

## 9. Quality of Service

### Introduction

This section summarizes various kinds of service quality data filed by certain incumbent local exchange telephone companies for calendar year 2002. The data track both the quality of service provided to retail customers (business and residential) and to access customers (interexchange carriers).

The Federal Communications Commission (FCC or Commission) does not impose service quality standards on communications common carriers. Rather, the Commission annually monitors data submitted by incumbent carriers that collectively serve about 90% of the nation's access lines and periodically publishes a report on quality of service trends.<sup>1</sup> The data contained in this section provide a summary of recent quality of service indicators including customer-initiated trouble reports and company responses. This section publishes information about company performance and statistics about company responsiveness to network failures and associated consumer complaints. We include, in the tables following the text, comparative data about various service parameters including installation, maintenance, switch downtime, and trunk blocking, along with associated customer perception data.

### Background

At the end of 1983, anticipating AT&T's imminent divestiture of its local operating companies, the Commission directed the Common Carrier Bureau<sup>2</sup> to establish a monitoring program that would provide a basis for detecting adverse trends in network service quality. Throughout 1985, the Bureau modified the service quality reporting requirements to reduce unnecessary paperwork and to ensure that needed information would be provided in a more uniform format. The data were received semiannually, typically in March and August, and formed the basis for FCC summary reports published in June 1990 and July 1991.

With the implementation of price-cap regulation for certain local exchange carriers, the Commission made several major changes to the service quality monitoring program beginning with reports filed in 1991. First, the Commission expanded the class of companies filing reports to

---

1 The last report was released in January 2003, which covered data for 2001. *See* Industry Analysis and Technology Division, Wireline Competition Bureau, Federal Communications Commission, *Quality of Service of the Local Operating Companies* (rel. Jan. 30, 2003). This report can be found on the Commission's website at [www.fcc.gov/wcb/iatd/stats.html](http://www.fcc.gov/wcb/iatd/stats.html) under the file name QUAL02.ZIP.

2 As the result of a reorganization in March 2002, Common Carrier Bureau functions described in this section are now performed by the Wireline Competition Bureau. In this section, references to the Common Carrier Bureau apply to activities prior to the above date.

include non-Bell carriers subject to price-cap regulation.<sup>3</sup> Second, the Commission included service quality reports in the Automated Reporting Management Information System (ARMIS).<sup>4</sup> Third, the Commission ordered significant changes to the kinds of data these carriers had to report.<sup>5</sup> Following these developments, the Commission released service quality summary reports in February 1993, March 1994, March 1996, September 1998, December 1999, December 2001, and January 2003.

In 1996, pursuant to requirements in the Telecommunications Act of 1996,<sup>6</sup> the Commission reduced the frequency of the filed data from quarterly to annual submissions.<sup>7</sup> In May 1997, relevant definitions were clarified further. These changes have been reflected starting with data covering the 1997 calendar year.

### The Data

- 3 *Policy and Rules Concerning Rates for Dominant Carriers*, CC Docket No. 87-313, Second Report and Order, 5 FCC Rcd 6786, 6827-31 (1990) (*LEC Price Cap Order*) (establishing the current service quality monitoring program and incorporating the service quality reports into the ARMIS program), Erratum, 5 FCC Rcd 7664 (1990), *modified on recon.*, 6 FCC Rcd 2637 (1991), *aff'd sub nom.*, *Nat'l Rural Telecom Ass'n v. FCC*, 988 F.2d 174 (D.C. Cir. 1993). The incumbent local exchange carriers that are rate-of-return regulated are not subject to federal service quality reporting requirements.
- 4 *LEC Price Cap Order*, 5 FCC Rcd at 6827-30. The ARMIS database includes a variety of mechanized company financial and infrastructure reports in addition to the quality-of-service reports. Most data are available disaggregated to a study area or state level.
- 5 *Id.*; *Policy and Rules Concerning Rates for Dominant Carriers*, CC Docket No. 87-313, Memorandum Opinion and Order, 6 FCC Rcd 2974 (1991) (*Service Quality Order*), *recon.*, 6 FCC Rcd 7482 (1991). Previously the Common Carrier Bureau had collected data on five basic service quality measurements from the Bell Operating Companies. These were customer satisfaction levels, dial tone delay, transmission quality, on time service orders, and percentage of call blocking due to equipment failure.
- 6 *Telecommunications Act of 1996*, Pub. L. No. 104-104, 110 Stat. 56.
- 7 Orders implementing filing frequency and other reporting requirement changes associated with implementation of the Telecommunications Act of 1996 are as follows: *Implementation of the Telecommunications Act of 1996: Reform of Filing Requirements and Carrier Classifications*, CC Docket No. 96-193, Order and Notice of Proposed Rulemaking, 11 FCC Rcd 11716 (1996); *Revision of ARMIS Quarterly Report (FCC Report 43-01) et al.*, CC Docket No. 96-193, Order, 11 FCC Rcd 22508 (1996); *Policy and Rules Concerning Rates for Dominant Carriers*, CC Docket No. 87-313, Memorandum Opinion and Order, 12 FCC Rcd 8115 (1997); *Revision of ARMIS Annual Summary Report (FCC Report 43-01) et al.*, AAD No. 95-91, Order, 12 FCC Rcd 21831 (1997).

