9. Quality of Service

Introduction

This section summarizes various kinds of service quality data filed by the regional Bell operating companies, Embarq (formerly Sprint) and other price-cap regulated incumbent local exchange carriers for calendar year 2007.[1] The data track the quality of service provided to both retail customers (business and residential) and access customers (interexchange carriers).

The Commission does not impose service quality standards on communications common carriers. Rather, the Commission annually monitors quality of service data submitted by incumbent local exchange carriers that are regulated as price-cap carriers. The Commission summarizes these data and periodically publishes a report on quality of service trends.[2] The tables included in this section present comparative data on key company performance indicators. These include objective indicators of installation and maintenance performance, switch outages and trunk blocking performance. The tables also present data on customer perceptions of service, as well as the level of consumer complaints.

Background

At the end of 1983, anticipating AT&T's imminent divestiture of its local operating companies, the Commission directed the Common Carrier Bureau[3] to establish a monitoring

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1 In February 1992, United Telecommunications Inc. became Sprint Corporation (Local Division); and in March 1993, Sprint Corporation acquired Centel Corporation. Recently Sprint spun off its Local Division as a new company named Embarq. 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). Pacific Telesis, Ameritech, and SNET are shown separately despite the merger of SBC and Pacific Telesis in April 1997, SBC and SNET in October 1998, and SBC and Ameritech in October 1999. Following the merger of SBC and AT&T, the name SBC was changed to AT&T. More recently AT&T acquired BellSouth.

2 The latest report, which covers data for 2006, was released February 1, 2008. *See* Industry Analysis and Technology Division, Wireline Competition Bureau, Federal Communications Commission, *Quality of Service of Incumbent Local Exchange Carriers* (February 2008). This report includes data revisions that were received after the cutoff date for data in this Monitoring Report. It also includes an analysis of the quality of the data and the significance of changes over time. It can be found on the Commission's website *at* www.fcc.gov/wcb/stats as a PDF file.

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

program that would provide a basis for detecting adverse trends in Bell operating company network service quality. Subsequently, the Bureau modified the service quality reporting requirements to reduce unnecessary paperwork and to ensure that needed information would be provided in a uniform format. Initially, the data were received twice yearly. The data collected for 1989 and 1990 formed the basis for FCC summary reports published in June 1990 and July 1991, respectively, highlighting five basic elements of quality of service data collected at that time.

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 include non-Bell carriers that have elected to be subject to price-cap regulation.[4] These carriers are known as non-mandatory price-cap carriers and most of them are much smaller than the Bell operating companies. Second, it included service quality reports in the Automated Reporting Management Information System (ARMIS).[5] Finally, the Commission ordered significant changes to the kinds of data these carriers had to report.[6] Following these developments, the Commission released service quality summary reports in February 1993, March 1994, March 1996, September 1998, December 1999, December 2001, January 2003, February 2004, December 2004, November 2005, February 2007, and February 2008 that focused on the largest reporting companies.[7] This

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4 *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.

5 *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 level which generally represents operations within a given state.

6 *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.

7 The reports have included data from the mandatory price-cap companies and the largest non-mandatory carriers, GTE and Embarq (formerly Sprint). GTE is now a part of Verizon, a mandatory price-cap carrier. Non-mandatory carriers are not required to file customer satisfaction data that appears in the ARMIS 43-06 report.

section summarizes current year data from all reporting price-cap companies used in preparation of the summary reports.[8]

In 1996, pursuant to requirements in the Telecommunications Act of 1996,[9] the Commission reduced the frequency of data reporting for all reports to annual submissions.[10] In May 1997, relevant definitions were clarified further. These changes have been reflected in filed data starting with the 1997 calendar year. The raw data are now filed annually in April of each year.

The Data

The data presented in this section summarize the most recent ARMIS 43-05 and 43-06 carrier reports.[11] Tables in this year's summary include data from the regional Bell operating companies, Embarq (formerly Sprint), and all other reporting incumbent local exchange carriers. Tables 9.1(a), 9.2(a), 9.3(a), 9.4 and 9.5 cover data for the Bell operating companies, or mandatory price cap companies, and Tables 9.1(b), 9.2(b) and 9.3(b) cover data for smaller non-mandatory price-cap companies. These companies report quality of service data at a study area level which generally represents operations within a given state. Although the companies provide selected company aggregate data, the tables of this section contain summary data recalculated by FCC staff as the composite aggregate of all study areas for each listed entity. This section also includes a fairly

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8 The following smaller non-mandatory price-cap companies that file ARMIS 43-05 data are included in this summary: Century Tel., Cincinnati Bell, Citizens, Citizens Frontier, Iowa Telecom, and Windstream Communications (spun off from Alltel Corp. and merged with Valor Telecommunications). Embarq (formerly Sprint), the largest of the non-mandatory price-cap companies, has been included in prior summaries.

