16. Fill Factors decreased 20%
Economic Lives shortened 30%
Cost of Money increased from 10% to 14%
Distribution and Feeder Structure Fraction Assigned to Telephone = 66%
Variable/Corporate Overhead Factor increased to 20%

17. Fill Factors decreased 40%
Economic Lives shortened 50%
Cost of Money increased from 10% to 12%
Distribution and Feeder Structure Fraction Assigned to Telephone = 66%
Variable/Corporate Overhead Factor increased to 20%

18. Fill Factors decreased 40%
Economic Lives shortened 30%
Cost of Money increased from 10% to 14%
Distribution and Feeder Structure Fraction Assigned to Telephone = 66%
Variable/Corporate Overhead Factor increased to 20%

19. Fill Factors decreased 20%
Economic Lives shortened 50%
Cost of Money increased from 10% to 14%
Distribution and Feeder Structure Fraction Assigned to Telephone = 66%
Variable/Corporate Overhead Factor increased to 20%

20. Fill Factors decreased 40%
Economic Lives shortened 50%
Cost of Money increased from 10% to 14%
Distribution and Feeder Structure Fraction Assigned to Telephone = 66%
Variable/Corporate Overhead Factor increased to 20%

Hatfield Model 2.2.2 – Input Modifications

Fill Factors Decreased 20%

	Feeder		Distribution	
Density	Default	New	Default	New
<5	.65	.52	.5	.4
5-200	.75	.6	.55	.44
200-650	.8	.64	.6	.48
650-850	.8	.64	.65	.52
850-2550	.8	.64	.7	.56
2550+	.8	.64	.75	.6

Fill Factors Decreased 40%

	Feeder		Distribution	
Density	Default	New	Default	New
<5	.65	.39	.5	.3
5-200	.75	.45	.55	.33
200-650	.8	.48	.6	.36
650-850	.8	.48	.65	.39
850-2550	.8	.48	.7	.42
2550+	.8	.48	.75	.45

Description	Default	Decreased 10%	Decreased 30%	Decreased 50%
Loop Distribution	20	18	14	10
Loop Feeder	20	18	14	10
Loop Concentrator	10	9	7	5
Wire Center	37	33.3	25.9	18.5
End Office Switching	14.3	12.87	10.01	7.15
Tandem Switching	14.3	12.87	10.01	7.15
Transport Facilities	19	17.1	13.3	9.5
Operator Systems	8	7.2	5.6	4
STP	14	12.6	9.8	7
SCP	14	12.6	9.8	7
SS7 Links	19	17.1	13.3	9.5
Public Telephones	9	8.1	6.3	4.5
General Support	7	6.3	4.9	3.5

Cost of Capital

	Default	Increased to 12%	Increased to 14%
Cost of Debt	.077	.097	.117
Cost of Equity	.119	.139	.159

Structure Fraction Assigned to Telephone = 66%

	Default	New
Distribution -- Aerial	.33	.66
Distribution -- Buried	.33	.66
Distribution -- Underground	.33	.66
Feeder -- Aerial	.33	.66
Feeder -- Buried	.33	.66
Feeder -- Underground	.33	.66

Variable Overhead Factor Increased to 20%

	Default	New
Variable Overhead Factor	0.1	0.2

Distribution Fill Factors

Density	Default	Decreased 20%	Decreased 40%
0-5	0.50	0.40	0.30
5-100	0.55	0.44	0.33
100-200	0.55	0.44	0.33
200-650	0.60	0.48	0.36
650-850	0.65	0.52	0.39
850-2,550	0.70	0.56	0.42
2,550-5,000	0.75	0.60	0.45
5,000-10,000	0.75	0.60	0.45
10,000+	0.75	0.60	0.45

Copper Feeder Fill Factors

Density	Default	Decreased 20%	Decreased 40%
0-5	0.65	0.52	0.39
5-100	0.75	0.60	0.45
100-200	0.80	0.64	0.48
200-650	0.80	0.64	0.48
650-850	0.80	0.64	0.48
850-2,550	0.80	0.64	0.48
2,550-5,000	0.80	0.64	0.48
5,000-10,000	0.80	0.64	0.48
10000+	0.80	0.64	0.48

Fiber Feeder Fill Factors

Density	Default	Decreased 20%	Decreased 40%
0-5	1	0.8	0.6
5-100	1	0.8	0.6
100-200	1	0.8	0.6
200-650	1	0.8	0.6
650-850	1	0.8	0.6
850-2,550	1	0.8	0.6
2,550-5,000	1	0.8	0.6
5,000-10,000	1	0.8	0.6
10,000+	1	0.8	0.6

