

February 1989

**TAX  
ADMINISTRATION**

**How Precise Are IRS  
Estimates of  
Taxpayers Calling for  
Assistance?**



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United States  
General Accounting Office  
Washington, D.C. 20548

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General Government Division

B-227740

February 21, 1989

The Honorable Lawrence B. Gibbs  
Commissioner of Internal Revenue  
Department of the Treasury

Dear Mr. Gibbs:

We reviewed IRS' approach for estimating demand for telephone assistance because of congressional and administrative concerns over the amount of resources devoted to IRS' Taxpayer Service Program. This report discusses the results of our review and the need for IRS to expand the information it provides to Congress regarding IRS' responsiveness to taxpayer demand for toll-free assistance.

This report contains a recommendation to you on page 26. As you know, 31 U.S.C. 720 requires the head of a federal agency to submit a written statement on actions taken on our recommendations to the Senate Committee on Governmental Affairs and the House Committee on Government Operations not later than 60 days after the date of the report and to the House and Senate Committees on Appropriations with the agency's first request for appropriations made more than 60 days after the date of the report.

We are sending copies of the report to the House and Senate Committees on Appropriations and other appropriate congressional committees. Copies will also be made available to other interested parties.

This report was prepared under the direction of Jennie S. Stathis, Associate Director, General Government Division. Other major contributors are listed in appendix IV.

Sincerely yours,

A handwritten signature in cursive script that reads "Richard L. Fogel".

Richard L. Fogel  
Assistant Comptroller General

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# Executive Summary

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## Purpose

How large should the Internal Revenue Service's (IRS) budget for telephone assistance be to respond to the millions of taxpayers who call each year for assistance? To decide, IRS and Congress need to know how many calls IRS expects to receive and how accessible telephone assistance will be at a given level of staffing and equipment.

Because of congressional and administration concerns over the amount of resources devoted to and the level of service provided by IRS in meeting the demand for taxpayer assistance, GAO

- reviewed IRS' approach for estimating demand for telephone assistance and for determining the level of telephone service provided to taxpayers and
- compared IRS' demand estimating approach and performance measurement with that of other organizations that operate toll-free telephone services.

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## Background

Telephone assistance plays a major role in IRS' Taxpayer Service Program. For fiscal year 1988, IRS estimated that 45.6 million taxpayers attempted to call its toll-free telephone sites seeking assistance.

The House and Senate Appropriations and Oversight Committees are interested in information on how responsive IRS is to taxpayer demand for telephone assistance (i.e., how many calls IRS answers) and the level of difficulty callers experienced in reaching IRS. Because IRS does not answer all of the calls it receives (21.4 million busy signals out of 62.2 million total calls in 1988), it uses formulas to estimate how many callers receiving busy signals ultimately had their calls answered or stopped calling. IRS uses this estimate to report to the Committees how responsive it is in satisfying taxpayer demand. (See pp. 14 to 15 and p. 24.)

For fiscal year 1988, Congress directed that IRS spend no less than \$318.5 million for taxpayer service. IRS said this amount enabled it to achieve its optimal goal of serving 85 percent of the taxpayers calling for assistance. IRS believes that providing a higher level of service would be inefficient because assistors would have to wait for calls at times. (See pp. 10 to 11.)

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## Results in Brief

IRS defines its telephone demand as the "estimated" number of persons calling for assistance and its level of service as the number of calls answered relative to the estimated number of callers. When estimating

callers, IRS assumes that a portion of unanswered calls are redial attempts and that the redial attempts are related to the level of congestion of its telephone system. Given the large volume of calls receiving busy signals and IRS surveys that show that callers redial, GAO agrees with these assumptions. Neither IRS nor GAO knows, however, the extent to which system congestion affects the redial rate or how often callers redial after receiving a busy signal. Due to these and other uncertainties inherent in estimating callers, GAO cannot attest to or refute the accuracy of IRS' demand estimates. (See p. 8 and pp. 14 to 16.)

IRS operates in a different environment from that of most of the other toll-free telephone service organizations GAO contacted. Private industry organizations operate with a profit motive that provides an incentive to answer almost every call, with few calls receiving busy signals. Rather than estimate callers, they equate their call volume to their demand and their level of service to the percentage of calls answered. (See pp. 21 to 22.)

Because of the volume of busy signals and the accuracy question regarding IRS' demand estimates, when IRS reports to Congress on the level of service provided taxpayers, it should report all relevant information, including readily available information on call volume. Congress would then have a more complete picture of IRS' telephone assistance when considering IRS' requests for resources to support the Taxpayer Service Program. (See pp. 23 to 26.)

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## Principal Findings

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### How IRS Estimates Demand

IRS uses formulas to convert total call volume to an estimated number of individuals seeking assistance. Although IRS knows how many calls it receives and how many of those it answers, it does not know how many of the unanswered calls represent (1) callers who redialed one or more times and ultimately had their calls answered or (2) callers who quit trying after making one or more attempts without reaching an assistor. Thus, IRS estimates how many calls equate to one taxpayer. IRS has changed its formulas several times, but applying these formulas to various years' actual call data generally result in similar estimates. IRS is presently considering a new approach to try to better reflect these unknowns. (See pp. 14 to 19.)

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### IRS' Approach Differs From Other Organizations

Unlike IRS, other telecommunications organizations GAO contacted do not estimate callers and, thus, their level of service is based on total call volume. Were IRS to do likewise, for fiscal year 1988 it would have reported a level of service of 61.9 percent, not 84.5 percent.

GAO found that the approach used by other organizations has advantages and disadvantages for IRS. Although call volume data are readily available and provide an indication of taxpayers' difficulty in reaching IRS, such data overstate the number of individual callers due to the large number of busy signals and callers having to redial. (See pp. 22 to 23.)

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### IRS Can Better Portray Service Provided

Evaluating IRS' service on the basis of either approach can be misleading. For example, IRS reported achieving its 85-percent optimal level of service goal during fiscal year 1988. This did not mean that IRS answered 85 percent of the calls received, but rather that an estimated 85 percent of the callers eventually reached an assistor. In contrast, IRS would have reported a 62-percent service level based on call volume. Because of calls receiving busy signals, the call volume approach would always show a lower level of service estimate, which in turn would foster an inflated perception of the number of taxpayers who sought assistance but were not helped.

Budget constraints and IRS' desire to avoid excess capacity preclude IRS from answering all calls and thus determining true demand. Because of the uncertainties contained in demand estimates and because the demand estimates are the primary basis for developing budget requests, IRS should provide Congress with information available to help in oversight and appropriations deliberations. If IRS reported information using both approaches, Congress would have estimated levels of IRS' service and an indication of the difficulty callers encountered in trying to obtain assistance. With such information, Congress would be in a better position to review IRS' performance, assess staffing needs, and make decisions on funding the level of service it believes the program warrants. (See pp. 23 to 26.)

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### Recommendation

To provide Congress information with which to (1) more fully assess the toll-free telephone assistance program, including the difficulty taxpayers encountered trying to reach IRS, and (2) help determine the level of funding the program warrants, IRS should provide in its budget submissions to Congress level-of-service information based on both estimated demand and actual call volume data from the prior fiscal year. This

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information should include the estimated number of persons calling IRS for service, the percentage of those assisted, the total call volume, and the percentage of calls answered. (See p. 26.)

