U S WEST's direct case. The amounts of these adjustments are shown in Table A3. In the case of GTE, we used tariff year actual BFP RR provided by GTE that excludes universal service support funds.

Some LECs did not supply or did not have data for all years. Rochester did not provide actual company-wide data for 1991/92 or 1992/93. GTE did not provide 1996/97 actual BFP RR data.

*B. Data Used for Commission Forecasting for Prescription purposes*

The 1997 Designation Order required the LECs to provide actual *calendar* year BFP RR for 1991-96, adjusted to reflect consistently the effects of Commission rules in effect as of December 31, 1996. Table A5 shows these adjusted data, corrected for one-time adjustments by three LECs. The LECs also provided actual lines on a calendar year basis. The only adjustments made to these data was to exclude the New York gross income tax revenues from NYNEX, as discussed in the text of the order.

After making prescription forecasts using calendar year per-line BFP RR, we adjusted the amounts to reflect increases in revenues in tariff year 1997/98 resulting from the OB&C, Payphone and OPEB Orders. These revenues were taken from the each LEC's direct case, as shown in Table A3. This adjustment is necessary because our forecasts are based on data which do not include these revenues.

As discussed below, problems with the amount and quality of data submitted by GTE forced us to use a different methodology in their case.

## III. Analyses of Data

*A. Introduction*

Our study consisted of three analyses. First we graphed the differences between forecast and actual per-line BFP to determine visually whether underforecasting appeared to be so widespread that further testing was needed. Next we employed a sign test to confirm our visual impression that at least some LECs have consistently underforecast per-line BFP RRs. We then applied a more formal statistical test using the means and variances of the forecasting errors to quantify the extent of downward bias. We conclude that several LECs have presented forecasts that are biased downward. We then propose a simpler forecasting methodology to be followed by these LECs in lieu of the biased methods they have been using.

Figure 1 shows per-line BFP RR forecast errors for RBOCs over the period 1991-96. Figure 2 shows the corresponding forecast errors for other price cap LECs. For evaluation,

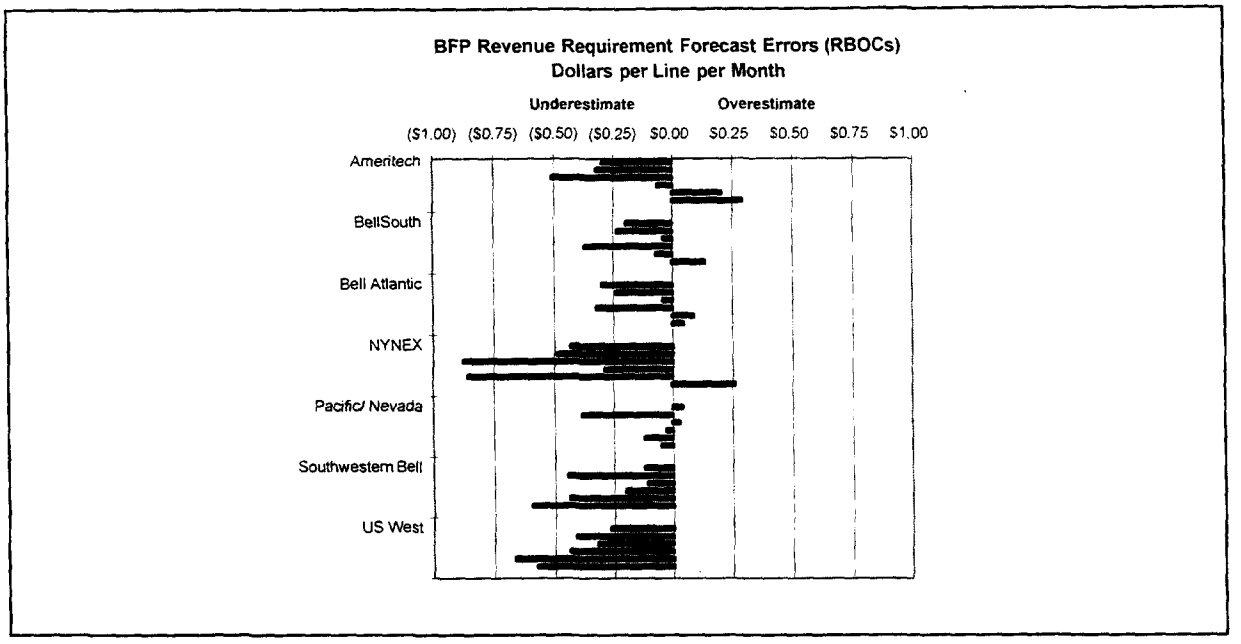



**Figure 1**

we combined components of Pacific Telesis (Pacific Bell and Nevada Bell) and of GTE (GSTC and GTOC). We did not combine data for Southwestern Bell and Pacific Telesis or Bell Atlantic and NYNEX because their mergers occurred after the period being examined.

Examination of the data displayed in Figures 1 and 2 shows that some LECs underestimated their per-line BFP RR for every year in which they have been under price cap regulation. Other LECs underestimated for almost all years. Several LECs also had sizable underestimates in particular years. The graphical analyses of BFP RR forecasts show that there is probably a downward bias in some LECs' forecasting.

*B. Testing the Validity of LECs' Forecasts*

Table A1 shows a summary of LECs' actual and projected per-line BFP RRs. The data underlying this table is presented in Tables A8 through A11 at the end of this Appendix. As illustrated in Table A1, GTE, Southwestern and U S West have consistently underforecast their per-line BFP RRs while others have had mixed results. To evaluate the price cap LECs' forecasts, we first computed the percentage differences between forecast and actual changes in per-line BFP RRs for tariff years 1991/92 through 1996/97. Table A2 shows these differences (forecast errors) in percentage terms.

We recognize that the LECs' forecast errors could be due to volatility of BFP costs, or to rule changes ordered by the Commission after the projections were submitted, rather than to downward bias in their forecasting technique. Volatility and post-projection rule changes

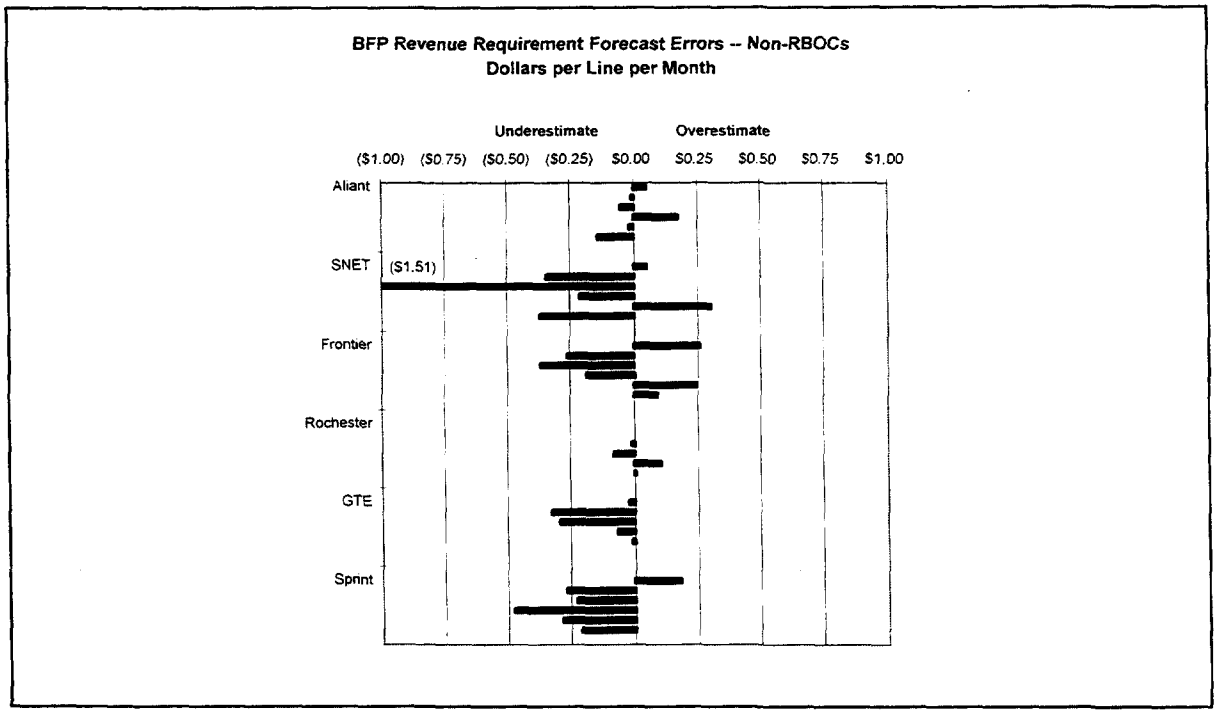



**Figure 4**

could make it difficult for LECs to estimate their BFP revenue requirements correctly. Our t-test, discussed below, accounts for effects of the volatility inherent in the cost components contributing to the BFP RR. The adjustments we made to the data, discussed above and shown in Table A3, should correct for all post-projection rule changes.

