Appendix A

Two independent rate calculators were used to project the access rates charged by the ten local exchange carriers subject to price cap regulation during the first half of 2000. The "base case" plan calculator reflects, to the extend possible, the access rules effective on 1/1/2000 found in parts 54, 61, and 69 of the Commission's rules. The "CALLS" plan calculator reflects, to the extent possible, modifications to parts 54, 61, and 69 of the Commission's rules as proposed by the CALLS coalition. The following list outlines common key assumptions made in the programming of each of the rate calculators.

- The inputs used in both calculators were drawn from Tariff Review Plans (TRPs) filed by the carriers in December of 1999. The inputs drawn from these filings represent charges effective beginning on January 1, 2000 and demand data for 1998. Charges reflect average revenue per minute based upon rates effective January 1, 2000 and demand for 1998. Charges reflect actual charges reported in the RTE-1 portion of the carrier TRPs, rather than allowable charges as reported in the CAP-1 portion of the carrier TRPs. Base growth rates are estimated based upon historical growth rates as computed from carrier TRPs and Common Carrier Bureau Industry Analysis Division (IAD) staff estimates. All rates, demands, and growth rates going forward are projections.

- Carriers access charges were calculated based upon the levels of aggregation selected by the companies when filing TRPs. Because carriers are given considerable flexibility in determining what level of aggregation to use when calculating rates, actual rates may be calculated at a level of aggregation that differs from that selected when filing TRPs. As a result, the charges projected by the access calculators may depart from those computed by carriers and reported in their TRPs.

- Both calculators assume that carriers remove all traditional USF contributions, or "flowback", from access rates on July 1, 2000. Estimates of USF contributions removed from holding company access charge rates were based upon data supplied by staff of the Common Carrier Bureau's Competitive Pricing Division (CPD). Removals by TRP were calculated based upon proportional removals of the amounts provided in the CPD holding company estimates. For example, CPD provided estimates of the amount of USF to be removed from the combined allowable Marketing Baskets of the Sprint companies. In order to achieve this reduction, an equal percentage of revenues was removed from each of the Sprint TRP level Marketing Baskets.

- Both calculators assume that the annual inflation rate as measured by the fixed weight GDP-PI will be 1.95% for all years between 1999 and 2005. The "Base Case" calculator assumes an initial inflation rate for 1998 of 1.41%.

- Both calculators assume that carriers currently charge the maximum rates allowable under the appropriate price cap rules and continue to do so for the life of the CALLS plan. No provision is made for potential low end adjustments, increases in competition, or changes associated with pricing flexibility.

The following are key assumptions made in the programming of the "CALLS" plan rate calculator.

- For the "CALLS" plan calculator, all 10 carriers currently under price cap regulation are assumed to adopt the "CALLS" plan rules.

- Access-USF is distributed to holding companies according to estimates submitted by the CALLS coalition. TRP level distributions within holding companies were calculated assuming proportional allocations based on TRP level Common Line Basket revenues as of January 1, 2000. Following the CALLS estimates, distributions totaled $650 million each year of the plan, and allocations were held constant over time.

- The CALLS plan proposes certain benefits to carriers after average traffic sensitive (ATS) rates reach specified targets. Targets for all carriers match those proposed in the CALLS submission except for targets for Citizens, which are set at $0.0095.

- The CALLS plan proposes a reduction in the sum of ATS and carrier common line (CCL) rates on July 1, 2000 (as measured based on 1999 demand) equal to $2.1 billion. Staff estimates that the removal of flowback, distribution of access-USF, and X-factor targeting proposed in the CALLS, must be supplemented by a one time reduction of local switching revenue of 37% in order to achieve the approximate $2.1 billion reduction. The CALLS calculator assumes the local switching revenues are removed prior to X-factor targeting. Alternatively, if the local switching revenue were removed after targeting, the percentage removal necessary to achieve the $2.1 billion reduction would increase slightly.

- All reductions in ATS revenue due to targeting are assumed to be removed proportionately from all elements included in the ATS. Under the CALLS plan, however, ILECs are given flexibility in reductions are distributed. Therefore, some carriers may reduce some rate elements in the ATS by more than others.

- For carriers that are allowed to move revenue removed from the local switching element to the carrier common line basket, and who are required to reduce these extra common line revenues over time, it is assumed that ATS and extra common line revenues are reduced proportionately by targeting. Therefore, for carriers required to reduce extra common line revenues, extra common line revenue will be eliminated at the same time ATS targets are met.

