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PUBLIC SERVICE COMMISSION OF THE DISTRICT OF COLUMBIA

WASHINGTON, D.C. 20001 (202) 727-3050

DATE:

TO: Chairman Patricia M. Worthy
Commissioner Ruth Hankins-Nesbitt
Commissioner Wesley H. Long

THROUGH: James E. Kerr
Executive Director

FROM: Phylicia A. Fauntleroy
Director, Office of Economics

SUBJECT: Residential Telephone Demand in the District of Columbia

A few weeks ago, I received a copy of the March, 1988 Monitoring Report, CC Docket No. 87-339, from Dr. Peyton Wynns, Chief, Industry Analysis Bureau, Federal Communications Commission (FCC). The report contains a copy of the FCC's latest Subscribership and Penetration Levels Study (see pages 11-42 of the Monitoring Plan). After reviewing the latter study, I called Dr. Alex Belinfante at the FCC and he, at my request, agreed to provide a special tabulation of the D.C. data by household size and income. (There was no charge for this tabulation.) He submitted the results to me last week. I have analyzed them in conjunction with other data from the monitoring report and additional information I assembled and I have prepared the attached report.

cc: Howard C. Davenport
Margo Domon
Jacqueline Reed
Richard Morgan

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Residential Telephone Demand in
the District of Columbia

1. The number of households without telephones in the District of Columbia has risen substantially since divestiture. (See Table 1.)

Table 1 contains information from special FCC/U.S. Census Bureau surveys of households in the District of Columbia which have been conducted in March, July and November of each year since 1983. Three types of information are shown in Table 1 as follow:

a. Number of households in D.C. (Column 1)

b. Number of D.C. households with a telephone (Column 2)

c. Number of D.C. households without a telephone (Column 3)

The figures in columns 1-3 are rounded off (by the FCC) to the nearest 000's. The information in Column 3 is derived by subtracting the figures in Column 2 from the figures in Column 1.

The data in Columns 1 and 2 show considerable variation in each time period and this variation, in my opinion, is unrealistic. The variation is probably due to the relatively small sample size of the survey in D.C. - about 630 households. The numbers from the survey are "blown up" to all households in D.C. by the U.S. Census Bureau on the basis of 1980 Census data.

Despite the apparent variation and some growth in the number of households in D.C. (from Column 1), the data in Column 2 indicate there has been virtually no growth in the number of households with a telephone since divestiture. On an annual basis, the number of households with a telephone has been lower each year between 1984 and 1987 than it was in November, 1983.

As shown in Column 3, the number of households in D.C. without a telephone has risen since divestiture. The figures show a rise of 7,000 households or 50% between 1984 and 1987. In total, by 1987, 21,000 households or approximately a minimum of 52,500 persons (assuming 2.5 persons her household) ~~is~~ are without a telephone. Another way of measuring the impact is about 8.4% of the D.C. population was without a telephone in 1987. In comparison, less than 6 percent of the D.C. population was without a telephone before divestiture.

2. Telephone penetration rates in the District of Columbia have declined since divestiture. (See Tables 2 and 3.)

Table 2 shows the percentage of households in D.C. with telephones beginning in November, 1983, annually for 1984-1987, and for three months (March, July and November) for 1984-1987. The telephone penetration rates are calculated by the Federal Communication Commission on the basis of special U.S. Census Bureau surveys and as reported in the March 1988 Monitoring Plan of the FCC.

Table 2 shows the penetration rate for D.C. in November, 1983, just prior to divestiture, was 94.7%. However, by 1987, the penetration rate was down 2.3 percentage points to 92.4%.

Table 3 contains penetration rate data for D.C. defined as the percentage of households with a telephone available. It shows a 1.4 percentage point decline in penetration rates from 95.6% in November 1983 to 94.2% in 1987.

3. Telephone penetration rates in the District of Columbia have declined more so than in the neighboring states (See Tables 2 and 3.)

