Office of the Comptroller and Auditor General

Report on Value for Money Examination

Management of Telephone Facilities in the Civil Service

Dublin
Published by the Stationery Office

To be purchased through any Bookseller, or directly from the
Government Publications Sales Office,
Sun Alliance House, Molesworth Street,
Dublin 2

Pn. 2041

November 1995

Price £5

ISBN 0-7076-2306-5

P.43796 Gr.30-01 1,000 11/95 Brunswick Press Ltd.

Report of the Comptroller and Auditor General

Management of Telephone Facilities in the Civil Service

I have, in accordance with the provisions of Section 9 of the Comptroller and Auditor General (Amendment) Act, 1993, carried out a value for money examination on the management of telephone facilities in the Civil Service.

I hereby submit my report of the above examination for presentation to Dáil Éireann pursuant to Section 11 of the said Act.

John Purcell
Comptroller and Auditor General

3 November 1995

Table of Contents

Glossary

ACG	Department of Arts, Culture and the Gaeltacht
DDI	Direct Dial Inward
Defence	Department of Defence
Education	Department of Education
Finance	Department of Finance
GTN	Government Telecommunications Network
Health	Department of Health
IDEA	Interactive Data Extraction and Analysis
IT	Information Technology
LCR	Least Cost Routing
PBX	Private Branch Exchange
TE	Telecom Éireann
TEC	Department of Transport, Energy and Communications
VPN	Virtual Private Network

Summary of Findings

Background

The total cost of telecommunication services to Government departments for 1994 was £22.5m. All public network lines and connections are supplied by Telecom Éireann. In addition, the Government established a private network in 1989 comprising high-capacity circuits leased from Telecom Éireann which link Government departments in Dublin and regional centres. The Government Telecommunications Network (GTN) offered the opportunity to realise economy and efficiency gains through the low unit cost of calls routed via the network and the reduction in the need for switchboard operators.

The examination focused on establishing whether

- the GTN was cost-effective
- the potential for economy gains was being realised
- there was proper monitoring of telephone costs.

Five departments which accounted for 10 per cent of total Civil Service spending on telecommunications in 1994 were chosen for detailed examination.

Cost-Effectiveness of the GTN

Although no independent cost benefit analysis of the GTN had been carried out, we established that for four of the five departments examined the GTN was cost-effective. The other department was excluded from the analysis as it was unrepresentative of GTN usage. Our findings support estimates by the Department of Finance that there is a net annual saving to the Exchequer of £2m through using the GTN over alternative public network routings.

Service Deficiencies

Major deficiencies were noted in the level of service in two of the departments (Health and Transport, Energy and Communications) which militated against the achievement of realisable savings in those departments.

Utilisation of the GTN

On the basis of our examination we concluded that bigger savings could be achieved through better management of telephone services in departments. Our analysis showed that 40 per cent of all calls could have been routed through the GTN but in practice only 23 per cent were. The estimated annual cost to the five departments of not using the GTN, when it was appropriate to do so, was £90,000.

Scope for Economy Gains

Taking into account the cost of necessary capacity upgrading, a readily achievable increase of 20 per cent in GTN usage would yield annual savings of £100,000, while a 30 per cent increase would yield £300,000 per annum. These savings will not be achieved however, unless management plays its part by setting targets for GTN usage in each department, introduces staff training and provides access by all staff to GTN directories.

Control and Management

The monitoring of telephone costs by the departments examined was poor with the exception of the Department of Defence. This appeared to contribute to the low recovery rate for personal calls by staff in those departments, in contrast to the Department of Defence where significant recoveries were being achieved.

Some departments had invested in a direct dialling inward system to facilitate telephone communication without the need for operator assistance. We estimated that the use of this system, where there was a viable alternative in the GTN, was costing departments an additional £10,000 a year. Many departments also pay for direct lines which are far costlier to maintain than extensions in a Private Branch Exchange (PBX) system. We found that many of these direct lines were used infrequently leading us to the conclusion that there may well be a case for reducing the number of such lines with consequential savings.

In two of the departments, Health and Transport, Energy and Communications, there were no dialling restrictions on premium rate calls such as weatherlines, speaking clocks and resultlines. Examination of call monitoring reports for those two departments revealed monthly charges of £450 for such unnecessary services - the equivalent of £5,400 annually.

On the basis of our findings, it is our opinion, that additional savings in telephone costs can be achieved across the Civil Service by proper call monitoring and barring and, where appropriate, the use of least cost routing.

Part 1 : Introduction

Overview

1.1 Government departments incurred expenditure of £22.5m on telecommunications in 1994. Telecommunication costs are part of departmental administrative budgets and represented 3 per cent of such spending in 1994.

Government Telecommunications

1.2 Communications are mainly effected by means of telephones and facsimile machines.

All public network lines and connections are supplied by Telecom Éireann (TE). In addition, the State has established a Government Telecommunications Network (GTN).

Twenty five departments/offices are connected to the GTN.

1.3 Government departments have direct control over their telecommunication budgets and do not need to refer to the Department of Finance (Finance) for their day to day spending requirements.

Government Telecommunications Network

1.4 The GTN which makes use of digital technology was introduced in 1989 and consists of a number of high-capacity circuits linking Government departments in Dublin and regional centres. These circuits are leased from TE at a fixed annual charge. Finance pays directly for the service and passes on the cost to other departments in proportion to their use of the GTN.

