

DOLLARS IN
THOUSANDS

BELLSOUTH TELECOMMUNICATIONS, INC.
1997 ANNUAL ACCESS TARIFF FILING
CC DOCKET NO. 97-149
BFP REVENUE REQUIREMENTS

Appendix C
Exhibit 4
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	AL	FL	GA	KY	LA	MS	NC	SC	TN	BST
REVENUE REQUIREMENT										
1 ALLOWED RATE OF RETURN	11.25%	11.25%	11.25%	11.25%	11.25%	11.25%	11.25%	11.25%	11.25%	11.25%
2 AVG NET INV (Ex. 1, pg4, Col. P)	308,779	760,032	610,144	159,242	242,700	189,480	337,978	198,893	332,789	3,140,036
3 RETURN (L1*L2)	34,738	85,504	68,641	17,915	27,304	21,316	38,023	22,375	37,439	353,254
4 INV TAX CR - AMORT	642	1,928	1,140	387	940	576	759	559	706	7,635
5 FIXED CHARGES	7,900	20,716	15,532	4,068	7,144	5,153	8,676	5,208	8,204	82,601
6 OTHER INCOME ADJS	-1,030	-2,280	-928	-1,030	-109	-476	-680	-957	-2,709	-10,200
7 FIT "TI" (L3-L4-L5+L6)	25,165	60,579	51,041	12,429	19,111	15,112	27,907	15,652	25,819	252,817
8 FIT GROSS UP FACTOR (.35/(1-.35))	0.5385	0.5385	0.5385	0.5385	0.5385	0.5385	0.5385	0.5385	0.5385	0.5385
9 GROSS FIT (L7*L8)	13,551	32,620	27,484	6,693	10,291	8,137	15,027	8,428	13,903	136,133
10 NET FIT (L9-L4)	12,909	30,691	26,344	6,306	9,351	7,562	14,268	7,870	13,197	128,497
11 SURPLUS DEFERRED FOR FIT	972	2,447	1,449	1,230	1,088	877	1,262	1,174	3,075	13,575
12 SIT GROSS UP FACTOR	0.0526	0.0638	0.0638	0.0870	0.0870	0.0526	0.0870	0.0526	0.0638	0.0668
13 SIT ((L7+L9+L11)*L12)	2,089	6,105	5,105	1,770	2,651	1,270	3,843	1,329	2,732	26,894
14 EXP AND OTH TAX (Ex.1, pg3, Col. AB)	106,042	378,959	245,081	66,966	131,417	89,626	138,407	95,020	146,424	1,397,943
15 TOTAL REVENUE REQUIREMENT (L3+L10+L13+L14)	155,778	501,260	345,170	92,957	170,723	119,774	194,540	126,595	199,791	1,906,588

Dollars in
Thousands

BELLSOUTH TELECOMMUNICATIONS, INC.
REVENUE REQUIREMENT IMPACT
OF PART 36 OBC RULE CHANGE
ORDER PARAGRAPH 27

Appendix C
Exhibit 5
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	BST BEFORE OB&C RULE CHANGE 97/98 (A)	BST AFTER OB&C RULE CHANGE 97/98 (B)	BST IMPACT OF RULE CHANGE 97/98 (C=B-A)
REVENUE REQUIREMENT			
1	ALLOWED RATE OF RETURN	11.25%	11.25%
2	AVG NET INV	3,134,467	3,140,036
3	RETURN (L1*L2)	352,628	353,254
4	INV TAX CR - AMORT	7,623	7,635
5	FIXED CHARGES	82,441	82,601
6	OTHER INCOME ADJS	-10,182	(10,200)
7	FIT "TI" (L3-L4-L5+L6)	252,381	252,817
8	FIT GROSS UP FACTOR (.35/(1-.35))	0.5385	0.5385
9	GROSS FIT (L7*L8)	135,898	136,133
10	NET FIT (L9-L4)	128,274	128,497
11	SURPLUS DEFERRED FOR FIT	13,553	13,575
12	SIT GROSS UP FACTOR	0.0668	0.0668
13	SIT ((L7+L9+L11)*L12)	26,849	26,895
14	EXP AND OTH TAX	1,395,705	1,397,943
15	TOTAL REVENUE REQUIREMENT (L3+L10+L13+L14)	1,903,456	1,906,589

Methodology: BellSouth reflected the Part 36 Rule change, which allocates 33% of billing expense to interstate, by changing the part 36/69 model logic to effect the rule change.

Dollars in
Thousands

REVENUE REQUIREMENT IMPACT
OF PART 69 PAYPHONE RULE CHANGE
ORDER PARAGRAPH 27

Appendix C
Exhibit 6
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		BEFORE PAY RULE CHANGE 97/98 (A)	AFTER PAY RULE CHANGE 97/98 (B)	IMPACT OF RULE CHANGE 97/98 (C=B-A)
REVENUE REQUIREMENT				
1	ALLOWED RATE OF RETURN	11.25%	11.25%	11.25%
2	AVG NET INV	3,102,215	3,140,036	37,821
3	RETURN (L1*L2)	348,999	353,254	4,255
4	INV TAX CR - AMORT	7,543	7,635	92
5	FIXED CHARGES	81,605	82,601	996
6	OTHER INCOME ADJS	-10,080	(10,200)	-121
7	FIT "TI" (L3-L4-L5+L6)	249,771	252,817	3,046
8	FIT GROSS UP FACTOR (.35/(1-.35))	0.5385	0.5385	0
9	GROSS FIT (L7*L8)	134,502	136,142	1,640
10	NET FIT (L9-L4)	126,958	128,507	1,548
11	SURPLUS DEFERRED FOR FIT	13,413	13,575	161
12	SIT GROSS UP FACTOR	0.0668	0	0
13	SIT ((L7+L9+L11)*L12)	26,572	26,894	322
14	EXP AND OTH TAX	1,381,752	1,397,943	16,191
15	TOTAL REVENUE REQUIREMENT (L3+L10+L13+L14)	1,884,282	1,906,598	22,316

Methodology: BellSouth reflected the Part 69 rule change, which reclassifies all regulated payphone lines to common line BFP, by changing the part 36/69 model input.

