Development of Separations Principles in the Telephone Industry
Development of Separations Principles in the Telephone Industry

by

Richard Gabel

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Dedicated to
Louise
Preface

The purpose of this book is to present an analytical chronology of methods followed by the telephone industry in the allocation of its property investment, revenues, expenses, taxes, and reserves to the various communications services. Telephony is an industry of joint and common costs. The procedures followed in allocating these costs are termed "separations." The history of separations largely revolves about issues developed out of the relationship between the Bell System and state and federal regulatory bodies.

Beginning as a systematic critique of current separations methods, the author was persuaded that comprehension of the subject required historical presentation. Thus the present approach.

Separation of telephone plant is a political process. As a political process, separations has been one of accommodation and adjustment. In its formal context separations appears to be but a cost accounting technique. Similar to any cost allocations process, telephone plant separations is founded on premises which are inherently arbitrary. The formal complexity of separations methods is awesome to the initiate. Such complexity often conceals the character and significance of the methods which are merely devices to reach a predetermined financial result.

The telephone industry is a regulated industry. In the political development of separations methods, it is of interest to find that most of the accommodation has been made by the public regulatory authorities. Herein lies our tale.

Discussion of separations principles has been clouded in technical controversy. Much of this controversy begs the relevant
issues. Separations involves questions of public policy, public regulatory objectives, and immediate social and economic considerations.

Very material thanks are due to the Brookings Institution which, by grant of a Federal Executive Fellowship during the calendar year 1966, permitted the undertaking of the present study. Considerable obligation is due the General Services Administration, and specifically to Mr. A. L. Issette of the Communications staff of that agency, for affording me the time away from official responsibilities to devote to research. Needless to say, the views expressed herein are those of the author.

Richard Cabel  
Washington, D.C.  
September, 1967
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I

Introduction

It is a historical truism that at each stage of industrial development, the social character of the productive process has been increased. This movement can be observed in the shift from the small to the large factory, from the individual businessman to the corporation, from private monopoly to publicly regulated monopoly. With each transition, it has been necessary to establish new institutional arrangements between what is “public” and what is “private.” In each stage governmental bodies have played the role of mediating not only inter-business rivalries, but also the logic of development between the social character of the productive forces and the pecuniary objectives of enterprise.

The underlying processes sometimes come to public view in stark fashion as one private competitive interest openly seeks the intercession of governmental bodies in its behalf. Thus, we have the dispute between savings and loan associations and the banks; between the railroads, the truckers, and the barge lines; between auto dealers and auto manufacturers over markets and market sharing, which engenders congressional legislation. The vehemence of these controversies shifts with the exigencies of the marketplace.

Sometimes, and less openly, as the dimensions of production have reached the macroscopic forms that we know today, the instruments of business domination of public institutions have
developed at a striking rate. Such strengthening of private centers of decision-making and of their influence over public centers augurs a degradation of democratic life and the loss of vital power by the community.

This present study, dealing with a micro segment of the economy, the telephone industry, focuses on the development of one such relationship. The growth of the publicly regulated monopoly affords opportunity to examine the operation of the private and public sectors, how their influence and effectiveness are deployed and to what extent the objectives of the private interest are controlled by, or are controllers of, the public interest.

The telephone industry in the United States is largely centered around one corporation, the American Telephone and Telegraph Company and its operating subsidiaries. The Bell System serves about 85 percent of the telephones and half of the area served in the coextensive United States; the balance is served by some 2300 independent telephone companies. Public regulation of the industry is scattered among some 49 state regulatory commissions, and at the federal level, authority is vested in the Federal Communications Commission. The study focuses on a small aspect of the public controlling function of these regulatory bodies. The industry is one of joint costs; telephone separations is the process of assigning these costs. The determination and assignment of these costs for both jurisdictional and division of revenue purposes are of concern and interest to both state and federal regulators, and to the company. These interests are not necessarily compatible. The present study is a chronology of how the public institutional arrangements set up to protect the wider community interests have been competing with one another, while a leading role is played by the ostensibly controlled utility.

It was said earlier that the premises that underlie the various shifts in telephone cost allocation methods have been arbitrary. While the various changes that have taken place over the years have been accompanied by appropriate explanation and rationale, we must look elsewhere for causes. Telephone cost allocation questions have been interfaced with the nature of the demand...
function for the separate communication services, the nature of the cost function, the degree of competition with these services, and with rate making policy.

The conventional industry view is that demand for local exchange service is price inelastic; in other words, customer demand for primary exchange service is largely unresponsive to price movement. Demand for message toll services has generally been recognized by the industry as price elastic. Price movement is usually correlated with corresponding and inverse shifts in demand. In this situation, where an entrepreneur has a degree of control over allocation of costs, the natural tendency would be cost assignment to the most inelastic service.

The economic nature of various telephone costs has played a major role in separations history. Consider only local exchange and message toll services for this purpose. Exchange plant is employed in both services. Most of the investment in exchange plant is determined by the number of exchange subscribers served, not by the volume of local traffic generated. The telephone investment, the local distribution plant connecting the subscriber to his central office, as well as a significant portion of the investment in the central office have a one-to-one correspondence with the unit subscriber. It is true that subscriber density, topography of the area served, and the physical location of the subscriber also have an important bearing on the magnitude of exchange plant investment. In any event, it is fair to say that exchange plant costs are primarily a function of the customer unit. In contrast, the magnitude of toll lines plant investment is largely dependent on usage, and not the individual customer. The paramount criterion employed in the separation of all telephone plant has been usage, the relative proportion of time or occupancy the facility has been engaged by each of the separate services. So it can be said that the primary standard set for allocation of telephone plant has been consistent with the nature of the toll business, but inconsistent with the cost character of exchange plant.

The rendition of local exchange telephone services is a literal monopoly today. While instances of duplicate and overlapping
exchange services were widespread at the turn of the century, there are no significant vestiges of exchange competition in the United States today. In contrast, the possibilities of toll competition between the principal communications common carriers and with private microwave non-common carrier and, more recently, with the Communications Satellite carrier, is manifest. In recent years, the potency of this competition has had decided influence on the industry view of appropriate telephone cost allocation methods.

Both utility and regulatory commission rate making policy has had an effect on telephone separations methods, although the effect has often been indirect and negative. In general, separated costs have not been paramount in determining telephone rates for the individual telephone service classifications. “Value of service” has been more determinative than costs alone. The state regulatory commissions, for example, have generally established total revenue requirements of the carrier under their jurisdiction, leaving discretion to the utility on how best to recover these costs. Intrastate message toll rates fall into the jurisdiction of state regulators; interstate toll rates are solely within the purview of the FCC. The state and interstate message toll services have significant differences in characteristics and, depending on how one defines them, of costs. Beginning in 1935, major reductions in interstate message toll rates were negotiated by the FCC. These reductions in interstate toll schedules raised questions with regard to the continuing differences in the level of charges for toll calls of the same distance and duration which did or did not cross state lines. Historically, this problem has been termed the “toll rate disparity” problem and has exercised an influence on the definition of telephone costs.

Each of these matters—the demand function, the cost function, the degree of competition and telephone rate making policy—has had greater or lesser bearing on the telephone cost allocations methods at various times. We will examine in succeeding chapters the chronology of telephone separations over the period 1910 through 1965. The development of these methods will be
more readily understood if these collective causation factors are borne in mind.

While relative use has been the predominant basis for apportionment of jointly used telephone plant, other criteria have been considered. Other criteria might involve significant re-distribution of telephone costs. The telephone industry is not renowned for its risk taking. Telephone regulators are prone to follow the industry pattern. Both the industry and its regulators have been reluctant to develop comprehensive cost allocation principles and aggressive pricing practices in terms of public policy objectives. Alternative separations treatment could reduce costs of local exchange service and, eventually, exchange rates, making possible a universal development of exchange services. Increased toll revenue requirements should be met not with higher rates, but by reduced unit charges. The demonstrated elasticity of toll demand, together with the vast economies of scale possible in the provision of interexchange service, would rapidly make up in traffic volume for the diminution of toll rate schedules.
History of Telephone Separations Through 1930

The major portions of telephone plant are used jointly or interchangeably for separate service classifications including local exchange, intrastate message toll, and interstate message toll services. The jurisdiction over intrastate communications service is in the hands of state regulatory commissions, while authority over interstate services is exercised by the federal regulatory commission. Telephone plant separations may be defined as a series of methods and principles for dividing the investment, expenses, revenues, taxes, and reserves of a communications common carrier and assigning them to the respective operations. While, historically, the emphasis on jurisdictional considerations has been paramount in separations matters, it is not limited thereto. The same principles and methods have been used for separating intra-jurisdictional plant, expenses, and revenues. For example, intrastate services include local exchange, state toll, and private line service classifications, each with separate tariffs and rate classifications with corresponding separate revenue requirements. Property and expense separations of exchange and state toll is necessary to determine their respective revenue requirements. Until World War II, the three-way separations between exchange, state toll, and interstate toll was common prac-
tice. After World War II, with the exception of California, the common practice in a state proceeding has been to separate out the interstate portion of plant, revenues, and expenses and determine total revenue requirements of the carrier for its exchange, state message toll, and state private line services in the aggregate. Similarly, the Bell System files recurring operating statements with the FCC for the interstate segment of its business. Thirty-one years after assuming regulatory responsibility over interstate communications services (1965), the FCC secured its first breakdown of earnings in the interstate message toll classification. Thus, it can be seen that jurisdictional separations has been the primary focus in telephone cost allocations.

Mechanics of Separations

It may be well to review some of the mechanics of separations. In general, the FCC Uniform System of Accounts for Telephone Companies does not provide a basis for assigning plant dollars to the various operations. The System of Accounts does provide a starting point for subsequent separations. Normally, the first step in separations is to rearrange the plant investment amount into broad types of plant roughly corresponding to the function or use made of the plant. These broad classifications are termed categories. The next step is the apportionment of these plant categories among the operations by application of various usage factors, or in certain instances the category may be assigned directly to a specific operation. Usage is measured in different ways for different types of plant.

Telephone plant can be classified into two primary classifications, depending on the primary of its use—exchange plant and interexchange or toll plant. Virtually all exchange plant is necessary for the rendition of toll service, while toll plant may, on occasion, be used in the rendition of exchange service. Both exchange and toll plant can be further classified into inside plant and outside plant. Inside exchange plant includes the station equipment and local switching equipment, land, and buildings; outside exchange plant consists of the local distribution facilities connecting
the subscriber to his central office, and exchange trunks connecting offices in the same exchange. Inside toll plant includes the toll switching systems and circuit equipment; outside toll plant the toll lines. In the early years of the industry, the distinction between exchange plant and toll plant was reasonably clear-cut. The growth of the services and development in the art have increasingly melded the physical media into one another.

Certain segments of telephone plant may be readily identifiable as utilized exclusively for a specific operation: toll lines interconnecting two exchanges may be used solely for toll purposes. Normally, such investment is not immediately obtainable from the books and ledgers of the company, but is derived on the basis of broad averaging of unit plant prices and quantities. Once calculated, this investment is "assigned" to toll. For jurisdictional purposes, however, further refinement is necessary. The facility may be used for both interstate and intrastate toll business. The apportionment of this joint toll investment to the specific operation is usually derived by calculating the relative toll conversation-minutes, as recorded on operator toll tickets, employed in intrastate vs. interstate toll calls. These studies can be undertaken by individual toll routes, by district, or by state areas—with different results in each case. Over the years, coincident with the growth and increasing complexity of the telephone business, the tendency has been in the direction of broader averaging of plant categories for development of jurisdictional as well as individual service results.

In contrast to the type of plant facilities which may be directly allocable to a specific operation, there are facilities which are inextricably joint. The telephone handset is such a case. It was not until February, 1943, that the industry recognized that any portion of the investment in station equipment was to be borne by toll services. However, it is said that the property investment in station equipment is "apportioned" rather than allocated or assigned. The apportionment of such investment has historically followed a relative "use" or occupancy criterion. The measurement of use has varied with conception of usage, separations philosophy, and the tools available to measure usage.
It should be clear that the distinction between property investment which is "directly assignable" and that which is subject to "apportionment" is often quite tenuous. In both instances, the averaging of certain accounting or statistical quantities is usually necessary. The Long Lines Department is an operating subdivision of the American Telephone and Telegraph Company that provides wholly interstate services. Long Lines investment is therefore normally not subject to state regulatory jurisdiction and is wholly subject to federal jurisdiction. On the other hand, Long Lines furnishes a number of interstate service classifications for facilities that are used interchangeably, for example, for public message toll and interstate private line. Again, the assignment of this property investament to the respective operation requires property identification and substantial averaging of gross plant property dollars and quantities.

At this stage we will not attempt to advert to the many refinements of the separations process, other than to recognize that the results of any individual study, just like any cost accounting process, will vary depending on the grossness of the book records and their accuracy, the accounting classifications prescribed by the regulators, the categorization of plant for both apportionment and direct assignment purposes, the nature of the usage studies undertaken and, above all, the underlying philosophy of separations.

The Significance of Separations

State regulation of telephone utilities is concerned, among other things, with the reasonableness and sufficiency of the earnings level of telephone companies within its jurisdiction. The magnitude of these earnings can be defined as the difference between intrastate revenues and intrastate expenses, including intrastate operating charges, depreciation, and taxes. These net earnings are usually related to state (net) property investment to calculate the rate of return. In substance, then, all segments of the rate base and net operating income are derived or arrived at by the separations process. The same observation
can be made, of course, with respect to federal regulatory review. Both state and federal regulatory agencies would seek to separate costs in a way that seems to provide the greatest benefit to their own constituency.

Industry spokesmen have emphasized the need for separations to be consistent, particularly where jurisdictional authority is involved. If the mode of dividing telephone plant, revenue, and expense is not consistent between jurisdictions, it is conceivable that a segment of the same investment or expenses would be recoverable as part of the revenue requirement in two jurisdictions and duplication of earnings would arise. Conversely, the utility is concerned that there are no "holes," that is to say, all of its property investment and expenses will fall into one or another regulatory jurisdiction.

The method of telephone plant separations may be of concern to the individual ratepayer. The incidence of use of the various telephone service classifications varies quite widely. In the early twenties only a minority of exchange telephone customers originated any toll calls, while 5 percent of subscribers produced more than 95 percent of the toll charges in one state jurisdiction. Since the volume of intrastate toll calls business is about twice that of interstate traffic, it can be surmised that an even smaller proportion of exchange ratepayers generated interstate message toll business. Since the output of separations studies determines, in effect, the revenue requirements within a jurisdiction and, where undertaken, the revenue requirements of a particular service classification (i.e., exchange), it becomes important that the procedures followed be equitable. While costs have only been one basis for establishing rates for telephone service classifications, it is one objective of separations to determine separated costs in such a fashion that ratepayers in one service classification do not subsidize revenue requirements for other service offerings.

Telephone separations is a costing process. The costing of telephone service within a jurisdiction or limited to a specific service determines revenue requirements. It does not determine rates or unit price. Revenues, however, are a function of price and demand. Where a telephone company is providing two or
more services characterized by joint costs, it would appear a matter of indifference to it how costs are loaded, if there is reasonable assurance of recovering these costs in the aggregate. If this were true, there would be no controversy over separations matters. The limiting factor that, it is believed, underlies the history of separations during this period is the demand function.

The Bell System has construed the demand for local exchange service as relatively inelastic in response to price. Viewed historically this observation would appear to be reasonable. On the other hand, the company appeared to recognize, within limits, a responsiveness of toll demand to price. In the absence of any regulatory prodding, the successive voluntary reductions during the twenties in the level of interstate message toll rates is some confirmation of this view. This thesis also serves to explain the adamantly position taken by the Bell System in refusing to recognize the liability of its toll services for any portion of exchange plant investment. It would be reasonable business judgment for a company to load its costs on the segment of its business least responsive to unit price changes—exchange service. The major controversy over separations matters during this period was precisely the allegation that toll services were not bearing a fair share of the joint costs.

The Exchange—Toll Share

We may observe the rate of growth and development of the exchange and toll service classifications during the years up until 1930. The relative importance of the two major service classifications, message toll and exchange, to the operating companies of the Bell System, is shown in Table I. Although the data are partly estimated, it appears that public message toll revenues contributed about 30 percent of combined System operating revenues over the period 1915-1930.

The growth in message toll revenues generally paced the growth in exchange revenues. However, the growth in message toll traffic up to 1930 exceeded the growth in telephone stations (cf. Table II). The greater growth in toll traffic volume over toll
TABLE I
Total Bell System Exchange and Message Toll Revenues, Quinquennial Years, 1915-1930

<table>
<thead>
<tr>
<th>Year</th>
<th>Exchange Revenues(^1) (Millions)</th>
<th>Message Toll Revenues(^1) (Millions)</th>
<th>Message Toll of Combined Revenues (Percent)</th>
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<tbody>
<tr>
<td>1915</td>
<td>159</td>
<td>58</td>
<td>27</td>
</tr>
<tr>
<td>1920</td>
<td>272</td>
<td>128</td>
<td>32</td>
</tr>
<tr>
<td>1925</td>
<td>471</td>
<td>199</td>
<td>30</td>
</tr>
<tr>
<td>1930</td>
<td>675</td>
<td>307</td>
<td>31</td>
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</table>

\(^1\) Derived as difference between total operating revenues and total toll revenues; includes a small portion of miscellaneous operating revenues (directory advertising, etc.)

\(^2\) Both state and interstate message toll. Excludes revenues from toll private line services.

SOURCE: “Investigation of the Telephone industry in the United States,” H. Doc. 340 (78-1), Table 58, p. 359 and Table 16, p. 56.

revenues is explained by the fact that beginning in February, 1919, with the introduction of the Postmaster General’s rate schedules, and on four successive occasions (1926, 1927, 1929, and 1930), reduced rates for long distance traffic as well as reduced night rate differentials were generally made effective throughout the country.\(^2\) Stimulation in the volume of message toll business was also effected by improvements in the art of long distance transmission, which greatly improved both the quality and speed of toll service.\(^3\)

TABLE II
Bell System Telephone Toll Messages and Stations, Quinquennial Years, 1915-1930

<table>
<thead>
<tr>
<th>Year</th>
<th>Telephone Toll Messages (Millions)</th>
<th>Telephone Stations (Millions)</th>
<th>Toll Messages per Station per Year</th>
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<tbody>
<tr>
<td>1915</td>
<td>266</td>
<td>6.0</td>
<td>43</td>
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<tr>
<td>1920</td>
<td>431</td>
<td>8.3</td>
<td>52</td>
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<tr>
<td>1925</td>
<td>686</td>
<td>12.0</td>
<td>57</td>
</tr>
<tr>
<td>1930</td>
<td>943</td>
<td>15.7</td>
<td>60</td>
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SOURCE: “Investigation of The Telephone Industry,” H. Doc. 340 (78-1), Table 58, p. 359 and Table 17, p. 57.

While telephone stations were growing at the rate of about 6.6 percent over the fifteen year period 1915-1930, toll traffic increased at a compounded rate of 9 percent annually.
The Physical Facilities

Separations of telephone plant requires some knowledge of the functional relationship between the various plant components. For this reason, it may be useful to describe a typical telephone system operation prevalent around 1925-1930. The point of the description is to illustrate the relative simplicity of separations problems of that day. Curiously enough, the detail and extensiveness of separations studies undertaken during the years 1910-1930 were far greater than undertaken today. There are undoubtedly a number of reasons for this tendency. The early separations engineers took their responsibility very literally and attempted to separate the plant items in terms of functional identification. This approach was possible under the then prevalent technology. Toll service was an appendage to exchange service so that facility identification was more easily determinable. By the late twenties, design and engineering of telephone plant was a joint proposition; function and use became increasingly muddled. The very growth of Bell System plant was a deterrent to piecemeal study. Bell System investment rose from $2.5 billion in 1925 to $32 billion in 1965. In later years, as we shall see, the principles of telephone separations became subject to political expediency. The specific mechanics employed in separations could be rationalized in any necessary form.

Telephony is the art of electrically transmitting information between two or more points. Transmission of speech is accomplished over wire circuits (or radio). The telephone circuit fundamentally consists of a device (transmitter) for transforming speech sounds into electrical currents, which traverse a connecting medium (loop or line) and activate a device (receiver) in such a manner as to convert the electrical currents into the original speech sounds.

Switching arrangements of various types and capacities are necessary to connect local or toll telephone circuits together, and a number of auxiliary circuits, in addition to the talking circuit, may be employed for a given connection, depending upon the types of systems involved and the length of the connection. The rendition of local service, both the engineering and
construction, to enable two subscriber lines (loops) in the same office to communicate, is relatively simple. Intercommunication between lines in widely separated offices and the design and engineering of the complete interconnecting circuits and associated apparatus may be extremely complex. A simplified block diagram of representative type telephone connections is shown in Figure I.

**FIGURE I**
Connection Between Two Subscribers in Same Central Office and Two Subscribers in Different Exchanges

The procedure in completing a local exchange call in a single office area during the time period under review was essentially as follows: When the subscriber removed the receiver off hook, under manual common-battery type operation, a light would flash in front of the switchboard operator indicating the specific customer desiring service. The operator would plug in her answering cord into the line receptacle (jack) and obtain the called number. She then would plug in the calling end of her cord circuit into the jack associated with the called party’s line and ring. Upon completion of the conversation, the line lamps would re-flash and the operator would disconnect by removal of the cords.

On a toll call from a single office exchange the same procedure would normally be followed except that for long distance toll the local switchboard operator would plug into a toll connecting
trunk providing access to the toll switchboard (a separate facility).

On toll calls, both state and interstate, the operator at the local originating switchboard would plug into an idle outgoing toll connecting trunk, which terminated at the toll switchboard. The toll operator recorded the details of the call and completed the call by jacking into the trunk multiple before her to summon the inward toll operator at the called exchange. When the subscriber hung up at the end of conversation, the toll operator would enter the time on the toll ticket and disconnect. In large cities, it was not economical to have each central office connected by direct trunks to all other offices in the area. Instead, an intermediate switching point, known as a tandem office, was introduced; the tandem office has direct trunk connections with all offices in the area. There were many variations of the foregoing methods depending upon the type of equipment, size of the office, and operating methods in the local exchange. Note, however, that exchange plant, i.e., the telephone, the line from the subscriber to the local central office (loop), and the local switching equipment were identifiable in whole function; similarly, the toll switchboard and the toll trunks generally functioned as entities performing wholly toll services. While there were numerous reservations in practice, the theory of plant separations was relatively simple.

Station-to-Station v. Board-to-Board Theory

The relative simplicity of manual switching and trunking operations described above was the foundation for the development of the earliest theoretical approach to telephone plant separations. The primary theory of separations dominant throughout this period was termed the "board-to-board" theory of separations. Telephone plant consists broadly of five principal categories: subscriber station equipment (subset), local distribution plant connecting the customer to his local central office (loop), local switching equipment, toll switching equipment, and the interexchange facilities that connect the separate exchanges. Under the board-
to-board theory the Bell Telephone Companies (except New York Telephone Company) contended that the local exchange rates cover the provision of subscriber station equipment, the local distribution plant, and the local exchange switching equipment. Toll rates and, therefore, the definition of what constitutes toll cost, were defined to include only compensation for use of the toll switching equipment and interexchange facilities. Hence the term "board-to-board" comprehended those facilities emanating from the trunk side of the originating local switchboard through the terminal side of the terminating toll switchboard. In the art of the day, this description was easily comprehended and physically identifiable.

As an alternative to the board-to-board basis of stating rates and separating plant, there was the "station-to-station" basis. Advocates of the station-to-station theory pointed to the fact that all the plant from the originating to the terminating telephone station, including the intermediary loops and local switching facilities, were used and necessary for the completion of a toll call and, to the extent that no portion of these investments or expenses was borne by the toll rate, the exchange rate-payer was subsidizing the toll user. Accordingly, it was proposed that a portion of the exchange plant investment be apportioned to the toll services. The controversy over "board" vs. "station" methods of telephone cost allocations dominated the separations issue all through the period we are reviewing.

Posture of the Regulatory Commissions

The earliest efforts at effective state regulation of telephone services came with the enactment in 1907 in Wisconsin, New York, and Georgia of enabling legislation creating commissions with jurisdiction over telephone service. While the Interstate Commerce Commission obtained nominal authority over interstate telephone service with passage of the Mann-Elkins Act of 1910, this area of the business remained unregulated.

Since the direction of interstate toll rates was voluntarily downward through this period, the ICC apparently saw no oc-
casion for initiating inquiry as to the reasonableness of the rate structure, nor did it precipitate any investigation over the principles of separations which, in effect, determined interstate revenue requirements. The state regulatory commissions, on the other hand, were compelled to some extent, by dint of repeated company requests for upward rate adjustment following World War I, to enter into the separations issues. Their expressions of view on the station-to-station vs. board-to-board theory of telephone rate making are set forth in decisions issued on rate applications during this time period. It can be noted that most state commissions disregarded the entire subject in their formal opinions, others expressed scanty coment and only a few commissions devoted more than a paragraph of discussion to the issue.8 State regulation was beset by problems of valuation; separations questions were of smaller consequence at this time. Carrier representatives were contending for rate base adjustments to reflect reproduction cost of the order of 25 to 40 percent increase over book cost. The then prevalent separations concepts would have relieved exchange property burdens of the order of 2 or 3 percent of investment.

**Position of the Bell System**

Historically, the Bell System has considered the rendition of intercity toll service as the “cream” of its business. Control of the nationwide network was a valuable tool during the competitive era after the expiration of the Bell patents (1893-94) in defeating incipient competition and consolidating control of telephone service in the major metropolitan communities.9 The rate of earnings in the provision of interstate toll business has generally been higher than earnings on intrastate services.10

The insistence of the Bell System on the board-to-board principle of telephone costing had the effect of reducing toll revenue requirements and increasing exchange revenue requirements inasmuch as the entire investment and expenses of three substantial categories of plant (station equipment, loop, and local switching) were borne wholly by the exchange ratepayer. After
1907 and my 1930 every state but three had enacted legislation creating a regulatory commission with authority over intrastate telephone rates. The state commissions, in some instances, reduced the flexibility of operation of the utility. On the other hand, the reluctance of the Interstate Commerce Commission to extend its regulatory efforts beyond railroad problems, was short-term insurance of flexibility of operations and earnings in the area of interstate telephone rates. It was only a question of reasonable business judgment to insist on cost definitions that resulted in greater investment and expense showing in the segment of business (intrastate) subject to regulation and to minimize concurrently the proportion of investment and expense that fell into the unregulated sector of its overall operations (interstate toll).

There was still a further consideration that may have contributed to the position of Bell System management on separations, which had the effect of minimizing interstate toll costs. As in most other business enterprises, the telephone industry is concerned with stability of revenues. Historically, exchange service revenues are relatively stable, while toll revenues are relatively volatile in that they are characterized by seasonal fluctuations and are more prone to contraction during periods of business recession than are exchange earnings. Exchange charges are billed, for the largest part, on a constant flat-rate monthly basis.13 Under the board-to-board theory, overall revenue stability of the System was enhanced in that a greater proportion of total revenue requirements was met through exchange service revenues, while the revenue requirements of the less stable toll business were reduced.

The Minnesota Rate Cases14

Separations principles have a few leading guideposts reflected in Commission and Court decisions. Perhaps the earliest Supreme Court decision bearing on separations principles is the Minnesota Rate Cases decided in 1913. The Minnesota Commission had prescribed maximum rates for intrastate rail freight carriage as well as a maximum passenger fare scale of two cents a mile. The
contesting railroad companies alleged that these rates disturbed the existing freight charge relationship so as to discriminate against cities competing for commerce across state boundaries. The railroads also contended that the rate scale was a burden on interstate commerce as well as confiscatory.

There were two salient rulings of the Court that bore on subsequent history of telephone separations. First, state regulation is not restricted, said the Court, by federal authority that is latent but has not been exercised. This issue has been very much to the fore in the separations of telephone plant. Although the ICC since 1910 and the FCC since 1934 have had authority to prescribe telephone separations standards, neither body has ever formally approved such principles. The implication of the Court appears to have been that state commissions had relatively wide discretion within a framework of reasonableness to specify such principles for telephone separations within their jurisdiction. As we shall see, this authority was scarcely exercised.

A corollary question to the foregoing is this: assume the federal regulatory authorities and one or another state commission disagree on appropriate separations principles—does one supersed the other or can varying principles operate concurrently? The answer of the Minnesota Rate Cases would appear to be that the separate regulatory authorities have prime responsibility within their own jurisdiction and, assuming a reasonable factual basis, could apply different separations methods. Clearly the same principle has operated successfully in the depreciation field, where the FCC has prescribed one set of depreciation rates and the state commission (California) has adopted a different set of rates.

A second part of the Supreme Court decision bearing on our subject treated with the method of jurisdictional cost determination. Part of the investment in rail property had been apportioned on the basis of weighted use; part of the investment was separated on the basis of operating revenues. It is noteworthy that the Court expressed no criticism of the weighted use relationship as an apportionment method. With regard to the method of separation employing jurisdictional revenues, Judge
Hand wrote: "it would seem to be necessary to find a basis for a total value of the property independently of revenue and this must be found in the use that is made of the property . . . it is said that this is extremely difficult . . . comparable units might be found which would afford the bases for reasonable division . . . ."

The "use" criterion was established as the axiom of telephone separations. The Court ruling, with all its simplicity, raised more questions than it answered. Webster's International Dictionary has some twenty-seven definitions of the word "use". Subsequent chronology will disclose that administrative construction of the term even exceeds the number of dictionary definitions. The law expressed in the Minnesota Cases turned out to be a restatement of the question, not the answer.

Separations Cases, 1910-1930

As noted earlier, questions of proper separations of telephone plant were not overriding considerations of the state commissions during the years under review. In a number of instances, the Bell Companies, in submitting requests for rate increases, appear to have disregarded questions of property, revenue, and expense apportionment, limiting their presentation to total company results. The Interstate Commerce Commission, with jurisdiction over interstate communications services, made no contribution to this issue, nor, as nearly as can be ascertained, was the matter brought to its attention by the carriers.13

The relatively few decisions, during this twenty-year period, which contained discussions of separations problems, revealed only slight insight into the problems, or expressed frustration at the complexity of the subject matter. The latter reaction is understandable. Some knowledge of the functional relationship of telephone components is essential to understanding the mode and principle of telephone plant allocation. The books and records of account are of limited assistance in this regard. The Uniform System of Accounts for Telephone Companies does not require a breakdown of major accounts by toll or exchange use. Some of the Associated Bell Companies did maintain subaccounts that classi-
fied outside plant investment (poles, wires, cable, conduit) on a so-called "major use" basis. Similar subaccounts were not maintained for property investment in central office or station equipment accounts.

Wide variation within the Bell System existed in the interpretation of the major use basis for classifying outside plant to toll and exchange subaccounts. Some companies interpreted major use as predominant use, with variations in the meaning of "predominant." Other companies construed major use to mean the use for which the facilities were originally planned. Still a third construction was to classify to toll service all structures carrying toll circuits, regardless of the proportion of exchange circuits. Proper plant separations would require reclassification of significant portions of outside plant investment, under any of these three methods of classification.

Generally, investment records in the central office equipment account were (and are) in much more deficient form than outside plant records. Separations, when undertaken, required a recourse to the underlying invoices furnished by suppliers to permit initial classification of the investment items and development of suitable use factors for apportionment of the investment categories to the various operations. The significance of the classification and apportionment of these investment accounts may have faced regulators on such a question as the following:

Toll trunks to a local central office terminate in what are termed "trunk equipments." In the typical manual ringdown operation of the day, these equipments were two-wire circuits with associated relays to provide signaling and supervisory control. Ordered in required quantities, the unit material and installation labor prices are not differentiated as between local trunk equipments or toll trunk equipments. An averaging of total costs with working trunks is necessary to obtain a unit cost per equipment. But what of spare equipments, not working but installed and paid for—because of greater rate of growth, these may be intended solely for future toll use. These trunks and associated trunk equipments are, during daytime hours, used exclusively for toll, but during the evenings, when the local
operating workforce is reduced, may be called on to furnish information services (a local exchange function). Having developed the investment, how is it to be apportioned among the services? The prevailing method was to assign trunk equipments wholly to exchange operations. It is no surprise that state regulators generally found themselves at a loss in evaluating the reasonableness of separated results.15

For historic reasons it should be noted that the earliest separations case was in 1910. At the time, the New York Public Service Commission was attempting to determine the reasonableness of metropolitan area exchange rates in the state. The Commission abandoned the inquiry with the following words: "It is impossible to determine the cost of the toll service separately from that of the local service for the reason that the greater part of the cost of both is joint cost and there is no way of allocating the proper portion of the joint cost to each branch of service.16

Eight years later (1918), the Kansas Commission was faced with the same question, but concluded that it could separate the joint expenses, and on a station-to-station basis. Normally, separations of major telephone expenses “follow” separation of property investment. This is to say, ratios of total specific expense classification such as maintenance or depreciation are related to the associated total book cost of property. The ratio, so determined, is then applied to the separated book cost of plant to estimate the jurisdictional expense. No effort was made by the Kansas Commission to separate property investment, the discussion being limited to expense apportionment. Since this may be the earliest public record of regulatory treatment of separation, it is reported here.17

Total maintenance expenses were divided by the Commission between exchange and toll on the basis of 1915 switchboard peg counts taken in the Kansas City exchange, using a weight of two for each originating local and toll call and a weight of unity for each inward toll call. A peg count is a record of call attempts by telephone customers or inward operators and measures roughly all work effort at the local switchboard. The apportionment technique was a crude effort to ascertain use. Most maintenance of
plant of the day was incurred on outside plant facilities. The extent of outside plant maintenance is a function of the age, character, and extensiveness of the facilities, as well as the standards of maintenance. It is scarcely affected by the degree of utilization of facilities as recorded in an operator peg count of calls. Today, in general, maintenance expenses are rationed in proportion to separated property. It would be interesting to know if the results are significantly different than the Kansas Commission's pioneering efforts.

Traffic expense, largely the wage cost of switchboard operators, was apportioned by the Commission on the ratio of traffic units, except that all pay station traffic was considered as toll business. A traffic unit is a measure of operator worktime. Each principal type of operator call handling function is denoted by a corresponding number of traffic units. Tables of operator worktime coefficients have been in use and amended a number of times from the earliest days of the industry. Fifty years after the Kansas Commission findings, the same principle of apportioning manual switching investment and operator salaries is still in use.

Revenue accounting expenses were apportioned by the Commission on the basis of revenue, with toll charges carrying a weight of two to reflect the fact that exchange bills were pre-stamped with local service charges at flat rates, while toll bills required manual handling. Revenues are still used in current separations methods in allocating major commercial costs of telephone company operation.