Even after the adjustments in Table A3 were made, several of the LECs had what appeared to be sizable underestimates of per-line BFP RR . We tested the validity of the LECs' forecasts, adjusted as shown in Table A3, by using a nonparametric test (a "signs test") to help analyze the likelihood of a LEC making a disproportionate number of underestimates of BFP costs.

*C. Explanation of signs test*

Over the period 1991-1996, the LECs submitted annual per-line BFP RR projections for the coming year. If the projections were unbiased estimators, we would expect them to exceed the actual levels in some years and be less than the actual levels in other years. *A priori* we would expect the actual per-line BFP RR to exceed (+) the projected level with probability 1/2 and to be less (-) than the projected level with probability 1/2 in any given year. (With per-line BFP RR treated as an almost continuous variable, the probability that the projected level will equal the actual level is negligible).

Assuming the projection errors are not correlated, the probability of projections being less than actual levels several years in a row is then given by the product of the probabilities that the projections are less than the actual levels in each year. Thus the probability of + + would be one fourth, and the probability of + + + would be one eighth.

Two LECs, U S West and Southwestern Bell, underforecast their per-line BFP RRs six years in a row. The probability of an unbiased estimator underestimating projected per-line BFP RR for the entire six year period, i.e. + + + + + +, is $(1/2)^6$ or 1/64 (approximately 1.6 percent). With such an outcome, the odds are thus 63 to 1 that this estimator is not unbiased. It is more likely that some downward bias in the forecasting technique led to this consistent underforecasting. GTE submitted data for only five years, but underforecast on a company-wide basis for all five years. The probability of this occurring by chance is $(1/2)^5$, or about 3 percent.

The two LECs that underforecast their per-line BFP RRs for five of the six years were NYNEX and Sprint. If the estimator is unbiased, the probability of one overestimate and five underestimates is 6/64 or 9.4 percent. The probability that an unbiased estimator would produce five or more underestimates is therefore 1.6 percent plus 9.4 percent or 11 percent. Thus the odds are roughly 8 to 1 that the estimator is not unbiased.

The results of the signs test strengthens the case that several LECs are using forecasting techniques that are biased downwards. However, the signs test is a nonparametric test that does not take account of the magnitude of the downward bias. For example, a LEC could have underestimated projected per-line BFP RRs by 1 cent every year and be found to have a downward bias by the signs test.

*D. Explanation of the difference of means t-test*

To remedy the difficulties in analyzing the downward bias of per-line BFP RR projections by some LECs, we applied a stronger statistical test to the data -- the difference of means t-test. This test standardizes the data by accounting for its variability and also giving weight to the actual amount of the difference between the actual and projected per-line BFP RR.

If LEC projections were unbiased estimators of the actual per-line BFP RR, the difference of the means of the actual and projected per-line BFP RRs should not be significantly different from zero statistically.

The actual and projected per-line BFP RRs form a set of six paired observations from the period 1991-1996. Both actual and projected per-line BFP RRs are assumed to come from the same population. This is reasonable because to assume otherwise would imply that the LECs are choosing their per-line BFP RR projections without trying to relate them to

actual costs. The appropriate test for the difference between the two sample means with paired data is to test the hypothesis that the average difference between the paired observations in the population is zero. Let $d_i$ be the $i$th difference between the actual and projected per-line BFP RR and $D$ the mean difference.

The t-test requires the calculation of the standard deviation of the differences between paired observations, $s_d$ :

$$s_d = \sqrt{\frac{\sum (d_i - D)^2}{n-1}}$$

The corresponding standard deviation of the mean difference is $s_D$ :

$$s_D = s_d / \sqrt{n}$$

The t statistic with n-1 = 5 degrees of freedom is

$$t = \frac{D}{s_D}$$

The t-statistic accounts for the variability in the data because the mean difference is divided by the standard deviation of the mean difference, where the standard deviation is a measure of the variability in the data.

This statistic, calculated from the sample of paired observations, is then compared with the t statistic corresponding to a confidence level of 90 percent. The one-tailed t statistic with 5 degrees of freedom at the 90 percent confidence level is 1.476.[348] This means that if a LEC has a t statistic -- calculated according to the formula above -- that is greater than this "critical value," it is unlikely to have arisen by chance. In such a case, the more reasonable explanation is that the difference between actual and projected mean per-line BFP RRs reflects a systematic downward bias in the forecasting methodology of the LEC. As shown in Table A4, six LECs had a calculated t statistic greater than the critical value -- Bell Atlantic, GTE, NYNEX, Southwestern Bell, Sprint, and U S West.

Bell Atlantic fails the bias test because its forecasts have substantially understated estimates of Total Other Taxes. The original data Bell Atlantic submitted made the same error in developing both its forecast and actual BFP RRs. When forecast and actual RRs were developed on this consistent (though incorrect) basis, Bell Atlantic's forecasts were highly accurate, and easily pass our t-test. On rebuttal, Bell Atlantic agreed that it had erred

[348] Rochester submitted data for only four years, and thus the corresponding one-tailed $t$ statistic is 2.353. GTE submitted data for only five years, and thus the corresponding one-tailed t-statistic is 1.533.

in its treatment of these taxes and submitted corrected actual BFP RR data. It is the comparison of the uncorrected forecasts to the corrected actual data that causes Bell Atlantic to fail the t-test. Rather than prescribe a per-line BFP RR for Bell Atlantic, it would be more reasonable to direct the company to recompute its 1997/98 tariff year forecast using its existing methodology and the corrected BFP RR data contained in its rebuttal.

The t-test provides a formal statistical confirmation of the downward bias in some LECs' projected per-line BFP RR. It thus strengthens the graphical analysis of the bias, the tabular evidence of the percentage errors between projected and actual per-line BFP RRs, and the results of the signs test regarding the probability of making a large number of underforecasts.

## IV. Prescribed Forecasting Methodologies

Based on our statistical analyses of the LECs' forecasts, we conclude that six LECs (Bell Atlantic, GTE, NYNEX, Sprint, Southwestern Bell and U S West) have failed to produce reasonable forecasts of their monthly per-line BFP RRs. We recognize that having limited observations affects our forecasting capabilities, because formal forecasting techniques, such as sophisticated econometric models, normally require many observations and variables.

As discussed above, we do not make a forecast for Bell Atlantic. The calendar year data supplied by GTE also presents special difficulties which we discuss below. The task of selecting a forecasting methodology for the other LECs is made more difficult by the fact that some LECs' actual per-line BFP revenue requirements show a strong trend, while others do not. For this reason, we selected a forecast based on autoregression. This technique performs a linear regression to estimate P (the level of per-line BFP RR) as a function of its level in the previous year: $P_t = \alpha + \beta * P_{t-1}$ (where $\alpha$ and $\beta$ are parameters estimated by the regression). The 1997 forecast is made by applying this equation to the 1996 level. A major advantage of this method is that if there is a significant trend in the data, this method will base the forecast on that trend. If there is no trend, the forecast will approximate the arithmetic mean of the data. This is the most reasonable forecasting methodology we can employ with the data available.

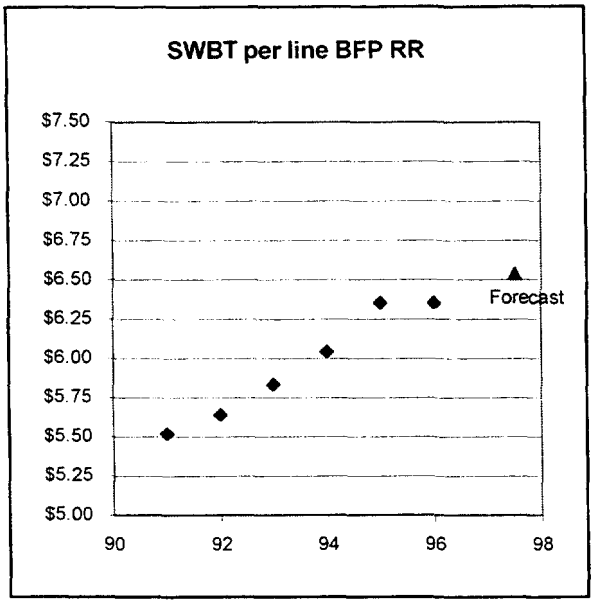
In order to produce a tariff year forecast by this method, we first use the equation described in the previous paragraph to forecast $P_{1997}$, per-line BFP RR for calendar year 1997. We then use $P_{1997}$ to forecast $P_{1998}$, using the same equation. We use the average of these two levels as our forecast of $P_{97/98}$, the per-line BFP RR for tariff year 1997/98.