APPENDIX D
End User Demand

Table of Exhibits

- 1** Report of past ARMIS end user demand filings report structure.
- 2** Analysis of past end user demand forecasts (1991-1995).
- 3** Analysis of past end user demand forecast (1996).
- 4** Development of ARMIS history for trending purposes.
- 5** Methodology for trending.
- 6** Results of trend analysis of filed 1997 end user demand forecast.
- 7** General conclusions from trend analysis
- 8** History test of trending accuracy
- 9** Treatment of Coin and ISDN for 1997 filing
- 10** Data and methodology for single-line business filing

Report of past ARMIS end user demand filings report structure

This exhibit details the quarterly ARMIS filings of end user demand for the periods under review covering 1991 to 1997. Due to the removal of the requirement to report ARMIS data except on an annual basis beginning in 1996, the quarterly data shown for the March, June and September dates for 1996 and 1997 are based on internal company data.

The average in-service quantity shown to the right of the quarterly data is consistent with the methodology prescribed by the FCC. Specifically the value for the year is the sum of the June, September and December value from the report year and the March and June value from the following year divided by five. This derivation was made for total billable lines and for each of the three identified components.

The created ARMIS history was then compared to the forecast average in service estimate to evaluate forecast accuracy as is shown in appendix D exhibits 2 and 3. The report structure shown below was utilized for this comparison. A description of the contents of each column follows.

Column	(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)
	ARMIS-95 Reported	ARMIS-96 Reported	Filed Estimate	Actual% Growth	Forecast% Growth	Growth Rate %Miss	Absolute Miss	Absolute %Miss
Multi-line Bus								
Single-Line Res								
Single-Line Bus								
Total Lines								

- A. Calculated average ARMIS value for the year prior to the year under review
- B. Calculated average ARMIS value for the year under review
- C. Filed estimate for the year under review
- D. Actual percent growth for the year under review. Calculated by dividing column A into column B and subtracting 1.
- E. Forecast percent growth for the review year. Derived by dividing column A into column C and subtracting 1.
- F. Percent miss in growth rate. Calculated by dividing column D into column E and subtracting one. This percent is the basis for the accuracy test for the forecast.
- G. The actual unit miss. Developed by subtracting column B from column C.
- H. The actual percent miss, generated by dividing column G by column B.

**ARMIS HISTORY USED TO DEVELOP AVGI FOR FORECAST
 VALIDATION PROCESS**

Multi-Line Business

	Mar	Jun	Sep	Dec	Average
1990		3,552,939	3,624,205	3,728,758	3,704,638
1991	3,782,243	3,835,046	3,901,794	3,964,424	3,964,772
1992	4,026,899	4,095,699	4,186,263	4,241,953	4,245,772
1993	4,316,670	4,388,273	4,486,539	4,568,145	4,574,848
1994	4,668,459	4,762,825	4,868,158	4,957,925	4,968,168
1995	5,074,965	5,176,968	5,295,478	5,395,963	5,419,230
1996	5,542,891	5,684,849	5,844,029	6,014,355	5,936,929
1997	6,153,558	5,987,853			

Single-Line Residence

	Mar	Jun	Sep	Dec	
1990		12,437,384	12,552,215	12,584,788	12,601,698
1991	12,704,865	12,729,237	12,850,855	12,918,182	12,939,187
1992	13,089,223	13,108,436	13,203,935	13,299,765	13,310,448
1993	13,465,246	13,474,856	13,591,104	13,689,840	13,713,445
1994	13,885,329	13,926,094	14,060,734	14,198,224	14,196,812
1995	14,361,193	14,437,816	14,554,544	14,664,424	14,696,319
1996	14,875,178	14,949,635	15,051,820	15,147,730	15,212,867
1997	15,399,443	15,515,706			

Single-Line Business

	Mar	Jun	Sep	Dec	
1990		560,378	560,497	566,230	563,119
1991	563,471	565,018	564,904	562,655	565,337
1992	565,650	568,460	569,255	568,026	569,336
1993	569,870	571,069	567,784	568,481	569,263
1994	569,465	569,518	571,660	568,744	568,654
1995	567,861	565,486	563,704	559,811	559,903
1996	555,275	555,239	551,914	547,552	547,529
1997	545,573	537,367			

Total Billable Lines

	Mar	Jun	Sep	Dec	
1990		16,550,701	16,736,917	16,879,776	16,869,455
1991	17,050,579	17,129,301	17,317,553	17,445,261	17,469,296
1992	17,681,772	17,772,595	17,959,453	18,109,744	18,125,555
1993	18,351,786	18,434,198	18,645,427	18,826,466	18,857,556
1994	19,123,253	19,258,437	19,500,552	19,724,893	19,733,634
1995	20,004,019	20,180,270	20,413,726	20,620,198	20,675,452
1996	20,973,344	21,189,723	21,447,763	21,709,637	21,697,325
1997	22,098,574	22,040,926			

Note: 03/96, 06/96, 09/96, 03/97, and 06/97 were obtained from internal company reports. Due to FCC rule changes concerning filing of ARMIS data only year end 96 data was filed.

Analysis of past end user demand forecasts (1991-1995)

During the 1991-1995 filing periods, the end user demand forecasts were developed in state forecast groups and summarized to the BellSouth level. For 1991-1992 the states that currently comprise BellSouth were in two separate companies, Southern and South Central Bell. In 1992 the companies were combined into one corporation and the headquarters units were merged into Atlanta. In 1995 the state forecast organizations were disbanded and centralized groups were created in the marketing units in Atlanta to handle the forecasting requirements of the business. Because of these geographic and organizational changes the documentation which could provide supporting detail on the 1991-1995 filings is not readily available, if at all.

