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Suite 1000
1120 - 20th St., NW
Washington, DC 20036
202 457-3810

February 12, 1997

Mr. William F. Caton
Secretary
Federal Communications Commission
1919 M. St., NW, Room 222
Washington, D.C. 20554

RE: Ex Parte Presentation – Proxy Cost Model Questions
CC Docket No. 96-45

Dear Mr. Caton,

Pursuant to Mr. Morabito's letter of December 12, 1996, and subsequent requests from the Joint Board Staff, enclosed please find AT&T's and MCI's updated responses to the Federal-State Joint Board staff's questions on the Hatfield proxy cost model. These responses update AT&T and MCI's filing of January 7, 1997 (hereinafter "Previous Filing") to incorporate results or procedures from Release 3.0 of the Hatfield Model that was submitted to the Joint Board on February 7, 1997.

In addition to these updated responses to the proxy cost model questions, this letter also transmits two additional papers that have been requested by the Federal-State Joint Board Staff. The first deals with the cost of capital, the second addresses depreciation issues.

Two copies of this Notice are being submitted to the Secretary of the FCC in accordance with Section 1.1206(a)(1) of the Commission's rules.

Sincerely,

Richard N. Clarke

- Attachments: Responses to the Federal-State Joint Board Staffs' Questions on Proxy Models
- Estimating the Cost of Capital of Local Telephone Companies for the Provision of Network Elements (with addenda)
 - Selection of Plant Lives for Use in Forward-Looking Economic Cost Calculations

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Responses to the Federal-State Joint Board Staffs' Questions on Proxy Models

1. *With regard to the model that you have submitted, list and explain the differences between the current model and the version of the model previously filed in CC Docket 96-45. Explain any plans for additional enhancements to the model. Provide a date certain for when the planned enhancements will be provided to the Commission.*

See answer to Q.1 in Previous Submission; and see Model Description: Hatfield Model Release 3.0, pp. 7-11, filed February 7, 1997 (hereinafter, "Model Description").

2. *Using the current version of your model, provide study area results for Southwestern Bell-Texas (SWTX). For this study area, please provide:*
 - a. *Summary statistics: total investment; investment per line; loop investment per line; end office switching investment per line; monthly cost per line; loop monthly cost per line; end office switching monthly cost per line; monthly transport cost per line, total households; total residential lines; total business lines; total single business lines, total switched lines; the number of residential lines per density zone, and monthly cost per line per density zone.*

See Attachment 2a.

- b. *Model results reported on an ARMIS basis: all expenses and plant in service rows that are contained in ARMIS report 43-03. If any of these rows can not be shown separately, provide a list of rows that have been combined and the algorithm used to combine the rows.*

See Attachment 2b.

- c. *Switching: the total number of switches and lines per each switch. Please explain how the cost of the switches was determined, provide all cost input data, and explain how the model determines whether a switch will be a host, remote or stand alone switch.*

Numerical calculations are provided in Attachment 2c.

See, also, Model Description, pp. 43-47.

d. Cable and wire statistics: percent underground, buried and aerial; the length, gauge and size of copper cable used; length and size of fiber cable used; fill factors used as inputs; percent distribution fill determined by the number of lines served divided by the total number of distribution lines installed; percent feeder fill determined by the number of lines served divided by the total number of feeder lines installed (when the feeder is fiber, explain what assumptions were used to determine the capacity and use of the fiber); the distribution of households by loop length; and any factors that alter the cost of cable or the installation of cable such as additional costs associated with placing cable in dense urban areas.

*** Type of Cabling and Placement Structure**

- See Model Description, pp. 24-42, and Appendix B to Model Description, pp. 1-20.

e. Digital carrier: the number of lines served by carrier; the investment in carrier and investment in carrier as a percent of circuit investment.

See Attachment 2e.

f. Depreciation: the model depreciation rate and expected life by type of plant.

See Model Description, pp. 54-55.

g. Expenses: direct network expenses; indirect expenses; and common and overhead expenses. Please explain how the model allocates expenses among these various expense categories.

See answer to Q.2g in Previous Filing, and see, Model Description pp. 55-58. Note that default value of corporate overhead factor in HM 3.0 is 10.4%.

h. Capital Costs: return on capital; and taxes. Please explain how the percentage return on capital was calculated; and how tax gross-ups were determined.

See answer to Q.2h in Previous Filing; and see, Model Description, pp. 53-54.

i. Support: the aggregate support at \$20, \$30 and \$40 support levels and the number of households by cost category, where cost categories are ranges of cost per month such as greater than and equal to \$5 and less than \$10.

See Attachment 2i

- 3. *Explain how the model complies with the criteria for evaluating proxy models set forth in paragraph 277 of the Joint Board's Recommended Decision.***

See answer to Q.3 in Previous Filing.

- 4. *In its Recommended Decision, the Joint Board recommended that universal service support be provided for single line businesses in high cost areas. How do models calculate costs for single line businesses?***

The HM constructs and costs a local exchange network sized to service all demand – including that of single and multi-line businesses in addition to residences. Because HM 3.0 identifies explicitly single line business lines by CBG, adding these lines to the household count in a CBG, wire center or density zone is the only modification needed to calculate the costs of universal service support to single-line business service in addition to primary line residential service.

- 5. *List all equations used in the model For each variable used in an equation, provide the definition of the variable, the default value of the variable, identify the source of the variable, and state whether the user can change the value of the variable.***

Appendix B to the Model Description defines and lists all user-adjustable inputs and provides their default values used in Release 3.0 of the Hatfield model. The equations of the model are displayed in the Excel Workbooks that comprise the model's modules. These are all contained on the CD-ROM that was submitted to the Joint Board on February 7, 1997.

- 6. *What sources are available to verify that a network derived by a model is capable of delivering telecommunications services consistent with the standard of service adopted in the Joint Board's Recommended Decision?***

See answer to Q.6 in Previous Filing.

- 7. *Your model assumes that vendors typically offer a discount off their list prices for switches and digital loop carrier equipment. Purchasers, however, may be***

prohibited from disclosing the size of such discounts. Given the inability to provide such information, what alternatives are available to acquire such information?

See answer to Q.7 in Previous Filing.

8. *Describe the specific manner in which network design parameters (cable gauge, capacitance, loading, resistance, attenuation, cable fill, and concentrator or repeater placement) are used in the development of the models.*

See answer to Q.8 in Previous Filing.

9. *What service capability will local loops have if built to the specifications used in the model? Will all local loops provide (1) full time (non-traffic sensitive and non-party line) service between the customer and the serving wire center and/or (2) digital subscriber line (DSL) capability as described in "BOC Notes on the LEC Networks - 1994"? Will all local loops be capable of providing (1) basic rate ISDN service (2B+D) and/or (2) full duplex service at the DS1 level (commonly called T1) of 1.544 Mbps?*

See answer to Q9 in Previous Filing.