- Revenues moved by carriers from the local switching element to the common line basket are assumed to flow within the same TRP entity where they were generated to the multiline business subscriber line charge (SLC) to the extent permitted by industry caps, then to the multiline business presubscribed interexchange carrier charge (PICC) to the extent permitted by industry caps. For carriers that are allowed to collect additional revenues, not collectable under the industry caps, from other areas within their holding company, collections are assumed to come first from the multiline business SLC in the TRP area with highest SLC to the extent permitted by industry caps, then from the multiline business PICC in the TRP area with highest SLC to the extend permitted by industry caps. If revenues remain, the carrier is assumed to collect additional revenues from the multiline business SLC in the TRP area with second highest SLC to the extent permitted by industry caps, then from the multiline business PICC in the TRP area with second highest SLC to the extend permitted by industry caps. and so on, until all permitted revenues have been collected or all multiline business industry caps have been reached.

- Part 61 A, 48(m)(I)(i) is assumed to apply to SBC and US West. Part 61 A, 48(m)(I)(ii) is assumed to apply to Sprint, Frontier, and Citizens. These assumptions are based upon CPD discussions with the CALLS coalition. IAD staff has not, based upon model results, verified qualification status.

Assumptions

Appendix B

GROWTH30.WK4 Module estimates changes in key growth rates as a result of changes in access rates.

Inputs

The Delphi- based Access Calculators produce cap price levels for access charges that are aggregated to the following broad levels.

Subscriber Line Charges: [by TRP area]
- Residential and Single Line Business
- non-primary residential
- multi-line business

PICC charges [nationwide averages]
- Residential and Single Line Business
- non-primary residential
- multi-line business

Access minute charges [nationwide averages]
- originating
- terminating

Special Access & IX charges [nationwide per switched minute charge even if actual charges are flat rated.]

Amount added (nationwide) for new USF program.

Change in Lifeline due to changes in SLCs.

Outputs:

This module estimates growth rates for:
- primary residential and single line business access lines
- non-primary residential access lines
- multi-line business access lines
- originating access minutes
- terminating access minutes
- switching access minutes

These growth rates are used by the Delphi-based Access Rate Calculators.

This Module also produces summary statistics.

Base Growth

Annual growth rates are predicted as the prior year growth rate plus or minus demand changes stimulated/repressed by price changes.

In order to avoid use of iterative techniques, trend amounts are calculated for key quantities. These amounts are used in determining demand stimulation and then final quantities are based on the trends plus or minus the stimulated amounts.
For example, the weighted average primary and non-primary PICC charge for a period is based on the trend numbers of primary and non-primary lines. Changes in the average PICC may, in turn, effect the number of lines for the period. The after stimulate numbers for lines are then used to determine ILEC revenue and become the base amount for the next period.
Prior period second line quantities are used for calculating weighted average second line PICC charges.

1 Assumption (1)

1999 growth rates are based on changes in quantities reported in the TRPs for 1997 through 1999.

The base growth rate for primary lines is slightly higher than the rate of household formation [1.4% per year compared with 1.0% to 1.1%] because: 1) penetration has been increasing; 2) residential lines at second homes are counted as primary lines and the percentage of households with vacation homes has been increasing by almost 5% per year; and 3) Primary lines include single line business access lines. Also, tax returns from non-farm sole proprietorships have been increasing at over 2% per year.

The use of constant growth rates for each TRP creates a slight upward bias in the weighted average for growth over time. This is because areas with faster growth become relatively larger, and therefore more important in the averages. This increases the effective growth rates for second lines from 8% to 9% per year, over five years. This does not bias the model with respect to CALLS vs. the BASE CASE.

1 Assumption (2)

All PICC charges are billed to IXCs. While some PICC charges are paid by customers that do not have a presubscribed IXC, we do not know how many of these customers exist in each TRP area. Since we would have to use nationwide average changes in PICC rates, the price effect is the same whether or not it is passed through an IXC.

1 Assumption (3) IXCs will pass PICC charges through to customers in the form of nationwide average monthly charges. We know that large multi-line customers in states with low PICCs are able to negotiate with IXCs so as not to pay a nationwide average amount. Since actual PICCs are used to calculate TRP revenue, the only bias created is in determining elasticity effects. Growth for low-PICC states will be slightly understated and for high-PICC states will be slightly overestimated. Nationwide totals should be unbiased.

1 Assumption (4) We assume that IXCs recover 100% of PICC charges by placing flat monthly charges on their customers. For residential customers, we assume that carriers use a single weighted average charge customer account. (Calculated as primary and secondary PICC revenue divided by primary lines) We assume that carriers use a separate PICC pass through charge for multi-lines, averaged for all lines.. Actual IXC practices vary.

1 Assumption (5) We assume that customer's treat all flat monthly charges as part of the monthly rate for local telephone service.

1 Assumption (6) Elasticities of demand: monthly service [no lag]
Note: changes in fixed monthly toll charges are treated as changes in local service cost.

-0.0080	Primary residential & single line business
-0.4000	Secondary residential
-0.1000	multi-line business

The primary residential & single line business elasticity is based on work by Hausman, Tardiff & Belinfante. The second line elasticity is based on work by Eisner & Waldon. The multi-line elasticity is assumed to be somewhat higher than the primary residential figure but significantly less than the second residential line figure.