REVIEW OF PREVIOUS FILINGS FOR PERIOD OF 1991-1995

Analysis of 1995 Filing

Column	(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)
	ARMIS-94 Reported	ARMIS-95 Reported	Filed 1995 Estimate	Actual% Growth	Forecast% Growth	Growth Rate %Miss	Absolute Miss	Absolute %Miss
Multiline Business	4,968,168	5,419,230	5,228,550	9.08%	5.24%	-42.27%	(190,680)	-3.65%
Single Line Residence	14,196,812	14,696,319	14,652,584	3.52%	3.21%	-8.76%	(43,735)	-0.30%
Single Line Business	568,654	559,903	606,416	-1.54%	6.64%	-531.52%	46,513	7.67%
Total Lines	19,733,634	20,675,452	20,487,550	4.77%	3.82%	-19.95%	(187,902)	-0.92%

Analysis of 1994 Filing

	ARMIS-93 Reported	ARMIS-94 Reported	Filed 1994 Estimate	Actual% Growth	Forecast% Growth	Growth Rate %Miss	Absolute Miss	Absolute %Miss
Multiline Business	4,574,848	4,968,168	4,869,687	8.60%	6.44%	-25.04%	(98,481)	-2.02%
Single Line Residence	13,713,445	14,196,812	14,092,202	3.52%	2.76%	-21.64%	(104,610)	-0.74%
Single Line Business	569,263	568,654	580,851	-0.11%	2.04%	-2002.79%	12,197	2.10%
Total Lines	18,857,556	19,733,634	19,542,740	4.65%	3.63%	-21.79%	(190,894)	-0.98%

Analysis of 1993 Filing

	ARMIS-92 Reported	ARMIS-93 Reported	Filed 1993 Estimate	Actual% Growth	Forecast% Growth	Growth Rate %Miss	Absolute Miss	Absolute %Miss
Multiline Business	4,245,772	4,574,848	4,543,496	7.75%	7.01%	-9.53%	(31,352)	-0.69%
Single Line Residence	13,310,448	13,713,445	13,745,644	3.03%	3.27%	7.99%	32,199	0.23%
Single Line Business	569,336	569,263	573,789	-0.01%	0.78%	-6200.00%	4,526	0.79%
Total Lines	18,125,556	18,857,556	18,862,929	4.04%	4.07%	0.73%	5,373	0.03%

Analysis of 1992 Filing

	ARMIS-91 Reported	ARMIS-92 Reported	Filed 1992 Estimate	Actual% Growth	Forecast% Growth	Growth Rate %Miss	Absolute Miss	Absolute %Miss
Multiline Business	3,964,772	4,245,772	4,210,058	7.09%	6.19%	-12.71%	(35,714)	-0.85%
Single Line Residence	12,939,187	13,310,448	13,280,357	2.87%	2.64%	-8.11%	(30,091)	-0.23%
Single Line Business	565,337	569,336	563,203	0.71%	-0.38%	-153.36%	(6,133)	-1.09%
Total Lines	17,469,296	18,125,556	18,053,618	3.76%	3.34%	-10.96%	(71,938)	-0.40%

Analysis of 1991 Filing

	ARMIS-90 Reported	ARMIS-91 Reported	Filed 1991 Estimate	Actual% Growth	Forecast% Growth	Growth Rate %Miss	Absolute Miss	Absolute %Miss
Multiline Business	3,704,638	3,964,772	4,076,141	7.02%	10.03%	42.81%	111,369	2.73%
Single Line Residence	12,601,698	12,939,187	12,926,127	2.68%	2.57%	-3.87%	(13,060)	-0.10%
Single Line Business	563,119	565,337	606,876	0.39%	7.77%	1872.81%	41,539	6.84%
Total Lines	16,869,455	17,469,296	17,609,144	3.56%	4.38%	23.31%	139,848	0.79%

Analysis of past end user demand forecast (1996)

The 1996 filing was prepared in Atlanta for the entire company by current employees, so information is available on the methodology used to forecast line demand. As indicated on Exhibit 3 page 3, single-line residence and total billable lines met the threshold of accuracy as defined. Multi-line business and single-line business failed the 10% threshold with misses of -23.5% for MLB and -639% for SLB.

In reviewing the history and the information which was used to develop the 1996 projection two issues emerged which impacted the analysis. First, it was discovered that in some of the states multi-line coin was included in the single-line business summary in error. The effect of this was to increase the single-line forecast by about 69,300 and to understate multi-line business by a similar amount. Second, due to the divestiture of the Bell Coin marketing unit, all Bell Public coin was included in the multi-line business category in the June 1997 report period. This migration was not anticipated in the forecast. While the exact amount of the lift to business multi-line in June is not known, the value can be estimated by the Bell Public in-service as of March 1997. This value (138,472) can be seen on Exhibit 4 page 2. The average effect can be estimated by dividing this amount by 5 yielding 27,694. When the history and forecast data are adjusted for these impacts, the multi-line business estimate meets the accuracy requirement but single-line business still exceeds the threshold. There are two reasons why the single-line forecast fails to meet the accuracy requirement:

1. The methodology used to determine when a significant error occurs is driven purely by the deviation between the actual percent growth rate versus the estimated percent growth rate. Using this calculation, as the actual growth rate approaches zero, the error margin also moves toward zero. In the extreme case, a projection in the growth of a 10,000,000 line base to increase by 2 lines generates a 100% miss if the actual growth was 1 line. When the 10% limit is applied to a group where the base of lines is small, the margin of acceptable error also becomes very small. Unfortunately, for single-line business both of these situations apply. In 1996 single-line business actual change rate was relatively small -2.21%. The application of the 10% threshold to this rate of change coupled with the small size of the base (about 550,000 lines or 2.5% of total billable lines) generates a margin of error tolerance of only approximately 1,200 lines ($.0221 \times .1 \times 547,529 = 1,210$). In relation to billable lines 1,210 equals .006% of the total lines.

2. The single line business category showed a substantial change in trend between 1991 and 1995 going from a pattern of increase to decrease as shown on Exhibit 6 page 12 and graphically on Exhibit 6 page 14. The 1995 period reported a dramatic increase in loss rate compared to previous years. The projection for 1996 was based on the assumption that the 1995 loss was an outlier and the estimate for 1996 projected a smaller loss. The result of this assumption resulted in an overstatement of the 1996 single-line business category 9,710 lines or 1.8% of the single line business category or .045% of total-billable lines.