Tables 2 and 3 also provide telephone penetration rate data for Maryland and Virginia in comparison with D.C. Both tables show declines in telephone penetration rates for Maryland and Virginia between November 1983 and 1987, but these declines are smaller than those experienced in D.C. For example, according to the data contained in Table 2, between November 1983 and 1987, telephone penetration rates in Maryland fell 0.9 percentage point and by 0.6 percentage point in Virginia; less than the 2.3 percentage points decline in D.C. over the same period. Likewise, in Table 3, the percentage of households in Maryland and Virginia with telephones available fell slightly (by 0.1 percentage point) between November 1983 and 1987. In D.C. the decline was larger, 1.4 percentage points. Moreover, in November 1983, D.C. had the second highest telephone penetration rate among the three jurisdictions. For 1987 as a whole, D.C. ranked last.

4. Telephone penetration rates in the District of Columbia have declined while telephone penetration rates in the U.S., on average, have increased. (See Tables 2 and 3.)

Tables 2 and 3 also contain telephone penetration rate data for the U.S., on average. Both tables show some increase in telephone penetration rates for the U.S. between November 1983 and 1987 - 1.0 percentage point defining telephone penetration as the percentage of households with a telephone and 0.5 percentage point defining penetration as the percentage of households with a

telephone available. As a consequence of the apparent rise in telephone penetration rates nationally, on average, and the declines in D.C., the D.C. rates, which exceeded the national rates in November, 1983, are now only equal to the U.S. averages.

5. Substantial decreases in telephone penetration rates in the District of Columbia between March 1984 and March 1987 are evident for low and moderate income households (households with incomes under $40,000). (See Table 4.)

Table 4 contains telephone penetration rate data (defined as the percentage of households with a telephone) by income class for the months of March, 1984-1987. Data were readily available for only March each year. The data were derived from a special tabulation, performed at my request by Dr. Alex Belinfante at the FCC and is based on a sample of about 630 households in D.C.

According to Table 4, telephone penetration rates in D.C. fell 4.5 percentage points from March 1984 to March 1987. All of the income classes below $40,000 experienced a decline in telephone penetration rates and the declines were substantial for the lowest income classes (10 percentage points or more) and the $30,000 - $40,000 income class.

6. Substantial declines in telephone penetration rates are evident for all household sizes except one size between March 1984 and March 1987. (See Table 5.)

Table 5 provides information on the telephone penetration rates in D.C. by household size for the months of March, 1984-1987. These data were also obtained from a special tabulation by the FCC, at my request. All household sizes except 4 show declines in penetration rates over the full period. The larger household sizes (5 and 6) have some of the largest declines at 10-12%.

7. In most cases, Whites have the highest telephone penetration rates in D.C., followed by Blacks second, and Hispanics last. (See Table 6.)

Table 6 presents another special tabulation of telephone penetration rate data, this time by race. Before presenting the results, one major caveat should be noted. It appears that the number of Whites and particularly Hispanics in the survey is quite small; hence, the variances are likely to be large and the results are not statistically significant. Examples of these instances are the reported 100% penetration rate for Hispanics in November, 1985; the 53% rate for Hispanics in November, 1987; and the lower penetration rate for Whites than Blacks in November, 1987.

In general, however, Table 6 shows the telephone penetration rates of Whites are substantially higher than the rates for Blacks (3 to 7 percentage points higher). Moreover, the telephone penetration rates of Hispanics are well below the rates for Blacks.

The differential in telephone penetration rates among the three racial or ethnic categories is consistent with the relative ranking of the three races by income. According to the 1980 Census for D.C., the 1979 median household income of Whites was the highest - $21,955. Blacks ranked second at $13,860. Hispanics ranked third with $13,452.

8. The larger decline in telephone penetration rates in the District as opposed to Maryland or Virginia cannot be explained by differences in telephone rates among the three jurisdictions. Telephone rates in the District have been and continue to be lower than in Maryland or Virginia, except for the lifeline rates for senior citizens. (See Tables 7 and 8.)