1 Assumption (7) Elasticity of demand for toll service

Same period

-0.8

The elasticity effect is based on the change in the average interstate and international toll charge per minute for both business and residential customers, adjusted to take out trend changes in toll rates (since an average decline in toll rates is built into the trend growth in minutes.) The average toll rate for the first half 1999 is assumed to be the amount estimated for 1998 in the Telecommunications Industry Revenue Report adjusted using trend change from Assumption (9) and Less PICC pass through, which is treated as part of local service revenue

$0.135 Interstate & international calls

Note: The elasticity effect should be based on per minute charges rather than on average revenue per minute including flat rated elements. The PICC pass through charges are treated as part of the local bill and have been removed from the overall toll ARPM and from imputed residential bill. Nonetheless, some USF pass through was flat rated in 1998 and toll revenue includes other flat rated elements. Since an access change would represent a greater percentage change measured against actual per minute charges, a relatively high elasticity has been specified to reduce the bias.

1 Assumption (8) Note: the weighted average per minute toll rates in Workpaper 3 ignore the fact that some IXC toll charges are flat rated. However, we have no information on flat rated elements for business customers. This creates a slight bias because changes in per minute access charges will have a greater percentage effect on toll rates than assumed by the model.

The module treats PICC flow through as a part of local rates rather than as a per minute toll charge. The analysis of interstate toll rates starts with estimates that include all IXC charges including PICC flow-through charges. In order to avoid double counting, the following per minute adjustments are used:

Average PICC rate in 1998 for residential	$0.82
Average residential toll minutes (see below)	73.2
PICC per Minute residential & SLB	$0.0116
weighted average all minutes (Telecommunications Industry Revenue, Table 10)	$0.0058
Average Multi-line billed minutes (see below)	380.9
PICC per minute - multi-line	$0.0047

For most IXCs, residential customers are subject to monthly minimums. This has no price effect for customers with high or average usage, but results in a flat $3 charge added to no toll customers. In theory, this amount should be added to the average monthly charge for these customers before considering elasticity effects. However, the growth module evaluates elasticity effects for average customers, not by customer groups. However, there would also be an offsetting and perhaps greater effect, since eliminating the $3 minimums means that carriers would have to increase per minute rates to collect the same amount of revenue. Workpaper 5 uses data from Bill harvesting data, to show that the elimination of the $3 minimums would result in a 5.5% decrease in IXC revenue. Residential rates would have to increase approximately $.011 to offset this amount.

1 Assumption (9) Trend growth in access minutes reflects demand stimulation in prior years due to toll price decreases. Prices have declined because of access reductions as well as other factors. Workpaper 4 estimates that interstate & international rates declined each six months between 1992 and 1998 by:

-2.7%

Workpaper 4 also estimates the semi-annual decline in per minute access cost to IXCs

-3.4%

Workpaper 4 also estimates the amount that rates declined for reasons other than access charge reductions.

-2.5%

This represents the reduction every six months in the non-access portion of toll rates. (i.e. the average rate minus the average cost of access)

1 Assumption (10) Stimulation of local access lines due to lower per minute charges:
The average total bill effect of a change in toll rates (average minutes per line times change in rate) is subject to a different elasticity effect than local rate changes.
Note that the change in access is adjusted to reflect trend changes in access. Thus, if access rates are constant, for example, there should be a slight reduction in growth rates in access lines. The elasticity's are:

	Same period
Residential	-0.0100
business	-0.0100

1 Assumption (11) Total nationwide conversation minutes are equal to terminating access minutes.

1 Assumption (12) Inflation for 2000 through 2005 is assumed to be the same as inflation for the years used to calculate base growth. Accordingly, we assume that demand changes due to changes in general price levels are already factored into the base growth rates

1 Assumption (13) For simplicity, this module starts with originating and terminating access minute rates that include switching. Since switching minutes differs slightly from originating plus terminating, multiplying the originating & terminating minutes and composite rates will not precisely equal actual revenue
(orig mins * orig rate + term mins * term rate + switch mins * switch rate)
However, this should not create any bias for various options.

1 Assumption (14) Base growth rates for originating, terminating and switching minutes already include minutes associated with base growth in primary and multi-line business lines. Where line growth is above or below the trend, the change in lines translates to changes in access minutes. In order to estimate changes in access minutes per primary line vs multi-line, we use the average base period originating and switching minutes per line, assume that Primary lines originate 73 minutes per month, and that all lines terminate an equal number of minutes. This permits the following table to be calculated:

Same period (interstate & international toll)

	originating	terminating	switching
primary	73	176	249
multi-line	164	176	340
overall	104	176	282

1 Assumption (15) The preceding assumptions permit calculation of billed interstate and international toll minutes per line per month. We assume that Primary is equal to the primary originating conversation minutes. Overall is based on total terminating minutes. Multi-line = [total minutes minus total residential minutes (primary lines X 73)] / # of multi-lines

percentage interstate & international toll conversation minutes originating from:

primary	27.6%	(Based on originating minutes)
multi-line	72.4%	(calculated from overall

Initial conversation minutes per line

primary	73.2
multi-line	380.9

1 Assumption (16) We assume that minutes per primary line and minutes per multi-line grow at the same rate. Since multi-line lines are growing faster than primary lines and since these have more minutes, on average, this rate of growth is less than the growth in total minutes per primary plus multi-lines.