The expense associated with revenue collection was apportioned to exchange and toll service on the basis of the ratio of the number of accounts. The use principle was subject to far reaching interpretation. The worktime involved in collection of revenues is, in fact, a function of the number of billing complaints. Toll bills invariably present a larger source of customer complaint than the recurring monthly flat rate charge. The Commission was seeking an approximate result.
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Smith vs. Illinois Bell Case

One of the outstanding legal benchmarks in the history of telephone separation is the Supreme Court decision in the case of Smith vs. Illinois Bell Telephone Company. The Court decision settled in principle, although not in immediate practice, the long-standing controversy over station-to-station vs. board-to-board method of telephone rate making.

One issue before the Court was the propriety of separations studies undertaken by the Illinois Bell Telephone Company. The company studies failed to include any exchange plant in the assignment of costs of toll service; the company followed the board-to-board method of rate making, which levied complete exchange plant costs on exchange rates. In its decision, the Court rejected the "practical difficulty of dividing the property between interstate and intrastate service . . . and point to the indisputable fact that the subscriber's station and other facilities of the Company are used in connecting with the long distance switchboard. . . ."

The company had emphasized the difficulties of separating exchange properties. The Court responded: "While the difficulty in making an exact apportionment of the property is apparent, and extreme nicety is not required, only reasonable measures being essential, it is quite another matter to ignore altogether the actual uses to which the property is put." Although the Smith case is frequently cited as authority for the need to employ "relative use" as the criterion for separating telephone property, this inference is misleading. It is important to understand what the Court did not do, as well as what it did.

Part of the difficulty in interpretation arose from the manifold meaning of the term "actual use." Careful examination of the context in which the phrase enters Court discussion indicates that the reference was not to methods of allocation. Illinois Bell had neglected any consideration of exchange plant investment as properly allocable to the toll services. In effect, then, the Court said the company must recognize that these facilities are employed (read: actually used) in the making of a toll call.
and accordingly, a portion of the exchange investment must be recognized as part of the cost of providing toll service.

Again, the company contended that its allocations were reasonable since the number of interstate toll calls was minimal compared to exchange traffic. The Court replied that this contention could not be accepted "without considering other factors of time and labor entering into the relative use." Here the Court was criticizing the impropriety of using the relatively small number of toll calls as a basis for dismissing any consideration of exchange investment. It did not thereby establish a mandate that relative use must be employed in telephone separations. On the contrary, the only straightforward discussion of apportionment methods, emphasized the need for "reasonable methods," while "extreme nicety is not essential."

Ofttimes Court opinion, which seeks to go to the heart of an issue, is defter in verbal precision than perception of the administrative chores its dicta will generate. The apparent clarity of the Supreme Court finding in favor of the station-to-station principle was effectively negated for the next twenty years by carrier interpretation. (The succeeding chapter of this narrative will discuss this aspect.)

The decision chided the ICC with a reminder of its responsibility to determine interstate property, revenue, and expenses. The Court, however, did not reiterate what was said in the Minnesota Rate Cases where it implied an extension of state authority where federal regulation was dormant. In the intervening three years before the ICC was relieved of regulatory responsibility over communications services, it chose not to act.

Separations, the Court pointed out, was not only "a theoretical allocation to two branches of the business. It is essential to the appropriate recognition of the competent governmental authority in each field of regulation." In effect, the Court enjoined the state regulatory commissions to exercise full responsibility in protecting the interest of intrastate telephone rate-payers.
Separations Principles in the Telephone Industry

FOOTNOTES TO CHAPTER II

2) Message Toll Telephone Rates and Disparities, Telephone Toll Rate Subcommittee, NARUC, 1951, Table V-1, p. 98.
7) See footnote 2.
8) Based on review of Bell System rate case decisions reported in Public Utility Reports, 1910-1930.
9) Investigation of the Telephone Industry, op. cit., Part I, Chapters 5 and 12.
10) Ibid., Tables 93-96 inclusive. Also see Message Toll Telephone Rates and Disparities, Chap. VIII, "Operating Results." For more recent data, see "Bell Telephone System, Selected Earnings and Balance Sheet Data, 1950-1965."
11) About three-fourths of Bell System residential main stations and half of business main stations were on flat-rate service. Testimony of V.P. Hanselman, A. T. & T., FCC Docket 6328, Trans. p. 794.
13) Based on review of reported cases and Annual Reports to Congress, 1911-1954.
14) Investigation of The Telephone Industry, Final Report of The Telephone Rate and Research Department, FCC, p. 49.
17) Re Mo. & Kansas Tel. Co., Kansas PUC, PUR 1918C, 55. No record of appeal of this decision has been found.
18) 282 U.S. 133; PUR 1931A, 1.
III

Telephone Separations, 1930-1943

The Supreme Court decision in *Smith vs. Illinois Bell Telephone Co.* in 1930 set forth clearly as the rule of law that a portion of exchange plant investment and expenses was allocable to the message toll services. However, it was not until the close of the time period under review, 1943, that the Bell System acknowledged the station-to-station principle as applying to its interstate tariffs. It was some seven years later, 1950, that the company complied fully with the tenor of the decision and modified its intrastate toll tariffs to recognize the exchange component as a necessary part of the investment to permit rendition of state toll service. The twenty-year delay between issuance of the court opinion and its implementation by the telephone company was made possible by legal and technical construction of the telephone costing operation.

In support of the board-to-board theory of telephone rate making, the Associated Companies referred to the conventional classification of plant as carried on their books, and to the published tariffs governing the provision of exchange and toll services. Thus, it was asserted that universal practice in industry recognized exchange revenues as compensation for all property classified as exchange, and that toll revenues merely render compensation for the additional property used for long distance purposes. To demonstrate the widespread acceptance of this
principle the carriers cited their tariff for affirmation. These views were expressed at the same time as the companies acknowledged the import of the Smith decision. The companies accepted the station-to-station theory in principle; they negated it in practice. This effect was produced by removing a portion of exchange revenues (balancing the interstate allocation of exchange property) for assignment as part of interstate toll revenues. Early in this period some state commissions began to recognize the company motivation behind the effort to minimize interstate revenue requirements: This segment of telephone service was largely unregulated.

It would be anticipated that the state regulatory commissions would seize the results of the Smith decision and use it for alleviation of exchange rates reflecting the reduction in exchange revenue requirements. This expected result was not uniformly true. A number of state commissions, as reflected in rate case opinions, continued to advocate the use of board-to-board telephone plant separations methods. Still other commissions effectively rebutted the legal arguments of the carriers and, in their own opinions and through court action, managed to secure some advantage of principle, if not of rates. In part, the delay in implementing the station-to-station principle was attributable to the overriding condition of economic depression which prevailed during the years 1930-1939. The telephone industry experienced a 25 percent decline in stations between 1929 and 1933 with corresponding excess plant capacity. In this climate, separations was a lesser issue.

Interest of state regulators in the separations issue was somewhat cursory until the creation of the Federal Communications Commission in 1934, and the subsequent effort of that Commission in negotiating interstate message toll rate reductions. These interstate telephone rate reductions precipitated a problem of disparity between intrastate and interstate message toll rates. The level of toll charges for calls of the some distance and duration became conspicuously lower when the message was transmitted between states, and therefore under FCC jurisdiction, than when wholly carried within a state, and under state regu-
ulatory jurisdiction. State regulators became advocates of changes to separations procedures that would effect a transfer of revenue requirements to the interstate jurisdiction. The thought behind such changes was that they would alleviate the intra-state burden, minimize the toll rate disparity and reduce the public comparison of the effectiveness of state vs. federal telephone regulatory efforts.

Prior to the thirties, state commission criticism of separations principles was infrequent and discursive. As the significance of the subject became clearer, and the impact of the cost allocation process on their own authority more certain, state opinion strengthened. Some commissions raised direct questions about the reasonableness of the criteria in apportioning jointly used exchange plant. To a limited extent, inquiry was directed to the basic premises of both the mechanics and underlying philosophy of separations as employed by the Bell System companies.

Just as the growing importance of telephone separations was reflected in commission decisions and rate case activity, it showed up in the proceedings of the National Association of Railroad and Utilities Commissioners (NARUC), which is the trade association of state regulatory commissioners. Until the late thirties the Association membership was primarily concerned with railroad regulatory and safety problems, judging from its Committee reports and the deliberations of its annual conventions. Problems associated with the regulation of the telephone industry are notable for the relative absence of discussion by the Association in the period 1920-1935. Just as businessmen are alerted to price and market activity upon introduction of a new technical innovation or the establishment of a competitive firm, the state commissions displayed increased telephone activity upon the creation and activation of the Federal Communications Commission. However, as events disclosed, the NARUC was in an anomalous position in separations matters. It was a federated body without authority over its constituent state regulatory members. Acting through its Commissioner Committees, together with a small staff drawn from the Commissions, it found itself in the position of recommending and adopting positions with-
out authority to implement them, other than through personal persuasion.

Between 1935 and 1940, the Federal Communications Commission negotiated four successive reductions in interstate message toll schedules. These actions were taken without acting on the question of telephone plant separations principles. A separations investigation was instituted by the Commission in 1941 on the initiative of the American Telephone and Telegraph Company. Fairly extensive hearings were held in Chicago in 1942, at which time a significant number of state commissions, the NARUC, and the Bell System as well, expressed support for the board-to-board theory of telephone rate making. The state regulators were apparently motivated to adopt this position out of fear of federal invasion of their jurisdictional authority. The theory adopted by the NARUC and those state commissions which favored the board-to-board approach was that inclusion of the exchange component as a charge to toll rates under the station-to-station rule would be a threat to their exclusive domain over exchange rates. The posture of the telephone company in opposing the station-to-station principle was consistent with that taken in earlier years. The formal objections associated with tariff language and industry practice was supplanted by an additional explanation. The FCC statute specifically forbade the federal body from exercising jurisdiction over exchange rates. Enactment of the statute, the company concluded, overrode the Supreme Court decision in the Smith case. The FCC never acted on the separations docket.

Shortly after the close of hearings in the separations proceedings, the company acceded to a modification of its interstate tariffs to recognize the station-to-station principle for determining interstate toll rates. This act simultaneously reduced intrastate (and specifically exchange) revenue requirements by about $22 million, and increased interstate revenue requirements by the same amount. Over 80 percent of the benefits of the reduction of state revenue requirements was absorbed by the Associated companies, since the states failed to flow the reduced revenue requirements through in the form of lower rates.
The Bell System now recognized the power of separations to offset latent pressure for interstate rate reductions. Acceptance of the station-to-station principle by the Bell System may be considered another landmark in separations history. With this step, the carrier officially recognized the dual character of separations principles; first, its formal content of serving as a means of separating property, revenues, and expenses between jurisdictions and, second, as a device to maneuver price and revenue requirements. The formal content became subordinated, in the course of time, to its political function of capitalizing on the competitive regulatory interests of state vs. federal regulatory bodies. The chronology of changes in separations methods will be discussed in this and successive chapters. It is not premature to note here that the timing of these changes was designed to either thwart further reductions in interstate toll rates, or to meet the operating convenience of the carriers. All modifications of principle and detail in separations have been instituted at the initiative or the concurrence of the regulated carrier.

Physical Changes in Telephone Plant

We digress briefly to mention a few of the major changes in the telephone art that took place during the years under review. As noted earlier, modifications to separations methods have partly followed changes in the art. From this viewpoint, we will limit discussion to those principal changes which impart a noticeable complexity in plant separations arising from technical changes in the rendition of telephone service. These may be classified as 1) changes in local switching methods and 2) provision of outside plant.

Local Switching. The expansion of local dial service and replacement of manual service created some novel problems for separations. By 1930 Bell had some 1.5 million lines of step-by-step and 1.5 million lines of panel dial switching equipment in operation, or about 20 percent of its equipped lines. Starting in the mid-thirties, the dial conversion program in small towns was accelerated by Bell and replacement of its small manual central offices was began. By the thirties the core of the General Toll
Switching Plan was formulated. The impact of the Nationwide Toll Switching Plan may illustrate some of these new separations problems. In most small dial exchanges a 3- or 4-digit numbering scheme is adequate for all subscribers served in the exchange. The Nationwide Toll Switching Plan required uniform nationwide numbering for reasons of equipment compatibility. Consequently, a 2-letter, 5-digit numbering scheme was devised for use by all exchanges. In the small step dial exchanges, digit absorbing equipment had to be installed to absorb the first 2 or 3 dial pulls. The equipment is provided only because of the requirements of the Nationwide Toll Plan, yet it only absorbs digits on a local call. On the basis of use, the additional equipment and associated investment could be construed only as exchange investment; however, exchange customers didn’t require the equipment in the first place.

After 1930, the previous method of operator toll handling was modified, which also had an impact on the complexity of separations. Prior to about 1930, one operator recorded the details of the toll call and passed the information to the toll operator, who handled it to completion. This method was largely supplanted by what is known as the combined line and recording (CLR) method of toll operation. Under this method one operator recorded the details of the toll call and handled it to completion. With CLR toll type operation also developed the so-called “A-B” method of handling short-haul toll traffic, both state and interstate. The operator at the local originating switchboard is known as the “A” operator. Herefore, she handled exchange and assistance calls. Her function was expanded to include short-haul toll calls. The local operator became responsible for recording the short-haul calls on an A-B toll trunk and connecting the call to the “B” switchboard located in the called office. The purely local switchboard investment and associated operator salaries became a thing of the past.

Outside Plant. The logic of spreading joint costs to the various operations on the basis of relative occupancy or use is founded on the presumption of homogeneity of plant and design standards
for the individual operations. Actually, the standardization of design and construction within the Bell System is done to meet the most severe technical and operating requirements of the separate services anticipated to be employing these facilities. Toll grade standards almost invariably require higher cost facilities and stiffer construction penalties than exchange. The presumption of homogeneity of cost requirements between toll and exchange service requirements, most telephone engineers would agree, is not valid: "In general, it may be said that improvement and development in exchange facilities have accompanied those in toll facilities." Early exchange telephony was furnished by means of single wire circuits, using ground as the return path. Two-wire (metalized) circuits were first developed for toll lines and extended back into local lines as the need to meet toll-grade transmission standards was experienced.  

Significant portions of aerial and underground cable installed by telephone companies through the twenties was so-called nonstaggered twist. The growth of carrier telephony and the associated toll transmission problems introduced inductance and resistance problems which made the nonstaggered twisted pairs technically obsolete. Thousands of miles of exchange cable had to be withdrawn from service to meet toll performance requirements. 

The growth of the message toll business during the period accentuated a number of telephonic separations problems. One illustration that may serve to typify the lack of homogeneity in the message services is pole line construction. Poles are classified as to both height and class. A pole class is meant to identify its rated breaking strength for a load considered to be placed below the pole top. Normally, pole leads carrying nothing but a crossarm of exchange facilities are engineered to a safety factor of 1.0. This factor is estimated as sufficient to withstand the transverse load introduced by the wire and sleet load in a given locality. If the pole route is to carry one or more toll trunks it will be engineered to a safety factor of 1.33 or better. This means heavier and more expensive poles, more expensive guying, closer placement of poles—all requiring considerably greater invest-
ment per mile of line. Similarly, it might be observed that the type and cost of the transposition scheme imposed on the wireline route is increased by the presence of toll wire and toll carrier systems using the facilities. This cost causation is disregarded in the mechanics of separating the investment in the pole line route. The investment in pole line facilities is apportioned to the exchange and toll services in the ratio of equivalent gauge wire conductors borne by the pole route.

Commission Decisions on Separations

Over the fourteen-year period under review there were some thirty state regulatory commissions which expressed views on separations. The largest number dealt with the issue of station-to-station vs. board-to-board principle, of telephone costing. A few expressed dissent on the reasonableness of the use measure of separating telephone plant and proposed "value" concepts for pricing. Occasional philosophic excursion is encountered in these decisions as to the reasons why the Bell companies preferred one rate making method over another. The two decisions cited below are intended to be illustrative and to communicate the principal direction of regulatory thought in those instances where state regulators expressed a viewpoint.

Southern Bell—Louisiana

A representative instance of the board-to-board vs. station-to-station rate controversy arose before the Lousiana Commission in 1935. The Commission rejected "any claim that any of the exchange revenues should be diverted to interstate toll classification." The separations issue was discussed in the following language:

The company proceeds on the theory that the use of exchange property, such as subscribers telephone instruments and the lines connecting them to the central office, and such other property as is used in reaching the toll switch-board, together with the expenses incurred in handling a toll call from the subscriber's station to the toll switchboard, are to be compensated for not out of toll revenues—and this despite the fact that a subscriber may never use toll service, and the further fact that in calling the toll board
from a pay station or message rate station, no charge in addition to the
toll charge is made.

If any attempt is made to claim that the exchange rates should cover
any toll service, the apportionment of property and expense is vitiated and
is contrary to the intent of the court in the above (Smith) case.

The Commission in establishing exchange rates has never contemplated
that they should cover anything but exchange service. The toll rates are
intended to cover the complete operations of providing toll service. We
reject any claim that any of the exchange revenues should be diverted to
interstate toll classification. Other state commissions found in favor of the board-to-board
principle of telephone rate making during this period.

**Michigan Bell Case**

The Michigan Public Service Commission, almost concurrently
with the Louisiana Commission (1935), ruled that no part of ex-
change revenues was to be assigned to toll service under the
"station-to-station" cost principle. However, the Michigan Com-
mission went further and offered an explanation of company
motives in submitting this proposed procedure:

It [the transfer of exchange revenues to interstate toll] means the appli-
cation of the station-to-station theory does not lighten the revenue burden
upon the purely exchange service, for it allocates to interstate commerce
and thus removes from the domain of intrastate regulations a portion of
exchange revenues, which counteracts the allocation to interstate use of a
portion of exchange property.

We consider the result thus achieved an example of misguided ingenuity.
The conviction upon which it is based ... is purely self-serving and was
calculated to fulfill the purpose of throwing into interstate commerce—a
field substantially unregulated—as great a portion of revenue as ingenious
act may make possible.

**The Toll Rate Disparity Problem**

As mentioned earlier, prior to the creation of the Federal
Communications Commission in 1934 there was virtually no reg-
ulation of interstate communication rates and service; the Inter-
state Commerce Commission, which had nominal authority over
the service, was absorbed with railway transport problems. With
the enactment of the Communications Act of 1934, the inter-
state business of the Long Lines Department of the A. T. & T., as well as the interstate toll business provided by the multistate Associated Bell Companies, became subject to the jurisdiction of the FCC. Rates for intrastate toll services rendered by the Associated Companies and the independent (non-Bell) telephone companies continued under the regulatory jurisdiction of the State Commissions. Prior to 1938, the intrastate toll rates of the Associated Companies were largely on the same level as the interstate rates of the Long Lines Department. Between 1936 and 1946, the FCC negotiated four intrastate toll rate reductions which, in the case of the Long Lines Department, amounted to some $27.5 million annually. In three states, Pennsylvania, Michigan, and Utah, intrastate toll rates were reduced to the level of interstate rates by formal action of the local commissions in those jurisdictions. Elsewhere, there appeared a burgeoning spread or disparity in the level of charges between the interstate and intrastate jurisdictions. This so-called "toll rate disparity" problem became a constant source of discussion at the annual conventions and in the committee reports of the National Association of Railroad and Utilities Commissioners.

Although the NARUC has been in existence from the turn of the century, concern over the telephone service and rate problems was, up to 1940, either casual or incidental. Although price differences in their product did not appear to disturb the Bell System, it did stimulate political competition on the part of the regulators. The toll rate disparity problem evoked criticism by some state regulators of the visible sources that appeared to generate the problem: separations and federal regulatory action.

Initially, this consideration took a peculiar turn. Rather than acknowledge the mutual interest of state and federal regulators for developing effective joint regulation of the industry, spokesmen for the states emphasized the conflicting aspects of jurisdictional authority. Michigan Commissioner O'Hara, in the first reported NARUC discussion of separations (1942 convention), spoke on the issue of board-to-board vs. station-to-station telephone rate principles. He argued from analogy. "For the railroad utilities it [separations] has been resolved so as to place
effective regulatory control of the intrastate as well as interstate service in the hands of the federal regulatory authority." Commissioner O'Hara went on to point out that the station-to-station method of telephone costing would assign a portion of exchange investment and exchange expense to interstate toll. This was a threat to state regulatory hegemony. He pointed out that all telephone ratepayers must collectively meet the total cost of service, both exchange and toll. He suggested that the issue was maintenance of "effective regulatory control" or sacrifice of the interest of exchange ratepayers. Since the interest of state regulation was for "effective regulatory control," he would opt for the board-to-board method of telephone rate making.14

The 1941 Interstate Reductions

Despite the previous rate reductions negotiated by the FCC between 1935 and 1940, earnings level of the Long Lines continued to rise with the growth in interstate message and private line traffic. In April, 1941, the FCC, on its own motion, instituted an investigation of interstate toll rates of the Bell System.15 The complaint of the state regulators regarding the increasing disparity between state and interstate message toll rates was of no avail. On June 4, 1941, the FCC announced that the rates under investigation "had been adjusted by conference," and a $14 million interstate message toll rate reduction had been approved.16 The federal commission had its own reputation to uphold.

State regulators were becoming concerned at the disregard of their interests and at the federal commission's action, which was increasing the disparity in toll rate levels. Accordingly, President Wolfe of the NARUC appointed a "Committee of Five" to confer with the FCC.17 The outcome of the conference was agreement to "carry on a comprehensive cooperative investigation of separations problems." This was the formal indication of a new proceeding, to become known as Docket 6328.

Pressure from the NARUC for a separations investigation merely added fuel to the impetus supplied by the Bell System. Initiative for such a proceeding actually came from the company. Prior to the conference of state and federal regulators, the Bell
System in April, 1941 had petitioned the FCC requesting a hearing on separations methods. A. T. & T. concern over ruling separations principles was understandable. The interstate rate reductions that the FCC had negotiated with the carrier during the first seven years of its tenure were based on Long Lines' reported income and balance sheet data. Long Lines operations are wholly interstate. The rate reductions were also applicable to the interstate business of the Associated Companies. There was no formalized basis for determining the interstate earnings of the Associated Companies, in the absence of separations standards. The FCC had neither prescribed any definition of what constituted appropriate interstate property nor provided any inkling of its inclination as to principles of separations. The rate reductions were apparently agreed to on the basis of a mutually held assumption that earnings were excessive on any separations basis. However, toll message service displayed marked demand elasticity with respect to price reductions. Each reduction in unit charges was followed by offsetting growth in demand compensating for losses in unit revenue. With the growth in demand, there has been comparable growth in earnings level. Rate reductions have not necessarily meant revenue reductions.

To get ahead of our narrative, the FCC for the next 25 years continued to regulate separations matters on the same basis. The nature of the separations hearings is of interest in their own right. However, the FCC never acted on them and regulation of interstate message services was carried on without the Commission either formally affirming or modifying methods used by the Bell System.

The Separations Hearing—FCC Docket 6328

The successive reductions in the interstate message toll schedule and the resultant state-interstate toll rate disparity generated peculiar reactions on the part of the NARUC senior membership. As the Committee of Five noted in its annual report to the Association: "[it] placed the state commissions in an unfavorable position with respect to the regulation of intrastate rates . . ." In lieu of praise for the relief afforded long distance telephone
rate payers by the rate reductions, the state regulators were concerned by the unfavorable comparisons made possible by the double scale of toll rates.

The dilemma posed to the state regulators by their public service functions and the competitive posture vis-à-vis the FCC evoked a curious response when the latter held its separations hearings in Chicago, August 19-25, and October 7-8, 1942. Early in the course of the hearings Frank Warren, the NARUC counsel read into the record a long list of states, which formally opposed the station-to-station theory of plant separations and endorsed the board-to-board principle.20 The formal basis for this position of the state regulators was that "a transition from board-to-board to station-to-station would . . . offer opportunity for an extension of federal jurisdiction to the field of exchange operations."21 This position was taken apparently with full knowledge that adoption of the station-to-station method would relieve exchange ratepayers of approximately $50 million in revenue requirements. This calculation was reported by Edward McNaughton, spokesman for the joint FCC-NARUC staff committee, working on the separations problem.22

In its behalf, the Bell System brought forth an eminent group of its senior executives from the Associated Companies to support the board-to-board principle. Until it filed a brief, however, it withheld its legal conclusion that the FCC had no authority to impose station-to-station rate making principles:

If the carriage from the subscriber telephone to the toll trunk [the toll side of the exchange switchboard] is a part of exchange service, the Federal Commission has no power to regulate it, and can regulate only the remainder of the service, i.e., the carriage from toll board to toll board. It then necessarily follows that the Federal Commission must determine and prescribe interstate toll rates on the Board-to-Board basis, since the toll board is as far as its jurisdiction extends.23

In short, the convention of the Bell System was that the decision of the U.S. Supreme Court in Smith vs. Illinois Bell was negated upon Congressional enactment of section 221 (b) of the Commission statute. Indeed, this section of the Act denies FCC jurisdiction over exchange service.
Relative Use vs. Relative Benefits

Positions taken by the parties in the testimony in Docket 6328 on the board-to-board vs. station-to-station principle have been discussed previously. One witness, however, raised an entirely new question of cost principle which merits discussion here. Manfred Toeppen, then assistant chief engineer of the FCC dissented from the use principle in the separation of telephone plant. The joint rendition of exchange and toll services, Mr. Toeppen contended, is mutually beneficial in that each service benefits. However, these benefits are disproportionate. Under the relative use and occupancy criterion of apportioning joint facility investment, an undue proportion of the benefits accrue to the toll services and an insufficient portion accrues to the exchange service.

By way of illustration, Mr. Toeppen submitted an exhibit demonstrating this alleged inequity. To facilitate understanding of the principle, the Toeppen presentation has been re-worked and included below as Table III. A pole line carries eight exchange circuits and two toll circuits. Under the use principle, 80 percent of the cost of the pole line is assigned to exchange operations, 20 percent to toll. Next, Mr. Toeppen examined the benefits accruing to each service from spreading costs pro rata to facility occupancy. To contrast this conventional treatment, he compared the cost of constructing separate toll pole lines and exchange pole lines, using the required standard of construction necessary for each. At this point Mr. Toeppen observed that under the relative use method all of the savings of joint construction are absorbed by toll (cf. Table III, part III).

The proper method of apportioning these joint costs, Mr. Toeppen asserted, is to distribute the cost savings in direct proportion to the separate pole line costs. This is illustrated in part II of Table III. Note that under the "relative benefits" method, the assignment of exchange investment is reduced by 19 percent under the use method of cost assignment, while the investment assigned to toll is increased by over 75 percent. Of course, the results would differ with a change in the basic plant dollars or a change in relative facility occupancy. In general, however, where
exchange and toll services share facilities, toll plant requirements are a small part of joint facility occupancy and the principle is a consistent one.

### TABLE III
Comparison of Property Assignment of Pole Line Investment on the Basis of the "Use" Principle and Relative Benefits Method

#### I. The Relative Use Method

<table>
<thead>
<tr>
<th></th>
<th>No. Circuits (^a)</th>
<th>Proportion Circuits (^b)</th>
<th>Joint Investment Apportionment</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Exchange</td>
<td>8</td>
<td>80.0%</td>
<td>$664</td>
</tr>
<tr>
<td>2. Toll</td>
<td>2</td>
<td>20.0%</td>
<td>165</td>
</tr>
<tr>
<td>3. Total</td>
<td>10</td>
<td>100.0%</td>
<td>$829</td>
</tr>
</tbody>
</table>

#### II. Relative Separate Cost Method

<table>
<thead>
<tr>
<th></th>
<th>Separate Pole Line Costs (^c)</th>
<th>Proportion Investment (^d)</th>
<th>Investment Apportionment (^f)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Exchange</td>
<td>$655</td>
<td>64.5%</td>
<td>$537</td>
</tr>
<tr>
<td>2. Toll</td>
<td>356</td>
<td>35.2%</td>
<td>292</td>
</tr>
<tr>
<td>3. Total</td>
<td>$1,011</td>
<td>100.0%</td>
<td>$829</td>
</tr>
</tbody>
</table>

#### III. Comparison of Savings under Two Methods

<table>
<thead>
<tr>
<th></th>
<th>Amount (^e)</th>
<th>Percent (^f)</th>
<th>Amount (^i)</th>
<th>Percent (^i)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Exchange</td>
<td>–9</td>
<td>–1</td>
<td>$118</td>
<td>18</td>
</tr>
<tr>
<td>2. Toll</td>
<td>191</td>
<td>53</td>
<td>64</td>
<td>18</td>
</tr>
<tr>
<td>3. Total</td>
<td>182</td>
<td>18</td>
<td>$182</td>
<td>18</td>
</tr>
</tbody>
</table>

\(^a\) Advocated by Toeppen, FCC Docket 6328.

\(^b\) Wire assumed to be equal gauge.

Note: Col. \(^c\) is Col. \(^b\) x $829, combined investment. Col. \(^f\) is Col. \(^e\) x $829.

Col. \(^d\) is the difference between separate construction cost and apportioned joint cost; \((D) = (C)\).

Col. \(^i\) is \((D) – (F)\), the difference between separate construction cost and relative separate cost.

Mr. Toeppen’s testimony was criticized both by Bell witnesses and regulatory staff members as “hypothetical” and “academic.” No effort was made to refute the presentation directly.24

From the viewpoint of administrative feasibility, the allocation of joint use costs on the basis of relative benefits leaves much to be desired. In 1942 the Bell System owned close to 4 million miles of open wire plant and over 92 million miles of aerial and underground cable.25 The day-to-day use of these facilities changes with both market and technical requirements. Jurisdictional separations is a continuing (monthly) process. The pole line illustration used above has its counterpart in virtually every segment of telephone equipment operation. The problem of re-pricing plant, either on a sample or universe basis, to reflect changing occupancy and to establish their separate service costs would be tremendous.

The lesson from the Toeppen presentation should not be lost. Provision of joint services has disproportionately benefited the toll services under the relative use method of apportioning costs. There is nothing inherently right or wrong with the use criterion; any cost allocations method is arbitrary. The premises established determine the results. Regulators need constantly to re-examine the postulates of the process and not dissipate their limited energy in pivoting over detail. To this objective, the Toeppen submission was a real contribution.

FCC Docket No. 6468

Before the Separations Investigation had been completed, the Federal Communications Commission observed the mounting earnings of the Long Lines Department. For the year ending September 30, 1942, the company reported net income (before F.I.T.) in excess of 24 percent of average net investment and a return of close to 15 percent after all expenses and income taxes.26 Accordingly, on November 20, 1942, the Commission instituted an investigation of Long Lines rates, Docket No. 6468. Hearings got under way on December 20, 1942. Prior to reconvening, on January 20, 1943, the company agreed to various reductions in the message toll and private line rates. The cost to Long Lines of
the tariff revision, according to the commission, was estimated at $50,000,000.27 As customary, this cost was calculated by multiplying old business volumes by unit rate reductions; no account was taken of demand elasticity. The fact that customer benefits could take place without revenue impairment was not reflected in the Commission announcement.

Despite the company position, stated in its brief to the Commission in the separations proceedings, that the FCC was without authority to establish toll rates on a station-to-station basis, the company assented to its filing on this basis. The effect of this re-filing, as estimated by the A. T. & T., was to transfer some $22 million (on an annual basis) in revenue to the Associated Companies. The abrupt reversal of company position on the station-to-station principle signalled their acknowledgment of the shifting position of state and interstate services. Adoption of the station-to-station separations principle reduced, to the extent of jurisdictional revenue transfer, the size of the interstate toll rate reduction.

We can speculate as to the considerations facing A. T. & T. management before effecting this reversal of policy. On the one hand was the value to the company of delaying imposition of the station-to-station principle through litigation. On the other hand, acceptance of the principle served to increase the intrastate rate of earnings. The state commissions had not shown marked aggressiveness in the regulation of telephony. Faced with this option, the company chose to abandon its position on the alleged unlawfulness of the station-to-station approach with respect to interstate telephone rate making.

At the end of 1943 the NARUC Committee on Utility Rates counseled the state membership:

It cannot be overemphasized that the additional and increased payments to the Associated Bell Companies have brought a definite responsibility to each state commission to see that these payments are reflected in reduced intrastate rates . . . . Although the Associated Companies have benefited from the changed principle of compensation . . . reduced rates have been made applicable in the aggregate of less than two million dollars.28

The NARUC also issued at the end of 1943, a tabulation furnished it by the Bell System showing, by states, the amount of
intrasate rate reductions authorized that year by state commissions as a result of the revenue transfer. They totaled $3.9 million of which less than $3.0 million represented changes in intrastate toll rates. The balance represented changes in charges for various private line services.28

The FCC, on its part, never issued a decision in the separations proceeding, Docket No. 6328. The investigation was finally closed in January, 1966, as a by-product of the telephone rate investigation initiated by the Commission in Docket No. 16258.29 Twenty years after the Supreme Court decision in the Smith vs. Illinois Bell case (1930) in which the court ruled that the cost of toll service included as a component the cost of the station equipment and local distribution plant, the Bell System acknowledged the decision as law. In 1930 the Associated Companies refiled their intrastate tariffs to reflect toll service costs on a station-to-station basis.30

FOOTNOTES TO CHAPTER III
2) "Message Toll Telephone Rates and Disputes," NARUC, 1951, p. 54.
4) "Design of Pole Lines," B.E.A. Telephone Engineering and Construction Manual, Sec. 611.2.05. This manual has been largely adopted from Bell System Practices.
5) 8 P.U.R. (N.S.) 1.
6) On appeal by the company, the court did not discuss the separations question. 18 P.U.R. (N.S.) 1, (1957).
9) Robert Nixon, Commissioner, Wisconsin Public Service Commission, in address at 52nd Annual Convention NARUC, reported at p. 360 of Proceedings.
11) "Report of The Committee of Five Cooperating with the FCC in Special Telephone Studies," 1942 Proceedings, p. 171. Pennsylvania and Delaware have continued to maintain toll rate uniformity.
12) Based upon review of NARUC Annual Proceedings, 1925-1940. One student of regulation has noted: "... the state commissions have particularly avoided telephone rate cases." J. Bauer, Transforming Public Utility Regulation (New York: Harper & Brothers, 1930), p. 337.

13) "There can be no such thing as concurrent jurisdiction or even cooperation between the states and the Federal Government on the subject of rate making," 1831 NARUC Proceedings, p. 150.


15) FCC Docket 6053 reported in 1941 NARUC Proceedings, p. 142.

16) Ibid., p. 144.


19) Ibid.

20) FCC Docket 6328 Trans. p. 14 and appended letters from the State Commissions. "The Cooperative Committee and the Committee of Commissioners have taken no position with reference to the board-to-board and station-to-station basis." Tr. p. 402.