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## Agency Comments

In a November 28, 1988, letter, the IRS Commissioner said that call volume information showing the number of calls answered, busy signals, and abandoned calls will be provided to Congress. The Commissioner agreed that doing so will provide Congress the data to both assess IRS' performance and make more informed decisions regarding budget submissions for Taxpayer Service. (See app. III.)

# Contents

<hr/>	
<b>Executive Summary</b>	2
<hr/>	
<b>Chapter 1</b>	8
<b>Introduction</b>	
How IRS Determines Toll-Free Telephone Demand	8
How IRS Uses Telephone Demand Estimates	8
Concern Over the Appropriate Level of Resources for Taxpayer Service	11
Objectives, Scope, and Methodology	12
<hr/>	
<b>Chapter 2</b>	14
<b>Precision of IRS' Demand Estimates Is Unknown</b>	
IRS Uses Formulas to Convert Unanswered Calls to an Estimated Number of Callers	14
IRS' Current Approach Assumes That Callers Redial and Congestion Affects Redialing	15
IRS' General Assumptions Are Reasonable but Precision of Estimates Is Unknown	15
IRS' Various Formulas Have Produced Similar Results	17
Conclusion	19
<hr/>	
<b>Chapter 3</b>	21
<b>IRS Should Provide a More Complete Picture of Its Telephone Service</b>	
IRS' System Differs From Other Systems	21
Using the Approach Others Use Presents Both Advantages and Disadvantages for IRS	22
Neither Approach Provides a Complete Picture of IRS' Service	23
Conclusion	25
Recommendation to the Commissioner of Internal Revenue	26
Agency Comments	26
<hr/>	
<b>Appendixes</b>	
Appendix I: History of IRS' Formulas Used to Estimate Demand for Telephone Assistance	28
Appendix II: Treasury's Proposed Approach for Estimating Demand for IRS' Telephone Assistance	32
Appendix III: Comments From the Internal Revenue Service	34
Appendix IV: Major Contributors to This Report	35
<hr/>	
<b>Tables</b>	
Table 1.1: Preparation of IRS' Fiscal Year 1988 Toll-Free Telephone Demand Estimates	9



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Table 2.1: Comparison of IRS' Estimates Using IRS' Current and Historical Formulas	17
Table 3.1: Comparison of the Percentage of Estimated Taxpayers IRS Assisted With the Percentage of Calls IRS Answered	24
Table I.1: How IRS' Three Formulas Would Estimate Demand for Telephone Assistance Given Different Levels of System Congestion	31

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**Figure**

Figure 3.1: Comparison of Annual Levels of Telephone Service Provided by IRS Using Estimated Callers vs. Call Volume	25
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**Abbreviations**

IRS	Internal Revenue Service
SLIDE	Service Level Indexed Demand Estimation

# Introduction

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Taxpayers often need assistance in understanding the income tax laws. Since the 1940s, the Internal Revenue Service (IRS) has provided some form of taxpayer assistance and for over 2 decades has operated a toll-free telephone program for assisting taxpayers. IRS' objective in providing this assistance is to encourage voluntary compliance with federal tax laws by informing taxpayers of their responsibilities and assisting them in meeting their obligations.

IRS' primary way to assist taxpayers is its toll-free telephone service, which is provided by 32 telephone sites. For fiscal year 1988, IRS estimated that its toll-free telephone sites assisted 38.5 million taxpayers and for fiscal year 1989, IRS projects that its sites will assist approximately 37.9 million taxpayers.

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## How IRS Determines Toll-Free Telephone Demand

IRS estimates how many individuals are represented by the number of telephone calls received at its toll-free telephone sites. IRS believes estimating the number of callers is necessary because it is unable to answer many callers on their first call attempt and some callers redial until they are either answered or they stop trying. To avoid double counting the same taxpayer, IRS uses data recorded by telecommunications equipment on the number of answered and unanswered calls and a formula to convert total call volume to an estimated number of individual callers, including those who were unsuccessful in their attempts to reach an IRS telephone assistor.

IRS' approach makes assumptions about callers' redialing attempts and how callers' behavior varies depending on how busy the telephone system is. As unanswered calls increase, IRS assumes that the same callers have to redial more often to get into the system and thus the percentage of the calls it counts as individual callers decreases.

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## How IRS Uses Telephone Demand Estimates

IRS uses telephone demand estimates to (1) develop budgetary projections, (2) determine the level of service it provides to taxpayers, and (3) manage and operate its telephone sites. IRS' telephone demand estimates fall into two categories: retrospective estimates of the number of persons who called each telephone site and projections of future demand.

IRS Uses Historical Demand Estimates to Project Future Demand

Annually, IRS' Research Division uses the demand estimates of several previous years to project future taxpayer demand for telephone assistance. In fiscal year 1987, the Research Division developed a 9-year trend line, using the results of the demand estimates from fiscal years 1978 through 1986 to project demand for fiscal year 1988. On the basis of this trend analysis, it projected that 52 million taxpayers would contact IRS for assistance via the telephone in fiscal year 1988. As table 1.1 shows, this information is the major component IRS uses in projecting future demand. On the basis of other factors that may arise after the Research Division makes its projections, such as legislative changes or enforcement initiatives, IRS may make adjustments to the Research Division's projection.

**Table 1.1: Preparation of IRS' Fiscal Year 1988 Toll-Free Telephone Demand Estimates**

Components of workload estimates	Estimated taxpayers (in millions)
<b>Research Division projection</b>	52.0
<b>Taxpayer Service Division adjustments:</b>	
Tax Reform Act of 1986 inquiries <sup>a</sup>	2.2
Input from regions <sup>b</sup>	2.3
Brochure sent to taxpayers <sup>c</sup>	1.5
Advertising campaign <sup>d</sup>	1.6
Increased number of notices <sup>e</sup>	0.4
<b>Workload Subtotal</b>	<b>60.0</b>
Deduct requests for centralized forms distribution	(9.2)
<b>Final demand projection</b>	<b>50.8</b>
85-percent level of service	x 85.0%
<b>Demand to be satisfied</b>	<b>43.2</b>

<sup>a</sup>Tax reform inquiries were based on the universe of affected taxpayers (113.5 million businesses and individuals) multiplied by a legislative taxpayer contact rate IRS developed in a 1983 study of the contacts taxpayers made concerning tax changes initiated by the Economic Recovery Tax Act of 1981. This adjustment also incorporated an estimate of how many taxpayers would call regarding the revised W-4 Form.

<sup>b</sup>The regions provided information on unique circumstances in their regions requiring adjustment in the estimated demand figure.

<sup>c</sup>IRS used the 1983 legislative contact rate to estimate the number of taxpayers who would contact IRS after receiving a tax reform brochure IRS mailed in October 1987.

<sup>d</sup>IRS again used the 1983 legislative contact rate to estimate the number of taxpayers who would call IRS after seeing an advertisement highlighting tax reform.

<sup>e</sup>On the basis of a recommendation by its Internal Audit Division, IRS used a notice contact rate that was also established in the 1983 study, and estimated that 0.4 million of the estimated increase of 2 million taxpayers receiving IRS notices would seek IRS telephone assistance.

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**IRS Uses Projected Demand to Develop Its Future Budget and Establish Service Goals**

IRS uses the projected demand to develop budgetary projections and establish its annual level of service goals. For example, on the basis of its demand projection that 51 million taxpayers would call the telephone sites for assistance during fiscal year 1988, IRS calculated that it needed funding for 2,736 staff years in order to achieve its optimum level of toll-free telephone service—providing service to 85 percent of the taxpayers who call.