1 Assumption (17) Overall access charges per conversation minute can be calculated from the rates times originating and terminating minutes. To estimate the rate for residential & SLB conversation minutes, we assume that all residential conversation minutes have one originating and one terminating access minute, and that the percentage of residential and SLB minutes does not vary from TRP area to TRP area. An international call has access minutes on only one end. However, we assume that for the purpose of setting residential rates, carriers will presume that residential customers get a foreign billed (i.e. terminating) minute for each outgoing minute.

1 Assumption (18) First half 1999 totals for lines and minutes are equal to 1998 base year demand plus base growth for 3/4th of a year.

1 Assumption (19) Local rates for first half 1999 were based on 1998 revenue and rate data.

Workpaper 1 uses SOCC data for Tier 1 carriers to calculate the average basic revenue (Local exchange, extended area, vertical features & connection, subscriber line & PICCs) per access line by operating company. The relative amount of basic revenue per line is used to translate nationwide average residential and single line business, and nationwide multi-line business average monthly charges into rates for each TRP area. Workpaper 2 develops the average monthly charges for residential and single line business, and multi-line monthly line charges.

IXC PICC charges to end users have been subject to universal service contribution since 1998. Those surcharges for 1998 were included in switched toll revenue for 1998 and therefore are already captured in the toll revenue per-minute estimates. The PICCs and associated universal service charges are removed from per-minute charges above.

1 Assumption (20) Local Number Portability surcharges are added by TRP area for first half 1999. Actually, only about half of subscribers are served by LNP capable offices and therefore pay the charge. However, most will by the end of the study and for simplicity, the charges are added up front. PBX trunks are assessed 9 LNP charges per trunk and PRI ISDN channels are also subject to a multiple charge. We do not have reliable information on PBX vs PRI vs key system multi-lines. LNP rates were formulated to collect an average of $760 million per year. Accordingly, we subtracted from this amount the total that would be generated by the LNP rate times (primary + secondary lines) and divided the remainder by multi-lines. This yields the average collections per multi-line. Dividing this average by the nationwide average LNP charge for all lines (approximately 28 cents for all lines) gives a factor representing average LNP payments per multi-line.

63.8 /27.5 = 2.32

1 Assumption (21) The analysis assumes that local rates and toll rates change by similar amounts in the future as they changed over the period on which base growth rates were based. In fact, some IXCs raised fixed monthly charges in 1999 through greater use of minimums and lowered per minute charges. No attempt has been made to estimate how these changes effect the levels of monthly or per minute charges or to project these trends into the future.

We assume that ILECs will recover universal service contributions from end users starting in January, rather than through per-minute access rates. Since SLCs represent almost all of ILEC end user revenues, we assume that ILECs will apply USF pass-through surcharges starting first half, 2000. Thereafter, base local rates remain unchanged. However, SLCs change by TRP, PICCs flow through to end users (through IXC nationwide average flat rated charges), and USF contribution rates change (due to changes in SLC, PICC & interstate toll revenue). These are the changes that lead to elasticity effects.

1 Assumption (22) the weighted average access cost per minute is based on the originating and terminating rates times prior period quantities.

1 Assumption (23) Independent of other factors, residential conversation minutes for each of the six usage factors are growing by 1.5% per period. (Based on the growth in terminating access minutes minus the overall growth rate for primary plus multi-line lines)

1 Assumption (24) Workpaper 3 develops 1998 average rate per minute for primary residential and SLB lines and for multi-line business lines. Residential interstate rates are based on bill harvesting. Residential international rates are based on the Revenue report. A weighted average is based on the overall estimates of interstate and international conversation minutes. This weighted average is then removed from the overall average revenue per minute estimated in the Revenue Report to yield the multi-line business estimate.

1 Assumption (25) All scenarios in the study assume that access charges will will not flow through LEC contributions to the maintenance of universal service. We assume that all LECs will recover Universal Service Contributions through direct percentage surcharges on end-users starting January 1, 2000
Other changes in contribution rates are:

a) introduction of new payments for non-rural high cost. ($300 million annual)
b) all requirements met with contribution on interstate & international
c) CALLS proposal to fund some access from universal service
d) increased low income program that automatically would happen if residential SLCs increase.

Toll rates are assumed to already fully incorporate an interstate contribution requirement of
0.03987 Initial Fourth Quarter Factors 1999.

Assuming an interstate and international end user revenue funding base of $37,910 millions (from DA 99-2780) First Quarter Fund Factor less 1% uncollectibles)

The contribution base in is moved forward, starting second half 2000, using changes in LEC SLC revenue and changes in IXC toll revenue, for second half 1999
No adjustments are made for other changes in interstate revenues.

