA toll
* and local use.
end

define account     240.11322000
*    Account 240 series, Category KCT2B
*    Outside Plant w/Message Exchange Trunks
*    for Toll & Exchange COCF Traffic
*       The Costs Contained in This Cost Category are
*       Feature Group B Costs
*    Separations Results are Incorporated in this Allocation
*    The Remainder is Allocated by:
*       The Relative Peak Use of This Equipment
set istol equal to isil@+isl@

set interstate equal to istol@
set state equal to total@-interstate@
alloc state to mts
alloc mts to swnet
alloc swnet to swtoll
alloc swtoll to swfgb
end

define account     240.11324200
*    Account 240 series, Category KCT4B
*    Exchange Trunk Portion of Outside Plant
*    for IS Switched Access for Private Line
*       The Costs Contained in This Cost Category are
*       Allocated to Interstate InterLATA and IntraLATA Services,
set istol equal to isil@+isl@
set interstate equal to istol@
end

define account     240.11325200
*    Account 240 series, Category KCT5B
*    Exchange Trunk Portion of Outside Plant
*    for Intrastate Switched Access for PL
*       The Private Line Costs Contained in This Cost Category are
*       Allocated to Intrastate InterLATA and IntraLATA Services
alloc total to state
alloc state to spl
alloc spl to silpl
end

define account     240.11900000
*    Account 240 series, Category KJ
*    Out. Plant Providing Urban Mobile, Bell
*    Boy, VHF Maritime Radio Serv., & Others
alloc total to state
alloc state to mts
alloc mts to swnet
alloc swnet to swlocal
alloc swlocal to swmobile
```

```
end

define account     261.10000000
*    Storeroom Furniture and Office Equipment
set istol equal to isil@+isl@
set ispl equal to isilpl@+islpl@
set interstate equal to istol@+ispl@
set spl equal to silpl@+slpl@
set state equal to total@-interstate@
set mts equal to state@-spl@
alloc mts to categories by wages#
alloc swlocal to categories by swloop#
alloc swsl to categories by slotfact#
alloc swsil to categories by silotfact#
end

define account     261.20000000
*    Other Furniture and Office Equipment
set istol equal to isil@+isl@
set ispl equal to isilpl@+islpl@
set interstate equal to istol@+ispl@
set spl equal to silpl@+slpl@
set state equal to total@-interstate@
set mts equal to state@-spl@
alloc mts to categories by wages#
alloc swlocal to categories by swloop#
alloc swsl to categories by slotfact#
alloc swsil to categories by silotfact#
end

define account    261.3
*     Furniture and Office Equipment
*    Separations Results are Incorporated in this Allocation
*    The Remainder is Allocated by the Allocation of Detail
*    Breakdown of 261.3 Defined in the 8261.3 Accounts Below
set istol equal to isil@+isl@
set ispl equal to isilpl@+islpl@
set interstate equal to istol@+ispl@
set spl equal to silpl@+slpl@
set state equal to total@-interstate@
set mts equal to state@-spl@
alloc mts to categories by act8261#
end

define account     8261.30100000
*    Account 261, Category 3
*    Computers and AMA Systems: Support and
*    Administration of Local Plant
* same as account 240.113101-240.113111
alloc total to categories by looptot#
end

define account     8261.30200000
*    Account 261, Category 3A
*    Computers/AMA Systems: Support & Admin-
*    istration of Local Dial Switching Equip.
```

```
* same as account 221.6-221.6999
alloc total to categories by coeldstot#
end

define account      8261.30300000
*    Account 261, Category 3B
*    Computers/AMA Systems: Support & Admin-
*    istration of Toll Dial Switching Equip.
* same as account 221.21-221.301
alloc total to categories by coetolltot#
end

define account      8261.30400000
*    Account 261, Category 3C
*    Computers/AMA Systems: Support & Admin-
*    istration of Total Dial Switching Equip.
* same as account 221-221.9999
alloc total to categories by coetot#
end

define account      8261.30500000
*    Account 261, Category 3D
*    Computers and AMA Systems: Message Trunk
*    Testing
* same as account 221.8-221.89999 for category mts
alloc total to categories by circuit#
end

define account      8261.30600000
*    Account 261, Category 3E
*    Computers and AMA Systems: Private Line
*    Circuit Equipment
* same as account 221.8-221.8999 for categories spl ispl
alloc total to state
alloc state to spl
alloc spl to categories by plcircuit#
end

define account      8261.30700000
*    Account 261, Category 3F
*    Computers and AMA Systems: Support and
*    Administration of Circuit Equipment
* same as account 221.8-221.8999 for category mts
alloc total to categories by circuit#
end

define account      8261.30800000
*    Account 261, Category 3G
*    Computers and AMA Systems: Overall
*    Support of Telecommunication Equipment
* same as account 221-221.9999 for category mts
alloc total to categories by coetot#
end

define account      8261.30900000
*    Account 261, Category 3H
```

```
*    Computers and AMA Systems: Support and
*    Administration of Manual Switchboards
* same as account 221-221.9999 except 221.116
alloc total to categories by 8261.309#
end

define account     8261.31000000
*    Account 261, Category 3J
*    Computers and AMA Systems: Directory
*    Assistance
* same as account 221.116
alloc total to categories by 221.116#
end

define account     8261.31100000
*    Account 261, Category 3K
*    Computers and AMA Systems: Non-Coe
*    Applications
alloc total to categories by wagestot#
alloc swlocal to categories by 8261.311#
alloc swsl to categories by slotfact#
alloc swsil to categories by silotfact#
end

define account     8261.31200000
*    Account 261, Category 3L
*    Computers and AMA Systems:
*    Non-Interstate
* same as account 240.113101-240.113111
alloc total to categories by looptot#
end

define account     261.40000000
*    Artworks
set istol equal to isil@+isl@
set ispl equal to isilpl@+islpl@
set interstate equal to istol@+ispl@
set spl equal to silpl@+slpl@
set state equal to total@-interstate@
set mts equal to state@-spl@
alloc mts to categories by wages#
alloc swlocal to categories by swloop#
alloc swsl to categories by slotfact#
alloc swsil to categories by silotfact#
* same as account 261.1-261.1999
end

define account     261.50000000
*    Items of Small Value
set istol equal to isil@+isl@

set ispl equal to isilpl@+islpl@
set interstate equal to istol@+ispl@
set spl equal to silpl@+slpl@
set state equal to total@-interstate@
set mts equal to state@-spl@
```

```
alloc mts to categories by wages#
alloc swlocal to categories by swloop#
alloc swsl to categories by slotfact#
alloc swsil to categories by silotfact#
* same as account 261.1-261.1999
end

define account     262.00000000
*    Other Communications Equipment
set istol equal to isil@+isl@
set ispl equal to isilpl@+islpl@
set interstate equal to istol@+ispl@
set spl equal to silpl@+slpl@
set state equal to total@-interstate@
set mts equal to state@-spl@
alloc mts to nts
alloc nts to ntsoff
* THIS IS OFFICIAL EQUIPMENT
end

define account 264.123456
*    Vechicles and Other Work Equipment
*    Categories 1 through 6, Combined from Separations Data
set istol equal to isil@+isl@
set ispl equal to isilpl@+islpl@
set interstate equal to istol@+ispl@
set state equal to total@-interstate@
set spl equal to silpl@+slpl@
set mts equal to state@-spl@
alloc mts to categories by ospmts#
end

define account     264.08000000
*    Small Value Items
set istol equal to isil@+isl@
set ispl equal to isilpl@+islpl@
set interstate equal to istol@+ispl@
set state equal to total@-interstate@
set spl equal to silpl@+slpl@
set mts equal to state@-spl@
alloc mts to categories by ospmts#
* same as account 264.01-264.06
end

define account     304.00000000
*    Tax Accounts: Investment Credits-Net
set interstate equal to istol@
set state equal to total@-interstate@
alloc state to categories by plantst#
* same as account 100.1
end

define account     307.00000000
*    Other Operating Taxes
* DATA SUBMITTED BY SOUTHWESTERN BELL HAS ACCOUNT 307 AGGREGATED
* ALL IN THIS ACCOUNT.  CONSEQUENTLY NO 307.02 THROUGH 307.06
```