Overall the estimate of expected billable lines missed the reported level by 13,590 lines on a base of 21,669,631 lines. This equates to a margin of error of .06%.

REVIEW OF PREVIOUS FILINGS FOR PERIOD OF 1996

Analysis of 1996 Filing

Column	(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)
	ARMIS-95 Reported	ARMIS-96 Reported	Filed 1996 Estimate	Actual% Growth	Forecast% Growth	Growth Rate %Miss	Absolute Miss	Absolute %Miss
Multiline Business	5,419,230	5,936,929	5,815,494	9.55%	7.31%	-23.46%	(121,435)	-2.09%
Single Line Residence	14,696,319	15,212,867	15,241,175	3.51%	3.71%	5.48%	28,308	0.19%
Single Line Business	559,903	547,529	626,552	-2.21%	11.90%	-638.62%	79,023	12.61%
Total Lines	20,675,452	21,697,325	21,683,221	4.94%	4.87%	-1.38%	(14,104)	-0.07%

Adjustments Due to miscategorizing of Multi Line Coin and Bell Public Migration

Multiline Business	27,694	69,313
Single Line Residence		-
Single Line Business		(69,313)
Total Lines	0	27694

Analysis of 1996 Filing with Multi-line Coin Reporting Problem Removed

	ARMIS-95 Reported	ARMIS-96 Reported	Adjusted 1996 Estimate	Actual% Growth	Forecast% Growth	Growth Rate %Miss	Absolute Miss	Absolute %Miss
Multiline Business	5,419,230	5,909,235	5,884,807	9.04%	8.59%	-4.99%	(24,428)	-0.42%
Single Line Residence	14,696,319	15,212,867	15,241,175	3.51%	3.71%	5.48%	28,308	0.19%
Single Line Business	559,903	547,529	557,239	-2.21%	-0.48%	-78.47%	9,710	1.74%
Total Lines	20,675,452	21,669,631	21,683,221	4.81%	4.87%	1.37%	13,590	0.06%

Development of ARMIS history for trending purposes.

Because of changes in the reporting of several categories of units in the last two years, reported ARMIS history must be adjusted to a consistent base for purposes of trend analysis. Adjustments were made to each category by obtaining the reported in-service quantity for each quarter from June 90 to June 97. Average in-service levels were then calculated using the FCC prescribed methodology. The in-service units used to develop the average in-service quantities and the calculated average in service are shown on this Exhibit page 2. The adjustments to each of the ARMIS categories and the adjusted history are shown on this Exhibit page 3. Specifically the adjustments which were made to the reported data were:

1. Inclusion of Bell Public coin in all years of multi-line-business and total-billable line history. This change was caused by the divestiture of the Bell Coin marketing unit in April of 1997
2. The shift of all semi public single-line coin from the single-line business to the multi-line business category. This change was caused by the implementation of the *Payphone Reconsideration Order*.
3. The addition of 3 line equivalents to multi-line business and total billable lines for each primary rate ISDN line. This adjustment was needed to reflect a change in the quantity of equivalent lines for each primary rate ISDN from two to five.

**BellSouth History of In-Service Counts used to Calculate
 Adjustments to ARMIS AVGI History**

BELL PUBLIC

	FCC				
	MAR	JUN	SEP	DEC	Average
1990	211,825	212,865	213,676	215,883	214,379
1991	215,334	214,138	209,426	204,794	203,695
1992	199,516	190,599	182,606	178,021	178,025
1993	173,385	165,514	159,412	155,696	156,595
1994	153,409	148,942	147,805	146,668	146,135
1995	144,897	142,365	139,387	136,635	138,322
1996	136,185	137,039	137,064	137,302	109,982
1997	138,472	31			

SEMI PUBLIC SINGLE LINE COIN (note 1)

	FCC					
	MAR	JUN	SEP	DEC	Average	
1990	4,502	4,505	4,339	4,121	7,018	10,444 (note 2)
1991	11,014	11,109	10,654	10,725	10,841	
1992	10,707	11,010	10,660	11,600	11,238	
1993	11,425	11,495	11,122	10,776	10,931	
1994	10,597	10,665	10,410	9,980	10,138	
1995	9,783	9,854	9,500	9,012	9,144	
1996	8,705	8,649	8,331	7,907	6,483	
1997	7,473	53	-	-	11	

LINE IMPACT TO MULTILINE BUSINESS DUE TO ISDN ADJUSTMENT

					FCC	ISDN
	MAR	JUN	SEP	DEC	Average	AVG*3
1993	81	138	193	299	297	891
1994	375	478	632	805	827	2,481
1995	979	1,242	1,593	1,920	2,012	6,036
1996	2,353	2,953	3,487	4,096	4,039	12,117
1997	4,770	4,888	-	-		

Note 1. The category of semi public single line coin includes a very small amount of single line coin belonging to Independent Payphone providers.

Note 2. For 1990 no history was available on five states. The 10,444 value is an estimate of AVGI for 1990 based on 1991 to 1992 growth.

ADJUSTMENTS TO ARMIS HISTORY FOR TRENDING PURPOSES

ARMIS AVGI HISTORY AS REPORTED

	AVG-90	AVG-91	AVG-92	AVG-93	AVG-94	AVG-95	AVG-96
Multiline Business	3,704,638	3,964,772	4,245,772	4,574,848	4,968,168	5,419,230	5,936,929
Single Line Residence	12,601,698	12,939,187	13,310,448	13,713,445	14,196,812	14,696,319	15,212,867
Single Line Business	563,119	565,337	569,336	569,263	568,654	559,903	547,529
Total Billable Lines	16,869,455	17,469,296	18,125,556	18,857,556	19,733,634	20,675,452	21,697,325

PROPOSED ADJUSTMENTS

	AVG-90	AVG-91	AVG-92	AVG-93	AVG-94	AVG-95	AVG-96
Bell Public	214,379	203,695	178,025	156,595	146,135	138,322	109,982
Semipublic Single Line Coin	10,444	10,841	11,238	10,931	10,138	9,144	6,483
ISDN	-	-	-	891	2,481	6,036	12,117