Future fund contribution factors will be based on requirements of

Existing High Cost	499.1	Projected 1st quarter 2000 program + Admin (DA 99-2780)
New Non Rural	51.25	based on $205 projected increase
Schools & Libraries	565.5	Projected 1st quarter 2000 program + Admin (DA 99-2780)
Low Income	129	Note that this is based on current SLC levels
New universal service to access transfer	inputs	CALLS plan only
Change Low Income	inputs	results from changes in SLCs

Note that the New Non Rural is expected to be implemented the first half of 2000. We implement it on Jan 1.

Note that all scenarios assume that LEC USF contributions will be recovered by a direct end user percentage charge on SLCs starting January 1, 2000. (It would not matter if LECs recovered the same amount of money using fixed amount surcharges since this is treated as part of the local rate in either case.)

1 Assumption (26) The PN&R Associates bill harvesting study for 1998 provides a breakdown of residential customer bills by average usage per month
These usage levels are assumed for both residential accounts and for single line business lines. Intrastate usage has been smoothed.

Usage Group	Sample Size	Intrastate & Other Per Month	Interstate & intl. Per Month	
1	7023	20	0	140460
2	6236	40	9	249440
3	6572	60	41	394320
4	4998	80	94	399840
5	2783	120	175	333960
6	2378	180	384	428040
Total	29990	64.9	73	64.8903

1 Assumption (27) In order to show the effect of the various access scenarios on total bills, Interstate average revenue per minute (first half 1999) is used as the average intrastate charge per minute for all periods. In addition, the toll minutes per line and the number of lines in each group (i.e., the weights) are held constant. Thus, the intrastate toll amounts do not vary from period-to-period and all bill effects shown in the results are due to changes in scenario.

Average amount of intrastate toll: $13.02

1 Assumption (28) No usage data is available for multi-line business lines. Interstate usage per month is based on total less residential & single line business. Intrastate is assumed to be proportion to average residential usage from Bill Harvesting. Again, the Second Half interstate toll rates (for multi-line traffic) are used as a surrogate for intrastate toll rates and are held constant for all periods.

	Intrastate & Other Per Month	Interstate & intl. Per Month
For Multi-line business lines	338	381

1 Assumption (29) Centrex lines make up approximately 1/3 of multi-line business lines. Customers play a multi-line SLC on each centrex line. Carriers, however, pay 1 multi-line PICC for customers with up to 9 Centrex lines, and 1/9th of the multi-line PICC charge for each additional Centrex line. We assume that 10% of lines are taken by customers with less than 9 total lines and that These customers have an average of 4 lines. Accordingly, multi-line PICC revenue is calculated as multi-line lines X multi-line PICC times the following factor:

0.7037037037037 0.71

At the moment, we assume that centrex lines are distributed evenly across all TRPs. Since the module assumes that customers end up paying nationwide avg. PICCs, this assumption has no impact on demand effects. It does add some uncertainty to revenue totals by TRP.

1 Assumption (30) Low Volume customers pay higher per minute rates.
Based on information in the Bill Harvesting Study, we use the following factors to calculate residential bills

0	n.a.		0
1 - 30	1.72	Times the ARPM	96279.24
31 - 75	1.24	"	334039
76 - 180	1.04	"	487977.6
181 - 300	0.95	"	463429.5
301 - up	0.89	"	813839.6
			73.2099

1 Assumption (31) Both the Delphi-based Access Rate calculators and the demand module assume that some households qualify for Lifeline assistance on monthly rates. This is not factored into the estimate of demand stimulation because Lifeline take rates are already included in the trend growth in lines. This creates a slight bias because a change in SLCs will not elicit a response in Lifeline customers. Instead, the model simplifies and assumes that the following percent of total primary lines will be for Lifeline service

5.32%

This percentage of customers do not pay SLCs. Accordingly, SLCs for these customers are not included in average household bill calculations.

Workpaper 1: Relative amounts of basic area revenue per access line (1998)