Depreciation – Economic Lives

Account	Description	Default	Decreased 10%	Decreased 30%	Decreased 50%
2112	Motor Vehicles	9.16	8.24	6.41	4.58
2115	Garage Work Equipment	11.47	10.32	8.03	5.74
2116	Other Work Equipment	13.22	11.90	9.25	6.61
2121	Buildings	48.99	44.09	34.29	24.50
2122	Furniture	16.56	14.90	11.59	8.28
2123.1	Office Support Equipment	11.25	10.13	7.88	5.63
2123.2	Company Comm. Equipment	7.59	6.83	5.31	3.80
2124	General Purpose Computer	6.24	5.62	4.37	3.12
2212	Digital Electronic Switching	16.54	14.89	11.58	8.27
2220	Operator Systems	9.94	8.95	6.96	4.97
2232.2	Digital Circuit Equipment	10.09	9.08	7.06	5.05
2351	Public Telephone Term. Equipment	8.01	7.21	5.61	4.01
2362	NID/SAI	12.00	10.80	8.40	6.00
2411	Poles	16.13	14.52	11.29	8.07
2421.1	Aerial Cable - metallic	16.80	15.12	11.76	8.40
2421.2	Aerial Cable - non metallic	22.11	19.90	15.48	11.06
2422.1	Underground Cable - metallic	21.17	19.05	14.82	10.59
2422.2	Underground Cable - non metallic	22.87	20.58	16.01	11.44
2423.1	Buried Cable - metallic	19.86	17.87	13.90	9.93
2423.2	Buried Cable - non metallic	24.13	21.72	16.89	12.07
2426.1	Intrabuilding Cable - metallic	15.64	14.08	10.95	7.82
2426.2	Intrabuilding Cable - non metallic	23.65	21.29	16.56	11.83
2442	Conduit Systems	51.35	46.22	35.95	25.68

Cost of Capital

	Default	Increased to 12%	Increased to 14%
Cost of Debt	.077	.097	.117
Cost of Equity	.119	.139	.159

Distribution Structure Fraction Assigned to Telephone = 66%

	Aerial		Buried		Underground	
Density	Default	New	Default	New	Default	New
0-5	0.50	0.66	0.33	0.66	1.00	0.66
5-100	0.33	0.66	0.33	0.66	0.50	0.66
100-200	0.25	0.66	0.33	0.66	0.50	0.66
200-650	0.25	0.66	0.33	0.66	0.50	0.66
650-850	0.25	0.66	0.33	0.66	0.40	0.66
850-2,550	0.25	0.66	0.33	0.66	0.33	0.66
2,550-5,000	0.25	0.66	0.33	0.66	0.33	0.66
5,000-10,000	0.25	0.66	0.33	0.66	0.33	0.66
10,000+	0.25	0.66	0.33	0.66	0.33	0.66

Feeder Structure Fraction Assigned to Telephone = 66%

	Aerial		Buried		Underground	
Density	Default	New	Default	New	Default	New
0-5	0.50	0.66	0.40	0.66	0.50	0.66
5-100	0.33	0.66	0.40	0.66	0.50	0.66
100-200	0.25	0.66	0.40	0.66	0.40	0.66
200-650	0.25	0.66	0.40	0.66	0.33	0.66
650-850	0.25	0.66	0.40	0.66	0.33	0.66
850-2,550	0.25	0.66	0.40	0.66	0.33	0.66
2,550-5,000	0.25	0.66	0.40	0.66	0.33	0.66
5,000-10,000	0.25	0.66	0.40	0.66	0.33	0.66
10,000+	0.25	0.66	0.40	0.66	0.33	0.66

Corporate Overhead Factor Increased to 20%

	Default	New
Corporate Overhead Factor	0.104	0.2

Appendix B

Comparison of Hatfield Model Release 3 and 2.2.2 Distribution Distances with Sums of Street Segment Lengths in Sample California CBGs

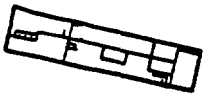
CBG 60650438.063

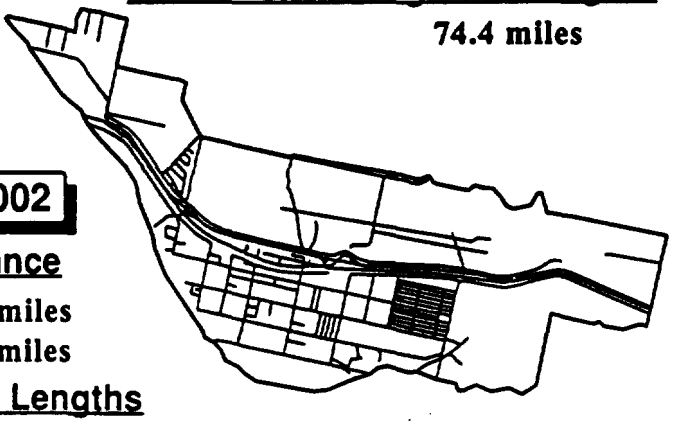
Distribution Distance

Release 3: 25.2 miles
Release 2.2.2: 3.0 miles

Sum of Street Segment Lengths

74.4 miles





CBG 60650443.002

Distribution Distance

Release 3: 12.5 miles
Release 2.2.2: 0.8 miles

Sum of Street Segment Lengths

7.6 miles

Scale (miles)