```
set interstate equal to istol@
set state equal to total@-interstate@
alloc state to categories by plantst#
* same as account 100.1
end

define account     308.00000000
*    Operating Federal Income Taxes Deferred
*    -Accelerated Tax Depreciation
set interstate equal to istol@
set state equal to total@-interstate@
alloc state to categories by plantst#
* same as account 100.1
end

define account     309.00000000
*    Income Credits & Charges Resulting From
*    Prior Deferrals of Federal Income Taxes
set interstate equal to istol@
set state equal to total@-interstate@
alloc state to categories by plantst#
* same as account 100.1
end

define account     500.01000000
*    Subscribers' Station Revenues: Telephone
*    Exchange Services
* *** BASED ON REVENUE RECEIVED ***
* Initial Values have ntsres ntsbus and ntscoin
alloc total to state
alloc state to mts
alloc mts to nts
end

define account     500.02000000
*    Subscribers' Station Revenues: Mobile
*    Telephone Service
* *** BASED ON REVENUE RECEIVED ***
alloc total to state
alloc state to mts
alloc mts to swnet
alloc swnet to swlocal
alloc swlocal to swmobile
end

define account     500.03000000
*    Subscribers' Station Revenues: Other
*    Exchange Services
* *** BASED ON REVENUE RECEIVED ***
* Initial Values have ntsbus
alloc total to state
alloc state to mts
alloc mts to nts
end

define account     501.00000000
```

```
*    Operating Revenue Accounts: Public
*    Telephone Revenues
* assigned directly to local service for public telephone customer class
alloc total to state
alloc state to mts
alloc mts to nts
alloc nts to ntscoin
end

define account     503.00000000
*    Operating Revenue Accounts: Service
*    Stations
* *** BASED ON REVENUE RECEIVED ***
* Initial Values File has $6,035 Total
* This Allocation Assumes That Residential Customers are in
* Remote Locations
alloc total to state
alloc state to mts
alloc mts to nts
alloc nts to ntsres
end

define account     504.00000000
*    Operating Revenue Accounts: Local
*    Private Line Services
* *** BASED ON REVENUE RECEIVED ***
* Initial Values File Has localpl
alloc total to state
alloc state to spl
end

define account     506.00000000
*    Other Local Service Revenues
* *** BASED ON REVENUE RECEIVED ***
* Initial Values for This Account DON'T MAKE SENSE
alloc total to state
alloc state to mts
alloc mts to swnet
alloc swnet to swop
alloc swop to swda
end

define account     508.10000000
*    Interstate Access Revenues: End User
*    Revenues
* *** BASED ON REVENUE RECEIVED ***
* Initial Values File has istol and isil
alloc total to interstate
end

define account     508.20000000
*    Interstate Access Revenues: Carrier's
*    Carrier Facilities Revenues
* *** BASED ON REVENUE RECEIVED ***
* Initial Values File has istol and isil
alloc total to interstate
```

```
end

define account     508.30000000
*    Interstate Access Revenues: Special
*    Access Revenues
* *** BASED ON REVENUE RECEIVED ***
* Initial Values File has istol and isil
alloc total to interstate
end

define account     509.02000000
*    Intrastate Access Revenues: End User
*    Revenues
* *** BASED ON REVENUE RECEIVED ***
* Initial Values File has swstol and swsil
alloc total to state
alloc state to mts
alloc mts to swnet
alloc swnet to swtoll
end

define account     509.04000000
*    Intrastate Access Revenues: Carrier's
*    Carrier Facilities Revenues
* *** BASED ON REVENUE RECEIVED ***
* Initial Values have swda, swsil, and swsl
alloc total to state
alloc state to mts
alloc mts to swnet
set swstol equal to swsil@+swsl@
set swtoll equal to swstol@
set swop equal to swda@
end

define account     509.06000000
*    Intrastate Access Revenues: Special
*    Access Revenues
* *** BASED ON REVENUE RECEIVED ***
* The Revenues are for Private Line and WATS Access
* For InterLATA and IntraLATA Services
* Initial Values DO NOT have InterLATA and IntraLATA Breakdown
alloc total to state
* alloc state to mts
* alloc mts to swnet
* alloc swnet to swtoll
* alloc swtoll to swstol
end

define account   510.00000000
*    Operating Revenue Accounts: Message
*    Tolls
* *** BASED ON REVENUE RECEIVED ***
* The Revenues in the Initial Values File Have istol
* The Remainder are for Intrastate IntraLATA Message Toll
set interstate equal to istol@
set state equal to total@-interstate@
```

```
alloc state to mts
alloc mts to swnet
alloc swnet to swtoll
alloc swtoll to swstol
end

define account     511.00000000
*    Operating Revenue Accounts: Wide Area
*    Toll Service
* *** BASED ON REVENUE RECEIVED ***
* The Revenues in the Initial Values File Have istol
* The Remainder are for Intrastate IntraLATA WATS
set interstate equal to istol@
set state equal to total@-interstate@
alloc state to mts
alloc mts to swnet
alloc swnet to swtoll
alloc swtoll to swstol
end

define account     512.00000000
*    Operating Revenue Accounts: Toll Private
*    Line Service
* *** BASED ON REVENUE RECEIVED ***
* Initial Values have ispl
set interstate equal to ispl@
set state equal to total@-interstate@
alloc state to spl
end

define account     516.00000000
*    Operating Revenue Accounts: Other Toll
*    Service Revenues
* *** BASED ON REVENUE RECEIVED ***
* These Revenues are for da and Settlements with Independents
set state equal to total@-istol@
alloc state to mts
alloc mts to swnet
alloc swnet to swop
alloc swop to swda
end

define account     521.00000000
* Telegraph Commissions
* NONJURISDICTIONAL
end

define account     523.00000000
*    Operating Revenue Accounts: Directory
*    Advertising and Sales
* *** BASED ON REVENUE RECEIVED ***
* assigned to directory profit center-classified directory
end

define account     524.00000000
* Rent Revenues -- Land, Buildings, Conduit Space, Right-of-Way,
```