1.5 The network relays both voice and data traffic. This examination focused mainly on voice traffic.

1.6 The GTN was designed to enhance efficiency through the provision of desk-to-desk dialling facilities and by facilitating the transfer of data files.

Telecommunication Developments

1.7 The GTN is currently the primary private telecommunications network utilised by Government departments. However, as a result of demand for access to the GTN from other users including health boards and local authorities, Finance has informed us that they are appraising other approaches to the provision of communication services.

1.8 The possible contribution of options such as Virtual Private Networking (VPN) in meeting demand is being considered by Finance.

A description of the GTN and VPN is set out in Appendix A.

1.9 A number of recent technological advances provide opportunities for cost efficiencies and better management of telecommunication systems, principally

- pre-programmable routing techniques which direct calls on available networks in the most economical way
- call monitoring systems which allow departments to review where and by whom costs are being incurred.

Objectives and Scope of Examination

1.10 This examination set out to determine how Government departments were managing their telecommunications.

1.11 To determine whether telecommunication costs were being managed properly, the examination focused on three issues

- whether the GTN was cost-effective
- whether there was scope for economy gains
- whether departments adequately monitor costs.

1.12 Five departments were examined in the course of this review. These departments accounted for 10 per cent of total spending on telecommunications in 1994.

1.13 The examination did not extend to

- data traffic
- incoming telephone traffic.

However, voice traffic which was examined, encompasses data traffic on the GTN which is transmitted via modem devices.

1.14 The Departments sampled were

- the Department of Health (Health)
- the Department of Education (Education)
- the Department of Defence (Defence)
- the Department of Arts, Culture and the Gaeltacht (ACG)
- the Department of Transport, Energy and Communications (TEC).

1.15 The examination methodology is outlined in Appendix B.

Part 2 : Investment and Utilisation

Origin of the GTN

2.1 Finance commissioned a telecommunications study in 1986. This study recommended that a phased, evolutionary approach be adopted to the development of a service-wide data network.

2.2 The consultancy study asserted that interdepartmental networking would bring about significant improvements in public service work practices. General benefits would be achieved through

- the transmission of data by electronic means
- increased security for communications
- instantaneous (or near-instantaneous) transactions
- the easier sharing of ideas with less travel and fewer formal meetings.

2.3 The Government's decentralisation programme was the catalyst for a subsequent extension to provide for voice traffic and in 1988, an interdepartmental committee recommended that a private countrywide voice and data network be established. The first connections on the GTN were made in 1989.

GTN Financial Arrangements

2.4 The GTN connects Government departments/offices throughout the country with each other and with the permanent representation at the European Union in Brussels. Its operation is overseen and monitored by Finance.

2.5 The annual lease charges paid by Finance for the GTN circuits between centres and that paid by user departments for access circuits to the GTN comprise the running cost of the network. Lease charges paid by Finance are recovered from user departments in proportion to their utilisation of the GTN. Break-out traffic[1] is subject to further charges by TE which are also billed to Finance and recovered from user departments.

2.6 The total cost of GTN facilities to the 25 user departments/offices was estimated at £1.2m excluding VAT for 1994. This covers both voice and data traffic.

[1] *Break-out traffic is the element of a GTN call which passes over the public network. TE rates are applied to this element of the call.*

2.7 The net asset value of investment by Finance in equipment to facilitate access to and operation of the GTN was estimated as £404,000[2] at 31 December 1994.

2.8 To obtain the maximum benefit from the total GTN investment, departments should use the GTN as often as possible in their day to day business, since decisions to use the public telephone network result in additional costs to the State.

Regarding lease costs as fixed outlay, potential financial benefits can accrue to the State as follows

- interdepartmental calls between offices connected to the GTN are not subject to additional charge

- in the case of other calls, including calls to the public and non-connected Government offices, the break-out facility allows for avoidance of any additional charge for the element of traffic which passes over the network.

The realisation of financial benefit from the system is dependent upon decisions by civil servants to use the GTN in substitution for the public telephone network. The return on the State's investment in the GTN depends on the extent to which the level of utilisation generates cost savings in excess of the lease charges.

Contractual Arrangements

2.9 There is no formal contract with TE for GTN capacity, with the exception of the link to Brussels. Agreements are negotiated with TE on an ongoing basis for all facilities. However, agreements covering the countrywide network may be terminated at short notice.

Service Provided

2.10 TE does not differentiate between data and voice channels utilised by the GTN. It is a matter for Finance to allocate channels to voice and data traffic as required. The full lease charge is payable regardless of the utilisation of capacity.

2.11 The GTN voice service is provided on the basis that users compete for capacity, while the data service is delivered as a point-to-point facility with certain channels dedicated to particular departments/offices.

[2] *Using a depreciation rate of 20 per cent.*

2.12 Capacity can be tailored to needs. Data channels can be allocated to connect departmental computer facilities between any two GTN centres. On some circuits, almost one third of the capacity is now allocated to data traffic with, on average, 19 per cent of capacity devoted to data.

Cost-Effectiveness of the GTN

2.13 No independent cost benefit analysis of the GTN has been carried out. However, the costs and benefits associated with extensions to the GTN are assessed by Finance as they arise, for example, when there is a proposal to connect newly decentralised departmental offices.

