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FEDERAL COMMUNICATIONS COMMISSION
OFFICE OF SECRETARY

October 24, 1996

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

Re: Ex Parte Presentation - CC Docket 96-45
Federal - State Joint Board on Universal Service

Dear Mr. Caton:

On Thursday, October 24, 1996, Mr. Michael Pelcovits and Mr. Len Sawicki, on behalf of MCI Communications Corporation, and Mr. Joel Lubin and I, on behalf of AT&T, met with Ms. Kathleen B. Levitz and Mr. Richard A. Metzger, of the Common Carrier Bureau, to present a comparison of the Hatfield Model and the BCM2. The attachment was used as the basis of the presentation.

In accordance with Section 1.1206(a)(1) of the Commission's Rules, two (2) copies of this Notice are being filed with the Secretary of the FCC.

Sincerely,

Bruce K. Cox

Attachment

cc: Ms. Levitz
Mr. Metzger
Mr. Pelcovits (without attachment)
Mr. Sawicki (without attachment)

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Recycled Paper

Overview

- Properties of cost models to implement TELRIC costing principles
- Comparison of BCM2 and Hatfield 2.2.2
  - Comparison of engineering principles
  - Comparison of inputs and outputs
  - Comparison of models' operation and format
- Conclusions

TELRIC Principles endorsed by FCC

- Forward-looking technology
- Existing network topology
- Total demand considered
- No embedded cost
- No subsidy cost
- Reasonable allocation of joint & common costs

Calculation methodology

Hatfield

- Calculate loop investment from bottom up
- Compute monthly capital carrying cost by explicit calculation of annual depreciation, return, and tax on return
- Calculate direct plant/state/density zone-specific support expense
- *Repeat* for all network elements
- Add in network support expense
- Add in corporate operations and operating tax expense

BCM2

- Calculate loop investment from bottom up
- Compute *aggregate* monthly carrying cost of depreciation, return, taxes, plant-specific and nonspecific support expenses by multiplying by three *national* ARMIS-generated factors
- Repeat only for switching element
- Add in national $133/year factor to collect costs of *all other elements* and *all other types of expense*

HM run with BCM2 inputs

- Investment
  - fill factors
  - structure percentages (aerial, buried, underground)
  - no sharing of structure
  - switch line size break points and costs
  - end office traffic-sensitive fraction
  - switch max line size
- Expenses
  - use of BCM2 expense methodology
- Results
  - Hatfield investment 4% higher than BCM
  - Hatfield monthly cost 16% higher than BCM

With similar inputs, Hatfield yields similar results to BCM2 for loop investment

Maryland - Comparison of BCM2 and HM 2.2.2 results

	0-5 lines/sq mi	5-200 lines/sq mi	200-650 lines/sq mi	650-850 lines/sq mi	850-2550 lines/sq mi	>2550 lines/sq mi	Totals
HM 2.2.2 Investments per line							
Loop	$ 3,312.14	$ 1,208.04	$ 615.22	$ 502.62	$ 587.86	$ 701.03	$ 727.79
Switching	$ 182.13	$ 176.69	$ 172.28	$ 168.53	$ 169.78	$ 176.73	$ 174.43
Total	$ 3,494.27	$ 1,384.72	$ 787.50	$ 671.15	$ 757.64	$ 877.76	$ 902.22
BCM2 Investments per line							
Loop	$ 2,437.36	$ 1,454.67	$ 733.00	$ 705.67	$ 622.70	$ 534.30	$ 758.27
Switching	$ 110.59	$ 126.03	$ 111.13	$ 106.85	$ 104.10	$ 101.16	$ 108.09
Total	$ 2,551.27	$ 1,584.49	$ 847.46	$ 815.73	$ 729.92	$ 638.49	$ 869.60