```
* and Taxes
end

define account     524.05000000
* Rent Revenues -- MFJ-Related
end

define account     524.09000000
* Rent Revenues -- Other
end

define account     525.00000000
*    Operating Revenue Accounts: Revenues
*    from General Services and Licenses
* *** BASED ON REVENUE RECEIVED ***
end

define account     526.00000000
*    Operating Revenue Accounts: Other
*    Operating Revenues
* *** BASED ON REVENUE RECEIVED ***
end

define account     527.00000000
*    Operating Revenue Accounts: Interstate
*    Billing and Collection Revenues
* *** BASED ON REVENUE RECEIVED ***
* assigned to interstate interlata service for other carrier access
* Initial Values have istol
end

define account     528.00000000
*    Operating Revenue Accounts: Intrastate
*    Billing and Collection Revenues
* *** BASED ON REVENUE RECEIVED ***
* assigned to intrastate interlata service for other carrier access
alloc total to state
alloc state to mts
alloc mts to swnet
alloc swnet to swtoll
alloc swtoll to swstol
alloc swstol to swsil
end

define account     530.00000000
*    Operating Revenue Accounts:
*    Uncollectible Operating Revenues-Debit
* *** BASED ON UNCOLLECTIBLE REVENUES ***
* Initial Values have istol
set state equal to total@-istol@
alloc state to mts
alloc state to swnet
end

define account     602.10000000
*    Repairs to Pole Lines
```

```
set interstate equal to istol@
set state equal to total@-interstate@
alloc state to categories by osp#
* same as account 240-244.9999
end

define account     602.20000000
*    Repairs to Aerial Cable
set interstate equal to istol@
set state equal to total@-interstate@
alloc state to categories by osp#
* same as account 240-244.9999
end

define account     602.30000000
*    Repairs of Underground Cable
set interstate equal to istol@
set state equal to total@-interstate@
alloc state to categories by osp#
* same as account 240-244.9999
end

define account     602.40000000
*    Repairs of Buried Cable
set interstate equal to istol@
set state equal to total@-interstate@
alloc state to categories by osp#
* same as account 240-244.9999
end

define account     602.50000000
*    Repairs of Submarine Cable
set interstate equal to istol@
set state equal to total@-interstate@
alloc state to categories by osp#
* same as account 240-244.9999
end

define account     602.60000000
*    Repairs of Aerial Wire
set interstate equal to istol@
set state equal to total@-interstate@
alloc state to categories by osp#
* same as account 240-244.9999
end

define account     602.70000000
*    Repairs of Underground Conduit
set interstate equal to istol@
set state equal to total@-interstate@
alloc state to categories by osp#
* same as account 240-244.9999
end

define account     602.80000000
*    Shop Repairs and Salvage Adjustment
```

```
set interstate equal to istol@
set state equal to total@-interstate@
alloc state to categories by osp#
* same as account 240-244.9999
end

define account     603.10000000
*    Test Desk Work: Subscriber Line Testing

* proportioned by account 221.8kcsl and 240.kcsl

set interstate equal to istol@
set spl equal to silpl@+slpl@
set state equal to total@-interstate@
set mts equal to state@-spl@
alloc mts to nts
alloc nts to categories by nts.alloc#
* same as account 221.8113101, 240.113101
end

define account     603.20000000
*    Test Desk Work: Inward Service Order

set interstate equal to istol@
set spl equal to silpl@+slpl@
set state equal to total@-interstate@
set mts equal to state@-spl@
alloc mts to nts
alloc nts to categories by inward#
alloc ntsres to categories by resloop#
alloc ntsbus to categories by busloop#
alloc ntsctx to categories by ctxloop#
end

define account     603.40000000
*    Test Desk Work: Message Trunk Testing
* same as account 221-221.80672, 221.80713-221.80716, 221.807191-221.807203, +
* 221.81111-221.8113114, 221.8113241-221.8113274
* proportioned by account 221 excluding category 8G1-8G12, 8G17-8G18,
*   8H, 8J, 8KJ, 8KCT1-8KCT2B
* THE DATA SUBMITTED BY SOUTHWESTERN BELL FOR THIS SUBACCOUNT
* CONTAIN THE COSTS FOR 603.3, 603.5, 603.6, AND 603.7
* THE ALLOCATION OF THIS COMBINED ACCOUNT IS DONE ACCORDING TO THE ALLOCATION
* OF OUTSIDE PLANT ACCOUNT 240 AND CIRCUIT EQUIPMENT ACCOUNT 221.8
set interstate equal to istol@
set state equal to total@-interstate@
alloc state to categories by ospcrt#
end

define account     604.10000000
*    Ordinary Repairs to Central Office
*    Equipment
* same as account 221-221.9999
set interstate equal to istol@
set state equal to total@-interstate@
alloc state to categories by coest#
```

```
end

define account     604.40000000
*    Shop Repairs and Salvage Adjustments
*    Expense for Central Office Equipment
set interstate equal to istol@
set state equal to total@-interstate@
alloc state to categories by coest#
* same as account 604.1
end

define account     604.60000000
*    House Service
set interstate equal to istol@
set state equal to total@-interstate@
alloc state to categories by 212.01#
* same as account 212.01
* account 211 and 212, category 1
end

define account     604.70000000
*    Rearrangements and Changes Expense for
*    Central Office Equipment
set interstate equal to istol@
set state equal to total@-interstate@
alloc state to categories by coest#
* same as account 221-221.9999
end

define account     604.80000000
*    Interoffice Facility Assignment and
*    Circuit Layout
* same as account 221-221.81131, 221.8113199-221.9999, 240-240.1131, +
*  240.113199-240.9999
set interstate equal to istol@
set state equal to total@-interstate@
alloc state to categories by interoffice#
* same as account 240 less category kcs
* and account 221 less category 8kcs
end

define account     605.11000000
*    Ordinary Repairs to Telephone and Misc.
*    Station Apparatus Repair Parts
set interstate equal to istol@
set state equal to total@-interstate@
alloc state to categories by loopst#
* same as account 240.113101-240.113111
* same as account 240 category KCS
end

define account     605.12000000
*    Ordinary Repairs to Large Private
*    Branch Exchanges
set interstate equal to istol@
set state equal to total@-interstate@
```

```
alloc state to mts
alloc mts to nts
alloc nts to ntsctx
alloc ntsctx to categories by ctxloop#
* same as account 8605.12
end

define account     605.40000000
*    Shop Repairs and Salvage Adjustments to
*    Station Equipment
set interstate equal to istol@
set state equal to total@-interstate@
alloc state to categories by repairs#
* same as account 605.1-605.1999
end

define account     605.72000000
*    Rearrangements and Changes for Station
*    Apparatus and Inside Wire
set interstate equal to istol@
set state equal to total@-interstate@
alloc state to mts
alloc mts to nts
alloc nts to categories except ntsctx by loop.ntsctx#
* same as account 8605.72
* same as account 240 kcs for pl and  customers except trunk and CENTREX
end

define account     605.74000000
*    Rearrangements and Changes to Large Pri-
*    vate Br. Ex. Station App. & Inside Wire
set interstate equal to istol@
set state equal to total@-interstate@
alloc state to mts
alloc mts to nts
alloc nts to ntsctx
alloc ntsctx to categories by ctxloop#
* same as 8605.74
end

define account     605.80000000
*    Plant Assignment and Related Clerical
*    Work
set interstate equal to istol@
set state equal to total@-interstate@
alloc state to mts
alloc mts to nts
alloc nts to categories by inward#
alloc ntsres to categories by resloop#
alloc ntsbus to categories by busloop#
alloc ntsctx to categories by ctxloop#
* same as account 645.11, 645.21, 645.3, 645.41
* same as account 645 1a, 2a, 3, 4a
end

define account     606.00000000
```

```
*    Repairs to Building and Grounds

set interstate equal to istol@
set state equal to total@-interstate@
alloc state to categories by bldg#
* same as account 211-212.9999
end