Although an 85-percent level of service is IRS' optimum goal, it is not the goal IRS sets each year. For example, due to the level of funding for taxpayer service in fiscal year 1987, IRS established a 75-percent level of service goal for that year. IRS establishes its annual goal on the basis of its projected demand and the funding that is allocated for providing telephone assistance.

According to IRS officials, its optimum service level goal resulted from analysis of IRS' experience and discussions with private industry. The officials said they met with other organizations that operated telephone services in 1976 and again in 1987 to gain insight into how private industry establishes telephone service goals and the method used to manage telephone operations. According to IRS officials, representatives from these organizations agreed with IRS' decision that a reasonable goal would be to serve at least 85 percent of expected demand. IRS believes an 85-percent level of service is the level that maximizes the efficient use of assistors and adequately accommodates the needs of the public (with some callers receiving busy signals and some having to wait for an available assistor after accessing the system). According to IRS officials, providing a higher level of service would result in assistors having to wait for calls at times. IRS reported that it reached its optimum goal (providing an 84.5-percent level of service) during fiscal year 1988—the first time since the 1978 tax filing season IRS accomplished its optimum goal.

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**IRS Uses Weekly Demand Estimates to Determine Level of Service Provided and to Manage Telephone Sites**

IRS calculates its level of service by dividing the number of calls answered by the estimated number of persons who called. According to IRS officials, telephone site managers monitor the level of telephone service provided to taxpayers on an hourly basis in order to determine whether the appropriate amount of staffing and telecommunications equipment is provided to accomplish IRS' annual service level goal. Field offices report this information on a weekly basis to IRS headquarters.

IRS officials said that site managers are also encouraged to meet but not exceed the annual goal throughout the year. This practice has the potential for discouraging sites from using the staff years allocated to them to provide a higher service level than the annual goal if projected demand does not materialize or if telephone assistants answer the telephones at a higher level of efficiency than anticipated. Nevertheless, according to IRS officials, it is necessary to operate as close as possible to the service-level goal in order to provide equitable service on a nationwide basis to all taxpayers seeking IRS telephone assistance. The officials said that rather than use funds for staff years at one site to provide a higher level of service than the annual goal, it is preferable to reallocate them to another site where the goal is not being met. For example, where one site is exceeding the annual goal because demand is lower than anticipated, the number of hours worked by employees could be reduced. Likewise, at other sites that are not meeting the goal because demand is greater than anticipated, the work hours could be increased.

Another reason for encouraging sites not to exceed the annual goal is that officials want to ensure that the agency has sufficient funds to meet the annual service goal throughout the fiscal year. IRS does not want to exceed the goal during any one of its three planning periods (generally October through December, January through April, and May through September) if doing so would jeopardize having sufficient funds to meet the goal during the other periods.

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## Concern Over the Appropriate Level of Resources for Taxpayer Service

IRS and the Department of the Treasury have disagreed about the level of funding that should be devoted to IRS' Taxpayer Service Program. According to IRS officials, Treasury has questioned the type of service that IRS provided to taxpayers and for fiscal year 1983 eliminated IRS' funding for responding to technical tax law questions. However, Congress intervened and restored the budget to a level similar to that of the prior year. Generally, the House and Senate Appropriations and Oversight Committees have not been receptive to the IRS taxpayer service budget submissions and have questioned the adequacy of IRS' taxpayer service resources to meet taxpayer demand. As a result, Congress has required IRS to maintain, and in some cases, increase the funding devoted to taxpayer service activities.

For example, Treasury initially reduced IRS' fiscal year 1988 taxpayer service budget request by approximately \$93 million. Subsequently, the House and Senate Appropriations Committees recommended an increase of \$58 million for taxpayer service. In fiscal year 1988, Congress

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directed that IRS spend no less than \$318.5 million. According to IRS, this amount enabled it to achieve its optimum goal of providing an 85-percent level of service.

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## Objectives, Scope, and Methodology

Because of the disagreement between Congress and the administration over the appropriate level of resources that should be devoted to taxpayer assistance, we reviewed IRS' approach for determining demand for telephone assistance—the major component of IRS' Taxpayer Service Program. We reviewed IRS' methodology for determining demand estimates because these estimates are the primary basis for developing budget requests for taxpayer assistance. They are also used as the basis for determining IRS' toll-free telephone system's level of service. We also contacted other organizations that operate toll-free telephone services to identify their demand estimating and performance measurement approaches. We compared IRS' approach with those of the other organizations to determine the feasibility of IRS using the same approach others use.

To achieve these objectives, we

- reviewed IRS' policies, procedures, internal studies, and instructions related to the method IRS uses to estimate telephone demand and measure its performance;
- reviewed annual taxpayer service budget requests and IRS' fiscal year 1988 work plans;
- interviewed IRS officials in the Divisions of Facilities and Information Management Support, Internal Audit, Taxpayer Service, Finance, and Research and officials in each of the seven regional offices and the Richmond District Office about how the telephone demand methodology was developed and how demand estimates are used;
- interviewed telecommunications experts, including airline, banking, telephone, telemarketing, hotel, and catalog company officials; the contractor who developed IRS' current methodology; and officials of other federal agencies who provide telephone assistance;
- reviewed the literature on telecommunications theory;
- reviewed reports summarizing data captured by IRS' telephone equipment;
- compared IRS' methodology with those of other organizations that rely heavily on the telephone to provide service;
- held discussions with the Department of the Treasury analyst who studied IRS' demand estimating methodology;

- reviewed documents describing an approach Treasury has proposed for estimating telephone demand; and
- used the results of our 1988 filing season study on the accessibility of IRS' toll-free telephone system and IRS' filing season data to obtain an indication of the demand estimates Treasury's approach would have produced for the filing season.

We did most of our work at IRS' National Office, where the demand estimates and decisions on the methodology used are made. We also made on-site visits to IRS' Richmond District Office and its toll-free telephone site, IRS' Eastern Area Distribution Center (centralized forms distribution), and J.C. Penney's Telemarketing Center. We visited these locations to obtain first-hand knowledge of how telephone systems operate and are managed.

In addition, we met with representatives of American Telephone and Telegraph Company, MCI Telecommunications Corporation, the Social Security Administration, and the Veterans Administration. We also contacted representatives from BankAmerica Corporation; Best Western International, Inc.; Delta Air Lines, Inc.; Holiday Inns, Inc.; and WATS Marketing of America, Inc. We selected these organizations because they represented a variety of the organizations operating toll-free telephone services and some of them were familiar with IRS' system because IRS had visited them to determine how they manage and operate toll-free operations.

We did our work from January 1987 through April 1988 in accordance with generally accepted government auditing standards.

# Precision of IRS' Demand Estimates Is Unknown

IRS has a unique way of determining the demand for its telephone service and the level of service it provides to taxpayers, but the precision of its demand estimates is unknown. Given the volume of unanswered calls, IRS' demand-estimating formulas incorporate several assumptions about callers' dialing behavior. We agree with IRS' general assumptions that a portion of its calls represents redial attempts and that the redial attempts are related to the telephone system's level of congestion. We do not know, however, the extent to which system congestion affects the redial rate and how often callers redial after receiving a busy signal. Due to the inherent uncertainties involved in estimating callers' behavior, we can neither attest to nor refute the accuracy of IRS' demand estimates resulting from the formulas.