9 Telecommunications Act of 1996, Pub. L. No. 104-104, 110 Stat. 56.

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*, 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).

11 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. The data are also available from Best Copy and Printing, Inc. at (202) 488-5300. A number of prior-year data summary reports are available through the FCC's Reference Information Center (Courtyard Level) at 445 12th Street, SW, Washington, D.C. 20554.

extensive summary of data about individual switching outages, including outage durations and numbers of lines affected, for which no company calculated summaries are provided. Switch outage data have also been aggregated to the company level for inclusion in the tables.

The company-level quality of service data included in the tables of this section are derived by calculating sums or weighted averages of data reported at the study area level. In particular, where companies report study area information in terms of percentages or average time intervals, this section presents company composites that are calculated by weighting the percentage or time interval figures from all study areas within that company. For example, we weight the percent of commitments met by the corresponding number of orders provided in the filed data.[12]

In the case of outage data summarized in Tables 9.2, and 9.3, we calculate a number of useful statistics from raw data records for individual switches with outages lasting more than two minutes. These statistics include the total number of events lasting more than two minutes, the average outage duration, the average number of outages per hundred switches, the average number of outages per million access lines, and the average outage line-minutes per thousand access lines and per event. The outage line-minutes parameter is a measure that combines both duration and number of lines affected in a single parameter. We derive this parameter from the raw data by multiplying the number of lines involved in each outage by the duration of the outage and summing the resulting values. We then divide the resulting sum by the total number of thousands of access lines or of events to obtain average outage line-minutes per access line and average outage line minutes per event respectively.

The tables contained in this section cover data for 2007. Table 9.1 provides installation, maintenance and customer complaint data. The installation and maintenance data are presented separately for local services provided to end users and access services provided to interexchange carriers. Table 9.2 shows switch downtime and trunk servicing data. Table 9.3 shows outage data by cause. Table 9.4 presents the percentages of residential, small business and large business customers indicating dissatisfaction with BOC installations, repairs and business offices, as determined by BOC customer perception surveys.[13] Table 9.5 shows the underlying survey sample sizes.

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12 Although companies have prepared their own company composites, we have recalculated a number of them from study area data for presentation in the tables to assure that company averages are calculated in a consistent manner. We weight data involving percentages or time intervals in order to arrive at consistent composite data shown in the tables. 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 multiplying the average installation interval at the individual study area level by the number of orders in that study area, summing the results for all study areas, and then dividing that sum by the total number of orders.

13 Customer satisfaction data, collected in the 43-06 report and summarized in Tables 9.4 and 9.5, are required to be reported only by the mandatory price-cap carriers.

More detailed information on the raw data from which this section has been developed may be found on the Commission's ARMIS web page cited earlier. Tables 9.4 and 9.5 were prepared from data filed only by the Bell operating companies in the ARMIS 43-06 report. The statistics presented in Tables 9.4 and 9.5 are straightforward and reflect the data in the format filed. Complete data descriptions are available in several Commission orders.[14]

14 *See supra* note 9.

Table 9.1 (a)
Installation, Maintenance, & Customer Complaints
Bell Companies - 2007