24) Cf. testimony of A. T. & T.'s Vice President Hanselman and staff witness C. W. Cummings, Docket 6328, Tr. pp. 374 and 460, respectively.

25) Statistics of Communication, 1942, FCC.


27) Ibid., p. 321.


29) Telecommunications Reports, Nov. 18, 1943, p. 21.


IV

Telephone Separations, 1944-1955

We have seen that by 1944 the controversy over station-to-station vs. board-to-board method of telephone cost allocation was largely resolved. However, the industry was still faced with the necessity of having a set of working separations principles to meet its day-to-day operating requirements. While the regulators sensed this need, it was the Bell System which fully recognized the potency and significance of the separations issue.

The time period under review in the present chapter, 1944-1955, was highlighted by the distinct postures taken by the three main participants—federal and state regulators and by the Bell System. The federal regulatory commission displayed intermittent competitive hostility to separations principles espoused by the states but took no decided action on its own initiative. It was swayed by events, but made no effort to dictate their course.

The state regulatory commissions, buffeted by repeated requests for intrastate telephone rate increases, sought through amendments to separations principles, to alleviate intrastate telephone revenue requirements. The 45 separate State Commissions attempted to effect these objectives through the NARUC, the trade association of public regulators. The competitive power of the Association was wielded through federal legislators; but it was a power which could only be used sparingly.
In view of the regulatory hiatus, the Bell System moved into the breach. Only those separations principles that were espoused or supported by the company became the ruling principles. While extensive discussions were held over alternative methods and principles of telephone separations, changes were not made until and unless the regulated carrier accepted them.

Postwar Developments

The close of World War II hostilities was marked in the telephone industry by a surge of state rate case applications for upward adjustments in both exchange and intrastate toll charges. In the immediate postwar period through May 31, 1948, Bell System companies had applied for increases totaling $242 million in intrastate rates in 43 states and the District of Columbia. About 80 percent of the amount applied for was granted by the state regulatory bodies. By this time the FCC laid claim to some $110 million reduction in interstate toll rates negotiated with Long Lines and the Associated Companies, effecting almost nationwide uniformity in the level of interstate toll charges.

This disparity in regulatory results generated new competition between the regulators. The competition was reflected first in greater interest in telephone separations matters on the part of state commissioners, and vocalized, on some occasions, by criticism of prevailing separations methods. This criticism took form in the written opinions of the state commissions dealing with Bell System rate cases; it also appeared in the published reports of the National Association of Railroad and Utility Commissioners.

The state commission's dilemma arose from very practical and specific observations: At the time, most System investment was in plant and equipment utilized jointly by exchange and toll services. One segment of this investment, utilized in the rendition of interstate toll service, was recurrently showing excess earnings sufficient for the utility to "assent to" successive rate reductions; the other segment of the same telephone plant, utilized in the rendition of intrastate telephone services, was being used to justify repeated rate increases. Lacking adequate technical
and professional staff to explore fully the details beneath these rate applications, it is little wonder that a number of the state commissions seriously disparaged the separations methods. Separations methodology was criticized on the basis of the variation in results.

Although joint hearings had been held in Chicago in the latter part of 1942 on separations methods, the FCC had failed to act—expressing neither assent nor dissent to the various suggestions offered during the course of the hearings. Few, if any of the state regulatory commissions ever formally adopted the draft of the manual sponsored jointly by the Bell System and the NARUC-FCC technical staff. Confronted by regulatory indecision on one hand and immediate operating requirements on the other, the Bell System decided to go on its own. Beginning in 1944 the Bell System had, with certain modifications, applied the Separations Docket (FCC No. 6328) principles in its division of interstate message toll revenues among Associated Companies and the Long Lines Department, A. T. & T.4

Failing to obtain sanction of the separations principles from the federal authorities, the company sought to press the state regulatory representatives for formal commitment. The recurrent theme of opposition, though a minority view, by state commissioners to the "accepted" separations principles was the cause of some anxiety among Bell System executives.

The concern of state regulators initially took the form of resolutions. The Southeastern Association of Railroad and Utilities Commissioners said at its 1946 annual convention:

Whereas, notwithstanding the fact that numerous large reductions have been made in recent years in the interstate toll rate schedules, further reductions on these rates may and probably will be prescribed by the FCC at the same time the Southern Bell Telephone and Telegraph Company is seeking increased revenue from revisions on exchange and intrastate toll rates, and Whereas, there is certainly something wrong with the present separation methods, which produce this anomalous situation, therefore be it Resolved that ... the NARUC call on the FCC to institute a cooperative proceeding together with representatives of state commissions to determine a proper method of separations ... Be it further Resolved that the FCC be notified that no further reductions shall be made in interstate toll rates without hearing ... and at such hearings representatives of state commissions be invited to participate fully therein.5
The Mountain-Pacific States Conference of Public Service Commissions in a resolution the same year also noted the disparity in the rate level between state and interstate toll rates. It recommended further conferences with the FCC to work out "changes if necessary in the factors and principles underlying the present cost allocation in order to develop ways and means of assigning the costs of furnishing telephone service to the interstate toll telephone category on a more equitable basis." The NARUC convention meeting in Los Angeles that year passed its own resolution incorporating the substance of the Southwestern and Western regulatory associations' resolutions.

Resolutions did not stem the tide. Early in 1947, FCC Commissioner Walker advised Commissioner McWhorter, Chairman of the Joint FCC-NARUC Cooperative Committee, that the FCC was considering a further reduction in interstate toll rates. This was to follow the $20 million reductions made effective February, 1946, by the FCC. Industry and regulatory representatives were hastily summoned. Consultant Lewis T. Hayner was employed by the NABUC Special Telephone Committee. While the roster of committee and subcommittee representatives, which met in New York City on A. T. & T. premises, was extensive, it appears that the bulk of deliberations was undertaken by Mr. Hayner, a few subcommittee staff representatives, and A. T. & T. representatives. The group was asked to:

1. Consider principles of making cost allocations on a basis other than the "actual use" basis outlined in Exhibit 2 (the separations methods sponsored by the staff in FCC Docket 6928) either on an over-all basis or for individual items of plant and expense.
2. Review the detailed "actual use" cost allocation methods outlined in Exhibit 2 to determine whether their application produces equitable allocation of plant, revenues and expenses among exchange, state toll and interstate toll under current operating conditions.

The subcommittee worked diligently for about a two-month period, submitting a 172-page report dated April 28, 1947, to summarize its findings. Since the composition of the regulatory group was essentially the same as that which had urged FCC to adopt Exhibit 2 five years previously, it would have been awkward to criticize the earlier efforts. Not surprisingly, therefore, the
staff subcommittee endorsed the use principle as "basically sound,"
The sole departure from then current separations procedure
was contained in the following paragraph:
As one possibility, the nation-wide toll network might be treated as a whole
rather than considering toll plant located within individual states as sep-
parate entities to be apportioned between state and interstate services.11

The 1947 Manual

The subcommittee re-drafted Exhibit 2 of FCC Docket 6328
incorporating procedural modifications endorsed by the Bell
System representatives. As incentive to the states for such
changes, it was pointed out that their effect would assign approxi-
mately $6,045,000 of plast and $17,267,000 of expense from intra-
state to interstate, while reducing interstate revenues some
$800,000.12 Prior to any formal adoption of these changes by the
National Association or by the FCC, the Bell System incorporated
them in its Division of Revenue instructions used for intra-system
determination of toll settlements.13 On May 28, 1947, the Tele-
phone Committee of the NARUC notified A. T. & T. of the
acceptance of the separations changes; concurrently, the FCC
notified the company that "it would interpose no objection to the
revision subject to such determinations as might later be
developed under FCC Docket No. 6328 now pending."14 Actual
writing got underway June 30, 1947, and the printed Manual of
Separations was available for distribution by October, 1947.

The subcommittee had urged that allocation of toll plant in-
vestment "be treated as a whole." To implement this sugges-
tion, detailed cost data had to be furnished by the utility. The
information requested by the technical staff was necessary to
determine the effects of the proposal on the individual states.15
The company declined. Unsuccessful in obtaining the required
supporting data, the subcommittee (consisting of technical staff)
turned to its parent Telephone Committee (composed of Com-
missioners) for assistance.

The Telephone Committee apparently thought highly enough
of the suggestion to request the information of Bell representa-
tives. "Company representatives claimed that the cost in time and
money to obtain the information requested would be tremendous
and they questioned the value of such information in solving the problem before us." The plan was dropped for lack of supporting data. Without assessing the appropriateness of the subcommittee proposal, this narrative is instructive in the fundamentals of telephone regulations in the separations field. Where the Bell System assumes an adamant position in opposition to a separations principle, even though proposed by the regulators, the changes have invariably floundered. Regulation of separations has been by consent.

Results of the 1947 Efforts

We find, in summary, three significant results of the deliberations of NARUC. First, the pending interstate toll rate reduction was avoided; the rate of earnings on A. T. & T. net plant increased from 6.69 percent in 1947 to 6.88 percent in 1948. Minor procedural changes effected a net reduction in intrastate revenue requirements of about $19 million, increasing interstate assignment by the same amount. The reduction in state revenue requirements was absorbed in the growing earning needs of the Associated Companies; there is no indication from available records that any state reduced its local Bell rates to reflect this reduction in revenue requirements.

Undoubtedly, the most significant result of the work of the subcommittee and Telephone Problems Committee was the issuance of the Separations Manual, the first formal published statement of separations principles. A relevant question is whose ends were immediately served by issuance of the separations manual. The FCC never adopted it, but merely "interposed no objections" to its use. The NARUC is not a regulatory body, but rather an association composed of individual regulatory commissions. In the role of regulators, the state commissioners most active in the endorsement of the principles contained in the Manual were restrained from criticizing their own product; other commissioners were more critical as the opinions we will consider below indicate. The Manual itself is limited to a broad statement of principles. It is nearly impossible to proceed with actual separation and allocation of telephone property with it as sole guide.
The basic directions for separations are contained in several thousands of pages of detailed instructions known as Division of Revenue (DR) Procedures published by the A.T.&T. and limited to distribution among member companies. To this date, there are not a half dozen regulatory commissions in the country which have copies of the DR procedures on file. However, publication of the Separations Manual did meet one salient objective. It served as a formal standard by which to legitimize separations practices followed by the Bell System. The vague and inchoate complaints and criticism of individual regulators and outside critics could now effectively be refuted by the submission of this quasi-public document appropriately titled "Standard Procedures for Separating Telephone Property . . .," the author—the "NARUC-FCC Special Cooperative Committee."

State Rate Case Activity

In the interim, state exchange and toll rate cases went forward unabated. Despite the existence of the Manual outlining separations principles, some of the commission's comments expressed in rate case decisions are worth attention. The bulk of state regulatory decisions on Bell System rate cases make only passing reference to separations matters. Here criticism, if any, is oblique while obeisance is given to the "standard procedures." The views of the Kentucky Commission, following its adoption of Southern Bell operating results, are typical of this approach:

The [separations] procedures should be studied further . . . Some uniform system is to be desired to solve this problem in an equitable manner. Until such a uniform system is produced and accepted by regulatory bodies, we are reluctant in this case to depart from the procedure most widely used.

A minority of state commissions criticized the separations results. Some criticized the fundamental use principle, others the detailed mechanics of separations; a few were discomfited by the application of standards to their local unique operating problems. Where commissions acted on the basis of their criticism, the companies generally filed appeal to the courts. At court the existence of "standard procedures" served the utility well. The judiciary prefer a normative approach and look on precedent and standardized methods of performing business operations as
a boon to wisdom. Most of the hostile regulatory decisions in
separations matters were overturned by the state courts. In view
of the complexity of the subject matter defying regulatory "exp-
erts," adherence to standards by the courts is not surprising.

Southern Bell—Georgia, 1948. A decision by the Georgia Public
Service Commission in January, 1948, after some 13 months of
hearings and investigation was critical of the methods followed
by Southern Bell in implementing its separations results.32

It is apparent that there is no physical separation of properties between
interstate and intrastate services; that the alleged separation relied upon is
admittedly based upon spot checks in many instances, subject to errors of
fact and judgment and that the separations procedures have not been ap-
proved by the Georgia Commission nor by the FCC . . . . The intrastate
separation made by the Company was based on statistical studies made
during the year 1945 and the early part of 1946 and factors obtained from
these studies were applied to the total investment of the Company in Georgia
as of June 30, 1946. The selection of a 12-month period ending March 31,
1947, for the application of factors developed in 1945 and early 1946
which were related to an investment figure as of June 30, 1946, would not
necessarily produce true facts. Different factors would be obtained if
different study periods were used and different results would have been
obtained if different factors had been applied to a more recent total in-
vestment figure.

The technical criticism of the Georgia Commission is correct,
yet somewhat misleading. The heart of separations procedures is the
assignment of plant to various categories; traffic usage
studies are then employed in the apportionment of the book
costs to various operations (interstate message toll, exchange).
Traffic studies are undertaken, in large part, on a sampling basis.
The comment of the Georgia Commission appears to have been
directed at the development of the traffic usage factors. Experi-
cence indicates that most traffic factors, such as holding time per
local call and conversation minutes per toll call, alter very slowly
with time. While it would have been feasible to develop such
factors concurrent with the test period employed in the rate
proceeding, the magnitude of changes in the coefficients would
probably have had little impact on the results.

In July, 1948, the Georgia Supreme Court reversed the com-
misson on other grounds. On remand the commission's decision
avoided discussion of separations methods.\textsuperscript{23}

New England T & T—New Hampshire. A decision marked by
criticism of separations methods when applied to New Hampshire
operating conditions was rendered in 1949. Extracts of the state
commission’s decision follow.\textsuperscript{24}

New Hampshire attracts a large number of visitors during the summer
vacation period. The construction of telephone plant in this state has been
designed to take care of the peak loads that result from its large volume
of business in these summer months. A substantial portion of the telephone
plant that has been constructed to accommodate summer peak loads of
necessity remain idle during the remaining parts of the year is shared by
the interstate and intrastate user on the basis of year-round relative use
of the plant. The result is that intrastate users in effect subsidize the inter-
state plant.

It is also to be noted that the telephone has a standby value for such toll
use . . . . The company has developed its plant in New England states as
a system proposition. The addition of each new telephone was considered
to give added value to the system and added service value to all existing
subscribers.

After the commission denied the rate increase, the Company
filed a motion in the New Hampshire Supreme Court requesting
interlocutory relief. In its decision denying the company re-
quest, the Court expressed views on separations stating, in part:\textsuperscript{25}

The (separations) formula is open to serious objection because it gives no
weight to the difference in the relative value of the local exchange service
and the toll service and thereby disregards standby value, and because
the formula imposes an artificial state line limitation upon economic factors
that operate regardless of state lines . . . . The U. S. Supreme Court’s
suggestion of division of use was made to avoid undue burden on intrastate
subscribers. The formula still leaves an undue intrastate burden. The
formula of separation is merely an attempt to divide the indivisible . . . .
The local use is a convenience, but it is not a measure of value to be weighed
as a time unit with the use of toll, either intra or interstate; and presumably
the longer the distance the more valuable the use . . . . In disregarding
the standby value of the telephone for toll use, the formula runs counter
to the general contention of telephone companies throughout the Bell
System, that the relative levels of telephone rates for different classes of
service are determined primarily on the basis of value of the service rather
than its cost.

Note that the Court upheld the state commission’s views
primarily on the “value” concept. In successive years, other
state courts found the other way. The value concept continues
to be a controversial issue to the present day. Recognition of relative value in ascertaining jurisdictional costs was considered by the 1947 NARUC subcommittee on separations, but rejected: "The value of service theory at this time is not warranted." The subcommittee reviewed the possibility of developing weighting factors to reflect length of haul and telephone availability but concluded:

no acceptable method of evaluating them [value] was found. Regulation of the telephone industry is vested in a number of state commissions and a federal regulatory body and the general concurrence necessary for adoption of appropriate factors to reflect value of service is therefore difficult to obtain. Determination of relative value seems to have no direct bearing on an allocation of actual costs.

The reasoning set forth by the subcommittee is not wholly clear. Presumably the function of the joint state-federal regulators was to agree on cost definitions. The absence of a numeric weight in calculating the relative minutes of toll and exchange use conceals the fact that a “value” imputation is contained in the very operation. Separations experts tend to seek solution in the physical unit as a proper method of cost allocation. There is nothing inherent in such unit to make it universally valid. The premises of telephone separations should be founded on publicly accepted principles of social value. The subcommittee refusal to depart from the relative minutes of use in the assignment of costs to the operations was due to self-imposed restraints and failure to recognize the broader questions of social policy within which telephone separations operates.

The New Hampshire Supreme Court upheld the state commission for its value concepts. But we should not lose sight of an additional point made by the commission. In addition to New Hampshire, a number of other states, such as Vermont, Maine, and Florida are heavily dependent on seasonal resort traffic. Substantial segments of telephone plant—toll connecting trunks, interexchange facilities, and switching equipment—are engineered for peak seasonal use. The relative use measure of those facilities assigns a portion of this investment to interstate jurisdiction during the tourist season. However, a division of revenue is made every month. When the tourist load falls, and with it the
use generated by this segment of business, the exchange and intrastate customer automatically pick up the burden of this investment, since the intrastate traffic does not fall nearly in proportion to the drop in interstate business. An apportionment method which attempts cost assignment on the basis of cost causation would give weight to peak usage.

New England T & T—Maine. The adjoining commission in Maine went a step further than New Hampshire in adopting its staff engineer’s recommendation of assigning a weight of two to toll minutes of use in calculating an apportionment factor for station equipment. A portion of the commission’s opinion follows:

It is apparent that little practical use has been made of separations procedures by the company or by the Bell System prior to 1946. No such separation was undertaken either by the company or by this commission when the general rate case was presented in 1923, the whole case having proceeded upon the basis of combined figures . . . .

The results obtained by this method (subscriber line usage factor) allocates 98.4% to intrastate and only 3.6% to interstate. This method disregards all factors except actual use. Although value of the service is considered an important factor in classifying local exchanges into groups according to the number of telephones that may be reached within this exchange, this consideration is totally ignored in the application of the subscriber line usage factor for the separation of intrastate and intrastate plant and expenses . . . . the character and extent of the use is to a large extent determined by the nature of the charge . . . . In our judgment the proper criterion is the extent of use in interstate and intrastate service when such use is available under substantially the same condition.

Critique of the Use Measure

The Maine Commission’s comments might be amplified slightly. Most states follow a pattern of so-called state-wide rate making in the establishment of local exchange telephone rates. In application this means that the level of exchange rates is graduated upward from the smallest to largest exchange areas with the largest exchanges bearing the highest charges. The justification for this rate structure, as explained by Bell witnesses, is that service is least valuable in the smallest exchanges, which have access to the smallest number of telephones, and increases in value with telephone availability in the larger exchanges. How-
ever, when it comes to jurisdictional costing through the telephone separations process, the Bell position at this time was that value of service should play no part; that costs must be allocated wholly from measurements of relative use.  

Except in purely academic discussions, there is no way of insulating a proper theory of telephone costing from a theory of telephone rate making. No place is this clearer than in telephone separations. It is generally recognized that all forms of measured (toll) telephone service impose a deterrent on usage; conversely, non-measured (flat rate) telephone service removes a deterrent to telephone usage. In utilizing relative use as determinant of apportioned costs the industry was applying basically dissimilar rate structures to serve as rationale for cost distribution. The criticism of weighting for "value" is self-serving. The weights are already contained in the underlying difference in rate structure—encouraging the use of exchange calling, increasing its "allocated costs," deterring the use of message toll and proportionately reducing its allocated costs. This is no more than a recognition of the circularity inherent in any costing operation. We can restate this picture in economic jargon to highlight its significance.

Telephone costs, both in the technical sense and in abstract conception, are a function of output. Output is a function of demand. The structure of telephone demand is, in part, determined by rate structure. Telephony is a joint cost industry. Exchange service is largely a flat rate, nonrestricted demand. Toll is a restricted demand service in the sense that imposition of charges for each call inhibits demand and therefore use. Under the relative use criterion prevalent in separations methods, this means that assignment of costs to the separate exchange and toll services becomes a function of the rate structure. Hence the circularity.

Does the circularity of the relationship destroy the validity of the use measure of separations? Not necessarily. There are two further assumptions implicit throughout the separations procedure that are probably more basic. First, is the assumption that cost causation is somehow a linear function of demand and use.
Second, is the assumption that demand function for the separate services, exchange and toll, is relatively homogeneous. Both assumptions are probably invalid. As pointed out earlier, the design of telephone plant is dictated by the most severe operating requirements of its separate service—usually toll. With respect to demand characteristics, exchange service is probably least elastic in response to price changes. Toll usage has shown pronounced elasticity of demand and use in response to price reductions. Since the two assumptions, cost causation and homogeneity of demand are unsound, the apportionment of joint telephone costs on the basis of relative use is at best a political compromise.

To return to our theme, the Maine Court overturned the state commission decision. In so doing, the Court cited the New England Company brief on the arbitrariness of applying a weight of two to toll minutes of use in apportioning station investment. Two years later the Bell System proposed the use on a nationwide basis of the “Charleston Plan” which, in effect, employs a weight of two to toll minutes of use in apportioning station investment.

C & P of West Virginia—West Virginia Public Service Commission

Another regulatory critic of the then prevailing separations methods was the West Virginia Commission:22 The principal advocates of the methods prescribed by the Manual appear to have been the Bell System companies and the advantages they have derived from them wherever the Manual has been used is the multitude of rare cases recently before the various state Commissions is obvious. . . . the average telephone is idle 98% of the time; it is used only .06% of the time for interstate messages and 1.94% of the time for intrastate (toll) messages. The Manual ignores the time it is not in actual use and allocates these accounts (station equipment) solely on the basis of the character of its use during the other 3% of the time. As a result, approximately 97% of the cost of the telephone instrument and other station equipment and of the expenses associated with them are assigned to intrastate business and only 3% to interstate . . . the telephone has a standby value or a potential use during the 98% of the time when it is not in actual use.

J. M. Honaker of the Kentucky Commission staff was the advocate before the West Virginia Commission of the foregoing
method of cost assignment on the basis of standby time. Mr. Honaker served on the 1947 separations subcommittee of the NARUC-FCC Telephone Committee. The subcommittee dismissed the suggested use of standby time with the following reasoning:83

(a) . . . idle time would in effect control the allocation of subscriber line facilities.

(b) . . . the assignment of idle time, giving equal weight to exchange, state toll and interstate toll is arbitrary and could be changed with equal justification to produce different results. For example, equal weight might be accorded exchange and toll, the toll portion divided equally between state and interstate.

(c) . . . idle time is present in varying degrees in all telephone plant and there seems no sound reason for according special treatment to subscriber line facilities.

(d) Few telephone subscribers now receive exchange service under timed message rate schedules, and while the number of calls made may well be reduced under measured rates the holding time per call is ordinarily higher than under flat rates. Any adjustment to express minutes of use on a timed message basis would necessarily be both hypothetical and arbitrary.

The criticism of the subcommittee report does not appear to meet the issue. The application of the relative use and occupancy measure for apportioning jointly used plant would appear to have some validity where the engineering basis for provision of such plant is use—its magnitude and duration. With respect to the provision of station equipment and local distribution plant, no such basis exists. Each telephone customer must be provided with a telephone instrument and a pair of wires (local loop) to connect the instrument with the central office. The apportionment of this investment on the basis of relative use has only slight economic basis of fact. Employment of relative use as an allocation device for separating investment whose magnitude is virtually independent of such use is arbitrary and, equally so, are the Committee comments.

It is somewhat premature to point out that pressure for modifying this means of allocation of station equipment continued to mount. In 1965 the Bell System representatives suggested modification of the separation methods to acknowledge standby time in the form of "availability." The change was
promptly adopted and incorporated in separations instructions.

The Toll Rate Disparity Report

The increased pressure on the state commissions for upward adjustments in intrastate toll rates generated annual resolutions at the NARUC conventions on toll rate disparities. The problem stemmed from a disparity in jurisdictional earnings but was translated into a problem of differentials in toll rate schedules.

The state commissions, through the rate making process, were aggravating the problem. To meet the increase in statewide revenue requirements found necessary, the state commissions frequently imposed the major portion of increased charges on state toll rates, rather than exchange services. This was done usually without knowledge of where the revenue deficiency lay; only the California and Wisconsin Commissions required a breakdown of intrastate toll and exchange costs. Regulatory commissions are political bodies. While increases in exchange rates have widespread impact on all telephone ratepayers, toll rate changes have the largest effect on the business class of users. By the end of 1950, the NARUC Staff Committee reported: “All but two state commissions have found it necessary to establish state toll rates at levels considerably above the interstate schedule and it is doubtful whether those rates produce a return equal to those produced by the nationwide schedule of interstate rates.”

To examine different approaches to the problem, the Association in 1949, upon recommendation of its Telephone Problems Committee, appointed a joint NARUC-FCC subcommittee to make a detailed study of state and interstate message toll rates. As a first step, the subcommittee queried each of its member commissions. All replies from the commissions “with one exception concluded that intrastate rates should be at the same general level as interstate toll rates.” The same respondents were asked how this rate equalization should be accomplished. “A number expressed the view that the disparity should be reduced by adjustment (increases) in the interstate schedule.” The studies of the group were published in July, 1951, as a volume entitled Message Toll Telephone Rates and Disparities.
It provided a reasonably complete compilation of data and discussion dealing with message toll services and rates. The statement of "purpose of the study" (p. 3) foreclosed any serious consideration of separations principles since these were "considered beyond the purpose of this study." The more significant findings of the subcommittee were summarized in its final chapter, excerpts from which are presented below:16

2. The disparity between state and interstate toll rates is substantial, estimated at $125 million per annum. . . . Based on this estimate, revenues from state toll are, on the average, about 35% higher than they would be if the interstate rates applied, and in at least one state the spread exceeds 60%. In all but two states, toll schedules are higher than the interstate schedules.

3. Disparities between state and interstate rates exist, in varying amounts, at all lengths of haul up to about 800 miles, the maximum state toll haul.

5. Disparities have been increasing in recent years through reduction in the interstate rates occurring from 1943 to 1946 . . . and through increases in state toll rates since 1946 . . .

6. A substantial part of all telephone plant is used jointly in furnishing state and interstate telephone services. Therefore, allocation of joint cost is a major consideration in determining revenue requirements subject to state and interstate jurisdictions.

7. According to the results of separation studies for 18 states which were available to the Subcommittee, state toll earnings ratios were generally lower than interstate toll earnings ratios, although state toll rate schedules were higher . . . . Those states having an average length of haul of less than 33 miles showed negative ratios . . .

8. Factors which have contributed to the current disparities:

(a) Toll rates applicable to traffic at the short hauls do not appear to cover the total cost . . . . The portion of state toll traffic in the shorter hauls is
greater than the proportion of interstate traffic at such hauls.

(b) The average length of haul of state toll traffic varied from 9 to 91 miles, and for interstate was 204 miles . . . costs of short haul interstate traffic are being met, to some extent, by revenues from traffic in the longer hauls.

(c) Differences in regulatory practices.

(d) Differences in cost patterns such as

(1) Variations in cost per unit of use of inter-
change toll line plant.

(II) Developments in the art of telephony, both as to facilities and operating methods . . . . For example, the developments in carrier tech-
niques, have been chiefly applicable to the longer haul circuits on heavy routes. Such developments have reduced Long Lines in-
vestment per circuit mile from about $109 in 1943 to less than $90 in 1950 (45 percent) de-
spite large additions of high cost plant, whereas the average circuit mile cost of the Asso-
ciated companies has been reduced from $134 to $120 (10 percent).

(III) Greater average density of traffic on interstate toll routes than on intrastate routes, making possible lower cost toll circuits and more effi-
cient utilization of such circuits.

(IV) Geographical characteristics and traffic dens-
ities differ among states. Such local variations in costs, while also applicable to interstate ser-
vice are merged on a nationwide basis for interstate rate-making.

(V) The greater impact of wage increases upon state toll costs, since a large proportion of short haul toll costs are represented by labor costs.
(VI) Difference in traffic patterns, e.g., more person messages and longer average conversation time at the longer hauls.

11. The disparity between state and interstate toll rates could be materially reduced by a change in the interstate rate structure, increasing short haul rates. For a given interstate revenue requirement, this would necessitate substantial reductions in other parts of the interstate schedule.

12. The disparity would be alleviated by greater recognition being given by the several jurisdictions to broad toll cost relationships by length of haul and service classifications.

Toll Rate Disparity—Analysis

The subcommittee report was broad in scope and quite factual but provided neither recommendation nor proposed solution to the toll rate disparity problem. At the risk of over-simplification, we will attempt to summarize the Committee observations in graphic form.

FIGURE II
Unit Costs and Revenues by Length of Haul, State and Interstate Public Message Toll Service

Unit costs of public message toll business slope upward gradually with distance. Short-haul toll is furnished primarily by physical circuits, open wire, and cable; long-haul toll is furnished primarily by carrier and radio. Intrastate business is largely short
haul; interstate business is much longer haul. The relatively high terminal costs of carrier and radio render them uneconomical for most short-haul toll traffic. Unit rates of public message toll business slope upward with distance but graduate more rapidly than unit costs. Most intrastate toll business is short haul and noncompensatory (less than unit revenues). Short-haul interstate business uses, in general, the same physical facilities as intrastate toll, but its short-haul proportion of traffic volume is more than offset by the lucrative long-haul business. In general, interstate toll business has only a modicum of the more profitable long-haul business to balance short-haul losses. Not only facility differences, but greater traffic densities favor the long-haul message toll costs. The Toll Rate Disparity Committee addressed itself primarily to the technical facets of jurisdictional differences in the toll rate structure. It failed to observe that the jurisdictional organization of regulation of telephone toll rates created the problem. Consolidation of state and interstate toll costs and the development of uniform nationwide toll rate schedules would obviate any question of toll rate disparity. Ultimately, this is the only answer to the problem. Modifications to the separation methods for allocating interexchange line costs are palliatives, but not solutions.

The Original Phoenix Proposal

The 1947 Separations Manual specified that the cost of message toll telephone circuits, which could readily be segregated by use, were to be assigned directly to that service. It also provided that where such costs are not directly assignable, they should be apportioned between state and interstate service on the basis of the relative usage of those facilities. Usage was measured in terms of conversation-minute-miles.41

There are two kinds of jointly used toll line plant. One includes facilities that are used interchangeably and intermittently in completing state and interstate toll calls. This investment was allocated on the conversation-minute-mile (CMM) factor. The other type of toll plant includes poles, conduit, or cable which support or contain circuits, some of which were used in
furnishing a single service (e.g., private line or message toll), while the remainder were used in furnishing other services. A large portion of Long Lines circuits were carried in cable or on poles used to carry other circuits so that such plant is jointly used, although certain circuit components are used in a single service. The 1947 Manual provided for the direct assignment of the investment in those components which were used exclusively on a single service to that service, provided that the cost of such plant was segregated on the records of the company or “can readily be segregated.”

By early 1950 the interstate earnings of the Bell carriers were showing a pronounced favorable trend in contrast to the intrastate earnings of the companies. Under a threat of further reductions in interstate rates, Bell System representatives approached the NARUC Telephone Committee suggesting a major revision of allocation methods for assignment of interexchange plant. This plan, it was estimated, would transfer $200 million of investment in toll line from the state to the interstate operations along with some $20 million of associated expenses. It appears that the thought behind the proposed separation amendment was that such change would ward off any contemplated reduction in interstate rates, and also alleviate intrastate revenues requirements.

The Bell proposal contemplated a change in the practice of assigning Long Lines costs directly to interstate, and would have introduced a cost and use averaging concept in the treatment of Associated Company toll plant. The book cost of Associated Company toll line plant would be added to a computed book cost of Long Lines plant within each state. The computed cost of Long Lines plant would be obtained by multiplying the number of Long Line circuit miles in the state by the nationwide average book cost per Long Lines message toll telephone circuit mile.

The book cost of toll line plant in a state would be allocated to the respective jurisdictions on a ratio of relative airline conversation-minute-miles of use (MMM). Interstate usage would be determined by adding actual MMM of Associated Company
circuits to the computed MMM for Long Lines circuits in the state. The computed Long Lines MMM would be derived by multiplying the number of circuit miles of Long Lines message telephone plant in that state by the nationwide average conversation minutes of use per Long Lines circuit mile. The ratio of these interstate MMM to total state and interstate MMM in the state would then be applied to total book cost of toll line plant, as developed above.47

The justification for the proposal was that it would spread the benefits derived from Bell System research more equitably between state and federal jurisdictions. The great reductions in circuit mile costs of interstate facilities were attributed to the concentration of Bell Telephone Laboratories research in the area of long-haul transmission, so that the short-haul and feeder lines, largely intrastate, suffered by comparison.48

The FCC rejected the proposal. In a letter dated October 18, 1950, addressed to Commissioner McWhorter, Chairman of the NARUC Telephone Cooperating Committee, Commissioner Walker, Chairman of the FCC Telephone Committee noted:49

By averaging in each state, costs of the Associated Company whose toll services and facilities are subject to both state and federal jurisdictions, with computed costs of the Long Lines Department in each state, whose services and facilities are subject solely to Federal jurisdiction, there necessarily results a distortion in the costs of the services which are subject to the respective jurisdictions. In addition, with the abandonment of the present method of directly assigning costs to services with which they may be readily identified, fictitious costs would be substituted for actual costs.

The extent of the benefits in a particular state would be affected materially by the number of Long Lines interstate toll circuit miles which happen to be in that state . . .

Not a great deal need be said concerning Commissioner Walker’s reply. A significant portion of the difference in jurisdictional toll line costs is due to the nature of the facilities provided. The difference in the nature of the facilities furnished is largely attributable to the nature of state and interstate message traffic. Interstate message toll is predominantly short haul, ranging between 9 miles and 91 miles for different states in 1950 at the time of the Toll Rate Disparity Report; average interstate haul was 204 miles at that time. At the going cost levels, it was not
economical to utilize carrier-derived circuits for short-haul toll; physical conductor, cable, and open wire predominated. Carrier, coaxial cable, and to an increasing extent, microwave radio were and are the predominant transmission media for long-haul toll services and are employed both in state and interstate message services. However, the bulk of investment in carrier and radio is at the terminals, not in line facilities. Spreading these relatively fixed terminal costs over the greater mileage distances characteristic of interstate toll, rather than over the shorter distances for state toll, produces a lower cost per circuit mile on the interstate routes. The technical basis for the disparity in jurisdictional circuit costs is aggravated by the higher utilization of interstate trunk groups, on the average, than is found on intrastate circuit groups. This increases the spread in costs between intrastate and interstate toll per message-minute-mile of conversation time.