The source data used in preparing this section may be useful for further investigation and can be readily extracted from the ARMIS 43-05 and 43-06 tables on the online database maintained on the FCC website at [www.fcc.gov/wcb/eafs](http://www.fcc.gov/wcb/eafs). The data are also available from Qualex International, at (202) 863-2893. A number of prior data summary reports are available through the FCC's Reference Information Center (Courtyard Level) at 445 12th Street, SW, Washington, D.C. 20554.

The data presented in this section summarize the most recent ARMIS 43-05 and 43-06 carrier reports, setting forth data for calendar year 2002. The tables accompanying this section highlight many of the data elements now received by the Commission. Tables include data from each major holding company of the regional Bell companies, along with GTE which is now part of Verizon, and Sprint.<sup>8</sup>

The data items summarized in the tables are based on information aggregated by the companies on a study area or state basis as well as a fairly extensive amount of raw data about switching outages, including outage durations and number of lines affected. A number of useful measures were calculated from these raw data records such as outage line-minutes per access line and average outage duration.

The data summarized in the tables of this section contain sums, or weighted averages, of data reported at the state or study area level of aggregation. Such data are useful in assessing overall trends. Where information is reported in terms of percentages or average time intervals, data presented in the tables are based on a composite of individual study area data that are calculated by weighting the percentage or time interval figures. For example, we weight the percent of commitments met by the corresponding number of orders provided in the filed data.<sup>9</sup>

---

8 In February 1992, United Telecommunications Inc. became Sprint Corporation (Local Division); and in March 1993, Sprint Corporation acquired Centel Corporation. Bell Atlantic and NYNEX merged in August 1997, and then merged with GTE in 2000. Verizon Communications is shown separately for GTE, Verizon North (the former NYNEX companies), and Verizon South (the former Bell Atlantic Companies). SBC, Pacific Telesis and Ameritech are shown separately despite the merger of SBC and Pacific Telesis in April 1997 and SBC and Ameritech in October 1999.

9 Company composite data were typically recalculated on a consistent basis from study area data, particularly to assure that averages are calculated in a consistent manner. Although the companies have prepared their own company rollups, we have discovered various inconsistencies or inaccuracies in some of these company-prepared composites. We have therefore weighted data involving percentages or time intervals in order to arrive at the more consistent composite data shown in the tables and expect that the companies will want to review their procedures for preparing composites. Parameters used for weighting in this section were appropriate for the composite being calculated and were based on the raw data filed by the carriers but are not necessarily shown in the tables. For example, we calculate composite installation interval data by summing the

The key items contained in the tables are summarized below. Installation, maintenance and customer complaint data are shown in Table 9.1 and switch downtime and trunk servicing data are shown in Table 9.2. Installation and maintenance data are presented separately for services provided to end users and for interexchange carrier access facilities. Outage data categorized by cause are shown in Table 9.3. Customer perception data are contained in Table 9.4 and the associated survey sample sizes are contained in Table 9.5. The tables cover data for 2002. This section displays a number of data elements that have remained roughly comparable over the past few years. More detailed information on the raw data from which this section has been developed is contained on the Commission's website for the ARMIS database noted above and in the report noted in footnote 2. In addition, complete data descriptions are available in several Commission Orders.<sup>10</sup>

---

individual study area results multiplied by the number of installation orders reported for each study area and then dividing the result by the total number of orders.