10. *The Hatfield and BCM2 models differ with regard to the sharing of structure investments, the mix of aerial, underground and buried cable, and the relationship between the costs of installation and the terrain. For example, the Hatfield model shares structure costs among three utilities, while the BCM2 models assigns 100% of the cost of structures to the telephone company. The Hatfield model assumes that cable will be extended by 20 percent when encountering difficult terrain rather than using terrain specific cost characteristics, while the BCM2 uses terrain specific cost characteristics. The BCM2, however, aggregates the terrain specific costs by activities, such as trenching in hard rock or restoring asphalt. Please provide documentation that supports the assumptions used in the models. Alternatively, please provide documentation that refutes these assumptions.*

See answer to Q.10 in Previous Filing. See also, Model Description, pp. 27-28 and Appendix B to Model Description, pp. 7-9.

11. *The models, at least in part, rely on Bellcore's Local Exchange Routing Guide, which may not include all wire centers. Do the models reflect all wire center*

locations? Should the models reflect all wire center locations? Do the models include host-remote configurations when it is efficient to do so?

The PNR data occasionally show NPA-NXXs that are not associated with any wire center in the Bellcore LERG. Similarly, there are a handful of wire centers that are listed in the LERG, but to which the PNR data maps no CBGs. These instances are generally de minimis. When the HM 3.0 data compilation for all fifty states is complete, we expect to provide fuller documentation of the amount and reasons for these occurrences.

See, also answer to Q.11 in Previous Filing.

- 12. *Do the models accurately estimate the total demand for lines in a particular geographic area, such as a Census block group, wire center, or service area? What types of lines (e.g., residential, single-line business, multiline business, and special access) are, or should be, included in a model's estimated demand for lines? Can the model estimate the incremental cost of adding households to the network.***

See, Model Description, pp. 21-23 and Appendix A to Model Description, pp. A-2 to A-3.

Not only does PNR use extensive Donnelley, Claritas and Dun & Bradstreet in addition to U.S. Census Bureau data to determine quantities of lines. But because PNR uses extensive statistical modeling, based on the particular demographic age, income and locational parameters of each CBG to determine the likelihood of residential second line penetration, its modeling of residential line categories is superior as well. In addition business lines are based not only on employee counts, but also on the telephone intensity of the employing industry based on 4-digit SIC codes.

- 13. *All of the models appear to base repair and maintenance and retail costs on historical costs. In some cases this is done based on a historical relationship between investment and expenses as reported in ARMIS; in other cases they are based on per line amounts. For these categories of expense, to what extent are these historical expenses a reasonable approximation of forward looking expenses? How are gains in productivity due to technological advances and increased competitive pressure captured by the model's estimates or repair and maintenance costs?***

See answer to Q.13 in Previous Filing.

14. *Do the retail costs--the cost of bill production, billing inquiries, sales and advertising--developed for your model reflect the costs associated with the services included in the revenue benchmark included in the Recommended Decision? What share of your retail costs are associated with bill production and billing inquiries? How are retail costs developed to capture the costs of services included in the revenue benchmark while excluding retail costs associated with services not included in the revenue benchmark, such as intraLATA toll?*

Bill production and billing inquiry costs currently account for 75 percent of the total retail costs included in the Hatfield Model's calculation of basic universal service costs.

See, also answer to Q.14 in Previous Filing.

15. *How is depreciation expense treated in the current version of the model? In particular, describe in detail the set of plant categories considered and the asset lives or economic depreciation rates associated with each. Justify, if possible the default choices made in the model. Describe the extent to which the model has sufficient built-in flexibility to accurately reflect differing decisions by the FCC and state commissions regarding depreciation rates. Are there enough distinct categories of plant to accurately model forward looking depreciation expense? For example, should asset lives for conduit necessarily be the same as cable lives?*

See answer to Q.15 in Previous Filing.

16. *The BCM2 includes 75% of 133.89 per year or \$8.34 per month per line to reflect non-plant related expenses such as marketing and customer operations. The adjustable 10% overhead figure in the Hatfield model is the only similar component. Should costs for customer or corporate operations be a fixed amount per line? If not, what should be the basis for allocating these costs? To what extent should basic local service be charged with marketing or customer operations expense?*

See answer to Q.16 in Previous Filing.

17. *Can a single proxy model be used to estimate the cost of the local exchange network for universal service support and for other objectives such as the pricing of network elements or access reform? Does a network specifically dedicated to universal service objectives differ in a significant way from the summation of network elements envisioned in Section 251? Are there*

insurmountable problems in the treatment of common costs in the different uses of the model? Describe specifically the modifications, if any, that would be required if a single model is used for multiple objectives.

See answer to Q.17 in Previous Filing.

Question 2a

	Density Range (Lines/Sq. Mi.)										Total
	0-5	5-100	100-200	200-650	650-850	850-2550	2550-5000	5000-10000	>10000		
Total Investment	\$ 301,042,350	\$ 952,143,571	\$ 293,769,862	\$ 694,595,483	\$ 214,753,735	\$ 1,710,165,679	\$ 1,618,016,880	\$ 641,086,882	\$ 431,059,550	\$ 6,856,633,992	
Total Investment/Line	\$ 4,690.80	\$ 1,746.35	\$ 1,169.47	\$ 919.69	\$ 799.37	\$ 663.46	\$ 595.04	\$ 515.48	\$ 439.84	\$ 729.04	
Loop Investment	\$ 243,184,896	\$ 805,471,331	\$ 243,880,682	\$ 562,317,656	\$ 171,109,530	\$ 1,372,391,465	\$ 1,284,199,419	\$ 491,218,716	\$ 309,002,727	\$ 5,482,776,422	
Loop Investment/Line	\$ 3,789.28	\$ 1,477.34	\$ 970.86	\$ 744.55	\$ 636.91	\$ 532.42	\$ 472.28	\$ 394.97	\$ 315.30	\$ 582.96	
EO Switching Investment/Line	\$ 173.25	\$ 132.24	\$ 120.87	\$ 116.09	\$ 110.41	\$ 104.28	\$ 101.91	\$ 105.28	\$ 118.00	\$ 108.85	
USF Total Monthly Cost/Line	\$ 88.61	\$ 37.66	\$ 26.51	\$ 21.49	\$ 19.03	\$ 16.44	\$ 14.97	\$ 13.35	\$ 11.69	\$ 18.94	
USF Loop Monthly Cost/Line	\$ 84.50	\$ 33.55	\$ 22.40	\$ 17.38	\$ 14.92	\$ 12.33	\$ 10.86	\$ 9.24	\$ 7.59	\$ 14.83	
USF EO Switching Cost/Line										\$ 2.00	
Monthly Transport+Signaling Cost/Line (USF usage)										\$ 0.20	
Households	60,041	401,356	160,978	434,734	153,889	1,500,023	1,497,272	532,627	189,548	4,930,468	
Residential Lines	60,482	427,488	172,255	469,500	167,650	1,644,420	1,643,559	571,760	208,959	5,366,073	
Business Lines	2,387	75,976	50,957	184,458	65,312	602,061	694,190	433,528	497,161	2,606,030	
Public Lines	84	2,683	1,798	6,511	2,290	21,286	24,506	15,320	17,613	92,092	
Total Switched Lines	62,953	506,147	225,010	660,469	235,252	2,267,768	2,362,254	1,020,609	723,733	8,064,196	
Special Access Lines	1,224	39,071	26,190	94,778	33,402	309,880	356,898	223,065	256,304	1,340,812	
Total Lines	64,177	545,219	251,200	755,247	268,654	2,577,647	2,719,152	1,243,674	980,037	9,405,008	
USF Monthly Cost/Line	\$ 88.61	\$ 37.66	\$ 26.51	\$ 21.49	\$ 19.03	\$ 16.44	\$ 14.97	\$ 13.35	\$ 11.69	\$ 18.94	