No doubt, Commissioner Walker was aware of this background before forming his reply to the NARUC. Further, his position was probably sound in a constricted legal sense. In the competitive posture vis-à-vis state regulation to which it had been moved, the FCC was defending future interstate regulatory action. From another viewpoint, however, it was a short-sighted attitude. A broader, public point of view would involve recognition that the toll business is essentially an integrated operation. There are more than offsetting technical considerations that are part of the same picture. The ability to isolate plant investment for purposes of direct allocation, as with interchange facilities, is the chance result of accounting methodology which, in turn, has been largely discretionary to the carrier. Major elements of pure toll investment have been merged into the local switching accounts and borne almost entirely by local ratepayers. Only nominal portions of the investment in station equipment and local distribution plant are borne by interstate message toll services, although the quality and cost of these facilities have been visibly bent to meet toll transmission standards. These costs, which are associated with ex-
change plant rather than interchange plant, are so closely mingled that there is no possibility of extricating them for purposes of direct assignment.

By 1950 the Commission had reversed itself and interposed no objection to a modified version of the Phoenix Plan, a plan that had most of the characteristics to which Mr. Walker had previously objected.

Pre-Charleston Developments

On January 19, 1951, the Federal Communications Commission issued an order directed to all Bell System companies requiring those companies to show cause why the Commission should not find existing interstate rates unreasonable. The original order stipulated that respondents should file an answer by March 23, 1951.

On February 8, 1951, the NARUC filed a petition with the Commission reminding it that "during recent years . . . Bell System exchange and state toll rate increases aggregating more than $400 million annually" had been authorized while "interstate toll rates were reduced in each of the years 1943, 1944, 1945, and 1946.” This situation, the petition continued “clearly shows the substantial inequities resulting under current separations procedures.” Before any further interstate toll reductions were ordered, the association suggested that the FCC modify the separations procedures.

The McFarland Letter

At this point political events precipitated a significant change in the FCC viewpoint. On January 31, 1951, Senate Majority Leader McFarland (also Chairman of Senate Interstate Commerce subcommittee on communications) addressed a letter to Acting Chairman Walker of the Commission. Citing the toll rate disparity problem and the pending interstate message toll rate reduction, the Senator stated:

The trouble is the general public does not realize that every move that is made to reduce long distance toll rates results directly or indirectly in an eventual increase in local telephone rates and in intrastate toll rates.
Put very simply and plainly, this merely shifts the cost from the big user to the little user . . . .

I had hoped that the proposal of NARUC for a tryout of its new separations formula would get a green light from the Commission (FCC). Now, I understand the Commission is going ahead with a heavy schedule to begin in April for a further reduction in long distance toll rates . . . and that the state utility commission's proposed separation formula should be formally presented at the hearing. Frankly, I do not think that is going to the state commission . . . .

I am not in a position to pass upon the question as to whether the remedy suggested by NARUC is the proper one, but I am certain that something should be done—and at once.

FCC Reaction

On February 14, 1951, the FCC decided to do "something at once" and postponed the response date in its interstate earnings investigation in order to re-examine the NARUC separations proposals. The staff committee of the Telephone Problems Committee including FCC staff representatives met in Washington, D.C., from March 26 to 30, 1951, to review proposed amendments to the Separations Manual. At this meeting, Bell System representatives proposed a number of minor modifications to the procedure. The separations subcommittee recommended the adoption of six changes proposed by A. T. & T. which had the effect of transferring about $235 million in expenses from state to interstate. Three additional changes proposed by the company were initially tabled by the subcommittee. These would have increased interstate plant by approximately $9.0 million and expenses by $800,000, relieving state operations by the same amount. When the subcommittee met again May 7-11, 1951, with company representatives, uncertainties were resolved, and all the Bell System revisions were recommended for adoption.

Independent of any changes in the Separations Manual, the Bell System decided to assist in the relief of "the toll disparity problem" by an exercise of its own initiative. New toll traffic coefficients were distributed by the American Company which had
the effect of transferring $15.5 million of plant and $13.2 million of expenses to interstate operations. The magnitude of changes in division of revenues results that could be effected by the company without any modifications in the Manual principles is noteworthy.

Traffic coefficients are used throughout the telephone industry in calculating operator worktime in the handling of different kinds of switchboard operator functions. The new traffic tables established a distinction in traffic units applied to manually handled calls over 36 miles for "LDI business" and "all other." The tables called for higher units for interstate calls as against intrastate calls.

The Davis Plan

Meanwhile, the staff committee was quite active. A special subcommittee had been appointed to determine "the practicability of establishing uniform rates for both state and interstate toll services without limiting or reducing the present state jurisdiction." The subcommittee met in Washington on June 18-20, 1951, and subsequently in New York City from June 21 - July 7, 1951. The subcommittee considered what became known as the "Davis Plan" after N. Knowles Davis, then chief engineer of the Georgia Commission. The plan provided that the Bell System would devise a single uniform nationwide schedule of message toll rates to cover the cost of both state and interstate toll service. Division of revenue contracts would be amended to provide that each Bell company would receive its operating expenses and a return on net book cost of the toll plant furnished. Rate proceedings on message earnings would be conducted jointly by the FCC and the Joint NARUC Telephone Committee. To protect the jurisdictional authority of the states, provision was made for modifying division of revenues where a state chose to increase or decrease its state toll charges as contrasted to the nationwide schedule.

The special subcommittee designated to work out the legal and administrative details of the so-called "Toll Settlement Plan" met with L. T. Pendeleton, assistant to the A. T. & T.
President on June 21, 1951. The company opposed the plan and furnished eight reasons for its position. 62

1. Since the revenues to be divided under the plan cross jurisdictional lines and are in a sense fictitious, they would not be in accord with the true facts, and could not be successfully defended if challenged.

2. Greater burdens would fall upon exchange service in those states, if any, which would lose under the plan.

3. The plan would encroach upon state jurisdiction.

4. The plan appears to be impracticable and difficult if not impossible to apply.

5. The problem of disparity has been overemphasized and disparities are to be expected because of cost differences.

6. In the event of a business recession state toll might be put in the position of subsidizing interstate toll.

7. The adoption and placing in effect of a settlement schedule would not, of itself, have any effect on disparity.

8. Adoption of the plan would not cure the separation problem and might stimulate criticism of separations between exchange and toll.

With regard to the first objection by the company, it was claimed the Davis Plan "would cross jurisdictional lines." It will be recalled that the previous year the Bell System had urged adoption of the original Phoenix Plan which would have provided for a "calculated" nationwide book cost of Long Lines interexchange plant to be pooled with Associated Companies state plant for separations purposes. The Davis Plan crossed jurisdictions only in the same sense as did the company's Phoenix proposal.

The second observation with regard to latent burdens on exchange service was window dressing. The company was aware that its own data on state toll earnings furnished the Message Toll Committee showed that in 9 out of 19 states where separation results were available, state toll operated at a loss; this revenue deficiency was recouped from exchange rates. 63

The third point, that the plan would encroach on state jurisdic-
tion, touched a raw nerve; the company was well aware that numbers of state regulators are more concerned with who has the authority to do, rather than with what is done.64

Only the sixth observation of A. T. & T. merits further comment. Under separation procedures prevailing and still followed by the industry today, jointly used plant is apportioned on various use criteria. In general, the most volatile of the three services classifications, the one which fluctuates most widely on a month-to-month basis is interstate message toll. Intrastate toll varies somewhat less, and exchange usage least of all. However, the joint plant, whether growing in response to the combined service needs or stable, is apportioned each month on the use basis. The service classifications that are most stable—exchange and state toll—must invariably bear the residual property assignment when interstate business is at a trough. The criticism of the Davis Plan that "in the event of a business recession state toll might be in the position of subsidizing interstate" is purely self-serving. The state operations are continually required to support interstate properties during monthly and seasonal lulls in interstate business.

To determine the workability of the Davis Plan, the subcommittee required extensive factual data. The strong objections of the company to the plan, together with lukewarm enthusiasm displayed by certain state commissioners (who govern the parent committee), appear to have effectively terminated its consideration. The data was not furnished. Successive year reports of the Toll Settlement Plan Subcommittee indicate it was transformed into a statistical body calculating the level of rate disparities.65

The Charleston Plan

When the state regulatory commissioners assembled for their annual convention in Charleston, South Carolina, on October 10, 1951, few had anything but pessimistic views on the state of their telephone regulatory responsibilities. While the FCC had temporarily halted its threatened reduction in interstate message toll rates, postponement of the FCC show cause
order had only been delayed until November 28, 1951, with hearings scheduled for January 7, 1952. The pace of state telephone rate increases was continuing unabated. The FCC had rejected the Phoenix Plan for modifying separations methods as proposed by the Bell System. On the other hand, the Davis Plan generated by the NARUC staff had been rejected by the Bell System.

NARUC President Flagg noted in his opening address: "The greatest problem facing a majority of the commission is undoubtedly that of telephone rates. . . ." And later on: "I do not think that any of our experts will maintain that the present method of separations can be supported as entirely sound." As an interim solution, Commissioner Flagg suggested: "simplify this problem by . . . devising a separation that would be made to accomplish a definite result, that result being to place all toll charges on as nearly as possible a uniform mileage basis."

The interim solution that was finally reached was not by modification of separation treatment of interexchange plant, but of exchange plant. The plan, announced by FCC Commissioner Walker, was termed the "Charleston Plan" after the convention in which it was introduced. The plan originated with A. T. & T. While negotiating with the FCC in Docket No. 9889, the company prepared a modification to the separations methods applicable to the exchange component, which was accepted by the FCC a week before the convention. The effect of Charleston was to shift an estimated $90 million of plant investment and $22 million of related expenses to interstate operations. By the end of November the FCC had vacated its show cause order on the interstate rate investigation. On January 21, 1952, the Bell Company filed higher interstate toll rates set to yield an additional $14 million in interstate message toll revenue. This indeed was a way to meet the "toll rate disparity problem."

The technical explanation and rationale for Charleston was contained in an attachment to Commissioner Walker's address. The rationale was apparently prepared by the Bell System.
The first step in the separation of telephone plant is identification and pricing of plant units and assignment of these units to various categories. These categories are then apportioned to the services on various bases. Charleston reduced the number of exchange categories from sixteen to three, thereby vastly contracting and simplifying the entire process. Further, while the Manual continued to pay deference to the use principle, the actual measurement of use was modified for the purpose of plant apportionment. A summary of the 1947 and Charleston classification and apportionment methods is shown in Table IV.

The new separation of Category A exchange plant, including station equipment and subscriber loop plant contributed the bulk of the revenue transfer effected under Charleston. The justification for the proposed method of apportioning this plant amount stated in the company memorandum was as follows: 74 the joint nature of most of the exchange wire plant, and the growing problems involved in its separation, suggests that a reasonable and practicable approach to the problem would be to treat the exchange wire plant as a single category and apply thereto a single broad measure of use.

Since the category consists primarily of wire plant, a possible basis of separation, consistent with the usage principle, would be message mile minutes . . . . However, the application of the message mile minute basis of apportionment to the exchange plant, if done in detail, would present an insuperable problem in determining the lengths of haul, since no point-to-point message data are available for the traffic involved. Consideration of the characteristics of the exchange plant, taking into account both the single-center and multi-center exchanges in the area under study, and such factors as the length of trunk involved for each of the services and the proportion of calls involving trunks, indicates that the average length of haul for local calls is not materially different from the average length of haul in the exchange plant for toll calls.

Charleston Method—Analysis

First, we should observe that under the Charleston amendment station equipment (handsets, private branch exchange equipment, and telephone booths) was included in Category A, exchange plant, despite the apocryphal reference in the rationale to "wire plant." Category A was apportioned on the basis of "minutes of use of exchange plant." In effect, this apportionment method weighted the interstate toll minutes of use
TABLE IV
Comparison of 1947 and Charleston Methods for Separations of Exchange Plant

<table>
<thead>
<tr>
<th>Type of Plant</th>
<th>1947 Method</th>
<th>Charleston</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Basis of Apportionment</td>
<td>Basis of Apportionment</td>
</tr>
<tr>
<td></td>
<td>Type of Plant</td>
<td></td>
</tr>
<tr>
<td>Station</td>
<td>SLU</td>
<td></td>
</tr>
<tr>
<td>Subscriber Lines</td>
<td>SLU</td>
<td></td>
</tr>
<tr>
<td>Trunk O.S.P.:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Local Interoffice Tks.</td>
<td>Dir. Assign. Category A</td>
<td>Minutes of Use</td>
</tr>
<tr>
<td>Toll Conn. Tks.</td>
<td>Toll TU’s</td>
<td>Exchange Plant</td>
</tr>
<tr>
<td>Inter-Exchange</td>
<td></td>
<td>of Exchange Plant</td>
</tr>
<tr>
<td>Number Checking Tks.</td>
<td>Calls</td>
<td></td>
</tr>
<tr>
<td>Local Dial C.O.E.:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Incoming Local Tk.</td>
<td>Dir. Assign.</td>
<td></td>
</tr>
<tr>
<td>Equipt.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Incoming Tan. Tk.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Equipt.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Incoming Tk. Equipt.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>for Interlocal Tks.</td>
<td>Dir. Assign. Category B</td>
<td>Minutes of Use</td>
</tr>
<tr>
<td>with toll Use</td>
<td>Exchange Plant</td>
<td>of Dial</td>
</tr>
<tr>
<td></td>
<td></td>
<td>C.O.E.</td>
</tr>
<tr>
<td>Number Checking</td>
<td>Calls</td>
<td></td>
</tr>
<tr>
<td>Facilities</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Toll Connect. Tk.</td>
<td>Toll TU</td>
<td></td>
</tr>
<tr>
<td>Equipt.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Other Local Dial</td>
<td>SLU</td>
<td></td>
</tr>
<tr>
<td>Equipt.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Local Manual Switch-</td>
<td></td>
<td></td>
</tr>
<tr>
<td>boards:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Subs. Line Equipt.</td>
<td>SLU</td>
<td>Category C</td>
</tr>
<tr>
<td>Toll Conn. Tk. Equipt.</td>
<td>Toll TU</td>
<td>Traffic</td>
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<tr>
<td>Positions</td>
<td>TU</td>
<td>Exchange Plant Units</td>
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<td>DSA and DSB Switch-</td>
<td>TU</td>
<td>Category C</td>
</tr>
<tr>
<td>boards</td>
<td></td>
<td>TU</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Exchange Plant</td>
</tr>
</tbody>
</table>

SLU: subscriber line usage, i.e., relative minutes of use.
TU: traffic units
Source: Attachment A, Address of FCC Commissioner Walker, 1951 NAfUC Convention
by two in deriving the jurisdictional allocation. View this change, which was proposed by the Bell System, in contrast to Bell’s vehement objection when the same proposal was made by the state commissions in New Hampshire, Maine, and elsewhere.

How valid was the assumption that the average subscriber loop used in the making of a toll call was approximately equal to the loop length of the average exchange call? Logically, it does not appear reasonable in either single or multi-office exchanges. Most toll business is generated by commercial and industrial firms. Typically, business houses are located downtown in the vicinity of the wire-centers with shorter average subscriber lines than the average residential customer who contributes to the making of the average exchange call. The only major effort to determine the mileage factor empirically was in 1952-53 by the Pacific Telephone & Telegraph Company. In San Francisco, Pacific found the ratio of exchange to toll loop mileage as 1.4 to 1, in Los Angeles as 1.3 to 1, and in the entire Southern California areas as 2.2 to 1. Apparently, the acceptable assumptions in separations principles are dependent on the results which need to be achieved by the carrier.

This period in separations history reverses the classical injunction in the form: “Don’t do as I say, do as I do.” It was FCC Commissioner Walker who submitted the Charleston changes to the NARUC convention. It was the same Commissioner who enjoined the state association the previous year in regard to the Phoenix proposal: “with the abandonment of the present method of directly assigning costs to services with which they may be readily identified, fictitious costs would be substituted for actual costs.” The Charleston modification had precisely this effect. In place of direct assignment of local interoffice trunks to exchange service, the investment was pooled in category A and apportioned on the basis of minutes of use of exchange plant. Toll connecting trunks, hereto identified for assignment to toll services, was similarly lumped into Category A with jurisdictional apportionment to be made on the basis of overall relative minutes of use.
Four months prior to submission of the Charleston amendments, A. T. & T. representatives had prepared a lengthy objection to the so-called "Davis Plan." Probably half the enumerated objections to the Davis Plan were equally applicable to the Charleston Plan, which the company proposed.

Results of Charleston
The results of the 1951 Charleston amendments to the Separations Manual can be looked at from the viewpoint of the regulatory commission, the utility, and the ratepayers. As noted earlier, the FCC vacated its show cause order on the interstate rate reduction. The proposed interstate rate reduction was transformed to a rate increase. Increased interstate toll rates were put into effect March 1, 1952, after no rate protests were filed. The increase in short-haul interstate toll rates alleviated the toll rate disparity, and, to that extent, mitigated the comparison of state and federal regulatory efficacy. The interstate rate revisions reduced the toll rate disparity from approximately $100 million to $92 million or, by $68 million. This reduction was accomplished by increases in short-haul interstate rates by about $22 million. This result followed from the greater concentration of intrastate toll traffic in the short-haul volumes. As a further concession to the company, the FCC authorized the Bell System to transfer its so-called Employment Stabilization Reserve of $11,500,000 to income. The reserve had been developed during the war years (1943-45) as charges to operating expense. This single accounting adjustment, according to the Commission Annual Report (1953, p. 40) "would have required an interstate rate increase of about $24 million." To paraphrase Senator McFarland: something was done—and at once.

In announcing the acceptability of the Charleston plan at the 1951 NARUC Convention, Commissioner Walker had taken pains to caution the state regulators to "see to it that the benefits to the states resulting from changes in separation . . . will be appropriately reflected in each jurisdiction." Since every state benefited by the change, it could be anticipated that at
least in some jurisdictions the trend to increased state rates would be reversed. We find upon review that in no state were either state toll or exchange rates reduced.⁶⁰

While Charleston may have momentarily slowed the pace of state rate applications, the state commissions, where they had opportunity, did not (with the exception of Indiana) attempt any rate reductions in intrastate services. Intrastate earnings results of a number of the associated companies would have warranted such action. (cf. Table V.) We must conclude that the principal beneficiary of the Charleston Plan was the Bell System.

**Post-Charleston Developments**

Despite the transfer from intrastate operations of $90 million in plant and about $22.5 million in expenses effected by the Charleston amendments, rate applications in the states by Bell companies continued. Increases in intrastate toll rates were

<table>
<thead>
<tr>
<th></th>
<th>1951</th>
<th>1952</th>
<th>1953</th>
</tr>
</thead>
<tbody>
<tr>
<td>Michigan Bell</td>
<td>6.27</td>
<td>8.02</td>
<td>6.41</td>
</tr>
<tr>
<td>Ohio Bell</td>
<td>5.94</td>
<td>6.18</td>
<td>6.41</td>
</tr>
<tr>
<td>Indiana Bell</td>
<td>5.99</td>
<td>7.88</td>
<td>7.09</td>
</tr>
<tr>
<td>Southwestern Bell</td>
<td>5.03</td>
<td>6.26</td>
<td>6.52</td>
</tr>
<tr>
<td>Cincin. &amp; Suburban</td>
<td>7.90</td>
<td>7.68</td>
<td>8.34</td>
</tr>
</tbody>
</table>

Source: "Selected Earnings and Balance Sheet Data, Bell Telephone System," FCC.

authorized in an additional 17 states. By May, 1953, the state toll disparity was calculated at about $127 million above the prevailing level of interstate rates.⁶¹ This is about the level estimated in 1949 prior to the advent of Charleston. The telephone Problems Committee of the NARUC recommended that
explorations be undertaken with the FCC for further modifications in separations procedures. Accordingly, the Commissioner's Committee met in Chicago on November 19, 1953, with directions to its staff to study the toll component of telephone separations methods.

The subcommittee on separations and toll rate disparity met with A. T. & T. representatives in Chicago on February 8, 1954, to discuss two alternative methods for determining interexchange message toll line costs. The two plans called the Message-Mile-Minute (MMM) Plan, and a modification thereof referred to as the "Circuit Mile" plan were rejected by the company. The principles of these two plans are discussed below.

**MMM Plan.** The MMM plan would take the total Bell System investment in, and use of, the toll line plant and obtain a systemwide average investment per message-minute-mile (MMM). The investment in each state would be determined by multiplying the state message-minute-miles by this systemwide investment per MMM. This would create cost uniformity in that the Associated Company toll line investment would be the same per airline message-minute-mile for both intrastate and interstate operations. The company estimated on the basis of June, 1953, data that the MMM Plan would shift approximately $326 million investment and $37 million of expense from state to interstate jurisdiction. State toll line costs would be reduced by about 47 percent.

**Circuit Mile Plan.** Under the terms of the Circuit Mile plan, as proposed by the separations subcommittee, the systemwide investment in toll lines plant would be divided by the systemwide number of interexchange circuit miles. The Associated Company investment in a particular state would be determined by multiplying this average system investment by the number of Associated Company jointly-used miles. This computed investment would then be allocated to the jurisdictions on the basis of the ratio of intrastate MMM's to total MMM's. On the basis of June, 1953, data, the company estimated the Circuit Mile Plan would transfer about $262 million of investment and $30
million of expenses to interstate. State toll line costs would be reduced by about 38 percent.

Having arranged a meeting with A. T. & T. President Cleo Craig to discuss the separations of interexchange facilities, the subcommittee obtained instead a response in Chicago on February 8, 1954, from Assistant Vice President Parker. The reasons for rejection of both plans by the company are set further in the subcommittee report:56

The Bell System is of the opinion that under the MMM Plan intrastate toll would be subsidized by the interstate toll and doubts whether on the basis of usage and actual costs the plan would withstand the test of reasonableness. They also feel that the adoption of an averaging process such as contemplated under the MMM Plan would lead to efforts to extend the averaging process to expenses related to such plant as well as costs associated with toll switching plant and even exchange plant. On a systemwide basis the company pointed out that the MMM Plan would reduce by about one half the amount of Associated Company toll line plant investment now assigned to intrastate operations. Thereby doing "great violence" to costs as determined under the Manual.

With respect to cost equalization; the company pointed out that the MMM Plan would result in the same cost per mile irrespective of length of haul. To the extent that rates were based on costs by length of haul, under the MMM Plan, long haul rates would be far too high and short haul rates far too low . . . .

**NARUC Interexchange Plans—Analysis**

The merit one gives to the company criticism of the interexchange cost allocation proposals is dependent on subjective considerations. The allegation that the MMM Plan would result in state toll being subsidized by interstate toll depends on the connotation one gives to "subsidy." The company has never been deflected from furnishing rural exchange service at the expense of the balance of telephone ratepayers. The small exchanges, under state-wide telephone rate-making, are frequently deficit operations.57 While the decision to furnish certain service classifications at less than cost may be appropriate social policy, can the invidious characterization of "subsidy" applied by A. T. & T. halt an otherwise justifiable method of cost allocation proposed by the public regulators? At that time it did so successfully. Yet, the so-called 7-way cost study pre-
pared by A. T. & T. in FCC Docket 14650 (1965) shows that entire service classifications were operating below level of cost plus reasonable return, with the deficiencies borne by the interstate message services.88

More fundamental is the credibility to be given to the basic accounting data and corporate organization in ascertaining costs. If Long Line facilities were operated by the Associated Companies, these costs would probably be merged within the accounting records. Ultimately, the definition of "costs" revolves on their purpose and objective.

The Charleston Plan, suggested by A. T. & T. in 1951, and subsequently incorporated in the Manual did "great violence" to the determination of costs. Here major components, such as toll connecting trunks, local extended area service, and inter-exchange trunks, which are readily identifiable and had been directly assigned to the toll and exchange operations, were "pooled" and apportioned on the basis of use ratios. How different in principle was the "averaging" of state and interstate toll line facilities? The full Phoenix Plan for calculating jurisdictional interexchange costs was proposed by the company. Both the MMM Plan and the Circuit Mile Plan are extensions of the same principle set forth in the Phoenix modifications; all three plans contain broad "averaging" concepts, which may be termed "subsidizing," depending upon one's viewpoint.

No plan should be considered without examination of its ancillary consequences. However, the company argument that the MMM Plan would lead to "an averaging process for expenses . . . as well as toll switching plant and even exchange plant" begs the question. If there is merit in such treatment, it should be considered on its own weight.

The final criticism to the MMM Plan, offered by the company, was that it would result in the same cost per mile irrespective of length of haul. The short answer is that cost is only one of the considerations used by regulators in determining rate structure. In the absence of the MMM and Circuit Mile plans, short-haul circuit costs are significantly higher per mile than long-haul toll facilities. This has not prevented construction of a toll rate
structure with increasing charges for distance. Short-haul interstate rates are more subsidized by long-haul interstate rates than are the state toll rate schedules, in this respect.

Proposal for Modified Phoenix Plan

Upon receipt of a negative response from the Bell System to the MMM and Circuit Mile plans, the NARUC in 1954 retraced its steps and asked for consideration of another plan which became identified as the Modified Phoenix Plan.

Under the original Phoenix Plan, in a given state all Associated Company toll lines plant would have been combined with the Long Lines plant within each state. The total plant would be allocated jurisdictionally in proportion to the state and interstate message-minute-miles (MMM). The Long Lines plant within a state was a calculated figure in that nationwide average Long Lines cost per circuit mile would be applied to the Long Lines circuit mileage in each state. Usage would be similarly developed on the basis of nationwide Long Lines usage.

The Modified Phoenix Plan provided that the book costs of Long Lines plant terminating in each state be combined with Associated Company toll lines plant in the state. The combined total investment would be apportioned between state and interstate on the basis of relative message-minute-miles. The company estimated, on the basis of 1953 data, that the Modified Phoenix Plan would transfer $162 million of investment and $18 million of expenses from state to interstate operations and effect a reduction in state toll costs of about 22 percent.

The Modified Phoenix Plan did not go into effect (until some years later), and for interesting reasons. Chairman Hyde of the FCC agreed to consider the revision “if it is endorsed by substantially all telephone regulatory commissions at the forthcoming Convention of the NARUC.” Commissioner Hemlock of the FCC adopted a minority opinion opposing Modified Phoenix on essentially the same grounds the Commission expressed to the original Phoenix Plan. However, at the National Convention meeting in Chicago the motion to approve Modi-
fied Phoenix was approved against the objections of regulators from Wyoming, New Hampshire, and Oregon—the three jurisdictions that were adversely affected by the plan. The disproportionate results that would arise from Modified Phoenix came about because its effect was determined by the relationship between average circuit mile cost and usage of the Associated Company and Long Lines in each state. Where the Associated Company costs were relatively high and usage relatively low as compared to Long Lines terminating circuit mile cost and usage within that state, the intrastate toll line costs would earn the greatest reductions.

Despite the concurrence of state regulators, the plan was not put in effect. The Bell System refused to put the plan into effect "until interstate rates are adjusted to care for the increase in revenue requirements." The purpose of the meeting apparently was to secure FCC agreement to increase interstate rates. Chairman McConnaughy of the FCC declined to agree to increased interstate rates at that time. Company earnings were increasing sharply with growth in traffic. By the end of 1955, Modified Phoenix was still stalemated.

FOOTNOTES TO CHAPTER IV

2) A tabulation of these interstate rate reductions as set forth in the FCC's annual reports over the period 1935-1948 shows the following:

<table>
<thead>
<tr>
<th>Year</th>
<th>Message Toll Reduction</th>
<th>Company</th>
</tr>
</thead>
<tbody>
<tr>
<td>1937</td>
<td>$12,000,000</td>
<td>Long Lines</td>
</tr>
<tr>
<td></td>
<td>5,300,000</td>
<td>Long Lines</td>
</tr>
<tr>
<td></td>
<td>91,000</td>
<td>Southern Bell</td>
</tr>
<tr>
<td>1940</td>
<td>525,000</td>
<td>Bell of Pa.</td>
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<tr>
<td></td>
<td></td>
<td>N.J. Bell and,</td>
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<tr>
<td></td>
<td></td>
<td>Diamond State Tel.</td>
</tr>
<tr>
<td>1941</td>
<td>14,000,000</td>
<td>Long Lines</td>
</tr>
<tr>
<td></td>
<td>320,000</td>
<td>New Eng. T. &amp; T.</td>
</tr>
<tr>
<td></td>
<td>316,500</td>
<td>Mt. States T. &amp; T.</td>
</tr>
<tr>
<td></td>
<td>175,000</td>
<td>N.W. Bell</td>
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</table>
3) Bell System investment in telephone plant at end of 1948:

<table>
<thead>
<tr>
<th>Year</th>
<th>Long Lines</th>
<th>Long Lines</th>
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<tbody>
<tr>
<td>1942</td>
<td>34,700,000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1944</td>
<td>5,600,000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1945</td>
<td>21,000,000</td>
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<td></td>
</tr>
<tr>
<td>1946</td>
<td>16,000,000</td>
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</tr>
<tr>
<td></td>
<td>$109,959,900</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

(millions)
- Station equipment: $7,482
- Exchange lines: 2,142
- Central office equipment: 2,718
- Land and buildings: 878
- Other plant: 239
- Sub-Total: $7,409
- Toll lines: 1,210
- Total Investment: $8,619


6) Ibid., p. 179.

7) Op. cit., p. 294. The Staff Committee on Telephone Regulatory Problems prepared a comparison of day station message toll rates in 34 states with interstate message toll rates. The differentials in cents for initial period charges tends to understate the size of the disparity, because of overtime differentials. The data was as follows:

<table>
<thead>
<tr>
<th>Differential Between State Schedule and Interstate Schedule</th>
<th>Number of State Schedules</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>At 100 miles</td>
</tr>
<tr>
<td>No difference</td>
<td>8</td>
</tr>
<tr>
<td>State schedule 5¢ higher</td>
<td>21</td>
</tr>
<tr>
<td>10¢</td>
<td>4</td>
</tr>
<tr>
<td>15¢</td>
<td>1</td>
</tr>
<tr>
<td>20¢</td>
<td>2</td>
</tr>
<tr>
<td>25¢</td>
<td></td>
</tr>
<tr>
<td>30¢</td>
<td></td>
</tr>
<tr>
<td>40¢</td>
<td></td>
</tr>
<tr>
<td>60¢</td>
<td></td>
</tr>
<tr>
<td>65¢</td>
<td></td>
</tr>
<tr>
<td>Not applicable</td>
<td>2</td>
</tr>
<tr>
<td>Total state schedules</td>
<td>34</td>
</tr>
</tbody>
</table>

Source: "Report of Staff Committee to the Cooperating Committee on Telephone Regulatory Problems," reported in 56th Proceedings, NARUC, p. 173.
9) Annual Report of the Federal Communications Commission, 1946. To minimize the disparity effect, the bulk of the message toll reductions were in long-haul traffic, 340-2,140 mile business. This is reported as producing a customer savings of $16 million. TWX rates over 300 mile length were also reduced by $1 million on an annual basis; private line rates were cut $1.7 million, while the balance of reduction totaling $20 million was in overseas line charges.
11) "Report on the Separation of Telephone Property . . .", op. cit., p. 3.
12) Ibid., p. 4.
13) Ibid. Also 1947 Proceedings, p. 353.
15) Ibid., p. 346.
16) Ibid., p. 357.
17) Ibid., p. 347.
18) Data from FCC Statistics of Communication for Long Lines is as follows:

<table>
<thead>
<tr>
<th>Year</th>
<th>Net operating income ($ thousands)</th>
<th>Net operating income ratio 6.69%</th>
<th>Average net telephone plant ($ thousands)</th>
<th>Average net telephone plant ratio 5.88%</th>
</tr>
</thead>
<tbody>
<tr>
<td>1947</td>
<td>$27,556</td>
<td>$32,131</td>
<td>467,192</td>
<td>551,432</td>
</tr>
<tr>
<td>1948</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

19) This consisted of $6 million in plant transfers with annual charge factors for return and taxes of some 12 percent, $17 million in expenses, and $800,000 in revenue transfer. 1947 NARUC Proceedings, p. 353.
20) An example of industry releases as reported in Telecommunications Reports, May 1947-May 1948, inclusive.
21) Ky. FSC In re Southern Bell Tel. & Tel., decided March 1, 1951, 88 PUR (NS) 4.
22) 75 PUR (NS) 221, decided January 20, 1948.
23) 77 PUR (NS) 7, January 19, 1949. Here the Commission approved an increase of $1,483 yielding a 5.65 percent return on intrastate average net investment. This was a reduction of $1.6 million below earnings in effect under bond through the previous court order. No further appeal is recorded in Public Utility Reports.
27) Ibid.
28) GSA witness A.L. Issette made this observation in a recent proceeding before the Florida PUC.
29) 80 PUR (NS) 397, Maine PUC In re New England Tel. & Tel. Co., decided September 14, 1949.
30) This viewpoint was expressed to the writer by Bell System representatives during the 1959 sessions working in cooperation with the USITA Task Force drafting the Independent Separations Manual.
On this point see the Wisconsin PSC decision involving the Wisconsin Telephone Company September 21, 1950, 86 PUR (NS) 70; South Dakota PSC decision In re N, Western Bell Tel. Co., October 8, 1940, 81 PUR (NS) 375 and Ky, PSC In re Southern Bell Tel. & Tel. Co., November 9, 1948, 75 PUR (NS) 33.

32) 89 PUR (NS) 250 decided May 2, 1951. No record of court appeal in PUR.


Appendix A, pp. 506-510 of the report on "Message Toll Telephone Rates and Disparities," NARUC, 1951, lists a number of these resolutions.

35) Toll Messages and revenues by customer classification are recorded by the Bell System for the third quarter of 1950 as follows:

<table>
<thead>
<tr>
<th>Business</th>
<th>Residence</th>
</tr>
</thead>
<tbody>
<tr>
<td>System over 24 miles</td>
<td>9.11</td>
</tr>
</tbody>
</table>


36) The Staff Committee report is reproduced in the 62nd Annual Convention Proceedings, NARUC, p. 55.


38) Ibid., p. 57.

39) Ibid.


41) 1947 Separations Manual, Par. 4.72.


43) 1947 Manual, Sec. 2, Part 4, Par. 2.71.

44) "Report of the Special Committee . . .", op. cit., p. 5.

45) "Report of Special Committee . . .", op. cit., Appendix A, p. 5. Proposal No. 1 changed the intercompany division of revenue arrangements so that each Associated Company and Long Lines was reimbursed from interstate revenues for its operating expenses and the remaning revenues prorated in proportion to net book cost of its plant. Earlier settlement (since 1944) had distributed earnings in ratio to gross book cost.