Tables 7 and 8 compare local residential telephone rates in D.C., Maryland and Virginia for the years 1986 (Table 7) and 1988 (Table 8). Both tables show the rates on most D.C. services are lower than in Maryland and Virginia. For example, in 1986, the first line rate for flat rate service in D.C. was $15.61; in Maryland (urban) it was $17.19 and in Virginia it was $16.48. In 1988, the same service cost $14.94 in D.C., lower than the $16.67 in Maryland and $15.48 in Virginia.

Similar relationships hold for message rate service. In addition, the per message unit rate in D.C. has continued to be lower than in Maryland and Virginia; 6.6 cents in D.C. compared to 9 cents in Maryland and 10 cents in Virginia.

The only exception to these comparisons is lifeline rates for senior citizens. In 1986, only D.C. had a lifeline rate for senior citizens. By 1988, all three jurisdictions had such rates and the rates in Maryland and Virginia were lower than in D.C. although their call allowance is also lower than in D.C.

9. The trend in telephone penetration rates in D.C. appears to be at least partly explained by changes in D.C. telephone rates over the same period. (See Tables 2, 9, and 10.)

Telephone rates, including local residential rates, generally increased at the beginning of divestiture, effective January 7, 1984. Those residential rates are shown in Table 9, under 1984-1985. They represented a 41.5 percent nominal increase over the predivestiture rates. The full impact of these increases appears to have occurred by 1985 when the telephone penetration rate fell 1.1 percentage point from the predivestiture level in November 1983.

Effective January 1, 1986, as a result of the Commission's Order in F.C. No. 827, residential rates, among others, increased again (25% for flat and message services and 50% for D.C. service and Economy I service). Between 1985 and 1986, according to data contained in Table 1, telephone penetration rates declined another 1.4 percentage point from 93.6% to 92.2%.

As a result of the impact of the 1986 Federal Tax Law changes, telephone residential rates in D.C. declined, effective August 1, 1987, by 1.8%. Correspondingly, telephone penetration rates rose from 1986 to 1987 by 0.2 percentage point. Based on monthly data, penetration rates increased 1.9 percentage points from 92.1% in July, 1987 (just before the rates went into effect) to 94.0% in November 1987.

10. Residential telephone demand in D.C. appears to be price inelastic, with possibly more responsiveness to rate increases than to rate decreases. (See Table 10.)

Table 10 presents a crude estimate of the price elasticity of demand for residential telephone service in D.C. based on information contained in previously referenced tables. The formula for calculating the price elasticity of demand is the percentage change in demand divided by the percentage change in price. To this end, Column 1 contains the percentage changes in telephone rates in D.C. between 1983 and 1988. Percentage changes are calculated on two bases - nominal prices (those reported in Table 9) and real prices which are the nominal prices deflated by the consumer price indices for D.C. Real prices must be utilized for calculating the price elasticity of demand. Column 2 contains the percentage changes in demand. Demand is measured on the basis of the number of households with telephones, information obtained from Table 1. The figures in Table 1 are also adjusted for the variation in the total number of households over the period.

As can be seen in Table 10, based on the rate increases effective in 1984 with divestiture, the estimated price elasticity of demand is 0.2. For the rate increases effective January 1, 1986, the price elasticity of demand is 0.12. Although there was very little time between the next two rate changes (only 5 months), evidence from the November, 1987 survey suggests there was virtually no change in demand following the small rate decrease in August, 1987.

Although the overall price elasticity of demand estimates are low, the rates for low and moderate income households may be much higher. Moreover, as is evident from the information in Table 1, the low price elasticity of demand also does not mean that there are not substantial numbers of households who are without telephone service and these numbers are likely to grow as rates are increased.

11. Telephone penetration rates in the District of Columbia appear to be positively correlated with income. (See Table 11.)

As an illustration, telephone penetration rates are lower in low income wards and higher in high income wards. The one exception is Ward 5 which has the fourth lowest median household income and the sixth lowest (or third highest) telephone penetration rate. The ward 5 results could be explained by the introduction in 1986 of a low income tariff for senior citizens and the fact that ward 5 has a relatively large number of senior citizens.