The accuracy of the demand estimates is important because, as noted in chapter 1, Congress uses these estimates as a basis for funding the toll-free telephone program. The funding that Congress provides is dependent, in part, on the level of service it wants IRS to provide. The accuracy of the estimates is also important to IRS for managing and operating its toll-free sites. For these reasons, IRS has periodically changed its formulas to try to better reflect the uncertainties in its taxpayer demand estimates. All of the formulas have produced similar demand estimates except for 1985, when IRS experienced an unusually high volume of calls. During the fall of 1987, Treasury recommended a less complex approach than the one IRS is using. IRS is still considering whether it will be able to use Treasury's proposed approach.

## IRS Uses Formulas to Convert Unanswered Calls to an Estimated Number of Callers

Because IRS believes its call volume overstates the number of individual callers, it does not rely solely on call volume to determine its current demand and project future demand. Due primarily to budget constraints, IRS cannot always answer taxpayers trying to call its toll-free telephone sites for assistance on their first call attempt. For example, in fiscal year 1988, IRS' equipment recorded receiving 62.2 million total calls, of which 21.4 million resulted in busy signals and 2.3 million were abandoned calls involving callers hanging up while waiting on hold. Although IRS' equipment records how many calls are received and how many calls go unanswered, IRS does not know how many of those unanswered callers redial and how often they will try again until they are either answered or stop trying.

IRS reasons that some callers redial when they receive a busy signal on their first call attempt; thus, the number of unanswered calls includes calls from (1) persons who reached IRS but made more than one call in



doing so and (2) callers who quit trying after making one or more unsuccessful attempts. For example, during its first planning period of fiscal year 1988 (October through December 1987), IRS received a total of 9.6 million calls and answered 6.1 million of them, leaving 3.5 million calls unanswered. Applying its formula to determine the number of callers who did not reach an assistor, IRS calculated that 1 million callers were unsuccessful in their attempts and, thus, its demand for this period was 7.1 million callers. This means that IRS believes the 3.5 million unanswered calls it received were generated by 1 million callers who called one or more times and failed to reach IRS and by other callers who reached IRS but had to make multiple calls to do so.

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## IRS' Current Approach Assumes That Callers Redial and Congestion Affects Redialing

IRS' current estimating approach makes assumptions about callers' redialing behavior and how such behavior varies depending on the level of congestion in the telephone system. The approach encompasses the use of three formulas. The formula IRS uses depends on how congested the telephone system is, that is, on the relationship between the number of calls answered and the number of calls unanswered. IRS assumes that as the congestion of the system changes, the estimated redial rate for callers who did not reach an assistor on the first call attempt also changes.

A key assumption in this approach is that as IRS' telephone system becomes more congested, the more likely it is that a caller would receive a busy signal and redial. Thus, as unanswered calls increase, IRS assumes that the same callers have to redial more often to get into the system and the percentage of the calls it counts as individual callers decreases. (See app. I.)

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## IRS' General Assumptions Are Reasonable but Precision of Estimates Is Unknown

Given the volume of unanswered calls, we agree with IRS' general assumptions that a portion of the calls received represents redial attempts and redial attempts are related to system congestion. However, due to the inherent uncertainties in estimating callers' behavior, especially how often they will call after an unsuccessful call attempt, we can neither attest to nor refute the accuracy of the demand estimates resulting from IRS' formulas.

IRS and our surveys support the assumption that callers have to dial IRS more than once to access the telephone system. For example, during the 1988 tax filing season, IRS asked a sample of callers how often they had dialed before being answered. The survey results indicated that about 2.3 million callers had to call three or more times before reaching an IRS

assistor. Consequently, these 2.3 million persons generated at least 6.9 million calls, of which 2.3 million would be counted as answered calls and 4.6 million as unanswered calls. Thus, had IRS used call volume to represent its demand, the number of individual callers would have been overstated by at least 4.6 million.

Although this survey shows that some callers who accessed IRS' system redialed, it does not show the number of attempts made by callers who failed to reach IRS. Furthermore, the survey would not show how many attempts the callers who reached IRS would have made had they encountered greater difficulty contacting IRS.

IRS' other assumption is that the redial rate is related to the level of congestion of its telephone system. We believe that this assumption is also reasonable but that the relationship between the two is unclear. Logic dictates that as IRS' telephone system becomes more congested, more taxpayers' calls will go unanswered. Logic further dictates that some portion of the unanswered callers will redial one or more times until they either access the system or stop trying. The number of times they redial generally relates to how congested the system remains but also probably relates to their level of patience and their sense of urgency.

Further support for IRS' assumptions comes from the results of two studies we made of the accessibility of IRS' toll-free telephone system.<sup>1</sup> During the 1987 filing season, we found that for about 40 percent of our calls we had to dial IRS more than once to access the system. In our study of the 1988 filing season, 24 percent of our calls required us to dial more than once to access the system. The improvement in accessibility between the two filing seasons probably related to IRS committing more staff and equipment to the system and a lower-than-anticipated demand that resulted in a less congested system during the 1988 filing season.

Although it is reasonable to assume that callers redial, no one knows how often they actually will. As the process of estimating callers involves assumptions on callers' redialing behavior, of necessity it involves uncertainty and thus it is difficult to estimate the number of callers represented by unanswered calls. As long as IRS operates at the level where many incoming calls receive busy signals, there will be doubt about the accuracy of IRS' demand estimates.

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<sup>1</sup>Tax Administration: Accessibility, Timeliness, and Accuracy of IRS' Telephone Assistance Program (GAO/GGD-88-17, Dec. 3, 1987) and (GAO/GGD-89-30, Feb. 2, 1989).

## IRS' Various Formulas Have Produced Similar Results

IRS has periodically changed its formulas to try to better reflect the uncertainties regarding taxpayer demand. Since 1983, IRS has used three different approaches to estimate the number of individuals seeking telephone assistance—the one-third formula, the Service Level Indexed Demand Estimation (SLIDE) formula, and the revised SLIDE formula. (See app. I.) IRS made some of the changes after noting problems with the formulas. Treasury has recommended a less complex method of estimating demand; it too may produce similar results.

Given the actual call volumes IRS experienced during fiscal years 1978 through 1988 (except for 1985 when IRS experienced unusually high demand), no major differences in demand estimates result from the various formulas IRS has used. As shown in table 2.1, we used IRS' historical data to show how IRS' demand estimates would differ using any of its historical or current formulas for estimating demand.

**Table 2.1: Comparison of IRS' Estimates Using IRS' Current and Historical Formulas**

Fiscal years	Total calls <sup>b</sup>	Unanswered calls <sup>c</sup>	Calls answered	Percent of total calls answered	Estimated demand and percent of estimated demand IRS assisted <sup>a</sup>					
					Estimated demand using 1/3 formula	Percent assisted using 1/3 formula	Estimated demand using SLIDE formula	Percent assisted using SLIDE formula	Estimated demand using revised SLIDE formula	Percent assisted using revised SLIDE formula
1978	46.3	18.6	27.7	60	34	82	34	81	33	83
1979	53.6	22.4	31.2	58	39	81	39	81	38	82
1980	63.7	30.1	33.6	53	44	77	42	79	43	78
1981	80.6	45.4	35.2	44	50	70	46	76	48	74
1982	85.3	47.0	38.3	45	54	71	50	77	52	74
1983	92.3	53.4	38.8	42	56	69	51	76	53	73
1984	80.9	39.6	41.4	51	54	76	53	79	54	77
1985	151.3	110.2	41.1	27	77	53	58	71	60	68
1986	69.4	31.6	37.9	55	48	78	47	80	48	79
1987	81.3	46.7	34.7	43	50	69	46	76	47	73
1988	62.2	23.7	38.5	62	46	83	46	83	46	84

<sup>a</sup>During this period, IRS used three formulas to estimate demand: One-Third Formula (FY 1978-1983), SLIDE Formula (FY 1984-1987), and Revised SLIDE Formula (FY 1988).