Southwestern Bell Texas		43-03	HM	DIFF:	UNIV SVC	HM UNE +	RATIO:
\$(000)		ARMIS	UNE	ARMIS vs.	RETAIL	US RETAIL	HM UNE+US
USOA DESCRIPTION		\$	\$	HM UNE	OPS COST	\$	/ ARMIS
PLANT SPECIFIC EXPENSES							
6112	MOTOR VEHICLES	4,954	2,675	2,279		2,675	
6113	AIRCRAFT						
6114	SPECIAL PURPOSE VEHICLES						
6115	GARAGE WORK EQUIPMENT	397	214	183		214	
6116	OTHER WORK EQUIPMENT	519	280	239		280	
6110	NETWORK SUPPORT	5,870	3,170	2,700		3,170	54%
6121	TOTAL LAND & BUILDINGS	109,770	59,281	50,489		59,281	
6122	FURNITURE	9,593	5,181	4,412		5,181	
6123	OFFICE EQUIPMENT	29,530	15,948	13,582		15,948	
6124	GENERAL PURPOSE COMPUTERS	128,079	69,169	58,910		69,169	
6120	TOTAL LAND & SUPPORT ASSETS	276,972	149,579	127,393		149,579	54%
TOTAL NETWORK & GENERAL SUPPORT							
		282,842	152,749	130,093		152,749	54%
6211	ANALOG ELECT SWITCH	64,295		64,295			
6212	DIGITAL ELECTRONIC SWITCHING	118,351	27,877	90,474		27,877	
6215	ELECTRO MECHANICAL	(632)		(632)			
6210	CENTRAL OFFICE SWITCHING	182,014	27,877	154,137		27,877	15%
6220	OPERATOR SYSTEMS	7,055	1,077	5,978		1,077	
6231	RADIO SYSTEMS	911		911			
6232	CIRCUIT EQUIPMENT	68,457	22,111	46,346		22,111	
6230	TRANSMISSION	69,368	22,111	47,257		22,111	32%
6311	STATION APPARATUS LARGE PRIVATE BRANCH	4		4			
6341	EXCHANGE	1,130		1,130			
6351	PUBLIC TEL TERMINAL EQUIPMENT	17,270	10,544	6,726		10,544	
6362	OTHER TERMINAL EQUIPMENT	68,973		68,973			
6310	TOTAL INFORMATION ORIG/TERM	87,377	10,544	76,833		10,544	12%
6411	POLES	2,902	1,456	1,446		1,456	
6421	AERIAL CABLE	110,131	103,808	6,323		103,808	
6422	UNDERGROUND CABLE	26,232	8,199	18,033		8,199	
6423	BURIED CABLE	225,968	86,476	139,492		86,476	
6424	SUBMARINE CABLE						
6425	DEEP SEA CABLE						
6426	INTRABUILDING NETWORK CABLE						
6431	AERIAL WIRE						
6441	CONDUIT SYSTEMS	4,241	291	3,950		291	
6410	TOTAL CABLE & WIRE FACILITIES	370,081	200,229	169,852		200,229	54%
PLANT NONSPECIFIC OPERATIONS							
6511	TPHFU						
6512	PROVISIONING EXPENSES	923		923			
6531	POWER EXPENSES	13,750		13,750			

Southwestern Bell Texas		43-03	HM	DIFF:	UNIV SVC	HM UNE +	RATIO:
USOA DESCRIPTION		ARMIS	UNE	ARMIS vs.	RETAIL	US RETAIL	HM UNE+US
\$(000)		\$	\$	HM UNE	OPS COST	\$	/ ARMIS
6532	NETWORK ADMINISTRATION	47,772		47,772			
6533	TESTING	120,361		120,361			
	PLANT OPERATIONS						
6534	ADMINISTRATION	80,581		80,581			
6535	ENGINEERING	61,078		61,078			
	TOTAL NETWORK OPERATIONS						
6530	EXPENSES	323,543	138,347	185,197		138,347	43%
6540	ACCESS EXPENSE	35,151		35,151			
6561	DEPRECIATION TPIS	980,887	456,720	524,167		456,720	
6562	DEPRECIATION TPHFU						
6563	AMORTIZATION - TANGIBLE						
6564	AMORTIZATION - INTANGIBLE						
6565	AMORTIZATION - OTHER						
	CUSTOMER OPERATIONS						
6611	PRODUCT MANAGEMENT	21,151		21,151			
6612	SALES	74,542		74,542			
6613	PRODUCT ADVERTISING	31,000		31,000			
6610	TOTAL MARKETING EXPENSES	126,693		126,693			
6621	CALL COMPLETION SERVICE	32,894		32,894			
6622	NUMBER SERVICES	145,465		145,465	16,929	16,929	
6623	CUSTOMER SERVICES	345,060		345,060	137,689	137,689	
6620	TOTAL SERVICES EXPENSES	523,419		523,419	154,618	154,618	
	TOTAL CUSTOMER OPERATIONS	650,112		650,112	154,618	154,618	24%
	CORPORATE OPERATIONS						
6711	EXECUTIVE	28,901		28,901			
6712	PLANNING	7,110		7,110			
6710	TOTAL EXECUTIVE & PLANNING	36,011		36,011			
6721	ACCOUNTING & FINANCE	36,372		36,372			
6722	EXTERNAL RELATIONS	39,994		39,994			
6723	HUMAN RESOURCES	52,872		52,872			
6724	INFORMATION MANAGEMENT	101,963		101,963			
6725	LEGAL	18,538		18,538			
6726	PROCUREMENT	12,537		12,537			
6727	RESEARCH & DEVELOPMENT	24,855		24,855			
	OTHER GENERAL &						
6728	ADMINISTRATIVE	122,460		122,460			
6720	TOTAL GENERAL & ADMINISTRATIVE	409,592		409,592			
	TOTAL CORPORATE OPERATIONS	445,603	316,562	129,041	16,080	332,642	75%
	TOTAL OPERATING EXPENSES	3,434,956	1,326,216	2,108,740	170,699	1,496,914	44%
7240	OPERATING OTHER TAXES	349,448	86,694	262,754		86,694	25%