Policy Implications

There are a number of policy implications from the above data and their analysis. These are listed as follows:

1. Price Elasticity of Demand. What is the price elasticity of demand for residential telephone service? The above data suggest residential demand, although price inelastic overall, is responsive to rate increases. In fact, use of the phrase "captive customers" for residential customers may be a misnomer; apparently, the demand by some residential customers is partly price elastic and is reflected by their leaving the network (involuntarily) and being without telephone service. A residential demand elasticity study (for the entire residential class and by income class) is greatly needed to clarify these issues.

Other telephone companies are conducting studies of the impacts of price changes on residential telephone demand and on residential penetration rates. As an example, Pacific Bell has engaged the National Economic Research Associates (NERA) to prepare such a study. A brief description of their results is contained in Attachment 1. I have requested a copy of the study and will distribute it as soon as it is received.

C&P needs to conduct such a study. In F.C. No. 827, under cross-examination by Commissioner Long, C&P Witness Vincent Scott indicated the Company was "making plans." (See the transcript pages 3496 and 3497 in Attachment 2.) Immediately after the hearing, Mr. Reiser and I met with Mr. Scott and subsequently with Mr. Scott, Mr. Alan Sprinkel from NSI, and staff from Bell Atlantic's Business Research Unit. Mr. Sprinkel explained his proposed research design for a study which would gather data on residential customers before the rates went into effect and again after the rates went into effect. About 6-9 months later, I asked Mr. Scott what was the status of the study. He informed me at that time that the pre rate increase data had not been collected as planned and therefore no study was underway.

Since that time, I have had several discussions with C&P staff on the issue. Last year, I learned C&P had conducted a residential demand study in 1986. I requested a copy of the study. After some delay, I received a copy in December, 1987. One major problem with the study is the racial and income characteristics of the sample. Nearly half of the respondents are white (in a city which is 70% black) and the median income is too high, between $25,000 and $35,000. By these measures, I do not consider the sample representative of the city population or of C&P's D.C. customer base. I do not know whether C&P intends on filing this study with the Commission at some later date but if it does, I will have serious problems with it.

Mrs. Barbara Woods and I attended the Bellcore sponsored Telecommunications Demand Modeling conference in Florida in February, 1988. Mrs. Woods had an opportunity to learn what other local exchange companies and regional Bell operating companies were doing and the level of sophistication. She made some valuable contacts, even within Bell Atlantic. Moreover, we both learned a National Telecommunications Demand Study is being planned and Bell Atlantic is to participate. Subsequent to her attendance at the conference, she arranged for C&P of D.C. to participate in the study. However, the information from that study is not likely to be available for several years.

Given the above, to my knowledge, as of this time C&P has not conducted an adequate residential demand elasticity study. I therefore recommend the Commission order C&P of D.C. to conduct a new residential demand elasticity study and to submit it in the next rate case, if not before. C&P should obtain input from Staff on the sample size and research design.

2. A Disconnect Study. The decline in telephone penetration rates in D.C. suggests a need to analyze the number of disconnects over the 1983-1988 period. I recommend the Commission order C&P of D.C. to undertake such a study. According to the March, 1988 Monitoring Plan of the FCC, (see pages 44-46 in Attachment 3) telephone companies in other states have performed such studies. In fact, Bell Atlantic recently conducted a study of C&P of Virginia territory. I also recommend, if C&P conducts a disconnect study, that the Company consult staff on the sample size and research design before the study is undertaken.

3. Subscriber Line Charge (SLC) Impact. The SLC is to be increased in December 1988 by 60 cents from $2.60 to $3.20. The data for D.C. suggest there could be a substantial adverse impact on residential demand if the regressive "tax" proposal is implemented in the context of already declining or stagnant

telephone penetration rates. Perhaps the Commission should seek a waiver for the SLC from the FCC for low-income households as has recently been done in Virginia. (See Attachment 4.)

4. Lifeline Rate Impact. The evidence in Tables 1-11 suggests there may be a need for a lifeline rate which is not exclusively for only senior citizens to stem the declining tide in telephone penetration rates, particularly among the low income.