2.14 The alternative to routing calls through the GTN is to have them transmitted over the public telephone network in the ordinary way. The alternative costs of the GTN and public network routings for a one month period were examined. The results indicate that the GTN was cost-effective. (See Table 2.1.)

Table 2.1
Comparable public costs of GTN calls[a]

Department[b]	GTN cost[c]	Public cost[d]	Savings	Annualised savings[e]
	£	£	£	£
Health	1,478	3,275	1,797	21,564
Education	2,614	8,532	5,918	71,016
Defence	1,546	2,426	880	10,560
ACG	531	861	330	3,960
Total	6,169	15,094	8,925	107,100

Notes

[a] *Only outgoing calls from the Dublin offices of the departments concerned were subject to this analysis.*

[b] *TEC had to be excluded from this analysis because it was unrepresentative of GTN usage.*

[c] *This includes the cost of leased lines for inter-node connection, site to node connection charges and break-out costs.*

[d] *This is calculated on the basis of actual usage by departments.*

[e] *It is likely that these savings would be greater if the service deficiencies noted in the course of the examination (see paragraphs 2.20 to 2.23) were eliminated.*

2.15 Finance has calculated that there is a net annual saving to the Exchequer of approximately £2m through using the GTN over alternative public network routings. This is based on its estimate of the extra cost of routing the volume of traffic now passing through the GTN over the public network.

2.16 These savings were broken down as follows :

- voice traffic £1.3m
- data traffic £0.7m.

Utilisation Levels

2.17 The examination analysed calls to establish the number of calls which could yield savings if routed through the GTN. Not every call can, with economic benefit, be routed through the GTN. It was found that in a monthly sample, economies could be achieved in 40 per cent of cases. (Table 2.2.)

Table 2.2
Potential for routing calls through the GTN

Department	Total calls in period[a]	Routeable through GTN[b]	Total calls %
Health	34,783	10,132	29.13
Education	32,679	17,682	54.11
Defence	24,952	9,127	36.58
ACG	11,667	5,678	48.67
TEC	10,384	4,138	39.85
Total	114,465	46,757	40.85

Notes [a] *Approximately a one month period.*
[b] *Only calls routed through the GTN or additional calls which would confer an economic benefit were reckoned.*

2.18 Further analysis of calls which could be routed through the GTN (46,757), indicate that they are made up of

- calls to other Government departments/offices in the Dublin area (34 per cent)
- calls to regional offices of Government departments (21 per cent)
- inland calls to non-Governmental destinations or to Government departments/ offices which are not serviced directly by the GTN (45 per cent).

2.19 In the course of our examination it was found that of the calls which could have been routed through the GTN (46,757), only 56 per cent were so routed. Table 2.3 shows this pattern for the Departments surveyed.

Table 2.3
GTN Utilisation

Department	Total potential GTN calls	Routed through GTN	Utilisation %
Health	10,132	5,535	54.63
Education	17,682	13,202	74.67
Defence	9,127	3,195	35.01
ACG	5,678	4,181	73.64
TEC	4,138	104	2.51
Total	46,757	26,217	56.07

Service Deficiencies

2.20 In the course of the examination it became apparent that technical factors had impacted on the pattern noted.

2.21 TEC was unable to make outgoing GTN calls in 1994 due to technical difficulties. The department moved to new offices in December 1994 and since then TEC has stated that the GTN has worked satisfactorily.

2.22 Defence traffic showed an uncharacteristic dip in GTN usage due to internal reorganisation of their voice network which included the provision of a second access link to the GTN.

2.23 Usage of the GTN in Health is well below what might be expected from a department of its size. Finance has attributed the low usage to Health's use of analogue tie-lines.[3] However, Health maintains that other factors may also impact on the quality of the service, including software deficiencies.

[3] *A tie-line is a method of interconnecting PBXs. Each tie-line is capable of supporting one telephone call at any one time.*

Avoidable Charges

2.24 The departments were exposed to additional charges due to their officials using the public telephone network for calls which could have been routed through the GTN. These additional costs were estimated by analysing calls under four types of destination as shown in Table 2.4. The four destinations were

- other Government departments in the Dublin area
- regional offices connected by GTN lines to the main Dublin centre
- destinations which incur a local call charge following a break-out from a GTN centre
- destinations which would be charged at Area A[4] rate by TE, following break-out from a GTN centre.

2.25 The result of this analysis concluded that non-use of the GTN in 20,540 cases, where it would have been advantageous to use the GTN, was estimated to have cost approximately £7,500 (the equivalent of £90,000 per annum).

Table 2.4
Costs to departments of under-utilising GTN

Destination of call	Avoidable monthly charges[a] £
Dublin departments	558
Dublin to regional offices	500
Break-out to 'local'	5,273
Break-out to 'Area A'	1,124
Total	7,455

Note [a] *Avoidable charges represent the net additional cost of calls routed through the public network which could have been routed through the GTN.*

2.26 The avoidable charges noted were due to under-utilisation of the GTN which was partly due to technical difficulties. However, even taking as a guide departments which displayed a pattern of usage considered normal by Finance, there was scope for increasing utilisation.