	AT&T Ameritech	AT&T BellSouth	AT&T Pacific	AT&T Southwestern	AT&T SNET	Qwest	Verizon North	Verizon South	Verizon GTE
ACCESS SERVICES PROVIDED TO CARRIERS -- SWITCHED ACCESS									
Percent Installation Commitments Met	99.8	100.0	99.8	98.7	99.7	99.4	98.2	97.2	98.0
Average Installation Interval (days)	21.9	17.2	19.4	22.3	11.7	14.7	14.0	11.4	21.2
Average Repair Interval (hours)	18.9	0.4	7.9	4.0	3.2	3.6	2.3	8.3	10.2
ACCESS SERVICES PROVIDED TO CARRIERS -- SPECIAL ACCESS									
Percent Installation Commitments Met	94.5	99.6	96.2	97.6	100.0	97.0	95.7	96.5	96.2
Average Installation Interval (days)	17.4	13.0	14.8	15.3	19.0	5.4	12.7	12.3	12.2
Average Repair Interval (hours)	5.5	3.1	5.0	4.5	3.6	3.5	4.5	3.7	3.8
LOCAL SERVICES PROVIDED TO RESIDENTIAL AND BUSINESS CUSTOMERS									
Percent Installation Commitments Met	98.4	96.8	99.2	99.2	99.7	99.6	98.9	98.1	97.9
Residence	98.4	98.2	99.3	99.2	99.7	99.6	99.0	98.3	98.1
Business	98.3	87.7	99.1	98.8	99.5	98.9	98.1	96.9	95.4
Average Installation Interval (days)	1.7	1.4	1.4	1.1	1.3	0.1	1.4	1.5	0.9
Residence	1.7	1.4	1.3	1.0	0.8	0.1	1.5	1.4	0.8
Business	1.8	1.4	1.8	1.6	3.1	0.5	1.4	2.0	2.2
Average Out of Service Repair Interval (hours)	21.7	18.0	30.9	30.3	21.6	16.3	25.1	39.3	22.4
Residence	22.3	19.8	32.1	31.2	22.2	17.0	26.4	44.3	24.0
Business	18.5	10.6	23.8	25.3	17.7	13.8	20.6	15.4	13.1
Initial Trouble Reports per Thousand Lines	164.7	241.6	101.2	220.8	147.4	107.7	175.7	156.1	163.4
Total MSA	165.3	233.7	100.3	216.3	146.6	121.3	175.6	149.8	155.3
Total Non MSA	158.2	288.3	125.5	242.5	156.1	43.9	176.1	235.7	197.0
Total Residence	227.7	287.9	142.7	286.9	191.3	133.1	227.9	221.6	202.1
Total Business	70.8	146.5	40.8	98.8	62.4	59.5	96.6	65.8	81.5
Troubles Found per Thousand Lines	132.6	173.0	81.1	170.3	110.2	88.5	139.9	122.0	134.7
Repeat Troubles as a Pct. of Trouble Reports	13.1%	15.9%	8.6%	13.9%	12.0%	20.7%	19.2%	18.3%	15.3%
Res. Complaints per Mill. Res. Access Lines	20.8	150.9	23.7	36.0	13.1	102.9	145.2	899.7	253.9
Bus. Complaints per Mill. Bus. Access Lines	5.3	41.8	5.6	12.6	5.4	28.8	40.0	66.0	66.0

NA: Not available

Please refer to text for notes and data qualifications

Table 9.1 (b)
Installation, Maintenance, & Customer Complaints
Other Price-Cap Companies - 2007