MULTI-LINE BUSINESS HISTORY FOR TREND ANALYSIS

	AVG-90	AVG-91	AVG-92	AVG-93	AVG-94	AVG-95	AVG-96
Reported Multi-line Business	3,704,638	3,964,772	4,245,772	4,574,848	4,968,168	5,419,230	5,936,929
Bell Public	214,379	203,695	178,025	156,595	146,135	138,322	109,982
Semipublic Single Line Coin	10,444	10,841	11,238	10,931	10,138	9,144	6,483
ISDN	-	-	-	891	2,481	6,036	12,117
Adjusted Multiline Business	3,929,461	4,179,308	4,435,035	4,743,265	5,126,922	5,572,732	6,065,511

ADJUSTED SINGLE LINE BUSINESS HISTORY FOR TREND ANALYSIS

	AVG-90	AVG-91	AVG-92	AVG-93	AVG-94	AVG-95	AVG-96
Reported Single Line Business	563,119	565,337	569,336	569,263	568,654	559,903	547,529
Semipublic Single Line Coin	(10,444)	(10,841)	(11,238)	(10,931)	(10,138)	(9,144)	(6,483)
Adjusted Singleline Business	552,675	554,496	558,098	558,332	558,516	550,759	541,046

ADJUSTED TOTAL BILLABLE LINE HISTORY FOR TREND ANALYSIS

	AVG-90	AVG-91	AVG-92	AVG-93	AVG-94	AVG-95	AVG-96
Adjusted Multi-line Business	3,929,461	4,179,308	4,435,035	4,743,265	5,126,922	5,572,732	6,065,511
Single Line-Residence	12,601,698	12,939,187	13,310,448	13,713,445	14,196,812	14,696,319	15,212,867
Adjusted Single-line Business	552,675	554,496	558,098	558,332	558,516	550,759	541,046
Adjusted Total Billable Lines	17,083,834	17,672,991	18,303,581	19,015,042	19,882,250	20,819,810	21,819,424

Methodology for trending

This Exhibit 5 explains the methodology used to develop the trend analysis shown on Exhibit 6. As specified in the FCC order, a trend of the ARMIS history and a trend using a natural log transformation of the history was prepared for each of the reporting categories. To evaluate the 97 estimates a standard process was developed which could be applied to each of the categories. Using this process, trends were developed with both non transformed and Ln transformed data using the full 91-96 history. Trends using shorter history periods were also developed and all were assessed using the 10% rule as a means of identifying significant differences between the trended forecast and the filed estimate for 1997.

Methodology for Accuracy Assessment

For each created forecast three possible measures of consistency were identified:

1. Evaluation of match between the trended in-service projection and the filed estimate
2. Comparison of the increase estimated for 1997 in the filing versus the increase projected by the trend analysis.
3. Comparison of the percent increase estimated in the 1997 filing versus the percent increase projected for 1997 by the trend analysis

Of these alternatives, method 3 seems to most closely fit with the defined 10% rule since the 10% threshold is based on the calculated variation between two growth rates.

A standard three page report was generated for each ARMIS category. The three pages consist of:

1. A trend analysis of the history versus the filed estimate
2. A trend analysis of the Ln transformed history versus the filed estimate
3. A graph showing the two 6 year trends versus the history and the filed 1997 estimate.

This exhibit pages 2 through 4 describes the layout of the analysis sheets for the trends.

Total Billable Lines	ARMIS Category under Review							
	Regression Analysis of Average Inservice Data							Analysis Technique being applied
	Adjusted ARMIS History and Filed 1997 estimate							
ARMIS AVGI	AVG-90	AVG-91	AVG-92	AVG-93	AVG-94	AVG-95	AVG-96	EST-97
	17,083,834	17,672,991	18,303,581	19,015,042	19,882,250	20,819,810	21,819,424	22,806,709 (Filed estimate)
Annual Increase	Calculated Increase based on In-Service history from Line above							
	589,157	630,590	711,461	867,208	937,560	999,614	987,285	
Annual % Growth	Calculated Percent Growth based on In-Service history from Line above							
	3.45%	3.57%	3.89%	4.56%	4.72%	4.80%	4.52%	

Estimated Average Lines In Service based On:

Displays the in-service quantity for 1997 as estimated by trend projection. The first row shows the value generated by using the full six years of data. Each successive row shortens the trend by one year down to a minimum of a two year trend. The bottom row shows the filed estimate.

6 year trend (91-96)	22,500,322
5 year trend (92-96)	22,618,958
4 year trend (93-96)	22,721,808
3 year trend (94-96)	22,777,669
2 year trend (95-96)	22,819,038
Filed estimate	22,806,709

Increase in Average Lines based on:

Shows the increase for 1997 generated by the various trend estimates. Each trend from the full six years down to the two year estimate is reported. The left column reports the increase using the actual 1996 in-service as the starting point while the right column uses the trended value for 1996 to develop the increase. The Bottom row shows the 1997 filing versus the 96 actual.

VALUE FOR 96	
Actual 96	Trended 96

6 year trend (91-96)	680,898	832,802
5 year trend (92-96)	799,534	883,645
4 year trend (93-96)	902,384	935,071
3 year trend (94-96)	958,245	968,587
2 year trend (95-96)	999,614	999,614
filed estimate	987,285	987,285

Projected 97 % growth rate based on:

Shows the % growth for 1997 generated by the various trend estimates. Each trend from the full six years down to the two year estimate is reported. The left column reports the % growth using the actual 1996 in-service as the starting point while the right column uses the trended value for 1996 to develop the % growth. The Bottom row shows the 1997 filing versus the 96 actual.

6 year trend (91-96)	3.12%	3.84%
5 year trend (92-96)	3.66%	4.07%
4 year trend (93-96)	4.14%	4.29%
3 year trend (94-96)	4.39%	4.44%
2 year trend (95-96)	4.58%	4.58%
filed estimate	4.52%	4.52%

% difference between filed and estimated

Displays the difference between the growth rate generated by the various trend estimates and the filed 1997 estimate. For example, the 45% shown in the left column is created by the calculation 3.12/4.52-1. In each case the filed estimate is used as the denominator.