47) The plan is more fully developed in "Report on the Separation of Telephone Property . . .", op. cit., Appendix D, pp. 5-5.


49) Ibid., Appendix E, pp. 1-5.

50) FCC Docket No. 9889.


52) The letter is quoted in Tel. Bpts, February 6, 1951, p. 22-23.


54) Ibid., p. 105.


56) Ibid., p. 146.
<table>
<thead>
<tr>
<th>Person-Person: Over 30 miles:</th>
<th>L.D.I.</th>
<th>Other</th>
</tr>
</thead>
<tbody>
<tr>
<td>Direct Rungdown</td>
<td>15.1</td>
<td>12.1</td>
</tr>
<tr>
<td>Key Pulsed</td>
<td>13.0</td>
<td>10.9</td>
</tr>
<tr>
<td>Straightforward</td>
<td>14.0</td>
<td>11.0</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Station-Station: Over 30 miles:</th>
<th>L.D.I.</th>
<th>Other</th>
</tr>
</thead>
<tbody>
<tr>
<td>Direct Rungdown</td>
<td>6.0</td>
<td>5.8</td>
</tr>
<tr>
<td>Key Pulsed</td>
<td>4.4</td>
<td>3.1</td>
</tr>
<tr>
<td>Straightforward</td>
<td>4.5</td>
<td>3.2</td>
</tr>
</tbody>
</table>

(Additional coefficients for miscellaneous functions, i.e., multiswitch, rate and route, WH reports, auxiliary work adjustments for team size, etc.)

Separations Principles in the Telephone Industry

75) Trans., pp. 3585-86, California PUC Case No. 5292 cited in City Tel. of Ohio Brief Case No. 26,046 before Ohio PUC, p. 83. In the California proceedings the Bell Company was attempting to demonstrate the inapplicability of Charleston to intrastate toll business. Apparently the evidence depends on what one wishes to prove. The California Commission dismissed the company results as "producing a hybrid separation method." cf. Calif. Dec. No. 50228, 5 PUR 3d 566 (1934) and Dec. No. 56659, 5 PUR 3d 269 (1956).

76) Letter of October 16, 1950, to Commissioner McWhorter, Chairman of NARUC Telephone Committee reported in 1950 Report of Special Committee Cooperating with FCC, Appendix E.


80) The Indiana Commission attempted to effect a $4 million reduction in rate but was stopped in the Marion County Circuit Court. Telecom. Rep. July 14 and August 4, 1952.


82) "Report of Special Committee Cooperating with the FCC," Ibid., p. 55.

83) "Report of the Staff Committee on Telephone Regulatory Problems" 195 Proceedings, pp. 267, 271.


86) Ibid., p. 278.

87) "Cost of Telephone Service by Size of Exchange" Cal. PUC Utilities Division, April 22, 1953.

88) A. T. & T. Exh. 81 and 82, FCC Docket No. 14650.


90) Letter to Spencer B. Eddy, Chairman of the Special Committee Cooperating with the FCC dated September 23, 1954, incorporated in the 1954 Proceedings, pp. 263-64.


92) The Report of the Executive Committee and passage of the motion recommend adoption of Modified Phoenix is found in the 1954 Proceedings pp. 335-7. Three states, Delaware, District of Columbia and Nevada, were not affected either way by the plan. Cf. tabulation, p. 277, 1954 Proceedings. On the other hand, the three states of Texas, California and Illinois covered nearly 30 percent of the nationwide book cost assignment for state to interstate.


94) "Report of the Special Committee Cooperating with the FCC" in 1954 NARUC Proceedings, p. 44.


V

Telephone Separations, 1956-1965

Modified Phoenix Plan

On January 20, 1956, the Federal Communication Commission approved “on an interim basis” the Modified Phoenix Plan for allocating the costs of interexchange toll lines plant of Bell System Companies between state and interstate operations. The plan had previously been accepted by the NARUC at its 1954 Annual Convention. It was placed into effect on July 1, 1956.

It will be recalled that adoption of the Modified Phoenix amendment had faltered in 1954 over the Bell System stipulation that further increase in its interstate rate level was a requisite for acceptance of the plan. In the succeeding year, 1955, neither the states, through the Association, nor the federal commission chose to fight the matter. Independent considerations, specifically the rising level of Long Lines earnings, apparently tempered A. T. & T.’s viewpoint in yielding to the separations changes.

In October, 1953, the federal commission had authorized a major increase in interstate message toll rates estimated to yield an additional $66,000,000 in annual revenue. At the time, Long Lines rate of earnings was about 5.9 percent on average net plant investment. By the end of 1954, the rate of return on Bell System interstate business had risen to 6.58 percent and by the end of 1955 had increased further to 7.67 percent.
Rather than allow an immediate interstate message rate increase, the A. T. & T. condition for the separations change, and in view of the level of company earnings, the Commission hedged. In a letter to A. T. & T., the Commission wrote: "In view of the present level of interstate earnings and operating results, it is the Commission's opinion that a reasonable period of time following the effectuation of Modified Phoenix is required to enable the Bell System and the Commission to evaluate the impact of the plan upon operating results. . . ." Vice President Ed Croland replying for the company said: "The Bell System Companies appreciate the necessity for uniformity in separations procedure and . . . will proceed with the change.9

The actual dollar effects of the Modified Phoenix plan were not made public. The basis for recommendation by the states was a study based on June, 1954, data which indicated a net transfer of revenue requirements from intrastate to interstate of between $35 and $40 million.10 Concurrent with publications of the Modified Phoenix plan, and at the suggestion of A. T. & T., significant reclassification of equipment categories were undertaken in the separations procedure. The financial effect of these reclassifications was not made known to the regulators.

According to the separations subcommittee, "These revisions may be occasioned by the changes in the art of telephony."11 The technical group assured the state commissions that "great care has been taken not to alter any of the underlying fundamental procedures of the 1947 Manual as amended."12 An example of such revision was the expansion and redefinition of the old category 9, toll (except switching) equipment as set forth in the 1947 Manual, and its replacement by category 8 in the central office equipment section of the 1957 Manual.13 The modification to this section of the Manual appears to have been justified by the growth and increasing complexity of telephone circuit plant, particularly carrier and repeater equipment. In addition, the Manual, for the first time, made provision for separation of Special Services, such as teletypewriter exchange service (TWX), private line, and broadcast. Additional categories were established for intertoll switching and automatic
message accounting classifications. The question remains, however, as to how any regulatory officials were able to ascertain the jurisdictional effect of Modified Phoenix.

It is clear that the classification of the equipment items to the separate categories and the apportionment of these categories to the separate jurisdictions are fundamental to the result. The 1954 study of the effects of the plan was undertaken prior to development of the changes in equipment classification and undoubtedly had an impact on the respective jurisdictional separated results. Outside of the Bell System, it is doubtful whether anyone was aware of their consequence.

The Modified Phoenix Plan appears to have been partially responsible, at the time the plan was invoked, for staying the more deleterious action on the part of the federal regulatory authorities of instituting interstate toll rate reductions. To what extent did the intrastate ratepayer benefit by the changes? A reduction of some $35 to $40 million in intrastate revenue requirements (based on 1954 data) was an act of major scope. This sum represented over 6½ percent of the combined Bell System intrastate net operating income in 1956.14 One would expect a deliberate effort to either alleviate the toll rate disparity by reductions in state toll rates or afford some relief to the ratepayers in their recurring exchange rentals. Neither occurred. Modified Phoenix went into effect July 1, 1956. Examination of the published record indicates through July, 1957, a year after the plan was introduced, no state had initiated action to flow the benefits of the plan through the state customers. While the level of intrastate earnings among several of the Associated Companies showed improvement attributable, in part, to the separations amendments, the trade press records no instance where the state regulators effectively capitalized on the toll rate disparity problem and reduced state toll rates or exchange charges.15 Table VI shows the intrastate earnings level of various operating companies during this time period.16

It is fair to conclude that the entire operation, the so-called Modified Phoenix plan, resulted in a transfer of Bell System earnings from the interstate pocket to the intrastate pocket.
The collective trousers, of course, are worn by the same corporate body.

TABLE VI
Ratio Net Operating Income to Average Net Telephone Plant, Intrastate Business, 1955-57, Various Bell System Companies
(Percentage)

<table>
<thead>
<tr>
<th>Company</th>
<th>1955</th>
<th>1956</th>
<th>1957</th>
</tr>
</thead>
<tbody>
<tr>
<td>Illinois Bell Tel.</td>
<td>7.37</td>
<td>7.50</td>
<td>7.66</td>
</tr>
<tr>
<td>Michigan Bell</td>
<td>6.64</td>
<td>6.39</td>
<td>6.43</td>
</tr>
<tr>
<td>N.Y. Tel. Co.</td>
<td>5.74</td>
<td>5.95</td>
<td>6.11</td>
</tr>
<tr>
<td>Southern Bell T. &amp; T.</td>
<td>5.31</td>
<td>6.00</td>
<td>6.31</td>
</tr>
<tr>
<td>Indiana Bell Tel.</td>
<td>7.01</td>
<td>7.46</td>
<td>7.30</td>
</tr>
<tr>
<td>Southwestern Bell</td>
<td>7.38</td>
<td>7.53</td>
<td>7.75</td>
</tr>
</tbody>
</table>

Source: "Bell System—State and Miscellaneous Operations," 1955-1957, FCC.

Post-Phoenix Developments

Substantial and effective state rate case applications by the Associated Bell Companies, combined with the introduction of major technical economies improved the System operating results through the fifties. Intrastate net operating earnings as a ratio to average net plant investment rose from 5.74 percent in 1951 to 7.41 percent in 1959.17 By 1959, Bell System exchange rates had risen by about 37 percent, while intrastate message toll rates since 1940 had been reduced by about 20 percent.18

Since the intrastate rate increase authorized by the FCC in 1953, Long Lines rate of earnings continually outpaced the rate of earnings on intrastate business.

On July 24, 1950, the FCC announced a $50 million reduction in interstate message toll rates to be effective September 19, 1960.19 The announcement precipitated a bitter letter from NARUC President McWhorter to Commission Chairman Doerfer. It said, in part:20

The suddenness of this action and the secrecy surrounding the negotiations leading up to this decision compel me to express my deep dissatisfaction and disappointment at the procedures adopted by your Commission . . . . The legal existence of jurisdictional lines does not alter the fact that the state
and federal commissions represent the same people, and their responsibilities and interests are identical. The person who makes the local exchange call or intrastate toll call is the same person placing the interstate toll call. Most of the plant and facilities involved is all three calls are one and the same, and physically inseparable; and so also are our interests and responsibilities . . . . The action of your Commission does not seriously affect the toll rate disparity problem, but the rather serious fact remains that in many states the local operating divisions of the A. T. & T. Co. are, because of low earnings, applying for increases in exchange rates . . . . It would indeed be regrettable if such actions were to produce a precedent establishing a new direction in your regulatory policies. If such were to prove the case, it would leave the states in the unenviable position of having to seek redress wherever possible, as was the case in 1951 . . . .

The turgid remarks from one regulatory commission to another warrant some reflections. Shorn of all social verbiage, Mr. McWhorter's letter said that the first obligation of the commissions is to each other. He promised to invoke pressure politics on the federal legislature; just such an effort had produced the "Mcfarland letter" in 1951.21

In a reply dated September 2, 1959, Chairman Doerfer attempted to soften the impact of the NARUC message, insisting that the interstate rate reduction was no departure from "the excellent relationships which have been established."

Although rate disparity is inherent in the division of jurisdiction over such [toll] services, we have made considerable progress in mitigating the problem through the modifications which, from time to time, have been made in the procedures for separating telephone plant investment and expenses . . . . These modifications . . . have, since 1947, relieved the intrastate telephone rate making jurisdictions as a whole of well over $100 million of annual revenue requirements, based upon current operating conditions . . . .

Mr. Doerfer's comments may be paraphrased. The state regulatory commissions had failed to utilize the benefits of earlier separations changes. No part of the relief afforded the states through separations changes and reduction of intrastate revenue requirements (Charleston and Phoenix) was employed by the state commission to reduce the toll rate disparity or to reduce exchange rate levels. Ratepayers were the beneficiary of the action initiated by the federal commission; the utility was the beneficiary of the transfer in revenue requirements from intrastate to interstate.22
The year closed with a resolution passed at the Annual Convention of the National Association of Railroad and Utilities Commissioners urging renewed efforts on the part of its Telephone Committee "to proceed with studies of further refinements in separation procedures. . . ."24

What Chairman Doerfer of the FCC had omitted saying in his reply to President McWhorter of the NARUC, the Commission staff was less reluctant to express. In a series of meetings involving both bodies, the FCC staff "indicated its concern over extant toll rate disparities but questioned whether state commissions had applied fully the revenue requirements transfers, arising from past refinements in separations, to minimization of such rate disparities."25

During 1960 the Separations Subcommittee of the Association devoted its efforts largely to review of the full Phoenix plan, the Circuit Mile, and the message-minute-mile (MMM) plans for determining jurisdictional costs of interexchange facilities.26 These proposals were carryovers from the 1950 Phoenix deliberations, and continued to retain the focus of discussion among the NARUC staff members from that time.

The report of the subcommittee experts found the Phoenix plan "least desirable." It will be recalled that three states had been adversely affected by adoption of Modified Phoenix—the relative advantage of the plan to any state jurisdiction being the wholly gratuitous circumstance of the extent, use, and cost of Long Lines facilities in each state relative to the Associated Company facilities in that state. The MMM plan was favored by the state commission staff since it was of benefit to all the states. "The FCC members found the Circuit Mile Plan least objectionable although they had many reservations as to this plan." Finally, the entire discussion floundered since "None of the three plans was acceptable to the Bell System."27

Regulation by cooperation may seem highly desirable; it depends on who does the compromising. The tripartite tribunal consisting of the FCC, the NARUC, and the Bell System has historically followed a rule of unanimity in making separations changes.28 The public interest, presumably represented by the
regulatory commissions, and the commercial interests of the Bell System have mutual conflicts. It would be difficult to define a more awkward mechanism for achieving effective telephone regulation.

The Above 890 MC Decision

In 1960 an extremely significant decision of the FCC was released, which helped to crystallize the position of the Bell System on separations principles. Up to this time, as we see it, the company was subjected to two competing pressures in affirming or rejecting separations principles and modifications to these principles. On the one hand, was the desire stemming from the days of controversy over the board-to-board theory of cost allocation to concentrate costs on the exchange component of telephone service. As discussed in earlier chapters, there were several reasons for this position. There was the question of revenue stability; local exchange rates provide a constant, recurring source of monthly income as against the fluctuation of message toll business. During the period 1910-1934 when interstate telephone rates were largely unregulated, it was good business for A. T. & T. to advocate separations principles that would minimize property investment and expenses allocated to the unregulated interstate segment of its business.

On the other hand, with the advent of the Federal Communications Commission in 1934, new problems were precipitated. The Commission negotiated a series of major interstate message toll rate reductions. These rate reductions coincided, in part, with major intrastate exchange and state toll rate increases. The jurisdictional disparity in earnings and toll rate levels developed a tremendous interest on the part of the state regulatory commissions for a change in the cost allocation methods. On its part, the telephone company seized on the separations methods as a means of simultaneously placating the state commissions and avoiding further interstate rate reductions.

However, until the FCC decision in 1960 in the "above 890 megacycle" case (27 FCC 359), the position of the Bell System in separations matters was taken without too serious an eye
to market competition. The decision changed this posture. The rendition of local exchange telephone service is a monopoly service, and has been, in this country, since about 1925. With relatively minor exceptions, this condition of market monopoly was equally true in the rendition of intercity (toll) services. The "above 890 megacycle" decision opened this portion of the frequency spectrum on a first-come, first-served basis. It laid the foundation for creation of powerful, potential market competition to permit large industrial and governmental bodies to establish their own private means of toll communications.

Despite the slowness of most large industrial corporations to meet rapidly changing conditions, the Bell System acted with deliberate speed on this occasion. The earliest manifestation of company reaction on the potential competition of the private microwave suppliers was the filing of tariffs for Telpak and Wide Area Telephone Service (December, 1960)—the former, a vastly reduced schedule of charges for private line services; WATS provided for flat rate intercity message toll services. While these were positive efforts of the company designed to protect its bulk toll market, the Bell System also shifted gears in separations matters. Proposals and suggestions, which we shall review below, for further averaging of state and interstate interexchange toll costs were met coldly or disregarded. We shall find from this point onward increasing reservations by the Bell System to any separations changes that could be construed as adversely affecting the company's cost and competitive position in intercity toll business, particularly in the private line area. The potential threat in future years of domestic use of communication satellite services reinforced this bent.

1961 Separations Efforts

The following year, 1961, the staff members of the NARUC shifted away from consideration of interexchange plant in order to explore modifications to the apportionment of exchange circuit plant and local dial switching investment. The Telephone Committee, on recommendation of its staff committee, adopted a resolution suggesting the Manual be changed so that
digit absorbing selectors be wholly assigned to toll where the equipment is not required for local service. The impetus to this recommendation was a number of state commission hearings initiated by the General Telephone System.

Another area of discussion between the subcommittee and Bell System representatives was over the "point of measurement" in determining minutes of use in apportioning switching plant and exchange circuit plant. Local holding time and local minutes of use are determined, in a particular office, by measuring total minutes of use and subtracting therefrom, the separately determined minutes of toll use. Thus, false dial attempts, a telephone receiver momentarily disengaged from its cradle, line hits on open wire leads, and a number of other transient causes, which engage the initial stages of the switch gear, are recorded in the total minutes of use, but not as toll minutes of use. In consequence, the local minutes of use bear the residual.

A Task Force of three NARUC representatives and three FCC staff members was appointed to represent the separative subcommittee in deliberation with Bell System. In conclusion, the Task Force recommended that it be authorized to explore the Circuit Minute Mile with the FCC and A. T. & T. "with the objectives of eliminating the features of this plan, which are objectionable."

The Task Force asked A. T. & T. to provide results of the application of a proposal identified as the State-Wide Apportionment Plan (SWAP). Under this proposal Associated Company and Long Lines interchange book costs within each state would be combined and apportioned to the jurisdictions in proportion to the holding time minute-miles of the state and interstate services. The Task Force requested information from Bell on the effects of the plan. Since the Bell System had already registered its opposition to the original Phoenix Plan, and SWAP was only a variation thereof, it is not surprising that nothing further is heard on the matter in either later Association proceedings or discussion by the full Committee.

The only specific changes affecting the separated rates were made known to the subcommittee in July, 1961, when A. T. & T.
representatives furnished information showing that they had revised the toll traffic coefficients and also modified the method prescribed for measuring minutes of use. These changes had been made in October, 1960, without any knowledge of the state regulatory authorities. The effect of these changes was to increase interstate revenue requirements by about $4 million annually.

1962 Separations Changes

The Long Lines rate of earnings continued to grow. The company was benefiting materially from the expansion and economies attendant upon the nationwide operator and customer toll dialing program (DDD), the steady growth of interstate message business, as well as the imperfections in telephone separations methods which benefited the interstate segment of the business. The rate of interstate earnings which had been 7.98 percent on average net plant for the year 1959 remained virtually unchanged in 1960 despite the rate reduction made effective in September, 1959. By the end of 1961, Long Lines earnings had increased to 8.0 percent. Sensing a rate reduction investigation as alternative, the company approached the FCC and proposed a number of separations changes which, in dollar effect, transferred about $46 million in revenue requirements from intrastate to interstate operations. The proposed changes, with one exception, avoided all of the toll plans advocated by staff members of the state regulatory commissions.

There were eight distinct separations changes recommended by the company, and subsequently adopted by the NARUC and, "on an interim basis," by the FCC. Only one change, the measurement of minutes of use, had been discussed with the technical staff of the Telephone Committee, according to published reports of the Association. The other seven changes served to reduce the record keeping work within the System, and although in the direction of simplifying procedures, did so at the price of increasing the coarseness of apportionment methods. This is not to quarrel with the effort at simplification, but rather to note that the number of such simplifications po-
tentative to the business is very great. While simplification was the published rationale for several of these changes, as explained by the company, it is clearly not a primary objective. Subsequent separations change added considerable complexity to the procedure and "was explained" on its own basis. The NARUC staff efforts at simplification seldom met with favorable response by the carriers, or support from the governing committee of regulators.

By the end of February, 1962, the state regulatory officials were assured that the separations amendments would go into effect April 1, 1962. Spurred by the earlier comments of the FCC, leading officials of the NARUC set out to see that the state ratepayers received the benefit of the reduction in state revenue requirements. At the end of 1961, about half the Associated Companies were earning in excess of $1.5 percent return on intrastate operations—a plea of earnings poverty would not stand up too well. In the form of Executive Resolution and by personal correspondence with each Commission, NARUC officials sought to obtain state reductions. A special subcommittee, chaired by Peter Mitchell of the California Commission, was created "to act as a Clearing House for Informational Data." In a letter to each state regulator, the subcommittee warned: "If the states do not pass on to the customers this $46 million in the form of reduced intrastate toll rates, where intrastate earnings are not extremely low, the FCC will be hard pressed to reduce interstate rates as done in 1959, in lieu of further refinements in separations procedures."

By the time the Association assembled at its Convention in New Orleans on November 12, 1962, NARUC President Brackman stated with pride: "To date 38 states have ordered or approved reductions on intrastate toll rates or the equivalent, depending upon the circumstances in each state, to a total annual basis of over forty million dollars." The Telephone Problems Committee published a table showing, state-by-state, the dollar reduction in state revenue requirements, the "toll rate reduction ordered," and its effective date. Analysis of the detailed actions of the various state commissions introduces significant qualifi-
cations with respect to the efficacy of these efforts.

1962 Separations Change—Analysis

The figure circulated by the Bell System on the amount of increase in interstate revenue requirements was $46 million. This transfer in revenue requirements from the states had the effect of staying any immediate interstate toll rate reduction. It is much less clear that there was any proportionate decrease in intrastate net operating revenues. For one thing, ten states, with reported reductions in intrastate earnings requirements in excess of $5 million, took no action.46 The bulk of the calculated “toll rate reductions ordered” was in the form of “after 9” rates. Under this new intrastate message schedule, customers in 22 states were able to call at reduced charges on a station-to-station basis after 9:00 P.M., and before 4:30 A.M. This promotional schedule was an attractive, if belated, medium for encouraging the utilization of idle switching and transmission facilities during off-peak hours. The so-called revenue reductions were calculated by the company as an arithmetic product of the new rate savings times the earlier traffic volume. No evidence is available to indicate that any traffic stimulation was assumed to take place due to customer interest in lower charges. Data is not available on toll message volume by states. However, total intrastate message traffic for the previous year, 1961 showed an increase of 3.3 percent; by 1962, following the introduction of the after 9 rates, message toll volume increased by 5.4 percent, and in 1963, by 10.4 percent (see Table VII).

<table>
<thead>
<tr>
<th>TABLE VII</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bell System Intrastate Message Toll Volume</td>
</tr>
<tr>
<td>Toll Messages (Millions)</td>
</tr>
<tr>
<td>1960-1965</td>
</tr>
<tr>
<td>1960</td>
</tr>
<tr>
<td>1961</td>
</tr>
<tr>
<td>1962</td>
</tr>
<tr>
<td>1963</td>
</tr>
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</table>

Source: Derived from Bell System Consolidated Report 51, No. 1, Sheet 2, and Interstate MR 1B, 1960-1962
A number of the Associated Companies used the occasion to obtain rate increases in other segments of their business, concurrent with the new toll rates. This included increases in service connection, move and miscellaneous charges, the establishment of wider flat rate calling areas (EAS), together with adjustment of the rate step interval in which the exchanges fell. Aware of their own promotional needs, a number of the companies used the reduced state revenue requirements to modify installation charges on color telephones and the "Princess" set.

Some indication of the hardship imposed on the carrier by imposition of the after 9 rates is reflected in the press release issued by Illinois Bell which stated, in part: "One good feature of the very large reductions directed by the Commission which we accept with natural reluctance, is the new after 9 bargain rates. . . ." It is clear that the System policy was to initiate the "bargain rates" irrespective of telephone separations changes. In Texas, where no regulatory commission has jurisdiction over intrastate toll charges, Southwestern Bell instituted the new toll tariff before most state commissions had even begun discussion of the matter. The following year, the NARUC Committee on Public Utility Rates remarked: In many of these states, the revenue loss associated with the introduction of the "after 9" service was more or less offset by the establishment of penny pricing on overtime units, increase in night person-to-person toll rates, introduction of extra charges for collect or third number charge calling, and other miscellaneous changes in tariffs.

The positive effect, which the state regulators sought to achieve, was a reduction in the level of toll rate disparity from 21.8 percent to 17.1 percent (expressed as a percent of intrastate toll revenue). Even so, as an absolute magnitude, or $270 million, the disparity represented a difference of more than twice the amount of $125 million noted by the 1951 Toll Rate Subcommittee.

The introduction of reduced after 9 state toll rates was of benefit to state toll ratepayers. At the same time it should be recognized that the new schedules, conceived as a means of encouraging the use of idle plant, were successful in this attempt and effected little or no reduction in state earnings.
A reduction in unit rates does not necessarily mean a reduction in gross or net operating revenues. Illustrative of this situation was the experience in California. The Pacific Tel. and Tel. Co., introduced after 9 toll rates on May 6, 1963, estimating at the time that a $3,200,000 reduction in revenues would result from the lower rates. Table VIII indicates what actually transpired. The promotional rates so stimulated traffic that revenues not only failed to decline, but showed unprecedented growth. Intrastate California message volume had been increasing at about 9.6 percent annually in the two years prior to the May, 1963, rate change. In the year following the toll rate reduction, traffic grew 12.9 percent and in the succeeding year, by 12.2 percent. The year prior to the May, 1963, rate reduction, toll revenue increased by 7.2 percent. If no rate change had taken place, and revenue had increased at the same rate, gross toll would have been $287 million in the year ending April, 1964. The company estimated a revenue loss of $3,200,000, so that at the same rate of growth experienced previously, intrastate toll revenue would have been approximately $283 million. Gross toll was actually $303.5 million. The revenue loss never transpired. Unit price reductions were more than offset by greater traffic.

| TABLE VIII |
|-----------------|-----------------|-----------------|-----------------|
| Intrastate Toll Revenue and Messages,                     |
| Troll Revenue | Percent Increase Over Previous Year | Troll Messages | Percent Increase Over Previous Year |
| Millions of Dollars |                          | Millions of Dollars |                          |
| May 1960-April 1961 | 225.8 | — | 272.5 | — |
| May 1961-April 1962 | 249.8 | 10.6 | 298.5 | 9.5 |
| May 1962-April 1963 | 267.7 | 7.2 | 327.5 | 9.7 |
| May 1963-April 1964a | 303.5 | 13.4 | 369.8 | 12.9 |
| May 1964-April 1965 | 334.5 | 10.2 | 415.0 | 12.2 |

Source: Table XIV, GSA, Exh. 286, Calif. PUC Case No. 7509.
We have noted previously in discussion of the various separations plan changes that the state regulatory commissions failed to capitalize on the reductions in intrastate revenue requirements made available as the result of the modified separations principles. The state rate activity that followed the introduction of the 1962 separations amendments appears to have reversed this pattern. The significance of this appearance depends on the construction of the facts. The 1962 separations changes did reduce the intrastate cost of service; however, the nature of the unit rate reductions neither reduced the companies intrastate gross revenue nor their rate of earnings. Reported rate of return on combined Bell System intrastate net plant actually rose from 7.5 percent in 1962 to 7.6 percent in 1963, the year when the state's after 9 toll pricing went into effect.48 Demand elasticity more than offset the rate reductions.

The 1963 Interstate Reduction

The 1962 separations amendments providing for a transfer of revenue requirements of some $46 million from intrastate to interstate operations was intended to scrape the "cream" off the surface of Long Lines earnings. It failed in this regard. Interstate rate of earnings of the Long Lines Department, A. T. & T., which had persisted around 7.9 percent of average net investment since 1959, remained at that level for the full year 1962,47 despite the separations amendments.

Accompanied by the usual spate of press releases, the FCC announced a major interstate message toll reduction effective April 6, 1963. The reduction in toll rates was the outcome of negotiated agreement with the company, following extensive informal hearings with the company on earnings requirements.48 The "rate reduction" was the interstate version of the station-to-station after 9 toll schedules that had previously gone into effect for intrastate business in a number of states, largely on company initiative. To reduce the effect on the state toll disparity problem, the reduced interstate rates were only applied beyond 220 airline miles distance. The company estimated, on the basis of 1962 volume, a $55 million revenue loss. This loss, the
company estimated, would be partially offset by a $25 million increase in person-to-person rates for distance under 800 miles. The Commission officially estimated that the rate reduction "would represent a .3 percent cut in earnings level." 59

Despite its public announcement to that effect, it is doubtful if the FCC really expected that introduction of reduced after 9 rates would reduce company revenues. Queried on this score by the Senate Commerce Committee a month before the rates went into effect, Chairman Minow of the FCC stated:

If you want my view, my view is the after 9 plan will very quickly return to the company more money than it lost originally. I would say within a year the Commission should take another look at this (Long Lines earnings) and I would feel, unless I am drastically wrong about the American public’s propensity to take advantage of the cheaper rate after 9, that the stimulation of new business will more than make up the loss of the $55 million. 59

Chairman Minow’s prognostications were generously fulfilled. Interstate message volume, which had grown at the rate of 5.7 percent and 6.6 percent for the years ending March, 1962, and March, 1963, jumped precipitiously to 10 percent by the year ending March, 1964, (a year after the after 9 rates went into effect). 61 Monthly earnings of the Long Lines Department, which had hovered between 7¾ percent and 8.0 percent for the first four months of 1963, jumped to 8.44 percent by April, 1964. 52

Pre-Denver Developments

Working under the pressure and public knowledge of the growing interstate earnings level, the NARUC separations subcommittee submitted five separations amendments for discussion with the industry. The suggestions were offered at a meeting in San Francisco in February, 1964, although a response from the company was not forthcoming until its Chicago meeting on June 2, 1964. 53 The five proposals were identified as (1) allocation of local dial central office equipment, (2) extended area service, (3) reclassification of telephone service, (4) timed versus untimed minutes of use, and (5) standby time allocation. The nature of the staff proposals is of interest not only be-
cause of content, but because of the reasons for their disavowal by the Bell System, and the subsequent development of the so-called "Denver Plan" the following year.

(1) Local Dial COE—Category 6. Since 1951, with the advent of the Charleston separation changes, local dial switching equipment was apportioned on the basis of holding time minutes of originating and terminating equipment (DEM factor). At the same time the factor for separating exchange circuit plant, including station equipment, and subscriber line plant was the call minutes of use (TCM factor). The major difference between these two factors is that in constructing the TCM (toll call minutes), exchange minutes of use are divided by two in the denominator of the ratio, resulting in (roughly) twice the ratio of exchange circuit plant as of local dial switching, apportioned interstate. Examination of the rationale underlying the distinctive treatment in the apportionment of these two segments of telephone exchange plant indicates no basis in theory for the separate approaches. One can only conclude that the separate approaches were motivated by revenue requirement conditions, and that company calculations had indicated that uniform application of the TCM or of the DEM factors to the entire exchange circuit and local dial switching investments would have in one case exceeded, and in the other case been insufficient to obtain the necessary jurisdictional transfer of revenue requirements.

Bound by the official NARUC Separations Manual which sets forth these separations "principles," the subcommittee attempted to develop a new rationale. Its report noted:

This "simplified method" [referring to consolidation of categories under Charleston] assumed that the switching costs per minute of use associated with the origination and termination of a toll call are the same as switching costs per minute of use of origination or termination of a local call . . . . Recently, the Task Force's studies were reexamined, and it appears that the assumed equality of cost per minute of use for originating and terminating a local call or a toll call, in an exchange, might no longer result in a reasonable separation.

Accordingly, the subcommittee suggested that the TCM factor used for separating exchange circuit plant be applied to local
switching plant as well. The company estimated this amendment would transfer about $38 million of revenue requirements to interstate.64

The company opposed the change. To buttress their position, A. T. & T. representatives produced "studies." Local dial switching investment is apportioned to the jurisdictions on the ratio of originating and terminating minutes of use in the separate operations. The special studies were intended to determine what the effect of isolating the purely toll and purely local switching would produce in the way of allocated costs. In one of these studies (step x step office) it was found that a separation based on a detailed cost analysis rather than use of the dial equipment minutes ratio (DEM) would increase the interstate assignment by 31 percent. In the other office studies (a No. 5 crossbar office) the detailed study method would increase interstate assignment by 9 percent. Bell representatives concluded that the detailed study method would result in an increased interstate assignment of about $9 million in annual revenue requirements. From the record it appears that the separation subcommittee was furnished no workpapers, no information as to the representativeness of the office studied, nor any definition of how the switching components were assigned.

After appraisal of the work of its subcommittee and the company studies, the parent committee relented. In its response to the annual NARUC convention in Honolulu, the full Committee suggested that "no recommendations can be made at this time," and that further studies be undertaken.

(2) Extended Area Service. The vast growth in establishment of flat rate extended service calling areas since the close of World War II has been a source of concern to state regulators. About a third of the industry toll routes have been converted to local calling by virtue of expansion of extended area service (EAS).65 The substitution of flat rate for measured service is invariably followed by a severalfold increase of traffic. Substitution of "free" calling privileges for the previous toll charges invariably stimulates traffic. This increase in traffic,
under the relative use method of plant assignment, increases the apportionment of telephone plant investment to intrastate operations, and reduces the apportionment to intrastate business. The growth in the number of EAS routes has paralleled the increased suburbanization of the American community and the geographic spread of the communities of interest. Expansion of extended area service has also paralleled the interests of the operating telephone companies. In a typical situation, EAS will supplant toll traffic over a 10 or 15 cent route. Cost studies conducted in 1950 under the auspices of the NARUC Toll Rate Disparity Committee for short-haul toll business in six areas indicated average expense at 29 cents per toll message. Increased mechanization of the toll handling function has occurred simultaneously with higher wage rates. There appears little doubt that today the short-haul toll routes are not self-supporting.

There is still a further consideration with the growth of extended area calling. Under the statewide method of telephone rate-making predominant in most jurisdictions, the level of rates applied in an exchange area is dependent on the number of stations available in the flat-rate calling area. By consolidating smaller suburban exchanges in with the metropolitan areas, higher local exchange rates are applicable to customers in the suburban offices since their "calling availability" is now enhanced with extended area service. The increase in local exchange rates may take place simultaneously with the creation of the new EAS route, or may await the next statewide rate application. In either event the common carrier, with its penchant for revenue stability, may recover its costs through exchange rentals rather than from state toll earnings. State toll business is one of the most volatile segments of the telephone business during periods of business recession.