- 10 Orders implementing filing frequency and other reporting requirement changes associated with implementation of the Telecommunications Act of 1996 are as follows: *Implementation of the Telecommunications Act of 1996: Reform of Filing Requirements and Carrier Classifications*, Order and Notice of Proposed Rulemaking, 11 FCC Rcd 11716 (1996); *Revision of ARMIS Quarterly Report (FCC Report 43-01) et al.*, Order, 11 FCC Rcd 22508 (1996); *Policy and Rules Concerning Rates for Dominant Carriers*, Memorandum Opinion and Order, 12 FCC Rcd 8115 (1997); *Revision of ARMIS Annual Summary Report (FCC Report 43-01) et al.*, Order, 12 FCC Rcd 21831 (1997).

**Table 9.1  
Installation, Maintenance, & Customer Complaints  
Company Comparison - 2002**

Company	BellSouth	Qwest	SBC Ameritech	SBC Pacific	SBC Southwestern	Verizon North	Verizon South	Verizon GTE	Sprint
<b>ACCESS SERVICES PROVIDED TO INTEREXCHANGE CARRIERS -- SWITCHED ACCESS</b>									
Percent Installation Commitments Met	100.0	98.5	85.2	90.5	85.1	98.7	98.7	91.2	93.8
Average Installation Interval (days)	19.1	12.7	43.3	28.3	31.7	29.7	23.0	25.5	16.5
Average Repair Interval (hours)	0.7	1.7	22.3	16.6	13.5	2.6	3.2	10.4	2.8
<b>ACCESS SERVICES PROVIDED TO INTEREXCHANGE CARRIERS -- SPECIAL ACCESS</b>									
Percent Installation Commitments Met	99.9	96.9	98.1	85.3	89.6	88.4	94.6	90.5	92.9
Average Installation Interval (days)	13.1	10.8	15.2	28.7	12.7	25.2	17.1	20.5	9.9
Average Repair Interval (hours)	3.0	2.4	4.0	3.4	3.2	8.1	3.3	14.6	4.7
<b>LOCAL SERVICES PROVIDED TO RESIDENTIAL AND BUSINESS CUSTOMERS</b>									
Percent Installation Commitments Met	93.0	99.4	99.0	99.5	98.6	98.6	98.5	98.7	97.8
Residence	97.1	99.5	99.1	99.6	98.7	98.6	98.7	98.9	98.2
Business	88.9	98.6	98.3	98.9	98.0	97.8	96.7	96.8	94.9
Average Installation Interval (days)	1.3	0.6	2.1	1.4	1.6	1.1	1.3	0.6	1.6
Residence	1.0	0.5	2.1	1.2	1.6	1.0	1.2	0.4	1.5
Business	1.6	1.4	2.6	2.7	1.8	1.8	2.4	1.7	2.5
Average Out of Service Repair Interval (hours)	18.4	13.6	18.6	23.5	19.8	23.8	21.6	14.3	15.1
Residence	20.0	13.6	18.9	25.9	21.0	25.1	22.9	15.4	15.2
Business	10.6	13.5	17.1	12.1	13.2	18.9	15.2	9.2	13.7
Initial Trouble Reports per Thousand Lines	285.0	111.4	165.7	129.0	186.8	175.1	135.8	143.9	165.6
Total MSA	267.5	110.5	169.1	126.8	173.3	182.1	132.7	138.2	148.0
Total Non MSA	380.7	115.1	128.4	179.9	254.4	133.1	172.3	165.1	200.6
Total Residence	326.7	134.1	214.6	168.8	258.8	245.0	178.5	165.2	202.3
Total Business	174.8	61.2	75.1	58.9	71.9	81.8	65.1	95.0	69.0
Troubles Found per Thousand Lines	161.3	76.2	111.9	106.2	130.2	125.9	102.9	122.1	93.0
Repeat Troubles as a Pct. of Trouble Reports	19.8%	21.9%	28.3%	13.3%	15.9%	20.1%	18.9%	12.4%	19.6%
Res. Complaints per Mill. Res. Access Lines	203.8	169.1	324.4	20.4	26.8	166.9	312.5	86.7	110.3
Bus. Complaints per Mill. Bus. Access Lines	59.3	129.3	102.4	4.6	7.1	47.9	58.6	33.8	40.2