	Statistics of Communnications Common Carriers (SOCC) Table 2.9					SOCC 2.10		
	(a)	(b)	(c)	(d)	(a)+(b)+(c)+(d)			
	BASIC AREA REVENUES	OPTIONAL EXTENDED AREA REVENUES	OTHER LOCAL EXCHANGE REVENUES	END USER REVENUES	Local Service Revenue	TOTAL SWITCHED ACCESS LINES	Local Service Revenue per Switched Access Line	Relative Factor
Ameritech	$4,906,110	$7,436	$1,629,282	$1,200,296	$7,743,124	20,510,770	$31.46	1.024
Bell Atlantic	$9,668,996	$167,472	$2,983,543	$2,318,395	$15,138,406	40,963,743	$30.80	1.002
Bell South	$5,029,752	$1,188,096	$2,601,784	$1,409,680	$10,229,312	23,688,031	$35.99	1.171
TPNV	$52,823	$633	$20,246	$19,524	$93,226	341,508	$22.75	0.740
PTCA	$3,323,047	$45,045	$903,745	$923,225	$5,195,062	17,915,591	$24.16	0.786
SWCT	$498,162	($3)	$105,693	$120,333	$724,185	2,311,014	$26.11	0.850
SWTR	$3,677,475	$173,832	$1,474,822	$915,191	$6,241,320	15,976,814	$32.55	1.059
USW	$4,181,720	($5)	$1,246,212	$1,021,561	$6,449,488	16,859,395	$31.88	1.037
CINCINNATI BELL	$258,805	$45,088	$96,291	$53,044	$453,228	1,032,640	$36.58	1.190
Aliant	$65,132	$9,492	$11,972	$13,210	$99,806	339,755	$24.48	0.797
Citizens	$59,269	$5,010	$11,780	$16,227	$92,286	302,027	$25.46	0.829
Frontier	$121,639	$0	$32,808	$24,945	$179,392	577,694	$25.88	0.842
GTE	$4,366,489	$126,147	$1,230,023	$952,336	$6,674,995	18,872,083	$29.47	0.959
Sprint	$1,363,991	$3,572	$512,533	$375,004	$2,255,100	7,103,197	$26.46	0.861
Total Reporting	38,204,946	1,775,464	12,959,279	9,471,576	62,411,265	169,235,266	$30.73	

Workpaper 1: Relative amounts of basic area revenue per access line (1998)

	Statistics of Communnications Common Carriers (SOCC) Table 2.9					SOCC 2.10		
	(a)	(b)	(c)	(d)	(a)+(b)+(c)+(d)			
	BASIC AREA REVENUES	OPTIONAL EXTENDED AREA REVENUES	OTHER LOCAL EXCHANGE REVENUES	END USER REVENUES	Local Service Revenue	TOTAL SWITCHED ACCESS LINES	Local Service Revenue per Switched Access Line	Relative Factor
Ameritech	$4,906,110	$7,436	$1,629,282	$1,200,296	$7,743,124	20,510,770	$31.46	1.024
Bell Atlantic	$9,668,996	$167,472	$2,983,543	$2,318,395	$15,138,406	40,963,743	$30.80	1.002
Bell South	$5,029,752	$1,188,096	$2,601,784	$1,409,680	$10,229,312	23,688,031	$35.99	1.171
TPNV	$52,823	$633	$20,246	$19,524	$93,226	341,508	$22.75	0.740
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SWTR	$3,677,475	$173,832	$1,474,822	$915,191	$6,241,320	15,976,814	$32.55	1.059
USW	$4,181,720	($5)	$1,246,212	$1,021,561	$6,449,488	16,859,395	$31.88	1.037
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Frontier	$121,639	$0	$32,808	$24,945	$179,392	577,694	$25.88	0.842
GTE	$4,366,489	$126,147	$1,230,023	$952,336	$6,674,995	18,872,083	$29.47	0.959
Sprint	$1,363,991	$3,572	$512,533	$375,004	$2,255,100	7,103,197	$26.46	0.861
Total Reporting	38,204,946	1,775,464	12,959,279	9,471,576	62,411,265	169,235,266	$30.73	

Workpaper 2: Estimating the average local charges for Multi-line Business

Average basic service revenue per line from Workpaper1	$30.73
Base Period access lines	
Primary	98,005,688
non-primary residential	16,720,682
Multi-line business	49,215,264
Total	163,941,635
Residential Monthly Local Service --Unlimited Calling rate including SLC & Touch Tone (Reference Book, June 1999, Table 1.1. Amount excludes taxes.)	$17.75
PICC Primary (January 1999)	0.53
PICC Secondary (January 1999)	1.38
Weighted Average (1998 lines)	$0.65
features, connection, and some other services) in thousands	$12,959,279
Assumed percentage residential & single line business	70%
Vertical Feature & Connection Charge per line per month	$6.59
Average IXC fixed charge (in addition to any PICC pass through charges.)	$0.65
Total charge per residential and single line business line (Monthly charge plus vertical feature & connection)	$24.99
Average SLC for primary lines	$3.50
Average SLC for secondary lines (Jan 1, 1999)	$5.88
Average Monthly charge W/O SLCs	$21.14
Average monthly charge for primary lines	$24.64
average monthly charge for non-primary lines	$27.02
Total local charge per multi-line busines line	$44.11

Workpaper 3: dividing average revenue per minute between Residential (incl. single line business) vs. Multi-line business

Bill Harvesting: Average residential payment per interstate minute 1998

Including fixed charges on bill	$0.180
Average fixed toll charge per residential bill including PICC pass through, Account maintenance and monthly plan charges and some monthly USF pass through charges	$1.96
incremental per minute charges	$0.150