[4] *Area A rate denotes the rate charged by TE for calls made to neighbouring districts.*

2.27 In considering the scope for savings which should result from increased usage, it is necessary to weigh the increased savings against any additional cost of capacity upgrading necessary to achieve them.

Network Capacity

2.28 GTN traffic is monitored by Finance who since January 1995 also produce a periodic report comparing circuit availability against circuit requirements for the GTN as a whole. Such a report was not available for 1994.

2.29 Finance's monitoring for the period January-April 1995 showed that circuits in place were generally sufficient to cope with existing GTN traffic across most nodes, with the possible exception of the Athlone, Galway and Sligo circuits. It is clear from that monitoring that the system would not support a significant increase in voice traffic without capacity upgrading. (See Appendix C.)

2.30 Investment in additional lines tends to be undertaken in 'lumps', increasing capacity on individual lines by amounts far greater than immediate demand. While this investment would probably give rise to small additional savings initially, as utilisation increases, the return would tend to grow.[5]

Scope for Savings

2.31 It has been calculated that based on figures available from Finance's monitoring and assuming a normal pattern of utilisation in the region of 75 per cent, that an increase in GTN usage of 20 per cent, although giving rise to increased investment in capacity, estimated at £300,000, would result in net savings of the order of £100,000, while an increase of 30 per cent in traffic would yield net savings estimated at £300,000.[6]

2.32 Alternative options include the use of compression techniques which would allow more voice traffic on existing circuits. This option would cost approximately £50,000 per line but on a once-off basis. However, there is a possibility of deterioration in quality with compressed traffic.

[5] *Each existing 2 megabit GTN line makes 30 circuits available. Increasing capacity to 60 circuits would result in initial spare capacity on that line.*

[6] *All figures exclude VAT.*

Future Development

2.33 Any potential extension to the GTN would be in response to two types of demand

- demand from organisations not connected to the network at present (including health boards)
- demands arising from increased use by existing users.

2.34 While each case would have to be examined on its merits, potential new customers tend to be located at a distance from an existing centre. Therefore, the lease costs of connecting their sites to GTN centres may make their connection uneconomic.

2.35 In addition, for existing users, each increase in capacity would, in the short-term, generate capacity far beyond the level of current demand.

2.36 It is, therefore, timely to carry out an analysis to determine the optimum approach to delivery of telecommunication services in the future.

The likely options are

- extension of the GTN
- retention of the GTN at its existing level in combination with VPN services
- providing services through VPN and a scaled-down GTN.

2.37 Finance is currently engaged in a study on the potential of a VPN service which TE is planning to make available.

Utilisation of Capacity

2.38 In the course of this examination we noted that some departments were not making optimum use of the GTN and were utilising capacity which could have been more efficiently used. The key findings were

- ACG, in common with other departments, uses the GTN to update a Parliamentary Questions database in the Oireachtas. Due to an error at system installation, the updating facility was tying up the GTN line for over 14 working hours each day. This compared with Education's use of a similar link for the same purpose for a duration of approximately 1 hour per day. The fault at ACG has now been rectified.

- Instances were noted where the GTN had been used to make calls to destinations in the greater Dublin area. There are no overall cost savings to be gained by

breaking out from a department's local GTN centre. The practice denies other users the opportunity to make cost-efficient calls and should be discouraged.

- Instances were also noted where calls from one department had been made by breaking out through another department's GTN facilities, including calls to international destinations.

  It is essential that this practice be kept under constant review by

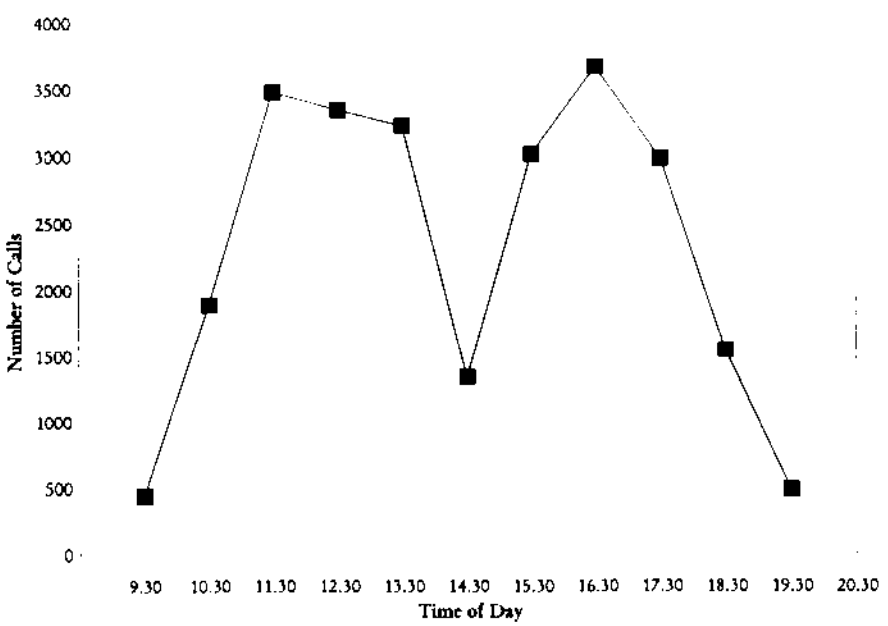
  — monitoring in the source department
  — configuring the systems in all departments to bar such calls.