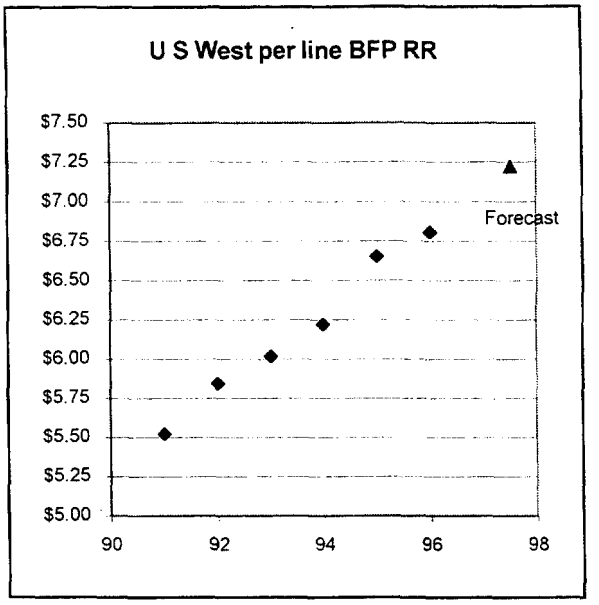
In developing these forecasts, we used adjusted Series II actual BFP revenue requirements for calendar years 1991 through 1996, from Table A5. This series corrects for the effects of the Commission's rule changes over the period, as described above, to produce consistent estimates reflecting the rules as of December 31, 1996. After the per-line BFP RRs

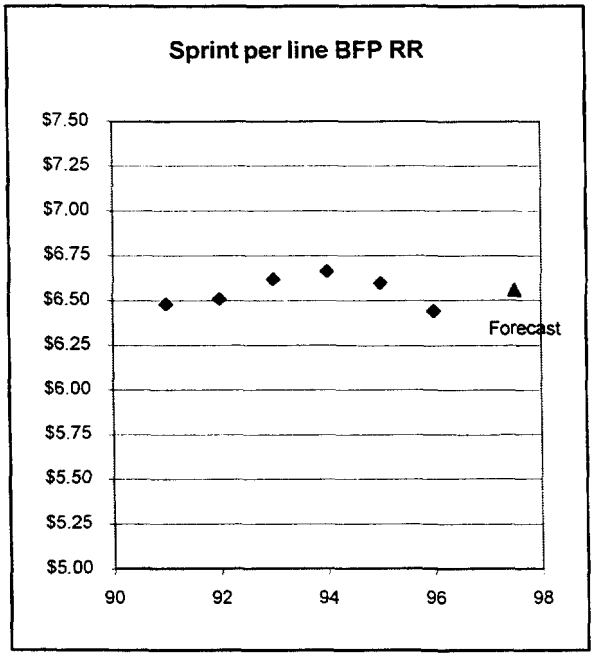
were forecast, we added the one-time adjustments to reflect rule changes in 1997 in the Payphone, OB&C, and OPEB Orders. Our resulting forecasts are shown in Table A7.

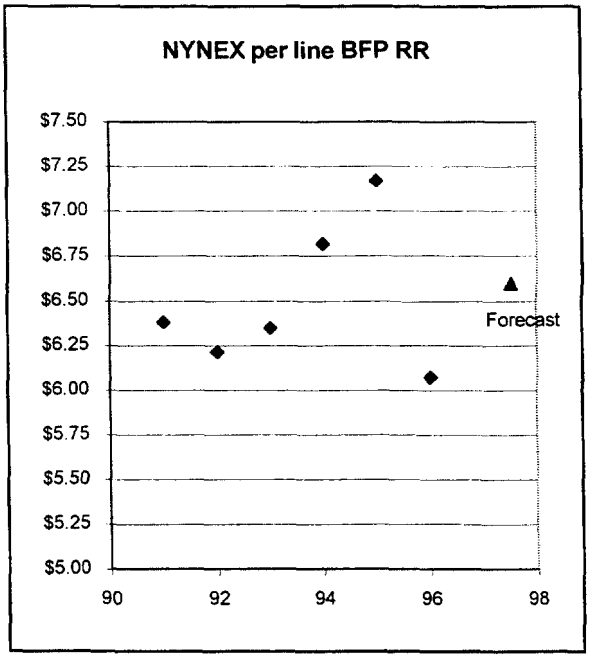
Figure 3 shows actual calendar year per-line BFP RRs and our forecasts for NYNEX, Southwestern Bell, Sprint and U S West.

**Figure 3: Actual Calendar Year Monthly per-line BFP RRs and FCC Forecast for TY 1997/98**



As a further check on the reasonableness of our forecasts, we made forecasts using several other methods. For those LECs with a strong trend (indicated by a high $R^2$, shown in Table A7), it is appropriate to compare our results with those of various other trend-based forecasting methodologies. We computed forecasts based on a time trend line and on 5-year geometric averages[349] (adjusting for 1997 rule changes as above). For LECs without a strong trend (indicated by a low $R^2$), it is reasonable to compare our forecast with forecasts based on the arithmetic mean of previous observations, or on 3- and 5-year moving averages.

We developed our five year geometric growth rates from the adjusted Series II *calendar* year data. To make a forecast applying these annual calendar year geometric growth rates (g) to tariff years, we multiplied the most recent calendar year data by $(1 + g)^{1.5}$. This shifted the estimate forward by an additional six months to reflect the fact that tariff years begin in July rather than January. The reasons we did not choose this methodology are that it assumes a strong statistical trend in the data (which is not present for all LECs) and that it gives inordinate weight to the final year's data. It does provide, however, a useful check on our methodology for those LECs with strong trends, in that it should produce a similar forecast.

In developing our geometric-average forecast, we next added the one-time adjustments for rule changes resulting from the Payphone, OB&C, and OPEB Orders in 1997/98. We then computed projected monthly per-line BFP revenue requirements. First we divided our annual projected BFP revenue requirements for the five LECs by their projected access lines to get annual BFP per line revenue requirements. We then divided by twelve to get the monthly BFP per line revenue requirements.

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[349] A geometric mean is particularly useful in dealing with data that grow over time, because other measures of annual growth operate from a different base each year. See Edward J. Kane, *Economic Statistics and Econometrics: An Introduction to Quantitative Economics* (New York: Harper & Row, 1968), p.69. We calculate the percentage annualized geometric growth rate as follows:

$$g_{cy} = \left(\frac{R_t}{R_i}\right)^{\left(\frac{1}{n-1}\right)} - 1$$

Where
$g_{cy}$= Average Calendar Year Geometric Growth Rate
$R_t$ = Current Adjusted Calendar Year BFP Revenue Requirement
$R_i$ = Base Period Adjusted Calendar Year BFP Revenue Requirement
n = Number of observations

For a five year average geometric growth rate, the current calendar year is 1997, the base period would be 1992, and n would be 5.

We also developed forecasts based on a simple time trend projection and forecasts based on arithmetic means and 3- and 5-year moving averages. In each case, we projected 1997 and 1998 estimates and averaged them to forecast for tariff year 1997/98. We then adjusted each forecast for the 1997 rule changes in the same manner described above.

We used the geometric-average-based forecast and the time trend-based forecast to check the reasonableness of our autoregression forecast for LECs with a time trend. For LECs without a significant trend, we used the forecasts based on arithmetic average and on the moving averages to provide a check of reasonableness. As can be seen in Table A7, our forecasts using autoregression closely match those based on arithmetic means and moving averages (for LECs without a trend) or those based on the trend-based forecasts (for LECs with a significant trend). This autoregression produces good forecasts for LECs with strong trends and also for those without trends. We therefore conclude that the autoregression methodology described above is the best basis for forecasting 1997/98 tariff year per-line BFP RRs for NYNEX, Southwestern Bell, Sprint and U S West.

Because GTE did not provide adequate data to support this methodology, a different methodology must be prescribed. In developing a forecasting methodology for GTE, we faced several obstacles. GTE did not provide its actual number of lines for calendar years 1991-96 in its Direct Case. Also, GTE estimated its tariff year 1996/97 per-line BFP RR using the same forecasting methodology it used to develop its 1997/98 forecast. In response to a Bureau request, GTE faxed its number of lines for calendar years 1991 through 1996 for GSTC and the number of lines for GTOC for calendar years 1992 - 1996. Because GTE did not provide the number of lines for GTOC in 1991, we estimated GTOC's lines in 1991 by taking an average of GTOC lines for tariff years 1991/92 and 1992/93. We then calculated GTE's calendar year per-line BFP revenue requirement using its adjusted actual Series II revenue and the number of lines for calendar years 1991-96.

Upon further examination of GTE's calendar year actual BFP RR and lines data, however, we conclude that we cannot use it to produce a forecast, because it is not consistent with the tariff year data GTE has filed. That is, for every tariff year the BFP RR lies outside the bounds of the adjoining calendar years. Likewise, tariff year lines are above the bounds of the adjoining calendar years in almost every year. This leads us to believe that GTE's calendar year data are flawed. Consequently, any forecast based on such data would produce erroneous results. We also recognize that we cannot use tariff year data for 1991/92 through 1992/93 because they are not adjusted for the Commission rule changes. Thus they are not comparable with later data. As noted above, GTE did not provide actual data for 1996/97. Therefore, we are left with only three data points, those for tariff years 1993/94, 1994/95, and 1995/96.