	Century Tel.	Cincinnati	Citizens	Citizens Frontier	Embarq	Hawaiian Telecom	Iowa Telecom	Windstream Alltel	WindStream Valor
ACCESS SERVICES PROVIDED TO CARRIERS -- SWITCHED ACCESS									
Percent Installation Commitments Met	96.0	97.9	93.6	98.3	95.3	83.4	56.5	96.4	88.8
Average Installation Interval (days)	20.0	26.7	16.6	22.4	11.1	12.4	17.7	6.8	10.3
Average Repair Interval (hours)	264.2	NA	6.8	9.3	2.0	28.5	11.9	4.0	51.1
ACCESS SERVICES PROVIDED TO CARRIERS -- SPECIAL ACCESS									
Percent Installation Commitments Met	95.0	95.2	89.4	96.0	94.1	71.1	89.0	95.8	83.8
Average Installation Interval (days)	16.3	28.7	17.2	22.1	10.4	16.8	1.2	7.8	10.0
Average Repair Interval (hours)	80.3	4.5	8.2	75.4	6.9	28.5	17.3	3.4	17.3
LOCAL SERVICES PROVIDED TO RESIDENTIAL AND BUSINESS CUSTOMERS									
Percent Installation Commitments Met	97.7	99.5	91.8	98.9	97.0	88.2	96.6	97.9	95.8
Residence	98.4	99.6	91.9	99.0	97.3	92.1	96.7	98.1	96.0
Business	95.0	99.0	91.7	98.5	95.4	73.1	95.6	95.8	92.8
Average Installation Interval (days)	0.8	2.3	4.4	4.4	1.7	5.0	1.2	3.1	4.2
Residence	0.6	1.9	3.8	3.9	1.6	4.2	1.1	3.0	4.2
Business	1.5	4.3	6.0	6.9	2.3	8.2	1.9	3.6	4.3
Average Out of Service Repair Interval (hours)	17.4	20.1	17.8	17.2	18.0	40.1	18.5	16.0	23.7
Residence	17.5	21.2	18.2	17.5	18.0	43.4	19.1	16.5	24.1
Business	15.8	14.8	15.7	15.5	17.8	31.8	13.1	12.6	20.4
Initial Trouble Reports per Thousand Lines	180.6	118.4	275.0	268.8	184.3	114.7	182.6	175.2	287.4
Total MSA	196.0	118.4	NA	256.1	160.8	114.9	177.5	168.2	245.3
Total Non MSA	166.9	NA	275.0	280.4	234.9	114.3	184.0	181.2	320.0
Total Residence	219.4	157.3	308.1	303.6	231.8	137.9	214.9	251.1	342.7
Total Business	72.4	46.4	179.6	171.6	81.1	79.3	82.9	59.5	141.7
Troubles Found per Thousand Lines	156.1	110.4	240.8	233.3	108.1	101.7	163.1	147.5	230.2
Repeat Troubles as a Pct. of Trouble Reports	8.3%	11.8%	17.2%	11.5%	21.4%	12.5%	21.7%	17.6%	22.1%
Res. Complaints per Mill. Res. Access Lines	908.6	286.4	686.0	279.8	82.7	91.4	6.3	151.0	319.7
Bus. Complaints per Mill. Bus. Access Lines	143.6	67.2	144.0	22.6	23.1	23.2	0.0	25.6	65.4

NA: Not available

Please refer to text for notes and data qualifications

Table 9.2 (a)
Switch Downtime & Trunk Blocking
Bell Companies - 2007

	AT&T Ameritech	AT&T BellSouth	AT&T Pacific	AT&T Southwestern	AT&T SNET	Qwest	Verizon North	Verizon South	Verizon GTE
Total Access Lines in Thousands	13,107	17,292	13,574	11,079	1,626	11,258	11,770	16,308	12,207
Total Trunk Groups	797	1,302	1,079	630	88	1382.0	768	1,009	1,506
Total Switches	1,433	1,635	778	1,622	181	1,309	1,298	1,400	2,408
Switches with Downtime									
Number of Switches	6	7	87	62	0	156	6	5	58
As a Percentage of Total Switches	0.4%	0.4%	11.2%	3.8%	0.0%	11.9%	0.5%	0.4%	2.4%
Average Switch Downtime in Seconds per Switch*									
For All Events	0.7	2.0	1.9	10.4	0.0	112.2	421.2	14.4	561.1
For Unscheduled Events Over 2 Minutes	0.5	1.9	0.6	9.0	NA	105.9	421.2	14.4	561.1
For Unscheduled Downtime More Than 2 Minutes									
Number of Occurrences or Events	4	3	2	11	0	36	6	5	62
Events per Hundred Switches	0.3	0.2	0.3	0.7	0.0	2.8	0.5	0.4	2.6
Events per Million Access Lines	0.31	0.17	0.15	0.99	0.00	3.20	0.51	0.31	5.08
Average Outage Duration in Minutes	3.3	17.5	4.0	22.1	NA	64.2	1518.7	67.3	363.2
Average Lines Affected per Event in Thousands	16.1	19.6	57.8	11.6	NA	1.9	14.0	6.7	2.3
Outage Line-Minutes per Event in Thousands	53.1	447.5	196.5	93.7	NA	144.0	8,786.1	181.7	859.1
Outage Line-Minutes per 1,000 Access Lines	16.2	77.6	29.0	93.0	0.0	460.5	4,478.8	55.7	4,363.7
For Scheduled Downtime More Than 2 Minutes									
Number of Occurrences or Events	1	0	0	0	0	2	0	0	0
Events per Hundred Switches	0.1	0.0	0.0	0.0	0.0	0.2	0.0	0.0	0.0
Events per Million Access Lines	0.08	0.00	0.00	0.00	0.00	0.18	0.00	0.00	0.00
Average Outage Duration in Minutes	3.0	NA	NA	NA	NA	5.0	NA	NA	NA
Avg. Lines Affected per Event in Thousands	41.8	NA	NA	NA	NA	4.7	NA	NA	NA
Outage Line-Minutes per Event in Thousands	125.3	NA	NA	NA	NA	27.6	NA	NA	NA
Outage Line-Minutes per 1,000 Access Lines	9.6	0.0	0.0	0.0	0.0	4.9	0.0	0.0	0.0
% Common Trunk Grps. Exceeding Blocking Objectives	0.00%	22.20%	1.02%	0.48%	0.00%	0.1	4.56%	0.00%	0.53%

