

Synopsis of

THE IMPACT OF MEASURED TELEPHONE RATES  
ON TELEPHONE USAGE OF GOVERNMENT  
AND NONPROFIT ORGANIZATIONS

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## PART 1

### INTRODUCTION

Traditionally, the pricing of telephone service has been formulated primarily on the basis of "value of service." That is, customers were divided into classes, and the rate charged was a function both of the average cost of supplying service to that class and the "value of service" to that class (demand elasticity). The result was a substantial degree of price discrimination that may or may not have reflected the actual cost incurred by a ratepayer's usage.

In recent years, however, there has been a trend toward pricing these services to reflect more accurately the costs per individual within a class, rather than the average of all members of a class. Full-scale use of such a technique in the telephone industry would require that price be related to the number of calls, length of calls, time of day, day of week, and distance. As a first approximation of this goal, rates based on the number of calls made are being implemented in many areas. The generic term used to describe this method of pricing is "usage-sensitive pricing" or, as in Ohio, "measured service rates." The general measured service rate structure requires the individual to pay for local telephone service based on actual usage (i.e., number of calls made) rather than on a flat rate

related to average usage. A typical telephone company tariff for measured service includes a flat monthly fee and a charge per call for all calls after an initial call allowance; for example, measured rate business service in the Cleveland exchange is \$16.45 per month plus 9¢ for each call in excess of the initial allowance of 80 calls per month<sup>1</sup>

Use of measured service rate structures gives the ratepayer greater control over his total bill. In addition, such rates should move the rate structure closer to the marginal cost pricing standard long favored by economists for its economic efficiency. However, since telephone bills for some would rise (while for others they would drop) under an accurately calculated measured rate service standard, it has been alleged that such a rate structure may force changes in the operations of public or social service (and other) institutions.<sup>2</sup> The primary objective of this study was to determine whether the use of measured rates as opposed to flat rates does, in fact, significantly affect the delivery of social services to a community.

The major analytical method used in the study was a survey of users. In addition, the study developed case studies and collected traffic data that was used to further analyze the effects of measured rate service. The study was conducted in three major Ohio cities: Cleveland, Cincinnati, and Columbus. Cleveland has used a measured

<sup>1</sup>See PUCO no. 3, Exchange Rate Tariff, Sec. 2, 2d Rev. sheet no. 9, August 13, 1976.

<sup>2</sup>For the purpose of this study, social service type organizations were divided into the following strata: local government agencies, state government agencies, hospitals, schools, universities, charities, and libraries.

rate structure since 1919. Cincinnati uses a flat rate structure, and Columbus recently switched to a measured rate structure. (The Cleveland and Columbus areas are served by the Ohio Bell Telephone Company, and Cincinnati by the Cincinnati Bell Telephone Company.)



## PART 2

### THE COLUMBUS PILOT STUDY- A LOOK AT THE RECENT RATE STRUCTURE CHANGE

The Columbus pilot study was undertaken for the purpose of testing the questionnaire and the survey techniques to be used in the Cleveland-Cincinnati study. It provided information that led to refinements in the approach of the later study. It also generated information yielding general insights into telephone usage by the public/social service type agencies in Columbus.

The results of the pilot study suggest that there has been no adverse impact due to the change to measured rates. Organizations sampled in Columbus are now evaluating telephone service as a resource with a cost. This has led to more efficient use of the telephone service and improved intra-organizational allocation of telephone costs.

Eighty-two percent of those responding reported no effect on their ability to serve the public. Twenty-seven of the organizations that responded reported no change in the method of operations of their agencies. However, there were 48 responses (representing less than 48 organizations) which indicated some change in the method of operations; and 16.66% of those responding felt their ability to serve the public was affected by the change to measured rates.

The fact that the method of operation has changed for a particular agency does not, itself, necessarily imply a negative impact from measured rates. Each change needs to be examined to determine whether it does, in fact, negatively affect the service provided by the organization.