Table 1

NUMBER OF HOUSEHOLDS WITH AND WITHOUT TELEPHONES IN D.C.

November, 1983 - 1987

Monthly	Total Number of Households 000's	Number of Households With Phone 000's	Number of Households Without Phones 000's
November 1983	266	252	14
March 1984	255	245	10
July 1984	263	245	18
November 1984	275	261	14
March 1985	255	234	21
July 1985	248	232	16
November 1985	264	252	12
March 1986	263	242	21
July 1986	267	250	17
November 1986	262	239	23
March 1987	270	246	24
July 1987	276	254	22
November 1987	270	254	16
Annually			
November 1983 (Benchmark)	266	252	14
1984	264	250	14
1985	256	239	17
1986	264	244	20
1987	272	251	21

Source: FCC and U.S. Bureau of the Census

Table 2

PERCENTAGE OF HOUSEHOLDS WITH A TELEPHONE:
D.C., MARYLAND, VIRGINIA & U.S. AVERAGE

Date	DC	MD	VA	U.S. Average
Nov. 1983	94.7	96.3	93.1	91.4
March 1984	96.1	96.1	93.2	91.8
July 1984	93.5	94.9	93.0	91.6
Nov. 1984	95.1	96.1	92.9	91.4
March 1985	91.6	95.2	92.8	91.8
July 1985	93.6	96.2	90.4	91.8
Nov. 1985	95.6	95.3	92.0	91.9
March 1986	91.9	95.7	92.0	92.2
July 1986	93.6	95.6	91.3	92.2
Nov. 1986	91.1	95.9	92.9	92.4
March 1987	91.2	96.2	92.9	92.5
July 1987	92.1	94.2	92.7	92.3
Nov. 1987	94.0	96.0	91.9	92.3
Percentage Point Change (Nov. 1983 - 1987)	(0.7)	(0.3)	(1.8)	0.9

Annual

Nov. 1983	94.7	96.3	93.1	91.4
1984	94.9	95.7	93.1	91.6
1985	93.6	95.5	91.7	91.8
1986	92.2	95.7	92.1	92.3
1987	92.4	95.4	92.5	92.4
Percentage Point Change (Nov. 1983 - 1987)	(2.3)	(0.9)	(0.6)	1.0

Source: FCC/US Bureau of the Census data as contained in the March, 1988 Monitoring Plan

Table 3

PERCENTAGE OF HOUSEHOLDS WITH A TELEPHONE AVAILABLE:
D.C., MARYLAND, VIRGINIA & U.S. AVERAGE

Date	DC	MD	VA	U.S. Average
Nov. 1983	95.6	96.7	94.7	93.7
March 1984	97.5	96.9	95.1	93.6
July 1984	95.4	95.7	95.6	93.8
Nov. 1984	96.0	96.8	94.6	93.6
March 1985	93.5	96.2	94.5	93.7
July 1985	94.9	98.1	92.3	93.9
Nov. 1985	97.4	95.9	94.5	94.0
March 1986	93.3	96.6	93.7	93.9
July 1986	94.8	96.8	93.7	94.0
Nov. 1986	93.9	96.7	94.9	94.4
March 1987	93.1	96.5	94.8	94.3
July 1987	94.2	96.1	94.5	94.2
Nov. 1987	95.4	97.3	94.3	94.3
Percentage Point Change (Nov. '83 - Nov. '87)	(0.2)	0.6	(0.4)	0.5

March 88 95.2 97.4 96.2 94.6
July 88 95.3 96.9 95.2 94.6

Annual

Nov. 1983	95.6	96.7	94.7	93.7
1984	96.3	96.5	95.1	93.7
1985	95.2	96.7	93.8	93.9
1986	94.0	96.7	94.1	94.1
1987	94.2	96.6	94.6	94.2
Percentage Point Change ('83-'87)	(1.4)	(0.1)	(0.1)	0.5

Source: FCC/US Bureau of the Census data as contained in the March, 1988 Monitoring Plan