* Aggregate downtime divided by total number of company switches.

NA: Not available

Please refer to text for notes and data qualifications

Table 9.2 (b)
Switch Downtime & Trunk Blocking
Other Price-Cap Companies - 2007

	Century Tel.	Cincinnati	Citizens	Citizens Frontier	Embarq	Hawaiian Telecom	Iowa Telecom	Windstream Alltel	WindStream Valor
Total Access Lines in Thousands	528	764	1,131	670	6,303	544	209	691	444
Total Trunk Groups	249	44	246	94	483	76	55	97	253
Total Switches	187	91	205	74	1,319	134	268	249	282
Switches with Downtime									
Number of Switches	0	3	9	2	138	23	43	72	101
As a Percentage of Total Switches	0.0%	3.3%	4.4%	2.7%	10.5%	17.2%	16.0%	28.9%	35.8%
Average Switch Downtime in Seconds per Switch*									
For All Events	0.0	395.6	487.9	73.8	12,080.7	372.7	5,150.2	9,221.5	22,813.6
For Unscheduled Events Over 2 Minutes	NA	NA	461.3	73.8	12,085.0	369.9	5,150.2	8,982.9	22,669.8
For Unscheduled Downtime More Than 2 Minutes									
Number of Occurrences or Events	0	0	9	3	136	2	42	130	360
Events per Hundred Switches	0.0	0.0	4.4	4.1	10.3	1.5	15.7	52.2	127.7
Events per Million Access Lines	0.00	0.00	7.95	4.48	21.58	3.68	200.80	188.13	809.91
Average Outage Duration in Minutes	NA	NA	175.1	30.3	1953.4	413.0	547.7	286.8	296.0
Average Lines Affected per Event in Thousands	NA	NA	3.6	3.8	4.7	3.0	0.6	0.7	0.4
Outage Line-Minutes per Event in Thousands	NA	NA	314.5	96.5	28,397.5	1,179.6	252.7	218.6	177.1
Outage Line-Minutes per 1,000 Access Lines	0.0	0.0	2,502.1	432.2	612,714.3	4,338.4	50,732.5	41,126.0	143,439.1
For Scheduled Downtime More Than 2 Minutes									
Number of Occurrences or Events	0	0	1	0	2	0	0	8	10
Events per Hundred Switches	0.0	0.0	0.5	0.0	0.2	0.0	0.0	3.2	3.5
Events per Million Access Lines	0.00	0.00	0.88	0.00	0.32	0.00	0.00	11.58	22.50
Average Outage Duration in Minutes	NA	NA	91.0	NA	194.0	NA	NA	123.8	67.6
Avg. Lines Affected per Event in Thousands	NA	NA	1.8	NA	3.5	NA	NA	1.0	0.3
Outage Line-Minutes per Event in Thousands	NA	NA	165.6	NA	862.8	NA	NA	73.0	19.6
Outage Line-Minutes per 1,000 Access Lines	0.0	0.0	146.4	0.0	273.8	0.0	0.0	844.8	440.6
% Common Trunk Grps. Exceeding Blocking Objectives	3.21%	25.00%	0.00%	0.00%	6.42%	0.00%	0.00%	0.00%	0.00%

* Aggregate downtime divided by total number of company switches.