A frequently mentioned change was that personal calls are now limited, not permitted, or charged for. While this may be an inconvenience to the employee, the opportunity to make personal calls should not be considered relevant to the public services provided by the organizations. In fact, some might contend that a reduction in personal calls could improve the delivery of services. In addition, charging for personal calls is simply a matter of attaching costs to benefits, i.e., those who receive the benefits pay the costs associated with them. If the ability to make personal calls is deemed necessary to the morale and effectiveness of the employee, then the employer may make the decision to provide this benefit in the same way that decisions are made about other fringe benefits.

Many organizations reported a reduction in their use of the telephone. Again, this change, in itself, does not necessarily imply an adverse impact on the organizations. It is clear that many groups are now more conscious of the telephone and the manner in which it is used. This can only be regarded as a positive result. To the extent that unnecessary calls are eliminated, the organization has moved to a better utilization of its resources.

The libraries felt that their effectiveness has been reduced because they are making fewer calls to and for patrons (calls about overdue material, calls to branch libraries, etc.). It may be correct to say that they have reduced the convenience previously offered their patrons, but it is difficult to conclude that their ability to serve the public has diminished. It may be more correct to interpret this as a more efficient allocation of the cost of the service; i.e., the patron now pays for the calls relating to his own service.

A few charities reported that they have reduced their use of volunteers, and one charity reduced the use of the office phone to organize residential fund drives. Without more detailed information, this response is difficult to evaluate in terms of its impact on the services provided by the charity. The major question here (unanswered by the survey results) is what is being substituted. For example, are the fund drive calls being made from the homes of the employees? Was the work of volunteers who are no longer used in the office vital to the delivery of service, and if so, is this work being done by someone else or not being done? Also, before a judgment is made regarding the significance of this response, one would want to know whether the charity, in making one of the changes mentioned above, has done an accurate analysis of the changes in costs versus the changes in benefits.

A few organizations reported that they were less likely to install new lines or to move equipment. Again, this response represents an increased awareness of the value of resources used--a positive result. Presumably, the new lines, etc., were not viewed as

vital, and thus there is more efficiency in the use of funds. The decision to install (or not to install) new telephone equipment should not be viewed any differently from the decision to purchase new office equipment, etc. These decisions should be made on a cost/benefit basis, and obviously, equipment vital to the performance of the agency will have very high benefits.

Several organizations reported an increased use of mail (public carrier) and/or interoffice mail. This is a somewhat interesting response, since it is not at all certain that these alternatives cost less than a 9¢ telephone call. Full accounting of the paper, typist's time, depreciation on the typewriter, etc., plus postage cost for public carrier mail might reveal that the telephone call can be less costly in some cases. Eighteen organizations reported that their costs had risen as a result of the change to measured rates. Whether increased telephone costs have a significant negative impact depends on many factors. Any cost can increase, and during these times of high inflation rates, many certainly will. The impact of a given cost increase depends primarily on two factors. Is the revenue rising sufficiently to meet the increased cost? What percentage of the budget does the increase in costs represent?

Those groups funded all or in part through an income tax (e.g., state government, local government, state universities, or agencies funded by the federal government) have some elasticity in their revenue base, i.e., their revenues are more likely to rise as costs rise (especially if it is a progressive income tax). The schools (dependent primarily on property taxes) and the libraries (dependent

primarily on intangible personal property taxes) have less elasticity; and those charities that are dependent on contributions have a somewhat unpredictable revenue growth pattern (though many of the charities surveyed are funded by a variety of sources). To the extent that revenue growth matches the growth in costs, a cost increase cannot necessarily be considered detrimental.

In addition to examining the cost increase relative to revenue growth, consideration should be given to the magnitude of the cost increase. It should be remembered that the nature of numbers is such that a relatively large percentage of change may represent a rather small absolute number. For example, one library (not included in the survey sample) reported monthly average costs before measured rates as \$26.10 and monthly average costs after measured service as \$45.75, a 75.29%<sup>3</sup> increase. The percentage increase is quite large; the dollar amount is \$19.65. If the cost increase represents a rather small percentage of the organization's total budget, there is a very real possibility that the higher cost can be met by increased efficiency in some phase of the group's operation.

Higher costs will have a negative impact only in those cases where the increased cost cannot be met by (1) higher revenue, (2) greater efficiency, or (3) passing the cost on to the client, patron, or customer.

