ORIGINAL

BellSouth Telecommunications, Inc.

Florida Docket No. 980696-TP

Staff's POD No. 2

SUPPLEMENTAL RESPONSE

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Determination of Parameters for the Fisher-Pry Model
With Particular Reference to Fiber in the Feeder

Determination of Parameters for the Gompertz-Makeham Model
With Particular Reference to Fiber in the Feeder

Life Estimate for Distribution Metallic Cable

We estimated the average remaining life (ARL) of distribution metallic cable after considering service drivers, replacing technologies, replacement scenarios in the inter-office and feeder, and an increasingly competitive environment. Although the current penetration level of fiber in the distribution is low, we were able to use this information to make a reasonable estimate of the rate of displacement of distribution metallic cable and the associated end-point of this technology.

The services that will support the deployment of last mile technologies will probably be offered in association with traditional telephony services. Further, there will be a variety of providers that will offer these services. The demand for data connectivity is growing rapidly. Among the applications for data connectivity are Internet access, access to business computer systems and multimedia services. These services are growing in popularity, which means that the number of users is increasing, but also the bandwidth needs of each application is growing. The result is an exponential growth in capacity requirements for customer access.

Other new services are being developed and expanding. Many are related to the Internet but deserve separate mention because of their potential impact. Electronic commerce, distance learning and tele-medicine will continue to gain acceptance. A myriad of services will certainly drive the efforts to pave the last mile with ample capacity.

The distribution portion of the telephony network is often called the "last mile" in reaching customers with new services. It is important to note that there are many ways, in addition to distribution metallic or fiber cable, that this last mile may be traversed. Although we included in our study only one displacing technology in the distribution, it is becoming increasingly apparent that various technologies will be used in the last mile to the customer. Fiber will be used as a direct replacement for copper cable and offers many advantages such as greater capacity and improved reliability. Coaxial cable reaches a large number of customers and will be used to provide data and telephony services in addition to conventional cable TV. Wireless technologies will be used in both mobile and fixed arrangements as an alternative to metallic cable.

Service providers will have the choice of these technologies as they consider the advantages of each and the particular conditions of each serving area. Wireless technologies have the advantage of relatively low entrance costs and are less sensitive to market share variability. Fiber, on the other hand, offers greater capacity and more security, but presents a large fixed investment. Coaxial cable already has significant penetration and can, with the proper electronics, be used to provide two-way communication. Declining prices, especially for wireless, will make these technologies attractive replacements for metallic cable.

We have two other metallic cable replacement scenarios that can be used as models for the analysis of distribution copper cable. Fiber displaced copper in the inter-office more rapidly than any other displacement scenario. Fiber deployment is progressing in the feeder but at a slower pace. This is to be expected because of the lower traffic concentration in the feeder. While the distribution has even less traffic concentration, we expect that the ultimate displacement of metallic cable to be similar to that of the feeder. This is due to the factors mentioned above and summarized in the table below.

Service Drivers	**Replacing Technologies**	**Replacing Companies**
Data connectivity	Fiber	ILECs
Internet Access	Coaxial Cable	CLECs
Multi-media Services	Cellular / PCS	Cable TV
Distance Learning	Wireless Local Loop	CAPs
Tele-medicine		
Electronic Banking		
Electronic Commerce		

Derivation of Mortality Displacement Rates for Metallic Feeder Cable

Run Date : 10/09/18 - 11.13.43
Report : GRADSUM

Company : BellSouth Telecommunications
State : BellSouth Composite
Account :
Category : OSP Cable: AERM +BURM +UGRM

Summary of Graduation Analysis -- Various Bands of Mortality Data

Grad Method	T Cut	c	G	S	Sum of Sq. or Fit Ind	% Retirement Differences --to T-Cut-- Net	--to T-Cut-- Abs	--to Total-- Net	--to Total-- Abs	Life	Suppr	X-Int
BAND : 1989 - 1991												
GRAD	43	1.01	-6.13962310E+00	6.00164880E-02	2.957E+07 *@	-2.0	13.3	-2.3	13.6	29.86	.0	107.5
	52	1.02	-1.29075780E+00	2.38378090E-02	4.045E+07 *	-2.7	12.2	-2.7	12.2	29.60	.0	98.5
MORT	43	1.02	-1.34608130E+00	2.53705130E-02	4.601E-01 *@	.4	12.0	.0	12.4 #	29.64	.0	96.5
	52	1.01	-6.01110180E+00	5.88118110E-02	4.825E-01 *	.5	13.1	.5	13.1	30.24	.0	108.5

Sum of Observed Life Table: 29.00

* Fitness measurement for selected value of c
@ Least fitness measurement within Graduation Method
# The least absolute retirement differences to total data for the @-selected curves

A Vintage v	B IGA	C Aerial Metallic Survivors	D Percent	E IGA	F Buried Metallic Survivors	G Percent	H IGA	I Underground Metallic Survivors	J Percent	K IGA	L Aerial + Buried + Underground Metallic Survivors	M Percent	N Normalized (SURV)
1960													
1961													
1962													
1963													
1964													
1965													
1966													
1967													
1968													
1969													
1970													
1971													
1972													
1973													
1974													
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1976													
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1978													
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1980													
1981													
1982													
1983													
1984													
1985													
1986													
1987													
1988													
1989													
1990													
1991													
1992													
1993													
1994													
1995													
1996													