Conclusion

- Comparison of models bolsters confidence in integrity of loop investment modeling process
  - Models are similar in approach to modeling loop investment
  - Hatfield yields similar results to BCM2 given similar inputs
  - BCM2 is too inflexible to accept Hatfield inputs
- Hatfield inputs more accurately reflect engineering practice than BCM2 inputs
  - HM model defaults are supported by documented sources and expert experience
  - However, unlike BCM2, the default values *can be changed*
- For investments beyond loop, for expenses, and for monthly cost development, Hatfield totally outclasses BCM2

Conclusions

- Hatfield Model is superior tool for both universal service and network element costs
  - ***Only*** model to estimate costs for both unbundled network elements and universal service
  - ***Only*** model to accommodate state/technology differences in expenses, ROR, depreciation, taxes, etc.
  - More flexible -- key input variables can easily be adjusted
  - ***Only*** model to fully comply with TELRIC principles
    - » BCM2 uses embedded expenses
    - » BCM2 does not consider total demand

Maryland - Comparison of BCM2 and HM 2.2.2 results

	0-5 lines/sq mi	5-200 lines/sq mi	200-650 lines/sq mi	650-850 lines/sq mi	850-2550 lines/sq mi	>2550 lines/sq mi	Totals
HM 2.2.2 Investments							
Loop							
Distribution	$ 2,336,664	$ 404,396,359	$ 132,211,048	$ 28,564,947	$ 229,188,242	$ 713,335,706	$ 1,510,032,966
Concentration	$ 279,776	$ 70,792,655	$ 37,389,782	$ 10,784,810	$ 69,912,453	$ 75,363,189	$ 264,522,665
Feeder	$ 308,177	$ 62,931,439	$ 36,480,850	$ 12,149,856	$ 160,509,363	$ 417,399,107	$ 689,778,792
Total Loop	$ 2,924,617	$ 538,120,453	$ 206,081,680	$ 51,499,613	$ 459,610,058	$ 1,206,098,002	$ 2,464,334,423
Lines	883	445,450	334,972	102,463	781,831	1,720,469	3,386,068
Investment/Line	$ 3,312.14	$ 1,208.04	$ 615.22	$ 502.62	$ 587.86	$ 701.03	$ 727.79
Switching							
Investment	$ 160,823	$ 78,704,537	$ 57,709,299	$ 17,268,429	$ 132,739,844	$ 304,055,088	$ 590,638,020
Investment/Line	$ 182.13	$ 176.69	$ 172.28	$ 168.53	$ 169.78	$ 176.73	$ 174.43
Total Investment	$ 3,085,440	$ 616,824,990	$ 263,790,979	$ 68,768,042	$ 592,349,902	$ 1,510,153,090	$ 3,054,972,443
Total/Line	$ 3,494.27	$ 1,384.72	$ 787.50	$ 671.15	$ 757.64	$ 877.76	$ 902.22
BCM2 Investment							
Loop							
Distribution	$ 80,439	$ 557,404,386	$ 197,637,052	$ 83,882,048	$ 437,088,747	$ 407,292,618	$ 1,683,385,290
Feeder	$ 163,297	$ 280,999,654	$ 147,470,214	$ 46,651,942	$ 230,584,637	$ 152,268,014	$ 858,137,758
Total Loop	$ 243,736	$ 838,404,040	$ 345,107,266	$ 130,533,990	$ 667,673,384	$ 559,560,632	$ 2,541,523,048
Lines	100	576,353	470,814	184,978	1,072,219	1,047,286	3,351,750
Investment/Line	$ 2,437.36	$ 1,454.67	$ 733.00	$ 705.67	$ 622.70	$ 534.30	$ 758.27
Switching							
Investment	$ 11,391	$ 74,818,993	$ 53,890,702	$ 20,357,909	$ 114,961,553	$ 109,123,910	$ 373,164,458
Investment/Line	$ 110.59	$ 126.03	$ 111.13	$ 106.85	$ 104.10	$ 101.16	$ 108.09
Total Investment	$ 255,127	$ 913,223,033	$ 398,997,968	$ 150,891,899	$ 782,634,937	$ 668,684,542	$ 2,914,687,506
Total/Line	$ 2,551.27	$ 1,584.49	$ 847.46	$ 815.73	$ 729.92	$ 638.49	$ 869.60
HM % of BCM2							
Loop							
Investment/Line	136%	83%	84%	71%	94%	131%	96%
Switching							
Investment/Line	165%	140%	155%	158%	163%	175%	161%
Total							
Total/Line	137%	87%	93%	82%	104%	137%	104%