In summary, the change to measured rate service does not appear to have had any significant impact on most of the agencies surveyed. The use of measured rates has led in many cases to a greater awareness

<sup>3</sup>"Contents 25", Public Library of Columbus & Franklin County, Staff Newsletter, April-May 1979.

of telephone usage, more efficient telephone usage, and an improved allocation of the costs of telephone usage. It has also increased costs for some organizations.

### PART 3

#### THE MAIN STUDY-A COMPARISON OF TELEPHONE USE AND USAGE BETWEEN CINCINNATI AND CLEVELAND

The main thrust of this study was to examine the use of the telephone in Cincinnati and Cleveland to determine (1) the degree to which the subject organizations were comparable, (2) the manner in which each organization made use of the telephone service to accomplish the goal of the organization, and (3) the total use of the telephone in each city. The underlying objective was to determine if each city used the telephone service in a similar manner to accomplish the goals of the organization and to determine if the total use of the telephone service differed between the cities. If the pattern of use was similar and total use different one could draw conclusions about the effects of rate structure. If the pattern of use was different and total use similar, we would conclude that other factors such as management discretion had more effect in the long run than rate structure. We concluded that the pattern of use was similar but total use was different suggesting that measured rate service could reduce total use in Cincinnati. This also suggests, that over the long run, the quality of service provided by social service type organizations would not decline due to rate structure.

The organizations in Cincinnati and Cleveland are comparable. The data indicates that the organizational characteristics were similar; both the survey and case studies suggest that the strata taken as a whole are similar; however, there are varying degrees of similarity and dissimilarity among strata. The demographic data also suggest that the areas are comparable although as expected there are size differences.

The next question that needs to be addressed is whether use is similar. In both cities, the majority of organizations responded that where either the telephone or another mode of communication is equally appropriate, the telephone was used. In addition, the major reasons for using the telephone were similar for both cities. The telephone service was also found to be necessary to accomplish the main function of most organizations in both cities.

One of the most significant questions asked of users in the survey related to the quality of service provided. Users were asked: "If the telephone could not be used, would there be significant delays in the service or benefits provided by your organization?" The answers in both cities were similar; the majority stated that there would be significant delays. Only the state government organizations in both cities stated that there would be only minor delays.

Clearly, most organizations cannot effectively serve the public without telephone service. However, with respect to rate structure and its effect on the organization, a key variable to determine is whether the organization's contact with the public is mostly in terms of outgoing telephone calls, since incoming telephone calls are not

charged against the organization. Over 50% of the organization's calls in both cities, Cincinnati and Cleveland, are incoming telephone calls and not billed to the organization.

We also sought to determine the degree of importance of the telephone service and the quality of service provided by an organization by determining whether a price increase would result in a decline in the quality of service provided by an organization. The results for this question are mixed. In Cleveland, 67% said no; and 33% said yes, quality of service would decline if the price of a call increased. In Cincinnati, 56% said no and 44% said yes.

The data indicate that in the flat rate area, Cincinnati, the organizations feel that any increase in the price of telephone calls would result in some decline in the quality of service for about one-half the organizations. Whereas, in the measured rate area that already pays a price per call, only one-third of the organizations believe that quality of service would decline. Also, we note that two-thirds of the universities and 90% of the libraries in the Cincinnati area said yes, quality of service could decline if the price of a call increased.

About half the organizations interviewed in both cities stated that their organization provided the community with services that required extensive use of the telephone. The service provided by these organizations that require extensive use of the telephone range from very general service to specific programs. We also asked whether any of the services requiring extensive use of the telephone were unique to the organization. The types of programs or service provided

range over a wide variety of areas, from the very general type service to the specific.

The study also analyzed the effect of measured service and the impact of switching rate structures. Seven questions were designed to give insight into the impact of measured rates. Since Cleveland has been on measured rate service for years, and Cincinnati is on a flat rate standard, the description of responses to these questions is confined to organizations in Cleveland.