define account     607.00000000
*    Repairs to Public Telephone Equipment
set interstate equal to istol@
set state equal to total@-interstate@
* alloc state to categories by act235#
alloc state to mts
alloc mts to nts
alloc nts to ntscoin
* same as account 235-235.9999
end

define account     608.00000000
*    Depreciation Expenses

set interstate equal to istol@
set state equal to total@-interstate@
alloc state to categories by plantst#
* same as account 100.1
end

define account     610.00000000
*    Maintaining Transmission Power

set interstate equal to istol@
set state equal to total@-interstate@
alloc state to categories by coest#
* same as account 221-221.9999
end

define account     612.00000000
*    Other Maintenance Expense
set istol equal to isil@+isl@
set ispl equal to isilpl@+islpl@
set interstate equal to istol@+ispl@
set state equal to total@-interstate@
alloc state to categories by operatexp#
* same as account 602.1-610.9999
end

define account     620.000000
*     Combined Traffic Expenses Accounts 621-631
set interstate equal to istol@
set state equal to total@-interstate@
alloc state to categories by act8620#
end

define account     8620.12070000
*    Account 620, Category FSG 1207
```

```
*    Operator Service Centers: Directory
*    Assistance Records
* same as account 8620.21150
alloc total to categories by 221.116#
end

define account     8620.12080000
*    Account 620, Category FSG 1208
*    Operator Services-General Supervision
* same as account 8620.1205-8620.1207, 632-635.9999
alloc total to categories by 8620.1208#
end

define account     8620.12090000
*    Account 620, Category FSG 1209
*    Operator Services-Equal Access
* same as account 8620.21150
alloc total to categories by 221.116#
end

define account     8620.21080000
*    Account 620, Category FSG 21080
*    Operation Service Centers: Customer Name
*    and Address Service Center
* same as account 221.1160
* same as account 221.1P
alloc total to categories by 221.116#
end

define account     8620.21090000
*    Account 620, Category FSG 21090
*    Operator Service Centers: IntraLATA
*    Toll and Assistance Network
* same as account 221.101, 221.102-221.1021, 221.108
* same as account 221.1A, 221.1B, 221.1H
alloc total to state
alloc state to mts
alloc mts to swnet
alloc swnet to swop
alloc swop to swtsps
end

define account     8620.21130000
*    Account 620, Category FSG 21130
*    Operator Services-Other Network
* same as account 8620.21080, 8620.21090, 8620.21150, 8620.21170
alloc total to categories by 8620.2113#
end

define account     8620.21150000
*    Account 620, Category FSG 21150
*    Operator Service Centers: Directory
*    Assistance Network Service Center
* same as account 221.1160
alloc total to categories by 221.116#
* same as account 221.1P
```

```
end

define account      8620.21170000
*    Account 620, Category FSG 21170
*    Intercept Operator Service Center
* same as account 221.117
alloc total to categories by 221.117#
* same as account 221.1Q
end

define account      8620.21180000
*    Account 620, Category FSG 21180
*    Operation Service Center: Directory
*    Assistance Record Maintenance
* same as account 8620.21150
alloc total to categories by 221.116#
end

define account      8620.21190000
*    Account 620, Category FSG 21190
*    Operation Service Center: Data Base
*    Administration Center
* same as account 8620.21170
alloc total to categories by 221.117#
end

define account      8620.21200000
*    Account 620, Category FSG 21200
*    Operation Service Center: Service
*    Evaluation Center
alloc total to categories by 8620.1206#
end

define account      8620.21210000
*    Account 620, Category FSG 21210
*    Operation Service Center: Message
*    Investigation Center
* same as account 510.0, 511.0, 512.0, 516.0
alloc total to categories by amausetot#
end

define account      8620.27000000
*    Account 620, Category FSG 27000
*    Network Administration-Data
* same as account 221.2-221.7999
alloc total to categories by coenocrt#
end

define account      8620.27010000
*    Account 620, Category FSG 27010
*    Network Administration-Switching
* same as account 221.2-221.7999
alloc total to categories by coenocrt#
end

define account      8620.27020000
```

```
*    Account 620, Category FSG 27020
*    Network Administration-Trunks
* same as account 221.8-221.81131, 221.8113109-221.8999, +
* 240-240.113100, 240.113112-240.9999
alloc total to categories by 8620.2702#
* same as account 221 (COE) and 240 (OSP) except kcs and 8kcs
end

define account     8620.27030000
*    Account 620, Category FSG 27030
*    Network Administration-Transition
* same as account 221.2-221.7999
alloc total to categories by coenocrt#
end

define account     8620.27040000
*    Account 620, Category FSG 27040
*    Network Administration-Line, Number
*    and Central Office
* same as account 221.8113101-221.8113108, 240.113101-240.113111
* same as account 240.kcs, 221.8kcs
alloc total to categories by 8620.2704#
end

define account     8620.27050000
*    Account 620, Category FSG 27050
*    Network Administration-Translation
* same as account 221.2-221.7999
alloc total to categories by coenocrt#
end

define account     8620.27220000
*    Account 620, Category FSG 00220
*    Network Administration Support -
*    Customer
* same as account 8620.27010, 8620.27020, 8620.27040
alloc total to categories by 8620.2722#
end

define account     8620.27600000
*    Account 620, Category FSG 27600
*    Network Administration Support-General
*    Administration
* same as account 8620.27000-8620.27050, 8620.27220
alloc total to categories by 8620.276#
end

define account     8620.27610000
*    Account 620, Category FSG 27610
*    Network Administration Support -
*    Supervisory
* same as account 8620.27000-8620.27050, 8620.27220
alloc total to categories by 8620.276#
end

define account     8620.27620000
```

```
*    Account 620, Category FSG 27620
*    Network Administration Support -
*    Education and Training
* same as account 8620.27000-8620.27050, 8620.27220
alloc total to categories by 8620.276#
end

define account     8620.29000000
*    Account 620, Category FSG 29000
*    Operation Service Center: Force
*    Management Center
* same as account 8620.21080, 8620.21090, 8620.21130, 8620.21150, 8620.21170
alloc total to categories by 8620.2113#
end

define account     8620.29020000
*    Account 620, Category FSG 29020
*    Operation Service Center: Facilities
*    Administration
* same as account 8620.21080, 8620.21090, 8620.21130, 8620.21150, 8620.21170
alloc total to categories by 8620.2113#
end

define account     632.00000000
*    Public Telephone Expense
set interstate equal to istol@
set state equal to total@-interstate@
alloc state to mts
alloc mts to nts
alloc nts to ntscoin
* same as account 8632.0
end

define account     633.00000000
*    Other Traffic Expense

set interstate equal to istol@
set state equal to total@-interstate@
alloc state to categories by act8620#
* same as account 620.1205-620.1209, 620.21180-620.21210, 620.29000-620.29020
* excluding accounts 633, 634, 635
end

define account     634.00000000
*    Joint Traffic Expenses-Debit

set interstate equal to istol@
set state equal to total@-interstate@
alloc state to categories by act8620#
* same as account 621-633.9999
end

define account     635.00000000
*    Joint Traffic Expenses-Credit

set interstate equal to istol@
```

```
set state equal to total@-interstate@
alloc state to categories by act8620#
* same as account 621-633.9999
end

define account     640.000000
*    General Commercial Administration

set interstate equal to istol@
set state equal to total@-interstate@
alloc state to categories by act8640#
end