Southwestern Bell Texas		43-03	HM	DIFF:	UNIV SVC	HM UNE +	RATIO:
\$(000)		ARMIS	UNE	ARMIS vs.	RETAIL	US RETAIL	HM UNE+US
USOA DESCRIPTION		\$	\$	HM UNE	OPS COST	\$	/ ARMIS
TOTAL EXPENSES & OPERATING TAXES		3,784,404	1,412,910	2,371,494	170,699	1,583,608	42%
TELECOMMUNICATION PLT IN SERVICE							
2111	LAND	96,305	36,140	60,165		36,140	
2112	MOTOR VEHICLES	146,241	43,203	103,038		43,203	
2113	AIRCRAFT						
2114	SPECIAL PURPOSE VEHICLES						
2115	GARAGE WORK EQUIPMENT	7,201	2,127	5,074		2,127	
2116	OTHER WORK EQUIPMENT	98,532	29,109	69,423		29,109	
2121	BUILDINGS	1,249,182	396,261	852,921		396,261	
2122	FURNITURE	24,495	7,236	17,259		7,236	
2123	OFFICE EQUIPMENT	226,493	66,911	159,582		66,911	
2124	GENERAL PURPOSE COMPUTERS	323,943	95,700	228,243		95,700	
2110	TOTAL LAND & SUPPORT ASSETS	2,172,392	676,688	1,495,704		676,688	31%
2211	ANALOG ELECT SWITCH	1,597,329		1,597,329			
2212	DIGITAL ELECTRONIC SWITCHING	1,507,676	735,297	772,379		735,297	
2215	ELCTROMECHANICAL SWITCHING	80		80			
2210	CENTRAL OFFICE SWITCHING	3,105,085	735,297	2,369,788		735,297	24%
2220	OPERATOR SYSTEMS	105,310	17,269	88,041		17,269	
2231	RADIO	43,747		43,747			
2232	CIRCUIT EQUIPMENT	3,030,438	1,445,151	1,585,287		1,445,151	
2230	TRANSMISSION	3,074,185	1,445,151	1,629,034		1,445,151	47%
2311	STATION APPARATUS	2,502		2,502			
2321	CUSTOMER PREMISES WIRING LARGE PRIVATE BRANCH						
2341	EXCHANGE	30,171		30,171			
2351	PUBLIC TEL TERMINAL EQUIPMENT	114,639	69,990	44,649		69,990	
2362	OTHER TERMINAL EQUIPMENT	117,334		117,334			
2310	TOTAL INFORMATION ORIG/TERM	264,645	69,990	194,655		69,990	26%
2411	POLES	188,380	116,135	72,245		116,135	
2421	AERIAL CABLE	1,037,567	1,450,820	(413,253)		1,450,820	
2422	UNDERGROUND CABLE	1,479,079	836,864	642,215		836,864	
2423	BURIED CABLE	3,544,902	1,860,766	1,684,136		1,860,766	
2424	SUBMARINE CABLE						
2425	DEEP SEA CABLE						
2426	INTRABUILDING NETWORK CABLE						
2431	AERIAL WIRE						
2441	CONDUIT SYSTEMS	1,015,481	189,393	826,088		189,393	
2410	TOTAL CABLE & WIRE FACILITIES	7,364,385	4,453,978	2,910,407		4,453,978	60%
TPIS (BEFORE AMORTIZABLE ASSETS)		16,086,002	7,398,374	8,687,628		7,398,374	46%

LIST OF COMBINED ARMIS 43-03 ROWS AND ALGORITHMS

USOA DESCRIPTION

6110 NETWORK SUPPORT summarizes the following Class A accounts.

- 6112 MOTOR VEHICLES
- 6113 AIRCRAFT
- 6114 SPECIAL PURPOSE VEHICLES
- 6115 GARAGE WORK EQUIPMENT
- 6116 OTHER WORK EQUIPMENT

6120 TOTAL LAND & SUPPORT ASSETS summarizes the following Class A accounts.

- 6121 TOTAL LAND & BUILDINGS
- 6122 FURNITURE
- 6123 OFFICE EQUIPMENT
- 6124 GENERAL PURPOSE COMPUTERS

TOTAL NETWORK & GENERAL SUPPORT is a summary of accounts 6110 & 6120.

6210 CENTRAL OFFICE SWITCHING summarizes the following Class A accounts.

- 6211 ANALOG ELECT SWITCH
- 6212 DIGITAL ELECTRONIC SWITCHING
- 6215 ELECTRO MECHANICAL

6230 TRANSMISSION summarizes the following Class A accounts.

- 6231 RADIO SYSTEMS
- 6232 CIRCUIT EQUIPMENT

6310 TOTAL INFORMATION ORIG/TERM summarizes the following Class A accounts.

- 6311 STATION APPARATUS
- 6341 LARGE PRIVATE BRANCH EXCHANGE
- 6351 PUBLIC TEL TERMINAL EQUIPMENT
- 6362 OTHER TERMINAL EQUIPMENT

6410 TOTAL CABLE & WIRE FACILITIES summarizes the following Class A accounts.

- 6411 POLES
- 6421 AERIAL CABLE
- 6422 UNDERGROUND CABLE
- 6423 BURIED CABLE
- 6424 SUBMARINE CABLE
- 6425 DEEP SEA CABLE
- 6426 INTRABUILDING NETWORK CABLE
- 6431 AERIAL WIRE
- 6441 CONDUIT SYSTEMS

6610 TOTAL MARKETING EXPENSES summarizes the following Class A accounts.

- 6611 PRODUCT MANAGEMENT
- 6612 SALES
- 6613 PRODUCT ADVERTISING

LIST OF COMBINED ARMIS 43-03 ROWS AND ALGORITHMS

USOA DESCRIPTION

6620 TOTAL SERVICES EXPENSES summarizes the following Class A accounts.

6621 CALL COMPLETION SERVICE

6622 NUMBER SERVICES

6623 CUSTOMER SERVICES

TOTAL CUSTOMER OPERATIONS is a summary of the accounts 6610 & 6620.

6710 TOTAL EXECUTIVE & PLANNING summarizes the following Class A accounts.

6711 EXECUTIVE

6712 PLANNING

6720 TOTAL GENERAL & ADMINISTRATIVE summarizes the following Class A accounts.

6721 ACCOUNTING & FINANCE

6722 EXTERNAL RELATIONS

6723 HUMAN RESOURCES

6724 INFORMATION MANAGEMENT

6725 LEGAL

6726 PROCUREMENT

6727 RESEARCH & DEVELOPMENT

6728 OTHER GENERAL & ADMINISTRATIVE

TOTAL CORPORATE OPERATIONS is a summary of accounts 6710 & 6720.