0 .5 1 1.5 2 2.5 3 3.5 4 4.5 5 5.5 6 6.5 7 7.5 8 8.5 9 9.5 10

Privileged and Confidential:
Prepared at the Request of Counsel

2/13/97 7:30 pm

Preliminary Draft:
Not Data Managed

Appendix C

Analysis of Hatfield CBG data

State	Hatfield Household Counts	Hatfield Average CBG distance	BCPM/ 1995Census Household Counts	BCPM Average CBG Distances	%Difference from Hatfield to 1995 Census Households	Actual Second Line Penetration	%Difference From Hatfield to BCPM CBG Distances
CA	15,495,577	8,897	11,033,168	9,302	40.4%	17.1%	-4.4%
CO	1,838,438	11,819	1,457,461	12,423	26.1%	14.7%	-4.9%
NJ	2,880,608	8,505	2,872,354	8,597	0.3%	32.1%	-1.1%
OH	5,056,088	9,475	4,198,488	9,683	20.4%	7.1%	-2.2%
TX	6,658,049	12,049	6,684,245	12,357	-0.4%	8.8%	-2.5%
WA	2,278,001	11,439	2,089,800	12,027	9.0%	9.7%	-4.9%

Note:

- *CBG distances are based upon weighted average of distance from CO to Centroid of CBG. The weighting factor used was Households*
- *The Second Line penetration was based upon 1995 ARMIS reported Residential lines divided by the 1995 Census Household counts.*

Appendix D

Comparison of Hatfield TSLRIC Results

GTE of California, Inc.

Loop elements	GTE Base Case	Costs with All Input Prices Increased 10%	Percent Change	Percent of Total Cost of Network Elements (Base)
(1)	(2)	(3)	(4)	(5)
NID	$0.72	$0.79	9.39%	4.34%
Loop Distribution (all)	$5.94	$6.51	9.45%	35.83%
Loop Concentration (all)	$2.77	$3.01	8.65%	16.71%
Loop Feeder (all)	$3.21	$3.51	9.50%	19.33%
Total Loop (all)	$12.64	$13.82	9.29%	76.20%
Total (w/ Public)	$887,151,410.29	$956,904,158.92	7.86%	
Total cost of switched network elements	$16.59	$17.87	7.73%	100.00%

Appendix E

Actual Versus Hatfield Comparison
CONTEL/GTE of California, Inc.
($ million)

Cost Category	Actual	Model	Model/Actual
(1)	(2)	(3)	(4) (3)/(2)
Network Investment	7,699.8	3,254.5	42.3%
General Support Investment	1,158.1	177.0	15.3%
Total Investment	8,921.1	3,431.5	38.5%
Network Expenses	272.1	104.6	38.4%
Support Expenses	404.2	144.2	35.7%
Corporate Expenses	396.5	85.1	21.5%
Total Expenses	1,072.8	333.8	31.1%
Revenue	2,411.3	887.2	36.8%

Actual Versus Hatfield Comparison
GTE Telephone Operations, Texas
($ million)

Cost Category	Actual	Model	Model/Actual
(1)	(2)	(3)	(4) (3)/(2)
Network Investment	3,399.2	2,220.4	65.3%
General Support Investment	561.7	131.5	23.4%
Total Investment	3,976.3	2,351.9	59.1%
Network Expenses	119.3	58.6	49.1%
Support Expenses	171.1	72.2	42.2%
Corporate Expenses	159.1	53.4	33.6%
Total Expenses	449.6	184.2	41.0%
Revenue	1,024.6	561.3	54.8%

Appendix F

HM 3.0 and HM 2.2.2 Distribution Distances and Street Lengths within Selected California CBGs Contained Entirely within GTE Wire Centers (miles)