define account     8640.10000000
*    General Commercial Administration
*    Expense for Business
* same as account 8642-8642.9999, 8643.1-8643.9999, 645-645.9999
alloc total to state
alloc state to mts
alloc mts to nts
alloc nts to ntsbus by loopbus
alloc nts to ntsctx by 1-loopbus
alloc ntsctx to categories by commxres#
alloc ntsbus to categories by commxres#
end

define account     8640.20000000
*    General Commercial Administration
*    Expense for Residence
* same as account 8642-8642.9999, 8643.1-8643.9999, 645-645.9999
alloc total to state
alloc state to mts
alloc mts to nts
alloc nts to ntsres
alloc ntsres to categories by commxbus#
end

define account     8640.30000000
*    General Commercial Administration
*    Expense for Public Telephone
set interstate equal to istol@
set state equal to total@-interstate@
alloc state to mts
alloc mts to nts
alloc nts to ntscoin
* same as account 8642-8642.9999, 8643.1-8643.9999, 645-645.9999
end

define account     8640.40000000
*    Gen. Commercial Administration Expenses
*    for Interexchange Customer Serv. Center
* same as account 645-645.9999
alloc total to categories by 645tot#
end

define account     8640.50000000
```

```
*    All Other General Commercial
*    Administration Expense
* same as account 8640.1-8640.4
alloc total to categories by act8640tot#
end

define account     642.000000
*     Advertising
set interstate equal to istol@
set state equal to total@-interstate@
alloc state to categories by act8642#
end

define account     8642.10000000
*    Account 642, Category 1
*    Advertising Expense for Corporate
* same as account 100.1
alloc total to categories by plant#
* common allocation
end

define account     8642.20000000
*    Account 642, Category 2
*    Advertising Expense for Informational
*    Purposes
alloc total to state
alloc state to mts
alloc mts to nts
alloc nts to categories by loopcnt#
alloc ntsres to categories by resloop#
alloc ntsbus to categories by busloop#
alloc ntsctx to categories by ctxloop#
end

define account     8642.31000000
*    Account 642, Category 3A
*    Advertising Expenses for Sales: Business
*    Customers
alloc total to state
alloc state to mts
alloc mts to nts
alloc nts to categories except ntsres by loopcntres#
alloc ntsbus to busloc
alloc ntsctx to ctxloc
end

define account     8642.32000000
*    Account 642, Category 3B
*    Advertising Expenses for Sales:
*    Residential Customers
alloc total to state
alloc state to mts
alloc mts to nts
alloc nts to ntsres
alloc ntsres to resloc
end
```

```
define account     8642.33000000
*    Account 642, Category 3C
*    Advertising Expenses for Sales: Public
*    Telephone
set interstate equal to istol@
set state equal to total@-interstate@
alloc state to mts
alloc mts to nts
alloc nts to ntscoin
end

define account     8642.41000000
*    Account 642, Category 4A
*    Advertising Expense for Long Distance:
*    Business Customers
alloc total to state
alloc state to mts
alloc mts to nts
alloc nts to categories except ntsres by loopcntres#
alloc ntsbus to categories except busloc busfga busfgb by buslooptoll#
alloc ntsctx to categories except ctxloc ctxfga ctxfgb by ctxlooptoll#
end

define account     8642.42000000
*    Account 642, Category 4B
*    Advertising Expense for Long Distance:
*    Residential Customers
alloc total to state
alloc state to mts
alloc mts to nts
alloc nts to ntsres
alloc ntsres to categories except resloc resfga resfgb by reslooptoll#
end

define account     8642.43000000
*    Account 642, Category 4C
*    Advertising Expense for Long Distance:
*    Public Telephone
set interstate equal to istol@
set state equal to total@-interstate@
alloc state to mts
alloc mts to nts
alloc nts to ntscoin
end

define account     8642.50000000
*    Account 642, Category 5
*    Other Advertising Expense for Long
*    Distance
* same as account 8642-8642.4999
alloc total to categories except swlocal resloc busloc ctxloc by act8642tol#
end

define account     643.0000000
*  Sales Expense
```

```
set interstate equal to istol@
set state equal to total@-interstate@
alloc state to categories by act8643#
end

define account     8643.10000000
*    Sales Expenses for Business Customers--
*    Both Private Line and Message Service
*    DATA SUBMITTED BY SOUTHWESTERN BELL DID NOT HAVE
*    DETAILED BREAK DOWN EXCEPT THROUGH SEPARATIONS DATA
set interstate equal to istol@
set spl equal to silpl@+slpl@
set state equal to total@-interstate@
set mts equal to state@-spl@
alloc mts to nts
alloc nts to categories except ntsres by loopcntres#
alloc ntsbus to categories by busloop#
alloc ntsctx to categories by ctxloop#
end

define account     8643.20000000
*    Sales Expense for Residential Customers
alloc total to state
alloc state to mts
alloc mts to nts
alloc nts to ntsres
alloc ntsres to categories by resloop#
end

define account     8643.30000000
*    Sales Expense for Public Telephone
*    Service
set interstate equal to istol@
set state equal to total@-interstate@
alloc state to mts
alloc mts to nts
alloc nts to ntscoin
end

define account     8643.50000000
* Sales Expense -- Other
* same as 8643.1-8643.4999
alloc total to categories by act8643tot#
end

define account     644.10000000
*    Connecting Company Relations Expense for
*    Private Line Service
alloc total to state
alloc state to spl
alloc spl to slpl
end

define account     644.30000000
*    Connecting Company Relations Expense for
*    Message Toll Service
```

```
set interstate equal to istol@
set state equal to total@-interstate@
alloc state to mts
alloc mts to nts
alloc nts to categories by loopcnt#
alloc ntsres to categories except resloc resfga resfgb by reslooptoll#
alloc ntsbus to categories except busloc busfga busfgb by buslooptoll#
alloc ntsctx to categories except ctxloc ctxfga ctxfgb by ctxlooptoll#
end

define account     645.10000000
*    Account 645, Category 1
*    Local Commercial Operations Expense
* DATA NOT SUBMITTED IN SUFFICIENT FORM TO DISTINGUISH SERVICE ORDER
* ACTIVITY FROM NON-SERVICE ORDER ACTIVITY.  SUBACCOUNT INFORMATION FROM
* THE ACCOUNTS MANUAL IMPLIED SUCH A BREAKDOWN WAS POSSIBLE!
set interstate equal to istol@
set state equal to total@-interstate@
alloc state to mts
alloc mts to nts
alloc nts to categories except ntsres by inward.res#
alloc ntsbus to categories by busloop#
alloc ntsctx to categories by ctxloop#
end

define account     645.20000000
*    Account 645, Category 2
*    Local Commercial Operations Expense:
* DATA NOT SUBMITTED IN SUFFICIENT FORM TO DISTINGUISH SERVICE ORDER
* ACTIVITY FROM NON-SERVICE ORDER ACTIVITY.  SUBACCOUNT INFORMATION FROM
* THE ACCOUNTS MANUAL IMPLIED SUCH A BREAKDOWN WAS POSSIBLE!
set interstate equal to istol@
set state equal to total@-interstate@
alloc state to mts
alloc mts to nts
alloc nts to ntsres
alloc ntsres to categories by resloop#
end

define account     645.30000000
*    Account 645, Category 3
*    Local Commercial Operations Expense for
*    Public Telephone
set interstate equal to istol@
set spl equal to silpl@+slpl@
set state equal to total@-interstate@
set mts equal to state@-spl@
alloc state to mts
alloc mts to nts
alloc nts to ntscoin
end

define account     645.40000000
*    Account 645, Category 4
*    Local Comm. Operations Expense
set interstate equal to istol@
```