The organizations were asked if, and in what way, they had been affected by measured rate service. Of the 187 organizations that responded, 123 (66.77%) said no. There were 66 responses (64 organizations) describing the way in which measured rates had affected the organization. Thirty-three (22.22% of responses) indicated that either costs are rising, or costs are now a concern. Two reported that costs have decreased. Eleven responses (10 of which were for schools, libraries, and charities) indicated that service has decreased either as a result of curtailing services or because of the need to divert funds from the organization's primary purpose to use for operating costs. Seven responses indicated a change in policy. These changes involved limiting the use of the telephone by students, teachers, employees, and patrons; and directing student and personal calls to a pay phone.

The organizations were also asked if a change from measured rates to flat rates would affect the way the organization served the public. Only 36, or 19.57%, responded yes. When asked to describe the effect, 15 responded that they would be less cautious in using the phone.

Only 4 reported service to the public would increase with a flat rate standard, and 5 reported that policy would change. These potential policy changes took the form of limiting or monitoring calls if costs increased, and one response viewed the prospect of a change to flat rates as being more of a burden.

Another question related to whether the organizations felt that measured rates gave them more, less, or about the same control over their telephone bill. Nearly two-thirds of those responding (113, or 63.48%) felt the degree of control was about the same as it would be with flat rates. Only 18 (10.11%) felt they had less control while 47 (26.40%) said they had greater control. Those who felt they had either more or less control were asked to explain why they felt this way. More than one response could be given, and a total of 70 responses were recorded. The most frequent response (33) related to the fact that under measured rates, the number of calls is known, i.e., more complete records, the ability to restrict the number of calls, and the ability to curtail unnecessary calls.

There appears to be little evidence that measured rate service has had any significant negative impact on public/social service type organizations in Cleveland. This may be because there was, in fact, no significant negative impact, or because over the years, the organizations have adjusted their behavior to the measured rates and therefore no longer notice an impact. While about two-thirds (123) reported no impact from measured rates, 64 had felt an impact from measured rates. Thirty-three of these responses related to rising costs, and 11 reflected a curtailment of services. However, these

responses conflict somewhat with those results obtained when the organizations were asked how they would react to flat rates. Only 36 reported that flat rates would affect their organizations, and 15 responded that the phone would be used with less caution. The one impact of measured rates that is seen throughout this series of questions is that the organizations are increasingly aware of the need to treat the telephone as a resource which should not be used unwisely. Now we turn to the effects of a rate structure change in Cincinnati.

In order to get a better idea of the impact of switching to measured service rates from flat rates, the organizations in Cincinnati were asked a series of hypothetical questions. These questions sought responses from Cincinnati organizations that tested reactions to various prices for measured service in relation to flat rate. For example, we asked, "Assume that the current flat rate was replaced by a measured rate where your bill remained the same if your phones were used about the same as they are now. Would this change your method of operation?" Sixty-two percent of the organizations said no, and 38% said their operations would change. If an organization said yes, we then asked the organization to tell us how its operation would change. The most common answer was that outgoing calls would be reduced. This answer indicates that they would see an opportunity to reduce their total bill by cutting usage. Presumably, there would be no need to reduce calls needed to maintain the quality of their services since the bill would not increase on measured rates. Alternatively, the response could indicate that rather than the total

bill being the controlling factor, the change from a flat rate structure to a measured rate structure in itself induced a change in behavior. Another response by organizations was that the change in rate structure would initiate organizational policies with respect to telephone use. This is a clear indication that a rate structure change could elevate the consideration given to the telephone as a resource.

In addition, we sought responses from organizations switching from flat rates to measured rates where their telephone bill went up or down. We asked, "Assume that the current flat rate was replaced by a measured rate where your bill increased 20% if your usage remained the same. Would this change your method of operation?" The majority of organizations (65 percent) stated they would change their operation; 35 percent said no.

Again, we questioned those organizations that said "yes" to determine how their method of operation would change. The majority once more stated that outgoing telephone calls would be reduced, and/or services would be cut. However, people also felt that because of the price increase a switch to other modes of communication would be considered. Again, we can conclude from the responses to this question that organizations would be giving more consideration to the telephone as a resource.

We then asked the organizations in Cincinnati what changes would result from a 20% decrease in their telephone bill. The majority response was that no changes would be made. Ninety percent said "no" and 10% said "yes." The "yes" respondents were again asked what changes would be made, and the primary response was the outgoing calls

would be increased. Specifically, organizations stated that the increase in outgoing calls would be in the form of outgoing toll calls. In other words, a decrease in the price of local telephone service could induce increased usage of long distance service. One can view this as allocating the total telephone budget differently from period to period.

