CPRO MODEL INPUTS

December 22, 2003

TABLE OF CONTENTS

INTRODUCTION

The CLEC Profitability Model ("CPRO") is a business case analysis of a hypothetical, efficient competitive local carrier ("CLEC"). It has been constructed to conform to the guidelines the Federal Communications Commission ("FCC") provides in its Triennial Review Order ("TRO"):

> In considering whether a competing carrier could economically serve the market without access to the incumbent's switch, the state commission must also consider the likely revenues and costs associated with local exchange mass market service, as detailed below. Specifically, state commissions must determine whether entry is likely to be economic utilizing the **most efficient** network architecture available to an entrant...The analysis must be based on the **most efficient business model for entry rather than to any particular carrier's business model.**
>
> Because this analysis involves comparing the potential revenues to the potential costs of entry, a state will necessarily be weighing advantages and disadvantages an entrant has in attempting to serve mass market customers.[1]

Significantly, the FCC emphasizes two points regarding this analysis: (1) the CLEC modeled is efficient, not only in the technology it utilizes, but in its manner of entry; and (2) the nature of the analysis is generic, not firm-specific.

In keeping with the FCC's mandate, the CPRO modelers have gathered information and data relating to the operations of many existing CLECs, and have developed informed assumptions regarding efficient practices. These assumptions relate to, for example, the number of lines served, the locations of the customers, the amounts of busy-hour traffic, the expenses and investments required for a CLEC start-up operation, the costs and revenues associated with operating a telecommunications network, the debt and equity funds needed to start and continue operations, the marketing and other customer service expenses that an efficient carrier requires, and the growth of the firm over the relevant time period.

To generate model results, it is necessary to select values for these and other inputs. This document describes each of the CPRO inputs and the default values that are used in CPRO. The model user can change any or all of the inputs discussed in this document.

---

[1] FCC, Report and Order and Order on Remand and Further Notice of Proposed Rulemaking, *In the Matter of Review of the Section 251 Unbundling Obligations of Incumbent Local Exchange Carriers, Implementation of the Local Competition Provisions of the Telecommunications Act of 1996, Deployment of Wireline Service Offering Advance Telecommunications Capability,* CC Docket Nos. 01-338, 96-98 and 98-147, Released August 21, 2003, ¶517, emphasis added. ("TRO").

MODEL & INPUT CONSISTENCY

Internal consistency in the inputs to any model is essential. There is a set of four interrelated inputs in CPRO for which an analyst or a reviewer should be particularly careful to maintain internal consistency. The variables are:

- **Revenue Per Line**: The CLEC's prices for various packages of services.
- **Customer Acquisition Cost**: The amount of money that the modeled CLEC spends acquiring customers.
- **Market Share**: The size and speed of market share growth for the CLEC across time.
- **Churn Rate**: The rate at which CLEC customers disconnect service and leave the CLEC.

There is not a single, precisely defined set of decisions relating to customer acquisition spending and service prices that a CLEC must adopt to be successful. CLECs will choose different combinations of marketing activities and prices for service that achieve the best results for them, given their past decisions and the decisions of their competitors. CLECs that set lower prices will, all else being equal, achieve higher market shares and have lower churn rates. CLECs that spend more on customer acquisition will achieve a higher market share and achieve it more quickly, but will also need higher average revenues. Analysts and reviewers must be careful to consider the impact of changing one variable on the value of other interrelated variables before presenting a run of the CPRO Model.

The TRO contains specific guidance about estimating the revenues and costs of a CLEC. The TRO contains two key points relating to creating an internally consistent set of inputs describing the marketing decisions of a CLEC and its performance. First, the TRO states that revenues should be based on today's prices; therefore, the prices in CPRO are based on service plans offered today by MCI. "[W]e expect states to consider prices and revenues prevailing at the time of their analyses. We believe that these are reasonable proxies for likely prices and revenues after competitive entry and will result in a more administrable standard."[2] That is why the modelers have chosen MCI's current prices as the basis for their assumptions on average revenue. The MCI prices are a reasonable approximation of what a CLEC can achieve today. Second, the TRO states that a business case of a CLEC must be based on an efficient carrier rather than a carrier-specific analysis.[3] Because the model begins with current MCI prices, the modelers have chosen values for market share, customer acquisition costs, and churn that are consistent with

[2] *Id.*, ¶520, footnote 1588.

[3] *Id.*, ¶517

those prices. In many cases, CLECs and analysts have forecasted values more favorable to the CLECs' claims of economic impairment for the churn and customer acquisition costs variables. To be internally consistent, the modelers have selected values consistent with today's experience rather than unsupported forecasts of the future.

To be consistent with the default prices, CPRO estimates the cost of customer acquisition at $120 per customer. This value is within the range of values that CLECs currently spend for customer acquisitions. It is a conservative estimate of what an efficient CLEC would spend. Several CLECs have forecasted lower costs in the future.

The default market share target of five percent is also consistent with the default prices. The modeled CLEC will achieve this market share over five years by gaining one percent each year. This assumption is conservative, since AT&T has achieved higher market share levels in other states in less time.[4] As a group, CLECs have gained over five percent of all access lines in just the span of two years.[5]

The default value of three percent churn per month is also consistent with the other inputs. This value is based on research of churn rates throughout the telecommunications industry. The analysis to support this input is discussed in Section 4.3.3. The default churn rate is consistent with what efficient CLECs have achieved in the current environment and with the other inputs selected. The modelers believe it is a conservative estimate of what is possible in the future.[6]

Users of CPRO are cautioned to consider three issues before changing any of these critical variables. First, the user should recognize and account for the interrelationship among all four inputs. Treating only one variable in isolation will necessarily be inadequate because such treatment does not account for the necessary consistency with the other three inputs. Second, the information should be granular enough to ensure it is consistent with the purpose of the proceeding and the other assumptions in the CPRO Model. It also should be verifiable by other parties. Third, the user should demonstrate that the information reflects the operations of an efficient CLEC. Thus, there must be some basis to assert that CLEC-specific information reflects the operations of an efficient CLEC.

---

[4] Bear, Stearns & Co., Inc., "AT&T Corp., AT&T Without UNE-P: Scenario Analysis," AT&T Without UNE-P: Scenario Analysis, February 6, 2003, at 14. ("Bear Stearns AT&T Report").

[5] CLECs gained 5.3 percent of all access lines from December 2000 to December 2002. *See* FCC, *Local Telephone Competition: Status as of December 31, 2002*, Industry Analysis and Technology Division, Wireline Competition Bureau, June 2003, Table 1.

[6] "Generally, POTS churn is higher than T1 churn...[w]e believe a reasonable churn target for [POTs] is between 2 and 2 1/2 %." "Q2 2003 Mpower Holding Corp. Earnings Conference Call – Final," Fair Disclosure Wire, August 6, 2003. *See also* discussion of churn in Section 4.3.3.

DATA SOURCES

In developing inputs for CPRO, the modelers rely on information based on industry knowledge, incumbent exchange carriers ("ILECs"), the operations and facilities of CLECs, data request responses, and publicly available information. Publicly available information typically includes SEC filings, annual reports, investor presentations, investment analyst reports, trade press, press releases, other cost or entry model documentation and Triennial Review filings.

In order to assess which CLECs are most comparable CPRO's model CLEC, the modelers have assembled a list of CLECs using information from the New Paradigm Group's *CLEC Report,* CLEC filings and other publicly available information.[7]

Considered criteria included:

- Does the CLEC primarily serve mass-market customers?
- If the CLEC serves businesses only, are they small to medium-sized businesses?
- Does the CLEC primarily offer voice-focused products?
- Does the CLEC serve between 200,000 and 1,300,000 access lines?
- Is there publicly available information about the CLEC?
- Are there any unexplained inconsistencies in data examined?
- Are there any unusual or specialized circumstances about the CLEC that would differentiate it from our model CLEC?

The modelers chose these criteria to mirror the modeled provider – a CLEC with 500,000 access lines, providing local and long distance services to the mass market. The modelers based their assumptions on only the most relevant CLECs for each input. Following the criteria outlined above, we came up with nine comparable CLECs. See Table 1 below.

[7] New Paradigm Resources Group, *CLEC Report 2003*, 2003. ("CLEC Report 2003").

Table 1:
Comparable CLECs

CLECs	Markets Served	Total Access Lines (Year-end 2002)
Allegiance Telecom	Majority of customers are small to medium sized businesses with 4 to 24 lines. Some institutions.	1,246,000 total.
ATX Communications	Residential and business.	285,800 residential and business lines in service.
Choice One Communications	Small and medium sized businesses.	500,923 in service.
ITC Deltacom	Business and residential, wholesale to telecommunications carriers.	231,820 total.
McLeodUSA	Business and residential, wholesale to telecommunications carriers.	1,100,000 total.
Mpower	Targeting small and medium sized businesses; some residential.	260,000 in service.
Pac-West Telecom	Small and medium sized businesses, service providers, IXCs.	327,021 lines in service.
Talk America~	Residential and small business (4 lines or less).	330,000 bundled lines in service.
Z-Tel Technologies~	Targeting residential, small business (4 lines or less) and wholesale.	203,000 subscriber lines for bundled residential and small business product.

Note: (~) indicates UNE-P based provider.
Sources: Company 2002 10-Ks, CLEC Report 2003.

Where reference is made to CLECs or companies not listed in Table 1 (i.e., AT&T or MCI), the information is included for comparison and the CLEC's differences from CPRO's model CLEC are noted.

1. TECHNICAL PARAMETERS

1.1. PLANT AND EQUIPMENT PARAMETERS

The model assumes that facility-based CLECs provide their own digital loop carrier ("DLC") systems, switches, and multiplexers. Each unit of equipment has a maximum capacity, usually expressed in terms of the number of lines served, and can be grown modularly, with each module having a capacity similarly expressed. The model therefore requires specification of the

maximum capacity and the increments in which capacity can be added for each type of equipment. In addition, maximum occupancy levels for equipment categories are specified to take account of requirements for maintenance, testing, and, in some cases, customer churn. As discussed in Exhibit PBC-1, the average capacity utilization rates actually achieved under CPRO model simulation are displayed as part of CPRO results and are substantially lower than the maximum occupancy limits discussed in this section.

1.1.1. DLC Concentration Ratio: Default Value: 4

DLC systems are placed in the CLEC's collocation space at the CO where the customer's access line is terminated. The DLC equipment digitizes the voice band signal coming over the analog loop and transmits it across the network to the CLEC switch using digital carrier facilities. Since all customer lines are not in use at the same time, these lines can be concentrated by the DLC equipment. Therefore, the number of voice band (DS0) channels connecting the DLC to the CLEC switch is less than the number of analog voice grade lines emanating from customers' locations. The appropriate concentration ratio (subscriber access lines per outgoing DLC channel) depends on the amount of busy-hour traffic per line.

The default value for the concentration ratio is four to one. With a minimal DLC of one channel bank of 224 lines (*See* Section 2.1.2), a four-to-one concentration ratio yields 56 trunks. If these 56 trunks were engineered at a standard blocking probability of 1 percent, they could carry over 43 Erlangs in the busy hour, which equates to 0.192 Erlangs or 6.9 CCS per subscriber access line—twice the average traffic levels normally experienced. A larger trunk group could operate at an even higher concentration ratio and provide the same blocking probability. The four-to-one ratio is therefore extremely conservative. This default value is affirmed by Microeconomic Consulting and Research Associates in a study filed by WorldCom (MiCRA study).[8]

1.1.2. Minimum DLC Increment (lines): Default Value: 224

DLC capacity must be added in discrete increments. The default value of 224 reflects the technical specifications of Alcatel, the world's largest supplier of DLC equipment. Alcatel's standard channel bank can terminate 224 voice-grade POTS lines.[9]

1.1.3. Maximum Size of DLC System (lines): Default Value: 2016

DLC systems typically have a maximal size. If there are more lines than can be accommodated by a single DLC system, multiple DLC systems must be deployed. The default value is based on the technical specifications of Alcatel. Alcatel states that its Litespan 2000 control assembly can

---

[8] *See* Microeconomic Consulting and Research Associates, "The Cost of Serving Residential Customers Using UNE Loops," January 8, 2003, at 5. ("MiCRA study").