CBG	HM 3.0 Distance	HM 3.0 Cable Sums	HM 2.2.2 Distance	Length of Streets	Claritas Areas
(1)	(2)	(3)	(4)	(5)	(6)
60650444.027	17.05	32.04	3.97	36.24	20.20
60650438.064	19.94	45.45	3.71	54.86	17.65
60650438.061	13.27	27.23	3.16	15.20	12.79
60650438.063	25.21	84.53	2.97	74.41	11.27
60710109.007	20.30	31.53	0.96	34.38	2.35
60710110.002	11.54	16.52	0.95	24.95	2.29
60710110.001	16.70	26.74	0.89	34.73	2.04
60830017.023	28.47	92.86	0.86	12.87	1.88
60710109.001	16.58	26.95	0.83	31.77	1.76
60710109.006	17.03	26.76	0.78	25.68	1.55
60650443.001	13.14	26.61	0.96	11.69	1.19
60830017.012	13.62	42.09	0.68	10.99	1.17
60650442.001	17.80	31.76	0.87	12.60	0.97
60650443.002	12.54	29.37	0.82	7.55	0.87
60830016.013	15.53	28.03	0.55	9.03	0.77
60650442.002	11.80	22.32	0.70	11.90	0.63
60650441.003	12.59	22.71	0.63	7.83	0.51
60830017.021	5.21	16.69	0.43	6.07	0.48
60650441.005	10.87	20.35	0.61	9.95	0.48
60830016.011	6.99	10.81	0.42	4.53	0.46
60830016.012	11.13	25.26	0.42	6.66	0.45
60830016.026	7.60	30.86	0.35	2.80	0.32
60650438.069	2.83	3.53	0.38	3.21	0.18
60830016.022	4.19	10.13	0.25	3.03	0.16
60830016.023	4.19	6.45	0.25	2.73	0.16
60650441.004	3.38	8.63	0.35	3.77	0.16
60830016.027	4.02	9.70	0.24	3.70	0.15
60830016.025	4.59	11.47	0.22	3.53	0.12
60830016.021	3.05	7.56	0.21	2.91	0.11
Total,29CBGs	351.17	774.92	28.43	469.58	83.11
Total,AllCBGs	52,190.71	129,294.60	2,955.34		

Ratio of Street Lengths to HM 2.2.2 Distance, Selected CBGs	16.5
Ratio of Street Lengths to HM 3.0 Distance, Selected CBGs	1.3
Ratio of HM 3.0 Distance to HM 2.2.2 Distance, Selected CBGs	12.4
Ratio of HM 3.0 Distance to HM 2.2.2 Distance, All CBGs	17.7
Ratio of HM 3.0 Cable Sums to HM 2.2.2 Distance, Selected CBGs	27.3
	43.7

Appendix G

Comparison of HM 3.0 and HM 2.2.2 Distribution Distance, Area, Density, and Distribution Cost and Investment for GTE California, GTE Texas and GTE Washington