One possible conclusion that could be drawn from the above responses is that organizations in Cincinnati are sensitive to a change to measured service. However, an alternative conclusion is that they could be more sensitive to price increases. It is also fairly clear that if one instituted a change from flat rate to measured service, almost no operational changes would result if the rate design decreased the average telephone bill.

The operational changes indicate that the organizations interviewed would give more consideration to telephone service as a valuable resource. It could also mean that it is possible, through a change from flat rates to measured rates, to increase efficiency of local telephone systems, not only through technology, but also through increased awareness and responsiveness of users.

The study also involved extensive interviews with three pairs of similar organizations in each city. These case studies sought information about the purposes for making local telephone calls and the organizations' standards or measures of quality. The organizations selected for the case studies were also included in the telephone interview studies that sought the same type of information. However, while the telephone survey interviewed individuals in

separate, organizationally subordinate units (such as branches of a library), the case study method used a nominal group technique, which is an interview method where the respondents work as a group to answer the interview questions.

The results of the case studies indicate that similar organizations had similar activities. There were some differences in activities. For example, in one of the case studies the activity lists for the two cities were remarkably similar with one striking difference. Both organizations had an extensive program whereby users of their services could call in to obtain information. In Cincinnati, it was often the case that such an incoming call would generate an outgoing call in order to relay an answer back. In Cleveland, this was not the case, as the administration had established specific guidelines about how long it should take to give an immediate answer to a question before other arrangements had to be made. Both programs in these two cities are heavily used so apparently the local populace receives satisfaction from them.

It would appear from the accumulation of the results of each case study, that other than in minor details discovered, there is relatively little difference in what these organizations do and how they do it with respect to telephone usage. The differences that do exist are inconsequential, in most cases, in their effect upon the overall quality of the services being provided. This study has turned up no data to the contrary.

As mentioned above, we selected several "like" organizations in Cincinnati and Cleveland; in each organization we used the nominal

group technique. In addition, we interviewed an upper level administrator asking many of the same questions used in our telephone survey. The most significant result from the interviews related to the "thought process." In every organization under flat rates, the administrator stated that he would reevaluate programs that used the telephone for local calls if the rate structure changed to measured rates. The reevaluation would consider using bulk mail or other means instead of local telephone calls. However, in most cases, many felt that programs would not change. The key variable for our purposes is cost. Organizations switching from flat to measured service would view local telephone service as a resource with a cost.

Another significant finding (which again relates to cost) with respect to quality of service relates to response time. Most of the organizations under flat rates believed that the only reduction in quality of service provided by the organization would be in delays. These delays would be due to using alternative means of communication. However, the key element in the quality of service effect is still the reevaluation programs. Programs that require a quick response time probably would still require the use of the telephone. In the measured rate area, the lack of quick response time due to measured service was not evident. In addition, most organizations did not feel that going from a measured service rate structure to a flat rate structure would affect the quality of service. Further, these organizations would not immediately add services due to a change in structure. Probably the most significant finding when we analyze all responses by organization is that the rate structure of local

telephone service is not a major consideration, although switching to a measured rate structure does upgrade the consideration given telephone services as a resource.

Since very few individuals in organizations would have reliable traffic data on hand, especially in Cincinnati where calls are not counted, we sought both organizational and aggregate central office traffic data from the telephone companies. The results indicate that there is a difference in usage.

The first request was for aggregate traffic data routinely collected by the two companies for their own engineering studies. These data consist of aggregate traffic figures for each central office expressed in hundred call seconds (CCS). These figures are busy hour, busy season measurements. Accompanying these data was a request for the number of customers, by class, associated with each central office. The results of the analysis of these data suggest that, in general, average CCS per line are higher in Cincinnati than Cleveland.

The second request was for counts on the number of local calls placed by randomly selected organizations. This request was a simple matter for Ohio Bell in the Cleveland area since it routinely collects such data for billing purposes. Cincinnati Bell had to write and implement special computer programs and restricted our random sample to ESS offices. The results of the analysis of this data indicate that on the average more calls per line per month are placed in Cincinnati than Cleveland.