AA	AB	AC	AD	AE	AF
Age	Proportion Surviving	Estimated Initial Gross Adds	Displacement Rate	Estimated Survivors	Weighted Disp Rate
36.5					
35.5					
34.5					
33.5					
32.5					
31.5					
30.5					
29.5					
28.5					
27.5					
26.5					
25.5					
24.5					
23.5					
22.5					
21.5					
20.5					
19.5					
18.5					
17.5					
16.5					
15.5					
14.5					
13.5					
12.5					
11.5					
10.5					
9.5					
8.5					
7.5					
6.5					
5.5					
4.5					
3.5					
2.5					
1.5					
0.5					
0					

AA	AB	AC	AD	AE	AF
Age	Proportion Surviving	Estimated Initial Gross Adds	Displacement Rate	Estimated Survivors	Weighted Disp Rate
37.5					
36.5					
35.5					
34.5					
33.5					
32.5					
31.5					
30.5					
29.5					
28.5					
27.5					
26.5					
25.5					
24.5					
23.5					
22.5					
21.5					
20.5					
19.5					
18.5					
17.5					
16.5					
15.5					
14.5					
13.5					
12.5					
11.5					
10.5					
9.5					
8.5					
7.5					
6.5					
5.5					
4.5					
3.5					
2.5					
1.5					
0.5					
0					

12

Year:	Disp Rate	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T
1998																					
1999																					
2000																					
2001																					
2002																					
2003																					
2004																					
2005																					
2006																					
2007																					
2008																					
2009																					
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2024																					
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2026																					
2027																					
2028																					
2029																					
2030																					
2031																					
2032																					
2033																					
2034																					
2035																					

1:
2:

continued

Year:	Disp Rate:	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
1998																
1999																
2000																
2001																
2002																
2003																
2004																
2005																
2006																
2007																
2008																
2009																
2010																
2011																
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2022																
2023																
2024																
2025																
2026																
2027																
2028																
2029																
2030																
2031																
2032																
2033																
2034																
2035																

WN-1

Vintage:	1962	1963	1964	1965	1966	1967	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979
Year:	ps	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q
Proportion Surviving for each year and vintage.	1998																	
	1999																	
	2000																	
	2001																	
	2002																	
	2003																	
	2004																	
	2005																	
	2006																	
	2007																	
	2008																	
	2009																	
	2010																	
	2011																	
	2012																	
	2013																	
	2014																	
	2015																	
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	2018																	
	2019																	
	2020																	
	2021																	
	2022																	
	2023																	
	2024																	
	2025																	
	2026																	
	2027																	
	2028																	
	2029																	
	2030																	
	2031																	
	2032																	
	2033																	
	2034																	
	2035																	

1
2
3

Proportion Surviving for each year and vintage.	Vintage:	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998
	Year:	ps	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R
	1998																			
	1999																			
	2000																			
	2001																			
	2002																			
	2003																			
	2004																			
	2005																			
	2006																			
	2007																			
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	2014																			
	2015																			
	2016																			
	2017																			
	2018																			
	2019																			
	2020																			
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	2022																			
	2023																			
	2024																			
	2025																			
	2026																			
	2027																			
	2028																			
	2029																			
	2030																			
	2031																			
	2032																			
	2033																			
	2034																			
	2035																			

Age Distribution Data for Aerial and Buried Cable

A Vintage v	B IGA	C Aerial Metallic Survivors	D Percent	E IGA	F Buried Metallic Survivors	G Percent	H IGA	I Aerial + Buried Metallic Survivors	J Percent	K Normalized (SURV)
1960										
1961										
1962										
1963										
1964										
1965										
1966										
1967										
1968										
1969										
1970										
1971										
1972										
1973										
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1976										
1977										
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1979										
1980										
1981										
1982										
1983										
1984										
1985										
1986										
1987										
1988										
1989										
1990										
1991										
1992										
1993										
1994										
1995										
1996										

Age	Proportion Surviving
36	5
35	5
34	5
33	5
32	5
31	5
30	5
29	5
28	5
27	5
26	5
25	5
24	5
23	5
22	5
21	5
20	5
19	5
18	5
17	5
16	5
15	5
14	5
13	5
12	5
11	5
10	5
9	5
8	5
7	5
6	5
5	5
4	5
3	5
2	5
1	5
0	

Run Date : 10/12/98 - 16.01.45
Report : GRADSUM

Company : BellSouth Telecommunications
State : BellSouth Composite
Account :
Category : OSP Cable AERM + BURM

Summary of Graduation Analysis -- Various Bands of Mortality Data

Grad Method	T Cut	c	G	S	Sum of Sq. or Fit Ind	% Retirement Differences --to T-Cut-- Net	Abs	--to Total-- Net	Abs	Life	Suppr	X-Int
BAND : 1989 - 1991												
GRAD	38	1.02	-1.68017700E+00	3.26323000E-02	3.516E+07 *#	-1.8	15.7	-1.9	16.0	27.71	.0	90.5
	52	1.03	-6.66989500E-01	1.87243860E-02	5.447E+07 *	-2.6	14.7	-2.6	14.7	27.29	.0	82.5
HORT	38	1.04	-3.18720740E-01	1.10971190E-02	5.711E-01 *#	.1	12.2	- .4	12.7 #	27.31	.0	77.5
	52	1.02	-1.62684870E+00	3.15299600E-02	6.053E-01 *	.4	15.5	.4	15.5	28.05	.0	91.5

Sum of Observed Life Table: 27.16

* Fitness measurement for selected value of c
\# Least fitness measurement within Graduation Method
\# The least absolute retirement differences to total data for the #-selected curves