2.39 Finance has stated that all users are advised, on joining the GTN to arrange for their telephone systems to accept only calls for that department's extensions and that formal reminders are also issued to departments in this regard.

Quality of Service

2.40 Our examination found that the throughput of GTN calls for the five departments examined varied throughout the day as shown in Figure 2.1.

Figure 2.1
Throughput of calls



2.41 Some staff complained of an inability to access numbers using the GTN during peak hours. This is mainly due to capacity constraints on certain lines. (See Appendix C.)

2.42 Users in Health, in particular, made the complaint of poor reception. Finance states that this is due to Health using analogue tie-lines rather than a single high capacity digital link. Health reports that the quality of the lines varied and that there was a high recurring incidence of line faults. This militated against efforts to persuade staff to increase their GTN use. The cause of the fault should be isolated in order to allow for an increase in use of the GTN by Health, if it can be cost-effectively remedied.

2.43 There were some complaints of calls being cut-off prematurely. By its nature, this complaint could not be substantiated in the course of the examination.

Direct Dialling Facilities

Direct Dialling Inward

2.44 Direct Dialling Inward (DDI) allows telephone communication to civil servants without the assistance of a telephonist. The examination noted that four departments/offices have invested in DDI equipment. These are

- Department of Finance
- Department of Defence
- Department of Social Welfare
- Office of the Revenue Commissioners.

2.45 Since calls made using such facilities are billed by TE at public network rates, civil servants should, where possible, use the GTN in preference to DDI in calling other public servants, thereby avoiding additional costs.

2.46 Call monitoring reports indicate that the departments examined were incurring unnecessary additional charges by using DDI instead of the GTN. (See Table 2.5.)

Table 2.5
DDI calls

Department	Calls in period[a]	Annualised number of calls
Health	406	4,872
Education	199	2,388
Defence	219	2,628
ACG	81	972
TEC	160	1,920
Total	1,065	12,780

Note [a] *Approximately a one month period.*

2.47 Other departments, apart from those examined, would also be calling the DDI equipped departments. It has been estimated that the practice may result in additional costs of up to £10,000 a year.

2.48 A clear benefit of DDI is that there is a greatly reduced need for individual direct lines. Introduction of DDI to departments in the future should result in savings.

2.49 It is recommended, however, that all departments should formally discourage use of DDI for calls to other departments where there is an available GTN alternative.

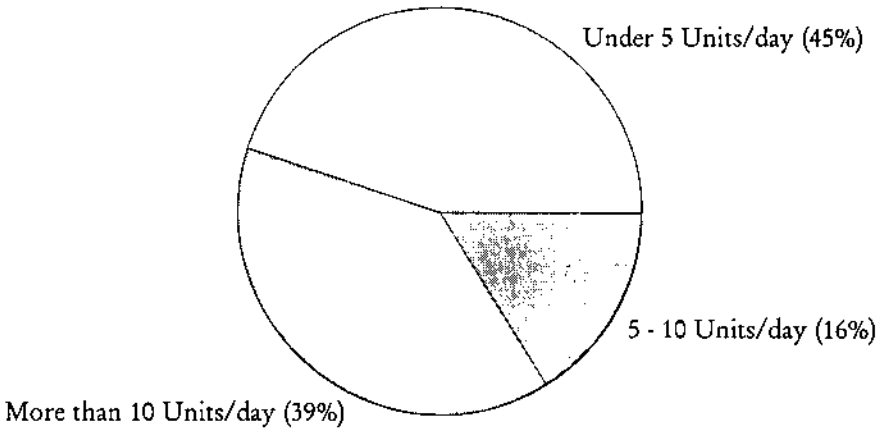
Direct Lines

2.50 Most departments allocate direct lines to officers by reference to their grade. The cost of installing a direct line is approximately £100 and thereafter there is a monthly charge of £10 payable to TE. Usually there is also a small equipment rental charge.

2.51 While the extent of inward traffic on direct lines could not be measured in the course of the examination, utilisation was measured in terms of the number of outgoing call units recorded.[7] An analysis of the utilisation of direct lines showed that many were under-utilised. (See Figure 2.2.)

[7] *Call units recorded give a reasonable indication of the extent of use. In order to put units of telephone time in context, 5 units is equivalent to an inland call made during working hours lasting just over 2 minutes.*

Figure 2.2
Use of Direct Lines



2.52 There is an apparent need to review the necessity for direct lines and investigate the costs and benefits to be obtained through installation of DDI equipment. As an indicator of the cost of providing lines which may not be required, the annual cost of providing direct lines to 85 users (out of the sample of 187) who had registered less than 5 units per working day, was over £10,000.

Mobile Phones

2.53 Some Government departments have invested in mobile phones. Eighty-four such phones were issued to staff of the five departments examined.

Part 3 : Management of Telecommunications

Departmental Management

3.1 The management of telecommunications within departments is usually assigned either to Personnel or Information Technology (IT) units. Finance has directed that departments should ensure that the management of voice and data communications is combined or coordinated. Their view is that the practical implication of this would be to assign all telecommunications to IT units in view of the technical nature of the work. However, some departments are not organised on this basis.

The Role of the Department of Finance

3.2 Finance has general responsibility for Government telecommunications. It does not however, have any enforcing capability as regards GTN usage. It has issued instructions on the management of telecommunication facilities and monitors GTN use centrally.