If GTE had provided its tariff year 1996/97 actual per-line BFP revenue requirement, we could have adjusted for changes to the Commission's treatment of payphones and OB&C

costs, as we did for the other LECs, to provide a fourth data point. GTE disregarded the *1997 Designation Order*'s requirement that it provide its tariff year 1996/97 actual BFP revenue requirement. GTE, without explanation, reports that its tariff year 1996/97 figure is "not available."[350]

With only three data points, we have no reasonable basis for determining whether GTE's data does or does not have a significant trend. In light of this data limitation, we have developed two forecasts. One uses a three year geometric growth rate (calculated as above, with 1995/96 as the final year). We produce a forecast by multiplying the 1995/96 tariff year per-line BFP revenue requirement by our three-year geometric growth rate to obtain the 1996/97 estimate, then multiplying this estimate by the growth rate to obtain the 1997/98 estimate. This forecast would be appropriate if GTE's data does have a significant trend. If there is no trend, a more appropriate forecast would be based on the arithmetic mean of the three data points. We adjusted both 1997/98 forecasts for the rule changes resulting from the Payphone, OB&C, and OPEB Orders.

Because GTE has provided so little reliable data, we believe the most reasonable forecast methodology is to average the results of the two forecasts we have made. These are shown in Table A12. The average of the two forecasts is $7.26. GTE's actual calendar year monthly per-line BFP RRs and the Commission's TY 1997/98 Forecast are shown in Figure 4.

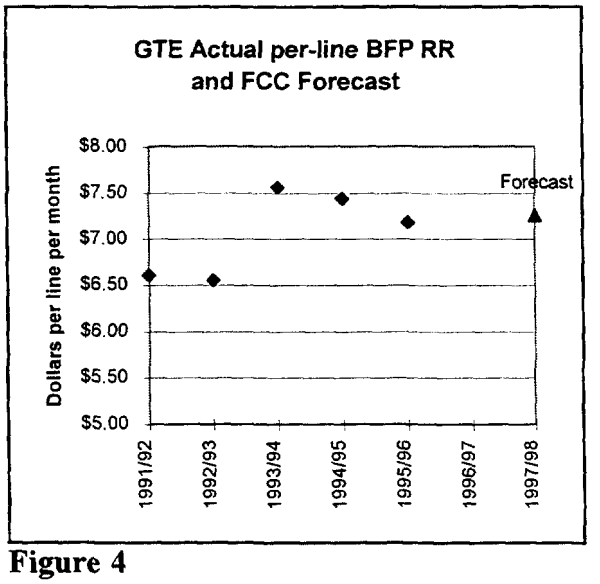


**Figure 4**

[350] GTE Direct Case at Exhibit A-8, p. 2.

**Table A1**

**Comparison Between Forecast and Adjusted Actual**

**Monthly per-line BFP Revenue Requirement**

| | 1991/92 | 1992/93 | 1993/94 | 1994/95 | 1995/96 | 1996/97* | 1997/98 |
|---|---|---|---|---|---|---|---|
| **Ameritech** | | | | | | | |
| ***Actual*** | $4.13 | $4.20 | $4.67 | $4.90 | $4.64 | $4.53 | na |
| ***Forecast*** | $3.83 | $3.88 | $4.16 | $4.84 | $4.85 | $4.85 | $4.62 |
| ***Forecast Error*** | **($0.30)** | **($0.32)** | **($0.51)** | **($0.06)** | **$0.21** | **$0.33** | na |
| **BellSouth** | | | | | | | |
| ***Actual*** | $6.61 | $6.70 | $7.32 | $7.47 | $7.43 | $7.17 | na |
| ***Forecast*** | $6.42 | $6.47 | $7.28 | $7.10 | $7.36 | $7.37 | $6.97 |
| ***Forecast Error*** | **($0.19)** | **($0.23)** | **($0.04)** | **($0.37)** | **($0.07)** | **$0.19** | na |
| **Bell Atlantic** | | | | | | | |
| ***Actual*** | $4.44 | $4.64 | $5.30 | $5.58 | $5.43 | $5.43 | na |
| ***Forecast*** | $4.14 | $4.40 | $5.26 | $5.26 | $5.52 | $5.52 | $5.24 |
| ***Forecast Error*** | **($0.30)** | **($0.24)** | **($0.04)** | **($0.32)** | **$0.09** | **$0.09** | na |
| **NYNEX** | | | | | | | |
| ***Actual*** | $5.72 | $5.54 | $6.56 | $6.52 | $7.02 | $5.80 | na |
| ***Forecast*** | $5.29 | $5.05 | $5.68 | $6.24 | $6.16 | $6.13 | $5.92 |
| ***Forecast Error*** | **($0.43)** | **($0.49)** | **($0.87)** | **($0.29)** | **($0.86)** | **$0.33** | na |
| **Pacific/ Nevada** | | | | | | | |
| ***Actual*** | $4.13 | $4.34 | $4.66 | $4.77 | $4.74 | $4.78 | na |
| ***Forecast*** | $4.17 | $3.96 | $4.68 | $4.74 | $4.62 | $4.77 | $4.50 |
| ***Forecast Error*** | **$0.04** | **($0.38)** | **$0.03** | **($0.03)** | **($0.12)** | **($0.01)** | na |
| **Southwestern Bell** | | | | | | | |
| ***Actual*** | $4.98 | $5.10 | $6.01 | $6.10 | $6.29 | $6.58 | na |
| ***Forecast*** | $4.86 | $4.66 | $5.90 | $5.90 | $5.86 | $6.05 | $5.75 |
| ***Forecast Error*** | **($0.12)** | **($0.44)** | **($0.11)** | **($0.20)** | **($0.44)** | **($0.53)** | na |
| **US West** | | | | | | | |
| ***Actual*** | $5.18 | $5.24 | $5.99 | $6.55 | $6.74 | $7.01 | na |
| ***Forecast*** | $4.91 | $4.84 | $5.67 | $6.12 | $6.07 | $6.48 | $6.56 |
| ***Forecast Error*** | **($0.27)** | **($0.41)** | **($0.32)** | **($0.43)** | **($0.66)** | **($0.53)** | na |
| **Aliant** | | | | | | | |
| ***Actual*** | $3.70 | $3.58 | $4.21 | $4.22 | $4.39 | $4.53 | na |
| ***Forecast*** | $3.75 | $3.57 | $4.17 | $4.40 | $4.38 | $4.44 | $5.01 |
| ***Forecast Error*** | **$0.05** | **($0.01)** | **($0.05)** | **$0.17** | **($0.01)** | **($0.09)** | na |
| **SNET** | | | | | | | |
| ***Actual*** | $5.10 | $5.28 | $6.63 | $6.35 | $6.22 | $6.28 | na |
| ***Forecast*** | $5.15 | $4.94 | $5.12 | $6.14 | $6.52 | $5.97 | $6.05 |
| ***Forecast Error*** | **$0.05** | **($0.34)** | **($1.51)** | **($0.21)** | **$0.30** | **($0.31)** | na |
| **Frontier** | | | | | | | |
| ***Actual*** | $5.05 | $5.53 | $6.01 | $6.11 | $5.88 | $5.62 | na |
| ***Forecast*** | $5.31 | $5.27 | $5.65 | $5.92 | $6.13 | $5.71 | $5.54 |
| ***Forecast Error*** | **$0.26** | **($0.26)** | **($0.36)** | **($0.19)** | **$0.25** | **$0.09** | na |
| **Rochester** | | | | | | | |
| ***Actual*** | na | na | $5.14 | $5.04 | $5.09 | $5.10 | na |
| ***Forecast*** | na | na | $5.13 | $4.96 | $5.19 | $5.14 | $5.15 |
| ***Forecast Error*** | na | na | **($0.01)** | **($0.08)** | **$0.11** | **$0.04** | na |
| **Total GTE** | | | | | | | |
| ***Actual*** | $6.61 | $6.56 | $7.57 | $7.44 | $7.18 | na | na |
| ***Forecast*** | $6.59 | $6.23 | $7.28 | $7.38 | $7.17 | $7.35 | $6.21 |
| ***Forecast Error*** | **($0.02)** | **($0.32)** | **($0.29)** | **($0.06)** | **($0.01)** | na | na |
| **Sprint** | | | | | | | |
| ***Actual*** | $5.97 | $6.16 | $6.53 | $6.75 | $6.47 | $6.39 | na |
| ***Forecast*** | $6.15 | $5.90 | $6.31 | $6.28 | $6.19 | $6.18 | $6.41 |
| ***Forecast Error*** | **$0.18** | **($0.27)** | **($0.22)** | **($0.47)** | **($0.28)** | **($0.21)** | na |

*1996/97 forecasts are adjusted for the effects of 1997 rule changes as shown in Table A3.