<sup>b</sup>Calls answered plus unanswered calls may not add to total calls due to rounding.

<sup>c</sup>Unanswered calls include overflow calls (calls receiving busy signals) and abandoned calls (calls where the callers hang up while waiting on hold).

<sup>d</sup>FY 1985 was an unusual year due to high demand experienced following returns processing problems.

Source: Data used in the preparation of this table were obtained from IRS' Toll-Free Telephone Data Reports.

According to IRS officials, because of the uncertainties in estimating taxpayer demand for IRS telephone assistance, they do not claim that the approach they use provides exact results, only that it may be the best available approach. Therefore, in the interest of achieving more precise estimates, IRS believes that new proposals are worth consideration.

IRS is considering Treasury's recommended alternative approach for estimating demand. The distinguishing feature of its approach is that it does not require knowledge of callers' redialing behaviors. It is based on the assumption that all calls to IRS have an equal chance of getting answered, and therefore those that are answered are representative of all calls made. Thus, it assumes that demand can be determined by surveying a representative sample of callers to determine the percentage of these callers who reached an assistor on their first call. That percentage would then be applied to the total number of calls received to obtain an estimate of demand.

IRS asked Bell Laboratories to independently review both its current approach and Treasury's proposal. Bell recommended that IRS use Treasury's proposal because it is simple, reasonable, and uses more information than IRS' current approach.

However, IRS has not made a final decision on whether to use Treasury's proposal because two caller surveys IRS made during 1988 to determine how many callers got through on their first attempt produced vastly different results. While one survey showed that approximately 75 percent of the callers reached IRS on their first call attempt, the other indicated that about 38 percent reached IRS on their first attempt. According to IRS officials, the disparate survey results may be due to differences in the wording of questions asked taxpayers by the two surveys to determine if they were answered on their first call attempt. IRS is developing procedures for another survey in an attempt to resolve the issue and to formally test Treasury's proposal. (See app. II for a description of Treasury's proposed approach.)

According to IRS officials, while testing Treasury's proposal, they plan to gather information to also test an in-house theory regarding taxpayer demand. Specifically, they plan to test the perception of some IRS officials that at an 85-percent level of service, IRS is actually serving more than 85 percent of the callers.

Because of the disparate results of IRS' first call attempt surveys, we used the results of our 1988 toll-free telephone accessibility study and

IRS' 1988 filing season data to obtain an indication of the demand estimates that may have resulted from Treasury's approach during the 1988 filing season. During the filing season, IRS received approximately 32 million calls, of which about 20 million were answered. On the basis of our test calls, we reached a telephone assistant on the first call attempt 76 percent of the time. On the basis of our calculation, it appears that Treasury's approach would have produced a slightly higher estimate of demand than IRS' current approach. IRS' approach estimates that 23.7 million callers tried to reach IRS during the filing season, while it appears that Treasury's approach would have produced a demand estimate of 24.3 million callers. If Treasury's approach does show a higher level of demand, then conversely IRS' reported level of service would be lower—as in this example.

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## Conclusion

IRS determines taxpayer demand for its toll-free telephone assistance and its level of service by using formulas to convert the calls it receives to an estimated number of persons seeking IRS' assistance. IRS estimates the number of callers represented by its call volume because a large number of its calls go unanswered.

Given the volume of unanswered calls, IRS' demand estimating formulas incorporate several assumptions about callers' dialing behavior. We agree with IRS' general assumptions that a portion of its calls represents redial attempts and that the redial attempts are related to the telephone system's level of congestion. Neither IRS nor we know, however, the extent to which system congestion affects the redial rate and how often callers redial after receiving a busy signal. Due to the inherent uncertainties involved in estimating callers' behavior, we cannot attest to or refute the accuracy of IRS' demand estimates. As long as IRS operates at the level where many of its incoming calls receive busy signals, there will be doubt about the accuracy of IRS' demand estimates.

The accuracy of demand estimates is important because Congress uses the estimates as a basis for funding IRS' toll-free telephone system. IRS has periodically changed its formulas to try to more precisely reflect taxpayer demand. Generally, all of the formulas have produced similar demand estimates. Treasury recently recommended a different approach that is based on sampling callers to determine how many reached IRS on their first call attempt. Bell Laboratories recommended that IRS use Treasury's proposal, and IRS is in the process of determining whether it will be able to use this proposed approach.

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**Chapter 2**  
**Precision of IRS' Demand Estimates**  
**Is Unknown**

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Because the demand estimates are a primary basis from which IRS develops its taxpayer service budget requests, they are an important component in the information Congress uses to assess IRS' service and determine the resources IRS needs to assist taxpayers. Chapter 3 discusses how IRS can provide Congress with more information to help in its appropriations and oversight deliberations.

# IRS Should Provide a More Complete Picture of Its Telephone Service

IRS' approach for estimating demand and measuring the level of service differs from that used by telecommunications representatives we contacted. While IRS estimates callers, other organizations use their call volume to represent demand and to determine level of service. Were IRS to adopt their approach, its use would provide advantages and disadvantages for IRS. However, reporting information to Congress on the basis of call volume, along with the information IRS currently provides, will provide Congress with information on IRS' estimated levels of service and an indication of the level of difficulty taxpayers experience in reaching IRS.

## IRS' System Differs From Other Systems

None of the private firms or the two federal agencies we contacted estimate callers. They equate their demand to the number of calls received and calculate their level of service by comparing calls answered to total calls received. In effect, they treat all calls received as representing different callers.

Other organizations we contacted set goals to operate with lower volumes of unanswered calls than IRS does. Unlike IRS, which expects callers to redial, private firms operate with a profit motive that acts as an incentive for them to answer almost every call. As a result, they attempt to eliminate the need for customers to redial by adjusting their staff and equipment as their call volume changes. According to the representatives we contacted, their annual call volumes range from about 1.3 million to 65 million calls, and their goals range from answering 81 to 99 percent of their calls. Their annual call volumes average about 23 million calls, similar to the number IRS answered during the 1988 filing season (about 20 million).

IRS says that it would be inefficient to staff call sites at levels allowing assistors to answer all callers on their first attempt because, at times, it would result in idle staff time. Therefore, IRS believes it is reasonable to expect some taxpayers to have to make multiple calls before reaching an assistor. According to IRS, it would prefer to serve as close to 100 percent of the callers as possible. However, as long as IRS eventually answers 85 percent of the estimated number of callers (on the basis of its formulas), it considers that it has achieved its optimum goal of efficiently serving the taxpayers calling IRS.

It should be noted that IRS operates in a different environment than most of the other organizations we contacted. According to representatives from the private firms, because of competition, they believe that a call that is not answered is a sale that is not made. In contrast, IRS has more

of a “captive audience” because certain callers, such as those with account-related inquiries, can only obtain the information they need from IRS. Thus, IRS’ callers may be more motivated to keep trying to call than callers dialing other telephone systems.