The main conclusion one can draw from the traffic data is that an analysis of traffic data has potential as a direct and quantifiable means of assessing the impact of telephone rates, but a good deal more research is required in order to develop the methodology into a reliable tool. One could draw the conclusion that usage is higher in Cincinnati than Cleveland, although we should keep in mind that (1) the Cincinnati organizational usage data in most cases represented a 5% sample whereas Cleveland was 100%; (2) the CCS data indicate that business main lines in Cleveland have higher usage than Cincinnati, but overall CCS per line in Cincinnati is 3.47, whereas in Cleveland it is 3.39.

## PART 4

### THE CONCLUSIONS OBTAINED FROM THE STUDY

The study was undertaken for the purpose of estimating the impact of measured rate telephone service on the public/social service type agencies. The project methodology consisted primarily of survey and interview techniques with some statistical testing of the results. It should be emphasized that the validity of the study results is highly dependent on the accuracy of organizational responses. The project team has attempted to eliminate all sources of bias that could be controlled. The sample size and identity were selected by proven methods. The questionnaires were carefully constructed, studied, tested, and refined. The interviews were undertaken by a professional organization with expertise in interview techniques.

The Columbus pilot study indicates that those organizations that can, do make some adjustments when measured rates are first implemented. In the long run, there appears to be very little difference in the way in which the telephone is used to aid the provision of social services. This long run conclusion is also shown by the lack of persuasive evidence that there are substantial differences between the use of the telephone in procedures and programs in Cincinnati

and Cleveland. The study suggests that total usage may be reduced in the long run due to measured service. This is indicated by the fact that Cincinnati, the flat rate area, has higher usage than Cleveland, the measured rate area.

There are some differences between the two cities. For example, there seems to be a difference in organizational style; some Cleveland institutions opt for very strong central administrations and central control while Cincinnati tends to let subordinate units be more autonomous. We do not consider this difference in degree of centralization to be only a response to measured telephone rates. However, the case studies revealed that the Cleveland organizations do take advantage of this central control in a way that probably has the effect of limiting the number of outgoing telephone calls (i.e., many programs are run centrally). Another difference is seen in the libraries in the two cities. In Cleveland, policies have been established to minimize the need to call patrons. Not so in Cincinnati; in fact, libraries are currently experimenting with a program of making telephone calls to retrieve overdue books. Cleveland probably would not consider such a program because of the cost of telephoning as well as employee time involved when a call produces a busy, not home, wrong person, wrong number, etc. There was no evidence that any of these specific differences would cause a difference in the quality of the services being provided.

Quality of service was understood to include effectiveness in remedying problems and efficiency, i.e., achieving objectives in a

reasonable time period and at a reasonable cost. Quality can also include the satisfaction of the client population being served by the agency and the ability to achieve any possible improvements in fulfilling the agency's objectives. Thus, measured rates would be considered to have a negative impact if the fact of their use significantly reduced effectiveness, efficiency, client satisfaction and/or the ability to improve service. Since this project involved interviews with the organizations only, there is no way to evaluate and compare client satisfaction between like agencies in the two cities. One might infer, from the absence of comments about client dissatisfactions, that telephone rate structures have not had substantial impact on the degree of client satisfaction. However, a more certain conclusion could only be reached by surveys of the client populations.

Similarly, with respect to the ability to improve service, the project methodology was such that only limited information could be obtained. However, one persistent response from the surveys does relate to this aspect of quality. That is, the use of measured rates does make the organizations more conscious of the value of the telephone as a resource. This, in turn, tends to lead to increased evaluation of telephone usage.

Comparisons between responses in the two cities yielded information with respect to effectiveness and efficiency. One way to infer the impact from measured rates on the effectiveness of the organizations is to estimate whether there is a substantial difference in the services offered by like organizations in one city as opposed to those

offered in the other. If such a difference does exist, then the possibility arises that the difference is due to the type of telephone rate structure in existence. However, in fairness, it should be mentioned that many other factors--tradition, differing needs, differing funding bases, etc.--could also be responsible for differences in services offered.