6 year trend (91-96)	-31.03%	-15.06%
5 year trend (92-96)	-19.02%	-10.15%
4 year trend (93-96)	-8.60%	-5.15%
3 year trend (94-96)	-2.94%	-1.85%
2 year trend (95-96)	1.25%	1.25%

Required adjustment to balance between trended level and filed level

Shows the numeric difference between the increase created by the trend versus the filed level. These values are developed from the Increase in Average lines group above. Each value is the difference between the filed estimate and the estimated value for that year and column.

6 year trend (91-96)	(306,387)	(154,483)
5 year trend (92-96)	(187,751)	(103,640)
4 year trend (93-96)	(84,901)	(52,214)
3 year trend (94-96)	(29,040)	(18,698)
2 year trend (95-96)	12,329	12,329

Total Billable Lines

ARMIS Category under Review

Regression Analysis of Natural Logarithm of Average Inservice Data

Analysis Technique being applied

	AVG-90	AVG-91	AVG-92	AVG-93	AVG-94	AVG-95	AVG-96	EST-97
LN ARMIS AVGI	16.653643	16.687548	16.722607	16.760741	16.805338	16.851415	16.898311	16.942565 (filed estimate)

Natural Log transformed
Adjusted ARMIS History and
Filed 1997 estimate

Annual % Growth	0.2036%	0.2101%	0.2280%	0.2661%	0.2742%	0.2783%	0.2619%
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Growth rate of Ln transformed
history and 1997 estimate

Estimated Average Lines In Service based On:

Values reported here are identical to those of the non transformed trend estimated except that the trends represent the conversion of the Ln trend projections back to their non transformed equivalent value by using and exponential transformation

6 year trend (91-96)	22,660,725
5 year trend (92-96)	22,755,268
4 year trend (93-96)	22,831,425
3 year trend (94-96)	22,854,564
2 year trend (95-96)	22,867,032
Filed estimate	22,806,709

Increase in Average Lines based on:

Values reported here are identical to those of the non transformed trend estimated except that the trends represent the conversion of the Ln trend projections back to their non transformed equivalent value by using and exponential transformation

VALUE FOR 96

	Actual 96	Trended 96
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6 year trend (91-96)	841,301	941,250
5 year trend (92-96)	935,844	984,058
4 year trend (93-96)	1,012,001	1,023,814
3 year trend (94-96)	1,035,140	1,038,115
2 year trend (95-96)	1,047,608	1,047,608
filed estimate	987,285	987,285

Projected 97 % growth rate based on:

Values reported here are identical to those of the non transformed trend estimated except that the trends represent the conversion of the Ln trend projections back to their non transformed equivalent value by using and exponential transformation

6 year trend (91-96)	3.86%	4.33%
5 year trend (92-96)	4.29%	4.52%
4 year trend (93-96)	4.64%	4.69%
3 year trend (94-96)	4.74%	4.76%
2 year trend (95-96)	4.80%	4.80%
filed estimate	4.52%	4.52%

% difference between filed and estimated

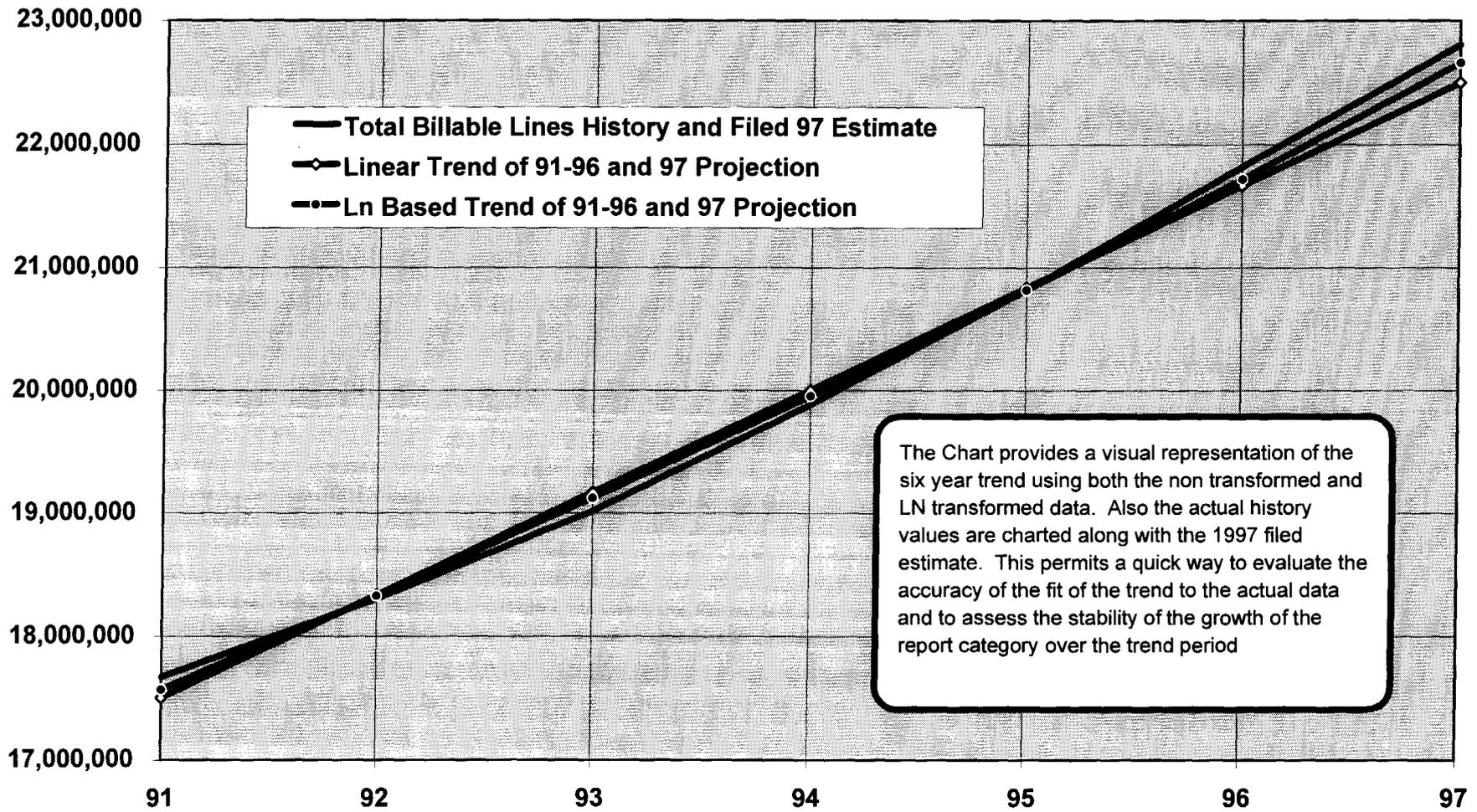
Values reported here are identical to those of the non transformed trend estimated except that the trends represent the conversion of the Ln trend projections back to their non transformed equivalent value by using and exponential transformation