Although the two federal agencies we contacted do not operate in the same environment as the private industry representatives, they also equate their demand to the number of calls received and set goals to answer from 81 to 85 percent of all calls. Although the agencies are similar to IRS in that they are subject to the same budgetary process and, according to agency officials, they also experience high volumes of busy signals at times, these agencies do not find it necessary to estimate the number of individual callers.

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### Using the Approach Others Use Presents Both Advantages and Disadvantages for IRS

To determine if IRS could use the same approach used by the organizations we contacted, we examined the feasibility of IRS using call volume to determine demand estimates and measure level of service. We found that, due to the number of IRS’ calls receiving busy signals, the approach has both advantages and disadvantages for IRS.

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### While Call Volume Is Readily Obtainable, It Overstates Demand

Call volume data are readily obtainable because the number of calls IRS receives is automatically recorded by its telephone equipment. An advantage of using call volume is that it needs no arithmetic adjustments and thus is readily comparable over time. However, a disadvantage of using call volume is that it overstates the number of persons seeking assistance. By considering each of the calls received as a different caller, call volume overstates demand because it does not account for callers redialing. Thus, presenting results of IRS’ efforts on the sole basis of call volume would understate the level of service, which in turn would foster an inflated perception of the number of taxpayers who sought assistance but were not helped.

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### Call Volume Provides Perspective on Difficulty in Contacting IRS

Although call volume data overstate the demand for assistance, such information would be useful for examining the level of congestion of IRS’ toll-free telephone system and the difficulty taxpayers experienced in contacting it. The number of calls that are answered relative to the total calls that are made indicates the difficulty or ease callers had in



obtaining assistance and is an indication of IRS' responsiveness to taxpayers. IRS has not on a regular basis presented call volume data to Congress to assist it in reviewing IRS' budget and performance. This is because IRS decided that its workload measurements should be represented by estimated callers.

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### **Estimated Caller Data Said to Ease Staffing Decisions**

IRS manages and staffs its telephone operation according to estimates of the number of individual callers represented in the call volumes it experiences and estimates of the number of assistors needed to answer their calls at the established level of service goal. Given the high volume of busy signals associated with IRS' telephone system, IRS believes that determining staffing needs using call volumes would be more difficult than determining these needs on the basis of estimated caller data.

According to IRS officials, by looking at estimated demand patterns rather than total call volume, managers can better identify staffing needs because an increase in call volume does not necessarily mean an increase in the number of callers. Instead, an increase in call volume, manifested by a larger number of calls receiving busy signals, may have resulted from such factors as temporary staffing constraints or inexperienced staff, rather than an increase in the number of persons calling.

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### **Neither Approach Provides a Complete Picture of IRS' Service**

Evaluating IRS' service on the basis of either call volume or estimated caller data can be misleading. For example, as table 3.1 shows, IRS reported achieving its 85-percent optimum level of service goal during fiscal year 1988. This did not mean that IRS answered 85 percent of the calls received, but rather it is an estimate of the percentage of callers who eventually reached an IRS assistor. In contrast, were level of service based on call volume, IRS would have reported a 62-percent service level. However, since call volume overstates individual callers, this approach understates the level of service.

**Chapter 3**  
**IRS Should Provide a More Complete Picture**  
**of Its Telephone Service**

**Table 3.1: Comparison of the Percentage of Estimated Taxpayers IRS Assisted With the Percentage of Calls IRS Answered**

<b>Fiscal year</b>	<b>Percentage of calls answered</b>	<b>Estimated percentage of taxpayers assisted (level of service)</b>
1978	59.8	81.7
1979	58.2	80.7
1980	52.7	77.0
1981	43.7	70.0
1982	44.9	71.0
1983	42.0	68.6
1984	51.2	79.5
1985	27.2	72.2
1986	54.6	81.0
1987	42.7	77.0
1988	61.9	84.5

Source: IRS' Toll-Free Telephone Data Reports.

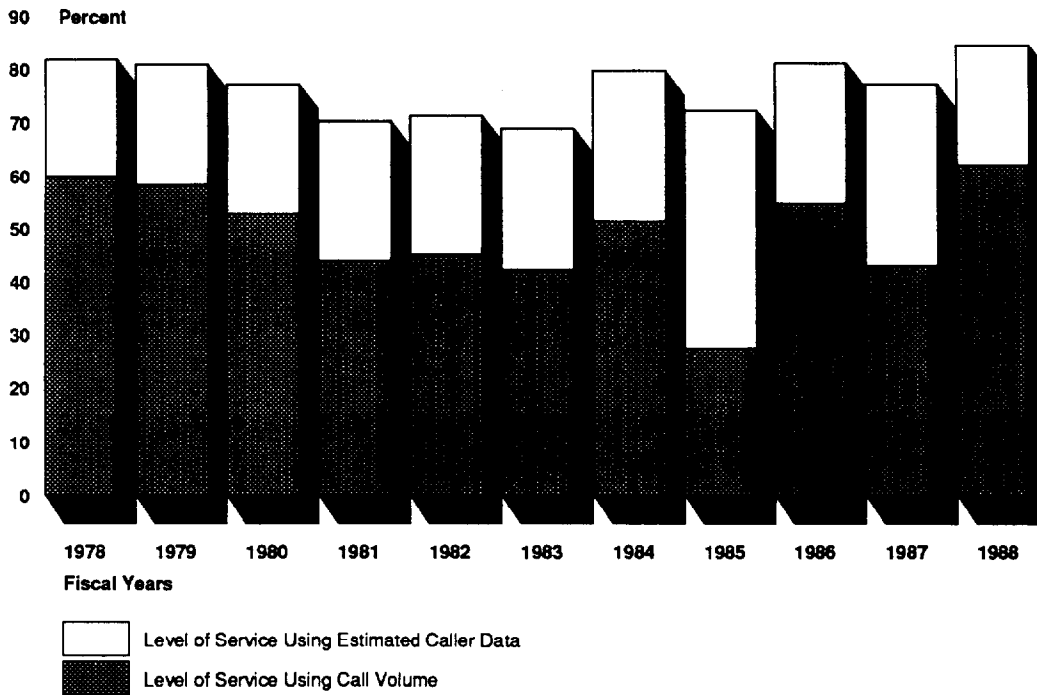
One reason IRS officials cite for estimating callers is that congressional committees want information on the number of taxpayers calling IRS. IRS justifiably believes that the committees are interested in how responsive it is to taxpayers seeking assistance. Our review of congressional hearings during fiscal years 1979 through 1987 showed that the House and Senate Appropriations and Oversight Committees are interested in this information. However, our review also showed that they are interested in information on IRS' call volume, especially the number of unanswered calls and the level of difficulty taxpayers experience when calling IRS.

During congressional testimony on its 1989 budget, IRS provided information from a 1988 filing season caller survey regarding the estimated percentage of callers who reached IRS on the first or second call attempt. However, IRS has not, on a regular basis, presented data to Congress on the components of its call volume, including the number of unanswered calls. As figure 3.1 illustrates, while the level of service IRS reported on the basis of estimated caller data has remained fairly constant, in the 70-to 80-percent range, the level of service provided on the basis of call volume has varied from less than 30 percent to about 60 percent.

Looking at both types of information gives one a better sense of how well IRS has provided assistance. Not only would such data provide Congress with an estimate of IRS' levels of service but it would also provide information on the amount of congestion experienced by IRS' telephone system and thus an indication of the level of difficulty taxpayers experienced in reaching IRS.