[9] Alcatel also offers a high capacity channel bank that can serve 544 lines, but this configuration is not included in CPRO. Alcatel 200 Litespan Product Literature, "Alcatel 2000 Litespan Multiservice Access/Transport Platform with Integrated ADSL," available at <http://www.alcatel.com>, accessed on December 10, 2003.

support up to nine channel bank assemblies.[10] Since each channel bank can serve 224 lines, this yields a maximum system size of 2,016 lines.

1.1.4. Maximum Occupancy for DLC: Default Value: 94 Percent

As discussed in Section 2.1, CPRO models the fixed costs of DLC systems over time. Since the DLC systems are modeled in discrete increments of 224 lines, there is likely to be some unused capacity at any point in time. The model recognizes this and accounts for it, even without the explicit maximum occupancy factor discussed in this section.

The capacity utilization of DLC systems is further limited by the need to allow some capacity for maintenance, testing and customer churn. There will be periods when a particular line unit will not be utilized because a customer has disconnected and a new customer has not yet been assigned, or a piece of equipment is out of service for maintenance. AT&T has estimated that these factors limit DLC system effective utilization to 94 percent.[11] This appears to be a reasonable estimate and has been adopted it as the CPRO default value.

1.1.5. Maximum Large Switch Size (lines): Default Value: 100,000

Large modern end-office circuit switches such as the Nortel DMS-100 and the Lucent 5ESS have maximum capacities of well over 100,000 lines.[12] The modelers recognize, however, that the maximum capacity of a switch is influenced by many factors other than the number of lines: usage, number of calls, and vertical services utilized. All these factors add to the load on the switch's central processor, which is often the limiting element of the switch. Further, few ILEC switches serve more than 100,000 lines. The modelers recognize that the switch is a critical element in a network and that overloads can cause major service interruptions. Therefore, the amount of 100,000 lines has been selected as the default value for the maximum size of a large digital switch.

---

[10] Alcatel Technical Information Guide, "Alcatel Litespan System Software, Release 12," available at <http://www.alcatel.com>, accessed on December 10, 2003, at 9.

[11] AT&T states that "[s]pares must be available for maintenance and testing, and to accommodate ordinary customer churn. Such buffer needs typically limit effective fill to 94%." Letter from Joan Marsh, Director, Federal Government Affairs, to Marlene Dortch, Secretary, FCC, re: Notice of Written Ex Parte Communication, *In the Matter of Review of the Section 251 Unbundling Obligations of Incumbent Local Exchange Carriers*, CC Docket Nos. 01-338, 96-98 and 98-147, February 4, 2003, at 15. ("Marsh letter 1").

[12] DMS-100 is described as being able to grow to 135,000 lines. Nortel website, "DMS-100/200 Local Switching Systems," available at <http://www.nortelnetworks.com>, accessed on September 23, 2003. *See also* Lucent website, "5ESS Switch and 5E-XC Applications," available at <http://www.lucent.com>, accessed on December 18, 2003.

1.1.6. Maximum Small Switch Size (lines): Default Value: 20,000

In some situations, it may be desirable to deploy a smaller, less expensive switch. For example, Nortel's advertised capacity for its DMS 10 product is 20,000 lines.[13] Lucent advertises a "Small Office Solution" with a maximum capacity of 28,000 lines.[14] As explained above, the maximum capacity of a switch is influenced by many factors. Therefore, CPRO adopts as the default value the lower of these two numbers; namely Nortel's value of lines.

1.1.7. Maximum Occupancy for Variable Large Switching: Default Value: 94 Percent

The maximum occupancy factor for variable switching allows for testing and maintenance. It also recognizes that switches are designed in a modular fashion, and that additional capacity must be ordered in discrete increments.

The architecture of CPRO assumes all switch ports are digital; thus, there are no line cards. Switch units, which terminate the DS1s, typically accommodate a few thousand lines, depending on the particular manufacturer and model. This increment is significant, but it is small compared to the capacity of a large switch. Consequently, a small reduction in the available capacity is sufficient to account for this effect. For example, if an average large switch contains 50,000 lines, and a switch unit serves 2,000 lines, then on average the last switch unit would be half full. This represents a reduction in capacity of 1,000/50,000 or approximately two percent. As in the case of the DLC equipment, there is also a requirement for some capacity to be allocated for maintenance and testing. Customer churn is not experienced at the switch with the CPRO architecture. After adding four percent for maintenance and testing, the default value is 94 percent.

1.1.8. Maximum Occupancy for Variable Small Switching: Default Value: 86 Percent

Small switches are subject to the same considerations as large ones, but the effect of the modularity of line units is greater. If the average small switch serves 10,000 lines, and a switch unit is 2,000 lines, then a half-utilized switch unit represents a reduction in capacity of 10 percent. After this is added to the four percent for maintenance and testing, the maximum occupancy for variable switching is 86 percent.

1.1.9. Maximum Occupancy for POP-to-Tandem Trunks : Default Value: 78 Percent

Traffic between the CLEC and ILEC networks is carried over tandem trunks that connect the CLEC POP to each ILEC tandem in the LATA. The number of trunks required in each trunk group is based on busy hour ("BH") traffic (measured in hundred call seconds or "CCS") to and from subtending offices and by the engineered blocking probability on these trunks. The CLEC

---

[13] Nortel website, "DMS-10 Carrier Class Switching System," available at <http://www.nortel.com>, accessed on September 29, 2003.

[14] Lucent Technologies website, "Small Office Solution," available at <http://www.lucent.com>, accessed on November 11, 2003.

architecture concentrates traffic on a small number of very large trunk groups. At a maximum occupancy of 78 percent or 28 CCS per trunk, the industry-standard blocking probability of one percent would be achieved on a tandem trunk group as small as 63 trunks—far fewer than the modeled CLEC generally deploys between the POP and the tandem. For larger trunk groups, the blocking probability would be lower than the industry standard of one percent.

1.1.10. Support Plant (Fraction of Gross Investment Other Than Support Plant): Default Value: 0.17

Support plant in the CPRO Model is plant other than switches, DLCs and multiplexing equipment. It includes expenditures for land and buildings (if any), furniture, fixtures, office equipment, and vehicles. It does not include computers, which are modeled separately under OSS and General Purpose Computers and Software.

The default value was calculated, as shown in Table 2, from the balance sheets of CLECs that disclose this detail on their financial reports. The modelers exclude Talk America and ATX from the average because of the opacity of their support plant numbers.

Table 2:
Support Plant & Equipment

	Total Support PPE							
CLECs	Office Equipment & Furniture	Leasehold improvement	Land and Building	Motor Vehicle	Other Equipment or Not Specified	Total	Total PPE	Support to PPE
Allegiance (2002)	68,325	145,914	9,164			223,403	1,497,215	0.149
Allegiance (2001)	54,539	134,618	9,164			198,321	1,181,885	0.168
ATX (2002)					3,010	3,010	43,105	0.070
ATX (2001)					12,956	12,956	168,798	0.077
Choice One (2002)	9,950	22,815				32,765	467,214	0.070
Choice One (2001)	11,203	25,585				36,788	434,148	0.085
ITC Deltacom (2002)	29,554		65,336	1,968		96,858	422,810	0.229
ITC Deltacom (2001)	63,460		134,156	6,166		203,782	963,276	0.212
McLeod (2002)	181,300		72,900			254,200	1,373,700	0.185
McLeod (2002 predecessor)	412,000		91,100			503,100	3,237,300	0.155
Mpower (2002)	3,320	7,192	1,727			12,239	39,950	0.306
Mpower (2001)	26,494	41,213	5,715			73,422	440,086	0.167
Pac-West (2002)	2,623	20,112		1,590		24,325	260,828	0.093
Pac-West (2001)	2,624	30,149		2,004		34,777	262,874	0.132
Talk America (2002)		397	7,112		44,770	52,279	117,934	0.443
Talk America (2001)		464	6,919		43,676	51,059	113,966	0.448
Z-Tel (2002)	9,034	6,244	4,439			19,717	112,732	0.175
Z-Tel (2001)	9,537	6,611	4,192			20,340	99,446	0.205
Average (All)	--	--	--	--	--	--	--	**0.187**
Average (Excl. Talk America & ATX)								**0.167**

Notes: Talk America and ATX had substantial amounts of PPE that were uncategorized or not specifically categorized.
Source: Company 10-Ks, 2001-2002.

1.2. Equipment Lives

Depreciation is used for tax purposes and income calculations, based on straight-line assumptions.

The default economic lives for telecommunications equipment are based on the lives and depreciation rates that each state commission uses to determine UNE prices. As discussed in the main testimony, it is appropriate in related proceedings for commissions to use the same estimates for the same inputs. The specific default values for each type of plant are discussed in the state-specific analysis.

1.3. Collocation Parameters

The prices of collocation rate elements are based on concrete, state-specific data, not user-specified inputs. The estimated costs of collocation depend additionally on certain assumptions regarding the collocation configuration. The collocation section of the model is built on the assumption of cageless collocation, a common and economical means of collocating. Caged

solutions are generally slightly more expensive, and there is no positive case for such an arrangement for the modeled CLEC.

The only CLEC equipment required in the collocated space to support the services modeled by CPRO are the DLC remote terminals.[15] These systems occupy a specified number of bays of equipment, depending upon their make and the number of lines. Similarly, they require a certain amount of DC power, which is assumed to be purchased from the ILEC. The collocation prices contain non-recurring and monthly recurring charges for elements as set by the state commission in the state being modeled, which vary somewhat in structure from company to company. Generally, the structure requires input specification of the elements discussed below.[16]

1.3.1. Number of Lines per DLC Bay: Default Value: 672

The default value of 672 lines per DLC bay is based on Alcatel Litespan equipment specifications. According to Alcatel, three standard channel banks of 224 lines each plus the control unit can fit into a standard seven-foot bay. Subsequent bays can accommodate four channel banks serving 994 lines, but the dimensioning becomes complex when multiple systems are in use. The modelers assume, conservatively, that there are 672 lines per bay.

1.3.2. Amps per 100 DLC Equipped Lines: Default Value: 3.35

The default value is 3.35 amps per 100 equipped lines based on Litespan technical specification of the maximum power per channel bank.

2. NETWORK COSTS

2.1. COSTS TO PURCHASE EQUIPMENT

2.1.1. Fixed Cost of Large Switch ($): Default Value: 2,400,000

The cost of a switch is modeled as the sum of a fixed cost component and a per-line cost component multiplied by the number of lines. The default values for these parameters are based on the MiCRA estimates. The default value, including EF&I, is $2,400,000.[17] This cost is consistent with internal ILEC estimates.

---

[15] The home CO will also contain a DSX frame to terminate the DS1 and DS3 EELs coming from offices where collocation is not used. Since there is only one such unit in the network and it is not very costly, it is not explicitly modeled. Its cost is included in the "miscellaneous cost" parameter.

[16] There are modest charges for security access cards, which are too small to be separately considered; they are included in Miscellaneous Costs.

[17] The MiCRA study postulates that the fixed cost of additional large switches is $468,000. We assume that once the maximum capacity is reached, a second switch is added at the same cost as the initial one—a far more conservative assumption than MiCRA's. *See* MiCRA study, at 4.

2.1.2. Fixed Cost of Small Switch ($): Default Value: 1,200,000

The default value including EF&I is $1,200,000. MiCRA provides this estimate for a 25,000-line switch. CPRO adopts this estimate for a 20,000-line switch.[18]

2.1.3. Switching Costs per Line ($) Default Value: Confidential

The per-line cost of switching ports is **[BEGIN CONFIDENTIAL]** *** **[END CONFIDENTIAL]** per line. This cost is consistent with Qwest internal cost studies given the fixed cost of the switch provided in the Micra study.

2.1.4. Cost of DS1-DS3 Multiplexer ($): Default Value: Confidential

Multiplexing services can be obtained from the ILEC at special-access or UNE rates—either at the remote CO or the tandem switch. For multiplexing at the CLEC POP, however, the CLEC must purchase its own equipment.