Please refer to text for notes and data qualifications

**Table 9.2  
Switch Downtime & Trunk Blocking  
Company Comparison - 2002**

Company	BellSouth	Qwest	SBC Ameritech	SBC Pacific	SBC Southwestern	Verizon North	Verizon South	Verizon GTE	Sprint
Total Access Lines in Thousands	22,955	15,682	19,151	17,248	15,294	17,442	21,368	16,894	7,953
Total Trunk Groups	3,577	3,378	1,111	1,581	802	826	1,005	1,669	7,436
Total Switches	1,637	1,337	1,455	778	1,652	1,279	1,344	3,130	1,563
Switches with Downtime									
Number of Switches	68	252	201	32	71	34	28	40	136
As a Percentage of Total Switches	4.2%	18.8%	13.8%	4.1%	4.3%	2.7%	2.1%	1.3%	8.7%
Average Switch Downtime in Seconds per Switch									
For All Events	97.8	95.0	90.5	4.2	49.0	36.3	31.2	117.2	460.8
For Unscheduled Events Over 2 Minutes	88.0	78.0	29.5	3.2	44.7	33.6	30.3	118.9	381.1
For Unscheduled Downtime More Than 2 Minutes									
Number of Occurrences or Events	33	42	25	8	11	26	13	42	71
Events per Hundred Switches	2.0	3.1	1.7	1.0	0.7	2.0	1.0	1.3	4.5
Events per Million Access Lines	1.44	2.68	1.31	0.46	0.72	1.49	0.61	2.49	8.93
Average Outage Duration in Minutes	72.7	41.4	28.6	5.1	111.8	27.6	52.2	147.7	139.8
Average Lines Affected per Event in Thousands	21.8	6.3	28.1	37.5	23.8	23.7	22.2	6.9	12.3
Outage Line-Minutes per Event in Thousands	766.9	218.7	644.9	171.9	2,900.1	483.1	163.6	859.8	1,896.0
Outage Line-Minutes per 1,000 Access Lines	1,102.5	585.7	841.9	79.7	2,085.8	720.1	99.5	2,137.6	16,925.4
For Scheduled Downtime More Than 2 Minutes									
Number of Occurrences or Events	4	51	58	0	7	3	3	1	64
Events per Hundred Switches	0.2	3.8	4.0	0.0	0.4	0.2	0.2	0.0	4.1
Events per Million Access Lines	0.17	3.25	3.03	0.00	0.46	0.17	0.14	0.06	8.05
Average Outage Duration in Minutes	5.1	4.0	24.8	NA	14.3	10.7	2.3	NA	32.4
Avg. Lines Affected per Event in Thousands	8.5	11.2	18.5	NA	52.3	20.8	23.6	NA	9.9
Outage Line-Minutes per Event in Thousands	28.1	53.3	539.9	NA	243.6	203.9	55.6	NA	364.7
Outage Line-Minutes per 1,000 Access Lines	4.9	173.4	1,635.2	0.0	111.5	35.1	7.8	0.4	2,934.9
% Common Trunk Grps. Exceeding Blocking Objectives	2.60%	2.19%	8.37%	1.45%	0.25%	3.63%	8.26%	0.06%	0.15%