**Table A2**
**Measuring LECs Forecast Accuracy**

| | Percent Error (PE) | | | | | | Mean PE |
|---|---|---|---|---|---|---|---|
| | 1991/92 | 1992/93 | 1993/94 | 1994/95 | 1995/96 | 1996/97 | |
| **Ameritech** | -7.15% | -7.65% | -10.84% | -1.30% | 4.46% | 7.26% | -2.54% |
| **BellSouth** | -2.92% | -3.45% | -0.49% | -4.95% | -0.89% | 2.70% | -1.67% |
| **Bell Atlantic** | -6.74% | -5.18% | -0.75% | -5.77% | 1.59% | 1.66% | -2.53% |
| **NYNEX** | -7.55% | -8.76% | -13.34% | -4.40% | -12.20% | 5.67% | -6.76% |
| **Pacific/Nevada** | 0.94% | -8.80% | 0.58% | -0.58% | -2.46% | -0.26% | -1.76% |
| **Southwestern Bell** | -2.37% | -8.69% | -1.77% | -3.28% | -6.95% | -8.11% | -5.19% |
| **US West** | -5.14% | -7.77% | -5.33% | -6.61% | -9.85% | -7.60% | -7.05% |
| **Aliant** | 1.41% | -0.23% | -1.17% | 4.13% | -0.33% | -2.00% | 0.30% |
| **SNET** | 0.99% | -6.44% | -22.71% | -3.27% | 4.89% | -4.94% | -5.25% |
| **Frontier** | 5.15% | -4.65% | -6.04% | -3.04% | 4.17% | 1.65% | -0.46% |
| **Rochester** | na | na | -0.17% | -1.57% | 2.08% | 0.72% | 0.26% |
| **Total GTE*** | -0.31% | -4.90% | -3.83% | -0.85% | -0.12% | na | na |
| **Sprint** | 3.04% | -4.30% | -3.42% | -7.02% | -4.36% | -3.23% | -3.22% |

Note:
Percent Error = [Forecast(t) - Actual(t)]/Actual(t)
Mean PE = Mean Percentage Error for 1991/92 through 1996/97

**Table A3**
**FCC Additional Adjustments to the LECs' 1996/97 Forecasts**
**For Rule Changes Effective in Spring 1997 (000)**

| | Payphone Revenues | | 1996 | 1996/97 | OB&C Revenues | | Depreciation | Source | |
|---|---|---|---|---|---|---|---|---|---|
| | 1997/98 Level (A) | 1996/97 Adjustment (B) | Payphone Lines * (C) | Payphone Line Adjustment (D) | 1997/98 Level (E) | 1996/97 Adjustment (F) | 1994/95 Adjustment ** (G) | Payphone (A) | OB&C (D) |
| AMERITECH | $9,892 | $2,061 | 187 | 39 | $0 | $0 | | Exhibit 5, Page 6 | |
| BELLSOUTH | $22,223 | $4,630 | 218 | 45 | $3,133 | $522 | | Appendix C, Exhibit 6 | Appendix C, Exhibit 5 |
| BELL ATLANTIC | $11,773 | $2,453 | 213 | 44 | ($21,252) | ($3,542) | | Exhibit 16S-2 | Exhibit 16S-2 |
| NYNEX | $11,300 | $2,354 | 241 | 50 | $700 | $117 | | Exhibit 16N-2 | Exhibit 16N-2 |
| PACIFIC BELL | $27,852 | $5,803 | 138 | 29 | $14,028 | $2,338 | | Attachment BFP-11 | Attachment BFP-14 |
| NEVADA BELL | $378 | $79 | 5 | 1 | $18 | $3 | | Exhibit NV-BFP-9 | Exhibit NV-BFP-9 |
| SOUTHWESTERN BELL | $18,330 | $3,819 | 175 | 37 | $1,200 | $200 | | Worksheet 8 | Text, page 11, table 2 |
| US WEST | $14,598 | $3,041 | 115 | 24 | $0 | $0 | $3,000 | Exhibit 7A | |
| ALIANT | $310 | $65 | 4 | 1 | $123 | $20 | | Exhibit EXG-PAY | Text, page 7 |
| SNET | $142 | $30 | 25 | 5 | $0 | $0 | | Workpaper BFP-6 | |
| FRONTIER | $0 | $0 | 0 | 0 | $0 | $0 | | | |
| ROCHESTER | $322 | $67 | 6 | 1 | $0 | $0 | | Exhibit 13 | |
| GTE | $0 | $0 | 0 | 0 | $17,389 | $2,898 | | | Exhibit A-9, page 2 |
| SPRINT | $0 | $0 | 0 | 0 | $1,277 | $213 | | | Exhibit 5 |

* 1996 payphone lines come from ARMIS 43-08, Table 3.
** U S West noted an error in their 1994/95 forecast: Direct Case, Page 8.
2.5 months of payphone lines were estimated as (D) = (C) x (2.5/12)
2.5 months of payphone revenues were estimated as (B) = (A) x (2.5/12)
2 months of OB&C revenues were estimated as (F) = (E) x (2/12)

**FCC Additional Adjustments to NYNEX's Actual and Adjusted Actual Revenues ($000)**

| **Tariff Year** | **1991/92** | **1992/93** | **1993/94** | **1994/95** | **1995/96** | **1996/97** |
|---|---|---|---|---|---|---|
| **NY Gross Income Tax** | ($24,300) | ($24,700) | ($28,700) | ($29,700) | $1,300 | ($9,200) |
| **Calendar Year** | **1991** | **1992** | **1993** | **1994** | **1995** | **1996** |
| **NY Gross Income Tax** | ($17,915) | ($27,062) | ($26,819) | ($29,219) | ($9,050) | ($9,332) |

Source: faxed/phone conversation

**Table A4**
**Measuring LECs Forecast Accuracy**

| | Testing Differences Between Means | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | Monthly BFP Per Line | | | Standard | Mean | Calculated | Critical | Score |
| | Actual | Forecast | Difference | Deviation | Difference | t | t @ .90 | Card |
| **Ameritech** | $4.52 | $4.42 | $0.10 | 0.133 | 0.109 | 0.816 | 1.476 | **Pass** |
| **BellSouth** | $7.14 | $7.03 | $0.11 | 0.079 | 0.117 | 1.477 | 1.476 | **Pass** |
| **Bell Atlantic** | $5.16 | $5.04 | $0.11 | 0.078 | 0.121 | 1.558 | 1.476 | **Fail** |
| **NYNEX** | $6.20 | $5.78 | $0.43 | 0.181 | 0.434 | 2.404 | 1.476 | **Fail** |
| **Pacific/Nevada** | $4.58 | $4.50 | $0.08 | 0.065 | 0.079 | 1.218 | 1.476 | **Pass** |
| **Southwestern Bell** | $5.88 | $5.57 | $0.31 | 0.076 | 0.306 | 4.017 | 1.476 | **Fail** |
| **US West** | $6.17 | $5.72 | $0.45 | 0.059 | 0.437 | 7.396 | 1.476 | **Fail** |
| **Aliant** | $4.12 | $4.13 | ($0.01) | 0.038 | -0.011 | -0.279 | 1.476 | **Pass** |
| **SNET** | $5.99 | $5.66 | $0.33 | 0.255 | 0.335 | 1.316 | 1.476 | **Pass** |
| **Frontier** | $5.71 | $5.68 | $0.03 | 0.110 | 0.035 | 0.316 | 1.476 | **Pass** |
| **Rochester** | $5.09 | $5.10 | ($0.02) | 0.039 | -0.009 | -0.231 | 1.638 | **Pass** |
| **Total GTE** | $6.96 | $7.02 | ($0.06) | 0.068 | 0.141 | 2.066 | 1.533 | **Fail** |
| **Sprint** | $6.39 | $6.17 | $0.22 | 0.088 | 0.212 | 2.411 | 1.476 | **Fail** |

**Table A5**
**Series 2: Adjusted Actual Calendar Year Revenue Requirements**
**($000)**

| | 1991 | 1992 | 1993 | 1994 | 1995 | 1996 | |
|---|---|---|---|---|---|---|---|
| AMERITECH | $892,813 | $937,435 | $941,041 | $1,045,371 | $975,226 | $1,032,269 | Exhibit 4 |
| BELLSOUTH | $1,498,051 | $1,545,969 | $1,618,000 | $1,716,578 | $1,825,171 | $1,850,117 | Appendix B, Exhibit 3 |
| BELL ATLANTIC | $975,153 | $1,026,665 | $1,094,999 | $1,168,527 | $1,187,554 | $1,224,893 | Exhibit 22S-2-A:F |
| NYNEX * | $1,105,487 | $1,073,238 | $1,123,192 | $1,248,873 | $1,380,861 | $1,206,433 | Exhibit 22N-2-A:F |
| PACIFIC BELL ** | $755,415 | $765,522 | $822,497 | $798,026 | $819,712 | $825,785 | Attachment BFP-10A |
| NEVADA BELL ** | $16,047 | $16,369 | $16,962 | $17,779 | $19,181 | $20,577 | Exhibit NV-BFP-4 |
| SOUTHWESTERN BELL | $771,322 | $812,727 | $868,873 | $931,619 | $1,020,727 | $1,079,177 | Worksheet 4 |
| US WEST *** | $819,458 | $889,047 | $946,642 | $1,022,702 | $1,136,046 | $1,238,837 | Exhibit 5, page 7 |
| ALIANT | $10,297 | $10,908 | $11,490 | $12,131 | $12,797 | $13,796 | RRQ-ADJ |
| SNET | $131,184 | $118,757 | $149,138 | $145,705 | $144,280 | $146,978 | Workpaper BFP-5 |
| FRONTIER | $8,011 | $9,315 | $10,264 | $10,842 | $10,731 | $10,694 | Exhibit 6 |
| ROCHESTER | $23,015 | $26,001 | $43,898 | $41,406 | $42,483 | $44,230 | Exhibit 9 |
| GTE | $1,387,903 | $1,506,447 | $1,542,782 | $1,601,450 | $1,645,418 | $1,546,561 | Exhibit A-2 |
| SPRINT | $423,755 | $441,920 | $470,290 | $497,579 | $515,227 | $529,207 | Exhibit 1 |

* Includes Gross Income Tax adjustments for New York.
** Includes additional one-time adjustment for booking expenses
*** Includes additional one-time adjustment for depreciation expenses in 1994.