6 year trend (91-96)	17.35%	4.41%
5 year trend (92-96)	5.50%	0.11%
4 year trend (93-96)	-2.44%	-3.62%
3 year trend (94-96)	-4.62%	-4.90%
2 year trend (95-96)	-5.76%	-5.76%

Required adjustment to balance between trended level and filed level

Values reported here are identical to those of the non transformed trend estimated except that the trends represent the conversion of the Ln trend projections back to their non transformed equivalent value by using and exponential transformation

6 year trend (91-96)	(145,984)	(46,035)
5 year trend (92-96)	(51,441)	(3,227)
4 year trend (93-96)	24,716	36,529
3 year trend (94-96)	47,855	50,830
2 year trend (95-96)	60,323	60,323



Results of trend analysis of filed 1997 end user demand forecast

Total Billable Lines

The analysis of total billable lines is summarized on this exhibit pages 3 through 5. As shown on this exhibit page 4, total billable lines meet the required level of historic consistency on the Ln transformed history for all years.

Single-line Residence

The analysis of single-line residence is summarized on this exhibit, pages 6 through 8. As shown on this exhibit page 6, single-line residence meets the requirement for consistency with history using untransformed data for all trend periods.

Multi-line Business

The analysis of multi-line business is summarized on this exhibit pages 9 through 11. Multi-line business fails to conform with trended history for the six year trend period exceeding the 10% tolerance by 1% on the Ln transformed analysis as shown on this exhibit page 10. However, due to the changing nature of multi-line growth during the 1991-1996 period this should be expected. Multi-line business has shown a pattern of steadily accelerating growth during the 1991-1996 period as evidenced by the fact that the 1991 increase of 253,273 was almost doubled in 1996 which grew by 492,779. Because of this pattern, the trend of the non log transformed data fails to meet the test of historic consistency, however the Ln transformed trend meets the test for all periods except for the longest trend (91-96). The best fit between the forecast and trended history occurred with a three year trend of Ln transformed data which generated a -.21% miss between the trended level versus the filed estimate.

Many causes can be identified which contributed to the growth in multi-line business growth. Several of the most significant are:

1. Increased use of fax machines and computers in business
2. Expanded use of credit verification services requiring dedicated lines
3. Continued robust economic growth in the region
4. Aggressive marketing of business services

Single-Line Business

The analysis of single-line business is summarized on this exhibit pages 12 through 14. Single-line business has shown such an erratic pattern of growth over the 91-96 period, represents such a small base of lines, and has had such small growth rates that it fails to meet the accuracy test for any trend years. However, the worst case difference between the estimated versus trended value generates 11,925 lines or .05% of the estimate of billable lines. As a review of the graphic history on this exhibit page 14 demonstrates, a margin of error consistent with the recent trend is probably about 6,000 lines. This would impact total billable lines by about .025%.

Total Billable Lines

Regression Analysis of Natural Logarithm of Average Inservice Data

	AVG-90	AVG-91	AVG-92	AVG-93	AVG-94	AVG-95	AVG-96	EST-97
LN ARMIS AVGI	16.653643	16.687548	16.722607	16.760741	16.805338	16.851415	16.898311	16.942565 (Filed estimate)
Annual % Growth		0.2036%	0.2101%	0.2280%	0.2661%	0.2742%	0.2783%	0.2619%

Estimated Average Lines In Service based On:

6 year trend (91-96)	22,660,725
5 year trend (92-96)	22,755,268
4 year trend (93-96)	22,831,425
3 year trend (94-96)	22,854,564
2 year trend (95-96)	22,867,032
Filed estimate	22,806,709

VALUE FOR 96	
Actual 96	Trended 96

Increase in Average Lines based on:

6 year trend (91-96)	841,301	941,250
5 year trend (92-96)	935,844	984,058
4 year trend (93-96)	1,012,001	1,023,814
3 year trend (94-96)	1,035,140	1,038,115
2 year trend (95-96)	1,047,608	1,047,608
filed estimate	987,285	987,285

Projected 97 % growth rate based on:

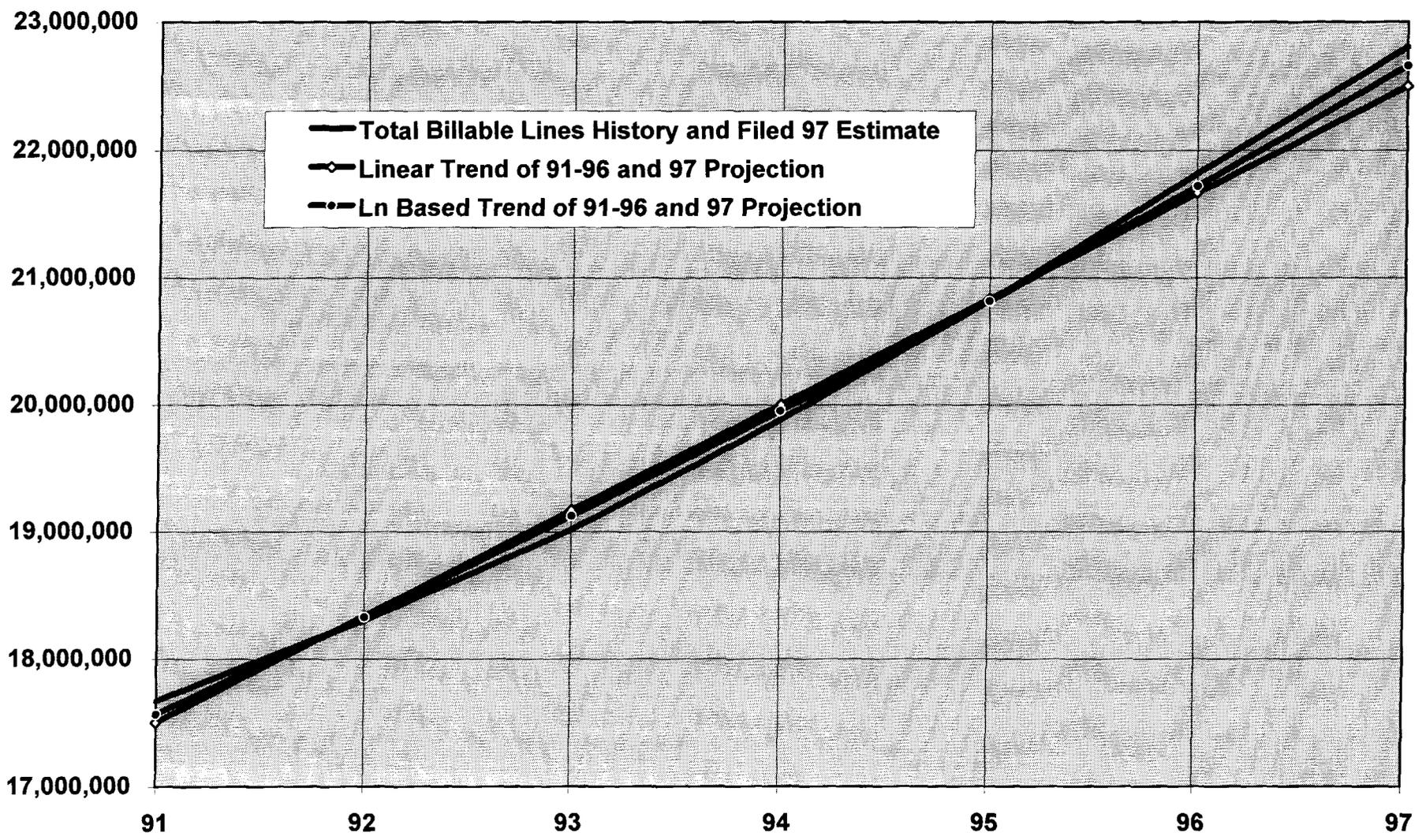
6 year trend (91-96)	3.86%	4.33%
5 year trend (92-96)	4.29%	4.52%
4 year trend (93-96)	4.64%	4.69%
3 year trend (94-96)	4.74%	4.76%
2 year trend (95-96)	4.80%	4.80%
filed estimate	4.52%	4.52%

% difference between filed and estimated

6 year trend (91-96)	-14.79%	-4.22%
5 year trend (92-96)	-5.21%	-0.11%
4 year trend (93-96)	2.50%	3.76%
3 year trend (94-96)	4.85%	5.15%
2 year trend (95-96)	6.11%	6.11%

Required adjustment to balance between trended level and filed level

6 year trend (91-96)	(145,984)	(46,035)
5 year trend (92-96)	(51,441)	(3,227)
4 year trend (93-96)	24,716	36,529
3 year trend (94-96)	47,855	50,830
2 year trend (95-96)	60,323	60,323



Single-Line Residence

Regression Analysis of Average Inservice Data

	AVG-90	AVG-91	AVG-92	AVG-93	AVG-94	AVG-95	AVG-96	EST-97
ARMIS AVGI	12,601,698	12,939,187	13,310,448	13,713,445	14,196,812	14,696,319	15,212,867	15,683,978 (Filed estimate)

Annual Increase 337,489 371,261 402,997 483,367 499,507 516,548 471,111

Annual % Growth 2.68% 2.87% 3.03% 3.52% 3.52% 3.51% 3.10%

Estimated Average Lines In Service based On:	6 year trend (91-96)	15,612,451
	5 year trend (92-96)	15,662,292
	4 year trend (93-96)	15,704,304
	3 year trend (94-96)	15,718,054
	2 year trend (95-96)	15,729,415
	Filed estimate	15,683,978

VALUE FOR 96	
Actual 96	Trended 96

Increase in Average Lines based on:	6 year trend (91-96)	399,584	457,411
	5 year trend (92-96)	449,425	478,771
	4 year trend (93-96)	491,437	499,777
	3 year trend (94-96)	505,187	508,028
	2 year trend (95-96)	516,548	516,548
	filed estimate	471,111	471,111

Projected 97 % growth rate based on:	6 year trend (91-96)	2.63%	3.02%
	5 year trend (92-96)	2.95%	3.15%
	4 year trend (93-96)	3.23%	3.29%
	3 year trend (94-96)	3.32%	3.34%
	2 year trend (95-96)	3.40%	3.40%
	filed estimate	3.10%	3.10%

% difference between filed and estimated	6 year trend (91-96)	-15.18%	-2.54%
	5 year trend (92-96)	-4.60%	1.82%
	4 year trend (93-96)	4.31%	6.14%
	3 year trend (94-96)	7.23%	7.86%
	2 year trend (95-96)	9.64%	9.64%

Required adjustment to balance between trended level and filed level	6 year trend (91-96)	(71,527)	(13,700)
	5 year trend (92-96)	(21,686)	7,660
	4 year trend (93-96)	20,326	28,666
	3 year trend (94-96)	34,076	36,917
	2 year trend (95-96)	45,437	45,437