Table 4

TELEPHONE PENETRATION RATES FOR D.C. CUSTOMERS BY INCOME CLASS

Income Classes ($)	March 1984 %	March 1985 %	March 1986 %	March 1987 %	Percentage Point Change 1984 - 1987
Less than 10,000	92.5	85.2	83.5	80.0	(12.5)
Less than 15,000	92.5	87.4	83.7	82.5	(10.0)
15,000 - 19,999	97.8	91.7	91.5	91.7	(6.1)
20,000 - 30,000	97.2	91.5	97.6	95.3	(1.9)
30,000 - 40,000	98.6	97.4	94.4	87.9	(10.7)
*40,000 - 50,000	100.0	97.9	94.8	100.0	-
50,000 +	98.2	97.6	100.0	99.1	0.9
TOTAL	95.9	92.0	91.9	91.4	(4.5)

*Sample size is very small, hence variance is large and result is not statistically significant.

Source: Derived on the basis of a special computer run of FCC/Bureau of the Census data as contained in the March, 1988 Monitoring Plan.

Table 5

TELEPHONE PENETRATION RATES FOR D.C. CUSTOMERS BY HOUSEHOLD SIZE

Household Size	March 1984 %	March 1985 %	March 1986 %	March 1987 %	Percentage Point Change 1984 - 1987
1	96.2	92.8	92.4	92.4	(3.8)
2	96.3	93.0	95.5	93.8	(2.5)
3	94.7	89.5	89.2	82.4	(12.3)
4	94.9	86.8	88.6	96.3	1.4
5	96.7	96.5	88.6	84.9	(11.8)
6 +	95.4	93.2	77.7	85.3	(10.1)
TOTAL	95.9	92.0	91.9	91.4	(4.5)

Source: Derived on the basis of a special computer run of FCC/ Bureau of the Census data as contained in the March, 1988 Monitoring Plan.

Table 6

TELEPHONE PENETRATION RATES IN D.C. BY RACE

(November 1985 - November 1987)

Date	White		Black		Hispanic	
	No. of Households	% with Phones	No. of Households	% with Phones	No. of Households	% with Phones
Nov. 1985	84,000	97.6	174,000	94.4	7,000	100.0
March 1986	87,000	96.6	169,000	89.9	10,000	87.6
July 1986	88,000	98.1	173,000	91.1	9,000	86.2
Nov. 1986	80,000	94.9	175,000	89.5	8,000	86.6
March 1987	94,000	95.1	167,000	89.8	11,000	84.7
July 1987	98,000	96.2	172,000	90.9	11,000	75.4
Nov. 1987	95,000	93.2	167,000	95.1	6,000	53.3

Source: **FCC** Same as Tables 4 & 5.

Table 7

Comparison of Typical Rates and Charges in the C&P Companies

C&P Local Exchange Service Rates
(Year - 1986)

	D.C. ß	MD		VA		W.VA	
		Urban	Rural	Urban	Rural	Urban	Rural
Rate Group		A	B	B	1	3	1
Residence	First Line / Additional Line						
Flat Unlimited Service	$15.61 / $17.61	$17.19	$15.92	$16.48	$9.57	$23.39	$19.10
Message Rate Service	7.98(60) / 9.98(60)	9.90(65)	11.35(65)	9.20(50)	7.25(50)	10.85(45)	10.85(45)
DC Service	9.57 / 11.57	-	-	-	-	-	-
Economy Service	4.67 / NA	6.10	6.10	5.00	5.00	6.80	6.80
Lifeline Service	4.00(60) / NA	-	-	-	-	-	-
Dial Tone Line (Metro)	- / -	6.10	7.95	5.00	5.00	-	-
Message Unit Charge (Individual Line Svc.)	6.9¢	9¢	9¢	10.6¢	10.6¢	10¢	10¢
Business							
IMB Line/PBX Trunk	12.00 / 12.00	11.40	13.80	11.00	13.00	20.00	20.00
Semi-Public Line	14.00 / 14.00	34.80	36.80	31.25	18.95	27.00	27.00
Dial Tone Line (Metro)	- / -	11.40	13.80	11.00	13.00	-	-
Message Unit Charge	6.9¢	10¢	10¢	10.6¢	10.6¢	10¢	10¢

ß Rates and charges exclude Gross Receipts and Subscriber Line Factor Surcharges.