Chapter 3  
**IRS Should Provide a More Complete Picture  
of Its Telephone Service**

**Figure 3.1: Comparison of Annual Levels of Telephone Service Provided by IRS Using Estimated Callers vs. Call Volume**



Level of service using estimated caller data is the percentage of the estimated number of taxpayers assisted.

Level of service using call volume is the percentage of total calls that IRS answered.

Source: IRS' Toll-Free Telephone Data Reports

## Conclusion

IRS should provide Congress with more information on its toll-free telephone service. While IRS estimates the number of callers represented by its call volume, other organizations we contacted use the number of calls they receive to represent their demand and to determine their level of service. For IRS, using call volume has certain advantages but because of the number of calls receiving busy signals, it has disadvantages as well. For congressional review of IRS' budget and performance, relying solely on either call volume or estimated caller data can be misleading. While not perfect, using both call volume and estimated caller data would provide a more complete picture of IRS' responsiveness to taxpayers, and we found that the committees have been interested in both kinds of data.

While call volume information is readily available, IRS has not, on a regular basis, presented it to Congress because IRS decided that its workload measurements should be represented by estimated callers.

Because of the uncertainties contained in demand estimates and because they are the primary basis for developing budget requests, IRS should provide Congress with information available to help in its oversight and appropriations deliberations. If IRS reported information using both approaches, Congress would have the estimated levels of IRS' service and an indication of the difficulty callers encountered in trying to obtain assistance. With such information, Congress would be in a better position to review IRS' performance, assess staffing needs, and make decisions on funding the level of service it believes the program warrants.

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## **Recommendation to the Commissioner of Internal Revenue**

To provide Congress information with which to (1) more fully assess the toll-free telephone assistance program, including the difficulty taxpayers encountered trying to reach IRS, and (2) help determine the level of funding the program warrants, IRS should provide in its budget submissions to Congress level of service information based on both estimated demand and actual call volume data from the prior fiscal year. This information should include the estimated number of persons calling IRS for service, the percentage of those assisted, the total call volume, and the percentage of calls answered.

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## **Agency Comments**

In a November 28, 1988 letter, the IRS Commissioner said that call volume information showing the number of calls answered, busy signals, and abandoned calls will be provided to Congress. The Commissioner agreed that doing so will provide Congress the data to both assess IRS' performance and make more informed decisions regarding budget submissions for Taxpayer Service. (See app. III.) We note that the percentage of calls answered can be calculated and would give a useful indicator of how accessible IRS' service is to the public and would aid Congress in its assessment of the toll-free service provided taxpayers.



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# History of IRS' Formulas Used to Estimate Demand for Telephone Assistance

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IRS has used a series of formulas to estimate the number of persons seeking toll-free telephone assistance. Each of the formulas relies, in part, on information that is recorded by telecommunications equipment at each of IRS' toll-free telephone sites. The information IRS captures falls into three categories: (1) calls assistors answer, (2) calls that receive a busy signal—overflow calls, and (3) calls that are abandoned by persons who hang up while waiting on hold for an available assistor—abandoned calls. All the formulas IRS has used have been based on the general assumption that the number of unanswered calls (overflow and abandoned calls) needs to be discounted in order to determine the number of individual callers (estimated demand). The formulas also contain assumptions on the propensity of callers to redial after receiving busy signals.

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## One-Third Formula

The first formula IRS used to estimate its demand was referred to as the one-third formula. First used in 1965, the one-third formula simply added one-third of the unanswered calls to the number of calls answered to arrive at the estimated demand. Thus, for every three unanswered calls, IRS added one call to the number of calls answered, resulting in its estimated demand. According to IRS officials, the one-third figure was developed on the basis of data provided by the telephone company, which did a survey during the 1950s of people calling telephone operators for directory listings.

This approach to discounting unanswered calls, however, assumed that a caller's tendency to redial remained constant regardless of the number of unanswered calls or how congested IRS' telephone system was. IRS' experiences at the telephone sites led IRS to believe that a constant factor for discounting unanswered calls was not always realistic. IRS noted that data from the toll-free sites showed that during certain periods unanswered calls increased significantly, and periodic caller surveys done by IRS revealed that at times callers had to dial more than three times to reach an assistor. As a result, doubts within IRS about the accuracy of the one-third formula began to grow. Subsequently, IRS hired a contractor to develop another method for estimating the number of persons calling its telephone sites.

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## The SLIDE Formula

IRS hired a contractor who developed a formula using a queuing model<sup>1</sup> based on IRS' telephone operations. On the basis of 40 weeks of call data collected over a 2-year period ending October 1981 from five of the 52 toll-free sites IRS operated during fiscal year 1981, the contractor estimated a daily redial percentage for callers who did not reach an assistor on the first call attempt. Using a regression analysis to analyze the relationship between the redial probability and the congestion of the system that the telephone sites experienced, he developed a formula that IRS used as a basis for its Service Level Indexed Demand Estimation Methodology, more commonly referred to as the SLIDE formula. This formula is expressed as

$$\text{Estimated demand} = \text{calls answered} + \frac{.52 (\text{unanswered calls}) (\text{calls answered} + \text{abandoned calls})}{(\text{total calls})}$$

IRS used the SLIDE formula for 4 years.

During fiscal year 1985, IRS noted a problem with this approach. In 1985, IRS' telephone demand was unusually heavy due to problems experienced in processing tax returns at IRS service centers. IRS officials noticed that as its telephone system became more congested and the number of busy signals increased significantly, demand as estimated by the SLIDE formula did not increase at the rate expected. The officials discovered that at very high levels of congestion, the SLIDE formula seriously underestimated demand, which resulted in unrealistically high levels of service. Thus, as the total number of calls increased, IRS' SLIDE formula reached a point where it no longer counted further unanswered calls as representing additional individual callers. According to IRS officials, the SLIDE formula did not accomodate high levels of telephone congestion because the data on which it was based were from years when IRS' system experienced lower congestion.

As a result, IRS modified the SLIDE formula in 1985 in an attempt to provide a more reasonable estimate of actual demand when the telephone system experienced high levels of congestion. According to IRS, the modification was to be used when the number of busy signals exceeded the number of calls answered by more than 3.5 times. However, IRS' telephone system has not again experienced such a high level of congestion.

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<sup>1</sup>Queuing models are mathematical representations of the behavior of systems in which objects wait in line for one or more services.

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## Revised SLIDE Formula

The contractor's 1982 report on the initial SLIDE formula recommended that IRS periodically analyze data from its toll-free telephone sites to ensure that the formula was still valid. During 1985, IRS' Internal Audit Division noted that IRS had not done so and recommended that IRS reevaluate the methodology because of increased telephone demand and changes in telecommunications technology, in particular telephones' automatic redial capabilities.

On the basis of Internal Audit's findings, in 1986 IRS asked the contractor who developed the basic SLIDE methodology to reevaluate the formula. The contractor, using updated data from seven telephone sites, estimated the daily redial probability for each site. The results of his analysis indicated that there were three separate relationships, depending on how busy the system was.

As a result, he developed three different formulas to discount unanswered calls and determine demand depending on the congestion of the telephone system. The first formula applies to periods of low congestion—when the number of unanswered calls are less than or equal to the number of calls answered. In this case, a formula similar to the previous one-third formula was developed. The contractor modified the one-third formula slightly, such as changing the discount rate from .33 to .31. IRS used this formula for the 1988 tax filing season to determine its demand on a national basis because the cumulative number of calls answered during this period was greater than the number of unanswered calls.