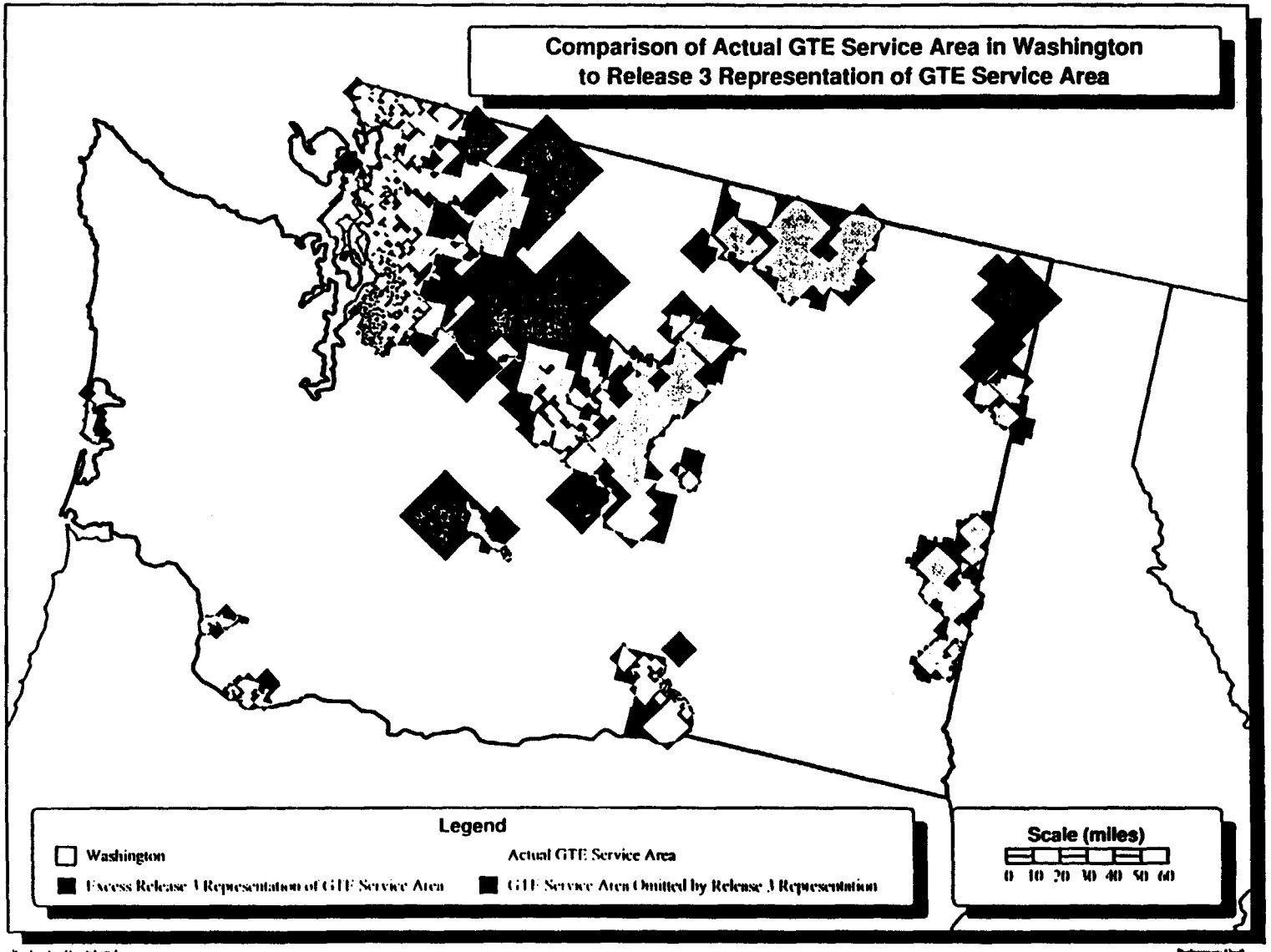
	Distance (miles)		Area (sq. miles)		Households (000)		Loop Distribution Annual Cost ($mm)		Total Distribution Investment ($mm)	
State	HM 3.0	HM 2.2.2	HM 3.0	HM 2.2.2	HM 3.0	HM 2.2.2	HM 3.0	HM 2.2.2	HM 3.0	HM 2.2.2
Total										
CA	52,190.71	2,955.34	55,461.67	27,036.29	3,657.69	2,358.98	$307.51	$309.95	$1,166.10	$1,158.01
WA	15,054.60	1,377.90	18,562.39	16,161.36	519.68	503.74	$68.94	$81.50	$274.29	$316.18
TX	45,648.28	5,934.53	89,336.71	97,943.76	1,153.99	1,191.52	$131.44	$267.54	$699.49	$1,025.25
Average										
CA	11.30	0.71	12.01	6.45	4,307.05	1,931.01	0.0666	0.0740	0.2525	0.2763
WA	14.67	1.33	18.09	15.55	1,578.40	915.17	0.0672	0.0784	0.2673	0.3043
TX	15.62	2.01	30.56	33.10	1,588.15	757.58	0.0450	0.0904	0.2393	0.3465
Ratio of HM 3.0 to HM 2.2.2, Total										
CA	17.66		2.05		1.55		0.99		1.01	
WA	10.93		1.15		1.03		0.85		0.87	
TX	7.69		0.91		0.97		0.49		0.68	
Ratio of HM 3.0 to HM 2.2.2, Average										
CA	16.02		1.86		2.23		0.90		0.91	
WA	11.06		1.16		1.72		0.86		0.88	
TX	7.79		0.92		2.10		0.50		0.69	

# of CBGs										
CA	4,619	4,191	4,619	4,191	4,619	4,191	4,619	4,191	4,619	4,191
WA	1,026	1,039	1,026	1,039	1,026	1,039	1,026	1,039	1,026	1,039
TX	2,923	2,959	2,923	2,959	2,923	2,959	2,923	2,959	2,923	2,959

HM 3.0 CBG areas are larger than those provided by Claritas in 2,589 instances, and smaller in 2,029. However, among the "larger" HM 3.0 CBGs, the average difference is .70 miles, whereas among the "smaller" HM 3.0 CBGs, the average difference is .02 miles. Thus, while HM 3.0 areas are smaller than Claritas areas around 80% as often as they are larger, the average difference is 35 times greater in the former cases than in the latter.

HM 2.2.2 CBG areas are larger than those provided by Claritas in 3,202 instances, and smaller in 987. However, among the "larger" HM 2.2.2 CBGs, the average difference is 2.70 miles, whereas among the "smaller" HM 2.2.2 CBGs, the average difference is .003 miles. Thus, while HM 2.2.2 areas are smaller than Claritas areas around a third as often as they are larger, the average difference is 900 times greater in the former cases than in the latter.