The default value of **[BEGIN CONFIDENTIAL]** ******** **[END CONFIDENTIAL]** for the cost of these multiplexers is based on information provided by Qwest, which the modelers believe is reflective of costs in the industry. It includes EF&I.

2.1.5. DLC Fixed Cost ($): Default Value: Confidential

DLCs have a fixed cost and additional costs for additional lines. The default value is based on Qwest information. CPRO adopts a default value including EF&I system cost of **[BEGIN CONFIDENTIAL]** *******. **[END CONFIDENTIAL]**

2.1.6. DLC Cost per Line ($): Default Value: Confidential

CPRO adopts a default value of **[BEGIN CONFIDENTIAL]** *** **[END CONFIDENTIAL]** per line, where the system is equipped in modules of 224 lines. The default value is based on information received from Qwest.

2.2. Network-Operations Costs

Network-operations costs include the costs associated with three specific activities; namely, hot cuts, collocation space preparation and long-distance transport. They also include several categories of plant-specific costs, which consist of operations and maintenance costs of specific plant and equipment. Also included are plant-non-specific network-operations costs, which consist of general network expenses, such as network administration and operations administration.

The default values for plant-specific and non-specific costs are based on aggregate statistics for mid-sized ILECs, (i.e., ILECs whose aggregate annual revenues on a consolidated basis are over $100 million and less than $7 billion). Mid-sized ILECs include individual operating companies

[18] MiCRA study, at 4.

that are, on average, approximately the same size as the modeled CLEC. Consequently, there is no issue of scale economies in using costs of mid-sized ILECs as our benchmark. CPRO's default value is derived from the total of all mid-sized ILECs with the exception of Sprint, which was subtracted from the totals. Some of the Sprint operating companies serve over a million lines, which is much larger than the typical CLEC. The network operations inputs are estimated by applying expense factors calculated from the appropriate mid-sized ILEC expense accounts, applied to the appropriate gross plant investment accounts. The aggregate data are based on ARMIS reports and calculated by the FCC. CLEC data could not be used, because CLECs do not disclose this information in sufficient detail in their annual reports.

ILECs carry out much the same activities as CLECs do to perform these functions. Thus, the costs of most mid-sized ILECs can be used as a reasonable indicator of the costs of an efficient CLEC.

2.2.1. CLEC's Own Costs Associated with Hot Cut ($): Default Value: 10

The CLEC may incur internal costs associated with hot cuts, in addition to what it pays the ILEC for the hot cut. AT&T and MiCRA (on behalf of WorldCom) have both estimated those costs to be $10 per line connected. CPRO adopts $10 as the default value.[19]

2.2.2. CLEC's Own Costs of Collocation Space Preparation ($): Default Value: 5,000

This parameter includes additional costs that the CLEC incurs for general design of the collocation space. Before a CLEC can collocate in a central office, it must perform a number of functions. These consist of estimating the demand (number of lines) it is likely to serve; determining how much DLC equipment and transport it will require, sizing and ordering the collocation space from the ILEC, and sizing and ordering DLC equipment from the vendor. Once the equipment is installed, the CLEC must confirm that it is properly dimensioned and installed and is operating properly. None of these activities is inordinately costly. Each activity may take one day for a trained person. If the loaded salary of such a person is $400 per day (equivalent to $100,000 per year), then the total cost for these activities will be about $2,000. CPRO's current default value of $5,000 per CO is therefore a conservative estimate based on consideration of these activities (in fact, it assumes greater cost than would normally be incurred).

2.2.3. Cost of Long-Distance Transport ($ per minute): Default Value: 0.015

CPRO's default value for the operating cost per minute of domestic long distance is $0.015 per minute—apart from access, SG&A, and uncollectibles, which are modeled separately. The following sources of information support the reasonableness of this estimate:

- AT&T has estimated its network operating costs per minute to range from $0.0101 to $0.0129 for its "WATS" services.[20]

---

[19] Marsh letter 1, at 16 and MiCRA study, at 6.

- The current GSA FTS 2001 contract tariff with MCI provides year four postalized domestic transport retail rates of $0.0097 to government users, excluding switched access charges.[21]

In light of the above information, the default value of $0.015 per minute is conservatively high.

2.2.4. Annual Plant-Specific Expenses-Switching (fraction of gross investment): Default Value: 0.035

Based on 2002 data, the default value for switching plant-specific expenses is 3.5 percent. It is the ratio for mid-sized ILECs (apart from Sprint) of digital central-office switching expense to digital switching plant gross investment increased by a factor that reflects the difference in expense-to-gross investment experienced by mid-sized versus large ILECs (apart from Sprint).[22] CPRO includes 2001 data for reference as 2002 data does not include Qwest. The adjustment factors are calculated in Table 3. Table 4 illustrates the Sprint's share of total mid-sized ILECs.

[20] MacAvoy, Paul W., *The Failure of Antitrust and Regulation to Establish Competition in Markets for Long-Distance Services*, MIT Press: Cambridge, MA, 1996, Table 5-3.

[21] Calculated using the SDP pricer for several different domestic U.S. locations, using input values: "Service type: CSS, Service: Sw DS0, Minutes: 200, Access Type: Switched Access." The SDP Pricer information is provided by the Network Information System – a "web-based decision support suite of key GSA related information, data, and applications that is being made available to government agencies using GSA services. Its purpose is to provide immediate on-line access to agency usage of FTS2001, MAA and WITS and the decision support tools to allow an agency to optimize its use of these networks." *See* SDP Pricer, available at <http://netinfo.mitretek.org>, accessed on October 2003.

[22] Mid-sized ILECs include Alltel, Cincinnati Bell, Citizens, Commonwealth, CenturyTel and SureWest. Data from FCC ARMIS reports using the following steps: 43-03, customized reports, 2002, rollup all ILECs, total BOC, Total, ratio of 6212: Digital Electronic (central office switching) expense times 1.13 to 2212: Digital Electronic (central office switching) investment. *See* FCC ARMIS data, Tables 43-01, 43-03 and 43-08, available at <http://www.fcc.gov/wcb/armis/>, accessed on November 7, 2003.

Table 3:
ARMIS Plant-Specific Switching Expenses

2002

ARMIS Account	Account Description	BOC	Mid-Sized ILECs	Adj. Factors (SPRI Input)	Mid-Sized ILECs (w/o Sprint)	Adj. Factors
1120	Plant Specific	17,158,300	1,552,703	-	457,274	-
1130	Plant Non-Specific	5,492,154	449,373	-	164,193	-
1690	Total Plant In-Service	320,906,249	25,709,107	-	9,059,598	-
	Plant Specific Expense Ratio	5.3%	6.0%	1.130	5.0%	0.944
	Plant Non-Specific Expense Ratio	1.7%	1.7%	1.021	1.8%	1.059

2001

ARMIS Account	Account Description	BOC	Mid-Sized ILEC	Adj. Factors	Mid-Sized ILECs (w/o Sprint)	Adj. Factors
1120	Plant Specific	19,548,634	1,583,729	-	452,623	-
1130	Plant Non-Specific	6,248,464	404,568	-	129,372	-
1690	Total Plant In-Service	355,453,194	23,410,500	-	7,365,760	-
	Plant Specific Expense Ratio	5.5%	6.8%	1.230	6.1%	1.117
	Plant Non-Specific Expense Ratio	1.8%	1.7%	0.983	1.8%	0.999

Notes: 2002 ARMIS Accounts do not include Qwest. "BOC" includes BellSouth, SBC, Qwest and Verizon; "Mid-Sized ILECs" include Alltel, Cincinnati Bell, Citizens, Commonwealth, CenturyTel and SureWest.
Source: FCC ARMIS data.

Table 4:
ARMIS Mid-Sized ILECs, Excluding Sprint

2002

Mid-Sized ILECs	Plant Specific 1120	Plant Non-Specific 1130	Total Plant In-Service 1690
Alltel Corporation	160,560	38,936	3,037,909
CenturyTel - Washington	23,586	5,417	543,100
Cincinnati Bell Telephone	129,923	62,888	2,110,296
Citizens Communications, Inc.	105,178	35,417	2,356,491
Commonwealth Telephone	19,840	11,137	605,494
Sprint Local Telecommunications Divn.	**1,095,429**	**285,180**	**16,649,509**
SureWest/Roseville Tel - California	18,187	10,398	406,308
Total	**1,552,703**	**449,373**	**25,709,107**
Total w/o Sprint	**457,274**	**164,193**	**9,059,598**

Sources: FCC ARMIS data.

2.2.5. Annual Plant-Specific Expenses-DLC (Fraction of Gross Investment): Default Value: 0.017

The default value for DLC plant-specific expenses is 1.7 percent of gross investment. It is the ratio for mid-sized ILECs (apart from Sprint) of central-office circuit-termination transmission expense to circuit-termination gross investment.[23]

See Table 5 for the calculations. The modelers include 2001 data because Qwest is not included in 2002 data.

2.2.6. Annual Plant-Specific Expenses-Multiplexing (Fraction of Gross Investment): Default Value: 0.017

The default value for multiplexing plant-specific expenses is 1.7 percent of gross investment. Like the DLC default value, it is the ratio of mid-sized ILECs (apart from Sprint) of central-office circuit-termination transmission expense to circuit-termination gross investment.[24]

See Table 5 for the calculations. The modelers include 2001 data because Qwest is not included in 2002 data.

2.2.7. Annual Plant-Specific Expenses- Support Plant (Fraction of Total Gross Investment): Default Value: 0.018

The default value for plant-specific support expenses is 1.8 percent of gross investment. It is the ratio of plant-specific support expense to total plant in service for total large ILECs adjusted for the ratio of the difference in the mid-sized-to-large ILEC expense-to-investment ratio.[25]

See Table 5 for the calculations. The modelers include 2001 data because Qwest is not included in 2002 data.

2.2.8. Annual Plant Non-Specific Network Operations Expenses (Fraction of Total Gross Investment): Default Value: 0.02

The default value for plant-non-specific network operations expenses is 2 percent. It is the estimated ratio for mid-sized ILECs (apart from Sprint) of plant-non-specific expense to network TPIS (excluding support and terminal apparatus investment). Non-specific network operations

---

[23] From FCC ARMIS reports using the following steps: 43-03, customized reports, 2002, rollup all ILECs, total BOC, Total, ratio of 6232: circuit equipment (central office transmission) expense times 1.13 to 2232: circuit equipment (central office transmission) investment.

[24] *Id.*

[25] From FCC ARMIS reports using the following steps: 43-03, customized reports, 2002, rollup all ILECs, total BOC, Total, ratio of 6120: General Support (including 6124: General Purpose Computers) to 2001: TPIS times 1.130.

expenses consist of network administration, testing, engineering, and operations administration, or FCC ARMIS accounts 6531 through 6535.[26]

See Table 5 for the calculations. The modelers include 2001 data because Qwest is not included in 2002 data.

Table 5:
ARMIS Expense to Investment Ratios

2002

Investment Account	Account Description	2002 Investments	Expense Account	Account Description	2002 Investments	E/I Ratio w/ Adj. Factor (SPRI Inputs)	E/I Ratio w/ Adj. Factor (w/o Sprint)	*Difference*
Plant Specific								
2212	Digital Electronic Switching	$56,254,913	6212	Digital Electronic	$1,723,213	0.035	0.029	*-0.006*
2232	Circuit Equipment	$78,080,600	6232	Circuit Equipment	$1,157,854	0.017	0.014	*-0.003*
2001	TPIS	$320,906,257	6120	General Support	$5,133,550	0.018	0.015	*-0.003*
Plant Non-Specific								
2210	Central Office Switching	$57,642,853						
2220	Operator Systems	$657,601						
2230	Transmission	$78,745,941						
2410	Cable and Wire Facilities	$133,586,385	6530	Network Operations	$5,419,241			
	Total Investment	$270,632,780		Total Expense	$5,419,241	0.020	0.021	*0.001*

2001

Investment Account	Account Description	2001 Investments	Expense Account	Account Description	2001 Investments	E/I Ratio w/ Adj. Factor (SPRI Inputs)	E/I Ratio w/ Adj. Factor (w/o Sprint)	*Difference*
Plant Specific								
2212	Digital Electronic Switching	$63,265,076	6212	Digital Electronic	$1,901,211	0.037	0.028	*-0.009*
2232	Circuit Equipment	$84,446,358	6232	Circuit Equipment	$1,290,979	0.019	0.014	*-0.004*
2001	TPIS	$355,453,186	6120	General Support	$5,290,098	0.018	0.014	*-0.004*
Plant Non-Specific								
2210	Central Office Switching	$65,320,318						
2220	Operator Systems	$724,968						
2230	Transmission	$85,227,760						
2410	Cable and Wire Facilities	$148,037,511	6530	Network Operations	$6,184,293			
		$299,310,557			$6,184,293	0.020	0.022	*0.002*

Notes: 2002 data does not include Qwest.
Sources: FCC ARMIS data.