3.3 Finance has no formal mechanism for reminding departments/offices of the need to maximise usage of the GTN and target usage rates have not been established. Should the GTN continue to be used, targets would be useful in focusing the attention of departments on utilisation patterns.

3.4 Finance's monitoring is carried out on a monthly basis using a proprietary call-logging system which is programmed to periodically interrogate the data banks at the GTN centres, which store information on the length of time each voice channel on the GTN is utilised and the department using it.

3.5 The data is analysed to determine the proportion of the total GTN cost which is applicable to each department and an invoice for that amount is issued by Finance.

3.6 Finance also analyses the collected data to compare actual usage with capacity. (See Appendix C.)

Interdepartmental Monitoring

3.7 A GTN monitoring committee, composed of user departments and chaired by Finance, has met regularly since implementation. The committee examines trends in utilisation of the voice and data services and deals with practical issues arising from implementation and operations.

Procurement

3.8 Acquisition of communications equipment by departments is subject to open competition. Finance advice is available to all departments throughout the procurement process.

3.9 A standard approach to the procurement of Private Branch Exchanges (PBX) has been developed as a result of the issuing of 'PBX Procurement and Management' guidelines by Finance and its involvement in the preparation of tender documents and the evaluation of proposals received.

Control and Management

3.10 Government departments are responsible for the management of their administrative budgets. However, budgets and responsibility for cost elements such as telecommunications have not, in general, been devolved to administrative units within departments. Allocating specific responsibility for telecommunication costs would focus the attention of managers on making maximum use of the GTN and reducing costs.

3.11 A number of technological aids are available to management to assist in the control of telecommunications. These include

- call monitoring systems
- least cost routing
- call barring.

Call Monitoring Systems

3.12 Call monitoring systems can impact on costs and control by

- fostering an awareness of cost
- providing a means of checking telecommunication bills
- identifying potential cost savings using traffic analysis
- allowing management to consider improvements which would benefit the general public where incoming traffic is monitored.

3.13 The telecommunications industry maintains that placing an electronic logging device on networked telephone systems can reduce costs by significant amounts. However, the extent of the savings depends on management involvement in producing relevant reports from the monitoring system and acting on them.

3.14 Such systems give the opportunity to public sector managers to manage their telecommunication budgets and particularly to query

- why the GTN is not being used where it is possible to do so
- whether the most expensive or longest duration calls are business related
- premium rate calls
- unusual patterns in calls.

3.15 The examination found that the departmental use of monitoring systems varied.

- At the time of the examination, Health did not send reports to its managers because of the inability of its monitoring system to generate them on a timely basis. This has since been rectified. However, Health has stated that usage was at all times monitored centrally and the attention of local managers was drawn to specific instances and unusual trends.

- Prior to the examination ACG had never produced monitoring reports. However, it commenced sending reports to its line managers during the course of the examination.

- Defence sends individual reports to its staff for attention and recovery action, where appropriate.

- As at September 1995 Education did not distribute reports as a matter of routine because of staff constraints. However, where details are requested by line managers reports are supplied to them. Education has informed us that it will shortly commence distributing reports to its senior managers.

- Due to technical difficulties experienced in 1994, TEC's monitoring system had fallen into disuse. However, TEC has informed us that call-logging is now fully operational and extends also to incoming calls.

3.16 For monitoring systems to be useful as a management tool it is essential that they capture all traffic completely and accurately. Deficiencies noted were

- Education's monitoring system did not record all the calls made from its Dublin offices to Athlone. There was a difference of 8,803 calls between its report and Finance's report for the same period which were substantially accounted for by Athlone calls.

- ACG's monitoring system recorded 266 occurrences of duplicate or multiple recording of the same call in a report consisting of 2,510 records.

Least Cost Routing

3.17 Modern telephone switching equipment is capable of being programmed so that users can make calls in the most economical manner. Least Cost Routing (LCR) is a technique which can direct calls onto the cheapest available route. The Office of the Revenue Commissioners, for example, use LCR extensively in their telephone links to decentralised offices. Of the departments examined, Defence and TEC have recently implemented LCR options.

3.18 In Government departments, LCR can be programmed to take advantage of the GTN. Where a GTN routing option is available the switching system should seek to avail of it as a first recourse. If this option is unavailable, the next cheapest alternative is chosen.

3.19 Speed-dialling facilities can also be used to direct calls economically. Frequently dialled numbers can be pre-programmed centrally using a designated routing. Health operates an extensive speed-dial system to its regional centres utilising the GTN.

3.20 A drawback of LCR is that it can be time consuming and therefore costly to install because selected routes must be analysed and programmed one by one. Consequently, where there is already a high usage of the GTN it may not be appropriate to invest significant resources in LCR. However, where management is aware of widespread use of the public network to access locations served by the GTN, then LCR should be considered.

3.21 Current monitoring systems register the number dialled rather than the actual routing chosen by the LCR software. Therefore, these systems are in need of enhancement to provide accurate management information. However, even at their current level of development, monitoring systems are capable of generating the profiles of use which would assist management in its decisions to use LCR.

Call Barring

3.22 It is possible on modern telephone systems to restrict use to certain types of calls. Our examination of the use of call barring on telephone systems found that, in general, departments do not place any restrictions on local calls. The extent of restrictions employed for other common categories of telephone calls are set out in Table 3.1.