Appendix H


Comparison of Actual GTE Service Area in Washington
to Release 3 Representation of GTE Service Area
Legend
Washington
Actual GTE Service Area
Excess Release 3 Representation of GTE Service Area
GTE Service Area Omitted by Release 3 Representation
Scale (miles)
0 10 20 30 40 50 60

Appendix I

The input changes are:

Switch real-time limit, BHCA	Default	20% Decrease	50% Decrease	90% Decrease
1-1,000	10,000	8,000	5,000	1,000
1,000-10,000	50,000	40,000	25,000	5,000
10,000-40,000	20,000	160,000	100,000	20,000
40,000 +	600,000	480,000	300,000	60,000

Results for all scenarios except 90% decrease are:

	Annual Cost	Units	Unit Cost
End Office Switching	$22,574,200		
Port	$6,772,260	726,227 Lines	0.78 per line / month
Usage	15,801,940	9,552,246,145 min.	$0.0017 per min.

EO Switching Investment	Total
end office switching	$61,556,956

Results for the 90% decrease scenario are:

Results for all scenarios except 90% decrease are:

	Annual Cost	Units	Unit Cost
End Office Switching	$29,413,351		
Port	$8,824,005	726,227 Lines	1.01 per line / month
Usage	20,589,346	9,552,246,145 min.	$0.0022 per min.

EO Switching Investment	Total
end office switching	$70,753,969

When real time BHCA are reduced by 90% the model yields only a marginal increase in switching costs.

Percent Change from default results for the 90% decrease scenario are:

	Annual Cost	Units	Unit Cost
End Office Switching	30.3%		
Port	30.3%	726,227 Lines	29.5% per line / month
Usage	30.3%	9,552,246,145 min.	29.4% per min.

EO Switching Investment	Total
end office switching	

EXHIBIT B

HATFIELD MODEL V2.2.2 - INPUT SUMMARY

September 26, 1996

HATFIELD MODEL V.2.2.2 - INPUT SUMMARY

September 26, 1996

Input Name	Inputs	Support Material
Cost of Capital Factors		
Depreciation Lives		
Loop Distribution	20	The model determines the appropria depreciable lives for each network element based on the approved life span for each element. The depreciable lives used as input values are taken from LEC prescribed lives
Loop Feeder	20	
Loop Concentrator	10	
Wire Center	[illegible]	
End Office Switching	[illegible]	
Tandem Switching	[illegible]	
Transport Facilities	[illegible]	
Operator Systems	[illegible]	
STP	[illegible]	
SCP	[illegible]	
Links	[illegible]	
Public Telephones	[illegible]	
General Support	[illegible]	
Cost of Capital		
Debt Percent	45.00%	Input values represent reasonable estimates of the debt/equity ratio, the cost of debt and the cost of equity that result in an after-tax nominal cost of capital of 10.01% - - consistent with preliminary results of cost of capital studies.
Cost of Debt	7.70%	
Cost of Equity	11.50%	
Equity Percent	55.00%	
Overall Cost of Capital	10.01%	

HATFIELD MODEL V.2.2.2 - INPUT SUMMARY

September 26, 1996

Input Name	Inputs	Support Material
Miscellaneous Expense Factors		
Manage Overhead Factor	10.00%	The 10% factor is designed to capture the corporate operations expenses that vary with levels of demand. The factor is based on a regression analysis of the Tier 1 LEC's ARMIS G&A ("overhead") expenses and all other costs. Those costs are then adjusted to reflect efficiencies resulting from operation in a competitive environment.
Federal Income Tax Rate	[illegible]	Input factor designed to reflect a combined Federal and state effective income tax rate.
Other Taxes Factor	[illegible]	Input factor to reflect Franchise Fees and ad valorem taxes
Operating State and Local Income Tax Factor	[illegible]	Not presently used by the model.
Billing Inquiry per line per month	$1.22	Derived from 1993 New Hampshire Incremental Cost Study, Manchester NH, April 3, 1993.
Directory Listing per line per month	$0.15	Determined during discussions between Hatfield, AT&T, and MCI.