[26] From FCC ARMIS reports using the following steps: 43-03, customized reports, 2002, rollup all ILECs, total BOC, Total, ratio of 6530: Network Operations Expense to the sum of accounts: 2210 (Central Office Switching) , 2220 (Operator Systems), 2230 (Transmission), and 2410 (Cable and Wire Facilities).

2.3. LAGS FOR EXPENDITURES AND OPERATIONS

Expenditure lags reflect the requirement to pay for network capacity before it is installed. Certain expenditures must be incurred and capacity installed before operations can begin.

Apart from lags, the timing of subsequent capital expenditures is based on a conventional mid-year assumption. Expenditures for capital added during the year are assumed to be incurred, on average, at mid-year.

A positive lag indicates that the expenditures must, on average, be made earlier than mid-year. In particular, if the lag is one month, $11/12^{ths}$ of the expenditure are assumed to take effect at midyear and $1/12^{th}$ at the middle of the previous year.

An exception to this treatment is made in the first year for fixed switching costs, fixed DLC costs and multiplexing costs. It is assumed that this equipment is required during the first year of operations and that the cost for this equipment is incurred in the year prior to the beginning of operations. Given the mid-year convention, it is assumed that these expenditures, on average, take place six months before the start of operations. This long lag is conservative for all types of telecommunications equipment.

2.3.1. Lag for Fixed Switching Expenditures (months): Default Value: 4

All fixed switching expenditures are assumed to occur before the beginning of the first year. Switches installed after the first year may, however, go into service at any time during the year. Based on Qwest data on the average duration of construction in progress for switching, CPRO sets construction in progress at precisely the lag between expenditures and the plant's going into service. The average duration of construction for new switches is between three and four months.

The activities that the modeled CLEC must undertake after delivery of the switch before it can be put into service are the same activities undertaken by ILECs after switch delivery. Consequently, the duration of construction in progress for ILECs is indicative of the lag required by an efficient CLEC. The lag is conservatively long to the extent that the ILECs are not completely inefficient.

For these reasons, CPRO's default value for fixed switching expenditure lag is four months.

2.3.2. Lag for Variable Switching Expenditures (months): Default Value: 2

The default value of two months is slightly longer than the average duration of ILEC construction in progress for small switching jobs. (See discussion in preceding subsection).

2.3.3. Lag for Multiplexing, Transmission and Collocation Trunk Expenditures (months): Default Value: 1

The lag for multiplexing, transmission and collocation trunk expenditures is often quite short. Installation time is minimal, and the plant can rapidly be put into service where needed. The lag should be significantly shorter than the lag for variable switching expenditures.

For these reasons, CPRO's default value is one month.

2.3.4. Start-up Period before Operations Begin (months): Default: 10

The CPRO default value for the start-up period lag has been set at ten months. This period represents the time prior to operations that the local management team is on the ground in the new LATA. Equipment could conceivably be ordered before the start of the period, but installation must await the arrival of the local managers. The ordering of collocation space may also have to await the arrival of the local managers.

The default value is based on a study of the range of start-up periods of over 3,000 firms. The start-up period for those firms varied between eight and fifteen months.[27] Given that a firm can start up from scratch in that length of time, CPRO's default value of ten months for a CLEC that already operates in other LATAs is conservative.

CPRO assumes that the modeled CLEC already operates in other LATAs. Consequently, it already has an operational OSS. The time required to modify the OSS for use in an additional LATA should not take more than a few months, since no records of existing customers need to be transferred. Furthermore, part of the required OSS modifications could, if necessary, be completed before the arrival of the management team in the new LATA.

The default value for the start-up period is far longer than the lags for telecommunications equipment deployment (discussed in the preceding subsections). All telecommunications equipment would be installed toward the end of the period.

3. NON-NETWORK COSTS

A significant portion of SG&A costs are the costs associated with the OSS that the CLEC is presumed to have in place the year prior to operations. Three parameters relate to OSS costs:

- The total number of lines that the CLEC serves in all LATAs. As discussed in the main testimony, the modeled CLEC is assumed to operate in multiple LATAs. OSS costs are attributed to the LATA in question, proportional to the number of lines;

[27] Reynolds, P. and B. Miller, "New Firm Gestation: Conception, Birth, and Implications for Research," *Journal of Business Venturing 7*, Table 3, 1992.

- The initial investment in the OSS; and
- Cost of annual upgrades thereafter to the OSS.

SG&A costs also include three categories of customer related costs: the costs of setting up a new account, customer acquisition marketing costs and customer care. Two parameters relate to customer acquisition marketing costs:

- Current customer acquisition costs, which apply while the CLEC is "buying market share" during the ramp-up period; and
- Steady-state customer acquisition costs, which are lower and apply while the CLEC is simply maintaining a given number of customers but must replace the ones lost to churn.
- Finally, SG&A costs include two categories of general and administrative costs: initial start up costs and ongoing G&A costs after operations begin.

3.1. SUPPORT COSTS

3.1.1. Total Lines Served in All LATAs: Default Value: 500,000

The default value for the total lines served in all LATAs is 500,000 lines. The default value is chosen is to be sufficiently low that the efficient CLEC can spread OSS costs over at least that number of lines.

It is reasonable to assume that the CLEC serves as many as 500,000 lines. Many CLECs already, or soon will, operate on this scale or larger. According to the *CLEC Report 2003*, four CLECs served over 1,000,000 access lines or equivalents at the end of 2002, with a growth rate of 35 percent over 2001. Fourteen additional CLECs reported 300,000 to 1,000,000 lines and grew at a rate of 18 percent.[28]

3.1.2. Initial Investment in OSS (total $ for all LATAs served): Default Value: $17,000,000

OSSs involve large fixed costs. Nevertheless, the costs depend to some extent on the number of lines in the system and the annual number of added lines, which are processed on the OSS. They also depend on the functionality of the OSS. In this regard, the modeled CLEC does not require the OSS to have nearly as much functionality as the OSSs typically used by CLECs that focus on the enterprise market. An enterprise-market OSS would generally have the capability to supply customized billing, and be able to provide for a wide range of product and service options. OSS requirements to provide customized billing entail a much higher cost of software development than the standardized mass market requirements.

[28] *CLEC Report 2003*, Chapter 4, Table 20.

Martin F. McDermott III, who served as Chief Marketing Officer for two CLECs—e.spire and KMC Telecom—has estimated initial OSS cost to be $17 million, including project management and system integration.[29] That amount is CPRO's default value.

MiCRA estimated mass-market fixed OSS costs at $30 million for an established CLEC serving over five million lines.[30] CPRO's default value of $17 million assumes more than half that level of costs to serve one-tenth the number of lines. The default value therefore allows for substantial scale economies. It also makes a reasonable allowance for the incremental costs of greater capacity and functionality of the larger system.

New Paradigm Resources Group, Inc., in *The CLEC Report 2003,* gives OSS investments for only a single CLEC: PaeTec Communications, Inc. For that company, OSS investments were reported to be approximately $12 million, while access lines were approximately 350,000.[31]

These values are also consistent with CPRO's default value. The comparison indicates substantial scale economies, but significant incremental cost to serve 500,000 access lines, rather than 350,000.

CPRO's default values are reasonable, notwithstanding the fact that much higher levels of gross investment for computer and software development reported on the balance sheets of some CLECs. Examples of higher levels of investment are as follows: Choice One Communications: $56 million in 2002, $49 million in 2001; and Z-Tel, $47 million in 2002, 35 million in 2001.[32]

Although these CLECs serve parts of the mass market, their OSS costs are not directly comparable for the following reasons:

- Choice One only serves business customers.[33]
- These CLECs have substantial requirements for investments in computers for businesses other than the provision of CLEC services. They have invested heavily in enhanced services. For example, Z-Tel provides a range of voice-activated products, while Choice One's consolidated balance sheet includes the

---

[29] McDermott III, Martin F., *CLEC, Telecom Act 1996: An Insider's Look at the Rise and Fall of Local Exchange Competition*, Penobscot Press, July 2002, at 233. ("McDermott").

[30] MiCRA states that its fixed and annual OSS estimate results in a cost per line per month of $0.10. Applying MiCRA's capital cost assumptions (the same as ours) implies a CLEC serving 5.8M lines. The CPRO lower OSS fixed cost of $17 million for a start-up CLEC serving 0.5M lines respectively results in a substantially higher unit cost. *See* MiCRA study, at 3; Letter from Gil Strobel, Lawler, Milkman and Metzgar, to Marlene Dortch, Secretary, FCC, re: Notice of Written Ex Parte Communication, *In the Matter of Review of the Section 251 Unbundling Obligations of Incumbent Local Exchange Carriers*, CC Docket Nos. 01-338, 96-98 and 98-147, January 27, 2003, at 12.

[31] *CLEC Report 2003*, Carrier Profile: PaeTec Communications, Inc, at 4.

[32] Choice One and Z-Tel 10-Ks, 2001-2002.

[33] Choice One 10-K, 2002.

software development of web hosting and design subsidiaries. Additionally, Z-Tel provides wholesale OSS services to MCI and Sprint.[34]

- Virtually all publicly traded CLECs have made substantial acquisitions of other CLECs. Choice One and Z-Tel also have made a number of CLEC acquisitions.[35] Whenever a CLEC acquires another CLEC, the result is duplicative OSS resources. At a minimum, the acquisition involves duplication of the fixed costs associated with OSSs. More realistically, in many cases the acquired OSS may be incompatible with the acquiring company's OSS. In that case, one of the two OSSs, though it may appear at original cost less depreciation on the company's books, would have very little economic value. Substantial additional investments would be required to migrate all customers to a single OSS. This loss of value of OSS investments is repeated each time a CLEC acquires another one. The repetition has occurred many times for some CLECs. For example, McLeodUSA was primarily built from acquisitions, while XO was formed by the merger of Concentric Network Corporation and NEXTLINK Communications. McLeod's 2001 annual report provides an insight into the complexity created by integrating multiple companies.

The modelers found data for only a single CLEC that has not made substantial acquisitions. This data does not include substantial computer investments for other lines of business. That company, Pac West Telecom, had OSS investments of $19.6 million for computers and software after their first complete year of operation (2000), although Pac West serves only small and medium business customers, as well as ISPs.[36] This value is consistent with CPRO's default value of $17 million for a mass market serving CLEC.

3.1.3. Annual OSS Upgrades (fraction of gross investment): Default Value: 17.3 Percent

CPRO's default value for annual OSS upgrades is 17.3 percent of initial investment. The resulting capital cost is the same as implied in MiCRA's model of OSS. MiCRA posited an economic depreciation life of seven years and annual upgrades of three percent, which sums to an annual capital cost of 17.3 percent.

Using the MiCRA parameters as they are would lead to much higher estimates of the profitability of the modeled CLEC. The reason is that depreciation is not a cash expense and does not affect discounted cash flow or the internal rate of return. In this respect, CPRO is far more conservative than MiCRA in modeling OSS capital costs.

---

[34] Z-Tel 2002 10K.

[35] *See* McDermott.

[36] *See* Table 1.