```
set state equal to total@-interstate@
alloc state to mts
alloc mts to nts
alloc nts to categories by loopcnt#
alloc ntsres to categories except resloc rda rtsps rsl by resloop.ix#
alloc ntsbus to categories except busloc bda btsps bsl by busloop.ix#
alloc ntsctx to categories except ctxloc cda ctsps csl by ctxloop.ix#
end

define account     645.50000000
*    Account 645, Category 5
*    The Remaining Local Commercial
*    Operations Expense
set interstate equal to istol@
set state equal to total@-interstate@
alloc state to categories by act645#
* same as account 645.1-645.4999
end

define account     648.00000000
*    Public Telephone Commissions
set interstate equal to istol@
set spl equal to silpl@+slpl@
set state equal to total@-interstate@
set mts equal to state@-spl@
alloc state to mts
alloc mts to nts
alloc nts to ntscoin
end

define account     649.00000000
* Directory Expense
* DATA NOT SUBMITTED BY SOUTHWESTERN BELL IN FORM REQUIRED
* CLASSIFIED DIRECTORY HELD BY A SEPARATE SUBSIDIARY
set interstate equal to istol@
set state equal to total@-interstate@
alloc state to categories by act8649#
end

define account      8649.200000
* Directory Expense for Alphabetica and Street Address
* BREAKDOWN FOR 649.21 THROUGH 649.23 NOT PROVIDED BY SOUTHWESTERN BELL
set interstate equal to istol@
set state equal to total@-interstate@
alloc state to mts
alloc mts to nts
alloc nts to categories by loopcnt#
alloc ntsres to resloc
alloc ntsbus to busloc
alloc ntsctx to ctxloc
end

define account     8649.32000000
*    Directory Expense for Delivery of
*    Alphabetical Directories
* same as account 8649.200000
```

```
set interstate equal to istol@
set state equal to total@-interstate@
alloc state to mts
alloc mts to nts
alloc nts to categories by loopcnt#
alloc ntsres to resloc
alloc ntsbus to busloc
alloc ntsctx to ctxloc
end

define account     8649.41000000
*    All Other Directory Expenses:
*    Mechanization of Directory Operations
* same as account 8649.200000
set interstate equal to istol@
set state equal to total@-interstate@
alloc state to mts
alloc mts to nts
alloc nts to categories by loopcnt#
alloc ntsres to resloc
alloc ntsbus to busloc
alloc ntsctx to ctxloc
end

define account     8649.42000000
*    Address Telephone Directories, Special
*    Number Services, & Foreign Directories
* alloc total to profit
* Costs NOT INCLUDED in the Revenue Requirement
end

define account     8649.43000000
*    Other Directory Expenses: Admin. or
*    Supportive Personnel in Dir. Operations
* same as account 8649.1-8649.429999
set interstate equal to istol@
set state equal to total@-interstate@
alloc state to mts
alloc mts to nts
alloc nts to categories by loopcnt#
alloc ntsres to resloc
alloc ntsbus to busloc
alloc ntsctx to ctxloc
end

define account     650.00000000
*    Other Commercial Expenses -- Total
*  THE DETAILED BREAKDOWN OF 650.1 THROUGH 650.3 WAS NOT
*  PROVIDED BY SOUTHWESTERN BELL
set interstate equal to istol@
set state equal to total@-interstate@
alloc state to categories by act650#
end

define account     661.00000000
*    General Office Salaries and Expenses:
```

```
*    Executive Department
set interstate equal to istol@
set state equal to total@-interstate@
alloc state to categories by plantst#
* same as account 100.1
* assigned to common
end

define account     662.00000000
* Accounting Department -- All Categories

set interstate equal to istol@
set state equal to total@-interstate@
alloc state to categories by act8662#
end

define account     8662.01100000
*    Customer Accounting Department Expenses:
*    Toll Message Operations
* ALLOCATED TO THE CUSTOMER CLASSES AND SERVICES BY THE
* RELATIVE AMOUNT OF ORIGINATING TOLL USE
alloc total to state
alloc state to mts
alloc mts to nts
alloc nts to categories by loop.nts#
* alloc ntsres to categories by ????
* alloc ntsbus to categories by ????
* alloc ntsctx to categories by ????
end

define account     8662.01200000
*    Customer Accounting Department Expenses:
*    Local Message Operations
* ALLOCATED BY THE RELATIVE LOOP COUNTS FOR LOCAL MEASURED SERVICE
* FOR EACH CUSTOMER CLASS
alloc total to state
alloc state to mts
alloc mts to nts
alloc nts to categories by measured#
alloc ntsres to categories by resloop#
alloc ntsbus to categories by busloop#
alloc ntsctx to categories by ctxloop#
end

define account     8662.01300000
*    Customer Accounting Department Expenses:
*    Service and Equipment Operations
alloc total to state
alloc state to mts
alloc mts to nts
alloc nts to categories by inward#
* ALLOCATED TO CUSTOMER CLASSES BY THE AMOUNT OF INWARD AND OUTWARD
* MIGRATION FOR EACH CUSTOMER CLASS
alloc ntsres to categories by resloop#
alloc ntsbus to categories by busloop#
alloc ntsctx to categories by ctxloop#
```

```
end

define account     8662.01400000
*    Customer Accounting Department Expenses:
*    Remittance Operations
alloc total to categories by loop.tot#
end

define account     8662.01500000
*    Customer Accounting Department Expenses:
*    Accounts Operations
alloc total to categories by loop.tot#
end

define account     8662.01600000
*    Customer Accounting Department Expenses:
*    Customer Output
alloc total to state
set spl equal to silpl@+slpl@
set mts equal to state@-spl@
alloc mts to nts
alloc nts to categories by loop.nts#
end

define account     8662.01700000
*    Customer Accounting Department Expenses:
*    Access Charges Operations
alloc total to categories by loop.tot#
end

define account     8662.01800000
*    Customer Accounting Operations -
*    Executive
* same as account 8662.01-8662.01799
alloc total to categories by act8662.018#
end

define account     8662.02100000
*    Corporate Accounting Operations: Payroll
*    Operations
alloc total to categories by wagestot#
alloc swlocal to categories by swloop#
alloc swsl to categories by slotfact#
alloc swsil to categories by silotfact#
end

define account     8662.02200000
*    Corporate Accounting Operations:
*    Investment and Cost Operations
alloc total to categories by plant#
* same as account 100.1
end

define account     8662.02300000
*    Corporate Accounting Operations:
*    Accounts Payable Operations
```