The case studies showed that there was remarkable similarity between cities in the listings of activities for all three types of organizations. The one striking difference was the result of a set of guidelines established by the management of that particular Cleveland agency and had the effect of merely altering the method of delivery of the service, rather than affecting the extent of service. Further, survey responses to identify two significant responses for placing local outgoing calls were quite similar. Confidence interval testing of these responses shows no significant difference in responses between cities for the all strata aggregate.

The project also collected information relative to the effect of telephone usage on efficiency. It would seem that the greatest potential impact on efficiency would relate to the possibility that higher telephone costs might lead to the use of alternate modes of communication and that this, in turn, would create delays in providing the service.

The case studies reported that those activities that are the most important are also those that require the highest frequency of telephone usage. However, the case studies also indicate that there was no significant correlation between the importance of an activity and

the effect of a call reduction program for four of the six cases. In those two cases where there was significant correlation, the correlation was negative, suggesting that the most important activities are not the ones that would be affected by a call reduction program.

The surveys included several questions relating to other modes of communication and the importance of the telephone. Confidence interval tests of responses to the question, "What other modes of communication does your organization use?" show either no significant differences or only marginal differences for all strata and types of communication except one. The one response that had a significant difference between cities was the libraries' use of media, and a substantially higher percentage of Cleveland libraries reported this as an alternative mode of communication than did Cincinnati libraries.

Responses to the question, "In those situations where either the telephone or another mode is equally appropriate, which is used most often?", were remarkably similar and showed only one significant difference between cities for any strata. Again, the one difference occurred in the library strata, where the Cincinnati libraries had a significantly higher percentage response to the use of mail.

The potential effect of measured rates on efficiency and more specifically the possibility of delays in service through the use of alternate modes of communication are probably best summarized in the results of interviews with upper level administrators. The use of measured rates (in Cincinnati) would create the possibility of increased use of alternative modes of communication. However, important activities requiring quick response time would continue

to use the telephone, and other activities would be reevaluated before any changes were made. As stated earlier, this increased tendency to view the telephone as a resource with an accompanying cost and to evaluate and reevaluate its costs vs. benefits can only be viewed as a positive effect.

Throughout the surveys and interviews, there were three persistent themes. One is that there are few significant differences between cities with respect to responses to all the questions.

A second persistent theme is that the telephone is very important to these organizations with respect to the provision of their services. More than 85% of organizations in both cities responded that outgoing calls are necessary to accomplish the main function of the organization. There was no significant difference in responses between cities for any strata except the schools. In the school strata, a significantly higher number of Cleveland schools reported outgoing calls are necessary than did Cincinnati schools.

The third persistent theme is that costs are a vital concern, and that the use of measured rates creates an increased awareness of the telephone as a resource with a cost attached. Slightly more than half of the organizations in each city responded that the quality of service provided would not decline if the price of a telephone call increased. However, a substantial number did respond that quality would decline. Of those responding that quality would decline, there was a significant difference between cities for only two strata--the universities and the libraries. In both strata the Cincinnati percentage response was significantly higher. Given the similarity of

responses between cities for most strata, it could be inferred that the response is more related to the fact of increased cost rather than to the type of rate structure. The restratifications give somewhat more information as to the identity of those who felt quality would decline if price increased. The restratifications show that the organizations that feel quality would decline are more inclined to have less than 10 telephone lines, are classified as "small" in terms of number of employees, and more than 50% of them do not provide services requiring extensive use of the telephone. It is interesting to note that the budget restratification on this question indicates that budget size did not influence the responses significantly.

In summary, the project results indicate occasional but infrequent differences between the cities. There was, however, no consistent pattern of differences that would indicate any significant negative impact from measured rates. The most persistent patterns in both cities are that the telephone is of great importance, and costs per se are more significant than the type of rate structure used.

For those sporadic instances where measured rates might have some negative impact, and the evidence is not clear that there is any consistent example of negative effects, two factors must be considered. One, a significant negative impact will be felt when the costs of telephone usage rise and, two, telephone usage is important to the organization and the increased costs cannot be met either by (1) passing them on to the client population, (2) increased revenues, or (3) increased efficiency in some area of operation. In this situation, the funds for increased telephone costs would come from

those reserved for another important function of the organization or the telephone usage would be reduced.