As discussed in the preceding subsection, most data on CLEC investments in computers and software are not useful for determining the OSS default values in CPRO. The exception is Pac West Telecom.

The annual growth of computer and software gross investment of Pac West Telecom is quite close to CPRO's default value. It grew at 18.7 percent per year. The default value is all the more consistent with Pac West Telecom's experience, when one considers that Pac West Telecom has made some minor acquisitions of other CLECs.[37]

3.1.4. CLEC's Cost of Setting up a New Account ($ per installation): Default Value: Confidential

The CLEC must expend some of its own resources in order to set up a new account. Many of the activities are the same as those an ILEC carries out to set up a new account when a site visit is not required. The default value per installation is based on data supplied by Qwest. **[BEGIN CONFIDENTIAL]** ********** ********** ********** **[END CONFIDENTIAL]**

3.1.5. Initial Customer Acquisition Marketing Expense ($ per installation): Default Value: 120

Customer acquisition marketing costs include advertising, sales commissions, and promotional discounts. They do *not* include non-recurring loop costs, hot-cut costs, or the CLEC's own costs of setting up a new account, all of which are modeled separately.

The best source of this information is, of course, from an efficient CLEC. In the absence specific information provided by the efficient CLECs, CPRO relies on publicly available sources to estimate customer acquisition marketing costs. The quotes below highlight the modeler's findings:

- **AT&T**: AT&T reports incremental local service sales and marketing expense of $300 million associated with adding 676,000 new customers at about $45 per line for 2002.[38] This value presumably does not include promotional discounts. A recent Legg Mason Report estimates that AT&T's customer acquisition costs in

[37] Pac-West Telecom computer and software investment increased from a lower base by 18.7 percent (2000: $19.6M, 2001: $25.3M and 2002: $27.6M). Pac West acquired Napa Valley Telecom and Installnet, Inc. in early 2000. *See* Pac-West 10-Ks, 2001-2002.

[38] AT&T 10-K, 2002, at 30, 38.

selling packages of local and long-distance services are $75 per line for month-to-month service.[39] Bank of America analysts use $125 for an AT&T UNE-P business case.[40]

- **Talk America**: Talk America provides local and bundled local services to residential and small business customers via UNE-P. The Kaufman Bros. reported that Talk America's cost per gross add ("CPGA") "remained steady at $80."[41]
- **Z-Tel**: In 2001, a Thomas Weisel analyst reported that Z-Tel was "making an increased effort to lower its customer acquisition cost to below $50 from roughly $100 - $120 excluding TV advertisements in 3Q01. Z-Tel plans to achieve this by cutting back on its use of telemarketing and eliminating the use of direct mail, as these are its most expensive sales channels."[42] Z-Tel appears to be succeeding with this strategy; by October 2003, Z-Tel's Secretary-Treasurer estimated its acquisition costs at between $80 and $100."[43]
- **BellSouth**: For "[C]ustomers who sign up for the BellSouth Answers package, which allows them to combine wireless and Internet plans with an unlimited local plan and a choice of long-distance options[,] [t]he company offers $25 for each new service you take [up to $100]."[44]
- **MCI**: MCI offers $25 Visa gift cards for some customers of The Neighborhood plan.[45]
- According to a Gartner report on local and long-distance telephone companies, acquisition costs are typically $100 or more.[46]

In addition, customer acquisition costs reflect market strategies.

---

[39] Zito, Daniel and Bradley Wilson, "Quantifying the Cost of Consumer Competition," Legg Mason, October 15, 2002. ("Legg Mason Report").

[40] Banc of America Securities, "AT&T Corporation: A Case for Consumer Services," Research Brief, April 30, 2003, at 20. ("Banc of America AT&T Report").

[41] Kaufman Bros. Equity Research, "Raising Numbers Again," April 30, 2003, at 1.

[42] Thomas Weisel Partners, "Z-Tel Technologies, Inc. – Market Perform: Still Chugging Along," Earnings Update, November 8, 2001, at 3.

[43] The estimate is taken from an interview with Mark Johnson, Z-Tel's secretary treasurer. Blackwell, Gerry, "Free Long Distance at Z-Tel," *ISP-Planet*, available at <http://www.isp-planet.com/cplanet/marketing/01292001blackwell.htm>, accessed on October 28, 2003.

[44] Young, Shawn, "A Bidding War for Your Phone Bill," *Wall Street Journal*, April 16, 2003.

[45] *Id.*

[46] Kessler, Michelle, "Callers Jump at Chance to Gab, Gab, Gab," *USA Today*, April 22, 2003.

- A CLEC that wants to grow rapidly must pay more per line than one that is satisfied with a more moderate rate of growth. The moderate growth target in CPRO (5 percent market penetration after 5 years, *see* Section 5.3) does not require exorbitant expenditures for customer acquisition marketing.
- Customer acquisition marketing costs cannot be explained by the local market alone. The AT&T and MCI strategy, once a Bell Operating Company obtained 271 relief, has been rapid market expansion, in part in order to ameliorate losses of long-distance revenues.[47] This strategy is obviously not appropriate for a start-up CLEC.
- A UNE-P based provider's customer acquisition costs may be higher than a UNE-L-based provider. As Hazlett and Havenner suggest, in markets where CLECs would not be impaired without access to the local switch, access to the local switch results in inefficiently (low) investment in facilities and inefficiently (high) customer acquisition costs.[48] This is because while the CLEC initially benefits from the availability of the switch, the benefits turn to downsides as UNE-P providers compete to provide service. As Morgan Stanley noted: "UNE-P conversion for many of these carriers requires significant marketing and advertising expense, as well as promotional giveaways. With those fees, in addition to the wholesale rates for the service, we question the profitability of the offering."[49]

As these points reflect, other CLECs' customer acquisition costs may not accurately indicate an efficient CLEC's customer acquisition cost. CPRO's default value for customer acquisition marketing costs is $120, higher than the range of the publicly available sources and higher than Z-Tel, the most comparable CLEC data points.

3.1.6. Customer Acquisition Expense Net of Installation Charges in Year 6+ ($ per installation): Default Value: $90

CPRO's default value for customer acquisition marketing costs in the steady state is $90 per installation. This number assumes a lowering of the initial customer acquisition cost of $120 by 25 percent to reflect that a CLEC no longer buying market (simply replacing customers lost to churn) can maintain customer levels at lower average cost.

---

[47] According to the Legg Mason Report, ILEC penetration of in-region long distance is reported to range between 40 to 68 percent.

[48] Hazlett, Thomas W. and Arthur M. Havenner, "The Arbitrage Mirage: Regulated Access Prices With Free Entry In Local Telecommunications Markets," *Review of Network Economics*, at 9 – 10.

[49] *Id.*, citing Morgan Stanley Equity Research, at 9.

3.1.7. Monthly Costs for Customer Care Apart from Setting Up Account ($/line): Default Value: 5.00

CLECs incur additional ongoing costs of customer care. These costs include those associated with call completion services, number and directory maintenance, maintaining and billing customer accounts, and instructing customers in the use of products and services. All these costs vary with the number of access lines served.

Customer-care activities are much the same for ILECs and CLECs. Consequently, it is reasonable to use ILEC data as an indicator of the costs of an efficient CLEC. CPRO's default value is based on customer-care costs of mid-sized ILECs apart from Sprint. Mid-sized ILECs excluding Sprint reported customer service expenses of $4.56 per line in their 2002 ARMIS reports.[50] Table 6 compares BOC and mid-sized ILEC customer care costs in 2002 and 2001. CPRO adds the incremental costs of customer care for long-distance service. These incremental expenses are estimated to be low because flat rate plans generate only limited billing inquiries. Including a reasonable allowance for long-distance customer care, CPRO's default value is $5.00 per line per month.

[50] The $4.56 per line is the same calculation based on a roll-up of all mid-sized ILECs except Sprint from ARMIS 43-01 reports for 2002. The category "roll-up mid-size ILECs." From this report, we extracted data for "Total Independents" and "Sprint Companies," and subtracted the Sprint data from the total for both customer care service expenses and billable access lines.

Table 6:
ARMIS Ongoing Customer Care Costs

2002

ARMIS Accounts	Account Description	BOCs	Mid-Sized ILECs	Mid-Sized ILECs (w/o Sprint)
1150	Customer Operations Services			
	Annual ($'000)	$7,717,168	$616,210	$187,687
	Monthly ($'000)	$643,097	$51,351	$15,641
910	Total Switched Access Lines	147,124,855	11,272,969	3,765,100
	Customer Operations/Line ($/Line/Month)	$4.37	$4.56	$4.15

2001

ARMIS Accounts	Account Description	BOCs	Mid-Sized ILECs	Mid-Sized ILECs (w/o Sprint)
1150	Customer Operations Services			
	Annual ($'000)	$7,717,168	$608,693	$169,492
	Monthly ($'000)	$643,097	$50,724	$14,124
910	Total Switched Access Lines	156,190,990	11,148,921	3,511,235
	Customer Operations/Line ($/Line/Month)	$4.12	$4.55	$4.02

Note: Qwest data not included in 2002.
Source: FCC ARMIS data.

3.1.8. Monthly Start-Up Expenses before Operations Begin ($/steady-state line): Default Value: 0.638

Start-up costs include the costs of the management team that the CLEC dispatches to the new LATA. For a sizable LATA, a management team would presumably be dedicated to the LATA. A smaller LATA may, however, be managed by a team that has responsibilities for other LATAs as well. In any event, start-up costs include an attribution of some centralized costs of the CLEC.

The default value is calibrated, based on a LATA where the CLEC has 100,000 lines in service in the steady state. In such a LATA, CPRO assumes that the local management team would consist of five managers (general manager, marketing/sales manager, operations manager, financial/administrative manager and engineering manager/chief engineer). They would be dispatched to the LATA the year before operations begin.

CPRO's estimate of the costs of this management team is based on Bureau of Labor Statistics data for 2002. The analysis uses salary data for managerial occupations, and benefits loading data for white-collar communications workers to come up with an annual and monthly cost. Calculation of start-up costs is shown in Table 7.

Table 7:
Start-Up Expenses

(1) Calculate Telecommunications Industry Benefits Loading Factor				
Communications, White-collar Workers	Average Cost per Hour			
Employer's Total Compensation	$34.84			
Wages/Salaries	$24.02			
Benefits	$10.82			
Derived Benefits Loading Factor	45%			
(2) Apply Benefits Factor to Wireline Carrier Specific Wages				
Wired Telecommunications Carriers[1]	Mean Hourly Wage	90th Percentile Hourly Wage	90th Percentile Annual Salary[2]	90th Percentile Annual Salary With Benefits[3]
Management Occupations	$40.55	$61.26	$113,331	$164,405
Marketing Managers	$42.29	$62.23	$115,126	$167,008
Sales Managers	$40.42	$60.66	$112,221	$162,794
Business and Financial Operations Occupations	$28.07	$41.74	$77,219	$112,018
Engineering Managers	$40.40	$59.46	$110,001	$159,574
(3) Calculate Total Start-Up Costs				
Model CLEC	Number of Employees	Total Annual Cost to Employer		
General and Operations Manager	1	$164,405		
Marketing Manager	1	$167,008		
Sales Manager	1	$162,794		
Business and Financial Manager	1	$112,018		
Engineering Manager	1	$159,574		
Total Annual Cost		**$765,799**		
Cost per Month		**$63,817**		
Cost over 100,000 lines		**$0.638**		

Notes: (1) Position definitions are as follows: Management Occupations and Business and Financial Operations Occupations include Accountants and auditors, Budget analysts, Cost estimators, Financial analysts and personal financial advisors, Financial managers, Human resources, training, and labor relations managers and specialists, Management analysts, Purchasing managers, buyers, and purchasing agents, and Top executives. Marketing Managers determine the demand for products and services offered by a firm and its competitors and identify potential customers. Develop pricing strategies with the goal of maximizing the firm's profits or share of the market while ensuring the firm's customers are satisfied. Oversee product development or monitor trends that indicate the need for new products and services. Sales Managers direct the actual distribution or movement of a product or service to the customer. Coordinate sales distribution by establishing sales territories, quotas, and goals and establish training programs for sales representatives. Analyze sales statistics gathered by staff to determine sales potential and inventory requirements and monitor the preferences of customers. Engineering Managers plan, direct, or coordinate activities in such fields as architecture and engineering or research and development in these fields. (2) The analysis does not rely on BLS' annual reported salary because it is calculated based on 2080 hours. Instead, we multiply the 90th percentile hourly wage by 1850 hours. We incorporate paid leave, time off and all other benefits in applying the derived benefits factor. (3) Benefit cost is calculated using "Derived Benefits Loading Factor," or the average benefits loading factor for white-collar communications workers.