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Table 8

1988 RESIDENTIAL TELEPHONE RATES - D.C., MD & VA

Service	D.C.($)	MD ($)	VA ($)
Flat Rate (1st line)	14.94	16.67	15.48
Message Rate (1st line)	7.64 (60) 1/	9.38 (65) 1/	8.90 (50) 1/
DC Service (1st line)	9.16	-	13.38
Economy I 3/	4.47	5.58	5.00
Economy II (Senior Citizens)	3.83 (60) 1/	2.79 (30) 1/ 2/	2.50 (30) 1/

1/Numbers in parentheses represent the free call allowances. Thereafter, a call costs 6.6 cents in D.C., 9 cents in Md., and 10 cents in Va.
2/Fifty percent discount on the first 30 calls.
3/Each call costs 6.6 cents in D.C., 9 cents in Md., and 10 cents in Va.

Source: C&P Telephone of D.C. - Tariff Schedules

Table 9

RESIDENTIAL TELEPHONE RATES FOR D.C. CUSTOMERS, 1983 - 1988

Service	1983[2/]	1984 & 1985[3/]	1986[4/]	1987[5/]	1988[6/]
Flat Unlimited	8.83	12.49	15.61	15.33	14.94
Message Rate [1/]	4.51	6.38	7.98	7.84	7.64
D.C. Service	4.51	6.38	9.57	9.40	9.16
Economy I	2.20	3.11	4.67	4.59	4.47
Economy II (Senior Citizens) [1/]	-	-	4.00	3.93	3.83

1/Includes a 60 call allowance
2/Effective November 13, 1982
3/Effective January 7, 1984
4/Effective January 1, 1986
5/Effective August 1, 1987
6/Effective January 1, 1988

Source: C&P Telephone of D.C. - Tariff Schedules

Table 10

COMPARISON OF CHANGES IN D.C. RESIDENTIAL RATES AND TELEPHONE DEMAND, 1983-1988

Period	Percentage Change in Telephone Rates	Percentage Change in Number of Households with a Telephone	Price Elasticity of Demand
1983 to 1984/85	41.5% Nominal Price Increase 29.5% Real Price Increase	5.8% Decrease	.20
1984/85 - 1986	25% Nominal Price Increase (flat & message rate) 17.1% Real Price Increase[1/]	2.0% Decrease	.12
	50% Nominal Price Increase (D.C. service & Economy I) 42.7% Real Price Increase[1/]		
1986 - 1987	1.8% Nominal Price Decrease 5.0% Real Price Decrease[1/]	0	0
1987 - 1988	2.5% Nominal Price Decrease	NA	NA
Overall			
1983 - 1987	Nominal Price		
Flat Rate	73.6% Increase		
Message Rate	73.8% Increase		
D.C. Service	10.8% Increase		
Economy I	10.9% Increase		
Economy II	-		

NA - Not available

1/Nominal prices are adjusted by the consumer price index

Sources: Derived from data contained in Tables 1 and 9

Table 11

MEDIAN HOUSEHOLD INCOME & TELEPHONE PENETRATION RATES
BY WARD IN THE DISTRICT OF COLUMBIA

Ward	1980 Median Household Income	1987 Median Household Income	1987 Penetration Rates
8	$12,747	$17,865	87.6
1	12,997	18,215	91.6
7	14,470	20,280	91.8
5	15,262	21,390	92.1
2	15,567	21,817	91.9
6	16,365	22,936	91.2
4	18,970	26,587	94.7
3	25,167	35,271	96.1
Overall	$16,211	$22,720	92.4

Sources: The 1980 income data were obtained from the D.C. Office of Planning. The 1987 income data were calculated by multiplying the 1980 figures by the consumer price indices for D.C., 1981-1987. Telephone penetration rates were obtained from C&P.