Maryland - Comparison of BCM2 and HM 2.2.2 results

	0-5 lines/sq mi	5-200 lines/sq mi	200-650 lines/sq mi	650-850 lines/sq mi	850-2550 lines/sq mi	>2550 lines/sq mi	Totals
Hatfield 2.2.2 (defaults) (#1)							
lines	883	445,450	334,972	102,463	781,831	1,720,469	3,386,068
households	676	287,193	192,189	55,870	445,496	840,124	1,821,548
Monthly Cost (USF)	$ 68.15	$ 29.48	$ 19.23	$ 16.71	$ 15.58	$ 13.91	$ 17.44
BCM2							
lines	100	576,353	470,814	184,978	1,072,219	1,047,286	3,351,750
households	-	331,208	215,821	87,736	554,336	560,177	1,749,278
Monthly Cost (USF)	$ 53.85	$ 39.68	$ 25.24	$ 24.56	$ 22.86	$ 21.00	$ 25.83
Difference using defaults	$ 14.30	$ (10.20)	$ (6.01)	$ (7.85)	$ (7.28)	$ (7.09)	$ (8.39)
HM 2.2.2 (no sharing of structure) (#3)	$ 76.77	$ 32.15	$ 20.07	$ 17.60	$ 17.96	$ 17.80	$ 20.36
Difference	$ 22.92	$ (7.53)	$ (5.17)	$ (6.96)	$ (4.90)	$ (3.20)	$ (5.47)
HM 2.2.2 (fill factors & structure)*	$ 82.37	$ 35.42	$ 21.94	$ 18.83	$ 19.04	$ 20.19	$ 22.63
Difference	$ 28.52	$ (4.26)	$ (3.30)	$ (5.73)	$ (3.82)	$ (0.81)	$ (3.20)
HM 2.2.2 (switching)**	$ 83.72	$ 36.70	$ 23.04	$ 19.87	$ 20.11	$ 21.31	$ 23.60
Difference	$ 29.87	$ (2.98)	$ (2.20)	$ (4.69)	$ (2.75)	$ 0.31	$ (2.23)
HM 2.2.2 (factors)***	$ 83.71	$ 37.04	$ 23.47	$ 20.34	$ 20.61	$ 21.80	$ 24.06
Difference	$ 29.86	$ (2.64)	$ (1.77)	$ (4.22)	$ (2.25)	$ 0.80	$ (1.77)
HM 2.2.2 (tier one)****	$ 81.67	$ 36.66	$ 23.43	$ 20.37	$ 20.89	$ 22.35	$ 24.33
Difference	$ 27.82	$ (3.02)	$ (1.81)	$ (4.19)	$ (1.97)	$ 1.35	$ (1.50)
HM 2.2.2 (BCM2 Expenses)*****	$ 80.14	$ 38.94	$ 27.23	$ 24.89	$ 26.58	$ 29.67	$ 29.99
Difference	$ 26.29	$ (0.74)	$ 1.99	$ 0.33	$ 3.72	$ 8.67	$ 4.16

* this run uses BCM2 fill factors, structure percentages, end office traffic-sensitive fraction, forward-looking net ops factor, no structure sharing (#4)
** this one substitutes BCM2 switch size breaks and per-line plus per-line fixed costs (#5)
*** this uses actual CO switching and circuit equipment expense factors for BA-MD (#6)
****this uses expense factors for all Tier One LECs (#7)
*****this uses the BCM methodology for expenses, discarding HM expenses entirely