Source: Employer cost and salary data for Wired Communications and Communications – White collar workers, Bureau of Labor Statistics, available at http://www.bls.gov, accessed on December 16, 2003.

The total of the loaded salaries applies to a LATA of 100,000 steady-state lines. Dividing that total by 100,000, CPRO derives the default value of 0.638.

The CLEC's activities are mainly of two types:

- Nationally centralized activities, e.g., operating the OSS and (probably) most management of advertising; and
- Decentralized activities; e.g., sales calls and activities that occur in the collocation spaces.

Only a small portion of the CLEC's activities take place on a LATA-wide basis; namely, those that take place at the POP.

Since only a small portion of costs is incurred on a LATA-wide basis, it follows that unit cost of management activities should not depend to a large degree on the size of the LATA. The management costs associated with nationally centralized and decentralized activities should be much the same, regardless of the size of the LATA. Thus, CPRO uses the same default value ($0.638 per steady-state line) for LATAs of all sizes.

3.1.9. General and Administrative Costs (Fraction of Own Network and Customer Care Costs): Default Value: 0.216

General and Administrative ("G&A") expenses reflect an industry sector's corporate overhead costs, which include both variable and fixed components. They are modeled in CPRO as a fraction of the CLEC's network-operations and customer-care costs.

Most firms in the economy, including CLECs, report SG&A costs as a single item in their financial reports. They do not distinguish "S" from "G&A." Certain classes of ILECs are, however, required by the FCC to file accounting and operating data that separately reports G&A.

Since ILECs and CLECs are in the same line of business, the ILEC ratio of G&A costs to the sum of network and customer-care costs should be indicative of what an efficient CLEC can achieve. As before, CPRO uses the FCC's ARMIS data for mid-sized ILECs apart from Sprint, so scale economies are not an issue. To the extent that these ILECs are not completely efficient, the ratio is high.

CPRO calculates G&A ("Corporate Operations") as a ratio to direct operations costs, e.g., the sum of "Customer Operations" expenses plus "plant specific" and "plant non-specific" network operations expenses.[51] CPRO's default value is derived from the total of all mid-sized ILECs with the exception of Sprint, which were subtracted from the totals.[52]

---

[51] Operating costs less depreciation and access costs. Access costs reflect costs paid to other firms. The relevant base is the value-added operations of the firm.

[52] Both large and certain mid-sized incumbent LECs that are required to file report "Total Corporate Operations Expense," which includes top executive expenses and other categories of "G&A" expenses. For large incumbent LECs, top corporate executive expenses are not included in accounts 672x, which are titled "General and *(footnote continued)*

CPRO's default value of 0.216 is based on 2002 data.[53]

Table 8:
General & Administrative Costs

2002

ARMIS Accounts	Account Description	Mid-Sized ILECs	Sprint	Mid-Sized ILECs (w/o Sprint)
1120	Plant Specific	1,552,703	1,095,429	457,274
1130	Plant Non-Specific	449,373	285,180	164,193
1140	Customer Operations Marketing	329,876	229,876	100,000
1150	Customer Operations Services	616,210	428,523	187,687
1160	Corporate Operations	761,361	511,171	250,190
	Operating Costs*	3,709,523	2,550,179	1,159,344
1160 / Operating Costs	G&A Fraction	20.5%	20.0%	21.6%

Notes: (*) Less depreciation and access costs
Source: FCC ARMIS data.

4. CLEC FINANCIAL PARAMETERS

4.1. CAPITAL COSTS

4.1.1. Cash and Equivalents as a Fraction of Annual Expenditures: Default Value: 0.07

CPRO models cash-balance needs as a fraction of total expenditures during the year—both cash expenses and cash expenditures for capital additions.

Many CLECs have operated with cash balances that are less than or equal to 10 percent of annual expenditures. See Table 9 below.

Administrative Expenses," but these accounts are combined as "Total Corporate Operations Expenses." The ARMIS data is from Tables 1 and 2, Report 43-01 rolled up for large ILECs and for Independents. These same data result in a ratio of G&A (Corporate Operations) to total operating expense of 13 percent. The HAI model uses as its default value 10.9 percent (corporate operations to operating expense).

[53] The data are from ARMIS 43-01 reports for 2002 for the category "roll-up mid-size ILECs." From this report, CPRO extracted data for "Total Independents" and "Sprint Companies" and subtracted the Sprint data from the total.

Table 9:
Cash & Equivalents as a Fraction of Expenditures

	2002	2001	2000	1999
Allegiance	0.37	0.50	0.55	1.22
ATX	0.04	0.13	0.09	0.08
Choice One	0.10	0.05	0.56	0.04
ITC Deltacom	0.57	0.11	0.25	0.76
McLeod USA	0.31	0.08	0.01	0.26
Mpower	0.15	0.03	0.02	0.27
Pac-West	0.31	0.52	0.34	0.91
Talk America	0.14	0.05	0.07	0.17
Z-Tel	0.07	0.05	0.17	3.11
Average	0.23	0.17	0.23	0.76

Notes: Ratio is equal to cash & equivalents over operating expenses and capital expenditure less depreciation.
Sources: Thomson Research Worldscope, company 10-Ks.

4.1.2. Debt as a Fraction of Property Plant and Equipment and Accounts Receivable: Default Value: 0.50

The default value is 50 percent. Given CPRO's default value for cash and equivalents, they amount to approximately 12 percent of the sum of PPE and accounts receivable. Thus, the ratio of debt to total assets is 0.5 / 1.12 or about 45 percent.

AT&T and MiCRA both assume in their studies that the CLEC's capitalization is 45 percent debt and 55 percent equity. CPRO's default value is equivalent to their assumption for a CLEC in steady state.

AT&T and MiCRA did not model a start-up CLEC. Consequently, they did not make assumptions about the funding of losses in the early years of operation. To be safe, the assumption that those losses are entirely funded with equity capital is made.

In summary, the default value of 0.50 is consistent with the values assumed by AT&T and MiCRA. In the model, the CPRO incurs the substantially higher cost of equity and pays higher taxes in order to have a sound financial structure—much sounder than that of the vast majority of actual CLECs.

4.1.3. Cost of Debt (per year) Default Value: 0.08

In Virginia, the FCC adopted AT&T/WorldCom's proposed cost of debt of 7.86 percent, calculated by taking the weighted average cost of Bell Atlantic and GTE outstanding issues. They reason that this method is superior to methods relying on non-telecommunications-related (but competitive) market data because it "reflects the cost of companies in the relevant industry."[54] CPRO rounds up to 0.08 and adopts it as the default value.

4.1.4. Post-Tax Cost of Equity (Per Year): Default Value: 0.15

In TRO filings, AT&T has estimated the cost of equity to be 15 percent.[55] MiCRA likewise estimated it to be 15 percent.[56] CPRO also relies on the FCC's conclusion in Virgina:

> We conclude that the CAPM is the better mechanism for estimating the cost of equity in this proceeding. In the CAPM, the overall cost of equity capital equals the expected risk-

---

[54] FCC, Memorandum Opinion and Order, *In the Matter of Petition of WorldCom, Inc. Pursuant to Section 252(e)(5) of the Communications Act for Preemption of the Jurisdiction of the Virginia State Corporation Commission Regarding Interconnection Disputes with Verizon Virginia Inc., and for Expedited Arbitration, In the Matter of Petition of AT&T Communications of Virginia Inc., Pursuant to Section 252(e)(5) of the Communications Act for Preemption of the Jurisdiction of the Virginia Corporation Commission Regarding Interconnection Disputes With Verizon Virginia Inc.*, CC Docket No. 00-251 & CC Docket No. 00-218, Released August 29, 2003, ¶¶ 66-67. ("Virginia Order").

[55] Marsh letter 1, at 14.

[56] MiCRA study, at 3.

free rate, plus the product of the expected beta for the common stock and a risk premium reflecting the difference between the expected market rate of return and the expected risk-free rate of return. Based on the analysis above, we will calculate two different cost of equity figures and use the average of the two in developing an overall cost of capital. First, using the 30-day Treasury bill, the cost of equity equals 4.93 + 9.45 (1.0), or 14.38. Second, using the 20-year Treasury bond, the cost of equity equals 6.26 + 8.10 (1.0), or 14.36. We will use the average of the two, **14.37**, in developing the overall cost of capital.[57]

To avoid controversy, CPRO uses the greater of these estimates as the default value. We believe that it is a reasonable, though clearly biased to the high-end, estimate of the cost of equity of a CLEC with the financial structure of the modeled CLEC.

4.2. REVENUE

The CPRO Model posits that the CLEC serves both business and residential customers. To each group it offers a choice of:

- A flat-rate plan that includes unlimited local calls, some vertical services, and unlimited domestic long-distance service; or
- A plan that includes unlimited local calls and some vertical services but charges for long-distance minutes. The residential plan is assumed to include some number of "free" minutes, but the business plan is assumed to include no free minutes.

The development of CLEC revenues involves a number of user-specified parameters, relating to prices, market penetration and take rates, average long-distance usage, and average number of paid minutes for the measured residential plan. Additional parameters relate to the contributions (revenues in excess of incremental costs) from vertical services not included in the basic plans.

The structure of the rate plans and the default prices are based on MCI's "The Neighborhood" and "Business Complete" Plans. Given MCI's success in marketing The Neighborhood plan, and the successes of other CLECs in marketing similar plans, this approach is reasonable.[58]

---

[57] Virginia Order, ¶¶ 58 – 104.

[58] Z-Tel's Z-LineHOME Unlimited plan includes unlimited local and toll calling, as well as over seven features for $55.99 (in Washington state); Talk America offers an Unlimited Nationwide plan for $44.95 that includes unlimited local and toll calling, as well as an unlimited number of features (from a list of over 15). Talk America gained over 150,000 bundled access lines in one year (an increase of over 80 percent from December 2001). *See* Z-Tel website, "Select Products," available at <http://www.ztel.com>, accessed on December 15, 2003; Talk America website, "Talk America," available at <https://secure.talk.com/>, accessed on December 15, 2003; Talk America 2002 10-K, at 20.

4.2.1. Prices

CLECs typically pass through a variety of costs that are also passed through by ILECs. These costs include the End User Common Line ("EUCL") charge, gross receipts taxes and contributions to universal service. The user-specified parameters include the base price and the EUCL. Other pass-throughs are not modeled explicitly, since they do not affect the profitability of the CLEC (given the level of demand).

The modelers set CPRO's efficient CLEC's prices using MCI's plans. From CPRO's analysis of public information and Qwest data, this assumption is valid. The prices of MCI's Business Complete and The Neighborhood Plans, and the amounts of the EUCLs vary from state to state and are discussed in the state-specific analysis.

The flat-rate unlimited long-distance minute plans cost consumers roughly $60 per line for business and $50 per line for residential subscribers. It is reasonable to ask whether CLECs actually achieve this level of mass market subscriber revenues.

Z-Tel primarily serves the residential and small business market. Z-Tel reports revenue per line at $68. Z-Tel's beginning and end year number of lines were averaged and applied to total year revenues for its Z-Home and Z-Business services. Separately reported long-distance and wholesale revenues were excluded from the calculation.[59]

Many publicly-owned CLECs focus on the small and medium-sized[60] business market. Calculation of monthly average revenue per switched line for these CLECs is over $60 per line per month.[61]

The Yankee Group's findings on the typical CLEC small to medium business ("SMB") customer also confirms that CLEC customers are higher spenders. They state that as a group, CLEC SMB customers outspend ILEC SMB customers in both local and long distance.[62]

Residential customers are spending within the range that CPRO assumes and demonstrating interest in bundled plans. J.D. Power reports that average household expenditure on long distance alone is $24.40, and the FCC's estimate of average monthly cost for flat-rate local calling is $14.55.[63] And the demand for packaged service is high - according to IDC and J.D.