The technical staff of the NARUC Telephone Committee was working in a narrower framework. To offset the tendency to increased intrastate plant apportionment as the result of the growth in EAS, the separations subcommittee proposed the establishment of a separate category for EAS trunk and associated central office equipment. Under the terms of the
proposal, this investment in EAS facilities would be assigned to toll and be separated between state and interstate using "appropriate usage factors."

The A. T. & T. objections to this proposal, as set forth in the Committee report, were threefold: (a) EAS revenues are classified as exchange revenues, so that plant and expense assignment should be assigned consistently, (b) it is wrong to assign any portion of a wholly intrastate service to interstate operations, and (c) touching the delicate issue of jurisdictional authority, the Company noted that: "If EAS across state lines were considered anything other than exchange service, the provision of the Communications Act would put the service under FCC jurisdiction. . . ."

It would be easy to dismiss this issue in view of the fact that the sub-committee retreated and stated in its report to the NARUC convention that "no conclusions were reached on the treatment of EAS facilities but . . . the subject warrants further study." The company response was nothing more than its own dictum. Let us examine the three objections to the staff proposal for alternate treatment of EAS facilities. With regard to the first point, consistency in treatment of revenues and expenses may be a virtue, but, in practice the separative Manual violates it elsewhere. For example, teletypewriter exchange (TWX) station equipment revenues are assigned "to the appropriate operation, based on the tariff under which the revenues are billed" (Par. 32.31.22 of the Separations Manual). Heretofore, TWX station equipment was filed in the state tariff filings, but more recently in the interstate tariff. On the other hand, the cost of this equipment and its associated expenses is apportioned between state and interstate toll on "the basis of the relative number of TWX connections" (Par. 25.21).

The second objection was that it is wrong to assign any portion of a wholly intrastate service to interstate operation. At the time this comment was made, standard separations procedures provided that the investment in EAS trunks, interlocal trunks, local tandem trunks (all handling nothing but local traffic) was apportioned to state and interstate operations on
the basis of the total call minute (TCM) factor (Par. 23.4331). The company criticism of the staff proposal would apply to the procedure then in effect, and for which the company was largely responsible.

The third objection was the possibility of federal government inroads ever state regulatory jurisdiction. In this instance, however, the threat was stimulated not by emergence of a new separations method, but of one essentially extending previous practice. A portion of EAS plant investment was assigned to interstate. The real threat to state regulatory authority arises with failure to fulfill public responsibilities. The company needed a way to say "no," and it created one.

(3) Reclassification of Telephone Service. The separations subcommittee also suggested that telephone service be reclassified into two basic services: exchange and interexchange. Exchange service would include all flat rate, message rate and intra exchange private line. Interexchange service would include message toll, both state and interstate, toll private line, TWX, Telpak, WATS (Wide Area Telephone Service), Switched Private Line Network (i.e., SCAN and CCSA), Multi-Message Unit (MMU), EAS, and Foreign Exchange Service. According to the Committee report, "allocations of plant and expenses could then be based on the total minutes-of-use for each of the two classifications. In determining allocations of exchange plant to inter-exchange operations, one TCM factor would be determined which would respect the minutes-of-use for each of the various exchange services."

The thought underlying this suggestion was twofold. Paramount, of course, was the intent to reduce intrastate revenue requirements. The application of minutes-of-use to the redefined interexchange classification would serve to "pool" the flat rate EAS and multi-message unit (MMU) traffic with flat rate type toll services—Wide Area Telephone Service (WATS), Telpak, and Foreign Exchange Service (FEX) and reduce the state jurisdictional apportionment. Again, this approach would simplify the categorization of telephone plant investment for separations purposes.
The company objected to the proposed change on two grounds:

Private line services are assigned specific circuits, whose plant costs, revenues and expenses are directly assigned to the appropriate jurisdiction. Direct assignment of costs which can be directly assigned to a given jurisdiction is one of the basic separations principles. Apportionment, rather than direct assignment of such costs would not be proper for state-interstate separations unless the substitute method would produce reasonably similar results and would result in less effort in making separations studies. Neither of these conditions would obtain.

The other company objection to the suggestion was that it would involve the measurement of minutes-of-use on private line circuits. Such measurements on many types of private line circuits would be impossible on a mechanized basis with present equipment arrangements, and measurement on a manual basis would be so costly as to be entirely impractical. Measurements on many private lines probably would not be permitted by customers (e.g., circuits provided for military and defense agencies).

The assertion that direct assignment of costs "... is one of the basic separations principles" does not seem to be borne out by anything contained in the Separations Manual. The Modified Phoenix Plan adopted in 1956 deliberately merged Associated Company and Long Lines book costs of interexchange plant even where the separate costs are determinable. It will be recalled that it was the Bell System that proposed the original Phoenix plan. The Modified Phoenix Plan did not produce "reasonably similar results" but, to the contrary, its objective was a revenue transfer of approximately $40 million to interstate. Neither did Phoenix "result in less effort in making separations studies," but increased their complexity. The statement that private line services are assigned specific circuits is generally valid. However, one should not overlook the fact that these costs "directly assigned" are derived costs and generally are not identifiable as such in the books and records of the carrier. The expenses for each portion of these facilities are not segregated from all similar expenses but are "spread" roughly in proportion to the identified (allocated) investment.

The second difficulty, namely that of measurement of minutes-of-use on private line circuits, is correct. It is also true that relatively minor equipment modifications would permit the tele-
phone company to undertake such measurements.53 While the military, as well as public customers, object to circuit monitoring, the question of mechanically determining usage in hundred-callseconds is another matter.

In concluding its discussion of this proposal, the subcommittee recommended "further study."

(4) Timed vs. Untimed Minutes. The objection to determining relative use by combining calls and usage for unlimited exchange service offerings with restricted toll business has been expressed repeatedly for the past two decades. The subcommittee, in another of its proposals, suggested that in order to obtain comparability, a weighting factor (unspecified) be applied to the toll minutes of use in the allocation of local exchange plant. The Bell System comment acknowledged the fact that similar suggestions had been made repeatedly, but "in Bell System rate cases have been generally denied by both the courts and the Commission."

The staff committee, following submission of company comments, reached no conclusions on the development of equivalent use units, and urged "further studies of this item." It should be noted that where, for example, the Washington Public Service Commission56 and the Oregon Circuit Court57 rejected this principle of weighting of toll minutes of use (or the consideration of standby time), it was largely on the grounds of being inconsistent with the NARUC-FCC Separations Manual. If the Association and the FCC were to officially sponsor such methods, the results might be quite different.

(5) Standby Time Allocation.57 The final suggestion of the subcommittee for amendment of separations principles was a variant of the fourth item discussed above. It was noted that the average telephone and local loop (wires connecting the telephone to the central office) is used about 30 minutes of each 24-hour day or approximately 2 percent of the time. There is little relationship between the amount of time the local plant is in actual use and the expense of its operation. These expenses are preponderantly of a continuous nature and are inescapable
during periods of idleness. The proposal envisaged the allocation of time actually in use (2 percent) on the basis of minutes of use, and the standby time (98 percent) to be "allocated to toll and exchange in a manner consistent with the relative use principle." As set forth by the subcommittee, this plan could be construed as not to change the effective apportionment of station and loop investment. It apparently was not so interpreted by the telephone company, for its reply noted:

a. When not in use, the telephone is standing by for when it does get used.
b. Since actual time in use may represent only a small fraction of the day, any "availability" factor not based on actual use might well be the controlling influence in the allocation of the exchange circuit plant. This would effect a complete departure from the actual use principle.
c. The suggestion has been considered on a number of previous occasions. Each time it has been rejected as being unsound.

The subcommittee did not abandon the standby time allocation plan but suggested "the matter be kept open for any constructive ideas on the subject."

The Separations and Toll Rate Disparity Subcommittee had labored diligently and shown ingenuity for the purpose of effecting modifications in separations principles. When agreement to these modifications was not reached with the Bell System, the parent Committee yielded. The rule of unanimity governing separations changes between regulators and regulatory prevailed once again.

1964 Separations Changes

Independent of the suggestions developed by the regulatory staff, A. T. & T. representatives suggested that the Separations Manual be modified with respect to the treatment of revenue accounting expense. The introduction of computers in substitution for manual handling of the revenue accounting functions had made the functional classification employed in the apportionment of this expense obsolete. The Company estimated the proposed change would save it $2 million a year in accounting expense and result in a transfer to interstate of $884,000 in revenue requirements. Accordingly, the subcommittee recommended the change. At the December convention of the Asso-
The state regulatory officials had come through with too little and too late. On November 5, 1964, the FCC, after review of Bell System interstate earnings, announced further message toll rate reductions estimated at $100 million. The reductions were to take place in two steps: $75 million of the rate reduction was mostly in the form of an extension of reduced night rates to 8:00 P.M. on weekdays, and to Saturday and Sunday traffic. Evening rates for station-places between 6:00 P.M. and 8:00 P.M. on weekdays and all day Saturday were reduced. Twenty-five million dollars of this reduction was made effective April 1, 1965, and was applicable to day station-to-station long haul rates; the rate for a transcontinental call was reduced to $2.00 for a three-minute station call. However, in the interstate message service, stimulation of traffic more than offset unit reductions in price and actually served to enhance the level of company earnings. Concurrent with the interstate “reduced after 8” plans, 26 states introduced rate reductions of this type. By the end of June, 1965, 39 states had announced similar rate treatment. While the state commissions naturally took credit for these reductions in toll rates, they could not be associated with the transfer of revenue requirements arising out of separations changes on this occasion, as they were in 1962. On the part of the carrier, it was just “good business.”

Elasticity of Toll Demand

The impact of toll rate levels on toll demand merits examination of some of the available statistical data on the responsiveness of interstate station-to-station message toll demand to price changes. Like many economic concepts, the measurement of demand elasticity involves many statistical problems not covered by textbook presentation. In the present context, we will develop a rough measure which, over the short term, is not independent of secular growth. Conceptually, the measure of demand elasticity seeks to determine the relationship between changes in market demand and changes in market price. In the message toll service, the message is not a homogeneous com-
modity. In fact, the 1963 and 1964 rate reductions were limited to the station-to-station rate classification. Accordingly, our analysis will be limited to this classification, observing parenthetically that the rate reductions in station business accelerated the shift from "person" to "station" traffic (from 69 percent in 1959 to 80 percent in 1965). The other variable, price, is also not a homogeneous statistic. Toll price is a function of the message characteristics, i.e., the length of haul (which has shown a secular trend to increase, independent of unit rate changes), the average length of conversation, including overtime, and the extent of use of the reduced evening versus daytime schedules. For this purpose, unit price was limited to initial period charges (exclusive of overtime) with the view that the basic three-minute charge forms the threshold of customer decision to initiate a call. Further, to standardize the variable of price, the mileage component was removed, so that the measure of price

### TABLE IX

<table>
<thead>
<tr>
<th>Year</th>
<th>Messages (Thousands)</th>
<th>Initial Period Charges ($ Thousands)</th>
<th>Average Mileage</th>
<th>Mego-Mile (Millions)</th>
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\[ E_p = \frac{(X_t - X_i)}{(X_t + X_i) / 2} \times \frac{(P_t - P_i)}{(P_t + P_i) / 2} \]

where: \( E_p \) = elasticity of demand with respect to price

\( X_t \) = quantity of station-to-station traffic in year \( t \)

\( P_t \) = initial period cost per message-mile in year \( t \)

For the year 1963 \( E_p = 1.06 \)

1964 \( E_p = 1.74 \)

1965 \( E_p = 1.33 \)

Source: Compiled from "Bell System Schedule I Traffic, Distribution by Length of Haul," October, 1959-1965, inclusive, FCC.
is the initial period charge per message-mile. The data are set forth in Table IX.

It will be observed from Table IX that with respect to each of the price reductions for the period 1963-1965, the elasticity of toll demand was greater than unity; that is, unit price reductions were more than offset by increasing consumption. The reduced after 9 rates were placed into effect in April, 1963. However, the promotional effort of the company showed its impact in the full year 1964. By 1965, when the after 8 interstate station-to-station toll rates were put into effect, the size of the demand "push" appeared to have trailed off so that the message growth in response to 1963 price changes was somewhat reduced.

We can examine the data in a different way. In the three-year period 1960-1962, inclusive, prior to the night rate reductions, the average annual rate of message growth was 8.7 percent. In the three-year period 1963-1965, inclusive, following the rate reductions, the average annual rate of message growth was 13.5 percent. Between the years 1954-1962 for each billion dollar increase in Gross National Product, there was, on the average, a corresponding increase of 630,000 station-to-station interstate messages. In 1963 the "after 9" station rates were introduced. Despite the slight deceleration of the economy in that year, interstate station-station traffic jumped by 3 million messages for each billion dollar increase in Gross National Product and continued to increase at this rate for the successive years 1964 and 1965.

Increased demand generated a requirement for increased facilities. The more significant fact is that despite the growth in new plant, interstate rate of earnings continued to rise.

The Denver Plan

With the echo of the FCC announcement of the interstate message toll rate reduction spurring his steps, Chairman Wiggins of the NARUC Committee on Communications Problems called on the FCC on January 26, 1965, to request an immediate hearing under Section 401b of the Communications Act "for the dis-
position of the second phase" of the rate reduction program. This meeting was followed by a letter confirming the request.

In a reply dated March 18, 1965, FCC Chairman Henry stated:

Revisions in separations procedures should, whenever possible, be translated into rate adjustments designed to lessen or eliminate disparity. However, separations methods should not and cannot be contrived solely for the purpose of equalizing costs of the several jurisdictions as a means of eliminating disparities in costs and rates. Nor should the merits of existing or proposed separations methods be evaluated in terms of level of earnings obtained in any jurisdiction.

In the foregoing, Mr. Henry was engaging in public semantics. The federal commission had acceded to (not approved) a half dozen major, and innumerable minor, changes in separations methods. If not for reasons of costs, earnings and rate disparities, why were any accepted? To assuage the state commissions, the FCC Chairman closed with a suggestion that, "Your [NARUC] staff committee . . . meet on a systematic or regularly scheduled basis with the staff of our Common Carrier Bureau in order to devise, analyze and make recommendations with respect to possible revisions in the separations procedures." The stage was set for further separations refinements.

Between March 16th and 18th the staff subcommittee met with the industry representatives to discuss possible plans of separation. In addition to the five modifications suggested in 1964, the subcommittee asked for reconsideration of the Message-Minute-Mile (MMM) Plan. The independent industry suggested allocation of local dial switching on the basis of call-minutes rather than equipment minutes of use. The Bell System representatives indicated responses would be available for the July meeting of the Subcommittee.

Prior to the scheduled meeting, A. T. & T. representatives met on July 16, 1965, with the Chairman of the Separations Subcommittee, the Chairman of the Staff Committee, the Chairman of the Commissioner's Committee, and several FCC officials to offer their own proposed plan of changes in the Separations Manual. These suggestions were discussed at the July
22-23, 1965 session of the full subcommittee held in Denver, Colorado. Hence the term “Denver Plan.”

Since the advent of the Charleston Plan (1951), exchange circuit plant (exchange outside plant and circuit equipment and station equipment) was apportioned on the relative state and interstate minutes of use (TCM factor). Under the Denver proposal, EAS and the interoffice trunks are assigned directly to exchange, while toll connecting trunks are apportioned on the basis of conversation minutes of use. The book costs of subscriber lines and station equipment are apportioned on a new composite use-user factor. The “use” factor is essentially the same as the old subscriber line usage factor, total originating plus terminating minutes of use, adding data for manual offices. A “user” factor is derived by obtaining the ratio of toll users to total users and multiplying this quantity by the ratio of interstate to total toll messages. The combined interstate use-user factor is applied to the book cost of subscriber lines and station equipment to obtain the interstate assignment.

Under the Denver Plan the book costs of local dial switching equipment are apportioned on the DEM factor (relative minutes of dial equipment use), except that the toll minutes are weighted to reflect the fact “that the switching costs per minute of toll use are greater than the costs per minute of exchange use.”

The company offered a justification for the proposed changes. This explanation stated:

Under today’s rapidly expanding toll market, it has become questionable whether the present method fully recognizes the true value of the use of local plant for interstate toll message services . . . . the quantities of subscriber lines and station equipment provided in the plant, in general, are a function of the number of customers, while the amounts of all other telephone plant installed are a function of the amounts of service furnished . . . . It is of prime importance that value assigned to the toll use of such plant shall not force the price of toll message service to a level which uncholy inhibits its future growth . . . . The user factor in the proposed allocation formula is designed to appropriately reflect the relative value of the availability for message toll use of subscriber line and station equipment plant . . . .

The explanation for the user factor appears to be a rationalization, not a rationale. In dozens of rate proceedings during the
past fifteen years the System has opposed the use of any value concept in weighting of interstate toll minutes of use as arbitrary. The investment in station equipment and subscriber lines, it is true, is a function of the number of customers, not of usage. This was equally true when the initial Separations Manual was drafted in 1947. Who is to determine when the "value assigned to the toll use of such plant" inhibits toll growth? If it is utility management, then regulation can only make the subsidiary decisions.

The company provided an explanation for the proposed separations changes in local dial switching systems:

With the advent of customer and operator toll dialing and automatic message accounting equipment, the costs of certain items of local dial equipment used for toll have increased with the result that it appears necessary at the time to reflect this increase in the allocation of the book costs of the local dial central office equipment.

Acknowledgement of this change in the art appears belated. By 1951 nearly 40 percent of Bell System toll calls were operator dialed to completion. The Englewood, New Jersey, customer dialing experiment began the same year, and expanded, by 1958, to a point where about one-fourth the System customers were dialing their own toll calls. Was recognition of the impact of DDD on investment in local switching systems merely overlooked in the past, or was it simply drawn out for this occasion as an expedient answer to meet a current problem?

According to initial estimates prepared by the A. T. & T., the Denver changes would effect a transfer of about $401 million in book costs, $62 million in expenses, and $110 million in revenue requirements to interstate operations. As a quid pro quo A. T. & T. proposed an offsetting reduction of about $35 million from "an updating of toll traffic coefficients." This estimate of $75 million net transfer of revenue requirements was modified by the company in April, 1966, when the company recalculated it to be $98.5 million.

The reaction of the separations subcommittee is of interest. No doubt more questions were raised than answered. Why the reversion to subscriber line usage (SLU) in determining the apportionment of station equipment and circuit equipment,
after having fought many years to extend the total call minutes (TCM) factor to local dial switching. Having striven for simplification of separations methods, the regulators were to be content with the added complexity from the direct assignment of local interoffice and EAS trunks, as well as the separate allocation of toll connecting trunks.

The preceding year, the company had furnished a summary of a study to the Separations Subcommittee alleging that detailed allocation of local dial switching equipment would increase interstate assignment by some $9 million. For the identical reason, namely the increase in local switching investment made necessary by toll services, the company was proposing a weighting factor which would increase interstate apportionment of local dial switching by $26.5 million in annual revenue requirements.

The technical staff of the subcommittee which had labored long on as many as fourteen significant separations proposals, now abandoned them and recommended acceptance of the Bell proposal. Expressing some doubt in the rationale for the changes submitted by the company, the subcommittee report notes the introduction of the value concept and “the departure from the traditional application of relative use as a method of apportionment.” The NARUC Proceedings and Committee Report for the year evidences no concern by the regulators at the fact that the previous year the company had rejected weighted techniques in determining minutes of use as “arbitrary.” No discussion is reported either in the convention proceedings or in the Committee Report (1965) of the $35 million shift in traffic coefficients.

Results of the Denver Plan

What were the results of the Denver separations amendments? Since the plan effected the single largest recorded dollar transfer of annual revenue requirements to interstate operations, the FCC was compelled to stay an immediate reduction in interstate message toll rates. The modified separations methods negated in two respects principles the state regulatory authorities over a number of years had sought to extend. Since Den-
ver the apportionment of station equipment and exchange circuit plant has been on the basis of total originating plus terminating minutes of use (SLU) in lieu of total call minutes of use (with one half weight given exchange minutes) (TCM). For a number of years the NARUC separations staff, questioning the lack of consistency of treatment, had tried to extend the TCM factor to local dial switching equipment. The weighted DEM is about halfway between TCM and DEM and is applied to local dial switching equipment only. The user-factor is applied to subscriber lines and station equipment. The rationale for adoption of the Charleston Plan in 1951 never attempted to explain the reason for difference in separations treatment; the rationale for Denver never attempted to explain why the DEM was adopted for both exchange circuit and local switching plant.

The direct assignment of local interoffice and extended area service trunks to wholly exchange operations was a refinement of separations methods, which stemmed from current needs. A number of students of separations methods have advocated refinement of local dial switching investment and direct assignment of the wholly toll portions of this plant (viz., toll selectors, toll trunk equipments, foreign area translators, etc.) to the toll operations. The response has invariably been that a change in this direction was a reversion to the complexities of pre-Charleston methods, and if one stepped in the direction of direct assignment for portions of exchange plant, it was necessary to extend the principle to all elements of the plant.

On the other hand, recognition of the value concept in deriving apportionment factors set a precedent for future negotiations in this area. In all previous discussion of separations methods, Bell representatives have marshed out impressive legal documentation to demonstrate that incorporation of a value measure in apportioning jointly used plant was arbitrary and contrary to law. In spite of the fact that the departure proposed in the Denver separations plan was termed a “user factor,” it nevertheless was recognition of the “relative value” of unlimited versus measured type telephone service operations.
According to company calculations, the Denver separations amendments increased interstate revenue requirements by $98.5 million and reduced intrastate requirements by a corresponding amount. Unlike the reduction in state revenue requirements at the time of the Charleston separations change, intrastate telephone earnings of the Bell Associated Companies were lucrative. At the end of 1965, the intrastate ratio of net operating income to average net plant of the affiliated Bell companies was 7.4 percent; 17 of the affiliated companies showed earnings in excess of 7.0 percent, while six of the Bell subsidiaries were earning on intrastate business, on the basis of their own published report, 8 percent or more. At the same time the nationwide toll rate disparity was estimated at about $200 million. The opportunity was afforded for a significant reduction in the toll rate disparity or relief of exchange ratepayers. Fourteen months after the Denver Plan went into effect (November 1, 1965), only 17 states had reduced state toll or exchange rates in recognition of the reduced revenue requirements associated with the Denver Plan. The dollar amount of all these rate changes totaled some $16.9 million. A larger part of these were in the form of toll rate reductions, incorporating the after 8 toll pricing plan adopted in February, 1965, for interstate business. A few states, including Washington and Illinois, did effect uniformity of the day station-to-station state toll schedules with the interstate schedule. The significant fact remains that most of the reduction in state revenue requirements was pocketed by the local Associated Bell Companies.

FOOTNOTES TO CHAPTER V


3) "Report of Special Committee Cooperating with the FCC in Studies of Telephone Regulatory Problem," 1956, op. cit., p. 270.

5) On October 4, 1955, Chairman Eddy of the NARUC Telephone Committee met with the FCC to discuss the increased intrastate earnings and the "Telephone" Committee and the Commission agreed that it was inadvisable for your Committee to press at this time for a final decision." Report of the Special Committee, 1955 NARUC Proceedings, p. 44.


7) "Selected Earnings and Balance Sheet Data, Bell Telephone System," year ending December 31, 1953, FCC.

8) Ibid. data for years ending December 31, 1954, and December 31, 1955.


10) 1956 Annual Report of the FCC, p. 36; also Attachment B to 1956 Report of Special Committee Cooperating with the FCC.


13) The broad reclassification set forth in the Manual never appears to have been subject to any regulatory discussion. For example, local test desks, under the implemented 1957 procedure, were classified to Exchange Basic Circuit Equipment (Category 8.12) subject to apportionment on the basis of holding time minutes (Par. 24.03212, October, 1957, Separations Manual). Local test desks rarely are involved in any nonlocal operation. The specific classifications appear to have been determined by the results that were meant to be achieved. It is not clear from the record who, outside the Bell System, had the necessary information to perceive the significance of this major reclassification of property.

14) Bell System intrastate net operating income in 1956 was $913 million. "Selected Earnings and Balance Sheet Data, Bell Telephone System, 1956," FCC.


16) On the other hand, when Curtis Bushnell advocated deviation from the Separations Manual before the Miss. PSC, the company witness stated: "The procedures used by the company have been approved by the FCC and the NARUC and Mr. Bushnell is putting his judgment against the commissions." 16 P.U.R. 3rd 415 cited in T.R. 11/26/56, p. 3. The fact is the FCC has never, to the present day, endorsed the Manual, and the NARUC is not a regulatory commission.

17) "State and Miscellaneous Operations, Based on Company Reports," FCC.


20) Ibid., Attachment I, pp. 408-410.

21) Supra, Chap. IV.

22) "Report of Special Committee Cooperating with the FCC," 1959, Attachment II.

23) Except, of course, in the sense that the magnitude of state toll and exchange rate increases were dampened by the reduction of intra-state revenue requirements.

24) 1959 NARUC Proceedings, p. 413.
"Report of the Special Committee Cooperating with the FCC . . .," 1960 reported in 72nd NARUC Proceedings, p. 62.


Ibid., p. 85.


The resolution is reported in 1961 Proceedings, p. 400.

This paper gives inadequate treatment to the very toll settlement-separations problem experienced by the independent segment of the telephone industry. Independents' concern over separations matters has been to obtain sufficient revenue through settlements with their connecting Bell carriers to cover the cost of furnishing toll service. The "toll rate disparity" problem within the Bell system has its counterpart in the "exchange rate disparity" of Independent Telephone Companies vis-a-vis the Bell Companies, in that the level of non-Bell exchange rates, for comparable sized cities, is normally much higher than that charged in Bell exchanges. A portion of this exchange rate disparity is attributable to inadequate toll settlements. In order to attain overall earnings objectives, Independents have required the deficiencies in toll earnings to be recouped through higher exchange rates. In 1960 and 1961 the General Telephone System sought revision of the toll settlement plans in Kentucky, Ohio, Florida, and Washington. Bell initiated the case in Indiana and failed to prove its point. The North Carolina Commission initiated a separations investigation in which General Telephone submitted testimony and exhibits and cross-examined Bell witnesses. A thorough review of this issue is contained in the Ohio FUC decision in Case No. 28, 946 decided June 9, 1961.


Ibid., p. 298.


"Selected Earnings, Bell System," December 31, 1961, FCC.


"Selected Earnings, 1961 . . .," FCC.

Cf. 74th NARUC Proceedings, pp. 156, 222, 364, 408-411.

Ibid., p. 409.


Idem.


1951 Report of NARUC-FCC Toll Rate Subcommittee, p. 118. The calculation is reported by the Subcommittee as of April 1963, after the interstate after 2 rates had gone into effect.

"Bell System-Average Plant, Revenues and Expenses, State and Miscellaneous Operation," 1962 and 1963, FCC.
"Bell System-Average Plant, Revenues and Expenses, 1962—Based on Company Reports," FCC.

"Bell System Earnings," FCC—no docket number.


Compiled from monthly reports, "Selected Interstate Message Toll Telephone Traffic and Revenue Data," FCC.

"Bell System Rations of Net Operating Income to Average Net Book Cost of Telephone Plant," FCC.


Report of Staff Subcommittee on Separations, p. 171.


"Message Toll Telephone Rates and Disparities," 1951, NARUC, p. 259. The same study showed the State Toll "Full Cost" per message for Rhode Island with an average length of haul of 9 miles at 19 cents per message, New Hampshire with a 14 mile average haul at 24 cents per message and Maine with an average length of haul of 23 miles at 27 cents per message. Table IX-16.


Ibid.

Ibid., p. 173.

The company comments are contained in the 1964 Subcommittee Report, July 24, 1964, pp. 173-74 of the Proceedings.

Traffic usage registration (TUR) equipment located in most large bell central offices uses the sleeve lead of a switched circuit for measuring use in hundred-call-seconds. The sleeve conductor on private line circuits is employed in furnishing "busy" condition on the circuit and therefore not available for the TUR purpose. A modified form of usage registration equipment could be developed across the ring and tip conductors which would provide some means of compensation device.


100 PUR (NS) 309 "To be fair to all parties, a change in separations should be accomplished on a national scale and uniformly applied to intrastate and interstate alike." Wash. PSC v. F. T. & T. Co., May 6, 1955. 25 FUR 3d 18, 24-26. July 11, 1955. The Washington Commission said: "Continuing attention to improvements in separation procedure is warranted. Pending further study . . . no alternative exists except to follow the present revised separation manual . . . ." (p. 51)

In F. T. & T. v. Oregon PUC, 30 FUR 3d, 417, October 9, 1959, The Oregon Circuit Court said: "If there was no uniform system (of separations), property would either be allocated to both or to neither. If allocated to both services,
the public would be penalized by paying higher rates . . . and if allocated to neither service, property of the utility would not be recognized by either state or federal authorities.”

67) This plan is discussed briefly in the 1964 Proceedings, pp. 174-75.
68) 1964 Report to NARUC Committee on Communication Problems, p. 6. Intra-state revenue requirements in 18 states were increased by the amendment. Cf. Attachment I of Committee Report.
69) The FCC “accepted” the changes on October 29, 1964, per Telec. Rpts., November 2, 1964, p. 20, and they were passed on by the NARUC membership December 2, 1964. Cf. 1964 Proceedings, pp. 402-63.
71) Idem.
72) In 1963 after the after 9 rates went into effect, interstate earnings rose from 7.9 percent to 8.2 percent. In 1964, following the after 8 rate reduction, the rate of return rose to 8.4 percent. The way to reduce interstate earnings is to increase the level of rates, quipped one FCC staff member.
74) Attachment I to Committee Report, pp. 6-7.
77) Idem., pp. 48-47.
82) Reported in 1964 Proceedings, p. 171.
83) 1965 Communications Problems Committee Report to NARUC, p. 48.
84) Ibid., pp. 48-49.
85) “Bell System—State and Miscellaneous Operations, by Companies, Year 1965 Based on Company Reports,” FCC.
87) FCC Staff Exhibit No. 33, Docket 19258. An additional $52.7 million reduction was volunteered during this period, but not associated with the Denver Plan.
VI

Some Concluding Observations

We have concluded our chronology of telephone cost allocation methods. It should be clear that separations principles have been influenced strongly by the regulated utility, the American Telephone and Telegraph Company. It should be equally clear that the criticisms expressed herein are not primarily directed to the myths that have been generated to rationalize the "philosophy" of telephone separations. Nor is the primary question one of cost accounting method or of identifying separations principles with appropriate telephone engineering practice. Neither should separations be viewed merely as a subject of academic interest. The matter is one of sound public policy: what objectives are to be achieved and what separations methods are appropriate to achieve these objectives. Our criticism is that our public policy makers, fragmented and competitive, have been unable to arrive at a clear public direction.

There undoubtedly are a number of differing objectives that could be stated as preferable public policy. However, it is our belief that the paramount public objective in the regulation of the communication industry should be the development of relatively inexpensive local exchange service, which would make possible a nearly universal development of the service. In practice, telephone cost allocation methods have benefited interstate toll services at the expense of exchange service. We will examine below the effect of separations changes that have taken
place since 1942 in terms of the impact on the jurisdictional ratepayers.

A subsidiary question of public policy has been the historic problem of disparity between the level of interstate and intrastate public message toll rates. We will examine this issue once again. Our examination may disclose that public regulators have asked the wrong questions. Significantly, it discloses that regulators by attempting to solve the toll disparity problem within narrow jurisdictional limits have again burdened the exchange customer unnecessarily. As an alternative, it will be suggested that consolidation of all toll costs, state and federal, and the development of uniform rate schedules, promises the only solution.

The chapter concludes with an economic analysis of telephone costs intended to orient the separations question to meet the basic objectives of public policy.

The Effect of Separations Changes on Interstate Operations

Between 1942, when the first coordinated regulatory effort was directed to separations matters, and 1965, with the advent of the "Denver Plan," changes to separations methods amounted to approximately $280 million transfer of revenue requirements from the intrastate to the interstate jurisdictions. This amount, of course, only includes the publicly sanctioned separations changes, viz., "Charleston," "Modified Phoenix," and so forth. During this 23-year period innumerable changes to separations took place within the Bell System not set forth in the official NARUC Manual, but reflected in the company Division of Revenue instructions and beyond these instructions. These affected results materially. The $280 million cumulative separations changes are stated in terms of the then current effect (Table X). If re-priced to reflect current traffic volumes and plant investment, the separations changes would probably amount to in excess of half a billion dollars in increased interstate revenue requirements. For the year ending December 31, 1965, Bell System revenues from total interstate services were about $3.1 billion. On this basis cumulative changes to the formal separations princi-
ples have increased interstate revenue requirements by about 20 percent.

Modification of the separations methods was generally designed to afford relief to the intrastate services provided by the Associated Bell Companies. The estimated $.5 billion cumulative reduction in state revenue requirements made up roughly 6 percent of the 1965 System intrastate revenues of $8.0 billion.4

In most instances the state regulatory commissions failed to capitalize on the cost reduction brought about through changes in separations methods. Table X summarizes the dollar effect of the major modifications to separations methods, and the amount of rate reductions authorized by the state commissions as an outgrowth of amendments to separations procedures. It will be noted that the single largest such rate reduction took place subsequent to the 1962 amendments. The 1962 rate reductions were principally in the introduction of after 9 station-to-station intrastate toll rates. Overall, for the period 1942-1965,

**TABLE X**

Summary of Telephone Separations Changes on Net Jurisdictional Revenue Requirements and on State Telephone Ratepayers

<table>
<thead>
<tr>
<th>Date</th>
<th>Nature of Separations Change</th>
<th>Net Decrease in Intrastate Revenue Requirements ($ Millions)</th>
<th>Decrease in Intrastate Rates ($ Millions)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1942</td>
<td>Introd. of S-S Allocations</td>
<td>22.0</td>
<td>3.9</td>
</tr>
<tr>
<td>1951</td>
<td>New Toll Coefficients</td>
<td>17.0</td>
<td>-0.</td>
</tr>
<tr>
<td>1951</td>
<td>Charleston Modifications</td>
<td>32.8</td>
<td>-0.</td>
</tr>
<tr>
<td>1956</td>
<td>Modified Phoenix Plan</td>
<td>40.0</td>
<td>-0.</td>
</tr>
<tr>
<td>1960</td>
<td>New Toll Coefficients</td>
<td>4.0</td>
<td>-0.</td>
</tr>
<tr>
<td>1962</td>
<td>Reclassification of OSP AC/S; measurement of minutes of use; local comm ops.; etc.</td>
<td>46.0</td>
<td>40.0</td>
</tr>
<tr>
<td>1964</td>
<td>Revenue Acct. Modifications</td>
<td>.9</td>
<td>-0.</td>
</tr>
<tr>
<td>1965</td>
<td>Deaver Plan</td>
<td>98.5</td>
<td>16.9</td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>Total</strong></td>
<td><strong>280.2</strong></td>
</tr>
</tbody>
</table>

60.8
about 22 percent of the reduction in intrastate revenue requirements was reflected in corresponding intrastate rate reductions, largely state toll rates. These were reductions identified with the specific separations change.