NA: Not available

Please refer to text for notes and data qualifications

Table 9.3 (a)
Switch Downtime Causes -- Outages More Than 2 Minutes in Duration
Bell Companies - 2007

	AT&T Ameritech	AT&T BellSouth	AT&T Pacific	AT&T Southwestern	AT&T SNET	Qwest	Verizon North	Verizon South	Verizon GTE
Total Number of Outages									
1. Scheduled	1	0	0	0	0	2	0	0	0
2. Procedural Errors -- Telco. (Inst./Maint.)	0	0	0	0	0	0	0	1	4
3. Procedural Errors -- Telco. (Other)	0	0	0	0	0	0	0	0	0
4. Procedural Errors -- System Vendors	0	0	0	0	0	2	0	0	1
5. Procedural Errors -- Other Vendors	0	0	0	2	0	0	0	0	1
6. Software Design	1	0	1	1	0	1	0	1	0
7. Hardware Design	0	0	0	0	0	0	0	0	0
8. Hardware Failure	3	1	1	4	0	16	4	3	18
9. Natural Causes	0	1	0	0	0	0	1	0	3
10. Traffic Overload	0	0	0	0	0	0	0	0	0
11. Environmental	0	0	0	0	0	0	1	0	2
12. External Power Failure	0	0	0	0	0	3	0	0	31
13. Massive Line Outage	0	0	0	0	0	2	0	0	0
14. Remote	1	0	0	0	0	2	0	0	0
15. Other/Unknown	0	0	0	0	0	0	0	0	1
Total Outage Line-Minutes per Thousand Access Lines									
1. Scheduled	9.6	0.0	0.0	0.0	0.0	4.9	0.0	0.0	0.0
2. Procedural Errors -- Telco. (Inst./Maint.)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	11.5	35.4
3. Procedural Errors -- Telco. (Other)	0.0	72.7	0.0	6.9	0.0	21.6	0.0	0.0	14.6
4. Procedural Errors -- System Vendors	0.0	0.0	0.0	0.0	0.0	12.9	0.0	0.0	7.0
5. Procedural Errors -- Other Vendors	0.0	0.0	0.0	58.4	0.0	0.0	0.0	0.0	17.3
6. Software Design	6.0	0.0	26.1	4.4	0.0	19.7	0.0	0.5	0.0
7. Hardware Design	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
8. Hardware Failure	10.2	4.3	2.9	23.3	0.0	48.7	2,026.2	43.7	2,911.2
9. Natural Causes	0.0	0.6	0.0	0.0	0.0	0.0	2,298.9	0.0	396.4
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	153.7	0.0	767.1
12. External Power Failure	0.0	0.0	0.0	0.0	0.0	59.7	0.0	0.0	210.3
13. Massive Line Outage	0.0	0.0	0.0	0.0	0.0	288.2	0.0	0.0	0.0
14. Remote	0.0	0.0	0.0	0.0	0.0	9.7	0.0	0.0	0.0
15. Other/Unknown	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4.3

Please refer to text for notes and data qualifications

Table 9.3 (b)
Switch Downtime Causes -- Outages More Than 2 Minutes in Duration
Other Price-Cap Companies - 2007