---

[59] Z-Tel 10K, 2002, at 31.

[60] A CLEC sales executive informed us that Allegiance considered a customer with nine DS0s to be medium-sized.

[61] They are Pac-West Telecom Inc, Allegiance Telecom Inc, Choice One Communication Inc, McLeod USA and Mpower Communications. Revenues and access lines are from the *2003 CLEC Report*, Tables 20 and 21. Revenues per line were based on 2002 revenues and an average of access lines reported for 2001 and 2002.

[62] Yankee Group, "Small and Medium Businesses Show Loyalty to CLECs, Again," January 2003, at 9-10.

[63] The local rate is for urban areas and does not include additional federal or state line charges or taxes. *See* J.D. Power & Associates press release, "J.D. Power and Associates Reports: Customer Satisfaction Increases as Stiff Rate Competition and Bundling Cause Steep Drops in Long Distance Spending, July 1, 2003. *See also* FCC, Reference Book of Rates, Price Indices, and Household Expenditures for Telephone Service, Industry Analysis & Technology Division, Wireline Competition Bureau, 2003, Table 1.1.

Power, over 40 percent of households are interested in receiving telecommunications services from one provider.[64] The Yankee Group reports similar findings for over 46 percent of small businesses.[65]

Additionally, CLECs are far more successful than ILECs in selling bundled services: "Regardless of the type of bundle, CLECs show a greater ability to move bundled services. This is due in part to regulatory constraints imposed on the RBOCs. In addition, the CLECs focus on selling bundled services as a key competitive differentiator."[66] Focusing on the VSB group, over 50 percent of CLEC VSB survey respondents subscribed to bundled local and long distance, whereas the same was true of only 22 percent of ILEC VSB respondents.[67]

See Table 10 below for the prices of MCI's residential and business plans.

[64] IDC, "Evolving Landscape of Consumer Telecom: IDC's 2002 U.S. Residential Telecommunications Survey," August 2002, at 3. ("IDC Consumer Telecom Report"). *See also* J.D. Power & Associates press release, "J.D. Power and Associates Reports: Customer Satisfaction Increases as Stiff Rate Competition and Bundling Cause Steep Drops in Long Distance Spending, July 1, 2003.

[65] PR Newswire, "Sprint Gives Small Business Customers What They Want: Bundled Calling Packages," November 16, 2000.

[66] IDC Consumer Telecom Report at 12.

[67] The SB group had a similar breakout: 25 percent of ILEC customers versus 49 percent of CLEC customers subscribed to a bundle of local and long distance. *Id* at 14.

Table 10:

Selected States' Monthly Costs for MCI's The Neighborhood and Business Complete Plans

	The Neighborhood			Business Complete		
	Complete	Advantage	Standard	Unlimited	Advantage	Basic
Arizona	$49.99	$37.99	$25.99	$59.99	$34.99	n/a
Colorado	$49.99	$37.99	n/a	$59.99	$39.99	$27.99
Iowa	$49.99	$37.99	$22.99	$59.99	$31.99	n/a
Minnesota	$49.99	$37.99	$25.99	$59.99	$39.99	n/a
Nebraska	$49.99	$39.99	$20.99	n/a	n/a	n/a
New Mexico	$55.99	$39.99	$28.99	$59.99	$39.99	n/a
Oregon	$49.99	$37.99	n/a	$59.99	$34.99	n/a
Utah	$49.99	$35.99	$21.99	$59.99	$34.99	n/a
Washington	$49.99	$33.99	$23.99	$59.99	$31.99	n/a
Average	$50.66	$37.77	$24.42	$59.99	$36.12	$27.99
Long Distance	Included	200 mins. incl.; $0.05 / add'l min.	Sign up for plan of choice - $5.95 + $0.05 / min.	Included	$0.06 / min.	$0.09 / min.

Notes: The prices represent the cost of the first line. Additional lines can be purchased at similar or lower prices. The Neighborhood Complete plan includes unlimited local and toll calling, Voicemail, Call Waiting, Caller ID, Call Waiting ID, Speed Dial 8, Three-Way Calling and other features for no cost by request; The Neighborhood Advantage plan includes unlimited local calling, 200 minutes of toll calling (with additional minutes at $0.05 per minute), Call Waiting, Caller ID, Call Waiting ID, Three-Way Calling and other features for no cost by request; The Neighborhood Standard plan includes unlimited local calling, Call Waiting, Caller ID, Three-Way Calling, Speed Dial and Anonymous Call Rejection. A long distance rate is not included with the Neighborhood Standard plan; the consumer can choose from various plans, including the one noted above for $5.95 per month, $0.05 per toll minute. Business Complete Unlimited includes unlimited local and toll calling, Call Waiting, Caller ID, Speed Dial 8, Three-Way Calling and other features for no cost by request; Business Complete Advantage includes unlimited local calling, toll calling at $0.06 per minute, Call Waiting, Caller ID, Speed Dial 8, Three-Way Calling, Call Forwarding, Anonymous Call Rejection and other features for no cost by request; Business Complete Basic includes unlimited local calling and toll calling at $0.09 per minute. Other services and products are available for cost with plans, including international calling, other features, services and calling card plans. *See* Table 13.

Sources: MCI website, available at <http://www.mci.com>, accessed on October 23, 2003; conversations with company representatives.

4.2.2. Long-Distance Usage

CPRO assumes 200 toll minutes of use for measured rate plans, and 400 minutes of use ("MOU") for flat rate plans.

[BEGIN CONFIDENTIAL]

REDACTED

[END CONFIDENTIAL]

Table 12:
Break-Even Analysis of Plans

Residential

	Monthly Price	MOU Included	Cost per Toll Min	Price Difference to Next Plan	Price Difference in Add'l Mins
Neighborhood Advantage	$37.77	200	$0.05	$12.89	258
Neighborhood Complete	$50.66	Unlimited	--	--	--

Business

	Monthly Price	MOU Included	Cost per Toll Min	Price Difference to Next Plan	Price Difference in Add'l Mins
Business Advantage	$36.12	None	$0.06	$23.87	398
Business Unlimited	$59.99	Unlimited	--	--	--

Note: The analysis is based on the average prices for the plans as shown in Table 10.
Sources: MCI website, available at <http://www.mci.com>, accessed on October 23, 2003; conversations with company representatives.

Examining the MCI plans indicates that the price differential between the measured and flat-rate plans (excluding the additional features) is equivalent to 250 to 400 minutes of incremental monthly toll use. CPRO assumes that the flat-rate caller uses 400 toll MOUs as this is the break-even point – the point where the consumer would find it more economical to choose the flat-rate plan.

4.2.3. Market Penetration and Take Rates

CPRO assumes 60 percent flat-rate, 40 percent measured-rate plan penetration for residential and business.

4.2.4. Overall Penetration at the End of the Fifth Year: Default Value: 0.05

This parameter indicates the overall market penetration that the CLEC achieves at the end of the fifth year. It is expressed as a function of all lines at ILEC COs. These lines include UNE-L and UNE-P loops, as well as the lines that the ILEC supplies to its retail customers.

The default value of 0.05 is chosen to reflect a growth target that the modeled CLEC could realistically achieve. Many CLECs have grown more rapidly than indicated by this default value. For example, AT&T achieved *far* more rapid growth in Texas and Michigan.[68]

4.2.5. Monthly Contributions from Other Services and Features ($): Default Value: 3.00

As discussed above, the rate plans of the modeled CLEC include unlimited local service and some vertical services. Domestic long-distance usage has already been discussed. In addition, the CLEC has numerous opportunities for additional contributions.

By far the best evidence regarding these additional contributions would be information provided by the efficient CLECs. Unfortunately, limited information has been provided by CLECs through discovery.

In its absence, CPRO's estimates of contributions from other services are based on consideration of the various services involved.

MCI offers over ten a la carte vertical features in addition to the features included in The Neighborhood and Business Complete plans. Voicemail and call forwarding, in particular, are not included in the Business Complete packages.[69] Although some businesses may use an answering machine or purchase a voicemail through a different provider, some small businesses will purchase the $7.50 feature. Some of these a la carte features are listed in Table 13 below.

Other non-feature services that are commonly offered by carriers include: directory assistance/operator services, calling cards, international calling plans, and wire maintenance services, among others.

[68] Bear Stearns AT&T Report, at 14.

[69] Voicemail is also not included in The Neighborhood Advantage plan.

Table 13:
Examples of Additional Revenue Sources

Feature	Price per Month	Residential Take Rate[1]	Very Small Business Take Rate[2]
Voicemail	$7.50 ($0.50 per sub account)	Included in Neighborhood Complete only	--
Calling Card Rate Plan*	$2 + per minute charges may apply	--	29%
Call Forwarding Busy, Call Forwarding Busy No Answer	$0.25 - $4.75	10%	56%
Call Screening	$2.95 - $4.50	--	--
Call Return	$1.50 - $4	--	--
Directory Assistance	$0.99 for 2 searches	--	--
Multi Ring / Distinctive Ring	$4.50 - $7.80	7%	--
International Long Distance Plans~	$2 - $5.95 + per minute charges may apply	--	--
Repeat Dial	$1.50 - $3.50	17%	--
Speed Dial 30	$2.75 - $4.75	--	--
Wire Maintenance	$4 - $4.95	--	--

Notes: Some features, such as voicemail, are included in plans and not included in others. Feature prices vary based on location. Prices shown based on Qwest states. Features may not be available in all areas. From MCI website, available at <http://www.mci.com>, accessed on October 28,2003; conversations with MCI representatives. (--) indicates that sources did not have take rates for features listed. (*) The $2.00 does not include the additional per minute fees for calling card use. (~) International calling plans may or may not require additional per minute fees, depending on the plan.

Sources: Prices for features from MCI website, available at <http://www.mci.com>, accessed on October 23, 2003; conversations with company representatives. Take rates from (1) IDC, "Evolving Landscape of Consumer Telecom: IDC's 2002 U.S. Residential Telecommunications Survey," August 2002, at 5, (2) Yankee Group, "Small and Medium Businesses Show Loyalty to CLECs, Again," January 2003, at 11-12.

Taking all these opportunities into account, the default value of $3.00 per month is a reasonable estimate of the contributions that an efficient CLEC could derive from other services and features.

4.2.6. Lag for Receivables (months): Default Value: 2.2

The model allows a lag between the time when service is provided and when the money is collected.

In Table 14, CPRO compares the lag for all of the CLECs that have determined to be within reasonable comparison to CPRO's model CLEC. CPRO assumes a default receivables lag of 2.2 months, greater than the comparable CLECs' average.

Table 14:
Receivables Lag

	2002	2001	2000	1999
Allegiance	2.4	3.3	4.0	3.7
ATX	1.5	1.3	3.2	1.6
Choice One	1.8	2.7	3.7	7.9
ITC Deltacom	1.4	1.8	2.4	2.4
McLeod USA	1.7	1.8	2.9	2.5
Mpower	2.7	2.2	3.1	3.4
Pac-West	0.9	1.1	1.7	1.1
Talk America	1.1	0.7	1.2	1.4
Z-Tel	1.4	1.2	4.5	7.8
Average	1.6	1.8	3.0	3.5

Notes: Ratio is equal to accounts receivables over total revenue, multiplied by 12.
Sources: Company 10-Ks, Thomson Research Worldscope.

4.2.7. Fraction of Total Revenue which is Uncollectible: Default Value: 0.06

The model accounts for revenue that will not be collected.

In Table 15, CPRO compares the uncollectible revenue for all of the CLECs that have determined to be within reasonable comparison to CPRO's model CLEC. CPRO assumes a default uncollectible fraction of 0.06, greater than the comparable CLECs' average.