Average international per minute rate for 1998
(Telecommunications Industry Revenue Report)

All interstate and international minutes	$0.144
International minutes	$0.584

Conversation Minutes (Telecommunications Industry Revenue Report)

interstate	336,696
international	22,950

Weighted Average Residential Rate Including all flat charges	$0.206

Percentage of interstate & international minutes

primary lines (residential & SLB)	27.6%
multi-line business	72.4%

Average multi-l;ine business toll charge per minute	$0.120

Workpaper 4: Estimating trend changes in ARPM & Access cost

Y=ln(interstate+international revenue per minute)

Regression Output:

Constant		0	Annual
Std Err of Y Est		0.025072	-0.05378
R Squared		0.964564	
No. of Observations		7	semi-annual
Degrees of Freedom		5	
			-0.02726
X Coefficient(s)	-0.05528	-1.5616	
Std Err of Coef.	0.004738	0.02119	
t Statistic	-11.67	-73.70	

	ln ARPM	Trend	Constant	predicted	trend
1992	-1.6450	-0.0553	-1.5616	-1.6169	0.1985
1993	-1.6466	-0.1106	-1.5616	-1.6722	0.1878
1994	-1.7244	-0.1658	-1.5616	-1.7274	0.1777
1995	-1.7760	-0.2211	-1.5616	-1.7827	0.1682
1996	-1.8167	-0.2764	-1.5616	-1.8380	0.1591
1997	-1.9273	-0.3317	-1.5616	-1.8933	0.1506
1998	-1.9430	-0.3869	-1.5616	-1.9485	0.1425

Workpaper 4: Estimating trend changes in ARPM & Access cost

Y=ln(revenue per minute net of access)

Regression Regression Output:

Constant		0	Annual
Std Err of Y Est		0.033639	-0.0498
R Squared		0.909815	
No. of Observations		6	semi-annual
Degrees of Freedom		4	
			-0.02522
X Coefficient(s)	-0.05108	-1.92069	
Std Err of Coef.	0.008041	0.031316	
t Statistic	-6.35	-61.33	

	ln (ARPM - access)	Trend	Constant	predicted	trend
1992	-2.0030	-0.0511	-1.9207	-1.9718	0.1392
1993	-1.9827	-0.1022	-1.9207	-2.0229	0.1323
1994	-2.0835	-0.1532	-1.9207	-2.0739	0.1257
1995	-2.1290	-0.2043	-1.9207	-2.1250	0.1194
1996	-2.1436	-0.2554	-1.9207	-2.1761	0.1135
1997	-2.2550	-0.3065	-1.9207	-2.2272	0.1078
1998	-2.1440	-0.3576	-1.9207	-2.2783	0.1025

Workpaper 4: Estimating trend changes in ARPM & Access cost

Y=ln(access cost per minute)

Regression Output:

Constant		0	Annual
Std Err of Y Est		0.035037	-0.06707
R Squared		0.944986	
No. of Observations		6	semi-annual
Degrees of Freedom		4	
			-0.03412
X Coefficient(s)	-0.06942	-2.74925	
Std Err of Coef.	0.008375	0.032617	
t Statistic	-8.29	-84.29	

	ln (access per min.)	Trend	Constant	predicted	trend
1992	-2.8458	-0.0694	-2.7492	-2.8187	0.0597
1993	-2.9001	-0.1388	-2.7492	-2.8881	0.0557
1994	-2.9227	-0.2083	-2.7492	-2.9575	0.0519
1995	-2.9885	-0.2777	-2.7492	-3.0269	0.0485
1996	-3.0938	-0.3471	-2.7492	-3.0964	0.0452
1997	-3.2024	-0.4165	-2.7492	-3.1658	0.0422
1998	-3.6461	-0.4860	-2.7492	-3.2352	0.0394

Bill Harvesting Study First Quarter 1999

Households	Minutes of IXC toll	Total minutes	Revenue with $3 minimum	Revenue without $3 minimum	
0	1461	0	$4,383	$0	23.6%
1	70	70	$210	$14	1.1%
2	73	146	$219	$30	1.2%
3	70	210	$210	$43	1.1%
4	54	216	$162	$44	0.9%
5	41	205	$123	$42	0.7%
6	46	276	$138	$57	0.7%
7	39	273	$117	$56	0.6%
8	30	240	$90	$49	0.5%
9	46	414	$138	$85	0.7%
10	35	350	$105	$72	0.6%
11	42	462	$126	$95	0.7%
12	42	504	$126	$104	0.7%
13	29	377	$87	$78	0.5%
14	27	378	$81	$78	0.4%
15	35	525	$108	$108	0.6%
16 or more	4055	448,889	$92,382	$92,382	65.5%
Total	6195	453,535	$98,805	$93,338	