	Century Tel.	Cincinnati	Citizens	Citizens Frontier	Embarq	Hawaiian Telecom	Iowa Telecom	Windstream Alltel	WindStream Valor
Total Number of Outages									
1. Scheduled	0	0	1	0	2	0	0	8	10
2. Procedural Errors -- Telco. (Inst./Maint.)	0	0	0	0	7	0	0	2	3
3. Procedural Errors -- Telco. (Other)	0	0	0	0	0	0	0	0	0
4. Procedural Errors -- System Vendors	0	0	0	0	0	0	1	0	1
5. Procedural Errors -- Other Vendors	0	0	1	0	4	0	5	0	1
6. Software Design	0	0	2	0	5	0	1	1	1
7. Hardware Design	0	0	0	0	0	0	0	0	0
8. Hardware Failure	0	0	1	0	31	0	0	52	86
9. Natural Causes	0	0	2	0	16	0	0	17	71
10. Traffic Overload	0	0	0	0	0	0	0	1	0
11. Environmental	0	0	0	1	3	1	2	0	0
12. External Power Failure	0	0	3	2	10	1	31	11	63
13. Massive Line Outage	0	0	0	0	34	0	2	30	63
14. Remote	0	0	1	0	2	0	0	8	10
15. Other/Unknown	0	0	0	0	14	0	0	10	43
Total Outage Line-Minutes per Thousand Access Lines									
1. Scheduled	0.0	0.0	146.4	0.0	273.8	0.0	0.0	844.8	440.6
2. Procedural Errors -- Telco. (Inst./Maint.)	0.0	0.0	0.0	0.0	1,825.7	0.0	0.0	100.5	7,774.2
3. Procedural Errors -- Telco. (Other)	0.0	0.0	0.0	0.0	117,024.7	0.0	0.0	0.0	60.5
4. Procedural Errors -- System Vendors	0.0	0.0	0.0	0.0	0.0	0.0	330.3	0.0	9.0
5. Procedural Errors -- Other Vendors	0.0	0.0	64.3	0.0	8,751.7	0.0	2,100.0	0.0	2,019.3
6. Software Design	0.0	0.0	22.2	0.0	1,616.9	0.0	1,433.4	2,934.8	225.0
7. Hardware Design	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
8. Hardware Failure	0.0	0.0	55.5	0.0	325,191.6	0.0	0.0	4,937.1	13,557.2
9. Natural Causes	0.0	0.0	966.8	0.0	7,648.8	0.0	0.0	2,353.4	92,215.2
10. Traffic Overload	0.0	0.0	0.0	0.0	0.0	0.0	0.0	44.5	0.0
11. Environmental	0.0	0.0	0.0	110.1	759.5	4,016.9	3,449.7	0.0	0.0
12. External Power Failure	0.0	0.0	1,393.4	322.1	103,936.4	321.5	41,495.9	1,313.6	8,514.8
13. Massive Line Outage	0.0	0.0	0.0	0.0	43,469.7	0.0	1,923.1	27,863.0	15,269.4
14. Remote	0.0	0.0	0.0	0.0	1,774.7	0.0	0.0	929.2	2,198.7
15. Other/Unknown	0.0	0.0	0.0	0.0	714.4	0.0	0.0	650.0	1,595.7

Please refer to text for notes and data qualifications

Table 9.4
Customer Perception Surveys - Percent of Customers Dissatisfied
Bell Companies - 2007

	AT&T Ameritech	AT&T BellSouth	AT&T Pacific	AT&T Southwestern	AT&T SNET	Qwest	Verizon North	Verizon South	Verizon GTE
Installations:									
Residential	7.49%	6.72%	5.65%	7.19%	9.85%	3.75%	6.93%	9.79%	7.63%
Small Business	8.58%	10.19%	6.70%	6.81%	9.97%	5.87%	10.26%	13.10%	11.66%
Large Business	NA	NA	NA	NA	NA	NA	27.78%	20.88%	19.64%
Repairs:									
Residential	9.22%	9.65%	8.49%	8.53%	10.54%	6.81%	18.20%	27.61%	16.02%
Small Business	8.32%	7.32%	6.63%	7.85%	6.88%	7.36%	12.31%	12.16%	9.84%
Large Business	NA	NA	NA	NA	NA	NA	17.24%	21.92%	19.26%
Business Office:									
Residential	10.55%	9.26%	7.18%	9.17%	11.13%	1.85%	7.65%	9.49%	12.08%
Small Business	6.47%	11.70%	5.72%	6.30%	8.81%	2.92%	6.64%	8.56%	11.66%
Large Business	NA	NA	NA	NA	10.59%	NA	42.75%	42.47%	27.47%

NA: Not available

Please refer to text for notes and data qualifications

Table 9.5
Customer Perception Surveys - Sample Sizes
Bell Companies - 2007

	AT&T Ameritech	AT&T BellSouth	AT&T Pacific	AT&T Southwestern	AT&T SNET	Qwest	Verizon North	Verizon South	Verizon GTE
Installations:									
Residential	5,410	39,566	5,452	4,978	2,405	14,932	17,629	15,619	15,647
Small Business	6,551	46,386	6,683	5,652	1,314	7,172	16,764	15,327	15,577
Large Business	0	0	0	0	0	0	144	249	107
Repairs:									
Residential	5,435	26,533	5,533	4,830	1,214	16,423	17,649	15,609	15,718
Small Business	6,644	42,174	6,477	5,973	887	11,681	16,919	15,612	15,595
Large Business	0	0	0	0	0	0	145	245	109
Business Office:									
Residential	10,811	37,460	16,086	10,760	1,500	13,714	7,762	8,051	11,920
Small Business	10,612	9,573	16,446	10,670	590	6,946	3,024	3,895	2,986
Large Business	0	0	0	0	86	0	131	219	91

Please refer to text for notes and data qualifications