The second demand formula was designed for periods when the number of unanswered calls exceeds but is not more than three times the number of calls answered. This formula is similar to the original SLIDE formula, although the base discount rate was adjusted from .52 to .60 on the basis of more recent information from IRS' telephone system.

Finally, a third demand formula was designed for periods of high congestion—when unanswered calls are more than three times the number of calls answered. In this case, unanswered calls are discounted at an even higher rate, reflecting IRS' belief that as the telephone system becomes more congested a greater number of callers have to redial more often before reaching an IRS assistor.

Table I.1 presents three hypothetical caller scenarios to illustrate the three formulas contained in IRS' current approach for discounting unanswered calls and estimating IRS' telephone demand.



**Appendix I  
History of IRS' Formulas Used to Estimate  
Demand for Telephone Assistance**

**Table I.1: How IRS' Three Formulas  
Would Estimate Demand for Telephone  
Assistance Given Different Levels of  
System Congestion**

<b>Discount method</b>	<b>Calls answered</b>	<b>Unanswered call attempts<sup>a</sup></b>	<b>Estimated demand</b>	<b>Number of unanswered attempts counted as callers</b>	<b>Percent of unanswered attempts counted as callers</b>
1 <sup>b</sup>	100	100	131	31	31.0
2 <sup>c</sup>	100	200	140	40	20.0
3 <sup>d</sup>	100	400	154	54	13.5

<sup>a</sup>Unanswered call attempts include calls receiving busy signals and abandoned calls. IRS' formulas include first and second abandoned calls, where callers placed on hold hang up without receiving assistance either before (first abandoned) or after (second abandoned) reaching an assistor. To simplify this example, since IRS data show that abandoned calls are a small portion of the number of calls IRS receives, we have assumed there were no abandoned calls.

<sup>b</sup>Used when the calls receiving busy signals are less than or equal to the number of calls answered.

$$\text{Estimated demand} = (\text{calls answered} - 2\text{nd abandoned calls}) + .31 (\text{unanswered calls})$$

<sup>c</sup>Used when the number of calls receiving busy signals is greater than, but does not exceed three times the number of calls answered.

$$\text{Estimated demand} = (\text{calls answered} - 2\text{nd abandoned calls}) + .60 (\text{unanswered calls}) \frac{(\text{calls answered} + 1\text{st abandoned calls})}{(\text{total call attempts})}$$

<sup>d</sup>Used when the number of calls receiving busy signals exceeds three times the number of calls answered.

$$\text{Estimated demand} = (\text{calls answered} - 2\text{nd abandoned calls}) / (.81 - (.04 [\text{unanswered call attempts}]))$$

$$([\text{calls answered} - 2\text{nd abandoned calls}]))$$

# Treasury's Proposed Approach for Estimating Demand for IRS' Telephone Assistance

IRS is reevaluating its approach to estimating demand for telephone assistance in light of questions the Department of the Treasury raised, an alternative estimating methodology Treasury proposed, and an independent report that recommended the Treasury's methodology over IRS'. Treasury reviewed IRS' estimating methodology and although it implicitly accepted the general overall assumptions that (1) some callers have to redial and (2) the extent to which they do is related to some extent to the system's level of congestion, it disagreed with the way the contractor interpreted those assumptions in developing the formula for IRS.

Specifically, Treasury questioned the supposition that as the number of unanswered calls increase, the percentage of calls that should be counted as new callers decreases. In the opinion of a Treasury analyst, the probability of callers redialing at any point should be viewed as a function of the number of previous call attempts and individual caller's redial tendencies. Thus, Treasury questioned whether callers dialing at peak congestion will always redial when they get a busy signal.

Treasury's proposal assumes that IRS' demand can be determined if the proportion of callers that reach IRS on their first call attempt is known. Treasury's approach does not require knowledge of callers' redial behaviors—a key component of IRS' approach—to estimate demand. The proposal is based on the concept that all calls to IRS have an equal chance of getting answered and, therefore, those that are answered are representative of all calls made. Treasury believes that the percentage of calls that are answered on the first call attempt, as determined through a random sample of callers, can be applied to the universe of all calls to calculate demand. The Department of the Treasury's formula is as follows:

Demand =  $T (C_1/C)$ , where

T = Total calls

C = Calls answered

$C_1$  = Number of calls answered on the first attempt

IRS asked Bell Laboratories to review both its approach and Treasury's proposal. Bell found that IRS' current approach seems unnecessarily complex and contains contradictory suppositions. Their report says that this contradiction arises because IRS' approach supposes that the expected number of times a caller will try to call is constant throughout the day, yet the formula was developed on the basis of the redial rate

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**Appendix II**  
**Treasury's Proposed Approach for Estimating**  
**Demand for IRS' Telephone Assistance**

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changing each hour. Bell Laboratories recommended that IRS use Treasury's proposal because it is simple, reasonable, and uses more information (regarding first call attempts) than does the current approach.

In order for Treasury's approach to be valid, IRS must be able to reliably determine callers' first call attempts. However, during 1988, IRS did two surveys of callers that arrived at significantly different first-call percentages. These differences may be related to the differences in the wording of questions asked callers by the two surveys to determine whether they were answered on their first call attempt. IRS officials are studying the different survey results and evaluating whether a valid survey method can be implemented for determining first call attempts.

# Comments From the Internal Revenue Service



COMMISSIONER

DEPARTMENT OF THE TREASURY  
INTERNAL REVENUE SERVICE  
WASHINGTON, D.C. 20224

NOV 28 1988

Mr. Richard L. Fogel  
Assistant Comptroller General  
United States General Accounting Office  
Washington, DC 20548

Dear Mr. Fogel:

We have reviewed your recent draft report entitled "Tax Administration: How Precise Are IRS Estimates for Telephone Demand?".

The draft GAO report goes a long way towards validating Taxpayer Service's telephone demand estimates and we concur with GAO that information on call volume should be provided to Congress. Accordingly, in budget submissions for future years, along with a proposed Level of Service, we will include the number of calls answered, busy signals, and abandoned calls for the most recently completed fiscal year. As you pointed out, we believe this will provide Congress the data to both assess our performance and make more informed decisions regarding budget submissions for Taxpayer Service.

As you know, the Service has worked with the telephone industry, private industry, and outside consultants to develop our current system for estimating telephone demand. Due to resource limitations, we determined with several large network telephone users that the goal for IRS should be to service 85% of the demand determined under this system. At this level of service, we maximize our use of telephone resources whereas at higher levels IRS telephone assistants would experience periods where they were waiting for calls. Reaching this 85% level of service objective, as we did this past year, also dramatically improves the number of callers who reach the IRS on their first attempt.

We hope you find these comments useful.

With best regards,

Sincerely,

A handwritten signature in cursive script, appearing to read "Larry Ginn".

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# Major Contributors to This Report

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**General Government  
Division, Washington,  
D.C.**

Jennie S. Stathis, Director, Tax Policy and Administration Issues  
(202) 275-6407

Larry H. Endy, Assistant Director

Robert P. Glick, Assignment Manager

Lucy M. Hall, Evaluator-in-Charge

Susan Ragland, Evaluator

Gregory Dybalski, Methodology Specialist