TOTAL OPERATING EXPENSES is summary of ALL operating expenses.

2110 TOTAL LAND & SUPPORT ASSETS summarizes the following Class A accounts.

2111 LAND

2112 MOTOR VEHICLES

2113 AIRCRAFT

2114 SPECIAL PURPOSE VEHICLES

2115 GARAGE WORK EQUIPMENT

2116 OTHER WORK EQUIPMENT

2121 BUILDINGS

2122 FURNITURE

2123 OFFICE EQUIPMENT

2124 GENERAL PURPOSE COMPUTERS

2210 CENTRAL OFFICE SWITCHING summarizes the following Class A accounts.

2211 ANALOG ELECT SWITCH

2212 DIGITAL ELECTRONIC SWITCHING

2215 ELCTROMECHANICAL SWITCHING

2230 TRANSMISSION summarizes the following Class A accounts.

2231 RADIO

LIST OF COMBINED ARMIS 43-03 ROWS AND ALGORITHMS

USOA DESCRIPTION

2232 CIRCUIT EQUIPMENT

2310 TOTAL INFORMATION ORIG/TERM summarizes the following the Class A accounts.

2311 STATION APPARATUS

2321 CUSTOMER PREMISES WIRING

2341 LARGE PRIVATE BRANCH EXCHANGE

2351 PUBLIC TEL TERMINAL EQUIPMENT

2362 OTHER TERMINAL EQUIPMENT

2410 TOTAL CABLE & WIRE FACILITIES summarizes the following Class A accounts.

2411 POLES

2421 AERIAL CABLE

2422 UNDERGROUND CABLE

2423 BURIED CABLE

2424 SUBMARINE CABLE

2425 DEEP SEA CABLE

2426 INTRABUILDING NETWORK CABLE

2431 AERIAL WIRE

2441 CONDUIT SYSTEMS

TPIS (BEFORE AMORTIZABLE ASSETS) is a summary of all Telecommunications Plant assets excluding tangible & intangible assets such as capitalized leases & franchises.

Question 2c		Total
Total Number of Switches		534
Total Number of Lines Served		8,064,196
Average Lines Per Switch		15,101

Switch	Lines	Switch	Lines	Switch	Lines
ABLNTXOR	41,636	FLHGTXFH	669	MNWLTXFA	10,427
ABLNTXOW	25,144	FLTOTXFL	1,077	MOLTTXMN	766
ABRYTXGI	1,914	FNNTXFN	1,607	MRCDTXME	6,305
ADVLTXAV	338	FRERTXFR	1,233	MRDNTXME	838
AGTNTXDA	2,721	FRNYTXHI	3,742	MRLNTXML	3,905
AGTNTXTI	12,667	FRPTTXFR	8,023	MRSHTXWE	16,335
ALBYTXPO	1,173	FRSCTXCO	11,024	MRTHTXMA	266
ALICTXAL	12,658	FRSCTXES	4,847	MRVLTXMR	3,993
ALLNXTSA	16,978	FRSCTXWE	2,621	MSSNTXMI	21,481
ALPITXAP	2,846	FRVLTXST	3,022	MTGRTXMT	729
ALSNTXAL	318	FTDVTXFD	736	MTHSTXMA	4,091
ALVDTXTI	5,108	FTSTTXFS	5,023	NBRNTXNB	23,529
ALVNTXAL	17,618	FTWOTXAL	4,094	NCGDTXNC	26,786
AMRLTX02	36,324	FTWOTXAR	43,416	NLDLTXND	25,320
AMRLTXDI	1,798	FTWOTXAT	40,076	NRDHTXNH	321
AMRLTXEV	14,035	FTWOTXAX	38,932	NWRKTXHU	1,522
AMRLTXFL	57,900	FTWOTXBB	8,336	ODSSTXEM	33,038
AMRLTXOS	3,405	FTWOTXBE	3,135	ODSSTXLI	27,574
ANNATXWA	1,747	FTWOTXBN	16,143	ODSSTXRE	7,231
ANSNTXAN	1,915	FTWOTXBR	11,100	OGLSTXOG	611
ASTNTXAS	356	FTWOTXBU	53,881	OMAHTXTU	1,120
ATLNTXSW	5,109	FTWOTXBY	5,453	ORNGTXOR	19,174
AUSTTX02	18,644	FTWOTXCE	12,273	OWTNTXTR	1,841
AUSTTX56	3,695	FTWOTXCF	2,063	PAMPTXPP	12,391
AUSTTXBC	2,987	FTWOTXCI	15,617	PARSTXNO	2,246
AUSTTXBE	1,216	FTWOTXCP	13,550	PARSTXSU	19,666
AUSTTXCF	7,894	FTWOTXCR (2 switches)	90,856	PCRKTXPC	948
AUSTTXCR	1,816	FTWOTXEC	17,991	PHRRTXPH	28,941
AUSTTXCV	9,551	FTWOTXED	34,633	PLTNTXPL	4,330
AUSTTXEV	19,314	FTWOTXEU	53,503	PLVWTXPV	13,128
AUSTTXFA	17,979	FTWOTXGL	39,572	PNHRTXPN	10,230
AUSTTXFI	27,105	FTWOTXJE	24,765	PRSLTXPS	3,275
AUSTTXHI	43,068	FTWOTXKE	31,872	PRSPTXFI	1,209
AUSTTXHO	78,512	FTWOTXLW	8,972	PRTNTXRE	4,498
AUSTTXJO	36,694	FTWOTXMA	26,955	PRVWTXPR	805
AUSTTXLE	5,487	FTWOTXPE	44,096	PSBGTXUN	5,306
AUSTTXLT	4,437	FTWOTXTE	25,890	PTARTXPE	4,677
AUSTTXLW	3,999	FTWOTXWA	41,620	PTARTXWO	14,202
AUSTTXMA	2,307	FTWOTXWS	12,072	PTARTXYU	18,820
AUSTTXMC	25,996	GLDSTXGS	172	PTBLTXPT	303
AUSTTXMF	2,662	GLTNTXSH	16,185	PTETTXPO	3,615
AUSTTXPF	12,904	GLTNTXSO	27,287	PTISTXPI	6,497
AUSTTXRR	33,821	GLTNTXWI	2,155	PTSBTXST	3,380
AUSTTXTE	30,655	GNVLTXGL	15,382	PYTETXPA	51
AUSTXTW	30,252	GOLITXGO	2,498	PYTETXPY	81
AUSTTXWA	18,167	GRBYTXRA	10,178	QANHTXMO	2,114
AUSUTXEN	19,703	GRDNTXMY	530	RCDLTXRD	4,013
BAVLTXBK	1,172	GRFLT XGF	195	RCPTTXRP	7,896
BETNTXBE	9,605	GRHMTXLI	6,420	RDOKTXHO	7,319
BEVLTXBV	8,905	GRVRTXGV	606	REFGTXRF	1,939
BGSPTXBS	12,995	GRWDTXGR	831	RGANTXRG	310
BGWLTXBW	253	GSVLTXHO	11,616	RHNDTXRH	2,085
BLLVTXFR	701	HBVLTXHB	2,126	RKWLTXPA	12,270
BLVLTXBL	4,477	HERNTXHE	3,385	RNGETXRU	563
BNDRTXBD	2,332	HLBOTXJU	5,229	RNGRTXMI	1,555
BNVDTXBN	876	HLCTTXHC	953	RNKNTXRK	433