Table 15:
Uncollectible Revenues

	2002	2001	2000	1999
Allegiance	0.009	0.021	0.013	0.026
ATX	0.025	0.030	0.032	n/a
Choice One	0.031	0.008	0.011	0.003
ITC Deltacom	0.015	0.009	0.004	0.003
McLeod USA	0.060	0.023	0.027	n/a
Mpower	0.035	0.017	0.019	0.004
Pac-West	0.131	0.019	0.016	0.008
Talk America	0.028	0.174	0.055	0.008
Z-Tel	0.065	0.063	0.014	0.010
Average	0.045	0.041	0.021	0.009

Notes: Ratio is equal to doubtful accounts over total revenue.
Sources: Company 10-Ks, Thomson Research Worldscope.

4.3. DEMAND GROWTH

4.3.1. Initial Penetration (fraction of total market): Default Value: 0.00

CPRO's base case analysis posits that the CLEC begins with zero lines in the LATA, which is the default value. This modeling choice is discussed in the main testimony.

The model can, however, analyze scenarios in which the CLEC already operates in the LATA. In such scenarios, this parameter would be positive.

4.3.2. Growth Total Lines (Fraction per Year): Default Value: -0.013

CLEC penetration is modeled as a specified fraction of the total market. The total market may grow or contract over time. In that case, CLEC penetration is measured relative to the total market after the growth or contraction. See Table 16.

Table 16:
CLEC and ILEC Line Growth

	CLEC			ILEC			Total	
	Lines	% Change	% of Total	Lines	% Change	% of Total	Lines	% Change
12/99	8,194	--	4.3%	181,308	--	95.7%	189,502	--
6/00	11,557	41.0%	6.0%	179,762	-0.9%	94.0%	191,319	1.0%
12/00	14,871	28.7%	7.7%	177,642	-1.2%	92.3%	192,513	0.6%
6/01	17,275	16.2%	9.0%	174,861	-1.6%	91.0%	192,136	-0.2%
12/01	19,653	13.8%	10.3%	172,044	-1.6%	89.7%	191,697	-0.2%
6/02	21,645	10.1%	11.4%	167,472	-2.7%	88.6%	189,117	-1.3%
12/02	24,766	14.4%	13.2%	162,743	-2.8%	86.8%	187,509	-0.9%
Change from 12/02 - 12/00							**-5,004**	**-2.6%**
Annual change							**-2,486**	**-1.3%**

Note: CLEC share excludes CLECs with under 10,000 lines. Previously reported data in December 2000 and June 2001 was revised in the December 2002 report.
Source: FCC, Local Telephone Competition: Status as of December 31, 2002, Industry Analysis and Technology Division, Wireline Competition Bureau, June 2003.

As the table shows, total lines have declined by -0.026 percent since December 2000. This decline is equivalent to –0.013 percent decline per year. CPRO's default value of -0.013 reflects this recent negative trend.

4.3.3. Churn

Churn is the fraction of customers that the CLEC loses each month. It does not include customers that move location but are retained as customers. The optimal source of information to determine the churn rate of an efficient CLEC would be a complete set of CLEC churn rates across time, with the rates segmented by customer type. This data does not exist; therefore, the default values for CPRO were estimated with the data available from CLECs supported by data about other telecommunications industry churn rates.

Based on the survey of publicly available data, CPRO assumes business churn of two percent and residential churn of four percent, resulting in an average of three percent overall churn.

While CLEC data does not provide adequate information about churn to estimate rates, it does provide information about how rates vary by customer type. Table 17 highlights the difference between Mass Market CLECs and CLECs that serve businesses (typically enterprise, other carriers, or medium to large businesses) only.

Table 17:
Comparing CLECs and Monthly Churn

Markets Served

	Allegiance	Choice One	Focal	McLeod USA	Mpower	US LEC	Z-Tel
Residential				X	X		X
Business							
1 - 4 lines	X			X	X		X
5 - 24 lines	X	X		X	X		X
24+ lines			X	X	X	X	
Other carriers			X	X		X	

Monthly Churn

	Allegiance	Choice One	Focal	McLeod USA	Mpower	US LEC	Z-Tel
Range Reported	1.8% - 2.8%	1.4% - 1.6%	0.8%	0.8%	4.3% - 4.8% 2.4% - 3.0%	0.3%	2.3%

Note: Allegiance range represents total churn and retail only churn. Mpower churn – first number is residential churn only, second number is business only.

Sources: Company websites; press releases; SEC filings; Shafer, Kelly Kirkendoll, "Finding the Leaks, A Closer Look at RBOC Win-back Numbers, Fat Pipe, *September2003.*

From Table 17, the modelers infer that medium to large business customers do not turnover as frequently as residential and small business customers. Focal, McLeod, and US LEC have the lowest churn rates and serve large business customers. Allegiance and Choice One serve small and medium customers and have higher churn rates. Mpower and Z-Tel, which serve the mass market, tend to have higher rates. Mpower indicates that its churn rate for residential customers is higher than for business customers. These churn rates are consistent with the finding in the TRO that Enterprise customer sign term agreements that reduce their churn rate. While our default rates do not come solely from CLEC sources, the assumed churn rates for CPRO will account for the higher churn rate for residential customers versus small business customers.

Reported CLEC churn rates are also insufficient to estimate the proper rate because firms like Z-Tel are shrinking in the reported time frame. A shrinking firm will have a lower churn rate than a growing firm.[70] The CLEC modeled in CPRO is growing and the churn rate must be consistent with the modeled growth pattern.

Publicly reported CLEC churn rates are an important source of data, but other pertinent data exist, including churn rates reported for wireless, long distance, and internet services.

[70] CLECs indicate that churn is highest among new customers. *See* MCI ex parte filings.

Certain factors about the wireless industry may cause its customer to behave differently than the likely customers of CLECs.

- Wireless customers are often required to sign one or two-year term agreements, whereas mass market CLEC customers are not.
- Churn figures are almost always reported by wireless carriers and are scrutinized by the investment community, while only some CLECs choose to report churn. This information gap makes comparisons difficult.
- Number portability is expected to increase short-term wireless churn, but the long-term effects of number portability are unclear.
- According to the FCC, 95 percent of the U.S. population has a choice of at least three or more wireless providers; approximately 77 percent of U.S. households have access to the same (or greater) number of CLEC providers.[71]

These factors indicate that the wireless industry may be closer to approaching an efficient level of churn. Bank of America analysts estimates that the average monthly wireless churn rate for the "big six" carriers is 2.4 percent. They also state:

> We believe the wireless churn rate is a relatively close proxy for local churn, although we would expect local churn to be higher than wireless churn. The lack of local number portability is a solid churn defense for the wireless companies (LNP is available for local service) and is only partially offset by service and network issues facing wireless carriers.[72]

---

[71] Data as of December 2002. *See* FCC, *In the Matter of Implementation of Section 6002(b) of the Omnibus Budget Reconciliation Act of 1993 Annual Report and Analysis of Competitive Market Conditions With Respect to Commercial Mobile Services*, WT Docket No. 02-379, July 14, 2003, ¶84. *See also* FCC, *Local Competition: Status as of December 31, 2002,* Industry Analysis and Technology Division, Wireline Competition Bureau, June 2003, Tables 14, 15.

[72] Banc of America AT&T Report, at 11

Table 18:
Wireless Monthly Churn

Wireless Company	Monthly Churn (Q2 2003)	Monthly Churn (Q1 2003)
AT&T Wireless	2.2%	2.3%
Cingular	2.5%	2.6%
Nextel	1.6%	1.9%
Sprint PCS	2.4%	3.1%
Verizon Wireless	1.7%	2.3%

Source: Company Q2, Q3 2003 10-Qs.

The long distance industry, long exposed to competition, has settled from its unsustainable churn rates in 1994 to around 23 to 25 percent per year.[73]

An IDC survey of residential customers states "26.2% of the total population indicated that they changed their long distance telephone service (not necessarily providers) in the past 12 months."[74] The Yankee Group reports "23.5% of long-distance companies changed phone companies at least once last year."[75] These estimates are equivalent to 2.2 to 2.5 percent per month.

Although high-speed Internet access is not a voice service, comparing CLEC services to broadband providers is useful in CPRO's analysis. Monthly charges for high-speed services are often $40 to $80 per month, and greater for non-contract access.[76] In addition, broadband providers such as Covad and Earthlink target a similar market to CPRO's model CLEC - residential and small business customers.[77] According to the IDC, "25.4% of the high-speed

---

[73] Nucifora, Alf, "Long-distance Firms Spend Wantonly," *The Business Journal of Jacksonville*, February 17, 1997. *See also* Morgan Stanley Equity Research, "Wireline Telecom Services – Annual Telecom Services Survey Part 3: Competition," June 17, 2003, at 7.

[74] IDC Consumer Telecom Report, at 4.

[75] Snel, Ross, "Fighting the Fickle: New Technology is Helping Phone Companies Battle One of Their Biggest Enemies," *Wall Street Journal*, September 18, 2000.

[76] Covad's business "A-DSL" product is available for $69.95 per month; its residential "TeleSurfer LINK" product is available for $39.95 per month, and its "TeleSoho" product (for small home or office customers) is available for $69.95 per month. Earthlink's residential DSL is $29.95 for three months and $49.95 per month thereafter, its SOHO product is $79.95 per month. These prices require a one-year contract; early termination fees apply. See Covad website, available at <http://www.covad.com>, accessed on December 9, 2003; Earthlink website, available at <http://www.earthlink.com>, accessed on December 9, 2003.

[77] Covad press release, "Covad Debuts New Advertising Campaign Targeting Small Businesses," March 17, 2003. *See also* Covad 10-Q, Q3 2003, at 16; Covad website, available at <http://www.covad.com>, accessed on December 9, 2003; Earthlink 10-K, 2002, at 2; Earthlink website, available at <http://www.earthlink.com>, accessed on *(footnote continued)*

Internet population indicated they changed providers in the last 12 months." This is equivalent to 2.4 percent monthly churn rate.

Lastly, in a static analysis filed by AT&T in the FCC's Triennial Review proceeding, AT&T posited an annual churn rate of 33 percent, based on its estimation that CLEC accounts have an average duration of 36 months.[78] This estimate corresponds to a churn rate of 3.3 percent per month.

CPRO's default of three percent is comparable with the AT&T default. This churn rate is also higher than monthly churn achieved by Mass Market CLECs like Z-Tel, higher than monthly churn of the "big six" wireless carriers, and higher than both estimates of long distance and broadband churn. It is conservative estimate of what an efficient CLEC could achieve and is consistent with the other inputs in the CPRO model.

5. OTHER COSTS

5.1.1. Income Tax Rate

This input should be the sum of the federal income tax rate plus whatever state and local income taxes apply. It varies from state to state. The default value is 35 percent.

5.1.2. Other Taxes

Other taxes vary from state to state. The default value is 0.6%.

5.1.3. Monthly Miscellaneous Costs ($/line): Default Value: 1.00

CPRO includes explicitly all the significant costs that the modeled CLEC would incur. Nevertheless, as in any model, there are always a number of items whose costs, while present, are too small to justify modeling explicitly. Some of these items are:

December 9, 2003.

[78] Letter from Joan Marsh, Director, Federal Government Affairs, to Marlene Dortch, Secretary, FCC, re: Notice of Oral Ex Parte Communication, *In the Matter of Review of the Section 251 Unbundling Obligations of Incumbent Local Exchange Carriers*, CC Docket Nos. 01-338, 96-98 and 98-147, December 6, 2002, at 4; and Letter from Joan Marsh, Director, Federal Government Affairs, to Marlene Dortch, Secretary, FCC, re: Notice of Oral Ex Parte Communication, *In the Matter of Review of the Section 251 Unbundling Obligations of Incumbent Local Exchange Carriers*, CC Docket Nos. 01-338, 96-98 and 98-147, November 12, 2002, at 10.

- Signaling;
- Security access cards for collocation;
- DSX frames at the home CO; and
- Voicemail

The default value of $1.00 per month per line more than suffices to cover the costs of the items listed above.