If the state regulatory commissions failed to capitalize on the separations amendments through rate reduction, the changes to separations methods did have an impact on jurisdictional property allocations. Table XI is a comparison of the property separations of Bell System Companies in 18 states in 1948 with the total Bell System Associated Companies for the year 1965.

**TABLE XI**

<table>
<thead>
<tr>
<th></th>
<th>Total Plant ($ Million)</th>
<th>Intrastate Plant ($ Millions)</th>
<th>Intrastate Plant ($ Millions)</th>
<th>Intrastate (Percent)</th>
<th>Intrastate (Percent)</th>
</tr>
</thead>
<tbody>
<tr>
<td>18 States, 1948</td>
<td>2,436</td>
<td>272</td>
<td>2,164</td>
<td>11.2</td>
<td>88.8</td>
</tr>
<tr>
<td>All Associated</td>
<td>32,065</td>
<td>6,601</td>
<td>25,464</td>
<td>20.6</td>
<td>79.4</td>
</tr>
</tbody>
</table>


The shift in the proportion of Associated Company plant allocated to interstate operations from 11 percent in 1948 to 21 percent in 1965 was attributable to more than changes in separations principles. Over this period, although nearly all telephone business grew, interstate toll services grew more rapidly than state and local telephone services. Between 1948 and 1965 the number of Bell System main telephones increased from 23 to 44 million, an annual compounded rate of 3.9 percent. The average daily local calling rate per telephone, a rough measure of exchange use, went down from 5.75 in 1948 to 5.0 in 1965. Over the same period, interstate message toll traffic grew at the annual rate of 6.9 percent, from 500 million messages in 1948 to 1,569 million in 1965. The growth in other interstate services was far more phenomenal, but difficult to measure with available data. For
example, the number of teletypewriter exchange (TWX) stations served by the Associated Companies rose from 10 thousand in 1948 to 57 thousand in 1965.\textsuperscript{a} TWX is primarily an interstate service employing exchange facilities for local distribution and switching. The number of TWX customers grew in excess of 10 percent annually over this 17-year period. Private line interstate voice circuits leased by the Bell System grew more rapidly than any of the foregoing service classifications; however, data are not readily available to demonstrate the magnitude of this growth. The data available, nevertheless, are sufficient to indicate that a significant part of the shift in the proportion of total Bell System telephone plant allocated to interstate operations was attributable to the greater growth rate in interstate services. Probably less than a third of the 9 percent increase in property distribution to interstate is due to changes in separations principles.

Bell System Telephone plant in service has more than quadrupled over this period, from $7.6 billion in 1948 to $32.1 billion at the end of 1965.\textsuperscript{a} Within the state jurisdiction, the question arises as to the effect on the intrastate toll and exchange classifications. No firm answer is available and we can only conjecture on the basis of estimates. For the year 1948, the Bell System furnished the NARUC data showing three-way (intrastate toll, state toll, and exchange) separated results in 18 states. While data for these 18 states represented only about 31 percent of Associated Company’s investment at the time, we must assume the results are typical of the entire nationwide operation. It was about this time that the Bell System discontinued preparation of three-way separations studies (except in California and Wisconsin). However, in FCC Docket 16258 the Bell System furnished combined Associated Company jurisdictional separated results. Starting from this data, and on the basis of broad but conservative assumptions, an estimate of intrastate Bell System toll plant and exchange plant for 1965 has been developed (Table XII).

A more detailed discussion of the method of developing the separated 1965 intrastate toll and exchange results is found in note 24. At this point it should be noted that the intrastate toll
### TABLE XII

**Distribution of Separated Plant, Bell System Companies, 19 States, 1948 Compared with Estimated Total Associated Companies Separated Results, 1965**

<table>
<thead>
<tr>
<th>Year</th>
<th>Gross Plant</th>
<th>Interstate Plant</th>
<th>State Toll Plant</th>
<th>Exchange Plant</th>
</tr>
</thead>
<tbody>
<tr>
<td>1948: Amount ($) millions</td>
<td>2,433</td>
<td>272</td>
<td>358</td>
<td>1,806</td>
</tr>
<tr>
<td>Percent</td>
<td>100.0</td>
<td>11.2</td>
<td>14.7</td>
<td>74.1</td>
</tr>
<tr>
<td>1965: Amount ($) millions</td>
<td>32,065</td>
<td>6,601</td>
<td>4,487</td>
<td>20,977</td>
</tr>
<tr>
<td>Percent</td>
<td>100.0</td>
<td>20.6</td>
<td>14.0</td>
<td>65.4</td>
</tr>
</tbody>
</table>

Source: Same as Table XI. For details of derivation see text and note 24.

Allocation has been predicated on prevailing separations principles and is based on the interstate results developed by the telephone company. Exchange plant has been derived as a residual after deducting interstate and intrastate toll investments from gross plant.

While absolute precision should not be expected from the figures estimated for 1965 state toll and exchange investment set forth in Table XII, the relative distribution of total Associated Company plant appears reasonable for logical considerations.

The relatively stable proportion of total Associated Company plant allocated to intrastate toll (from 14.7 percent in 1948 to about 14.0 percent in 1965) is surprising. The separations changes accepted by the NARUC during this 17-year interval were developed because of their net jurisdictional effect, not the effect on the separate state service classifications, exchange and toll. Except for California, none of the state commissions has consistently required separated results for its intrastate business, preferring to adapt rates on the basis of overall statewide revenue requirements. Three out of four of the major separations changes—Charleston, Denver, and the 1962 account reclassification—would have had the effect of increasing revenue requirements on state toll services, just as they were designed to increase the burden on the interstate message toll service.

Apart from separations changes, the relative growth in intrastate toll business should have increased the proportion of gross
plant allocated to this segment of service. Despite the great expansion in extended area service which shifts property from state toll to exchange, the rate of growth in state toll traffic has exceeded the rate of growth in exchange telephones. In 1948, an estimated 1.4 billion state toll messages were originated by Bell System customers as against 2.9 billion in 1965. This is a compounded growth rate of 4.4 percent as contrasted to the 3.9 percent annual increase in main telephones.

**Toll Disparities Again**

Having developed an estimate of intrastate toll property, it is appropriate to carry through on the issue of message toll rate disparities.

The 1951 Report on “Message Toll Rates and Disparities” estimated the disparity between intrastate and interstate toll rates at $125 million. By 1963 the amount of the disparity was estimated at $270 million. Conscious efforts have been made by the state commissions to reduce the disparity. Despite these efforts, today there are state toll schedules with charges of more than twice the interstate charges for the same length of haul. In view of the generally higher level of intrastate toll charges over interstate charges, can we attribute this rate difference to excessive earnings on intrastate toll business? The available evidence indicates the contrary to be the case, and that state toll revenues are actually insufficient to support separated state toll investment by use of the same separations procedures used to determine interstate toll costs. In Table XII an estimate of intrastate toll plant investment was developed for the Bell System for 1965. Applying an expense-to-plant ratio developed from company data, we can compare the revenue requirements, excluding any return on investment with the actual intrastate toll revenues earned by the combined Associated Companies (Table XIII).

A word of explanation is in order with regard to the development of the annual charge factor, 27.7 percent, used in estimating state toll revenue requirements. Such factors are widely accepted by regulatory commissions and used by the company
TABLE XIII
Comparison of Intrastate Toll Revenues
Associated Bell Companies, with Estimated Intrastate
Toll Revenue Requirements, 1965

<table>
<thead>
<tr>
<th>Description</th>
<th>Value (in $ Million)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. 1965 State Toll Revenues</td>
<td>1,310.3</td>
</tr>
<tr>
<td>2. Estimated State Toll Investment</td>
<td>4,487.1</td>
</tr>
<tr>
<td>3. Annual Charges, excluding return, at 27.7%</td>
<td>1,242.9</td>
</tr>
<tr>
<td>4. Net Revenue, before return (1) − (3)</td>
<td>67.4</td>
</tr>
</tbody>
</table>

Source: 1) State toll revenues derived from Combined Report 51, No. 1, Sheet 1, December, 1965, plus Cincinnati and Suburban, Southern New England Telephone and Telegraph gross toll revenues less interstate toll revenue from Interstate Monthly Report No. 1, December, 1965; 2) Table XII; 3) annual charges developed from C. R. 51, Sheet 1, December, 1965, expenses and taxes for year 1965 reported at $9,111 million, and average telephone plant at $32,500 million.

in developing annual revenue requirements on specific equipment items or service classifications. They are broad approximations to be used when additional refinement for cost development purposes is considered unnecessary. The overall carrying charge used in Table XIII probably results in a conservative estimate of assignable state toll expenses. Four categories of telephone operating charges—maintenance, depreciation, operating taxes, and return—can be construed as directly a function of plant investment. These four items made up over 71 percent of consolidated Bell System charges in 1965. These expenses, of course, are not recorded separately on the carrier books by service, i.e., exchange and toll; this necessitates this means of approximation, and explains why this method is employed in estimating the allocated expenses in standard separations studies. In fact, however, because of the more severe operating and maintenance requirements imposed by toll service, the use of overall expense-to-plant averages somewhat understates the appropriate cost burden in estimating state toll costs.

Our estimate of intrastate toll earnings of the Bell System in Table XIII indicates a nationwide revenue margin, before any return on investment, in excess of $67 million on an extended state toll investment of about $4.5 billion. The implication of
this finding suggests a pause to examine the data in greater detail.

It is emphasized that state toll investment has been allocated primarily on the basis of the Associated Company investment assigned to interstate operations, and utilizing the standard separations principles adopted for jurisdictional purposes. The method followed in the preparation of this estimate is obviously coarse and subject to estimating error. It is believed that sufficient precaution has been taken to retain any error on the conservative side. In view of carrier reluctance and state regulatory commissions hesitance to order specific intrastate cost studies, the means followed here are necessary to highlight the problem. It might be helpful to evaluate the possible margin of error of estimate. As noted earlier, usage is the single most important criteria in the separations of telephone plant. State toll messages in 1965 were about 95 percent greater than interstate toll messages, while the interstate toll investment developed by the company is 47 percent greater than intrastate toll investment developed here. The single most significant factor affecting telephone property allocation is minutes of use. The industry total intrastate toll minutes of use are reported at 39 billion as against 32 billion of interstate minutes of use, a difference of 22 percent. Despite the greater state toll usage, our estimated state toll investment is $2.2 billion lower than that estimated by the company for interstate business. If anything, our result may be unduly conservative.

There is still an additional source of evidence which tends to confirm our view that in the aggregate intrastate toll rates are not self-sustaining. The California Commission is the only state regulatory body which has consistently required the local Bell Company to develop separated costs and revenue requirements of exchange and state toll services. State toll rates in California are among the highest in the country. There are many factors, of course, which determine the costs of exchange and state toll service. It is noteworthy, however, that the level of exchange rates for comparable sized cities within California are among the lowest in the country. While many variables affect the level
and structure of exchange rate schedules in the various states, it is suggested that the deliberate effort of the California Commission to maintain its toll services on a viable basis has insulated its exchange ratepayers from any burden of toll costs.

We need to carry this analysis one step further. If intrastate toll business is not self-supporting, the Associated Companies are recovering the deficiency elsewhere. For the year 1965, total Bell System intrastate rate of earnings on net investment was 7.4 percent. The only revenue source which could make up this deficiency in state toll business is exchange service. On

**TABLE XIV**

**Estimated State Toll Costs Recovered from Monthly Exchange Rentals, Bell System Companies, Based on Operations During Year 1965** ($ Millions)

<table>
<thead>
<tr>
<th>Item</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Net State Toll Revenue, excluding return</td>
<td>67.40</td>
</tr>
<tr>
<td>2. Estimated Gross State Plant Invest.</td>
<td>4,487.1</td>
</tr>
<tr>
<td>3. Less: Dep. Reserve at 21.4 percent</td>
<td>960.2</td>
</tr>
<tr>
<td>4. Estimated Net State Toll Plant</td>
<td>3,526.9</td>
</tr>
<tr>
<td>5. Return on Net Plant at 7.4 percent</td>
<td>261.0</td>
</tr>
<tr>
<td>6. Estimated Net Toll Revenue Deficiency (5) – (1)</td>
<td>193.6</td>
</tr>
<tr>
<td>7. No. Main Telephones, Bell System 12/31/65</td>
<td>45.0</td>
</tr>
<tr>
<td>8. Estimated Monthly State Toll Expenses met from exchange revenues. (6)/(7) ÷ 12</td>
<td>.36</td>
</tr>
</tbody>
</table>

Sources. s). Table XIII; 1) Table XII; 2) reserve ratio calculated from Bell System Consolidated Report 51, No. 1 Sheet 2, December, 1965; 3) the rate of return on total intrastate earnings of the Bell System as reported in "State and Miscellaneous Operations, 1965," FCC; 4) number of main telephones reported in B.S. Consolidated Report 51, No. 1.

the basis of the previously developed data, we conclude that exchange ratepayers may be subsidizing state toll business by thirty-six cents per month per main telephone. Table XIV sets forth the derivation of this amount.

The theme of this section was the question of toll rate disparities—the difference in the level of state and interstate mes-
sage toll charges for a call of equal distance and duration. The question was raised as to whether, in view of the generally higher level of state message toll charges, earnings on this segment of toll business would explain the disparity. Our response is strongly negative. We now find that state toll revenues, rather than supplementing exchange earnings, may not carry their own weight.

The view that state toll services are not self-supporting is not altogether novel. The NARUC in its 1951 report on "Message Toll Rates and Disparities," (Table IX-15), indicated that in 15 out of 20 states studied, state toll expenses exceeded revenues. Since the report was issued, no serious effort has been made by regulatory commissions to examine this aspect of the problem. In effect, by abandonment of the requirement (except for California) that individual cost of service studies be undertaken, the state commissions have delegated authority to the telephone company to recover its revenue needs as the carrier deemed appropriate. The generally lower level of interstate toll rates served as a pressure source on both the Bell System and the state commissions to avoid examination of state toll costs. In the limited frame of reference in which commissions usually examine this question, cost studies would have justified higher state toll rates thereby aggravating the jurisdictional rate disparity problem. The favorable reaction by many state commissions to the 1953 interstate message toll increase allowed by the FCC indicates the direction preferred to resolve the disparity issue. In spite of the rhetoric expressed over the inequity of separations principles, it seems clear in retrospect that many influential state commission spokesmen would have been happy to see interstate rates rise through revenue requirement transfers and thereby erase the toll disparity. Yet these very amendments to separations principles, which increased interstate revenue requirements, worked with equal effect to increase state toll costs. State regulators must have been aware of the circularity of these efforts. The alternative was less palatable. It was to work directly with the FCC in the direction of consolidating toll costs and effecting toll rate uniformity. This course of action involved some invasion of States' rights by reducing the sovereignty of the state regulators.
within their own domain. The victim of this judgment has been the exchange ratepayer. Accordingly, in the next section we turn to examination of exchange telephone development.

Exchange Rates and Exchange Development

Rates for local exchange telephone service rose systematically after World War II. They increased to some degree because of improper cost allocation methods, but more as a result of the general rise in material and labor costs experienced by the industry. One source estimates that since 1940 local telephone rates have risen by less than 50 percent.29 This is the approximate magnitude of increase in residential rates. In view of our findings that a portion of this increase in local rates is attributable to inequitable cost allocations methods (vis-à-vis interstate toll services) and improper rate making practices (vis-à-vis intrastate toll services), what has been the effect on exchange telephone development? Since our prime interest here is with residential telephone development, Table XV shows the proportion of households with main telephone service for the period 1930-1965.

<table>
<thead>
<tr>
<th>Year</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>1930</td>
<td>40.9</td>
</tr>
<tr>
<td>1940</td>
<td>36.9</td>
</tr>
<tr>
<td>1950</td>
<td>61.9</td>
</tr>
<tr>
<td>1960</td>
<td>78.3</td>
</tr>
<tr>
<td>1965</td>
<td>80.6</td>
</tr>
</tbody>
</table>


The reported information on residential phone development indicates that exchange rate increases have not been a widespread deterrent to development of the service. The proportion of households with telephone service has increased from 37
percent in 1940 to 81 percent in 1965. While local rates have risen by less than 50 percent since 1940, average weekly earnings have increased more than threefold over the same period. For those who could afford it, local telephone service has been "a good buy." Over the past two decades the cost of main station telephone service has made up a declining portion of the average wage worker income. However, nationwide figures conceal vast differences.

Accordingly, we will next examine the income-demand relationships for local telephone service. Table XVI summarizes

<table>
<thead>
<tr>
<th>Money Income of Household</th>
<th>1958</th>
<th>1965</th>
</tr>
</thead>
<tbody>
<tr>
<td>Under $1,000</td>
<td>10.3</td>
<td>6.6</td>
</tr>
<tr>
<td>$1,000-$1,999</td>
<td>9.8</td>
<td>9.4</td>
</tr>
<tr>
<td>$2,000-$2,999</td>
<td>9.8</td>
<td>8.8</td>
</tr>
<tr>
<td>$3,000-$3,999</td>
<td>11.5</td>
<td>8.5</td>
</tr>
<tr>
<td>$4,000-$4,999</td>
<td>13.4</td>
<td>8.6</td>
</tr>
<tr>
<td>$5,000-$5,999</td>
<td>13.4</td>
<td>9.4</td>
</tr>
<tr>
<td>$6,000-$6,999</td>
<td>9.5</td>
<td>9.0</td>
</tr>
<tr>
<td>$7,000-$7,999</td>
<td>14.8</td>
<td>20.3</td>
</tr>
<tr>
<td>$10,000-$14,999</td>
<td>6.0</td>
<td>13.9</td>
</tr>
<tr>
<td>$15,000-$24,999</td>
<td>1.2</td>
<td>4.5</td>
</tr>
<tr>
<td>$25,000 and over</td>
<td>0.4</td>
<td>1.0</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>1958</th>
<th>1965</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>100.0</td>
<td>100.0</td>
</tr>
</tbody>
</table>

**TABLE XVI**

Proportion of U.S. Households with Telephone Service, by Income Class, 1958 and 1965 (Percentage)

Results of two telephone censuses undertaken by the U.S. Department of Commerce.

The so-called demand inelasticity for local exchange service has been an accepted verity in the industry. Independent study of customer reaction to company rate increases for residence
main station development found "the response to rate increases practically nonexistent." The Bell System companies act on this assumption in rate case proceedings. It is standard procedure to estimate exchange revenues after an increase by applying the proposed rates to the existing number of subscribers. Within the constraints imposed by the question, this treatment may be appropriate. The relationship indicated in Table XVI demonstrates, however, that very real income-demand elasticity exists. Price apparently has been a real deterrent to telephonic development at low family-income levels. The inelasticity reference by both the industry and the regulators merely indicates that once a household obtains exchange communications services, it relinquishes it only as a last resort. This begs the question of social policy. Unnecessarily high exchange rate levels have clearly acted to deter development of the service in households with relatively low income. More than a fourth of all U.S. households with money income under $5,000 (about 8 million households) did not have telephone service in the relatively affluent year 1965. It is a reasonable surmise that relative cost level, for telephone service, in competition with all other household needs, restricted this segment of the economy from obtaining telephone service. On the other hand, it will be noted that the greatest relative increase between 1958 and 1965 in telephone development (13 percent) took place in the lowest income category, households with less than $1,000 money income. It is significant also that close to 56 percent of the households in 1965 in the under $1,000 income group, operating at submarginal income levels, found telephone service either a social or business necessity.

It has been the thesis of this study that telephone cost allocations methods have unduly burdened the exchange ratepayer to the benefit of the interstate toll customer. Earlier in the present chapter, it was indicated that a portion of intrastate toll costs are currently borne by exchange rates, that state toll rates are collectively not self-supporting. The effect of cost allocation policies (with respect to interstate toll) and ratemaking policies (with respect to intrastate toll) has been to deny a considerable
segment of U.S. families the benefit of more economical local telephone service. If it is a paramount policy of public regulation to achieve a nearly universal development of exchange telephone service, it is necessary and essential to proceed with a modification of both the cost allocation and rate-making policies as practiced in the industry today. If exchange telephony is "a good buy," it can be made a much better buy if public regulatory officials establish universal service as a prime objective of public policy.

Other Economic Considerations

The provision of telephone facilities involves the provision of a common plant usable for many services. The allocation of these property costs to the separate services may involve arbitrary assumptions but should be directed by the requirements of public need. In a market economy costs determine rates. Rates and demand determine revenues. It has been demonstrated that toll demand is elastic in response to price on the down side. Similarly, it has been asserted that demand for local exchange service, particularly in the unsaturated segment of low income families, is also elastic. The present section will examine telephone costs from another approach—the supply side. If telephone cost allocation criteria are to meet the needs of public policy, an understanding of supply costs, their relevance and impact on the separate service is necessary. Table XVII contains a percentage distribution of separated investments developed by the Bell Companies for 1943 as well as both dollar and percentage distribution of separated investment between exchange, interstate and state toll for 1965. Intrastate property separation has been developed by the author employing the interstate results prepared by the company as a base, and using the prevailing separations principles. The reader is referred to the footnotes for a more extended explanation of the derivation of the 1965 separated results.

It has been pointed out in previous chapters that until recently telephone plant has been allocated almost entirely on the basis of relative use and occupancy. With the inception of the
Denver Plan in November, 1965, some minor exception to the use criterion has been made to incorporate a value weight in the apportionment of station equipment and distribution plant. Use is still the overriding basis for telephone cost allocations. It should be observed, however, that the technical basis for provision of telephone plant is at least twofold: demand or use and the number of subscribers.

**TABLE XVII**

Distribution of Separated Investment by Major Classes of Plant, 18 States for 1948 and for Total Associated Companies, 1965

<table>
<thead>
<tr>
<th></th>
<th>Total 18 States</th>
<th>Interstate</th>
<th>State Toll</th>
<th>Exchange</th>
</tr>
</thead>
<tbody>
<tr>
<td>Land and Buildings</td>
<td>10.8</td>
<td>19.2</td>
<td>12.0</td>
<td>9.3</td>
</tr>
<tr>
<td>Central Office Equipment</td>
<td>28.6</td>
<td>35.3</td>
<td>27.9</td>
<td>27.8</td>
</tr>
<tr>
<td>Station Equipment</td>
<td>19.7</td>
<td>7.8</td>
<td>7.2</td>
<td>23.9</td>
</tr>
<tr>
<td>Outside Plant</td>
<td>38.6</td>
<td>35.3</td>
<td>49.9</td>
<td>36.8</td>
</tr>
<tr>
<td>General Equipment</td>
<td>2.3</td>
<td>2.4</td>
<td>3.0</td>
<td>2.2</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>100.0</strong></td>
<td><strong>100.0</strong></td>
<td><strong>100.0</strong></td>
<td><strong>100.0</strong></td>
</tr>
</tbody>
</table>

**Dollar Distribution, Separated Investment, Associated Companies, 1965**

<table>
<thead>
<tr>
<th></th>
<th>Total Assoc. Co. Investment (Millions)</th>
<th>Allocated to Interstate (Millions)</th>
<th>Est. Alloc. to State Toll (Millions)</th>
<th>Est. Alloc. to Exchange (Millions)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Land and Buildings</td>
<td>3,136.0</td>
<td>876.4</td>
<td>382.1</td>
<td>1,877.5</td>
</tr>
<tr>
<td>Circuit Equipment</td>
<td>3,399.1</td>
<td>1,822.9</td>
<td>227.9</td>
<td>1,346.3</td>
</tr>
<tr>
<td>Local Dial Switching</td>
<td>5,551.2</td>
<td>932.1</td>
<td>342.1</td>
<td>4,877.9</td>
</tr>
<tr>
<td>Other Switching</td>
<td>1,645.7</td>
<td>657.2</td>
<td>657.2</td>
<td>331.3</td>
</tr>
<tr>
<td>Station Equipment</td>
<td>7,053.3</td>
<td>920.7</td>
<td>948.3</td>
<td>5,184.3</td>
</tr>
<tr>
<td>Exchange OSP</td>
<td>8,837.5</td>
<td>950.1</td>
<td>987.9</td>
<td>6,890.5</td>
</tr>
<tr>
<td>Toll OSP</td>
<td>1,679.3</td>
<td>884.1</td>
<td>795.2</td>
<td>-0-</td>
</tr>
<tr>
<td>General Equipment</td>
<td>762.7</td>
<td>146.2</td>
<td>146.4</td>
<td>468.1</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>32,064.8</strong></td>
<td><strong>6,600.7</strong></td>
<td><strong>4,487.1</strong></td>
<td><strong>20,977.0</strong></td>
</tr>
</tbody>
</table>
Separations Principles in the Telephone Industry

TABLE XVII (continued)

Percentage Distribution, Separated Investment, Associated Companies, 1965

<table>
<thead>
<tr>
<th></th>
<th>Total</th>
<th>Interstate</th>
<th>State Toll</th>
<th>Exchange</th>
</tr>
</thead>
<tbody>
<tr>
<td>Land and Buildings</td>
<td>9.8</td>
<td>13.3</td>
<td>8.5</td>
<td>9.0</td>
</tr>
<tr>
<td>Circuit Equipment</td>
<td>10.6</td>
<td>27.6</td>
<td>5.2</td>
<td>6.4</td>
</tr>
<tr>
<td>Local Dial Switching</td>
<td>17.3</td>
<td>5.0</td>
<td>7.6</td>
<td>23.3</td>
</tr>
<tr>
<td>Other Switching</td>
<td>5.1</td>
<td>1.0</td>
<td>14.6</td>
<td>1.6</td>
</tr>
<tr>
<td>Station Equipment</td>
<td>22.0</td>
<td>3.9</td>
<td>21.1</td>
<td>24.7</td>
</tr>
<tr>
<td>Exchange OSP</td>
<td>27.6</td>
<td>14.5</td>
<td>22.0</td>
<td>22.8</td>
</tr>
<tr>
<td>Toll OSP</td>
<td>5.2</td>
<td>13.4</td>
<td>17.7</td>
<td>—</td>
</tr>
<tr>
<td>General Equipment</td>
<td>2.4</td>
<td>2.3</td>
<td>3.3</td>
<td>2.2</td>
</tr>
<tr>
<td></td>
<td>100.0</td>
<td>100.0</td>
<td>100.0</td>
<td>100.0</td>
</tr>
</tbody>
</table>

Percentage Distribution of Investment by Separations Category, Associated Companies, 1965

<table>
<thead>
<tr>
<th></th>
<th>Total</th>
<th>Interstate</th>
<th>State Toll</th>
<th>Exchange</th>
</tr>
</thead>
<tbody>
<tr>
<td>Land and Buildings</td>
<td>100.0</td>
<td>27.9</td>
<td>12.2</td>
<td>59.9</td>
</tr>
<tr>
<td>Circuit Equipment</td>
<td>100.0</td>
<td>53.6</td>
<td>6.7</td>
<td>39.7</td>
</tr>
<tr>
<td>Local Dial Switching</td>
<td>100.0</td>
<td>6.0</td>
<td>6.2</td>
<td>87.8</td>
</tr>
<tr>
<td>Other Switching</td>
<td>100.0</td>
<td>39.9</td>
<td>39.9</td>
<td>20.2</td>
</tr>
<tr>
<td>Station Equipment</td>
<td>100.0</td>
<td>13.0</td>
<td>13.5</td>
<td>73.5</td>
</tr>
<tr>
<td>Exchange OSP</td>
<td>100.0</td>
<td>10.9</td>
<td>11.2</td>
<td>77.9</td>
</tr>
<tr>
<td>Toll OSP</td>
<td>100.0</td>
<td>52.6</td>
<td>47.4</td>
<td></td>
</tr>
<tr>
<td>General Equipment</td>
<td>100.0</td>
<td>19.3</td>
<td>19.2</td>
<td>61.4</td>
</tr>
<tr>
<td></td>
<td>100.0</td>
<td>20.6</td>
<td>14.0</td>
<td>65.4</td>
</tr>
</tbody>
</table>

Sources: 1948 distribution of investment from "Message Toll Telephone Disparities." Table IX-9, NARUC (Wsh., D.C., 1951). The breakdown of total and interstate investment is from FCC Staff Exh. No. 25, Pocket 162558. The estimate of investment and its distribution for state toll and exchange prepared by author. For details of derivation see note 24.

The determinant of the amount of investment in a substantial portion of switching and interexchange facilities is use; the determinant of investment in station equipment and local distribution facilities is essentially the number of subscribers, rather than use as such. Every telephone subscriber has a telephone instrument; he can utilize it in originating local, state toll, or
Some Concluding Observations

interstate toll calls or he may use it only on an emergency or standby basis or to receive incoming calls. The size and investment in local duct, pole routes, exchange cable, and aerial wire facilities (so-called loop plant) are determined by the existing size and expected future growth in the exchange area. However, these costs are a function of the number of subscribers and not of the traffic these subscribers send or receive. From an economic viewpoint, the cost of furnishing station equipment may be considered a constant. The labor cost of installing and wiring a handset will vary from location to location, but is almost independent of the scale of the market. Stated differently, within a given geographic area serving a central office the cost per cable pair, including the support structure (poles, ducts, etc.) declines with increasing density. From a cost allocation viewpoint these observations teach two lessons. First, relative use has no bearing on cost causation with respect to exchange outside plant and station equipment, despite the prevailing separations criterion. Second, one must be an exchange user before one can be a toll user. Both services benefit through intensity of exchange service development.

Telephone traffic (except perhaps some data and teletype traffic) is not a commodity which can be stored. The provision of toll lines plant and a major portion of switching facilities must be engineered to meet peak periods of demand or use. It would seem to follow that the cost of equipment that is required to satisfy the peak demand should be allocated on the basis of peak traffic.

Some explanation is in order at this point to indicate the significance of peak traffic use. The amount of calls a given amount of equipment can handle depends on the "grade of service" for which it has been engineered. Grade of service is a concept based on the probability of encountering a busy condition in setting up a connection during the busy hour of the day. The greater the amount of calls (or the longer the holding time) with a given amount of equipment, the greater is the chance that a call will not be completed, and the lower is the grade of service. Certain segments of switching plant are en-
gaged only during the initiating stages of a call and therefore their required quantity to provide a predetermined grade of service is a function of the calling rate. Other segments of the switching system as well as all transmission systems are occupied for the duration of a call, and thus their provision is a function of both calling rate and holding time to provide a given grade of service. The additional capital funds required to permit a call to be made depends upon its effect on the predetermined grade of service.

With the foregoing background, we are ready to analyze the data in Table XVII more readily. Note that in 1965 about half of the total investment of the Associated Companies was in station equipment and exchange outside plant. While the quantum of this investment is a function of the number of customers, it is, in fact, largely allocated on the basis of use. The unlimited nature of exchange calling as against the restrictive effect of toll shows up immediately in the results: about 76 percent of these two major segments of plant were assigned to exchange operations in 1965 (as against about 71 percent in 1948). Looking at the vertical organization of the data in Table XVII, we see from the separated exchange results that station equipment and exchange outside plant comprise 62 percent of total separated exchange costs. In contrast, they are about half this proportion for both toll service classifications.

The relatively high proportion of station equipment and distribution plant costs allocated to exchange service is, of course, a consequence of the use separation criterion. The impact on the separate service classifications, however, is quite distinct. Due to its almost infinite growth possibilities such costs are more readily absorbed by the toll services, at any level of allocation, but have been a deterrent (through price) to the optimum expansion of exchange service. Under the guidance of publicly motivated price and cost allocations policy, the provision of primary exchange service will achieve virtual saturation, the limits to toll growth are not in sight.

The next largest item of Associated Company equipment investment is in the local dial switching account, about $5.6
billion or 17 percent of the total. Cost causation in the local switching accounts is partially a function of call carrying capacity, partially a function of the individual line or subscriber. Certain equipment such as the line circuit, terminals, and connectors have one-to-one correspondence with the customer line; other equipment such as the marker group frames and originating registers in number 5 crossbar offices are determined by peak hourly calling rates, but are not engaged for the duration of use; still other equipment such as the selector stages in panel and step-by-step switching systems, the line link, and trunk link frames in crossbar offices are engineered on the basis of total peak use. Overall, for all local switching systems in the Bell System, it is estimated that about 30 percent of dial equipment costs are a function of the customer, about 70 percent a function of call carrying capacity (usage).25 Referring to Table XVII, we see that on the basis of this analysis a disproportionate fraction of local switching investment is assigned to exchange services and, bearing in mind the frailties of the primary allocation, an insufficient sum to intrastate toll.26 Local dial switching makes up a fourth of total separated exchange investment, but about 5 percent of the costs of the toll services. In 1965, 88 percent of the investment in local dial switching was allocated to the exchange service, according to Table XVII.

The major investment component in the toll services is toll line plant (OSP) and circuit equipment. They constitute over 40 percent of the 1965 interstate toll property and about 23 percent of our estimated investment in state toll service. Within the classification of Interexchange toll lines there is a significant cost aspect worth noting. This is with reference to the cost difference for Long Lines and Associated Company plant, Table XVIII summarizes the book costs per mile for the years 1950-1963, inclusive.

Between 1950 and 1963 the cost of Long Lines interexchange circuits was reduced by 62 percent while the cost per revenue producing circuit mile of the Associated Companies went down some 15 percent over the same period. Even more significant is the increasing cost ratio of Associated Company plant to Long
Lines interexchange plant. Long Lines provides only interstate services; the Associated Companies provides all the intrastate services as well as interstate services. The rapid decline in Long Lines cost over this time period was brought about largely by the substitution of microwave radio, coaxial cable, and heavy carrier facilities for physical conductor (VF cable and open wire). The Associated Companies participated as well in the

<table>
<thead>
<tr>
<th>Year</th>
<th>Long Lines</th>
<th>Associated Companies</th>
<th>Ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>1950</td>
<td>$59</td>
<td>$114</td>
<td>1.9</td>
</tr>
<tr>
<td>1952</td>
<td>56</td>
<td>114</td>
<td>2.0</td>
</tr>
<tr>
<td>1954</td>
<td>43</td>
<td>111</td>
<td>2.6</td>
</tr>
<tr>
<td>1956</td>
<td>39</td>
<td>109</td>
<td>2.8</td>
</tr>
<tr>
<td>1958</td>
<td>38</td>
<td>112</td>
<td>2.9</td>
</tr>
<tr>
<td>1960</td>
<td>32</td>
<td>106</td>
<td>3.3</td>
</tr>
<tr>
<td>1961</td>
<td>31</td>
<td>104</td>
<td>3.4</td>
</tr>
<tr>
<td>1962</td>
<td>29</td>
<td>101</td>
<td>3.5</td>
</tr>
<tr>
<td>1963</td>
<td>27</td>
<td>97</td>
<td>3.6</td>
</tr>
</tbody>
</table>

Source: NARUC Exhib. No. 1, Attachment 10, FCC Docket 16238

use of the newer transmission media, but not as extensively or in proportion. A high proportion of radio and carrier costs are contained in the terminal (central office) investment rather than in the line haul (outside plant) portion of the investment. The level of these terminal costs, with present technology, makes them uneconomical for employment on the relatively short-haul, small volume toll business characteristic of many intrastate toll routes.