**Table A6**
**Input Data Used to Calculate FCC's Lagged Regression Forecast**

**SOUTHWESTERN**

| Calendar Year | Adjusted Series II Actual | Total Number of Lines | BFP/LINE | Regression Input Data BFP (t) | BFP (t-1) |
|---|---|---|---|---|---|
| 1991 | $771,322 | 11,644,608 | $5.52 | | |
| 1992 | $812,727 | 12,004,230 | $5.64 | $5.64 | $5.52 |
| 1993 | $868,873 | 12,411,411 | $5.83 | $5.83 | $5.64 |
| 1994 | $931,619 | 12,848,492 | $6.04 | $6.04 | $5.83 |
| 1995 | $1,020,727 | 13,384,185 | $6.36 | $6.36 | $6.04 |
| 1996 | $1,079,177 | 14,155,025 | $6.35 | $6.35 | $6.36 |

**US WEST**

| Calendar Year | Adjusted Series II Actual | Total Number of Lines | BFP/LINE | Regression Input Data BFP (t) | BFP (t-1) |
|---|---|---|---|---|---|
| 1991 | $819,458 | 12,483,474 | $5.47 | | |
| 1992 | $889,047 | 12,902,359 | $5.74 | $5.74 | $5.47 |
| 1993 | $946,642 | 13,315,690 | $5.92 | $5.92 | $5.74 |
| 1994 | $1,022,702 | 13,886,279 | $6.14 | $6.14 | $5.92 |
| 1995 | $1,136,046 | 14,476,201 | $6.54 | $6.54 | $6.14 |
| 1996 | $1,238,837 | 15,163,380 | $6.81 | $6.81 | $6.54 |

**NYNEX**

| Calendar Year | Adjusted Series II Actual | Total Number of Lines | BFP/LINE | Regression Input Data BFP (t) | BFP (t-1) |
|---|---|---|---|---|---|
| 1991 | $1,105,487 | 14,670,851 | $6.28 | | |
| 1992 | $1,073,238 | 14,751,794 | $6.06 | $6.06 | $6.28 |
| 1993 | $1,123,192 | 15,092,103 | $6.20 | $6.20 | $6.06 |
| 1994 | $1,248,873 | 15,620,900 | $6.66 | $6.66 | $6.20 |
| 1995 | $1,380,861 | 16,158,220 | $7.12 | $7.12 | $6.66 |
| 1996 | $1,206,433 | 16,679,225 | $6.03 | $6.03 | $7.12 |

**SPRINT**

| Calendar Year | Adjusted Series II Actual | Total Number of Lines | BFP/LINE | Regression Input Data BFP (t) | BFP (t-1) |
|---|---|---|---|---|---|
| 1991 | $423,755 | 5,448,722 | $6.48 | | |
| 1992 | $441,920 | 5,657,275 | $6.51 | $6.51 | $6.48 |
| 1993 | $470,290 | 5,919,870 | $6.62 | $6.62 | $6.51 |
| 1994 | $497,579 | 6,221,764 | $6.66 | $6.66 | $6.62 |
| 1995 | $515,227 | 6,505,807 | $6.60 | $6.60 | $6.66 |
| 1996 | $529,207 | 6,845,396 | $6.44 | $6.44 | $6.60 |

**Table A7**

**Comparison of Monthly BFP Per Line Forecasts for Tariff Year 1997/98**

| | Nynex | GTE* | Sprint | Southwestern | US West |
|---|---|---|---|---|---|
| **FCC Autoregression Forecast** | $6.48 | na | $6.56 | $6.53 | $7.38 |
| ***Regression R-Squared*** | 0.09 | | 0.01 | 0.97 | 0.99 |
| **Comparative Forecasts:** | | | | | |
| **FCC Trend Forecast** | $6.72 | na | $6.58 | $6.72 | $7.24 |
| **FCC Calendar Year Arithmetic Mean** | $6.39 | na | $6.55 | $5.96 | $6.10 |
| **FCC 3-Year Moving Average** | $6.35 | na | $6.50 | $6.37 | $6.82 |
| **FCC 5-Year Moving Average** | $6.61 | na | $6.59 | $6.16 | $6.50 |
| **FCC 5-Year Geometric Average** | $6.01 | na | $6.45 | $6.64 | $7.35 |
| **LEC's Forecast** | $5.92 | $6.21 | $6.41 | $5.75 | $6.56 |

Note: 1997/98 forecasts reflect additions for OB&C, OPEB, and Payphone using LECs data.
NYNEX: $11.3 million for payphone and .7 million for OB&C.
Bell Atlantic: $11.8 million for payphone and -$21.3 million for OB&C.
Bell South: $22.2 million for payphone and $3.1 million for OB&C.
GTE: $11.6 million for loop pay, $4.5 million for payphone equipment and $17.4 million for OB&C.
Sprint: $1.3 million for OB&C.
US West: $14.6 million for payphone based on 1996 data.
Southwestern: -$17.0 million for OPEB, $1.2 million for OB&C, and $18.3 million for Payphone.

**Table A8**
**Actual Tariff Year Revenue Requirements**
**($000)**

| | 1991/92 | 1992/93 | 1993/94 | 1994/95 | 1995/96 | 1996/97 | Source |
|---|---|---|---|---|---|---|---|
| AMERITECH | $787,187 | $820,991 | $952,858 | $1,037,718 | $1,022,699 | $1,033,471 | Exhibit 1 |
| BELLSOUTH | $1,386,648 | $1,457,351 | $1,655,630 | $1,768,817 | $1,843,461 | $1,867,910 | Appendix A, Exhibit 1 |
| BELL ATLANTIC | $910,304 | $975,404 | $1,141,585 | $1,236,944 | $1,247,084 | $1,293,304 | Exibit 16S-1-B, rebuttal |
| NYNEX | $1,010,901 | $988,784 | $1,207,693 | $1,243,459 | $1,379,790 | $1,182,131 | Exibit 16N-1-B, Direct Case, pp. 7-8. |
| PACIFIC BELL | $678,773 | $731,745 | $802,661 | $845,251 | $870,834 | $916,947 | Appendix B, Exh. PTCA, Attachment BFP-2 |
| NEVADA BELL | $17,174 | $16,388 | $17,056 | $18,406 | $19,879 | $21,738 | Appendix B, Exhibit NV-BFP-2 |
| SOUTHWESTERN BELL | $704,637 | $745,986 | $907,365 | $953,267 | $1,031,487 | $1,137,438 | Worksheet 2 |
| US WEST | $776,126 | $811,770 | $956,607 | $1,092,181 | $1,170,617 | $1,276,355 | Exhibit 2, pp.1-6 |
| ALIANT | $9,820 | $9,751 | $11,804 | $12,251 | $13,221 | $14,194 | Exhibit ACT-TY |
| SNET | $108,806 | $114,244 | $146,440 | $144,673 | $146,883 | $152,139 | Workpaper BFP-2 |
| FRONTIER | $8,150 | $9,188 | $10,293 | $10,786 | $10,713 | $10,642 | Attachment B, Exhibit 2 & Exhibit 3, p.1 |
| ROCHESTER | na | na | $41,172 | $41,944 | $43,357 | $45,040 | Attachment A, Exhibit 8, p.1 |
| GTE (WITHOUT USF ADJ.) * | $1,131,864 | $1,160,461 | $1,389,294 | $1,421,105 | $1,413,077 | na | Exhibit A-8, p.1-2 |
| SPRINT | $394,134 | $424,537 | $472,239 | $512,230 | $517,572 | $536,793 | Exhibit 1, p.2 |

* GTE did not provide data for its 1996/97 actual revenue requirement.