Attachment 2c

BOWITXTR	3,882	HMLNTXHM	1,616	ROBYTXRB	542
BRCYTXBR	7,014	HMPSTXHM	2,985	RONKTXWO	5,210
BRGRTXBG	9,553	HNGVTXFR	1,010	ROSCTXRS	907
BRHMTXBR	12,748	HNRTTXBR	2,099	RSBGTXRR	25,033
BRKBTXEF	7,035	HNVTXHN	19,799	RTANTXRT	1,192
BRRGTXHI	5,238	HONDTXHO	4,310	RYCYTXNE	3,429
BRTLTXBR	653	HRFRTXHF	7,509	SAGSTXSA	3,237
BSTRTXBS	7,199	HRLNTXHG	34,808	SBNLTXSB	707
BTVLTXBV	253	HRMLTXHL	578	SELYTXSE	4,597
BUMTTXTE	30,849	HSTNTXAD	27,785	SGINTXMQ	2,124
BUMTTXTV	20,368	HSTNTXAI	56,782	SGINTXSG	15,364
BUMTTXUN	16,426	HSTNTXAL	73,958	SHNRTXSH	1,959
BUMTTXVI	7,745	HSTNTXAP	35,612	SHPHTXXA	2,451
BUNATXBU	1,658	HSTNTXBA	54,855	SHRKTCSR	1,667
BWWLTXLI	34,270	HSTNTXBE	1,650	SINTTXSI	4,266
BWWLTXOL	3,345	HSTNTXBR	24,365	SKDMTXSK	996
BWWLTXTE	18,873	HSTNTXBU (2 switches)	102,455	SKLYTXSK	307
BYCYTXBY	12,192	HSTNTXBW	23,758	SLATTXSL	3,307
BYSCTXBY	158	HSTNTXCA	76,805	SLCYTXSC	3,214
CELNTXDU	1,152	HSTNTXCH	13,358	SLSBTXSL	8,029
CHINTXCH	852	HSTNTXCL	23,643	SMFRTXSF	2,656
CHLCTXUL	449	HSTNTXDP	17,793	SMLKTXSM	2,321
CHLDTXWE	3,591	HSTNTXEE	22,903	SMNLTXSM	4,583
CHRNTXCH	1,056	HSTNTXEH	8,136	SMVLTXSM	4,057
CHRSTXCH	216	HSTNTXFA	57,294	SNANTXBA	37,604
CISCTXHI	2,269	HSTNTXFR	22,556	SNANTXBR	40,169
CLBNTXMI	22,771	HSTNTXGL	32,976	SNANTXCA	52,271
CLCYTXCC	3,095	HSTNTXGP	27,791	SNANTXCU	57,013
CLEVTXCL	10,181	HSTNTXGR	36,822	SNANTXDI	67,289
CLMBTXCL	3,668	HSTNTXHO	72,439	SNANTXED	19,303
CLNNTXMA	5,128	HSTNTXHU	38,056	SNANTXFR	30,475
CLUTTXCL	15,229	HSTNTXID	12,992	SNANTXGE	41,911
CLUTTXLJ	12,468	HSTNTXJA	68,838	SNANTXHE	3,882
CLVTTXCL	742	HSTNTXLA	43,472	SNANTXIC	6,536
CMRNTXCM	3,737	HSTNTXLP	14,816	SNANTXJA	2,238
CMTNTXCB	190	HSTNTXMA	3,777	SNANTXLA	32,352
CNDNTXCD	1,835	HSTNTXMC	42,816	SNANTXLE	39,113
CNTLTXMA	4,247	HSTNTXMI	41,749	SNANTXLS	3,349
CNRTXCN	5,709	HSTNTXMO	58,148	SNANTXMA	19,905
CNYNTXCY	6,989	HSTNTXNA (2 switches)	85,070	SNANTXMC	36,102
CRANTXCR	2,084	HSTNTXNE	23,725	SNANTXPA	1,380
CRCHTXBU	11,134	HSTNTXOR	33,624	SNANTXPE	41,557
CRCHTXCA	11,005	HSTNTXOV	55,074	SNANTXSA	3,519
CRCHTXFB	12,339	HSTNTXOX	49,075	SNANTXSH	381
CRCHTXPD	14,332	HSTNTXPA	37,999	SNANTXSL	17,362
CRCHTXTE	51,624	HSTNTXPE	16,460	SNANTXSO	4,357
CRCHXTU	17,806	HSTNTXPR (2 switches)	90,966	SNANTXTA	54,952
CRCHTXWY	39,526	HSTNTXRE	23,952	SNANTXTH	3,200
CRCYTXCC	2,690	HSTNTXRI	20,416	SNANTXUC	27,381
CRGNTXCR	1,964	HSTNTXSA	44,245	SNANTXWA	41,719
CRSCTXTR	15,081	HSTNTXSE	4,035	SNANTXWE	38,367
CRSPTXCS	2,851	HSTNTXSH	2,806	SNBNTXSB	10,936
CRTHTXOX	271	HSTNTXSU	70,555	SNDGTXSD	1,967
CSVLTXCT	1,679	HSTNTXUN	56,035	SNTNTXSN	834
CTLLTXCO	1,651	HSTNTXWA	26,718	SNYDTXSD	8,112
CTRNTXCR	84	HSTNTXWE	18,621	SPLDTXSP	7,737
CUERTXCR	5,002	HSTNTXWL	23,599	SPRGTXSP	2,223
CYPRTXCY	8,904	HSTNTXWY	7,543	SPRNTXNO	36,498
DDWDTXMA	218	HSTXTXSM	2,056	SPRNTXSO	29,967
DESNTXHO	15,597	HTVLTXHV	3,420	SRLKTXSR	1,144
DEVNTXDV	3,283	IRANTXIR	698	STNTTXST	1,298
DLLSTXAD (2 switches)	102,763	ITLYTXHU	974	STRWTXOR	308
DLLSTXCH	11,395	ITSCTXMU	1,317	SWTWTXSW	7,615