Table 3.1.
Departmental restrictions on dialling facilities

Department	Inland calls	International calls	Premium rate calls[a]
Health	No restriction	Allowed to Principal Officers and above and Assistant Principals on request	No barring[b]
Education	Allowed at the discretion of Personnel	Allowed to section heads on request	Universally barred
Defence	Allowed to senior management and to others where required	Allowed to Principal Officers and higher grades	Universally barred
ACG	Allowed to sections where required	Allowed to sections where required	Universally barred
TEC	Allowed to sections where required	Allowed to sections where required	No barring[b]

Notes [a] *Premium rate services include weatherlines, speaking clocks and resultlines.*
[b] *Premium rate calls have been subsequently barred by these Departments.*

3.23 In general, premium rate services should be prohibited since in the normal course of their business, officers should have no need for them. However, all departments examined had incurred charges for premium rate services.

3.24 Examination of call monitoring reports for the two departments where no restriction was placed on premium rate calls revealed monthly charges of £450. This would be the equivalent of £5,400 per annum for the two departments.

Bill Checking

Output from call monitoring systems may be used to

- assist in reconciling overall telephone bills with departmental estimates
- reconcile items billed with individual calls registered.

3.25 Departments as a general rule do not utilise their monitoring systems to effect reconciliations.

3.26 Using audit software[8], the bills received by one department were compared with summary information extracted from the department's monitoring system. The amount charged was reconciled to a reasonable degree of precision. Periodically it is recommended that this exercise be carried out by all departments to validate telephone charges.

3.27 It was noted that the departments examined do not request itemised billing from TE. Periodic checks of itemised bills against reports generated by a department's monitoring system could assist in the management and control of telephone costs.

Recovery in Respect of Personal Calls

3.28 Responsibility for checking reports generated by the monitoring system is generally delegated to individual division heads and this means that these officers decide which costs should be recovered. The total amount recovered in respect of the private use of official telecommunications equipment in all departments in 1994 was £57,000.

3.29 Table 3.2 shows the amounts recovered by the departments examined.

Table 3.2
Recoveries in respect of private use[a]

Department	Amount recovered £
Health	2,179
Education	691
Defence	22,914
ACG	422
TEC	53

Note [a] *For the year ended 31 December 1994.*

3.30 The practices in the departments examined were as follows

- At the time of the examination deficiencies in Health's call monitoring system prevented its use as part of a systematic recovery process. Reports are now generated and passed to sections for appropriate action. Health also recovers the cost of personal calls directed through switchboard operators.

[8] *Interactive Data Extraction and Analysis (IDEA).*

- Education recovers the cost of personal calls which are directed through switchboard operators. High cost calls are also queried.

- Defence produces individual reports from its call monitoring system in cases where the cost exceeds a defined limit. Staff are asked to identify their personal calls and deductions are made in the identified cases.

- ACG did not systematically charge officials for personal calls.

- TEC does not seek to recover local call charges. However, personal calls made through switchboard operators are recovered.

3.31 It is noted that the Defence practice has resulted in significant recoveries in comparison to other Departments. There is merit in reviewing recovery arrangements and applying best practice more widely throughout the Civil Service.

GTN Directories and Training

3.32 The GTN has been in place in Government departments since 1989. Knowledge of the benefits of GTN usage and availability of directories to users is vital to ensure that the system is used to its maximum potential and thereby help reduce overall telecommunication costs.

3.33 Finance periodically produces a directory of the GTN which shows dialling arrangements for connected offices. Individual extensions are given in this directory as are break-out codes from GTN centres.

3.34 An electronic version of the GTN directory, which is capable of more frequent updating, has been prepared by Finance and will be made available to departments in late 1995.

3.35 Staff training in using the GTN was provided initially by Finance to personnel and information technology managers who became responsible in turn for the training of staff in their departments. Staff were usually briefed at one-off meetings. Refresher training is rare in departments.

3.36 It is suggested that departments should follow a rigorous procedure in developing a favourable climate for maximum use of the GTN. This may include the following steps

- informing and training new staff members in the use and benefits of the GTN
- making GTN directories available to all staff
- periodically reminding staff of the need for maximum utilisation of the GTN

- barring access to public networks as far as possible, for example, by using LCR
- ensuring good quality connections to the GTN.

Survey of Users

3.37 A survey of 60 GTN users in three departments was carried out as part of the examination. (See Appendix D.) The key findings were

- 33 per cent of those surveyed had no formal instruction on GTN use
- 42 per cent used the break-out facility
- 67 per cent of users encountered difficulty in using the GTN.

Appendices

Appendix A

Communication Networks

Government Telecommunications Network

The Government Telecommunications Network (GTN) has been implemented as a 'star' configuration with high capacity digital links radiating from the hub of the network in Dublin to fifteen regional GTN centres or nodes throughout the country. GTN nodes, which in turn serve locally connected offices, provide services at the following locations

Dublin	Nenagh
Letterkenny	Killarney
Sligo	Cork
Ballina	Waterford
Castlebar	Kilkenny
Galway	Tullamore
Limerick	Athlone
Ennis	Cavan

The GTN supports a private Civil Service voice network and also a data service. Finance has overall responsibility for the management and development of the GTN.