**Table A9**
**Total Actual Number of Lines**

| | 1991/92 | 1992/93 | 1993/94 | 1994/95 | 1995/96 | 1996/97 | |
|---|---|---|---|---|---|---|---|
| AMERITECH | 15,892,679 | 16,295,755 | 17,013,650 | 17,638,239 | 18,369,963 | 19,027,898 | Exhibit 7 |
| BELLSOUTH | 17,469,296 | 18,125,555 | 18,857,556 | 19,733,634 | 20,675,452 | 21,697,325 | Appendix E, Exhibit 1 |
| BELL ATLANTIC | 17,092,182 | 17,508,322 | 17,945,333 | 18,467,931 | 19,135,123 | 19,850,591 | Exhibit 345-1, rebuttal |
| NYNEX | 14,726,241 | 14,873,840 | 15,350,200 | 15,882,257 | 16,383,891 | 16,986,520 | Exhibit 31N-1 |
| PACIFIC BELL | 13,800,912 | 14,107,677 | 14,422,467 | 14,834,503 | 15,377,843 | 16,065,625 | Exhibit 1 |
| NEVADA BELL | 230,670 | 242,053 | 251,696 | 265,531 | 282,527 | 303,808 | Exhibit NV-BFP-11 |
| SOUTHWESTERN BELL | 11,797,943 | 12,187,124 | 12,582,743 | 13,031,694 | 13,656,925 | 14,395,007 | Exhibit 1SW |
| US WEST | 12,483,474 | 12,902,359 | 13,315,690 | 13,886,279 | 14,476,201 | 15,163,380 | Exhibit 9 |
| ALIANT | 221,424 | 227,187 | 233,392 | 241,675 | 250,778 | 261,171 | AVR-ACT |
| SNET | 1,777,990 | 1,801,923 | 1,841,366 | 1,898,517 | 1,967,867 | 2,017,876 | Exhibit 2 |
| FRONTIER | 134,426 | 138,450 | 142,671 | 147,179 | 151,765 | 157,929 | Exhibit 9 |
| ROCHESTER | na | na | 667,846 | 694,059 | 710,318 | 735,912 | Exhibit 14, page 1 |
| GTE | 14,271,423 | 14,751,142 | 15,301,154 | 15,914,387 | 16,395,618 | 16,938,663 | Exhibit B-1, Page 1 |
| SPRINT | 5,506,101 | 5,739,129 | 6,026,792 | 6,322,710 | 6,665,544 | 7,003,530 | Exhibit 8 |

**Table A10**
**Projected Tariff Year Revenue Requirements**
**($000)**

| | 1991/92 | 1992/93 | 1993/94 | 1994/95 | 1995/96 | 1996/97 * | 1997/98 | Source |
|---|---|---|---|---|---|---|---|---|
| AMERITECH | $735,746 | $757,906 | $833,823 | $1,006,213 | $1,028,026 | $1,108,772 | $1,108,290 | Exhibit 3; Exhibit 5, p.5-6 |
| BELLSOUTH | $1,356,340 | $1,401,481 | $1,648,031 | $1,665,010 | $1,843,367 | $1,921,130 | $1,906,588 | App. A, Exh.2; App. B, Exh.4; App. C, Exh.4 & Exh.5 |
| BELL ATLANTIC | $851,092 | $915,634 | $1,130,894 | $1,159,884 | $1,259,843 | $1,303,620 | $1,310,584 | Exibit 16S-1-C, rebuttal |
| NYNEX | $944,967 | $914,476 | $1,037,579 | $1,174,429 | $1,211,303 | $1,245,812 | $1,247,153 | Exibit 16N-1-C |
| PACIFIC BELL | $692,952 | $669,613 | $801,594 | $828,146 | $820,333 | $863,445 | $882,526 | Attachments BFP-3; BFP-11, p.9; BFP-12; BFP-14 |
| NEVADA BELL | $16,741 | $15,192 | $16,803 | $17,627 | $17,759 | $18,646 | $22,783 | Exhs. NV-BFP-3; NV-BFP-4; NV-BFP-9; |
| SOUTHWESTERN BELL | $681,597 | $669,479 | $885,246 | $920,554 | $948,126 | $1,030,044 | $1,051,927 | Worksheet 3; Worksheet 8; Text, p.11, Table 2; Attachment 5.6 |
| US WEST | $748,748 | $754,627 | $911,127 | $1,025,253 | $1,035,131 | $1,167,934 | $1,251,060 | Exhs. 3; 7, p.1; 7A |
| ALIANT | $10,014 | $9,736 | $11,555 | $12,655 | $13,021 | $13,812 | $16,174 | PROJs - 91/92 to 97/98; Text p.7; EXG-PAY |
| SNET | $110,178 | $106,510 | $112,196 | $137,679 | $150,036 | $144,881 | $141,962 | Exh. 12; Workpaper BFP-6 |
| FRONTIER | $8,608 | $8,754 | $9,618 | $10,463 | $11,136 | $10,698 | $10,941 | Exh. 4, p.1 |
| ROCHESTER | na | na | $40,755 | $40,710 | $44,234 | $45,272 | $47,266 | Exh. 8, p.1; Exh. 13 |
| GTE | $1,133,953 | $1,098,976 | $1,335,180 | $1,410,849 | $1,436,879 | $1,477,455 | $1,348,870 | Exhs. A-8; A-9, p.2 |
| SPRINT | $399,975 | $404,382 | $449,691 | $468,439 | $485,200 | $509,764 | $566,860 | Exh. 4; Exh. 5 |

**Table A11**
**Total Forecasted Number of Lines**

| | 1991/92 | 1992/93 | 1993/94 | 1994/95 | 1995/96 | 1996/97 * | 1997/98 | |
|---|---|---|---|---|---|---|---|---|
| AMERITECH | 15,998,268 | 16,289,911 | 16,698,770 | 17,328,870 | 17,677,967 | 19,032,582 | 20,011,377 | Exhibit 7-8 |
| BELLSOUTH | 17,601,926 | 18,053,618 | 18,862,929 | 19,542,740 | 20,860,709 | 21,728,710 | 22,806,709 | Appendix E, Exhibit 1 |
| BELL ATLANTIC | 17,135,859 | 17,332,640 | 17,911,365 | 18,378,015 | 19,029,046 | 19,682,764 | 20,847,609 | Exhibit 34N-1, rebuttal |
| NYNEX | 14,889,899 | 15,076,375 | 15,217,326 | 15,690,551 | 16,382,434 | 16,940,253 | 17,563,242 | Exhibit 34S-1 |
| PACIFIC BELL | 13,946,474 | 14,162,510 | 14,316,287 | 14,610,316 | 14,828,009 | 15,121,957 | 16,447,727 | Exhibit 1 |
| NEVADA BELL | 229,538 | 240,293 | 249,910 | 262,827 | 278,670 | 299,944 | 318,718 | Exhibit NV-BFP-11 |
| SOUTHWESTERN BELL | 11,689,267 | 11,977,615 | 12,497,030 | 13,011,110 | 13,490,162 | 14,186,725 | 15,255,951 | Exhibit 1SW, 2SW |
| US WEST | 12,695,515 | 13,003,956 | 13,396,418 | 13,957,342 | 14,199,787 | 15,017,058 | 15,904,551 | Exhibit 10 |
| ALIANT | 222,654 | 227,359 | 231,183 | 239,744 | 247,811 | 259,326 | 236,861 | PROJ-RR; 93/94 |
| SNET | 1,782,699 | 1,795,481 | 1,825,360 | 1,867,907 | 1,916,472 | 2,021,560 | 1,954,006 | Exhibit 2 |
| FRONTIER | 135,032 | 138,344 | 141,879 | 147,243 | 151,448 | 156,186 | 164,570 | Exhibit 9 |
| ROCHESTER | na | na | 662,227 | 684,392 | 709,929 | 734,405 | 765,384 | Exhibit 14, p.1 |
| GTE | 14,342,117 | 14,688,912 | 15,291,389 | 15,935,434 | 16,691,270 | 16,750,193 | 18,115,178 | Exhibit B-1, page 1 |
| SPRINT | 5,422,947 | 5,712,560 | 5,942,450 | 6,218,741 | 6,533,404 | 6,872,898 | 7,367,130 | Exhibit 8 |

* Includes additional adjustments for OBC and Payphone displayed in Table 6.