```
alloc total to categories by plant#
end

define account     8662.02400000
*    Corporate Accounting Operations:
*    Corporate Reports Operations
* same as account 100.1
alloc total to categories by plant#
* assigned to common
end

define account     8662.02500000
*    Corporate Functional Accounting System
*    Processing Operations
* same as account 8662.01-8662.02999
alloc total to categories by act8662.02#
end

define account     8662.03000000
*    General Accounting
* same as account 8662.01-8662.02999
alloc total to categories by act8662.02#
end

define account     663.00000000
*    Treasury Department
* assigned to common
set interstate equal to istol@
set state equal to total@-interstate@
alloc state to categories by plantst#
end

define account     664.00000000
*    Law Department
set interstate equal to istol@
set state equal to total@-interstate@
alloc state to categories by plantst#
end

define account     665.00000000
*    Other General Office Salaries and
*    Expenses
* assigned to common
set interstate equal to istol@
set state equal to total@-interstate@
alloc state to categories by plantst#
end

define account     668.00000000
*    Insurance
* assigned to common
set interstate equal to istol@
set state equal to total@-interstate@
alloc state to categories by plantst#
end
```

```
define account     669.00000000
*    Accidents and Damages
* assigned to common
set interstate equal to istol@
set state equal to total@-interstate@
alloc state to categories by plantst#
end

define account 671.000000
* Operating Rents -- All Categories
set istol equal to isil@+isl@
set ispl equal to isilpl@+islpl@
set interstate equal to istol@+ispl@
set state equal to total@-interstate@
set mts equal to state@
alloc mts to categories by act8671#
end

define account     8671.10100000
*    Account 671, Category 1
*    Operating Rents: Manual Switching
*    Equipment Space
* same as 212.01
alloc total to categories by 212.01tot#
end

define account     8671.10200000
*    Operating Rents: Dial Switching
*    Equipment Space
* same as 212.01
alloc total to categories by 212.01tot#
end

define account     8671.10300000
*    Operating Rents: Circuit Equipment
*    Space
* same as 212.01
alloc total to categories by 212.01tot#
end

define account     8671.10400000
*    Operating Rents: Operators' Quarters
* same as 212.02
alloc total to categories by 212.02tot#
end

define account     8671.10500000
*    Operating Rents: Genral Traffic
*    Supervision Space
* same as 212.03
alloc total to categories by 212.03tot#
end

define account     8671.10600000
*    Operating Rents: Commercial Office
*    Space
```

```
* same as 212.04
alloc total to categories by 212.04tot#
end

define account     8671.10700000
*    Operating Rents: Revenue Accounting
*    Space
* same as 212.06
alloc total to categories by 212.06tot#
end

define account     8671.10800000
*    Operating Rents: Garages, Storerooms,
*    Warehouses, and Pole Yards
same as 212.07
* same as 212.07
alloc total to categories by 212.07tot#
end

define account     8671.11000000
*    Operating Rents: General Office Space
* same as 212.09
alloc total to categories by 212.09tot#
end

define account     8671.20000000
*    Account 671, Category 2
*    Operating Rents: Outside Plant Rents
* same as account 240-240.9999
alloc total to categories by osptot#
end

define account     8671.30000000
*    Account 671, Category 3
*    Operating Rents: Circuit Rents
* same as account 221.8-221.8999
alloc total to categories by circuittot#
end

define account     8671.40000000
*    Account 671, Category 4
*    Operating Rents: Equipment Rents
* same as account 221
alloc total to categories by coetot#
end

define account     8671.51000000
*    Account 671, Category 5A
*    Operating Rents: Switching Equipment
* same as account 221-221.7999
alloc total to categories by coenocrt#
end

define account     8671.52000000
*    Account 671, Category 5B
*    Operating Rents: Cable Transmission
```

```
*    Facilities and Structures
* same as account 240-240.9999
alloc total to categories by osptot#
end

define account     8671.53000000
*    Account 671, Category 5C
*    Operating Rents: Central Office Circuit
*    and Radio Transmission Equipment
* same as account 221.8-221.8999
alloc total to categories by circuittot#
end

define account     8671.54000000
*    Account 671, Category 5D
*    Operating Rents: Operator Services
alloc total to state
alloc state to mts
alloc mts to swnet
alloc swnet to swop
alloc swop to swtsps
end

define account     8671.55000000
*    Account 671, Category 5E
*    Operating Rents: Land and Buildings
* same as account 211-212.9999
alloc total to categories by bldgtot#
end

define account     8671.56000000
*    Account 671, Category 5F
*    Operating Rents: Operations Center and
*    Support Systems
* same as account 221-221.9999, 261.3-261.3999
alloc total to categories by 8671.56#
end

define account     8671.57000000
*    Account 671, Category 5G
*    Operating Rents: Power and Distributing
*    Frames
* same as account 221
alloc total to categories by coetot#
end

define account     8671.60000000
*    Account 671, Category 6
*    Operating Rents: Antitrust and Other
*    Rents
* same as account 100.1
alloc total to categories by plant#
* assign to common
end

define account     8671.90000000
```

```
* Operating Rents -- Intra-Company
* same as account 100.1
alloc total to categories by plant#
end

define account     672.00000000
*    Operating Rents: Operator Services
*    Relief and Pensions
set interstate equal to istol@
set state equal to total@-interstate@
alloc state to categories by wagesst#
alloc swlocal to categories by swloop#
alloc swsl to categories by slotfact#
alloc swsil to categories by silotfact#
end

define account     673.00000000
*    Telephone Franchise Requirements
* same as account 100.1
* assign to common
set interstate equal to istol@
set state equal to total@-interstate@
alloc state to categories by plantst#
end

* define account     674.00000000
*    General Services and Licenses
* same as account 100.1
* assign to common
* set interstate equal to istol@
* set state equal to total@-interstate@
* alloc state to categories by plantst#
* end

define account     675.00000000
*    Other Operating Expenses
* same as account 100.1
* assign to common
set interstate equal to istol@
set state equal to total@-interstate@
alloc state to categories by plantst#
end

define account     676.00000000
*    Telephone Franchise Requirements -
*    Credit
* same as account 100.1
* assign to common
set interstate equal to istol@
set state equal to total@-interstate@
alloc state to categories by plantst#
end

define account     677.00000000
*    Expenses Charged Construction-Credit
* same as account 100.1
```

```
* assign to common
set interstate equal to istol@
set state equal to total@-interstate@
alloc state to categories by plantst#
end