NA: Not available

Please refer to text for notes and data qualifications

**Table 9.3  
Switch Downtime Causes  
Company Comparison - 2002**

Company	BellSouth	Qwest	SBC Ameritech	SBC Pacific	SBC Southwestern	Verizon North	Verizon South	Verizon GTE	Sprint
<b>Total Number of Outages</b>									
1. Scheduled	4	51	58	0	7	3	3	1	64
2. Procedural Errors -- Telco. (Inst./Maint.)	0	0	0	0	4	3	1	4	20
3. Procedural Errors -- Telco. (Other)	5	7	1	1	0	0	0	9	0
4. Procedural Errors -- System Vendors	4	4	1	0	1	2	0	1	1
5. Procedural Errors -- Other Vendors	0	1	0	0	2	1	2	2	1
6. Software Design	9	2	13	0	3	7	2	1	3
7. Hardware Design	1	0	9	0	0	0	0	0	0
8. Hardware Failure	8	25	1	6	0	12	5	15	13
9. Natural Causes	1	0	0	0	1	1	1	4	3
10. Traffic Overload	0	0	0	0	0	0	0	0	0
11. Environmental	0	0	0	0	0	0	0	1	2
12. External Power Failure	4	3	0	0	0	0	2	5	9
13. Massive Line Outage	0	0	0	0	0	0	0	0	3
14. Remote	0	0	0	0	0	0	0	0	9
15. Other/Unknown	1	0	0	1	0	0	0	0	7
<b>Total Outage Line-Minutes per Thousand Access Lines</b>									
1. Scheduled	4.9	173.4	1,635.2	0.0	111.5	35.1	7.8	0.4	2,934.9
2. Procedural Errors -- Telco. (Inst./Maint.)	0.0	0.0	0.0	0.0	1,661.7	186.1	8.7	84.7	224.3
3. Procedural Errors -- Telco. (Other)	25.0	146.5	7.7	10.0	0.0	0.0	0.0	373.3	0.0
4. Procedural Errors -- System Vendors	211.0	28.3	3.3	0.0	7.0	24.3	0.0	94.9	264.7
5. Procedural Errors -- Other Vendors	0.0	84.6	0.0	0.0	390.1	0.5	0.5	109.9	9.6
6. Software Design	718.2	3.0	747.8	0.0	24.6	394.4	23.4	0.2	2,061.1
7. Hardware Design	3.7	0.0	76.5	0.0	0.0	0.0	0.0	0.0	0.0
8. Hardware Failure	78.4	180.7	6.7	47.9	0.0	114.7	17.7	674.6	2,446.6
9. Natural Causes	5.5	0.0	0.0	0.0	2.5	0.1	21.6	128.4	7,190.4
10. Traffic Overload	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
11. Environmental	0.0	0.0	0.0	0.0	0.0	0.0	0.0	561.7	60.6
12. External Power Failure	45.4	142.5	0.0	0.0	0.0	0.0	27.6	110.0	1,941.4
13. Massive Line Outage	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1,725.9
14. Remote	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	972.7
15. Other/Unknown	15.3	0.0	0.0	21.9	0.0	0.0	0.0	0.0	28.2

Please refer to text for notes and data qualifications

**Table 9.4**  
**Customer Perception Surveys - Percent of Customers Dissatisfied**  
**Company Comparision - 2002**

Company	BellSouth	Qwest	SBC Ameritech	SBC Pacific	SBC Southwestern	Verizon North	Verizon South	Verizon GTE	Sprint
Installations:									
Residential	10.25	7.17	10.67	6.35	8.12	5.26	5.07	4.36	NA
Small Business	9.58	15.93	11.85	6.30	8.87	9.20	8.16	7.69	NA
Large Business	7.33	NA	10.69	5.55	6.44	1.84	2.73	4.79	NA
Repairs:									
Residential	14.60	9.30	14.57	7.25	9.63	15.96	14.62	12.36	NA
Small Business	8.49	11.82	12.81	5.61	6.76	11.89	9.53	9.05	NA
Large Business	6.67	NA	11.67	4.08	5.90	4.39	2.98	4.42	NA
Business Office:									
Residential	12.26	3.63	13.23	5.96	8.88	6.78	5.71	6.20	NA
Small Business	14.26	7.09	12.48	5.79	7.67	7.67	8.73	9.04	NA
Large Business	9.00	NA	10.99	5.88	6.67	2.21	6.86	5.73	NA

NA: Not available

Please refer to text for notes and data qualifications



**Table 9.5  
Customer Perception Surveys - Sample Sizes  
Company Comparison - 2002**

Company	BellSouth	Qwest	SBC Ameritech	SBC Pacific	SBC Southwestern	Verizon North	Verizon South	Verizon GTE	Sprint
<b>Installations:</b>									
Residential	27,226	7,086	10,693	10,742	7,899	20,440	18,597	22,434	NA
Small Business	31,351	3,542	10,477	10,515	7,240	18,590	18,385	18,332	NA
Large Business	8,496	NA	3,355	3,206	2,660	837	1,104	313	NA
<b>Repairs:</b>									
Residential	27,948	2,267	10,722	12,615	10,819	20,349	18,550	18,523	NA
Small Business	34,260	513	10,745	10,358	10,719	20,323	18,116	22,439	NA
Large Business	7,929	NA	3,710	3,063	2,726	780	925	294	NA
<b>Business Office:</b>									
Residential	41,753	7,086	21,409	23,834	38,342	10,851	13,622	14,462	NA
Small Business	11,106	3,542	20,787	21,294	4,823	5,308	5,683	5,500	NA
Large Business	400	NA	3,454	4,681	2,639	660	845	227	NA

NA: Not available

Please refer to text for notes and data qualifications