Leased capacity from TE is used to interconnect GTN nodes which are located at decentralised offices and other large Civil Service offices throughout the country. These offices have immediate access to the GTN, while others gain access via leased circuits from TE. GTN nodes are equipped with one or more multiplexors and also a voice concentrator or switch. Multiplexors provide a means to manage the available capacity enabling it to be shared by voice and data traffic. All voice traffic passing through a GTN node is directed to the voice concentrator which determines, on the basis of the number dialled, where a call is to be routed.

The GTN voice network supports desk-to-desk dialling between connected offices and also offers a 'break-out' facility providing access to remote offices and clients on the public network by routing calls across the GTN network to the node nearest its final destination. A GTN telephone directory is available detailing office and 'break-out' dialling codes, and numbers allowing direct access to some fourteen thousand civil servants.

A common dialling or numbering scheme has been implemented on the GTN. Access is by means of a special GTN code followed by a combination of numbers which will direct the call to its destination.

The GTN data service is offered as a point-to-point facility providing dedicated capacity between any two offices as required. Capacity can be tailored to user needs and is typically used to bridge local area networks or to connect remote terminals to a central computer.

Proposed Virtual Private Network

TE are planning to offer Virtual Private Network (VPN) facilities to large clients at discounted rates under which networking would be provided from anywhere in the State.

VPN will allow public telephone and data services to appear to users as if they were supplied on a dedicated basis, similar to the way in which the GTN appears to operate.

With VPN, dispersed offices within an organisation can be treated as being part of a single network. Within this network VPN voice services can deliver GTN features such as desk-to-desk dialling and call transfer. In addition, a tailored dialling code or numbering system can be employed, as on the GTN.

VPN services could have the following advantages

- services are based on public networks giving countrywide connection which would not otherwise be economically achievable on the GTN
- volume-based discounts are offered by TE
- services could form the basis for providing cheaper access for the general public to Government departments/offices
- network management and administration (including billing and statistics) would be the responsibility of the VPN supplier, thus reducing administrative costs.

In June 1995, the Minister for Finance approved a study into the potential use of VPN services and that study is currently in progress.

Appendix B

Examination Methodology

The examination was conducted by staff of the Office of the Comptroller and Auditor General.

Records of voice traffic (including GTN calls) are maintained by the individual departments and, in addition, the Department of Finance (Finance) monitors GTN usage.

The examination team requested and reviewed telephone monitoring data in respect of five departments. The data was analysed with the aid of an audit software tool - Interactive Data Extraction and Analysis (IDEA) and a profile of each department's telephone usage was developed.

The departments examined were

- the Department of Health
- the Department of Education
- the Department of Defence
- the Department of Arts, Culture and the Gaeltacht
- the Department of Transport, Energy and Communications.

To determine cost-effectiveness, a comparison was made, in the case of calls actually made through the GTN by the five departments, between the cost of using the GTN and the alternative cost of the public network.

The scope for economy gains was based on recent monitoring figures (second quarter 1995) recorded by Finance and assumptions agreed with them on the likely effect of increased traffic on costs and savings.

All figures were computed on a VAT exclusive basis to avoid any circular flow effects.

Appendix C

Capacity Monitoring

The Department of Finance currently monitors GTN capacity.

Monitoring is based on observations of hourly traffic flow. Using this data it determines how much capacity is required to facilitate users at a given service level.[1]

The result of Finance's capacity monitoring is set out beneath.

Comparison of capacity and requirements during peak periods for January-April 1995

GTN node	Circuits available for voice traffic	Maximum number of circuits required	Minimum number of circuits required
Athlone	25	28	25
Ballina	26	18	15
Castlebar	24	23	21
Cavan	21	18	16
Cork	43	39	37
Ennis	23	18	17
Galway	26	26	24
Killarney	21	18	16
Letterkenny	20	13	8
Limerick	60	47	40
Nenagh	25	22	21
Sligo	21	24	21
Waterford	25	20	17

[1] *The service level is based on achieving a 2 per cent grade of service at the busy hour, i.e. that capacity is designed to achieve a probability of a failure rate of no more than 2 calls in 100 at those times.*

Appendix D

Survey of Users

As part of the examination, a survey was conducted of 60 users in three departments[1]. While these results must be viewed with caution, as they represent users' best estimates of their telephone usage, they are nonetheless helpful as an indicator of the users' perception of the service.

The results of the survey indicate the destination of outgoing calls as can be seen in Table D.1.

Table D.1
Destination of outgoing calls

Destination	%	%
Interdepartmental traffic		
Dublin region	47	
Other regions	21	68
Calls to the public		
Dublin region	20	
Other regions	9	29
International calls	3	3
Total		100

The respondents estimated that 78 per cent of incoming calls emanated from Government departments while 22 per cent came from the public.

Other survey findings were

- Of the 85 per cent of respondents who stated that they used the GTN, 67 per cent stated that they encountered problems. The problems seem to occur for the most part in making a GTN connection.

- 42 per cent of respondents stated that they used the break-out facility. Although this figure appears low, it should be noted that some users may have no need to use break-out due to the nature of their work.

- 33 per cent of those surveyed had no formal instruction in the use of the GTN.

[1] *The Departments of Defence, Social Welfare and the Office of the Revenue Commissioners.*