end iteration
```

APPENDIX H

List of Summaries for Basic Cost Allocation Model

Report Summaries

Summaries are designed by the analyst to summarize the results of the allocations for reporting purposes. The summaries in the ICAS model for the scenarios refer to formulas in the formula file. Summaries provide a customized output that reports the costs or revenue requirement that is assigned or allocated to each of the service and/or customer class categories. This information can be used directly as a report or as input for deriving other reports.

SUMMARY NAME	ID NO.	DESCRIPTION/EQUATION
busbill	0	Revenue requ'rement for Business Local per Access Line for Business busbill
bussil.line	0	Revenue Requirement for Business Intrastate InterLATA Toll / Access Line bussil.line
bussilo.line	0	Revenue Requirement for Business ORIG Intrastate InterLATA toll /Access Line bussilo.line
bussilt.use	0	Revenue Requirement for Business TERM Intrastate InterLATA Toll / Second bussilt.use
bussl.line	0	Revenue Requirement for Business Intrastate IntraLATA Toll / Access Line bussl.line
busslo.line	0	Revenue Requirement for Business ORIG Intrastate IntraLATA Toll / Access Line busslo.line
busslt.use	0	Revenue Requirement for Business TERM Intrastate IntraLATA Toll / second busslt.use
coelds#	0	Local Dial Switching Investment by Category coelds#
commercials#	0	Commercial Expenses for the Test Year June 1986 to May 1987 commercials#
ctxbill	0	Revenue Requirement for Centrex Local Use / Access Line ctxbill
ctxsil.line	0	Revenue Requirement for Centrex Intrastate InterLATA Toll / Access Line ctxsil.line
ctxsilo.line	0	Revenue Requirement for Centrex ORIG Intrastate InterLATA Toll / Access Line ctxsilo.line
ctxsilt.use	0	Revenue Requirement for Centrex TERM

SUMMARY NAME	ID NO.	DESCRIPTION/EQUATION
		Intrastate InterLATA Toll / Second ctxsilt.use
ctxsl.line	0	Revenue Requirement for Centrex Intrastate IntraLATA Toll / Access Line ctxsl.line
ctxslo.line	0	Revenue Requirement for Centrex ORIG Intrastate IntraLATA Toll / Access Line ctxslo.line
ctxslt.use	0	Revenue Requirement for Centrex TERM Intrastate IntraLATA Toll / Second ctxslt.use
dep#	0	Depreciation Reserve for Test Year: June 1986 to May 1987 dep#
depreciatn#	0	Depreciation Expense for the Test Year June 1986 to May 1987 depreciatn#
expense#	0	Expenses for Test Year: June 1986 to May 1987 expense#
fractrr#	0	Fraction of Revenue Requirement to Each Category with Total as Basis fractrr#
fractrrst#	0	Fraction of Revenue Requirement to Each Category with State as Basis fractrrst#
general#	0	General Office Expenses for Test Year June 1986 to May 1987 general#
kcs.sum#	0	Subscriber Loop Investment Account 240 Cost Category KCS kcs.sum#
kcs8kcs.sum#	0	Sum of Subscriber Loop Plant and Assoc. Circuit Equipment kcs8kcs.sum#
operating#	0	Operating Expenses for the Test Year June 1986 to May 1987

SUMMARY NAME	ID NO.	DESCRIPTION/EQUATION
		operating#
origcost#	0	Original Cost of Plant Used and Useful Test Year: June 1986 to May 1987 origcost#
other#	0	Other Expenses for the Test Year June 1986 to May 1987 other#
ratebase#	0	Rate Base for Test Year: June 1986 to May 1987 ratebase#
resbill	0	Revenue Requirement for Residential Local Use / Access Line resbill
reslt.use	0	Revenue Requirement for Residential TERM Intrastate IntraLATA Toll / Second resslt.use
ressil.line	0	Revenue Requirement for Residential Intrastate InterLATA Toll / Access Line ressil.line
ressilo.line	0	Revenue Requirement for Residential ORIG Intrastate IntraLATA Toll / Access Line ressilo.line
ressilt.use	0	Revenue Requirement for Residential TERM Intrastate IntraLATA Toll / Second ressilt.use
ressl.line	0	Revenue Requirement for Residential Intrastate IntraLATA Toll / Access Line ressl.line
resslo.line	0	Revenue Requirement for Residential ORIG Intrastate IntraLATA Toll / Access Line resslo.line
return	0	Allowed Rate of Return During the Test Year: June 1986 to May 1987 percent
revenues#	0	Revenues Collect During Test Year: June 1986 to May 1987 revenues#

SUMMARY NAME	ID NO.	DESCRIPTION/EQUATION
revreq#	0	Revenue Requirement for Test Year: June 1986 to May 1987 revreq#
rr.swsil	0	Revenue Requirement for Intrastate Inter LATA Toll / Second rr.swsil
rr.swsilo	0	Revenue Requirement for Intrastate InterLATA ORIG Toll / Second rr.swsilo
rr.swsilt	0	Revenue Requirement for Intrastate Inter LATA TERM Toll / Second rr.swsilt
rr.swsl	0	Revenue Requirement for Intrastate Intra LATA Toll / Second rr.swsl
rr.swslo	0	Revenue Requirement for Intrastate Intra LATA ORIG Toll / Second rr.swslo
rr.swslt	0	Revenue Requirement for Intrastate Intra LATA TERM Toll / Second rr.swslt
tax#	0	Taxes Paid During the Test Year: June 1986 to May 1987 tax#
traffic#	0	Traffic Expenses for the Test Year June 1986 to May 2987 traffic#

No. of Summaries = 46

APPENDIX I

List of Tests for Basic Cost Allocation Model

Allocation Tests

The allocation test provides a method of "debugging" the allocations that are performed. One can think of the allocations categories as a zero-sum game. The amount in the total category is assigned or allocated 100 percent to the interstate and state category. Stated more generally, the amounts allocated to one or more categories below a category must add to the amount in the input category for these lower-level categories. In the example of the total above, the total category is the input category and the amounts allocated or assigned to the state and interstate categories must sum to the total. The tests are designed to check this additivity for all category relationships. Tests compare the amount in the input category to the sum of the amounts in the categories specified in the tests. These tests provide the analyst with a check on the validity of the procedures and are used to debug them.

LIST OF TESTS FOR MODEL: use24

TEST NAME	ID NO.	DESCRIPTION/EQUATION
bsil	0	Test for bsil Categories bsil@=bsilo@+bsilt@
bsl	0	Test for bsl Categories bsl@=bslo@+bslt@
buss	0	Test for buss Categories buss@=bsil@+bsl@
csil	0	Test for csil Categories csil@=csilo@+csilt@
csl	0	Test for csl Categories csl@=cslo@+cslt@
ctxs	0	Test for ctxs Categories ctxs@=csil@+csl@
interstate	0	Test for interstate Categories interstate@=istol@+ispl@
ispl	0	Test for ispl ispl@=isilpl@+islpl@
istol	0	Test for istol istol@=isil@+isl@
mts	0	Test for mts Categories mts@=swnet@+nts@
nts	0	Test for nts Categories nts@=ntsres@+ntsbus@+ntsctx@+ntscoin@+nt sfga@+ntsfx@+ntsmob@+ntsoff@+ntswats@
ntsbus	0	Test for ntsbus Categories ntsbus@=busloc@+busfga@+busfgb@+buss@+bd a@+btsps@
ntsctx	0	Test for ntsctx Categories ntsctx@=ctxloc@+ctxfga@+ctxfgb@+ctxs@+cd a@+ctsps@
ntsres	0	Test for ntsres Categories ntsres@=resloc@+resfga@+resfgb@+ress@+rd a@+rtsps@
ress	0	Test for ress Categories ress@=rsil@+rsl@

LIST OF TESTS FOR MODEL: use24

TEST NAME	ID NO.	DESCRIPTION/EQUATION
rsil	0	Test for rsil Categories rsil@=rsilo@+rsilt@
rsl	0	Test for rsl Categories rsl@=rslo@+rslt@
spl	0	Test for slp Categories spl@=silpl@+slpl@+localpl@
state	0	Test for state Categories state@=mts@+spl@
swlocal	0	Test for swlocal Categories swlocal@=swbus@+swres@+swctx@+swmobile@
swnet	0	Test for swnet Categories swnet@=swlocal@+swtoll@+swop@
swop	0	Test for swop Categories swop@=swtsps@+swda@
swsil	0	Test for swsil Category swsil@=swsilo@+swsilt@
swsl	0	Test for swsl Categories swsl@=swslo@+swslt@
swstol	0	Test for swstol Categories swstol@=swsil@+swsl@
swtoll	0	Test for swtoll Categories swtoll@=swfga@+swfgb@+swstol@
total	0	Test for total Categories total@=state@+interstate@

No. of Tests = 27