There is no pattern of evidence in the data collected to indicate that such a situation has arisen. In thinking about the hypothetical possibility, however, two points should be considered. One, any cost can increase, and it is difficult to defend viewing increased telephone costs differently from the way one views increases in the cost of any other resource necessary to the organization. Either the organization absorbs the costs or makes other changes such as increased efficiency. Two, if such a clear-cut case of negative impact should arise, it is not at all clear that the "best" solution would be to revert to flat rates. Under the flat rate average price structure, low users tend to subsidize high users--usually unknowingly. If the services of these organizations are deemed to be in society's interest, then the alternative of direct, measurable, and known subsidies arises. The indirect subsidies of the flat rate have no inherent relationship to a telephone customer's ability or desire to subsidize other customers. Equity suggests that these are highly relevant considerations.

Further study could be undertaken, and one possible project that should yield increased information--though not necessarily different results--would be to study, over time, similar organizations that are in the process of changing from flat rates to measured rates.

The results of the study shed some light on several critical policy alternatives. Two alternatives are either to retain flat rate

structures or to implement measured rate structures. Clearly, the economic literature suggests that price equal to marginal costs is the most efficient method of allocating resources. However, we have also pointed out that the marginal costs of telephone service have not been clearly defined. Costs are an important consideration since the benefit of usage sensitive pricing rests in the idea of economic efficiency. The fundamental doctrine of economic efficiency is that a charge for additional usage is justified only if there is an additional cost.

Both public acceptance and economic efficiency criteria demand that rates be related to costs. From a policy standpoint, the benefits that can be achieved through the use of usage sensitive rate structures probably outweigh the costs in the long run. The introduction of usage sensitive pricing will ultimately help to achieve the goal of cost sensitive rate structures.

The policy alternative to exempt social service type organizations selectively needs to consider and compare the economic efficiency losses with any gains achieved by selective exemption. As stated, there are very few significant differences in the use of the telephone to provide social services. Not surprisingly, when an area switches rate structures, the telephone service, as a resource with a cost, is given more consideration. However, over time, it appears that the cost of telephone service in the measured rate area is given little consideration. Still, since telephone service is a relatively small portion of most organizations' total budget, it is often given less consideration than costs that are rapidly escalating, such as

energy costs. The result is that an organization should take the real cost of telephone service into consideration.

Most of our discussion thus far has centered on the fact that the services provided by social service organizations in both cities are similar and that: (1) a switch to measured service in Cincinnati would not significantly affect the quality of service provided and (2) that in Cleveland the measured rate structure has not affected the quality of service provided by these organizations. The next logical question is whether measured service could decrease telephone usage in Cincinnati. Based on the data on usage, we can tentatively conclude that measured service could reduce calling volume in Cincinnati. Both the CCS data and organization usage data indicate that usage is higher in Cincinnati. The overall CCS per line in Cincinnati are 3.47 and in Cleveland 3.39. CCS per line, of course, represent all users in the exchange sampled and both incoming and outgoing calls in each city exchange. However, the organization traffic data sample also indicates that usage is higher in Cincinnati than in Cleveland. Average calls per line per month in Cincinnati for our sample was 673 whereas in Cleveland there were 125 calls per line per month. Even given the limitation of the data, there is an indication that usage is higher in Cincinnati than in Cleveland. Measured service, by making organizations aware of the cost per call in Cincinnati, could reduce usage for these organizations.

## PART 5

### A GUIDE TO THE STUDY

The study—The Impact of Measured Telephone Rates on Telephone Usage of Government and Nonprofit Organizations—contains over 160 pages of text and over 200 pages in the appendices. It is not necessary for all readers to read the entire report. The following is a suggested approach depending upon the individual's goal in reading the study.

The reader interested in the results only should read the Executive Summary or Chapters 1 and 9.

The reader who is unfamiliar with the issues surrounding measured service should read Chapter 2.

The reader interested in the study method should read Chapter 3 and Appendices A, B, C, and E.

The reader who is interested in the complete results should read Chapters 4 through 8, and for the results of the questionnaires, refer to Appendices D, F, and G.