Percentage loss of revenue from eliminating $3 minimum 5.5%

Increase in Per minute charges $0.011

Appendix C: Residential Customer Bills * Base Case

Total Monthly Bill for Households with a Single Line

Interstate minutes per month	% Households	1999 H-2	2000 H-1	2000 H-2	2001 H-1	2001 H-2	2002 H-1	2002 H-2	2003 H-1	2003 H-2	2004 H-1	2004 H-2	2005 H-1
0	23.4%	$29.78	$29.92	$30.17	$30.17	$30.36	$30.36	$30.29	$30.29	$30.11	$30.11	$29.92	$29.92
1 - 30	20.8%	$36.22	$36.42	$36.57	$36.50	$36.61	$36.55	$36.41	$36.35	$36.11	$36.06	$35.81	$35.76
31 - 75	21.9%	$46.10	$46.42	$46.35	$46.12	$46.04	$45.85	$45.55	$45.37	$44.98	$44.81	$44.42	$44.26
76 - 180	16.7%	$57.94	$58.43	$58.07	$57.63	$57.30	$56.92	$56.42	$56.08	$55.49	$55.16	$54.60	$54.29
181 - 300	9.3%	$77.37	$78.11	$77.31	$76.57	$75.86	$75.23	$74.42	$73.83	$72.96	$72.40	$71.57	$71.04
301 - up	7.9%	$118.99	$120.36	$118.46	$116.93	$115.26	$113.97	$112.38	$111.17	$109.58	$108.43	$106.92	$105.82
Weighted Avg.		$50.88	$51.28	$51.07	$50.74	$50.54	$50.26	$49.86	$49.61	$49.12	$48.88	$48.41	$48.17
Components of the Average bill													
Local & vertical		$21.10	$21.10	$21.10	$21.10	$21.10	$21.10	$21.10	$21.10	$21.10	$21.10	$21.10	$21.10
Intrastate toll, D.A., etc		$12.26	$12.26	$12.26	$12.26	$12.26	$12.26	$12.26	$12.26	$12.26	$12.26	$12.26	$12.26
SLC & PICC pass through		$4.85	$4.73	$4.96	$4.97	$5.16	$5.16	$5.09	$5.09	$4.92	$4.92	$4.75	$4.75
Interstate toll (less USF)		$12.13	$12.09	$11.64	$11.36	$10.99	$10.74	$10.43	$10.20	$9.91	$9.69	$9.42	$9.20
USF contributions		$0.53	$1.10	$1.11	$1.05	$1.03	$1.00	$0.98	$0.95	$0.93	$0.91	$0.88	$0.86

Total Monthly Bill for Households with Two Lines

Interstate minutes per month	% Households	1999 H-2	2000 H-1	2000 H-2	2001 H-1	2001 H-2	2002 H-1	2002 H-2	2003 H-1	2003 H-2	2004 H-1	2004 H-2	2005 H-1
0	23.4%	$56.72	$57.16	$58.08	$58.07	$58.03	$58.04	$57.72	$57.74	$57.33	$57.35	$56.89	$56.91
1 - 30	20.8%	$63.16	$63.65	$64.48	$64.40	$64.27	$64.23	$63.84	$63.81	$63.33	$63.30	$62.78	$62.75
31 - 75	21.9%	$73.04	$73.66	$74.26	$74.02	$73.71	$73.53	$72.98	$72.82	$72.20	$72.05	$71.39	$71.25
76 - 180	16.7%	$84.88	$85.67	$85.98	$85.53	$84.96	$84.61	$83.85	$83.53	$82.72	$82.41	$81.57	$81.28
181 - 300	9.3%	$104.31	$105.35	$105.22	$104.47	$103.52	$102.91	$101.85	$101.28	$100.19	$99.65	$98.54	$98.03
301 - up	7.9%	$145.93	$147.60	$146.36	$144.83	$142.92	$141.65	$139.81	$138.62	$136.81	$135.68	$133.89	$132.82
Weighted Avg.		$77.82	$78.52	$78.98	$78.64	$78.20	$77.94	$77.30	$77.06	$76.35	$76.12	$75.38	$75.16
Components of the Average bill													
Local & vertical		$42.20	$42.20	$42.20	$42.20	$42.20	$42.20	$42.20	$42.20	$42.20	$42.20	$42.20	$42.20
Intrastate toll, D.A., etc		$12.26	$12.26	$12.26	$12.26	$12.26	$12.26	$12.26	$12.26	$12.26	$12.26	$12.26	$12.26
SLC & PICC pass through		$10.69	$10.49	$11.35	$11.36	$11.33	$11.35	$11.05	$11.08	$10.69	$10.71	$10.28	$10.30
Interstate toll (less USF)		$12.13	$12.09	$11.64	$11.36	$10.99	$10.74	$10.43	$10.20	$9.91	$9.69	$9.42	$9.20
USF contributions		$0.58	$1.48	$1.53	$1.46	$1.42	$1.39	$1.36	$1.33	$1.29	$1.26	$1.22	$1.20

* Unlike data presented in some graphs, toll usage is held constant over time in this table..