## Table A12: Actual and Forecast per-line BFP RR for GTE

| Tariff Year | Actual | GTE's Forecast | OB&C/Payphone Adjustments | Geometric Growth Forecast | 3-year Arithmetic Mean Forecast |
|---|---|---|---|---|---|
| **1991/92** | $6.61 | $6.59 | | | |
| **1992/93** | $6.56 | $6.23 | | | |
| **1993/94** | $7.57 | $7.28 | | | |
| **1994/95** | $7.44 | $7.38 | | | |
| **1995/96** | $7.18 | $7.17 | | | |
| **1996/97** | | $7.35 | | | |
| **1997/98** | | $6.21 | | $7.00 | $7.40 |
| | | | $0.15 | $6.97 | $7.55 |

# Comment Summaries--APPENDIX C

## I. Price Cap Carriers

### A. Common Line Issues

#### 1. Direct Cases

##### a. Aliant

232. In its direct case, Aliant provides its actual BFP revenue requirement data, calculated using ARMIS, for the 1991 through 1996 calendar years. To calculate these data for the 1991/92 through 1996/97 tariff years, Aliant allocated the calendar year figures based on ratios calculated using actual quarterly cost study BFP revenue requirement data.[351] Aliant also provides its projected BFP revenue requirements, drawn from its tariff filings over the same period. In every case, Aliant's forecasted BFP revenue requirement growth fell outside a ten percent margin of error when compared to its actual BFP revenue requirement growth. In every tariff year except 1994/95, Aliant significantly underestimated its BFP revenue requirement, while in 1994/95, its forecasts significantly overestimated the actual BFP revenue requirement.[352] Aliant states that its use of a two-point linear projection to forecast its BFP revenue requirement for the upcoming tariff year will fail the Commission's ten-percent test, set forth in the *1997 Designation Order*, but that the resulting errors are not necessarily significant.[353]

233. Aliant also provides BFP revenue requirement series for the calendar years 1991 through 1996, adjusted for changes to the Commission's rules that required: (1) a 25 percent interstate Subscriber Plant Factor (SPF), effective January 1, 1993; (2) changes in Dial Equipment Minutes-of-use (DEM), effective January 1, 1993; (3) the reallocation of General Support Facilities (GSF), effective July 1, 1993; and (4) changes to the treatment of Account 4310 ("Other Long-term Liabilities"), effective January 1, 1993, through December 31, 1995. Aliant states that it has used a constant 5 percent common line allocation for Other Billing and Collection expenses (OB&C) throughout the time period under review in this investigation and that, therefore, no adjustments to the BFP revenue requirement calculations

[351] Aliant Direct Case at 1-2. This process did not allocate precisely 50 percent to each tariff year.

[352] Aliant Direct Case at 2 and Exh. RRQ-COMP.

[353] Aliant states that it does not consider the difference between its 1992/93 BFP actual revenue requirement growth (-0.7 percent) and its actual figure (-0.9 percent) to be significant because the dollar amount of the error was only $15,000.00. Aliant Direct Case at 2.

for OB&C expenses were necessary.[354]

234. Aliant states that it has used the same method to project its BFP revenue requirements since its initial price-cap filing in 1993. To perform this calculation, Aliant computes the interstate BFP revenue requirement growth rate between the base period and the previous base period, at an 11.25 percent rate of return, and extrapolates this growth rate to develop the BFP revenue requirement for the upcoming tariff year, including adjustment for the six-month lag time between the calendar-year and tariff-year time lines.[355] Aliant states that its only modifications to this process took place in preparing the 1993/94 and 1994/95 tariff filings, in which it adjusted its calculations to remove the effect of the change to a 25 percent interstate SPF allocation factor.[356]

235. Aliant states that the Commission's *OB&C Order*[357] changed its allocation of OB&C expenses to the interstate jurisdiction from 12.33 percent to 33.33 percent for tariff year 1997/98. Aliant, therefore, applied the new allocation to its base period cost studies. By subtracting the actual base period cost study amounts from these revised figures, Aliant determined that the change in its BFP revenue requirement, and corresponding upward exogenous adjustment to its price cap, was $122,503.00.[358] Based on Aliant's projected line count of 268,919 access lines for tariff year 1997/98, this rule change increased the monthly per-line BFP revenue requirement by approximately $0.04 for the coming tariff year.

236. Similarly, Aliant states that, in response to the *Payphone Reconsideration Order*,[359] it calculated the exogenous cost change for pay telephones by dividing the 1995 pay telephone revenue requirement by the sum of the 1995 total common line revenue requirement and the LTS requirement. Aliant then multiplied this resulting exogenous factor by the negative of the common-line R value to arrive at the exogenous cost change.[360]

237. Aliant forecasts its EUCL using the same method it uses to project its BFP

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[354] Aliant Direct Case at 3.

[355] Aliant Direct Case at 5.

[356] Aliant Direct Case at 5.

[357] Amendment of Part 36 of the Commission's Rules and Establishment of a Joint Board, Report and Order, 12 FCC Rcd 2679 (1997).

[358] Aliant Direct Case at 6-7.

[359] Implementation of the Pay Telephone Reclassification and Compensation Provisions of the Telecommunications Act of 1996, Order on Reconsideration, 11 FCC Rcd 21233 (1996).

[360] Aliant Direct Case at 7.

revenue requirement. Aliant calculates the EUCL demand growth it experienced in the base period, as compared with the previous base period, and extrapolates to the upcoming tariff year using this growth rate.[361] Aliant provides a comparison of its actual and projected lines for the past six tariff years, showing that, in the four most recent tariff years, its EUCL demand forecasts understated EUCL demand by more than ten percent of the actual growth.[362] As required by the Commission's *Designation Order*, Aliant also performs a historical trend analysis, using the natural log of lines over the 1991/92 through 1996/97 tariff years, to project its 1997/98 line count. The line count growth projection Aliant calculated using the two-year extrapolation method (and filed in its 1997/98 access tariff) is not within ten percent of the line count growth indicated by this longer-term trend.[363]

238. Aliant nevertheless contends that the line count filed in its tariff is statistically valid. In support of this argument, Aliant constructed, using the *t* distribution, a 95 percent confidence interval centered around the value predicted by the Commission-mandated historical trend analysis. Because the line count filed in Aliant's 1997/98 access tariff falls within this confidence interval, Aliant argues that its line count prediction, based on a two-year extrapolation, should be accepted, despite the fact that it fails the Commission's ten percent test.[364]

239. Aliant states that it has 299 semi-public payphones on which it now charges multi-line business EUCL rates, instead of single-line business EUCL rates.[365] Aliant states that it does not forecast separately ISDN lines or payphone lines.[366]

**b. Ameritech**

240. Ameritech submits BFP data showing that it significantly underestimated its BFP revenue requirement in tariff years 1991/92 through 1994/95, while it significantly

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[361] Aliant Direct Case at 7. Aliant states that it did not develop separate projections for individual classes of lines.

[362] Aliant Direct Case at Exh. AVR-ACT. In tariff year 1991/92, Aliant's EUCL demand growth forecasts overestimated actual EUCL demand by more than 10 percent of the actual growth. In tariff year 1992/93, Aliant's estimates were within the 10 percent tolerance established in the *Designation Order*.

[363] Aliant Direct Case at Exh. ACT-COMP.

[364] Aliant Direct Case at 8-9.

[365] Aliant Direct Case at 10.

[366] Aliant Direct Case at 9-10.

overestimated its BFP revenue requirement in tariff years 1995/96 and 1996/97.[367] Ameritech significantly overestimated its EUCL demand in the 1991/92 tariff year, and significantly overestimated EUCL demand in tariff years 1993/94, 1994/95, and 1995/96. In the remaining tariff years, Ameritech's forecasts were within the ten percent tolerances established in the *Designation Order*.[368]

241. To develop its 1997/98 BFP revenue requirement and line count forecasts, Ameritech used a mathematical formula to determine the growth rate experienced between 1991 and 1996, and applied this growth rate to the 1996 data, extrapolating to the 1997/98 tariff year.[369] Without focussing on the reasons underlying the differences between its forecast data and actual BFP revenue requirements and line counts, Ameritech argues that the Commission should evaluate not whether its projected growth rate was accurate, but whether the actual BFP revenue requirements and line counts differed significantly from the forecasted amount. Ameritech contends that even statistically insignificant differences between forecasts and actual results could fail the ten percent test set forth in the *1997 Designation Order*.[370]

242. Ameritech opposes the Commission's proposals to pool all LEC data into a single data set for analysis purposes, arguing that it would be both difficult to account for company-specific situations and burdensome to obtain industry-wide information on a timely basis.[371] Ameritech suggests the use of historical data, rather than forecasts, to develop the per-line BFP, arguing that such an approach would eliminate the controversy associated with forecasting and would be consistent with the Commission's decision in the *Access Charge Reform Order* to require the EUCL charge to be set at the average per-line common line revenue permitted under the price cap rules (using historical line counts) once the PICC no longer recovers any common line revenue.[372]

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[367] Ameritech Direct Case at Exhibits 1, 3, 6.

[368] Ameritech Direct Case at Exh. 7.

[369] Ameritech Direct Case at Exh. 5, 6.

[370] Ameritech Direct Case at 2-3.

[371] Ameritech Direct Case at 4.

[372] Ameritech Direct Case at 4. The Commission has reconsidered this aspect of the *Access Charge Reform Order*, concluding that a price cap carrier should set its EUCL charge to recover the average per-line common line revenues permitted under the price cap rules once the maximum PICC assessed on primary residential lines, plus the maximum EUCL charge assessed on those lines, recovers the full amount of the price cap LEC's per-line common line price cap revenues. The Commission did not disturb its findings with respect to the use of historical line counts. *Access Charge Reform, et. al.* CC Docket 96-262, *et. al.*, Order on Reconsideration, FCC 97-247 (rel. July 10, 1997) at ¶ 15. The Common Carrier Bureau recently granted a waiver requested by USTA to permit the use of historical line counts in developing the PICC as well. United States Telephone Association