Attachment 2c

DLLSTXDA	40,407	IWPCTXBA	4,058	TAYLTXTA	7,117
DLLSTXDI	55,576	JCBOTXLO	2,470	TBLLTXXKL	27,664
DLLSTXDN	16,850	JFSNTXMO	2,995	TBLLTXTB	12,837
DLLSTXDS	15,779	JSPRTXDU	7,806	TGUETXTE	2,390
DLLSTXDV	39,764	JSPRTXRA	1,651	TMPLTXDN	36,219
DLLSTXEM (2 switches)	88,302	JWTTTXJW	428	TMPSTXTM	1,153
DLLSTXEV	21,768	KBVLTXKB	3,396	TRMNTXTE	1,264
DLLSTXEX	17,650	KGVLTXKV	13,172	TROYTXTR	1,648
DLLSTXFB	66,098	KNDYTXKN	2,227	TRRLTXJO	10,310
DLLSTXFE	35,639	KNTZTXKN	3,062	TXCYTXLM	14,775
DLLSTXFL	44,410	KRCYTXFC	517	TXCYTXTC	17,359
DLLSTXFR	28,788	KRCYTXKC	1,765	TYLRTXCH	6,661
DLLSTXGP	30,203	KRMTTXKM	3,164	TYLRTXLY	37,126
DLLSTXHA	17,743	LADNTXEN	369	TYLRTXSO	26,286
DLLSTXHU	5,607	LAPRTXLP	774	UVLDTXUV	8,711
DLLSTXLA	41,867	LARDTXDG	56,205	VCTATXVI	41,816
DLLSTXLN	9,443	LARDTXLA	6,832	VDORTXRO	8,899
DLLSTXMC	48,493	LBCKTXFR	15,425	VDORTXSU	3,784
DLLSTXME	43,477	LBCKTXND	427	VERNTXLI	7,554
DLLSTXMS	34,897	LBCKTXPA	15,058	VLLDTXVL	2,682
DLLSTXNM	43,562	LBCKTXPS	38,285	VNTNTXMA	1,555
DLLSTXNO	17,354	LBCKTXSW	55,532	WACOTX01	40,720
DLLSTXRE	43,591	LBHLTXLH	1,217	WACOTXCS	2,334
DLLSTXRI	38,171	LBLLTXLB	554	WACOTXED	980
DLLSTXRN (2 switches)	93,499	LBRTTXLB	5,806	WACOTXGH	2,794
DLLSTXRO	23,125	LCKHTXLK	4,934	WACOTXHE	9,396
DLLSTXRY	15,376	LCKNTXLO	1,027	WACOTXLO	2,440
DLLSTXSE	9,524	LCSTTXLC	897	WACOTXMD	1,092
DLLSTXSU	4,519	LFRSTXLF	633	WACOTXMG	3,102
DLLSTXTA	45,521	LGVWTXGR	20,914	WACOTXMO	6,802
DLLSTXWH	31,631	LGVWTXJU	5,318	WACOTXMT	1,454
DONNTXDO	5,485	LGVWTXMI	2,885	WACOTXPR	18,073
DWVLTXDW	1,575	LGVWTXPL	30,242	WACOTXSB	6,985
DYNTXDY	6,268	LLNGTXLU	3,231	WACOTXSW	14,039
EDBGTXEB	27,915	LMPSTXLS	4,775	WACOTXWE	3,049
EDCHTXED	4,523	LMTNTXLM	6,019	WBRYTXWB	1,616
EDNATXED	3,976	LNDLXTU	6,299	WCFLTXXCF	25,693
EDWDTXTW	1,466	LSFRTXLF	3,881	WCFLTXXNI	28,073
EGLKTXEG	2,069	LYTLTXLY	2,796	WCFLTXXTF	9,897
EGPSTXEP	14,224	MARFTXMF	1,145	WDBOTXWB	980
ELCMTXEL	8,382	MARNTXMR	3,457	WDVLTXWD	4,306
ELGNTXEL	4,299	MCALTXXHI	3,548	WFCYTXGY	1,201
ELPSTXEA	32,913	MCALTXXMU	48,289	WHTNTXWH	7,394
ELPSTXHA	78,924	MCKNTXLI	16,808	WINKTXWK	406
ELPSTXHC	2,833	MCKNTXTE	1,185	WLLRXXWL	4,173
ELPSTXMA	39,280	MCLNTXML	630	WLPTTXNO	1,574
ELPSTXMS	10,161	MCMYTXMC	947	WLPTTXTR	2,994
ELPSTXNE	29,235	MDKFTXMK	1,454	WLWDTXWL	304
ELPSTXNO	42,166	MDLDTXMU	27,297	WRHMTXWR	412
ELPSTXSE	27,259	MDLDTXOX	41,194	WRRNTXWR	1,024
ELPSTXSH	14,397	MDLKTXML	3,143	WSBKTXXWB	369
ELPSTXYS	20,866	MDLTTXGR	6,827	WTFRTXLY	20,153
ENCLTXEC	218	MDVITXMD	3,888	WXHCTXWE	13,453
ENNSTXTR	8,419	MEXITXXM	4,637	YKUMTXYK	4,884
ESLDTXMA	3,030	MINLTXLO	5,343	YRTWTXYT	1,415
EVDLTXEV	900	MNHNTXMO	5,252	ZPTATXZA	3,026
FLDDTXFL	2,124	MNPLTXPA	10,829		

Question 2d

Fills	0-5 lines/sq mi	5-100 lines/sq mi	100-200 lines/sq mi	200-650 lines/sq mi	650-850 lines/sq mi	850-2550 lines/sq mi	2550-5000 lines/sq mi	5000-10000 lines/sq mi	>10000 lines/sq mi	weighted average
calculated copper feeder fill (non-DLC)	31.3%	46.8%	60.5%	65.5%	66.9%	69.5%	72.1%	73.7%	75.8%	71.9%
calculated distribution fill (DLC)	33.5%	39.0%	39.5%	42.3%	45.2%	49.0%	53.9%	55.0%	54.9%	49.3%
calculated distribution fill (non-DLC)	12.1%	24.6%	35.4%	38.7%	41.8%	47.4%	53.8%	53.5%	53.9%	51.1%
								DLC+nonDLC avg dist'n fill:		49.9%
calculated "mainframe fill" (non-DLC)	12.1%	22.8%	52.2%	43.4%	35.4%	18.6%	12.9%	9.8%	15.0%	16.1%

Question 2e	Total
Total Lines (Res+Bus+Pub+Sp)	9,405,008
Total Lines Served by DLC	6,338,501
Investment in DLC	\$ 1,332,977,320
Pct. Investment DLC to Total Ckt.	92%