The pattern of the two segments of toll business, together with the nature of the physical facilities used to meet the jurisdictional toll service requirements is the crux of the toll rate disparity problem. The public message toll business originates in thousands of small offices throughout the country. Toll trunk
facilities to these small offices are relatively small in size and relatively uneconomical in terms of call carrying capacity.27 State toll service constitutes roughly two-thirds of all public message traffic and, on a use basis, state toll must bear somewhat less than this proportion of the cost of these facilities. These relatively high cost, short feeder routes also carry the interstate traffic to the metropolitan areas for nationwide distribution. It then becomes economically practicable to concentrate the interstate traffic on high density, relatively low cost transmission facilities—the microwave and coaxial facilities, mentioned earlier. The difference in traffic characteristics of the two segments of the message toll business underscores the physical provision of facilities: state toll is predominantly short-haul station-to-station service with relatively low average revenue per message; interstate toll has a higher proportion of person-to-person messages, longer conversation time, average length of haul of about 400 miles, and an average revenue per message of about $1.76. While all segments of the toll business are characterized by increasing economies of scale, the long-haul portion (principally interstate) has garnered these benefits most extensively.

Bringing the loose threads together, we can say that the short-haul, low revenue state toll business has inherently a high cost structure per message relative to interstate traffic, which is relatively low cost per message with relatively high revenue per message. Thus our rate disparity problem.

Referring back again to Table XVII we see that the category “other switching” makes up 10 percent of interstate property costs, an estimated 15 percent of intrastate toll costs, but less than 2 percent of exchange property. This is due to the nature of the facilities. The major components of this classification include the intertoll and tandem switching offices, automatic message accounting equipment as well as the manual switchboard investment. Except for the dial service assistance work, metropolitan area exchange calls, and message unit business, the primary function of these plant items is related to toll functions.
Investment in land and buildings in the Bell System has grown at about the same rate as overall company operation. However, an increasing proportion of usable space has been employed for plant functions as against administrative function, i.e., revenue accounting, general office, and commercial operations. At the present time it is estimated that about one-fourth of the land and building investment is devoted to administrative functions, three-fourths to plant operating functions.28 The allocation of building costs to the various jurisdictional service "follows" the prior assignment of the primary property and expense apportionment. For example, the allocation of building space charges to local dial switching is done in proportion as these switching costs are assigned to interstate toll, state toll, and exchange change. To the extent that the use criterion in allocating major segments of primary telephone plant is inappropriate, the tax limitation carries through in the allocation of the common investment in land and buildings.

FOOTNOTES TO CHAPTER VI

1) An example of a change in Bell System operating practices beyond the purpose of the published Separations Manual which materially affected jurisdictional revenue requirements was the introduction of direct distant dialing. DDD materially reduced the holding time per toll message, and with the relative apportionment of common use plant to the interstate jurisdiction.

2) Commissioner Hyde of the FCC estimated that separations charges between 1947 and 1964, restated on the basis of 1964 business volume, amounted to $575 million. This was before the Denver Plan effective November 1, 1964. Talk Reported in 66th Annual NARUC Proceedings, p. 429.

3) "Bell System Interstate Service Under Division of Revenue Contract, Summary of Financial and Operating Data," M.R. No. 1, December 1965, FCC Staff Exhibit No. 9, Docket 16258.

4) Intragate revenues of the Bell System calculated for year ending December 31, 1965, by subtracting intrastate revenues from total Bell System operating revenues; Combined Bell System Report 62, M.R. No. 4, December 19 shows total operating revenues as $11,061 million.

5) FCC Statistics of Communications.

6) Bell System Statistical Manual, "Average Daily Calling Rate Per Telephone.


8) Statistics of Communications, 1948 and 1965, FCC.
Some Concluding Observations

9) Ibid.

10) 1948 state toll messages from "Message Toll Rates and Disparities." Table II-5 has interstate traffic. 1965 state toll messages derived from Bell System C.R. 51-No. 1 sheet 2 and Long Lines M.R. No. 1B, December 1965.

11) "Message Toll Telephone Rates and Disparities," NARUC (Wash., D.C., 1951), p. 301. The disparity was apparently calculated by multiplying state message volume by the difference between state and intercity rates.

12) Report of Staff Subcommittee on Separations and Toll Rate Disparity, August 1, 1965, reported in 75th NARUC Proceedings, p. 481.


14) The annual expenses for maintenance, depreciation, taxes, and operating income reported for the year ending December 31, 1965, for the consolidated Bell System were $7,072 million. This is 71 percent of combined Bell System charges of $11,206 million. C.R. 51 No. 1 sheet 1, December 1965, Bell System.

15) Bell System intrastate toll messages were 2.904 million in 1965 as against 1,509 interstate toll messages. C.R. Report No. 1, Sheet 2, plus Cincinnati and Suburban and Southern New England Telephone and Telegraph M.R. Report, and Long Lines, M.R. No. 1B.

16) Investment of the Associated Companies allocated to intrastate services in 1965 was $6,601 million as against our estimated state toll investment of $5,912 million.


18) A comparison of exchange rates in a difficult and risky business. It may be of interest, however, to compare San Diego, Los Angeles and San Francisco metropolitan rates with other large metropolitan areas:

Comparison of Local Service Telephone Rates in 25 Largest Cities of the United States—June 1960

<table>
<thead>
<tr>
<th>City</th>
<th>Residence 1-Party Message</th>
<th>3-Month 1-Party Message</th>
<th>Interstate 1-Party Message</th>
</tr>
</thead>
<tbody>
<tr>
<td>San Diego</td>
<td>$4.45</td>
<td>$4.40 (75)</td>
<td>$13.30</td>
</tr>
<tr>
<td>San Francisco</td>
<td></td>
<td>4.80 (85)</td>
<td></td>
</tr>
<tr>
<td>Los Angeles</td>
<td></td>
<td>4.10</td>
<td>4.55 (85)</td>
</tr>
<tr>
<td>Baltimore</td>
<td>$6.10 (65)</td>
<td>7.79</td>
<td>9.70 (95)</td>
</tr>
<tr>
<td>St. Louis</td>
<td>7.90</td>
<td>8.50 (100)</td>
<td>10.00</td>
</tr>
<tr>
<td>Cleveland</td>
<td>6.90</td>
<td>9.05 (90)</td>
<td></td>
</tr>
<tr>
<td>Buffalo</td>
<td>5.35 (75)</td>
<td>6.75</td>
<td>8.59 (75)</td>
</tr>
<tr>
<td>Philadelphia</td>
<td>4.65 (70)</td>
<td>6.65</td>
<td>7.50 (95)</td>
</tr>
<tr>
<td>Milwaukee</td>
<td>5.35 (75)</td>
<td>6.60</td>
<td>8.50 (75)</td>
</tr>
<tr>
<td>Detroit</td>
<td>4.85 (90)</td>
<td>6.50</td>
<td>7.10 (75)</td>
</tr>
<tr>
<td>Seattle</td>
<td></td>
<td>6.45</td>
<td>8.25 (90)</td>
</tr>
<tr>
<td>Denver</td>
<td></td>
<td>6.35</td>
<td>8.30 (100)</td>
</tr>
<tr>
<td>Pittsburgh</td>
<td>4.40 (65)</td>
<td>6.35</td>
<td>7.00 (90)</td>
</tr>
<tr>
<td>Memphis</td>
<td></td>
<td>6.05</td>
<td>10.00 (75)</td>
</tr>
<tr>
<td>Atlanta</td>
<td></td>
<td>8.00</td>
<td>9.00 (100)</td>
</tr>
<tr>
<td>Washington, D.C.</td>
<td>4.70 (60)</td>
<td>5.05</td>
<td>7.20 (110)</td>
</tr>
<tr>
<td>Houston</td>
<td></td>
<td>5.90</td>
<td>8.50 (100)</td>
</tr>
<tr>
<td>Boston</td>
<td>8.80 (85)</td>
<td>9.90 (90)</td>
<td></td>
</tr>
<tr>
<td>Minneapolis</td>
<td>5.70</td>
<td>26.15 (85)</td>
<td>16.75</td>
</tr>
<tr>
<td>Cincinnati</td>
<td>5.65</td>
<td>7.80 (95)</td>
<td>16.50</td>
</tr>
<tr>
<td>New Orleans</td>
<td>5.60</td>
<td>9.25 (75)</td>
<td>17.50</td>
</tr>
<tr>
<td>City</td>
<td>Rate (75)</td>
<td>Rate (85)</td>
<td></td>
</tr>
<tr>
<td>------------</td>
<td>-----------</td>
<td>-----------</td>
<td></td>
</tr>
<tr>
<td>New York</td>
<td>5.60</td>
<td>9.00</td>
<td></td>
</tr>
<tr>
<td>Chicago</td>
<td>5.60</td>
<td>8.50</td>
<td></td>
</tr>
<tr>
<td>San Antonio</td>
<td>5.50</td>
<td>8.50</td>
<td></td>
</tr>
<tr>
<td>Dallas</td>
<td>5.50</td>
<td>8.50</td>
<td></td>
</tr>
</tbody>
</table>

Note: The monthly message service rates are followed by the number of message units allowed without additional charge. In the different states the message unit allowance may be used both for local calls (one message unit call regardless of duration of call) and for timed multi-message unit calls. The geographic area to which the message unit charge applies varies in the different states.

Source: "Local Service Telephone Rates in the U.S. in effect June 30, 1966," NARUC.

19) "Bell System—State and Miscellaneous Operations," based on Company Reports, Year 1965, Sheet 5, FCC.

20) Wall Street Journal, January 11, 1966, p. 4. Also see "Bell System Rate Index" response to information request transcript, p. 3474, FCC Docket No. 16258 which shows for 1940 = 100, the 1965 intrastate rate index = 148.4.

21) Average weekly earnings of production workers in 1940 were $34.96 and $107.53 in 1965. "Employment and Earnings Statistics for the U.S.," Bulletins 1312-2 and 1370-3, pp. 34, and xx, respectively, B.L.S.


23) The decline and elimination in most jurisdictions of the lower cost exchange classifications, message rate and R-4 classes of service further reduce the price attractiveness of exchange service for low income households. The Bell System has employed its extensive "class-of-service" potentialities inherent in No. 5 crossbar and ECO switching to expand the more profitable "Metroplan," Cenutex and WATS offerings, while contracting the marginal exchange services.

24) Stat. Eq. and Exch. OSP. Under prevailing separations methods, there are two principal factors employed in the apportionment of station equipment and exchange outside plant; minutes of use and relative proportion of users. In 1965 the industry generated 39 billion minutes of intrastate toll use as against 32 billion interstate toll use (Bell Ex. 59, Attachment K, FCC Docket 16258). In an average month 58.5 percent of all users are toll users. (1962 Draft Report of Staff Subcommittee on Telephone Separations, NARUC). This ratio is then weighted by the relative proportion of messages; intrastate messages comprise 65 percent of total toll messages, as against 35 percent interstate toll messages. Considering both apportionment methods, it is clear that a larger proportion of investment in station equipment and exchange OSP is allocable to state than interstate toll. The state toll allocation was derived by the ratio of state toll to interstate toll minutes of use, for a factor of 1.03 applied to the derived interstate apportionment of station equipment and exchange OSP.

Local Dial Switching. The investment in this account is allocated in proportion to relative originating and terminating minutes of use with the toll minutes of use weighted to reflect "the higher switching cost per toll minute of use than the costs per minute of exchange use." Again, the greater minutes of state toll minutes of use than interstate toll minutes of use would justify a greater allocation of local dial switching to interstate toll. The minutes of state toll use relative to interstate toll minutes of use were employed in this apportionment.
Other Switching includes principally the investment in the big 4A X BAR offices, the dial tandems, manual switching and automatic message recording equipment. The toll switching offices, both No. 4 and tandem, as well as AMA equipment are apportioned on the basis of minutes of use, number of connections, or message quantities. The actual interstate toll allocation made by the company was used in estimating the allocation to state toll, despite the greater quantities of state toll business. Manual switching is allocated on the basis of traffic units. The greater proportion of P-F business in interstate will generate a higher per message traffic coefficient than on state business. This is compensated for by the fact that there are roughly twice the number of state toll as interstate toll messages.

Circuit Equipment consists principally of carrier modulation equipment, repeaters, composite sets, testboards, and generally all central office equipment other than switching and message recording equipment. These costs are either directly assigned or averaged in determining the average cost per circuit mile of interexchange facilities. Circuit Equipment assigned to intrastate toll was estimated on the basis of message-minute-miles. To the message-minutes for state and interstate toll (15,081 million state minutes in 6 months 1966 and 15,495 million interstate minutes) was applied the average mileage of 49 for state traffic and 352 for interstate traffic. This produced a ratio of 5,919: 740 = 1,822.9: x where x is the estimated apportionment of state toll circuit equipment.

Toll OSP. By definition, the investment in toll outside plant not assigned to interstate is intrastate toll.

Land and Buildings. This investment was allocated to state toll in proportion to the investment in switching and circuit equipment as assigned to interstate toll. The residual was allocated to exchange.

General Equipment. The estimate for state toll was derived on the basis of state and interstate toll investment in outside plant and station equipment.


26) This conclusion is based, of course, on the "use" criterion. The arithmetic of this conclusion can be seen in the following tabulation:

<table>
<thead>
<tr>
<th></th>
<th>Cost proportion</th>
<th>Interstate Toll</th>
<th>State Toll</th>
<th>Exchange</th>
</tr>
</thead>
<tbody>
<tr>
<td>Customer costs</td>
<td>.3% Dist</td>
<td>13</td>
<td>25</td>
<td>62</td>
</tr>
<tr>
<td>Use costs</td>
<td>.7% Dist</td>
<td>4</td>
<td>4</td>
<td>92</td>
</tr>
</tbody>
</table>

Exchange costs: (.7) (.62) + (.3) (.62) = 88 percent as against 88 percent estimated in 1965 per table XVII.

State Toll costs: (.7) (.04) + (.3) (.25) = 10 percent as against 7 percent estimated in 1965.

Where the percent distribution represents, for customer costs, the proportion of telephone customers who use each service; the use cost is the 1965 industry distribution of minutes of use of each service.

27) This is a point easily overlooked. Trunking efficiency increases very rapidly up to about 30 trunks, thereafter remaining fairly constant. However, hundreds of small community dial offices have complements of three to four toll connecting and switching trunks to a toll center which could never be supported from originating toll revenues at the particular location. Some idea of the difference in call carrying capacity of different sized trunk groups can
be judged from the P. 02 table (probability of encountering a busy-hour delay twice in a hundred attempts.)

<table>
<thead>
<tr>
<th>No. Trunks</th>
<th>Hundred Call Seconds</th>
<th>No. Trunks</th>
<th>Hundred Call-Seconds</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>.7</td>
<td>30</td>
<td>715</td>
</tr>
<tr>
<td>2</td>
<td>7.9</td>
<td>31</td>
<td>744</td>
</tr>
<tr>
<td>3</td>
<td>20.4</td>
<td>32</td>
<td>773</td>
</tr>
<tr>
<td>4</td>
<td>36.7</td>
<td>33</td>
<td>803</td>
</tr>
<tr>
<td>5</td>
<td>55.8</td>
<td>34</td>
<td>832</td>
</tr>
<tr>
<td>6</td>
<td>76.0</td>
<td>35</td>
<td>863</td>
</tr>
</tbody>
</table>

Based on analysis of Bell System Division of Revenue Form 8610, Monthly Settlement Studies, Land and Buildings.
VII

Summary

It may be helpful to the reader to recapitulate the essential findings of separations history and ratemaking covered by the present volume. Telephone separations has been a practical problem arising out of the nature of joint costs in the telephone industry. Separated costs determine jurisdictional revenue requirements and, in effect, rates of the various services, exchange, message toll, and private line. The principles governing separations have been a series of compromises generated within the political framework. Most of the compromise and accommodation have been made by the public regulatory authorities. The federal regulatory authorities have largely played the role of middleman in the operation, furnishing tacit assent to separations changes which interstate business could “afford” to forego in lieu of more drastic steps in the way of negotiated interstate rate reductions. The state regulatory authorities, operating through their national trade association, the NARUC, have been the goading force to separations changes—but one without direct power or authority. The NARUC has sought to reduce the jurisdictional rate and earnings disparities by transfer of revenue requirements to interstate operations by way of separations changes. The real power has been exercised by the Bell System. The American Telephone and Telegraph Company has, for all practical purposes, exercised a firm veto power in separations matters, cultivating the fragmented regulatory authorities to
assure itself that the timing and content of separations changes meet with its corporate interests.

Telephone separations is a process of cost allocations. It is inherently an arbitrary process in that no absolute correctness or incorrectness can be attributed to the premises which underlie its principles. It all depends on where you want to go and what objectives you are trying to achieve. The loss of public control, the singular absence of consideration of the objectives of the separations process by the regulatory authorities may be due, in part, to their organization, their appeal to separate constituencies, as well as other factors. The state bodies are badly atomized, lack adequate staff, and are perceptibly impressed by the attentions of the mammoth telephone organization. The FCC is predominantly a radio-TV commission giving consideration to regulatory responsibilities over common carrier services as sideline to a principle role. The fact remains that development of appropriate cost principles affects the entire telephone using community and regulatory leadership has not been exercised by either state or federal bodies. The nature of the problems calls for centralized review and this will not be forthcoming so long as jurisdictional interests continue to compete. Prevailing institutional arrangements will only assure the domination of policy in this field by the Bell System.

1910-1930

During the years 1910-1930, state regulatory commissions evidenced little interest in telephone separations matters. In a number of jurisdictions, Bell System rate case presentation was based on total company operations, without any effort to determine intrastate operating results. Although the Interstate Commerce Commission was vested with authority to regulate interstate communication service, it evidenced no interest in the separations problem.

The single pervasive issue that arose during this period was the controversy over board-to-board versus station-to-station method of telephone costing. Under the board-to-board principle, toll service costs included only those facilities which extended
from toll switchboard to toll switchboard, excluding any consideration of exchange facilities. The station-to-station theory included the costs of all facilities from the originating telephone station to the terminating telephone station. This controversy was decided by the Supreme Court in 1930 in *Smith v. Illinois Bell Telephone Company*, (282 U.S. 133).

In addition to adoption of the station-to-station basis of telephone separations, the Court emphasized the absence of need for "extreme nicety" in separating telephone property, "only reasonable measures being essential."

Antedating the Smith decision, the Supreme Court views in the 1913 Minnesota Rate Cases (230 U.S. 352) are an equally significant legal precedent to separations principles. There are two major legal constructions which grew out of the Minnesota Rate decision. First, the Court criticized the use of revenues as an inappropriate basis for separation of property, but accepted without criticism the employment of weighted usage as an allocation method. Secondly, the Court stated that state regulation is not restricted when federal authority has not been exercised.

1930-1942

The Supreme Court decision in 1930 that telephone plant should be separated on the station-to-station basis was effectively negated by the practice of the Bell System in most state jurisdictions. Company practice, following the decision, was to credit a portion of exchange revenues to interstate toll services. The station-to-station theory of ratemaking was not accepted fully by the Bell System until 1943 with respect to interstate toll services, and in its intrastate toll not until 1950, when the company amended those tariffs.

The relatively dormant interest of most state regulatory commissions in separations matters up to the forties was activated by the creation of the FCC in 1934. The new federal commission initiated a number of interstate message toll rate reductions. These interstate rate reductions produced unanticipated results. Intrastate toll message rates for calls of the same distance and
duration as interstate calls were provided at higher charges than required by the interstate rate schedules. This problem has been termed the toll rate disparity problem. State regulators saw changes in the methods of telephone separation as a solution to the problem. A shift in property investment and expenses from intrastate to interstate services derived from modification of separations methods was seen as a means of increasing the interstate revenue requirements and rates to alleviate the disparity in jurisdictional toll schedules.

Following the 1941 interstate toll rate reduction, the NARUC and the Bell System urged the FCC to undertake hearings on separations principles. Such hearings were held in 1942 (Docket 6328). The competitive dilemma confronting many state regulators came to the fore in the course of the hearings. The paramount issue in the proceedings was resolution of the board-to-board versus station-to-station principle of telephone cost allocation. The Commission's staff estimated at the time that adoption of the station-to-station rate principle would effect a transfer of $50 million in revenue requirements to the interstate operation and, presumably, could serve as a material basis for alleviating the toll rate disparity problem. Despite the advantages of advocating the station-to-station principle, a number of the state commissions as well as counsel for the NARUC endorsed continuation of the board-to-board theory. The basis for their position was fear of federal regulatory invasion of the state jurisdictional authority. For its part, the Bell System questioned the legal authority of the FCC to adopt the station-to-station theory. The company contended that since the FCC Act precluded federal regulatory authority over exchange rates, it also denied ratemaking on the station basis since this method would include a portion of the exchange investment and expenses as part of interstate message toll costs of service. The FCC never rendered a decision in Docket 6328, and it was closed in 1966 with the separations issues raised in the Telephone Investigation (Docket 16258).

In 1943, following an interstate message rate reduction, the Bell System filed its tariffs on the station-to-station ratemaking
principle. This reversal, following the adamant stand taken the previous year, appears to be evidence of the recognition by the Bell System of the two-fold character of separations methods: the formal character, as prescription for allocating property, revenues, and expenses to the jurisdictions; the political character governing the direction of costs and rates. One effect of the shift in revenue requirements to interstate operations was to reduce the magnitude of intrastate rate reductions. The reduced intrastate revenue requirements, on the other hand, were not utilized by the state commissions, in reduction of either state toll or exchange rates. The bulk of the revenue transfer served to enhance intrastate net operating earnings of the telephone company.

1944-1955

Great pressure was exerted on state regulatory commissions for increases in telephone rates after World War II. This pressure resulted in state commissions turning to separations principles as a way of alleviating intrastate telephone costs. For while exchange and intrastate toll charges were being increased in every state, interstate toll rates were being systematically reduced at the initiative of the FCC. The state commissioners began to look to changes in the methods of allocating joint telephone plant and expenses as a device to relieve pressure on state telephone costs.

In 1947 the NARUC appointed a separations task force to review existing separations principles and recommend any changes thereto considered appropriate. This task force, working jointly with FCC staff members and Bell System representatives reaffirmed the use criterion in apportioning telephone plant to the jurisdictions. The use method allocates joint facilities on the basis of relative occupancy or use of facilities. The NARUC subcommittee also recommended that toll plant, both state and interstate, be treated as a unit on a nationwide basis. In attempting to pursue this latter proposal the subcommittee, as well as its parent committee, urged the American Telephone Company to undertake studies to evaluate the effect of this plan.
The Bell Company declined to furnish the data and, accordingly, consideration of the nationwide toll rate plan was abandoned at this juncture.

In October 1947, the first official NARUC-FCC Manual of Telephone Separations was issued. Although authorship was attributed to the "NARUC-FCC Special Cooperative Committee," the FCC did not officially assent or dissent to the separations principles.

Despite the issuance of the Separations Manual in 1947, a number of state commissions continued to rebel at the claimed inequity of the separated results. One continuing criticism was that the separations principles failed to incorporate any value weighting in the apportionment of exchange plant. The reply by the telephone company was that any value attributed to the separate operations (toll and exchange) would be arbitrary and defeat the use concept.

The position on separations methods taken by the Bell System appears to have been motivated by market considerations. Little or no loss in subscribers follows increases in rates for local telephone service; the company view has been that the market is relatively inelastic. On the other hand, message toll telephone service is quite elastic in response to price reductions; repeatedly, reductions in toll rates have been followed by more than offsetting increases in traffic volume and improvement in earnings. In view of this difference in the structure of demand for the joint services, the telephone company viewed as its best interest the maintenance of cost allocation principles which apportioned the greater costs and revenue requirements on its most inelastic service, local exchange, and correspondingly reduced revenue requirements, and therefore the required level of rates for its services characterized by elastic demand, message toll.

Still seeking solutions to the recurrent state Bell System earnings cases, the NARUC appointed a Toll Rate Disparity Committee in 1949. The Committee issued a substantial report in 1951 with virtually no reference to cost allocation principles. The report did point up several facts: short-haul toll costs gener-
ally exceed toll revenues; while intrastate toll business is largely composed of short-haul business, interstate business is predominately long-haul traffic with earnings sufficient to offset the unprofitable short-haul traffic; the difference in jurisdictional toll rates was attributed to differences in length and composition of traffic, and differences in the cost and composition of facilities to serve this traffic.

Once again threatened in 1950 by the FCC with a reduction in interstate message toll rates, the American Telephone Company proposed a modification to separations methods, which would transfer substantial intrastate investment and expenses to the interstate jurisdiction. This change, termed the Phoenix proposal, for separations of interexchange toll lines plant, would have averaged the investment of relatively low-cost Long Lines facilities and higher cost toll lines of the Associated Companies in assigning jurisdictional investment in interexchange facilities. The combined investment would be apportioned in proportion to the relative state and interstate message-minute-miles. A key to this method was the use of nationwide average Long Lines costs and usage. On this occasion, the Federal Communications Commission objected, contending that the Phoenix Plan involved a crossing of jurisdictional lines in the determination of costs.

Thwarted in its efforts to attain relief of state telephone costs by the federal administrative body, the NARUC sought the aid of Senate Majority Leader McFarland. The Senator advised the FCC to "do something—and at once." The Commission appropriately rescheduled its current investigation of interstate earnings and at the 1951 NARUC convention, Chairman Walker proposed the Charleston Plan. This plan, prepared by the Bell System, effected major changes in interexchange plant separations methods. It transferred about $33 million in revenue requirements to the interstate jurisdiction. Concurrently, the FCC, which had scheduled hearings directed to further interstate rate reductions, cancelled the hearings and allowed a $22 million interstate rate increase to go into effect.

The Charleston Plan introduced major simplification to the separations procedure by reducing the number of exchange
plant categories from 16 to 3. Major plant items heretofore
directly assigned (local trunks, toll connecting trunks, etc.) were
now pooled and apportioned on the basis of minutes of use.
The telephone company, which had labeled any weighting of
toll minutes of use for value consideration as arbitrary, now
proposed this step directly in assignment of exchange circuit
plant. An extensive rationale was developed by the company
to justify the change in procedures.

If the Charleston method did furnish some relief to state
earnings, it did not hold up the pace of intrastate rate increase
applications. Accordingly, the NARUC reopened consideration
of separations changes for interexchange toll lines plant in
1952. In addition to the original Phoenix Plan tabled by the FCC
in 1950, the state regulatory staff suggested the MMM Plan and
the Circuit Mile Plan. These alternative procedures were de-
signed to give the states the benefit of Long Lines low cost
facilities to be averaged with the intrastate relatively high cost
toll plant. Both plans were rejected by the Bell System and
therefore not pursued at this stage.

Recalling the opposition of the FCC in 1950 to the original
Phoenix Plan, the state regulatory association developed a var-
ant of the Phoenix Plan for allocating costs of interexchange
plant, that was termed the "Modified Phoenix Plan." Under this
proposal the interexchange plant investment of the Associated
Bell Company within a state would be averaged with the
Long Lines interexchange plant investment that terminated
in that state for apportionment on the basis of message-minute-
miles. By the end of 1954, the NARUC, through resolution at
its convention of that year, approved the Modified Phoenix
Plan. However, the Bell System refused to put the plan into
effect. Adoption of the plan by the telephone company was
made contingent on the FCC authorizing a further increase in
intrastate toll charges. In view of the growing rate of interstate
earnings shown by the company's published reports, the FCC
was reluctant to meet the carrier conditions. Changes to the
methods of allocating cost of interexchange plant was stale-
mated through the end of 1955.
1956-1965

Early in 1956 the Modified Phoenix Plan for separation of interexchange toll lines plant was put into effect. The American Company withdrew its reservations to use of the plan after the FCC furnished a letter promising to watch the impact of the plan on interstate earnings. Despite some $40 million reduction in intrastate revenue requirements, no state reduced its toll or exchange rates.

Notwithstanding the increase in revenue requirements offered by the introduction of Modified Phoenix, interstate earnings continued to rise. In July, 1959, the FCC ordered a $50 million reduction in interstate charges. The NARUC, following this rate reduction and sensitive to the public comparison between its member efforts and the favorable publicity attendant on the interstate reduction of the FCC, sent Chairman Doerfer a letter threatening another "McFarland letter" if additional separations changes were not forthcoming.

The Communications Problems staff of the NARUC again reviewed its study of the Phoenix Plan, the Message-Mile-Minute Plan, and the Circuit-Mile Plan for separating the interexchange component. At this point the federal commission was not the obstacle to additional separations changes. All of these suggestions foundered on the continued objection of the Bell System.

In 1961, the NARUC technical staff resumed study of various additional separations proposals with the intention of alleviating intrastate revenue requirements. Bell refused to furnish data on the proposed Statewide Apportionment Plan (SWAP) for separating interexchange facilities. Accordingly, this approach could go no further.

Not finding separations proposals of the regulators satisfactory, but convinced this was a more fruitful avenue than interstate rate cuts, the American Telephone Company came through with proposals of their own. These effected a transfer of costs from the state operations to the interstate (federal) operation of $46 million. Both regulatory groups concurred with the telephone company's suggestions, so they were made effective in 1962. To counter past criticism of their failure to flow the benefits of re-
ductions in intrastate revenue requirements arising from separations changes to the users, a number of NARUC regulators lobbied vigorously to get state rate reductions. The reductions that did take place were centered in the after 9 message toll schedules. This type of rate reduction would apparently have been undertaken by the Bell System regardless of separations changes and did not necessarily result in revenue reductions.

The 1962 separations changes did not reduce interstate earnings. Accordingly, the FCC negotiated an interstate rate reduction in 1963. The reduced interstate after 9 rates applicable to station-to-station business was offset by an increase in person-to-person rates. The growth in interstate message volume in 1963 more than offset the unit reduction in station-to-station toll rates. Interstate rate of earnings continued to rise.

Concerned over the mounting toll rate disparity, the NARUC Communications Problems Committee developed in 1964 five proposed separations amendments. The proposals of the regulators were rejected by Bell representatives who proposed instead a change in the method of separating revenue accounting expense. This change was adopted by the regulators, but effected only an $384,600 transfer in revenue requirements to interstate, which was insufficient to dampen the rise in intrastate rate of return.

In November, 1964, the FCC approved after 8 interstate message toll rates in addition to other message toll rate changes involving a reduction of $100 million in the interstate message schedule. Again we see that rate reductions do not necessarily indicate a corresponding revenue loss. Demand elasticity continued to offset reduced unit price. Interstate earnings continued to mount. The company deemed it appropriate to reexamine separations principles.

In 1965 the American Company proposed its Denver Plan of separations, which drastically modified previous separations principles. Adoption of the Denver Plan effected a transfer of $98 million in revenue requirements from intrastate to interstate jurisdiction. Among the changes introduced with Denver was a reversal of the simplified method of separating exchange plant categories; under the Denver Plan local trunks and toll connect-
ing trunks were assigned directly to the various operations (ex-
change and toll). Since Charleston (1951), these facilities had
been allocated on the basis of minutes of use as part of a total
Category A, exchange plant. Denver also changed the method
of apportioning local switching investment by providing a weight-
ing factor to the toll minutes of holding time. The most significant
change of principle was the introduction of an "availability factor"
in allocating subscriber line and station equipment investment.

The immediate effect of Denver was to stay a further inter-
state rate reduction. About three-fourths of the transfer of
revenue requirements was absorbed by the intrastate earnings
of the local Bell Companies, since most of the state commissions
took no action after the intrastate revenue requirement had been
reduced.

**Conclusion**

A different set of telephone cost allocation principles would
have shifted the revenue requirement burden from local exchange
to the toll services. This alternative approach, it may well be
argued, would have required higher message toll rates and in-
hibited the growth of the toll services. This view is antithetical
to those expressed in the present volume. The aggregate level
of toll costs do not—should not—determine the level and struc-
ture of toll rates. The critical variable is demand. Low levels
of toll rates will continue to stimulate traffic volume to meet any
reasonable level of toll costs. The vast economies of scale possi-
ble in the provision of interexchange facilities seems to be
almost unlimited, at this juncture in time. The occasion may well
be opportune to effect significant reduction in exchange revenue
requirements, with no increases and, possibly, continued reduc-
tion in the level of message toll rates. Such a program requires
sharper vision on the part of the industry, and more regulatory
aggressiveness than the Commissions have yet disclosed. The
technical possibilities are there for social application.

The decision by the FCC in 1960 in the so-called "above 890
MC" case to open the frequency spectrum to all comers inten-
sified the competitive aspects of toll business to the Bell System
and hardened its position on cost definitions with respect to interexchange plant. The potential impact of the Communications Satellite Corporation in providing long distance communications facilities within domestic United States intensified this view still further. On the other hand, some eight million low income households (with family income under $5,000) remain without local telephone service; in this segment of the economy, price is apparently a principal deterrent to exchange service development. The immediate question for public policy makers is what objectives they should pursue in the development of separations principles. It is clear that the prevailing use principles in allocating station equipment and local distribution plant (making up half the Associated Company investment) have neither technical nor economic basis. These investments are a function of the number of customers and virtually independent of use.

If historically telephone separations principles have penalized exchange ratepayers, the problem of toll rate disparity has apparently compounded the abuse. Due to the nature of the traffic generated and the difference in physical facilities employed to meet this variation in traffic composition, state toll rates are generally higher than interstate message toll rates.

To minimize these toll rate differences, state regulators have, under the statewide method of telephone ratemaking, permitted application of the "value of service" criterion in distributing state telephone revenue requirements, rather than requiring separated toll and exchange costs. While a reversal of state ratemaking policy is not imminent, it is overdue. The divided, competitive method followed by state regulatory commissions to alleviate the toll rate disparity is no solution and has created a more significant problem than the one it sought to solve. The consolidation of state and interstate toll costs and the development of a unified rate schedule is in accord with the basically integrated character of all toll services.
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