HATFIELD MODEL V.2.2.2 - INPUT SUMMARY

September 26, 1996

Input Name	Inputs	Support Material
Miscellaneous Expense Factors (contd.)		
Forward-Looking Network Operations Factor	70.00%	Forward looking adjustment based on judgement by HAI in conjunction with testimony in a California proceeding by Mr. R.L. Scholl of Pacific Bell.
Central Office Switching Expense Factor	2.69%	Forward looking adjustment based on the 1993 New Hampshire Incremental Cost Study, Manchester, NH April 1993.
End Office Traffic-Sensitive Fraction	[illegible]	Based on review and modification of estimate produced by Pacific Bell
per-line Monthly LNP Cost	$[illegible]	Developed and provided by AT&T
alternative circuit equipment factor	[illegible]	Forward looking adjustment based on the 1993 New Hampshire Incremental Cost Study, Manchester, NH April 1993.
Carrier-carrier customer service per line per year	$[illegible]	Based on representative amounts collected from ARMIS.
NID expense per line per year	$3.00	Based on representative amounts collected from ARMIS.
Switch line circuit offset per DLC line	$35.00	Assumption of cost of POTS interface on digital switch. HAI estimate of investment for battery, over voltage, ringing, supervision, codec and hybrid functions.

HATFIELD MODEL V.2.2.2 - INPUT SUMMARY

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Input Name	Inputs	Support Material
Fill Factors		
Cable		
Feeder		
0-5	0.65	The Feeder Fill input values in the BCM1 model were reviewed and accepted by Telecom Visions, Inc based on knowledge of the Bell System Practice, AT&T 916-250-250 Section 3, Issue 2 published in 1951 which discusses the generally-accepted fill relief factor of 85%. For the higher density zones, the model fill factors were reduced by 5% to account for forward looking technology and the technical longevity of copper. The model fill factors for lower density zones were further reduced to reflect the industry standard practice of building in spare capacity for smaller wire sizes rather than incurring the cost of upgrading capacity due to future demand. This is not inconsistent with the fill assumption generally employed for distribution cable. The fill factors reflect fill actually experienced in the cable as distinguished from fill measured when terminated at the MDF (as represented in Exhibit 1 hereto) . The distinction is in the definition of fill factor. The model employs the expected fill factor for network technical development as opposed to technical fill at relief (which requires that the network be reinforced with costly upgrades).
5-200	0.75	
200-650	0.80	
650-850	0.80	
850-2550	0.80	
2550+	0.80	

Input Name	Inputs	Support Material
Fill Factors (contd.)		
Cable		
Distribution		
0-5	0.50	The Distribution input values in the BCM1 model were reviewed and modified by Telecom Visions, Inc. based on knowledge of generally-accepted Distribution fill standards. The most generally accepted guideline is that "Distribution plant is designed to meet the ultimate requirement for an area. Distribution network design requires more distribution pairs than feeder pairs so distribution cables are more numerous but smaller in cross section than feeder cables." [Telecommunications Transmission Engineering, 3rd Ed., Bellcore, 1990.]
5-200	0.55	
200-650	0.60	
650-850	0.65	
850-2550	[illegible]	
2550+	[illegible]	
		In addition, the normal speculative ratio is two pairs per living unit. Therefore, it is unreasonable to design distribution cable for less than 50% fill. The BCM1 model called for a fixed value of 75% spare for the lowest density zone (25% expected fill). That was deemed to be far too low. The BCM1 model factor for the highest density zone were deemed acceptable and left unchanged. BCM2 uses higher fill factors than BCM1 and are only slightly below the Hatfield model assumption.

HATFIELD MODEL V.2.2.2 - INPUT SUMMARY September 26, 1996

Input Name	Inputs	Support Material
EO Switching Parameters		
Busy hour call attempts, residential	1.3	Bell Communications Research, LATA Switching Systems Requirements, Section 17: Traffic Capacity and Environment, TR-TSY-000517, Issue 3, March 1989
Busy hour call attempts, business	3.5	Bell Communications Research, LATA Switching Systems Requirements, Section 17: Traffic Capacity and Environment, TR-TSY-000517, Issue 3, March 1989
Switch Maximum Line Size	100,000	Assumption based on industry common knowledge
Switch Maximum Line Fill	0.80	Assumption based on industry common knowledge
Switch Maximum Processor Occupancy	0.90	Assumption based on industry common knowledge
Processor Feature Loading Multiplier	1.00	No loading multiplier used. Input set at 1.0, has no effect on the model.
Switch Installation Multiplier	1.10	Determined during discussions between Hatfield, AT&T, and MCI.
Switch Parameters		
Switch real-time limit, BHCA		
1 - 1,000	10,000	HAI assumptions.
1,000 - 10,000	50,000	
10,000 - 40,000	200,000	
40,000+	600,000	
Switch traffic limit, BHCCS		
1 - 1,000	10,000	HAI assumptions.
1,000 - 10,000	50,000	
10,000 - 40,000	500,000	
40,000+	1,000,000	