	0-5 lines/sq mi	5-100 lines/sq mi	100-200 lines/sq mi	200-650 lines/sq mi	650-850 lines/sq mi	850-2550 lines/sq mi	2550-5000 lines/sq mi	5000-10000 lines/sq mi	>10000 lines/sq mi	Totals
DLC electronics	\$ 24,833,250	\$ 182,190,250	\$ 57,906,860	\$ 137,403,940	\$ 44,181,570	\$ 343,990,220	\$ 349,739,080	\$ 122,825,180	\$ 69,906,970	\$ 1,332,977,320
total DLC lines	62,799	537,306	236,491	642,468	206,043	1,769,326	1,747,019	710,897	426,152	6,338,501

Question 2i

	0 - 5	5 - 100	100 - 200	200 - 650	650 - 850	850 - 2,550	2,550 - 5,000	5,000 - 10,000	> 10,000	Total
	lines/sq mi	lines/sq mi	lines/sq mi	lines/sq mi	lines/sq mi	lines/sq mi	lines/sq mi	lines/sq mi	lines/sq mi	
Number of Households	60,041	401,356	160,978	434,734	153,889	1,500,023	1,497,272	532,627	189,548	4,930,468
Annual Support Benchmarks at Pre-Selected Monthly Benchmarks (wtd by hh)										
\$ 20.00	\$ 49,432,105	\$ 85,068,350	\$ 12,567,488	\$ 7,748,610	0	0	0	0	0	\$ 154,816,553
\$ 30.00	\$ 42,227,185	\$ 36,905,630	0	0	0	0	0	0	0	\$ 79,132,815
\$ 40.00	\$ 35,022,265	0	0	0	0	0	0	0	0	\$ 35,022,265
\$ 50.00	\$ 27,817,345	0	0	0	0	0	0	0	0	\$ 27,817,345
\$ 60.00	\$ 20,612,425	0	0	0	0	0	0	0	0	\$ 20,612,425
\$ 70.00	\$ 13,407,505	0	0	0	0	0	0	0	0	\$ 13,407,505
\$ 80.00	\$ 6,202,585	0	0	0	0	0	0	0	0	\$ 6,202,585

CONFIDENTIAL

**ESTIMATING THE COST OF CAPITAL
OF LOCAL TELEPHONE COMPANIES
FOR THE PROVISION OF NETWORK ELEMENTS**

Bradford Cornell

**Professor of Finance
Anderson Graduate School of Management
University of California at Los Angeles**

**President
FinEcon**

September 1996

**ESTIMATING THE COST OF CAPITAL
OF LOCAL TELEPHONE COMPANIES
FOR THE PROVISION OF NETWORK ELEMENTS**

Requirements of The Telecommunications Act of 1996

The Telecommunications Act of 1996 (the Telecommunications Act) requires that local telephone exchange companies (LEC's) make available to other telecommunications carriers such as AT&T the same unrestricted access to LEC network elements, interconnections and other services that LEC's currently provide to themselves.

In its order interpreting the local competition provisions of the Telecommunications Act, the FCC concluded that LEC's are entitled to a reasonable return for providing these services commensurate with their risk.¹ In order to achieve this, the pricing of such elements and services must be based on economic costs. The FCC order clarifies the meaning of economic costs to be forward-looking incremental costs (including the cost of capital) which are necessary to provide the elements, not costs which have been expended in the past and may not represent the costs that the utility will actually incur in the future.²

The FCC Order states that the concept of normal profit is embodied in forward-looking costs because the forward-looking cost of capital, i.e. the cost of obtaining debt and equity financing, is one of the forward-looking costs of providing the network elements (FCC Order at ¶700). The FCC Order explicitly rejected the use of embedded costs, which represent historical, "sunk" investments (FCC Order at ¶'s 703-705), opportunity costs (FCC Order at ¶ 673) or internal "hurdle rates" used by LEC's to evaluate projects which exceed the market cost of capital (FCC Order at ¶689).

¹ Implementation of the Local Competition Provisions in the Telecommunications Act of 1996, CC Dkt. No. 96-98, First Report & Order, FCC 96-325 (rel. August 8, 1996).

² The FCC also permitted the prices of these elements to include a reasonable allocation of forward-looking joint and common costs.

The Business For Which Cost Of Capital Must Be Estimated

The business for which the cost of capital is to be estimated in the state arbitrations that will implement the Telecommunications Act is essentially the business of “leasing” unbundled local exchange telephone network elements and other services to other carriers. This leasing of local network facilities has relatively low risk compared to many of the risky business endeavors being pursued by telephone holding companies, such as retailing, broadband, cellular, paging, information, telemarketing, long-distance, cable, international, airphone and entertainment services.

There is currently very little facilities-based competition, and wide-spread facilities-based competition may take years to develop. The FCC Order specifically states that unbundled network elements and interconnection services are generally bottleneck, monopoly services that do not now face significant competition (FCC Order at ¶702). Further, increased demand spurred by competition may result in a more extensive use of local telephone companies’ networks even as competing facilities are eventually constructed. Thus, there is little threat that local telephone companies’ network facilities will remain idle.

Applying widely-accepted techniques for determining the cost of capital requires choosing companies in businesses comparable to the business under consideration. However, currently there are no directly comparable companies that exclusively lease unbundled network elements. Consequently, the most comparable companies are the large telephone holding companies. Thus, these companies must be selected to serve as proxies for the business of leasing network elements. But these holding companies engage in riskier endeavors such as cellular, foreign investments, and retail telephone service, and public data for key variables such as stock prices, etc., are available only at the holding company level. As a result, these proxies will have greater risk than that associated with the leasing of network elements. Therefore, results based on these proxies will overestimate the cost of capital associated with the leasing of network elements.

The Relationship Between Risk And The Cost Of Capital

Financial research has shown that investors are risk averse. Consequently, the greater the risk of a business, the higher the expected return that investors require to invest in the business. From the standpoint of a company, this means that riskier businesses will have higher costs of capital.

There are two fundamental sources of risk: operating risk and financial risk. Operating risk arises from the actual operation of the business. It is affected by factors such as competition, technological change, customer acceptance of a company's products, variation in the costs of producing the company's products and the like. Financial risk is determined by the amount of debt in a company's capital structure. Taking on more debt increases fixed financial charges, thereby increasing the risk that the firm will not be able to meet its financial obligations. The total risk investors face is determined by the combination of operating risk and financial risk.

To control the total risk that investors face, companies manage their capital structures accordingly. In particular, companies that face a great deal of operating risk, like high technology firms, limit the debt they issue to prevent total risk from becoming too large. On the other hand, firms that face little operating risk, like regulated utilities, can benefit by using a good deal of low-cost debt without raising total risk to an unacceptable level.

The Weighted Average Cost Of Capital

The basic formula for the weighted average cost of capital (WACC) is used to estimate the cost of capital.

The **WACC formula** is given by,

$$\text{WACC} = w_d * k_d + w_e * k_e \quad (1)$$