HATFIELD MODEL V.2.2.2 - INPUT SUMMARY

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Input Name	Inputs	Support Material
EO Switching Parameters (contd.)		
Switch cost points	*lines*	
Low line size	2,752	Average BCC and independent switch line sizes derived from data published in the FCC's Statistics of Communications Common Carriers plus information on larger switches obtained from switch manufacturers
Mid line size	11,200	
High line size	30,000	
	[illegible]	
Low line size	[illegible]	Based on data in a study of the central office equipment market published by McGraw-Hill plus information on larger switches obtained from switch manufacturers
Mid line size	[illegible]	
High line size	[illegible]	
Residential Holding Time Multiplier	[illegible]	Item included for potential future use
Business Holding Time Multiplier	[illegible]	Item included for potential future use.
Busy Hour fraction of daily usage	0.10	Estimate of busy hour fraction of daily usage.
Annual to daily usage reduction factor	[illegible]	Estimate of number of business day year

HATFIELD MODEL V.2.2.2 - INPUT SUMMARY

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Input Name	Inputs	Support Material
Interoffice and Tandem Parameters		
Operator Traffic Fraction	0.02	HAI estimate based on knowledge of industry practice.
Total Interoffice Traffic Fraction	0.65	HAI estimate based on knowledge of industry practice
Direct-Routed Fraction of Local Interoffice	0.98	From information filed by LEC's in response to FCC
Maximum Trunk Occupancy, CCS	27.5	AT&T Capacity Cost Study.
Trunk Termination Investment, per end	$100	AT&T Capacity Cost Study
Average Direct Route Distance, miles	10	HAI assumption
Average Trunk Usage Fraction	0.3	AT&T Capacity Cost Study.
Toll traffic inputs		
Tandem-routed % of total intraLATA traffic	0.2	Determined during discussions between Hatfield, AT&T, and MCI
Average direct intraLATA route distance, mi.	25	
Tandem-routed % of total interLATA traffic	0.2	
Average direct access route distance, mi.	15	
Tandem Switching parameters		
real time limit, BHCA	1,500,000	HAI assumption.
port limit, trunks	120,000	AT&T Capacity Cost Study.
common equipment investment	$1,000,000	AT&T Capacity Cost Study.
maximum trunk fill	0.8	Estimated to be the same as End Office
maximum real time occupancy	0.9	Estimated to be the same as End Office
common equipment intercept factor	0.25	Scaling of tandem loop investment account for joint usage based on HAI experience

HATFIELD MODEL V.2.2.2 - INPUT SUMMARY

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Input Name		Inputs	Support Material
Wire Center Parameters			
Lot size, multiple of switch room size		2	Assumes that land area needed is sufficient to accommodate building plus parking requirements.
Tandem/EO wire center common factor		0.40	Based on AT&T analysis.
Power and frame investment		*sum of power &*	
	[illegible]	$10,000	HAI assumption
	[illegible]	$20,000	
	[illegible]	$40,000	
	[illegible]	$100,000	
	[illegible]	$500,000	
Switch Room Size		*floor area required*	
	[illegible]	500	HAI assumption
	[illegible]	1,000	
	[illegible]	2,000	
	25,000	5,000	
	50,000	10,000	
Construction costs per sq. ft.		*construction/$/sq. ft.*	
	0	$75	HAI assumption.
	1,000	$85	
	5,000	$100	
	25,000	$125	
	50,000	$150	
Land price per sq. ft.		*price/sq. ft.*	
	0	$5.00	HAI assumption
	1,000	$7.50	
	5,000	$10.00	
	25,000	$15.00	
	50,000	$20.00	

HATFIELD MODEL V.2.2.2 - INPUT SUMMARY

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Input Name	Inputs	Support Material
Distribution Structure Inputs		
Aerial Fraction		The three structure categories of Aerial, Buried and Underground, are assumed to reflect an equal distribution between Aerial and Buried structure in all but the two highest density zones, based on experience of Telecom Visions, Inc. The highest density zone employs a larger factor for aerial structure to reflect the increased difficulty of placing cable in the earth that arises from a higher incidence of obstacles as density increases. The use of underground structure in higher density zones allows for the placement of cable in conduit. This accounts for the increased likelihood of having to trench through pavement in areas of more intensive use, the need to have a protected path to allow for replacement of cable, and to minimize future in these locations.
0-5	0.5	
5-200	0.5	
200-650	0.5	
650-850	0.5	
850-2550	0.4	
2550+	0.35	
Buried Fraction		
0-5	0.5	
5-200	0.5	
200-650	0.5	
650-850	0.5	
850-2550	0.5	
2550+	0.35	
Underground Fraction		
0-5	0	
5-200	0	
200-650	0	
650-850	0	
850-2550	0.1	
2550+	0.3	